

Chapter 9

Bridging Environmental Sustainability and Quality of Life in Metropolitan Atlanta's Urban Communities

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Abstract Quality of life (QOL) is a central concern in urban planning, given the profession's orientation towards advancing the public well-being. This study develops a multi-attribute Quality of Urban Life (QoUL) Index to compare and track place-based amenities and the state of public welfare in cities within the Atlanta region. Of particular interest is the examination of QoUL in relation to an Urban Environmental Sustainability (UES) Index, which offers important insights about whether and how sustainability contributes to quality of life.

The Increasing Role of Quality-of-Life Studies

Advances in technology and transportation have allowed us to easily transcend the physical boundaries of our communities; yet we are becoming increasingly cognizant of the impact of our local built, social, and natural environment on the quality of our day-to-day lives (Kates and Wilbanks 2003). There has been a return, in academia and in the media, to examining the fundamental structures of local societies within a comparative context (Castells 2002). This exploration of the various physical and cultural attributes within our cities expands our understanding of how sustainable choices can grow our economic, social and personal assets in the long run.

There has been some debate in the literature about how the pursuit of sustainability can enhance quality of life (Gottlieb 1995; Moser 2009; Portney 2003). Although the Brundtland Report (World Commission on Environment and Development 1987) laid out the framework for sustainable development as "...development capable of

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satisfying the needs of the present generation without compromising the ability of future generations to satisfy their own needs” (p. 43), it was careful to emphasize that such development must enhance human individual and collective well-being. However, others have acknowledged that unsustainable resource use may impact quality of life differentially at different parts of the globe (Berke 2002). That is, unsustainable resource use often supports high quality of life in locations distant from the source of the resource. Clearly, individual well-being can be often divorced from collective development of environmental qualities such as pollution, biodiversity, and mobility (Steg and Gifford 2005). In addition, the concept and measures of quality of life differ among cultures and groups (Maslow 1954; Gatersleben 2000; Vlek et al. 1999; Steg and Gifford 2005). The role of sustainability in quality-of-life assessments varies based on how much value individuals or groups associate with it. Therefore the relationship between quality of life and sustainability is contingent upon the specific ways quality of life and sustainability are measured and how they relate to the populations being described. Regardless, place-based measures of both quality of life and sustainability can better inform individuals’ household location choices and aid policymakers to better identify specific community projects that enhance livability according to community needs.

Both sustainability and quality of life are malleable concepts that are difficult to precisely define (Szalai 1980; Romney et al. 1994; Diener and Suh 1997; Cutter 1985). They are employed in wide and varying manners dependent on different disciplines’ perspectives. The concern about sustainability stems from the notion that the earth’s resources are limited or that such resources regenerate more slowly than they are being used. Many economists allay this concern by suggesting that resource scarcity often triggers compensatory behavioral responses such as substitution and innovation. Hence, according to this economic perspective, improving quality of life does not necessarily entail sustainability. Ecologists, on the other hand, adopt a more expansive perspective of sustainability as maintaining the health of the ecological system. This broader concept is based on a systems view of ecological processes in which such systems are intimately connected in complex ways. This connectedness of different parts of the system implies that impacts on one component propagate through the system. Therefore, degrading one part of the system may have several unintended and unanticipated consequences that compromise ecosystem health. In this view, sustainability is fundamental to perpetuating the quality of human existence, albeit, in harmony with the environment.

Although various disciplines construct different conceptualizations of quality of life, they all converge on the broad principle of measuring the well-being of individuals within the context of their environment. Whereas health sciences tend to assess health-related quality of life for individuals or cohorts, social sciences employ varied approaches with discrepant dimensions, such as: cost-of-living indices and other economic analysis; degree of ‘liveability,’ a term for which varied definitions abound; psychological or perception basis; well-being evaluations at differing levels of totalities, both global and domain-specific; and idiographic, comparative,

and personal assessments of life quality. In planning, however, an imperative focus is on the well-being and development of the community. Myers (1988) has distinguished the planning conception of community QOL from models employed in other disciplines in order to highlight the developmental process of community well-being. Likewise, Marans (2003) and Sirgy et al. (2010) articulate the need for community-based QOL, given that it is a context-dependent concept. Place-based studies are essential to the planning profession because planners seek to design and implement strategies that enhance community well-being. The planner is able to rely on indicators of community well-being to understand attributes of significant impact, identify needed improvements, and anticipate negative trends.

Quality-of-life work at its core is conceptualized in two forms: the objective and the subjective. Much research, such as Ben-Chieh Liu's (1975, 1977) foundational studies on U.S. metropolitan cities, has focused on an objective approach, and entails exhaustive, data-driven evaluations of social, economic, and environmental conditions. The complement to this vein of study is the utilization of resident satisfaction and perceptions to underpin quality-of-life research, such as the ones pioneered by Campbell et al. (1976). Cutter (1985), Wish (1986), Rogerson et al. (1989), and others propose a third way forward, one that has gained traction in recent years. Wish originated a cogent argument for fusing the 'psychographic' and 'demographic' in a single QOL evaluation. Rogerson et al. (1989) cultivated a superior framework from the rudiments of Cutter's work for applying a subjective weighting scheme to objective indicator measurements of QOL. Given that studies such as Cummins' (2000) show there is often divergence between objective and perceptive QOL, an integrated research structure is deemed essential to bridging these two spheres and accurately capturing a complete representation of life quality.

Guhathakurta and Cao's (2011) study of metropolitan Phoenix is a model that employs the integrated approach in constructing a QoUL index. Their study collected objective indicator measurements and melded public opinion survey data taken from metropolitan Phoenix residents to properly weigh attributes of QoUL. In contrast to Guhathakurta and Cao's work, this study expands upon traditional quality-of-life concerns to focus specifically on urban environmental quality from a sustainable development perspective. In so doing, we gain further insight into the interactive effects of our built environment and our overall well-being. Marans (2003) argues that to develop an understanding of environmental quality of places, it is useful to couch such issues within a quality-of-life research framework. Merging QoUL and UES in communities is possible when the emphasis is on improving mutually beneficial attributes. To create vibrant, liveable, and sustainable places requires not only urbanization through densification and other physical determinants, but also enhancement of valued community elements that will engender greater desirability for sustainable environments (Howley et al. 2009). It is expected that capitalizing on the interplay between UES and QoUL will augment quality of place in the long-run. This could serve as a key strategy to address the planners' goals of community development.

The Inimitable Attributes of Metropolitan Atlanta

Atlanta bears the status of a great American city, with a rich and tumultuous history that continues to impact its region to this day. The city was burned to the ground during the civil war but came up from the ashes to become the “Gateway to the South.” By 1895 Atlanta had evolved into the “Capital of the New South” (Rice 1983, p.31) as a major transportation hub and center for commercial and industrial development. Over the past decades the city region grew outwards rather than up, experiencing typical twentieth century patterns of sprawl due to innovations in transportation and the rise of the suburban ideal. Atlanta’s metropolitan region has grown continuously since the 1900s although the city of Atlanta itself has experienced a steady decrease in its portion of the metropolitan population. The boundaries of the metro region doubled in the 1990s and the Northern suburbs began to receive the lion’s share of both population and jobs (Lee 2011). The flight of jobs and middle-income residents to the northern suburbs exacerbated racial polarization in housing, schools, and jobs. Even today the region is characterized by an increasingly black and poor south-central Atlanta encircled by mostly white middle-income suburbs.

The US Census Bureau reports that the South is the fastest growing region in America, jumping by 14.3 %, or over 14 million people, from 2000 to 2010. Georgia on its own added 1.5 million to the population in the past decade. The Atlanta metropolitan region is the 9th most populous metropolitan area in the United States, the largest in the south, and home to about 5.3 million individuals as of 2010. The city of Atlanta has 420,000 or 8 % of the metro area population. None of the other cities are 100,000 or more in population although there are many of them. The four largest cities after Atlanta are Sandy Springs (93,853), Roswell (88,346), Johns Creek (76,728), and Alpharetta (57,551) (U.S. Census Bureau 2010a). The median size of the cities in the Atlanta metro region is about 12,000 persons. Although diminishing in importance over time, metropolitan Atlanta continues to be the physical, cultural, and economic core of this rapidly evolving mega-region, and thus makes an interesting case for studying urban environments and their influence on quality of life.

Methodological Dimensions

This study assesses Quality of Urban Life (QoUL) within metropolitan Atlanta in order to discern patterns and variations in livability among its incorporated places. A Quality of Urban Life Index is constructed that allows for clear comparisons among cities in the metropolitan region. An auxiliary Urban Environmental Sustainability Index is also generated to educe interrelationships between quality of life and environmentally sustainable modes of living. Results yielded by this study indicate a discrepancy between urban life quality and environmental sustainability in the Atlanta Region. However, improvements in urban infrastructure hold the potential to increase both quality of life and sustainability for current and future generations.

The motivations behind this study are threefold: first, to produce a QoUL index that evaluates and compares urban places in metropolitan Atlanta; second, to identify patterns and variations in both QoUL and sustainable living; and third, to determine whether high quality of life and sustainable modes of living are spatially contingent.

The ten inner counties of metropolitan Atlanta, known as the core counties, comprise the spatial extent of the study area. This extent is identical to the Atlanta Regional Commission's (ARC) regional planning domain. This metropolitan boundary delimits the communities in the region that have strong connections to the city center.

Determination of the proper unit of analysis was critical in ensuring that comparability remain valid across the urban region. A number of concerns were deliberated upon, such as the repressing issue in spatial analysis of the Modifiable Areal Unit Problem (MAUP). As well, both availability of data and functionality were considered. One principal objective was to arrive at a format and a unit of analysis that can be updated over time more frequently than the 10-year census cycle. In addition, we intended the chosen unit of analysis to be unambiguous, clearly identifiable, and relevant for policy-making. Cities are places that have a definitive identity and some administrative autonomy. The American Community Survey, which conducts a survey of all incorporated places (cities) above 20,000 at least every 3 years and all places every 5 years, is an ideal source of data that is updated at a reasonable frequency. Thus, cities were chosen as the spatial unit of analysis, inclusive of all incorporated places above a population threshold of 5,000. This minimum eliminates those cities that do not maintain general administrative autonomy, as many below this threshold rely on counties or neighboring cities to provide basic municipal services. Moreover, results from this study are applicable only at the level that they are assessed at in order to avoid the problem of "ecological fallacy". That is, QoUL statistics cannot be inferred for partial areas, and are applicable only to the city as a whole. The final set of cities for QoUL analysis includes the 50 cities shown in Fig. 9.1. The only peculiarity in the data set is the city of Dunwoody, which is included in this study, although it was not formally incorporated until 2008.

It must also be noted that the results from this study are reflective of only the time period from which the data is sourced, 2004–2011. Additional points in time may eventually be assembled for future study in order to examine longitudinal trends. For now however, this temporal window allows for the incorporation of data averaged or estimated over multiple years, such as that provided by the American Community Survey (ACS) and the Georgia Department of Public Health (GDPH).

Quality of Urban Life and the Multi-attribute Approach

QoUL indicators capture those factors that are both responsive to and indicative of our overall urban environment. Moreover, the indicators embody the connection between the QoUL attributes and the local community, and thus must deliver location-specific data. A special consideration in choosing QoUL indicators for cities within a metropolitan region is that city boundaries are less relevant for particular

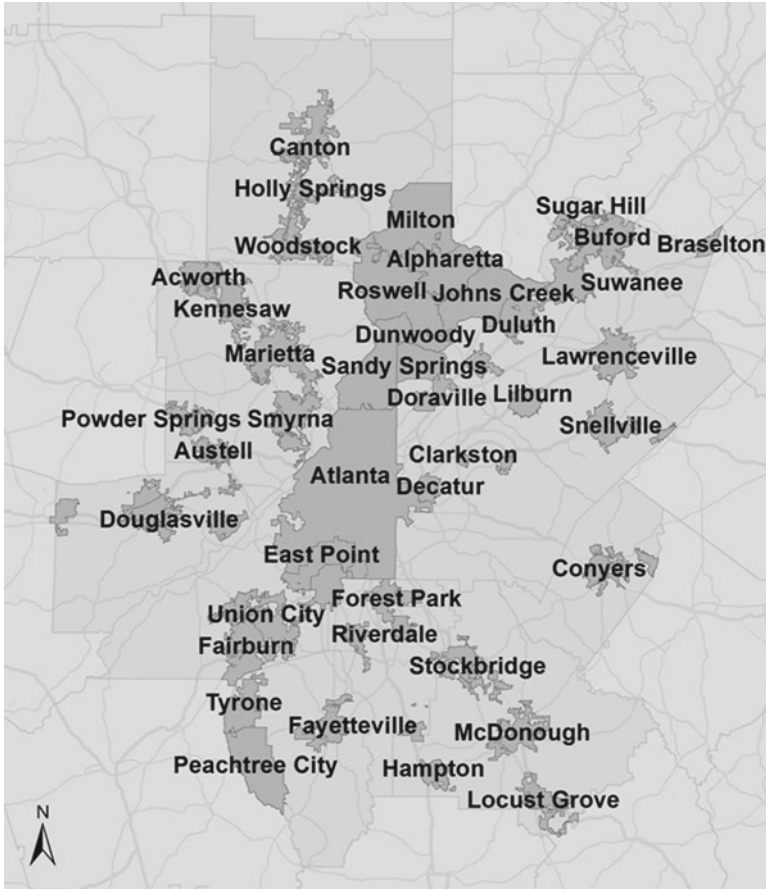


Fig. 9.1 Cities and counties in the metropolitan Atlanta region (Source: U.S. Census Bureau 2010b. Image produced by authors)

types of indicators. For example, large entertainment venues such as ballparks, symphonies, operas, and theme parks cater to metropolitan wide inhabitants (Guhathakurta and Cao 2011). Similarly, the effects of point-source pollution can be problematic to people downstream or downwind and not just to locals. Such spillover effects can confound the assessment of a city's quality of life. In this study, we only concentrate on those indicators for which substantial benefits can be attributed mostly to the local city residents. However, we have used access to greenspace, supermarkets, and other activity centers as measures of local amenities despite the fact that people generally access the closest location which may be within a nearby city rather than the city of one's own residence. Proximity to such amenities does augment the quality of life of the community, whether the amenities fall within the city boundary or closely outside of it. Therefore, the approach we adopted was to determine the percentage of households in a city that are within a reasonable distance of such amenities (separately determined for each amenity), regardless of their location.

Table 9.1 QoUL indicators and measures

Indicators	Measures
Amenities	Access to activity centers Low access to food Greenspace access
Economy	Household incomes Poverty rate Unemployment rate Jobs in highest paying sectors Jobs in lowest paying sectors
Education	High school attainment Bachelor degree attainment
Health	Cancer-related mortality rates Cardiovascular-related mortality rates Behavioral-related mortality rates
Housing	Median home values Homeownership rates Rental rates
Public safety	Violent crime rates Crime rates
Transportation	Mean travel times to work Transit access

Source: Authors

In endeavoring to produce a wholly comprehensive, multidimensional index, seven indicators were ultimately chosen: economy, health, housing, public safety, education, amenities, and transportation. These seven indicators are based on a number of previous studies that have derived objective indicators to examine variation in QoL within a metro region (Guhathakurta and Cao 2011; Tazebay et al. 2010; Das 2008). We applied four criteria to determine the applicability of these indicators to our study area. First, the data should be available from public sources and updated at a reasonable frequency (5 years or less). Second, the indicator should be relevant to Atlanta metro residents (i.e., substantial variation exists within the region). Third, the chosen indicators should be policy relevant. And finally, as discussed earlier, the indicators should be applicable to sub-regional places (cities) within the metro area. Multiple measures for each indicator are utilized to ensure that each aspect of QoUL is sufficiently accounted for. Concrete, long-term, or output measures are employed wherever possible to minimize ambiguity or inaccuracy. Furthermore, all statistics chosen are related to city populations to ensure comparability. Observations for all measures are normalized to produce standardized scores, and each bundle of measures is then aggregated. The result of this process yields scores by city for each of the seven indicators outlined in Table 9.1.

Housing

Housing is a fundamental aspect of quality of life, as a form of shelter, an asset, and an investment. Housing, as with other attributes, is not an isolated facet of QoUL,

Table 9.2 Housing measures and ranking

City	Median home values (\$)	Median rent (\$)	Homeownership (%)	Housing ranking
Milton	466,400	868	73.9	1
Decatur	337,300	657	63.3	2
Tyrone	270,900	775	85.7	3
Hampton	138,200	568	77.3	4
Sandy Springs	452,700	828	47.6	5
Roswell	304,000	812	66.9	6
Austell	147,900	629	70.1	7
Fayetteville	202,700	754	73.4	8
Holly Springs	183,600	779	79.3	9
Acworth	172,700	694	69.0	10
Peachtree City	277,600	891	76.2	11
Alpharetta	331,700	888	65.0	12
Buford	179,500	624	56.3	13
Villa Rica	154,000	623	60.8	14
Lilburn	177,300	705	66.6	15
Locust Grove	134,100	734	77.4	16
Johns Creek	342,200	1,028	79.6	17
Loganville	161,100	728	69.6	18
Canton	170,100	660	56.9	19
Braselton	267,100	1,025	88.8	20

Source: American Community Survey [ACS] (2009b)

but spills into other aspects that influences overall well-being. For example, housing measures often correlate with economic measures, such as income and poverty. Additionally there are generally tradeoffs between housing and transportation, two principal household expenses. This study attempts to create discrete categories for each attribute in order to avoid double-counting various aspects, however it is recognized that QoUL attributes are interlaced.

Three items for the housing indicator are considered: median home values, homeownership rates, and rental rates. While higher homeownership and median home values are desirable, low rental rates are more preferable because affordability is valued. A number of more affluent communities to the north of the city of Atlanta-Milton, Sandy Springs, Dunwoody, Alpharetta, Johns Creek, and Roswell- stand out on the list in Table 9.2, with median home values upwards of \$300,000, and some exceeding \$400,000. The only geographical outlier in this top tier is Decatur, a small city to the east of Atlanta that has a distinct character, yet is regarded as more of a neighborhood within the central city than a neighbor to it. Milton and Decatur also top the list for housing overall, followed by two small cities, Tyrone and Hampton, and then Sandy Springs, a large and more affluent city that lies just outside the “perimeter” of I-285 which encircles Atlanta. Rental rates are most affordable in Hampton by a fair margin, with median prices costing only \$568 per month. Homeownership in the region is quite variable, with percentile rates as low as 21.6 % in Clarkston and 25.6 % in College Park, to an 88.8 % peak in Braselton.

Table 9.3 Economic measures and ranking

City	Median household incomes (\$)	Poverty rate	% jobs in highest paying sectors	% jobs in lowest paying sectors	Unemployment rates	Economy ranking
Johns Creek	106,545	4.4	42.8	31.2	6.1	1
Alpharetta	95,888	3.1	43.5	33.3	4.7	2
Milton	117,608	4.7	35.4	36.4	5.0	3
Dunwoody	87,227	4.8	46.2	32.4	5.3	4
Sandy Springs	76,477	7.0	45.7	28.6	4.4	5
Norcross	53,060	9.4	46.3	25.4	6.8	6
Peachtree City	93,072	4.1	17.8	35.5	4.3	7
Suwanee	83,258	5.5	32.4	37.7	7.9	8
Roswell	79,733	7.4	34.4	41.6	5.4	9
Tyrone	77,457	3.0	17.4	33.8	5.0	10
Duluth	61,920	7.1	35.8	37.9	4.5	11
Smyrna	55,468	13.7	34.2	32.6	7.2	12
Chamblee	46,460	23.0	35.0	26.2	4.6	13
Sugar Hill	74,725	8.7	23	44.3	9.5	14
Holly Springs	66,879	3.5	10.8	48.3	4.7	15
Fayetteville	54,230	3.9	12.1	47.8	4.4	16
Woodstock	62,907	7.3	17.7	53.4	5.8	17
Marietta	45,428	16.1	22.7	34.4	7.3	18
Decatur	69,669	15.4	10.8	36.2	8.1	19
Kennesaw	62,149	7.7	19.9	46.1	10.3	20

Sources: ACS (2009a, 2010a) and Atlanta Regional Commission [ARC] (2009c)

Economy

Economy is explicitly tied to the quality of life that we lead. Diener and Suh (1997) argue that economy is a significant driver of life quality, explaining much of what social indicators measure. The economy indicator is of particular interest in this study because the time frame used encapsulates the period during which the 2008–2009 economic recession hit. Therefore the numbers seen in this case may appear disjointed if placed in a larger temporal perspective. The economic downturn serves somewhat as a backdrop for this QoUL snapshot, impacting other attributes as well, such as housing.

The economy indicator measures financial health as well as robustness of local economies. Much research has shown the multiplying effects of economic deprivation on quality of life (Kawachi and Kennedy 1999); likewise, strength of economy is shown to contribute a resilience that is beneficial and extremely critical in urban areas (Layton 2009). The economic attribute captures both the economic stresses and strengths of the cities in the region. The results produced in Table 9.3 are median household income and poverty rates, sourced from the ACS 2005–2009 estimates, and unemployment rates, from ACS 2006–2010 estimates. The range of median household incomes by city is quite broad, ranging from \$30,116 in Clarkston, to

Milton's \$117,608. The communities of Clarkston, College Park, Forest Park, and Stone Mountain rank poorly for unemployment rates for worker populations ages 16 and over. Peachtree City, Fayetteville, and Sandy Springs Duluth, Chamblee, Alpharetta Holly Springs all have extremely low unemployment rates, below 5 %. Percentages of jobs in the five highest-paying sectors and five lowest-paying sectors both approximate employment prospects within each city. Both of these two statistics are collected from ARC's 2009 employment data at the census tract level, and are thus aggregated to the city level. The job rates in both the lowest paying and highest paying sectors are lowest in the city of Hapeville.

Amenities

The amenities attribute evaluates accessibility of resources in the urban environment. Access to three basic amenities is considered: food retail outlets, greenspace, and activity centers. The statistics for access to greenspace were derived in ArcGIS from a parks and recreational facilities shapefile from the Atlanta Regional Commission. Quarter-mile buffers were produced for each facility. Estimates of population totals falling within buffer zones were calculated with the aid of Census block population data and a Tiger/Line shapefile from the 2010 Census. Populations with greenspace access were then converted to a percentage rate based on total city populations. Figure 9.2 illustrates the spatial calculation process.

Manifold benefits have been attributed to greenspace proximity. Increased access corresponds with increased usage, although other factors also affect usage, such as wealth and social cohesion (Jones et al. 2009; Seaman et al. 2010). Mitchell and Popham (2007) and van Leeuwen et al. (2010) have documented such positive impacts on quality of life as added economic value, increased health, and improved efficiency and functionality of urban spaces. Table 9.4 shows the results for the amenities measures. Three communities, Hapeville, Clarkston, and Decatur, stand out in the region with decent access to parks and recreational areas for more than 60 % of city residents.

A similar task was carried out for access to main activity centers, using another shapefile provided by ARC. The file is a digitized map of orthophotography that identifies traditional municipal downtowns and significant regional centers in the Atlanta region. Those with low access were determined by identifying the percentage of populations that live no further than 2 miles from main activity centers. Proximity to activity centers provides access to other basic needs such as clothes and household items, as well as increasing convenience and entertainment options. Most notably, the community of Braselton lacks any activity center as classified by ARC within 2 miles of its city limits, and thus receives a 100 % score for low access.

Statistics on low food access were sourced from the U.S. Department of Agriculture's (USDA) food desert locator tool, which presents multiple data by census tract. Low food access statistics were collected for the 10-county region and then aggregated to cities. The USDA defines 'low access' as greater than 1 mile from the nearest supermarket or large grocery store in urban areas and greater than

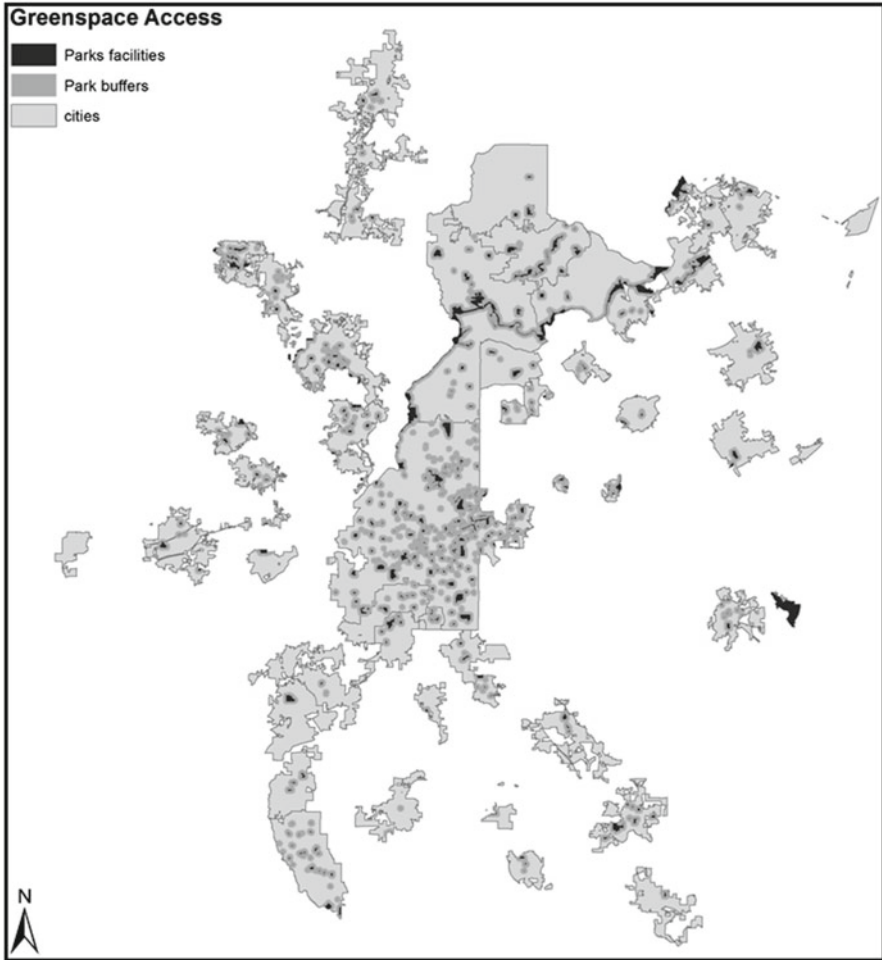


Fig. 9.2 Calculating greenspace access (Source: ARC 2009c; U.S. Census Bureau 2010a; U.S. Census Bureau 2010b. Image produced by authors)

10 miles from any supermarket or large grocery store for rural areas. Twenty-one cities contain populations with low access to food. Four of these – College Park, Morrow, Hapeville, and Union City – have majority populations with poor access, up to 92 % in the case of Union City.

Public Safety

Public safety is appraised in this study through the use of crime rates. The Federal Bureau of Investigation (FBI) manages a Uniform Crime Reports program that maintains updated records for eight major offenses, known as Part I crimes. The Part I

Table 9.4 Amenities measures and ranking

City	% greenspace access	% low access to food	% poor access to activity centers	Amenities ranking
Clarkston	68.3	0.0	0.0	1
Decatur	65.3	9.9	0.0	2
Stone Mountain	51.7	12.2	0.0	3
Atlanta	53.3	11.4	3.3	4
Doraville	47.4	7.1	0.0	5
Chamblee	38.8	0.0	0.0	6
Acworth	36.8	0.0	0.7	7
Duluth	31.6	0.0	0.0	8
Lovejoy	29.7	0.0	0.5	9
Suwanee	27.0	0.0	0.0	10
Austell	24.9	0.0	0.0	11
Kennesaw	27.1	0.0	7.0	12
Powder Springs	21.3	0.0	0.0	13
Conyers	31.0	12.6	0.8	14
East Point	31.6	13.1	1.2	15
Hampton	19.5	0.0	0.0	16
Smyrna	29.1	3.9	9.8	17
Alpharetta	25.7	0.0	9.7	18
Marietta	31.2	10.0	8.4	19
Norcross	14.3	0.0	0.0	20

Sources: ARC (2009c) and U.S. Department of Agriculture (2011)

classification is bisected into violent crimes, which includes forcible rape, aggravated assault, criminal homicide, and robbery; and property crimes, comprising burglary, larceny-theft, motor vehicle theft, and arson. The crime rates included in this study tally offenses for crime rates and for violent crime rates, as shown in Table 9.5. A number of cities to the south of Atlanta – Morrow, College Park, Union City, and East Point – experience the highest crime rates in the metropolitan region. The latter three, along with the city of Atlanta, also top the list for violent crime rates. Holly Springs is the best city in the region in terms of public safety, with very low crime rates and little violent crime. Tyrone, Johns Creek, Peachtree City and Kennesaw are also highly ranked, with crimes lower than 200 counts per 10,000 individuals, and violent crimes less than 10 counts for 10,000 individuals. Alpharetta has a sizeable crime rate, of 315 counts per 10,000, yet they are by and large property-oriented incidences, as the city has a relatively low rate for violent crime, with about 10 counts per 10,000 residents.

Health

The Georgia Department of Public Health tracks mortality statistics by cause of death (COD). Mortality statistics utilized in this study are based on place of residence to avoid the locational fallacy of associating deaths with other environments,

Table 9.5 Public safety measures and ranking

City	Crime rates per 10,000	Violent crime rates per 10,000	Public safety ranking
Holly Springs	116.6	5.7	1
Tyrone	151.6	4.4	2
Johns Creek	127.5	8.6	3
Peachtree City	165.7	4.3	4
Kennesaw	178.4	7.5	5
Canton	200.1	9.0	6
Milton	236.6	8.1	7
Braselton	253.4	11.2	8
Suwanee	245.4	12.6	9
Woodstock	234.6	15.0	10
Alpharetta	314.6	9.9	11
Roswell	258.7	16.9	12
Loganville	304.7	14.6	13
Powder Springs	251.9	24.3	14
Stockbridge	264.1	23.0	15
Duluth	321.7	19.9	16
Acworth	269.6	26.5	17
Fayetteville	301.6	26.0	18
Stone Mountain	320.5	24.7	19
Sandy Springs	364.1	22.9	20

Sources: Federal Bureau of Investigation [FBI] (2009), (2010), Gwinnett County Police Department, n.d., Crime records for Buford and Sugar Hill, Unpublished data and Neighborhood Scout (2011)

such as work, place of death, or other temporary locations. The three COD statistics that are employed are cardiovascular, cancer, and mental and behavioral mortality rates. The health indicator is informed by outcome measures to capture location-specific health across the region. While health has multiple determinants and various means of measurement, mortality statistics provide concrete measures that are highly relevant at the city-level.

Quotients were calculated for each of the COD statistics in order to reflect the demographic variations within each community. A location quotient was employed that measures the concentration of mortality by place in relation to the region. An age quotient was also utilized that accounts for city populations that are on the whole older or younger. Without the age quotient, death rates would otherwise also proxy for population ages, likely seeing higher rates for older city populations in the region and lower rates correlating with city populations that are young for the region. The following equation yielded quotients for each of the three measures:

$$\text{Quotient} = \frac{(\text{city COD rate})}{(\text{regional COD rate})} \div \frac{(\text{city median age})}{(\text{regional median age})}$$

The results can be seen in Table 9.6. Larger values for quotients indicate higher death rates for the community in relation to the region adjusted for median age of

Table 9.6 Health measures and ranking

City	Median age	Cancer mortality quotient	Cardiovascular mortality quotient	Mental and behavioral mortality quotient	Health ranking
Braselton	33.2	0.11	0.15	0.00	1
Villa Rica	32.3	0.12	0.15	0.10	2
Loganville	32.9	0.20	0.09	0.14	3
Johns Creek	36.2	0.51	0.35	0.45	4
Holly Springs	32.3	0.60	0.49	0.16	5
Milton	35.3	0.49	0.48	0.43	6
Suwanee	34.9	0.65	0.37	0.44	7
Lovejoy	26.1	0.73	0.43	0.28	8
Clarkston	29.7	0.52	0.61	0.52	9
Tyrone	42.8	0.80	0.57	0.16	10
Stockbridge	32.2	0.62	0.62	0.40	11
Alpharetta	34.4	0.71	0.52	0.49	12
Duluth	34.1	0.70	0.65	0.47	13
Kennesaw	32.2	0.73	0.76	0.42	14
Sugar Hill	33.7	0.69	0.70	0.56	15
Woodstock	33.8	0.71	0.73	0.52	16
Norcross	32	0.71	0.70	0.64	17
Locust Grove	30.7	1.01	0.87	0.28	18
Peachtree City	40.5	0.99	0.64	0.74	19
Canton	28.6	0.80	0.82	0.89	20

Source: Office of Health Indicators for Planning, Georgia Department of Public Health (2011)

the community, and thus have a negative effect in the ranking for overall health. The average median age for metropolitan Atlanta is 33.4 years. For the entire population of 1,569,426 in the region, the average annual number of cancer associated deaths is 1,874, 2764 for cardiovascular associated deaths, and 446 for mental/behavioral associated deaths. There is a great variance in the area among the 50 cities for cardiovascular related death rates. Braselton has the lowest overall mortality rates, ranking 1st for health. Mental and behavioral causes of death are fairly low throughout the region, although Decatur has a much higher incidence than other cities, with a quotient of 1.86.

Education

Education is a critical component of QoUL that receives much attention from citizens, politicians, and public officials alike. Education is a chief concern for cities and other localities in that it has the possibility to greatly improve or detract from societal welfare in the long run, impacting the prospects of future generations. 2006–2010 ACS estimates provided two statistics on educational attainment: percentages of city residents with high school diplomas, and percentages of city residents with bachelor's degrees. Table 9.7 highlights the communities that rank

Table 9.7 Education measures and ranking

City	% high school diploma	% bachelor’s degree or higher	Education ranking
Dunwoody	96.7	67.5	1
Milton	96.9	67.1	2
Johns Creek	97.3	64.0	3
Alpharetta	96.5	62.7	4
Decatur	92.2	65.9	5
Sandy Springs	94.1	59.9	6
Suwanee	96.8	54.1	7
Peachtree City	96.4	52.3	8
Roswell	92.9	52.9	9
Smyrna	90.8	49.3	10
Duluth	91.6	47.5	11
Woodstock	94.9	41.7	12
Braselton	91.1	45.3	13
Kennesaw	93.6	40.5	14
Tyrone	93.4	39.6	15
Atlanta	86.2	45.0	16
Fayetteville	90.9	36.0	17
Holly Springs	88.6	33.1	18
Snellville	89.5	31.2	19
Stockbridge	88.6	31.9	20

Source: ACS (2010b)

highest in education. High school attainment ranges from 53 to 97 %, the highest percentage rate occurring in the city of Johns Creek. Percentages of residents with bachelor’s degrees or higher are, as anticipated, noticeably lower than high school achievement rates. Dunwoody, which is strongest in terms of education, has the highest attainment for bachelor’s degrees or higher, at 68 %. The lowest percentage rate is for Forest Park, with an astoundingly low 5 %, seven points lower than the penultimate low attainment rate in Locust Grove.

Transportation

Due to high levels of congestion in metropolitan Atlanta, transportation is a dominant focus for planners and residents alike. Sufficient and convenient travel modes are critical for the commuting population in a large, relatively low-density, urban region. Short commute trips not only make travel less painful but also free up more time for friends and family or for other endeavors. We measure access to public transportation as the percentage of population that is within 0.5 miles of a transit stop. The threshold was chosen based on prior studies that show transit ridership declining sharply when commuters have to walk more than 0.5 miles to or from a transit station (Lund et al. 2004; Cervero 1994, 2007). The transit systems considered are: Metropolitan Atlanta Rapid Transit Authority (MARTA) bus and rail, and bus

Table 9.8 Transportation measures and ranking

City	% with transit access	Mean travel times	Transportation ranking
Decatur	96.4	21.4	1
Dunwoody	81.0	21.4	2
Atlanta	95.3	24.2	3
Sandy Springs	63.1	22.0	4
Smyrna	71.0	24.0	5
Hapeville	100.0	28.4	6
Marietta	70.0	26.1	7
Chamblee	94.3	29.0	8
Doraville	98.6	29.7	9
East Point	92.9	29.7	10
Clarkston	100.0	31.0	11
Alpharetta	29.6	23.2	12
College Park	84.1	29.6	13
Canton	60.2	27.5	14
Roswell	25.9	24.3	15
Milton	22.3	25.6	16
Riverdale	17.6	27.2	17
Johns Creek	11.2	27.0	18
Lilburn	0.0	25.9	19
Conyers	4.5	26.7	20

Source: ACS (2009a)

lines serviced by Cherokee Area Transportation System (CATS), Cobb County Transit (CCT), Georgia Regional Transportation Authority (GRTA), and Gwinnett County Transit (GCT). Buffers around transit stops identified those populations with access to bus stops and rail stations. The census block population weighted by block area within these buffers was then used to derive percentage rates with access to transit for each city.

Table 9.8 shows scores and rankings for the transportation attribute. Transit access and mean travel times are equally weighted for the transportation indicator. However percentages of transit access have a greater variance in the distribution and thus incremental increases have relatively greater impact than percentage point increases in transit access on the overall transportation scores. Mean travel times in the Atlanta region vary from about 21–40 min per one way commuting trip. Decatur ranks highest on the list for transportation, followed by the city of Dunwoody, and then Atlanta. The entire populations of Hapeville and Clarkston live within close proximity of transit stops. At the other end of the spectrum, multiple cities in outer counties have no access at all to public transit. Cities such as Locust Grove and Lovejoy fall at the bottom of the transportation ranking because they are further from large urban cores where most employment is provided and lack any access to public transportation.

Table 9.9 QoUL indicators and weights

QoUL indicator	Weight (%)
Education	20
Transportation	20
Economy	15
Safety	15
Health	10
Housing	10
Amenities	10

Source: ARC (2009a, b). Compiled by authors

Constructing the Quality of Urban Life Index

Two ARC surveys (Atlanta Regional Commission 2009a, b) on critical factors of life quality for the Atlanta region were referenced in order to produce weights for QoUL attributes that represent residents’ values and opinions. An online public opinion survey and a summer regional poll, both undertaken in 2009, form the foundation for the Index’s weighting scheme, based on answers from such questions as, “What is the most important factor for you in deciding where to live?” and “Which of the following issues do you want regional business and political leaders to work on?” Results reveal a value hierarchy for QoUL attributes. Economy, education, transportation and safety repeatedly surfaced as important issues; health, housing, and proximity to amenities received less focus but still garnered attention. Table 9.9 shows the issues ranked by the survey results and their respective weights designated for the QoUL Index.

The final results of the QoUL Index are shown in Table 9.10. Alpharetta, a medium sized city in north Fulton County, ranks first on the QoUL Index in the Atlanta metropolitan area. It is ranked above average for most attributes; however it shows up particularly strong in economy and education. Each of the top ten cities ranks in the top ten for education, a highly valued attribute in the Atlanta region, except the city of Tyrone. Two of the top cities, Milton and Johns Creek, ranked very low for amenities (45th and 46th respectively), yet because these two attributes are valued less by residents, their low rankings do not have a large negative impact on overall QoUL. The cities which are ranked lowest on the Index generally have low scores across the board for each of the seven indicators. For those communities that fall at the bottom of the composite QoUL index, the scores on all indicators are generally low. The anomaly in this case is the city of Hapeville, ranked 43rd in the Index but 6th for transportation. There are however multiple communities that could benefit from improvements to their amenities infrastructure, such as Tyrone and Milton. Both would have ranked higher on the list except for low scores in the amenities indicator.

Table 9.10 Quality of urban life index

City	Quality of urban life ranking
Alpharetta	1
Milton	2
Johns Creek	3
Sandy Springs	4
Decatur	5
Tyrone	6
Dunwoody	7
Peachtree City	8
Roswell	9
Suwanee	10
Smyrna	11
Duluth	12
Holly Springs	13
Kennesaw	14
Braselton	15
Fayetteville	16
Atlanta	17
Woodstock	18
Marietta	19
Acworth	20

Source: Authors

The Urban Environmental Sustainability Index: Appraisal and Comparative Analysis

Sustainability, by definition, is focused on choices that will safeguard human and environmental health in the long-run, not only in the here-and-now. In addition to this future-oriented principle, the term ‘sustainability’ has been used to evoke every value that humans strive towards including economic growth, equity, cultural diversity, and financial health. For the purposes of the study we look specifically towards the environmental aspect of sustainability as it is a growing concern, particularly for Atlanta. The metropolitan region has struggled over the last decades with air and water quality, congestion, and land degradation issues. Environmentally-oriented sustainable development in this case looks explicitly towards strategies that mitigate pollution and climate change while expanding livability for a growing region. Three attributes for the Urban Environmental Sustainability Index were selected to represent elements of urban infrastructure holding great potential for environmental impact: transportation, ecological amenities, and housing and population density. Figure 9.3 below shows the three attributes corresponding to urban environmental sustainability as well as the interactive relationship between QoUL and UES attributes. While transportation, amenities, and housing overlap both measurement systems, the indicators are constructed differently for each index. Consequently, the indicators appropriately capture impacts on the focal target – the community for QoUL, and the environment for UES.

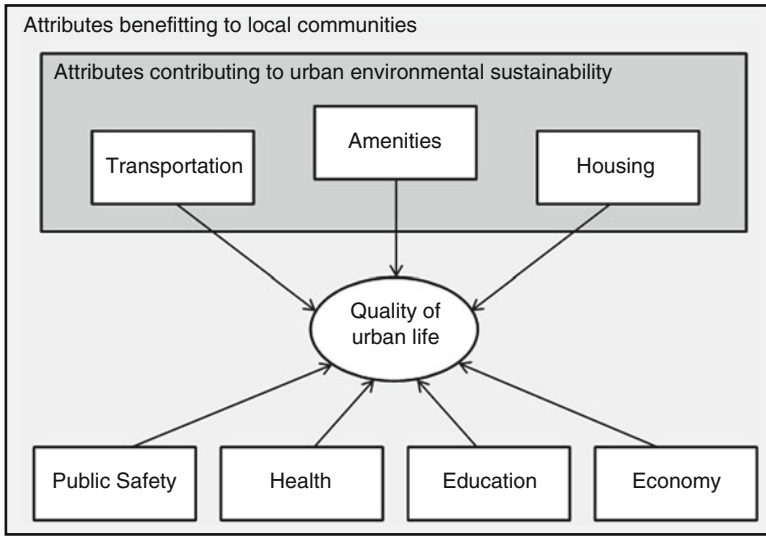


Fig. 9.3 QoUL and UES attributes (Source: Authors)

Table 9.11 Bossard’s sustainable urban development index

Indicators	Measures	Index weights
SUD transportation	Green transportation by public transit, walking, bicycling or working at home	1
	Ultra green transportation by walking, bicycling or working at home	1
	Green transportation less than 45 min	1
	No-vehicle households	1
	Short journeys to work: less than 10 min	1
	Not car-truck-or-van journey to work trips greater than 44 min	1
SUD housing and population density	Multiple family housing units	2
	High density housing: greater than 19 dwelling units per structure	1
	Population density per sq. mile	2

Source: Brossard (2011)

We fashioned the UES index based on Earl Bossard’s (2011) Sustainability Urban Development (SUD) Index. His SUD Index draws solely from ACS data and thus allows for widespread replication and frequent updating. Table 9.11 shows the SUD Index.

Many of the measures from the SUD Index were incorporated into the Urban Environmental Sustainability (UES) Index. Each of these measures is informed by data from the ACS 2005–2009 estimates. Additionally, another indicator, ecological

Table 9.12 Urban Environmental Sustainability Index

Indicators	Measures
Transportation	Green commutes
	Ultra green commutes
	No-vehicle households
	Short journeys to work
Housing and population density	High density housing
	Population density per sq. mile
	Multiple family housing units
Ecological amenities	Greenspace coverage
	Local food systems

Source: Authors

amenities, was included that assesses urban greenspace coverage and local food systems. The final UES indicators and measures are shown in Table 9.12.

The transportation indicator favors environmentally sustainable travel choices: short trips, car free households, and low-emissions and no-emissions commute modes. As can be noted in Table 9.13, the cities which rank high for sustainable transportation fall predominantly within the inner five counties of metropolitan Atlanta. This is likely due to the prevalence of public transit within the metro core as compared to the outer five counties. As well, cities for which streets are more walkable and bikeable, and contain work and home locations closer together, generally see higher utilization of alternative transportation. Green transportation modes reduce congestion, air pollution, and have larger user capacities without the same increased marginal costs per user that conventional automobile infrastructure bears.

Housing and population density measures the efficiency of land usage, a necessity for urban environments. Multiple housing units increase compactness and accommodate higher population densities. High densities in turn yield sufficient numbers of users for public transit utilization and allow for diversified and efficient allocation of limited land for non-residential uses that benefit communities at large.

The ecological amenities indicator comprises two measures: greenspace coverage and urban agriculture. Greenspace coverage is the percentage of park space to the total land area of the city, using the same ARC data as was used for the greenspace measure for the QoUL Index. Local food systems tallies the number of farmers markets in each city, drawing counts from the USDA National Farmers Markets Directory (2011), the Georgia Department of Agriculture Community Farmers Markets list (2011), and Georgia Organics' Online Local Food Guide (2010).

The final results for urban environmental sustainability across the Atlanta region are shown in Table 9.14. The City of Atlanta tops the UES Index, receiving very high rankings for all three indicators. Decatur comes in second, with two high scores for transportation and population and housing density, although not quite as strong in the ecological amenities indicator. Chamblee, ranked third, mirrors Decatur's strengths and weaknesses.

Decatur is the only city to fall within the top 5 of both indices. Milton and Johns Creek, though high on the QoUL Index, fall in the lower half of the UES Index. Conversely, Conyers and College Park, both highly ranked for environmental

Table 9.13 UES Index rankings

City	Transportation ranking	Housing and population density ranking	Ecological amenities ranking
College Park	1	10	19
Chamblee	2	3	18
Decatur	3	4	11
Atlanta	4	2	1
Doraville	5	21	34
Tyrone	6	49	41
Forest Park	7	32	33
Peachtree City	8	41	27
Norcross	9	35	21
Hapeville	10	18	31
East Point	11	15	38
Conyers	12	13	2
Alpharetta	13	17	15
Dunwoody	14	5	25
Fayetteville	15	40	35
Marietta	16	8	8
Sandy Springs	17	6	13
Buford	18	42	39
Milton	19	36	46
Canton	20	27	16

Source: Authors' calculations

Table 9.14 Urban environmental sustainability index

City	Ranking
Atlanta	1
Decatur	2
Chamblee	3
Conyers	4
College Park	5
Marietta	6
Sandy Springs	7
Clarkston	8
Dunwoody	9
Alpharetta	10
Duluth	11
Smyrna	12
Hapeville	13
Doraville	14
Stone Mountain	15
Canton	16
Douglasville	17
East Point	18
Roswell	19
Norcross	20

Source: Authors' calculations

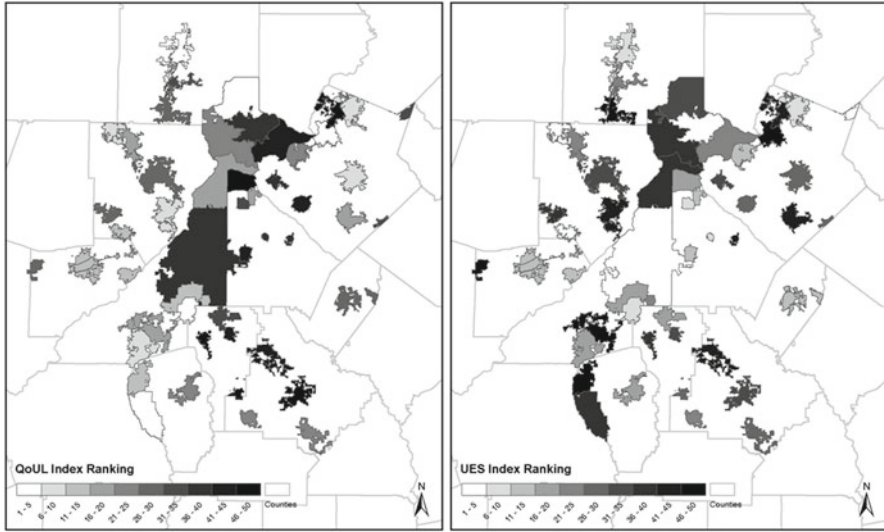


Fig. 9.4 Spatial comparisons of QoUL and UES (Source: U.S. Census Bureau 2010b. Authors' calculations)

sustainability, are in the lowest 20th percentile for QoUL. Very few cities perform well on both indices, although Decatur, Dunwoody and Alpharetta are ranked within the top ten for both. Those cities that perform well on the UES Index are generally ranked high for the amenities and transportation indicators on the QoUL Index. Spatial contrasts between the indices for cities in the region are evident in Fig. 9.4.

To assess the relationship between the two indices, Spearman's Rank Correlation Coefficient was employed. The calculated Spearman's r yields a statistic of .236 on the scale of -1 to 1 , indicating a small positive correlation. This fairly weak association between QoUL and UES leaves room for much improvement for the communities in the metropolitan Atlanta region. In particular, further development of local amenities and transportation will bear great advantages for residents' quality of life and the quality of their environment. Transportation is very highly valued in the region, and an issue of great concern; moreover it will contribute much towards urban sustainability. Amenities, though less of a priority for residents, still elevates QoUL, and would increase well-being for communities that currently experience relatively low urban life quality in the region.

Conclusions

Quality-of-life studies are critical precisely because they expand beyond the theoretical discussions of well-being and provide specific measures by which communities can benchmark themselves and track changes over time. Ideally, we would like

sustainable development to be an integral component of urban quality of life. However, this study shows significant variation in QoUL and UES among communities in the Atlanta region. We find that high quality of life does not necessarily entail high levels of environmental sustainability. This may be untenable over the long run. Given current projections of rapid population increase in the coming years, it is likely that Metropolitan Atlanta will face growing environmental problems that may begin to compromise quality of life. Improvements in amenities, housing, and transportation, in particular, are important in increasing quality of life for local communities while reinforcing environmentally sustainable lifestyles. Strategic investments in community infrastructure in the domains identified above will be critical for improving the overall health of urban ecosystems and for benefiting current and future generations in multiple ways.

Although this study used objective measures of QoUL, we acknowledge that perceptions play an equally important role in shaping attitudes towards aspects of quality of life. We have used subjective measures as appropriate to weigh the objective dimensions in order to determine the overall index. As noted by Howley et al. (2009), this study demonstrates that to advance both high quality of life and environmental sustainability, we must move beyond discussions about reconfiguring the built environment to make it compact and densely populated. We also need to increase its livability and resident satisfaction by creating more vibrant, functional, and attractive communities.

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