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UNDERSTANDING CITY PERFORMANCE THROUGH PERCEPTIONS: A DESCRIPTIVE MULTIDIMENSIONAL ANALYSIS OF SERBIAN CITIES

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Abstract: Gross Domestic Product remains the dominant metric of urban progress, yet it systematically fails to capture the dimensions of city life that residents themselves regard as most important: governance quality, environmental conditions, mobility, social inclusion, and safety. While the European Commission's Quality of Life in European Cities survey provides an internationally comparable benchmark, its coverage of Serbian cities is limited to Belgrade, leaving urban quality of life across the broader Serbian city system effectively unmeasured. This paper addresses that gap directly. Grounded theoretically in the beyond-GDP agenda of Stiglitz, Sen, and Fitoussi (2009) and in Sen's capability approach, and employing Principal Component Analysis to derive empirically weighted dimension scores, the study presents the most comprehensive within-country urban quality of life comparison conducted in Serbia to date, covering 28 cities across ten dimensions of urban experience. Results reveal a sharply stratified performance landscape in which governance, economic opportunity, and environmental conditions emerge as the most critical structural deficits, while mobility stands out as the single greatest differentiator of city performance. The findings carry direct implications for Serbian urban policy, arguing for a reorientation toward multi-domain quality of life measurement as the foundation of evidence-based city governance.

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1. Introduction

What makes a city a good place to live? The metrics by which city performance is most commonly assessed — GDP per capita, unemployment rates, investment volumes, and fiscal balances — address this question only indirectly and incompletely (Rogerson, 1999; Stiglitz et al., 2009). Economic output can grow while air quality deteriorates, unemployment may fall while governance quality erodes, investment in infrastructure may increase while residents' sense of safety, social inclusion, and cultural belonging declines (Stiglitz et al., 2018). The persistent reliance on economic indicators as the primary language of city performance evaluation is not merely a technical limitation; it is a governance problem (Kitchin et al., 2015). What policymakers measure shapes what they prioritise, and what they fail to measure tends to go unaddressed (Stiglitz et al., 2018).

This paper addresses that problem directly. It presents the results of a survey of urban quality of life covering 28 Serbian cities, designed to answer the question that GDP cannot: how do residents actually experience life in their cities across the full range of dimensions that make urban environments liveable, inclusive, and well-governed? By making these dimensions measurable and comparable, the paper aims to shift the basis of the Serbian urban policy debate from economic output toward a richer, resident-centred conception of city performance.

The study is motivated by three convergent imperatives. The first is theoretical. The beyond-GDP movement, crystallised by the landmark report of the Commission on the Measurement of Economic Performance and Social Progress (Stiglitz et al., 2009), established that quality of life is irreducibly multidimensional and that measurement systems focused on production systematically misdirect policy. Sen's capability approach (Sen, 1993; Sen, 1999) provides the philosophical grounding for why residents' own perceptions of their cities constitute primary evidence: if quality of life is about what people are able to do and become, then how residents assess their access to safe healthcare, reliable transport, good governance, environmental quality, and social inclusion is not a proxy; it is a direct expression of their quality of life.

The second imperative is methodological. The survey grounds its structure in the OECD Better Life Index framework (OECD, 2011), employing a perception-based instrument equally valid for cities of all sizes, and deriving dimension weights through Principal Component Analysis (PCA), an empirically grounded procedure that corrects for inter-dimension correlation and assigns higher weight to dimensions that genuinely differentiate city performance.

The third imperative is contextual. Serbia is a candidate country for EU accession, committed to aligning its governance and development frameworks with EU standards. Yet its urban policy debate remains largely GDP-centric, and no prior academic study has applied a standardised multidimensional quality of life instrument consistently across a national sample of Serbian cities. The European Commission Quality of Life in European Cities survey covers only Belgrade among Serbian cities (European Commission, 2023), leaving quality of life in the remaining 27 cities effectively unmeasured by internationally comparable instruments.

The study pursues three interrelated research objectives: (1) to characterise quality of life across ten dimensions of urban experience as perceived by residents of 28 Serbian cities; (2) to identify the dimensions on which inter-city variation is greatest; and (3) to determine the relative contribution of each dimension to overall city performance through PCA-derived weighting and to identify which combinations of performance and weight make certain dimensions policy-critical.

The paper is structured as follows. Section 2 provides theoretical background, Section 3 describes the methodology, Section 4 presents the results, while Section 5 discusses implications. The last section provides concluding remarks.

2. Theoretical Background

2.1. The Limits of GDP, the Beyond-GDP Agenda, and the Capability Approach

For much of the twentieth century, GDP served as the dominant summary statistic of national progress. Its appeal rested on practical virtues: it is consistently measured across countries, regularly updated, and intuitively linked to material resources (Coyle, 2014). Yet the equation of economic output with quality of life has attracted sustained criticism. The pivotal intellectual intervention came with the SSF report (Stiglitz et al., 2009), whose central thesis was that what we measure affects what we do. An over-reliance on GDP had systematically directed policy attention away from health, safety, social relationships, and environmental sustainability, dimensions citizens themselves regard as paramount. The report advocated a shift from measuring production to measuring quality of life, proposing a multidimensional dashboard organised around eight domains: material living standards, health, education, personal activities, political voice, social connections, environment, and insecurity. Stiglitz, Fitoussi, and Durand (2018) subsequently demonstrated that GDP-centric governance created measurable blind spots: rising aggregate incomes masked widening inequality, deteriorating public services, and eroding social trust. At the urban level, this argument is especially pertinent, as cities are the primary units through which citizens experience the domains that GDP leaves unmeasured.

The philosophical underpinning draws directly from Sen's capability approach. Sen (1993; 1999) argues that quality of life should be understood not as the possession of goods but as the real freedoms (capabilities) to choose among valued functionings. This justifies attention to a broad range of life domains and grounds the legitimacy of subjective, perception-based measurement. If quality of life is about what people are able to value and achieve, residents' assessments of their city constitute primary evidence, not a mere proxy. Anand et al. (2005) provided an early empirical operationalisation of this insight, demonstrating that Sen-inspired capabilities, covering health, knowledge, social relations, safety, and political voice, show statistically significant associations with life satisfaction. This established a methodological precedent for structured perception surveys as legitimate instruments for capability measurement. Additionally, the OECD's Better Life Index (2011) is the most widely cited institutional operationalisation, covering eleven domains and incorporating both objective indicators and subjective ratings.

2.2. Perception-Based Measurement of Urban Quality of Life

A substantial body of urban research has examined the relationship between objective city conditions and residents' subjective assessments. The consensus is that both dimensions are necessary and partially independent: objective indicators capture verifiable infrastructural realities, while subjective ratings capture experienced quality of life, shaped not only by objective conditions but by expectations, social comparisons, and individual values (Fleury-Bahi et al., 2008; Rogerson, 1999). A recent systematic review, synthesising 48 studies with over 52,000 respondents, confirms that urban Quality of Life research has progressively incorporated subjective perception as a central measurement dimension, identifying four domains consistently emerging across instruments: social, environmental, economic, and physical/infrastructural (Răducan et al., 2025). A large-scale empirical mapping exercise demonstrated that resident satisfaction ratings yield reliable composite assessments of city performance, with strong convergent validity against objective administrative data (Dobrovolska & Kopczewska, 2024).

The systematic ranking and benchmarking of cities has become a substantial field of applied research. The earliest wave was predominantly oriented towards economic competitiveness, with instruments concentrated on the business environment, infrastructure, and connectivity. As Saez et al. (2020) noted, this orientation remains most common, reflecting a default assumption inherited from national GDP accounting. Their critical analysis observed that economically oriented indices suffer from a structurally self-confirming logic: by selecting indicators that large, wealthy, well-connected cities excel at, they invariably produce rankings favouring such cities, rendering them poor instruments for identifying differentiated performance profiles across smaller urban centres. Furthermore, composite indices increasingly incorporate health, education, safety, environment, social cohesion, and

governance alongside economic indicators (Mori & Christodoulou, 2012), and SDG 11 (Sustainable Cities and Communities) explicitly frames urban development as a multidimensional challenge.

2.3. European and Regional Urban Quality of Life Surveys

The European Commission's Perception Survey on the Quality of Life in European Cities, conducted by DG REGIO every three years since 2007, is the most influential city quality-of-life instrument in the European context. In its sixth wave (2023), the survey covered 83 cities across 36 European countries, collecting over 70,000 interviews (European Commission, 2023). The 2023 results document a consistent east-west gradient: residents of Western Balkan cities report systematically lower satisfaction with public transport, housing affordability, employment prospects, and environmental quality compared to residents of northern and western European cities. Only Belgrade is covered among Serbian cities, leaving quality of life in the remaining cities effectively unmeasured by internationally comparable instruments. The Eurostat Urban Audit (2024) provides the complementary objective dataset. While its coverage of Serbian cities is more limited than its EU coverage, it establishes the methodological principle that urban performance requires simultaneous measurement across multiple domains. The present survey addresses this gap by extending perception-based multidimensional measurement to a nationally representative sample of 28 Serbian cities, positioned within the internationally legible beyond-GDP analytical vocabulary.

3. Methodology

Data were collected through a structured survey administered to adult residents of 28 Serbian cities, selected to include all Serbian municipalities. The total sample comprised N = 2,212 respondents. The survey was administered online, with city-level quotas set to ensure approximate proportionality to the city population.

The survey instrument was structured in five parts: (1) screening and demographic section; (2) ten perception dimensions (54 indicators); (3) two overall validation items measuring general life satisfaction and city recommendation intent; (4) open-ended items on the most valued and most problematic aspects of the respondent's city; and (5) socio-demographic profiling. All 54 indicators were measured on a five-point Likert scale (1 = very dissatisfied / very poor to 5 = very satisfied / very good), consistent with the DG REGIO Quality of Life survey (European Commission, 2023) and Eurofound's European Quality of Life Survey (Eurofound, 2016). All indicators were positively coded so that higher scores uniformly represent better perceived performance.

Prior to analysis, responses were screened for straight-lining and implausibly rapid completion (Meade & Craig, 2012). Internal reliability was assessed using Cronbach's alpha (Nunnally, 1978; Field, 2024) and all ten dimensions cleared this threshold. Dimension scores were computed as the arithmetic mean of constituent indicator scores at respondent level, then aggregated to city-level means.

Equal weighting, the most common choice in composite index construction, presupposes that all dimensions contribute equally to the underlying construct regardless of their empirical inter-relationships. Where dimensions are strongly correlated, equal weighting may double-count shared variance (OECD & JRC, 2008). To address this, dimension weights were derived from PCA of the city-level dimension scores, following the procedure recommended by Nicoletti, Scarpetta, and Boylaud (2000) and codified in the OECD/JRC Handbook. The squared factor loadings on the first principal component (or a weighted combination of leading components with eigenvalues greater than 1.0) assign weights reflecting each dimension's contribution to the dominant pattern of variation across cities. Component extraction used the eigenvalue-greater-than-one criterion (Kaiser, 1960). The resulting dimension weights sum to 1.0 and are reported in the next section.

4. Results

Table 1 presents the descriptive statistics for all ten dimensions at the city level. A range below 0.5 points is classified as Low dispersion, 0.5–0.9 as Moderate, and 1.0 or above as High.

The overall mean score across all dimensions and cities is 3.13, indicating a modestly positive aggregate assessment of Serbian city quality. However, this aggregate masks substantial cross-dimensional variation. D1 Safety and Healthcare records both the highest mean (3.88) and the lowest inter-city range (0.18), suggesting a relatively uniform national baseline. By contrast, D7 Public Services and Governance records both the lowest mean (2.11) and one of the two highest inter-city ranges (0.99), indicating that governance quality is simultaneously the weakest dimension overall and the one on which Serbian cities diverge most sharply. D6 Environment and Climate shows the single highest range (1.92 points, from 1.93 to 3.85), pointing to strong localised environmental determinants.

Table 2 presents the full cross-dimensional comparison, integrating descriptive statistics with PCA-derived weights and a three-tier performance classification, where the high-performance tier is characterized by mean $\geq$ 3.50, moderate performance tier has mean ranging between 2.80 and 3.49 while low performance tier encompasses dimensions with mean less than 2.80.

Table 1. Descriptive Statistics of BCI Dimension Scores Across 28 Serbian Cities

Code	Dimension	Mean	SD	Min	Max	Range
D1	Safety and Healthcare	3.88	0.25	3.23	4.41	0.18 (Low)
D2	Education and Human Capital	3.57	0.23	3.12	4.28	0.16 (Low)
D3	Economy and Labour Market	2.71	0.25	2.30	3.38	0.40 (Mod.)
D4	Housing and Affordability	3.32	0.25	2.92	3.99	0.32 (Mod.)
D5	Mobility and Accessibility	3.22	0.26	2.64	3.81	0.36 (Mod.)
D6	Environment and Climate	2.79	0.41	1.93	3.85	1.02 (High)
D7	Public Services and Governance	2.11	0.37	1.34	3.27	0.99 (High)
D8	Culture and Leisure	3.11	0.33	2.44	3.83	0.45 (Mod.)
D9	Digital Readiness	3.53	0.23	2.90	4.00	0.30 (Mod.)
D10	Social Inclusion and Equality	3.04	0.27	2.75	3.92	0.43 (Mod.)

Note. Scores are city-level means on a 1–5 scale (N = 28 cities). Range = Max − Min; dispersion classification: Low < 0.5, Moderate 0.5–0.9, High ≥ 1.0.

Source: Authors' preview

The ten dimensions cluster into three performance tiers with a clear structural logic. High-performing dimensions, D1 Safety and Healthcare, D2 Education and Human Capital, and D9 Digital Readiness, share a common characteristic: strong national-level provision establishes a floor that equalises outcomes across cities of very different sizes and economic profiles. D1's exceptionally narrow inter-city range (0.18) is the clearest illustration, consistent with European evidence that dimensions underpinned by universal national systems tend to show the lowest territorial variation in perceived quality (Charron et al., 2022).

Moderate-tier dimensions, D4 Housing and Affordability, D5 Mobility and Accessibility, D8 Culture and Leisure, and D10 Social Inclusion and Equality, are distinguished by their dependence on municipal-level investment and discretionary service delivery. This is the tier with the most direct policy leverage for local governments. D5 Mobility and Accessibility carries the highest PCA weight of all ten dimensions (13%), making it simultaneously the strongest differentiator between Serbian cities and an area of only middling aggregate performance. This finding aligns with European urban research documenting that perceived mobility quality varies sharply by city size and geographic position (European Commission, 2023), and is consistent with the well-documented north–south infrastructure disparity in

Serbia (Winkler, 2012). D10 Social Inclusion and Equality records the lowest Moderate-tier mean alongside an above-average weight (11%), indicating that local political culture and municipal policy commitments, rather than structural economic factors, are the primary drivers of variation in perceived social cohesion.

Table 2. Cross-Dimensional Comparison: Descriptive Statistics, Weights, and Performance Tiers

Code	Dimension	Mean	SD	Min	Max	Range	Weight	Tier
D1	Safety and Healthcare	3.88	0.25	3.23	4.41	0.18	6%	High
D2	Education and Human Capital	3.57	0.23	3.12	4.28	1.16	10%	High
D3	Economy and Labour Market	2.71	0.25	2.30	3.38	1.08	10%	Low
D4	Housing and Affordability	3.32	0.25	2.92	3.99	1.07	12%	Moderate
D5	Mobility and Accessibility	3.22	0.26	2.64	3.81	1.17	13%	Moderate
D6	Environment and Climate	2.79	0.41	1.93	3.85	1.92	12%	Low
D7	Public Services and Governance	2.11	0.37	1.34	3.27	1.93	9%	Low
D8	Culture and Leisure	3.11	0.33	2.44	3.83	1.39	9%	Moderate
D9	Digital Readiness	3.53	0.23	2.90	4.00	1.10	8%	High
D10	Social Inclusion and Equality	3.04	0.27	2.75	3.92	1.17	11%	Moderate

Source: Authors' preview

The three Low-tier dimensions, D3 Economy and Labour Market (M = 2.71), D6 Environment and Climate (M = 2.79), and D7 Public Services and Governance (M = 2.11), constitute the most significant collective finding of the survey. Residents across all city types consistently rate economic opportunity, environmental conditions, and governance as the weakest aspects of urban life, pointing to systemic rather than localised failures. D7 records the lowest mean of all ten dimensions, directly confirming the pattern identified by the European Quality of Government Index. Perceived institutional quality is persistently the weakest dimension of governance performance in Central and Eastern European regions, where post-socialist path dependencies and clientelistic administrative traditions continue to

depress citizens' assessments of public service impartiality and quality (Charron et al., 2015). D6 Environment and Climate shows the largest absolute inter-city range (1.92 points), driven by local industrial and geographic conditions, underscoring the need for city-specific environmental policy rather than uniform national standards. D3 Economy and Labour Market's relatively moderate inter-city range (1.08) suggests that economic dissatisfaction is broadly distributed, a systemic challenge requiring national policy responses.

5. Discussion

The multidimensional perception portrait of Serbian city performance diverges substantially from what GDP-based indicators would suggest. Across dimensions relating to safety, healthcare, education, and digital readiness, Serbian city residents assign solidly positive ratings, with mean scores for the three high-performing dimensions ranging from 3.53 to 3.88. This directly validates the central argument of Stiglitz et al. (2009) that GDP measures what economies produce, not what citizens experience. The relatively high safety and healthcare scores reflect a public service infrastructure, universal healthcare, low homicide rates, widely accessible emergency services, which functions well by regional standards and that residents recognise as such. GDP accounting does not capture this. Conversely, the dimensions on which Serbian cities perform most poorly— governance, economy, and environment—are precisely where the structural consequences of economic underdevelopment, institutional weakness, and industrial legacy are most keenly felt (Stiglitz et al., 2009).

Sen (1993; 1999) argues that governance quality is a foundational conversion factor: effective, transparent, and responsive municipal administration enables residents to access the services and opportunities their city nominally provides. The survey finding that D7 governance scores range from 1.34 to 3.27 across Serbian cities, a spread of nearly two full-scale points, implies that residents of the best-governed cities enjoy a substantially higher effective capability set than those in the worst-governed cities, even when objective economic circumstances may be similar. This within-country governance inequality is invisible in national aggregate statistics. The European Quality of Government Index (Charron et al., 2015) has documented analogous sub-national governance inequality across EU regions. Governance is likely a latent driver of performance on multiple other dimensions: cities that govern well also tend to invest more effectively in transport, environmental management, and economic development (Feruni et al., 2020).

The finding that D5 Mobility and Accessibility carries the highest weight (13%) warrants substantive discussion. Serbia's transport infrastructure has historically developed along a Belgrade-centred corridor, with the highest investment concentrated in the capital and in northern cities well-connected to the European

TEN-T network (Western Balkans Investment Framework, n.d.). The World Bank's Western Balkans Urban Mobility Initiative (2024) documented that urban mobility in Western Balkan cities is characterised by ageing public transport fleets, a declining modal share of public transport relative to private cars, and a significant infrastructure gap relative to comparably sized EU cities. Theoretically, mobility functions not merely as a transport amenity but as a structural enabler of access to employment, healthcare, education, and social life, consistent with Sen's (1999) framing of mobility as a basic capability. Cities that fail to provide reliable, affordable, and accessible transport systematically constrain their citizens' capability to participate in urban economic and social life, compounding disadvantages across multiple dimensions.

D6 Environment and Climate presents the most analytically striking paradox: it is the second-highest-weighted dimension (12%), it records one of the two lowest mean scores (M = 2.79), and it exhibits the largest absolute inter-city range (1.92 points, from 1.93 to 3.85). Serbia's industrial geography includes cities with significant heavy manufacturing and mining legacies alongside cities with largely post-industrial or agrarian economies. Residents of industrialised cities experience systematically worse air quality, greater noise pollution, and more limited green space, while residents of smaller agrarian cities with access to natural environments report substantially better conditions. This reinforces the policy case for nationally coordinated environmental remediation programmes targeting industrialised Serbian cities, complementing local government efforts to improve urban green infrastructure.

These findings argue for a reorientation of urban development metrics away from GDP-based indicators toward multi-domain quality-of-life dashboards that make governance quality, environmental conditions, and mobility investment visible, comparable, and politically accountable. They also draw differential policy attention to the lowest-performing dimensions, where the marginal return on investment is highest. They further support for the institutionalisation of the city-based monitoring framework as a regular, longitudinal monitoring instrument, a periodic urban quality of life census that tracks how Serbian cities respond to policy interventions, economic changes, and environmental challenges over time.

Nevertheless, several methodological limitations should be acknowledged. The study is cross-sectional and cannot track how city performance evolves in response to policy interventions or external shocks. It relies exclusively on perception data, which carry adaptation effects and social desirability bias. Future editions should integrate a parallel objective indicator strand from the Statistical Office of the Republic of Serbia and Eurostat's Urban Audit.

6. Conclusion

This study has presented a theoretically grounded, methodologically transparent, and empirically original instrument for assessing quality of life across 28 Serbian cities from the perspective of their residents. The results reveal a performance landscape that GDP statistics cannot capture. Safety, healthcare, education, and digital readiness perform consistently well across cities, underpinned by national-level provision systems that reduce territorial inequality. By contrast, governance, economic opportunity, and environmental conditions fall systematically below the satisfaction midpoint, pointing to structural deficits that are simultaneously both the most consequential and the most tractable through targeted policy interventions.

Two dimensions stand out as policy priorities. The Mobility and Accessibility carries the highest PCA weight (13%), making it the single greatest differentiator of city performance and, given its role as a capability-enabling infrastructure in Sen's (1999) sense, the highest-leverage investment for improving composite score. The Public Services and Governance records the lowest mean (M = 2.11) across all cities and an almost-two-point inter-city range, confirming that institutional quality is both the deepest deficit and the most unequally distributed dimension of urban life in Serbia. Given that governance functions as a foundational conversion factor for all other capabilities, the governance deficit documented here represents the most structurally significant impediment to improving quality of life across the Serbian city system.

These findings carry direct implications for Serbian urban policy. The study argues for a reorientation from GDP-centric toward multi-domain quality-of-life measurement as the foundation of evidence-based city governance, as well as the institutionalisation of a new longitudinal monitoring instrument. More broadly, this study contributes to the growing body of evidence that the beyond-GDP agenda is not merely a theoretical aspiration but an operational research programme: composite, perception-based, multidimensional indices can be constructed rigorously, interpreted substantively, and used to generate policy insights that GDP statistics systematically obscure.

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RAZUMEVANJE PERFORMANSI GRADOVA KROZ PERCEPCIJE: DESKRIPTIVNA VIŠEDIMENZIONALNA ANALIZA GRADOVA U SRBIJI

Rezime: Bruto domaći proizvod ostaje dominantna metrika urbanog napretka, ali sistematski ne uspeva da obuhvati dimenzije gradskog života koje sami stanovnici smatraju najvažnijim: kvalitet upravljanja, uslove životne sredine, mobilnost, socijalnu inkluziju i bezbednost. Iako istraživanje Evropske komisije o kvalitetu života u evropskim gradovima pruža međunarodno uporedivu referentnu vrednost, njegova pokrivenost gradova u Srbiji je ograničena na Beograd, ostavljajući kvalitet života u urbanim sredinama u širem sistemu gradova u Srbiji efikasno neizmerenim. Ovaj rad se direktno bavi tim jazom. Teorijski zasnovana na agendi Stiglica, Sena i Fitusija (2009) koja prevazilazi BDP i na Senovom pristupu sposobnosti, i koristeći analizu glavnih komponenti za izvođenje empirijski ponderisanih rezultata dimenzija, studija predstavlja najsveobuhvatnije poređenje kvaliteta života u urbanim sredinama unutar zemlje sprovedeno u Srbiji do sada, obuhvatajući 28 gradova u deset dimenzija urbanog iskustva. Rezultati otkrivaju oštro stratifikovan pejzaž učinka u kome se upravljanje, ekonomske mogućnosti i uslovi životne sredine pojavljuju kao najkritičniji strukturni deficiti, dok se mobilnost ističe kao najveći pojedinačni diferencijator učinka grada. Nalazi imaju direktne implikacije na urbanu politiku Srbije, zalažući se za preorijentaciju ka merenju kvaliteta života u više domena kao osnovi upravljanja gradom zasnovanog na dokazima.

Ključne reči: kvalitet života; performanse gradova; izvan BDP-a; anketa o percepcij; Srbija; pristup kapaciteta; analiza glavnih komponenti

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