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Research paper
Doi 10.61892/STP202601014D
ISSN 2566-4484

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IMPLEMENTATION OF URBAN PLANS AND PROJECTS RELATED TO PUBLIC OPEN SPACE IN MULTI-FAMILY RESIDENTIAL NEIGHBOURHOODS: A CASE STUDY IN NIŠ, SERBIA

Abstract

This paper discusses implementation as a critical phase of urban planning, where adopted policies and planning intentions are translated into spatial and social outcomes. It examines the regeneration of public open space (POS) in inherited large housing estates, exploring the interaction between urban plans, urban design projects, and operational programs. The research is based on a case study of two residential neighbourhoods in the city of Niš, involving an analysis of documents and realized interventions, and a residents' survey. The findings indicate a program-driven implementation with weak coordination between planning and execution, limited transparency, and marginal citizen involvement, resulting in outcomes misaligned with social and environmental objectives. The paper proposes directions for a more integrated, participatory, and accountable implementation model.

Keywords: implementation, public open space, regeneration, participation, management

ИМПЛЕМЕНТАЦИЈА УРБАНИСТИЧКИХ ПЛАНОВА И ПРОЈЕКАТА ВЕЗАНИХ ЗА ЈАВНИ ОТВОРЕНИ ПРОСТОР У ВИШЕПОРОДИЧНИМ СТАМБЕНИМ НАСЕЉИМА: СТУДИЈА СЛУЧАЈА У НИШУ, СРБИЈА

Сажетак:

Овај рад истражује имплемнтацију као кључну фазу урбанистичког планирања, у којој се усвојене политике и планска решења претварају у просторне и друштвене ефекте. Истражује се регенерација јавних отворених простора (ЈОП) у наслеђеним великим стамбеним насељима, уз испитивање интеракције урбанистичких планова, пројеката и оперативних програма. Истраживање се заснива на студији случаја два суседства у граду Нишу, а обухвата анализу докумената и реализованих интервенција, и анкету становника. Резултати указују на програмски вођену имплемнтацију, са слабом координацијом између планирања и реализације, ограниченом транспарентношћу и маргиналним учешћем грађана, што доводи до исхода који нису усклађени са друштвеним и еколошким циљевима. Рад предлаже смернице за интегрисанији, партиципативнији и одговорнији модел имплементације.

Кључне речи: имплементација, јавни простор, регенерација, партиципација, управљање

1. INTRODUCTION

The implementation of urban plans is a key phase of the planning process, as it is where adopted visions, strategies, and regulations are translated into actual spatial and social outcomes. Rather than being a purely technical or final step, implementation is now widely understood as a complex and ongoing process involving multiple actors and unfolding over time, often extending well beyond plan adoption [1], [2], [3].

Earlier planning theory tended to view implementation as a linear sequence, moving straightforwardly from analysis and policy formulation to execution [4]. However, empirical studies have shown that planning outcomes are strongly shaped by negotiation, institutional capacity, political priorities, and local context. As a result, significant differences frequently emerge between planned intentions and realized outcomes [5], [6]. Contemporary approaches therefore stress the importance of addressing implementation conditions early in the planning process, including governance arrangements, legal clarity, financing, and coordination among actors [3].

Implementation is often described as a life-cycle process, encompassing preparation, execution, monitoring and evaluation, and long-term management and maintenance [3]. Although each phase involves different instruments and actors, they are closely connected. Weaknesses at any stage, especially in stages of monitoring, feedback, and adaptive management, can undermine overall effectiveness [7], [8]. Successful implementation therefore depends not only on formal compliance with plans, but also on institutional learning, flexibility, and the ability to adjust actions in response to observed impacts [3].

A central issue in implementation research is the so-called implementation gap, referring to the divergence between formal plans and actual development outcomes [6], [9]. This gap is commonly linked to vague plan provisions, fragmented institutional responsibilities, limited financial resources, and weak public participation [5], [10]. In post-socialist and transition contexts, these problems are often intensified by unresolved property relations, discretionary interpretation of regulations, and poor coordination between planning and sectoral policies [11], [12].

Recent planning theory places increasing emphasis on process-oriented and participatory approaches to implementation, particularly in relation to public open space (POS) and neighbourhood-scale interventions. Implementation is no longer evaluated solely through physical outputs, but also through procedural quality, inclusiveness, patterns of use, and long-term sustainability [1], [13]. From this perspective, residents' perceptions and everyday experiences become an important source of evidence for assessing how planning decisions are realized in practice.

Within this framework, urban design projects function as operational instruments that translate the strategic and regulatory intentions of urban plans into concrete spatial solutions. While urban plans define the legal framework, land-use structure, and implementation conditions, urban design projects address spatial form, organization, and use at a more detailed scale. In this way, urban plans set the context and limits for action, while urban design mediates between policy objectives and their physical realization in POS.

In line with this theoretical perspective, the case study of POS regeneration in the city of Niš is used to explore how implementation unfolds within a concrete institutional and regulatory context. As a typical mid-sized post-socialist city, Niš features numerous large housing estates (LHEs) from the socialist era, originally planned with extensive public open spaces. Therefore, Niš makes a suitable research polygon for examining how planning visions for inherited socialist neighbourhoods are translated into urban design, and then into POS realization in practice.

Through literature review, examination of planning and implementation documents, and empirical research, all related to POS in multi-family residential areas, this research aims to compare the planned scenario and the developed scenario in the selected LHE neighbourhood in Niš. The case study allows examination of the gap between formal planning and design provisions and realized spatial outcomes, as well as the roles of institutions and residents in shaping implementation in practice. Moreover, the research critically assesses current implementation practices related to the provision of POS in residential areas, with a particular focus on the extent to which participatory approaches are incorporated into POS delivery. The overall research aim is to identify prevailing implementation patterns of POS development, examine the key barriers affecting realization, and propose directions for improving the implementation of POS-related urban plans and projects.

2. MATERIALS AND METHODS

The study explores a recent example of POS regeneration in a multi-family residential area in Niš from the perspective of implementation of urban plans and projects, and associated implementation of POS-related programs.

2.1. STUDY AREA

The particular study site was selected to include a redevelopment of existing POS in an inherited large housing estate (LHE) from the socialist past, representing an urban development pattern frequently found in the urban fabric of Niš. The selected residential settlement reflects well the original urban planning approach and POS development characteristics from the socialist period, when LHEs were developed with well-allocated and generous-sized POSs. This POS regeneration was performed by Niš city authorities recently, which enables an adequate insight into current implementation practices. Furthermore, the selected example aims to ensure that research findings are relevant to comparable urban settings in other Serbian cities.

The redeveloped area is part of the LHE along Zorana Đinđića boulevard, and has a disjointed form that consists of two adjacent multi-family housing segments from the socialist period (Figure 1). These two LHE segments – residential neighbourhoods – surround an urban block with a mixture of single- and multi-family buildings, which all underwent intense urban densification in the post-socialism. The redeveloped area that is the subject of this study, and for which an Urban design regeneration project was created, is framed by the following elements:

- Dragiše Cvetkovića, Ljudevita Gaja, Pasterova and Dragiše Cvetkovića streets in the north;
- Rentgenova street in the south-east;
- Zorana Đinđića boulevard in the south-west; and
- a plot of the former department store (now a supermarket) in the west.

2.2. METHODOLOGY

To achieve the set goal, this research uses a case study method, employing literature review, field observations, as well as surveys and interviews. The methodological framework is conceptualized on the description and analysis of comprehensive data involving planning/design documents and programs, data collected from field observations and survey results.

Research begins with the review of the standing planning document for the area, and further presents the relevant project documentation dealing with POS redevelopment in the subject LHE. Next, a strategic implementation program is explored, relative to POS in residential areas of the city of Niš.

Then, the selected study area was thoroughly examined to identify specific spatial changes brought about by POS regeneration actions. In May 2024, field observations involving structures, POSs, pavement, and greenery were conducted in the eastern residential neighbourhood, while the same field work was carried out in September 2025 for the western neighbourhood.

Surveys were conducted with residents in both neighbourhoods, who provided valuable input on the course of these projects. The surveys were conducted in the period September-October 2025, and involved 26 participants in total. Residents were approached in front of their buildings and interviewed on-site. Participation was voluntary and based on availability, as interviews were relatively time-consuming. The sample reflects the exploratory and in-depth nature of the research. Given the time-intensive format of the interviews and the on-site recruitment method, the sample size was limited but allowed for more detailed qualitative insights into user experiences and perceptions. While the number of participants does not allow for statistical generalization to the entire population of the neighbourhoods, the survey serves as a complementary data source within a broader case study framework. Its purpose is analytical rather than representative: the local community helped the researchers to gain a deeper understanding of POS-related implementation in a real-world setting, thereby identifying the specific contextual factors that influenced the outcomes. Accordingly, the survey results should be interpreted as indicative and context-specific, contributing to an in-depth understanding of implementation dynamics in Niš rather than as universally generalizable conclusions.

In addition, for the purpose of determining the existing model of implementation in this particular redevelopment, a semi-structured interview was conducted in December 2024 with an employee of the City Administration for Planning and Construction (CAPC) of the City of Niš, who provided valuable input on the course of this project.

Finally, the synthesis of all study findings is used as a basis for discussing POS-related implementation practices in the context of Niš, and the potential for their enhancement.

3. CASE STUDY: PUBLIC OPEN SPACE IN AN INHERITED LARGE HOUSING ESTATE IN NIŠ

3.1. URBAN BRIEF

The subject area within the LHE along Zorana Đinđića boulevard was developed during socialism in the 1960s, in line with CIAM's principles. Residential buildings are positioned in an open system of spatial organization, with row buildings (linear block buildings) framing the urban blocks in both residential neighbourhoods – in the south-east and south-west, and partly in the north of the area. Aside from row buildings, the eastern neighbourhood also involves freestanding buildings inside the block. This neighbourhood was characterized by anthropometric scale of open space, with public access, recreational use, limited motor traffic, and vast green areas. In such a quality setting, POS was treated as an integral part of the buildings' residential environment. The western neighbourhood features high-rise buildings, also involving a residential tower (Ground floor+20). Such high-rise development resulted in high residential densities. During the socialist period, the inner open space was a shared space for vehicles and pedestrians, which was not a major issue at the time from the perspective of pedestrians, given the limited number of cars for personal use.

Both neighbourhoods underwent significant urban densification during post-socialist period in the 1990s. The majority of residential buildings, particularly in the eastern neighbourhood, were upgraded vertically, by constructing additional floors on top of them. Even some of the high-rises were upgraded. This significantly increased residential densities and generated new, extensive parking needs. Currently, 1,500 people live in the western neighbourhood, with a density of 670 in/ha, while 1,600 of them reside in the eastern neighbourhood at a density of 1,070 in/ha. Increased motorization rates at the turn of the century have further exacerbated the problems caused by densification. Although the pre-existing above-ground garages were still clustered throughout the site, they were not being used in line with their function, and represented a visual and physical barrier within POS. Inadequate waste disposal has further exacerbated the quality of life and the aesthetics of the area.

All of these transformations have reflected on POSs, and once lavish greenery, particularly in the eastern neighbourhood, significantly deteriorated in size and quality. In 2018, before the initiative for regeneration, the common open space within this multi-storey housing area was characterized by a high-level of publicity, high levels of physical and visual flow through space, modest urban furniture, deteriorated pavement, insufficiently maintained greenery, frequent urban flooding, poor hygiene, and unclear rights of use [14]. Furthermore, the open space was burdened with vehicular traffic and unplanned parking lots, resulting in unsafe intersection of pedestrian and vehicle traffic.

The latest regeneration of POS was a city-led intervention and carried out in two phases, involving two residential neighbourhoods: 1) Neighbourhood east of Pasterova street (E), redeveloped in 2023, and 2) Neighbourhood west of Pasterova street (W), redeveloped in 2025 (Figure 1).

Figure 1. The cadastral-topographic plan of the analysed redeveloped area with neighbourhoods E and W. [16].

3.2. PLANNING SOLUTION FOR PUBLIC OPEN SPACE

The urban-architectural solution for the POS in these neighbourhoods is grounded in the First amendments and supplements to the Plan of general regulation of the city municipality of Medijana (PGR Medijana) [15]. The plan has fundamentally different representation of open space in the two residential neighbourhoods, despite the fact that these are both open spaces in the surroundings of multi-family housing inherited from the socialist period. This implies different treatment of POS in the Plan (Figure 2), although the residential POS itself is not elaborated in detail in this PGR.

Cadastral plot no. 3281 in the eastern neighbourhood is fully owned by the City of Niš. This urban block is zoned for medium-density housing, involving structures and open space in the entire area confined with regulation lines. This area is also labelled in the PGR Medijana as "Area of public use for the needs of functioning of buildings and plots within the residential block" (Površina javne namene za potrebe funkcionisanja objekata i parcela unutar bloka).

Cadastral plot no. 3202/1 in the western neighbourhood is mostly in public and partly in private ownership (existing parking garages are private property). In this case, only the structures (excluding garages) are assigned usage by the PGR Medijana, covering the area confined by building lines. Residential buildings are zoned for high-density housing, while non-residential buildings have a business-commercial use. Regarding the open space, there are two types of land use: (1) part of the plot is exempted for a driveway and labelled as public land; and the remaining portion of this plot is not zoned at all, and designated as "other land" (ostalo zemljište), leaving this space prone to misinterpretation. The open space in front of the buildings in the north is zoned as "traffic areas" representing public land, but it is a part of different cadastral plot (no. 11138/1).

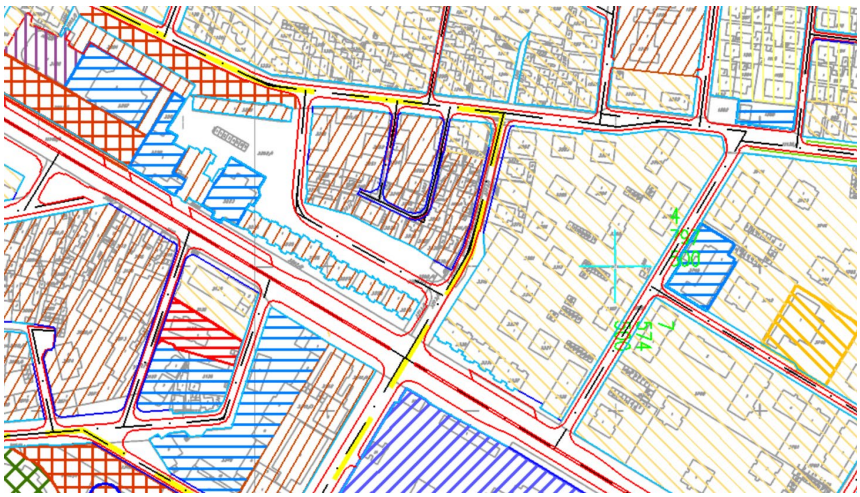


Figure 2. Land use plan of the analysed redeveloped area [15].

3.3. DESIGN SOLUTION FOR PUBLIC OPEN SPACE

The Urban design project for the "Urban-architectural design of public open space in the wider area of Pasterova street in Niš" was prepared by the Urban Planning Institute of Niš, and adopted in 2019 [16]. The official project incorporated a Conceptual solution (Idejno rešenje – IDR), which was produced within a cooperation between the City of Niš and the Faculty of Civil Engineering and Architecture of Niš. The IDR originated from an awarded student proposal authored by the students and their mentors.

Work methodology of the IDR included the following steps: (1) analysis of standing planning documents and existing state, to determine potentials and limitations of the site; (2) identification of people's needs, based on a survey and interviews with key actors in the area (residents, users, local administration); (3) systematization of conclusions about the space and formulation of guidelines for remodeling; (4) urban-architectural design and modelling of space, through elaboration of uses, amenities, flows, functional and spatial relations, and details.

When conceptualizing the urban-architectural solution for POSs in the Urban design project, the focus was on: 1) resolving the conflict between pedestrian and car traffic, improving pedestrian safety and ensuring the priority of pedestrians, 2) introducing new amenities for all user categories, 3) organizing and arranging green areas, and 4) re-evaluating the capacity of stationary traffic, removing unplanned parking spaces and organizing parking more efficiently [14] (Figure 3).

In the eastern neighbourhood, vehicular access to all residential buildings was provided through driveways, parking lots and shared streets, without introducing traditional streets with traffic

segregation, or fragmenting the urban block space. Moreover, the design favoured pedestrian traffic. By implementing green areas and installing mobile planters, vehicle traffic was disabled within pedestrian areas inside the blocks. In case of an emergency, necessary access and unimpeded flow of emergency service vehicles were enabled directly to the buildings, by moving planters and driving over green areas. On the other hand, in the western neighbourhood a new driveway was traced along the north-east plot border, in line with the solution in the standing plan. This new driveway enables access to building entrances facing the yard, and accommodates as much parking as possible. The new vehicle path consists of segments that change direction in order to enable traffic calming and safe pedestrian flows. Despite very high development densities, some greenery is still provided to perform environmental function, and provide for open space that accommodates social activities. The suggested paving material was adequate for both pedestrian and vehicle traffic.

The project's proposed design solution also prioritized preserving the existing green spaces as much as possible, including grass, hedges, trees, and existing spontaneously formed gardens, due to social and environmental benefits of these elements.

Furthermore, amenities for all user categories were provided, along with improving access for active use of space. Additionally, the characteristics of the paving material were also to create a permeable surface and thus contribute to better stormwater drainage, since the neighbourhood experienced frequent urban flooding. Therefore, it was suggested to set up a system for collecting and recycling stormwater for future reuse.

It was required to preserve existing parking garages in the entire area that was being redeveloped. Since these structures occupy a central position in both neighbourhoods, the design proposed to use them for purposes beyond parking, by creatively adapting them for children's play areas.

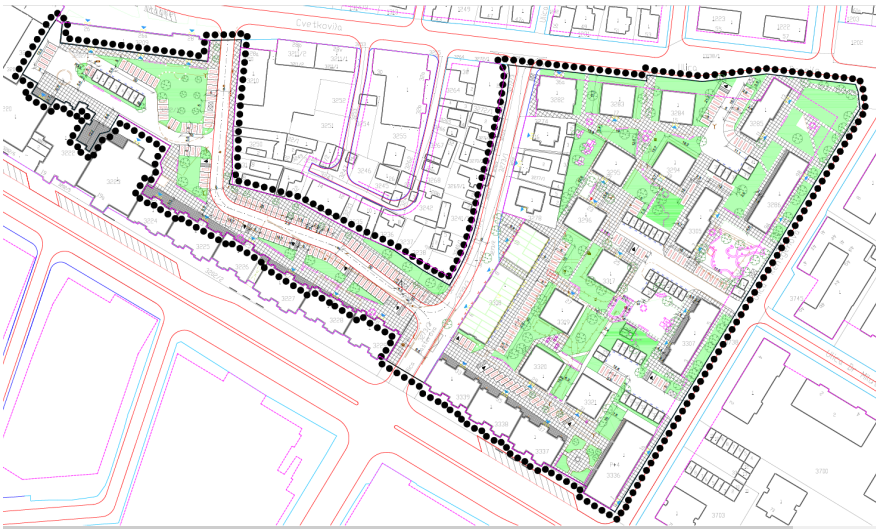


Figure 3. The proposed urban-architectural solution for the two neighbourhoods [16].

3.4. EFFECTS OF IMPLEMENTATION: REGENERATION OF PUBLIC OPEN SPACE

3.4.1. Eastern neighbourhood

A private-sector–led pilot project introducing a rain garden as an innovative Nature-based Solution (NbS) was implemented in the eastern neighbourhood in 2023 [14]. However, this intervention remained isolated and outside the formal planning system, featuring a small-scale intervention focused on innovation, visibility, and awareness rather than systemic change. Consequently, long-standing issues related to POS use and maintenance persisted.

The POSs in the eastern neighbourhood were severely degraded, with deteriorated pathways and devastated green areas. These were exacerbated with bad weather conditions, when rain and snow resulted in muddy areas that hindered access to buildings. Residents expressed dissatisfaction and repeatedly urged the authorities to improve living conditions (personal communication with CAPC employee, December 26, 2024). Particular concern was raised regarding the shortage of parking spaces and the usurpation of public areas for parking, which remained inadequately addressed [17].

Following the rain garden development, a city-led POS regeneration of neighbourhood's POSs was carried out in November 2023 [14]. The intervention was realized as part of program activities of the Local Economic Development Office, which acted as the implementing entity [18]. Funding was secured through the "Program for the arrangement of building land and maintenance of communal

infrastructure for the year 2019" (Program uređivanja građevinskog zemljišta i održavanja komunalne infrastrukture za 2019. godinu). Reconstruction was completed in a couple of months.

Once the works began, residents voiced concerns about introducing new streets and fragmenting the urban block area [19]. They had no insights into the actual Project of implementation (Projekat za izvođenje) and felt insufficiently informed or involved in decisions shaping their living environment. This dissatisfaction culminated in temporary protests, including blocking construction machinery. After discussions with city authorities, the protests ceased and the works continued.

The intervention primarily consisted of paving works, with no improvements to greenery or urban furniture. Driveways, pedestrian paths, and gathering areas were covered with asphalt, a non-permeable material. Existing paths were widened to street-like dimensions, and new parking spaces were introduced in formerly green areas (Figure 4a), thereby extinguishing some smaller green surfaces. As a result, paved surfaces now dominate the block to a much greater extent than in the original layout. However, parking problems persist, as most of the area still lacks properly organized parking. Pedestrian zones remain inadequately designed, and vehicle encroachment continues (Figure 4b). The newly created routes were not conceived as shared streets; their asphalt finish reinforces a roadway character, and some are unnecessarily wide given that they do not accommodate vehicle traffic. Since pedestrian and vehicular flows still intersect, safety conditions have not substantially improved.

Apart from the previously installed rain garden, no additional NbS elements were incorporated into the renovation. The increase in impermeable surfaces further worsened stormwater management, contributing to extensive flooding of the POS during heavy rainfall in June 2024 [20] (Figure 4b).

a) Paving of green areas for parking, 2024. Source: Photography by authors

(b) Urban flooding after POS renovation, 2024. Source: [20]

Figure 4. Effects of POS regeneration in the eastern neighbourhood.

3.4.2. Western neighbourhood

POS regeneration was implemented in 2025 in a neighbourhood where open spaces had long been in very poor condition. For decades, residents faced the usurpation of space around their buildings for unorganized parking, used not only by residents but also by hospital visitors and employees of nearby companies. The area was characterized by deteriorated pavements, poorly maintained greenery [21], frequent flooding, and muddy access routes to residential entrances. Residents repeatedly expressed dissatisfaction and demanded that authorities address these issues, particularly the parking problem [22].

POS redevelopment was again realized as part of program activities of the Local Economic Development Office, acting as the implementing authority [18], and financed through the "Program for the arrangement of building land and maintenance of communal infrastructure for the year 2024" (Program uređivanja građevinskog zemljišta i održavanja komunalne infrastrukture za 2024. godinu). Although the residents were informed that the open space will formally be zoned for charged parking and agreed to this solution, they also had no insights into the actual Project of implementation (Projekat za izvođenje).

In this redevelopment, POS was converted into a vast parking lot with paid parking (Figure 5a), further reducing the already modest greenery. Wide driveways were introduced with accompanying traffic signs, marked lines and pedestrian crossings, thereby cancelling all pedestrian character. An organized parking lot now contains 145 parking spaces and 4 reserved for people with disabilities [23], but no POSs for social activities, not even basic sitting areas in the immediate surroundings of residential buildings. In an attempt to reduce the risk of accidents and enhance pedestrian safety, a 30 km/h speed limit was introduced and protective posts were installed along sidewalks (Figure 5a,

5b). Notwithstanding, the driveways are designed as thoroughfares without justified cause, that favour increased vehicle speeds in spite of the speed limit sign. Moreover, some road markings are unclear, which is confusing for both drivers and pedestrians. The protective posts further reinforce the perception of a car-dominated environment.

All renovated open spaces were fully paved with asphalt coating. No NbS elements or porous materials were implemented in this POS regeneration either. Even a small green surface formerly containing children's amenities was paved unnecessarily, since it is not zoned for parking and has no real purpose. These developments have again produced a substantial increase in paved surfaces relative to the original urban fabric, thereby reducing the proportion of permeable and green areas. Finally, no social improvements in the neighbourhood were achieved in this regeneration, since there are no areas nor amenities for residents that would support their social life.

a) Planned parking with wide roadways and POS in front of building entrances.
Source: [23]

(b) Speed limit in the Ljudevita Gaja street.
Source: [23]

Figure 5. Effects of POS regeneration in the western neighbourhood.

3.5. RESIDENTS' SATISFACTION WITH THE EFFECTS OF PUBLIC OPEN SPACE REGENERATION: SURVEY RESULTS AND DISCUSSION

Understanding residents' satisfaction is essential for evaluating the effectiveness of POS regeneration beyond its physical outcomes. To this end, a residents' survey was conducted to capture the perceptions of information flow, participation opportunities, institutional responsiveness, and implementation success. The following section presents survey questions and summarizes the key results, highlighting residents' experiences across different stages of POS implementation and everyday use.

Question 1. Have you been informed about plans or projects related to POSs in your neighbourhood?

Survey results indicate generally low levels of awareness among residents (Chart 1). A total of 41.2% stated that they were not informed at all, while 30.8% were only partially informed. Smaller shares reported being little informed (7.7%), sufficiently informed (11.5%), or fully informed (3.8%). Those who were informed to some extents have heard about POS regeneration through the Housing association, internet and media. Overall, these results indicate a low level of communication and transparency between local authorities and residents. The fact that more than two-thirds of respondents were not or were only partially informed suggests the need for improved public outreach, participation mechanisms, and information-sharing practices in POS planning and implementation processes.

Question 2. Have you had the opportunity to participate in the decision-making process in your neighbourhood (public discussions, surveys, meetings)?

Participation opportunities were reported as extremely limited (Chart 2). A large majority (76.9%) stated they had no opportunity to participate, while 7.7% described opportunities as rare and limited. Only 15.4% reported that participation was possible partially, and none considered participation opportunities to be often or always available. Those who did not have the chance to participate in decision-making stated that no official notification was available nor posted in the neighbourhood, while those who were somewhat involved complained that their proposals were not incorporated into the design. These findings point to a severe lack of institutionalized mechanisms for citizen involvement in local decision-making. The data suggest that public participation is either absent or

occasional and unstructured. Strengthening participatory practices through inclusive planning processes would be crucial to ensure residents' voices are heard and integrated into urban development decisions.

Question 3. If you participated in the decision-making process in your neighbourhood, to what extent was your opinion respected?

Among the 23.1% of respondents who reported some level of participation, the majority feels that their opinions were not respected (Chart 3). Half of them (11.5% of the total sample) stated that their opinions were not respected at all, while 7.7% felt their views were respected very little. Only 3.9% believed their input was partially considered, and none reported substantial or full respect for their views. Complaints focused on the car-oriented design, extensive asphalt paving, and the lack of amenities. In the opinion of one interviewee, the majority of the local community is dissatisfied with the final outcome. These findings further corroborate the low level of responsiveness and inclusiveness in local governance and planning processes. Even when participation occurs, it appears to have limited influence on actual decisions. This highlights the need to foster dialogue, and strengthen transparency and feedback mechanisms so that residents' contributions are genuinely valued and integrated into project outcomes.

Question 4. How do you assess the role of local self-government, public companies or investors in providing and maintaining POSs in your neighbourhood?

Residents expressed a predominantly negative assessment of institutional performance (Chart 4). More than half (53.8%) rated it as very poor, and 30.8% as poor, while only 15.4% considered it acceptable; none rated it positively. Key complaints included stormwater runoff and recurrent flooding, inadequate maintenance, and inconsistent decision-making, such as the removal of linden trees due to allergens while a problematic plane tree undermining building foundations remained unaddressed. Even prior to regeneration, maintenance was perceived as minimal, limited mainly to removing unregistered vehicles. This strong negative assessment indicates widespread dissatisfaction with institutional performance, linked to issues such as insufficient maintenance, poor coordination, and limited communication with residents. The results suggest an urgent need for stronger institutional accountability, better inter-sectoral cooperation, and more participatory approaches to ensure that POSs are managed in line with residents' needs and priorities.

Question 5. To what extent do you think the plan/ project envisioned for your neighbourhood has been implemented?

More than half of respondents (53.8%) stated they were unfamiliar with the plan/project and could not assess its realization (Chart 5). Among those who commented, perceptions of implementation were largely negative: 23% believed it was partially realized, 11.5% mostly not realized, and 7.7% not realized at all. None considered it mostly or fully implemented. Some interviewees mentioned abandoned intentions to pave additional green areas for parking, poor construction quality, and prolonged works. Several residents emphasized that they supported renovation in principle, but not in the manner executed. These findings suggest that even among those familiar with the plan, there is a prevailing perception of incomplete or insufficient implementation. Combined with the fact that over half of the community could not comment on the plan/project, the results highlight significant gaps in transparency and effectiveness of project execution. This emphasizes the need for better communication, effective monitoring, and greater accountability to ensure that improvements to POSs are indeed achieved.

Question 6. Who uses POS in your neighbourhood and to what extent?

Most respondents stated that POS is used by everyone, including residents themselves, although 11.5% were unsure. Residents of the western neighbourhood particularly stress that POS around their buildings has been completely converted into streets and parking lots, and cannot be considered a quality space for social interaction; they therefore conclude that POS is being used insufficiently or not at all. The residents further point out that parking lots are often occupied by employees of various companies in the surroundings, such as Clinical Center and Electricity Distribution Company. Several respondents from the western neighbourhood noted that POSs are underused and lack amenities, especially children's playgrounds that existed prior to regeneration. In the eastern neighbourhood, there are a few playgrounds, but the number of children is relatively small.

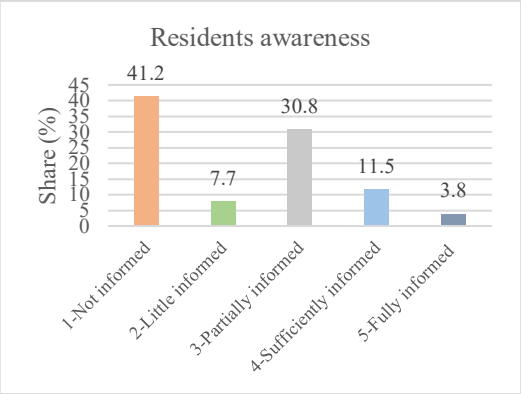


Chart 1.

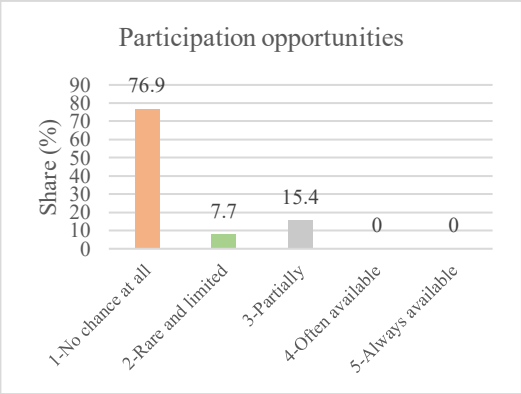


Chart 2.

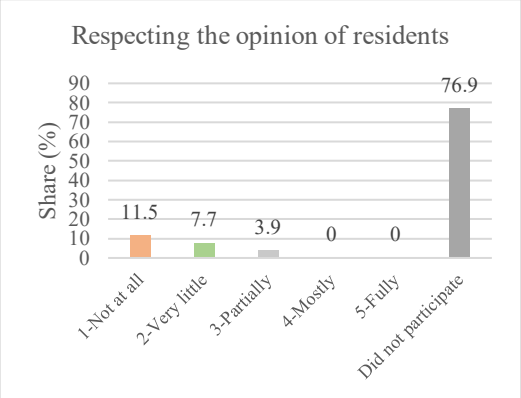


Chart 3.

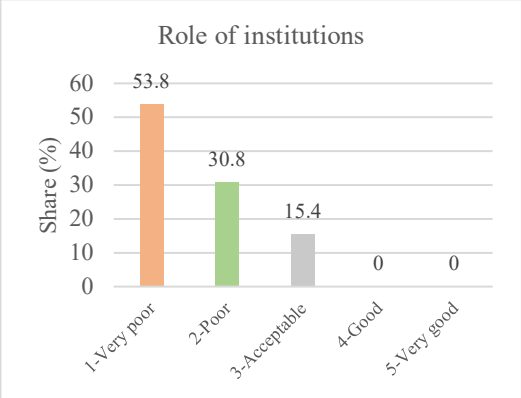


Chart 4.

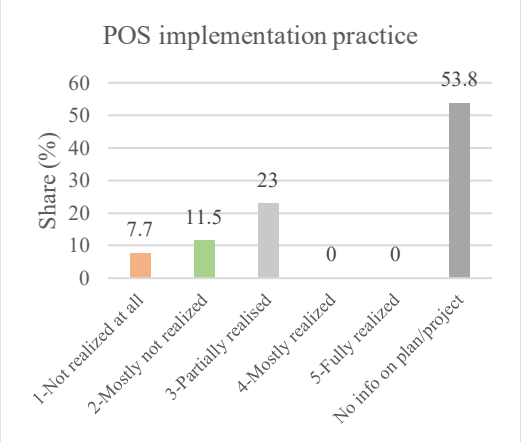
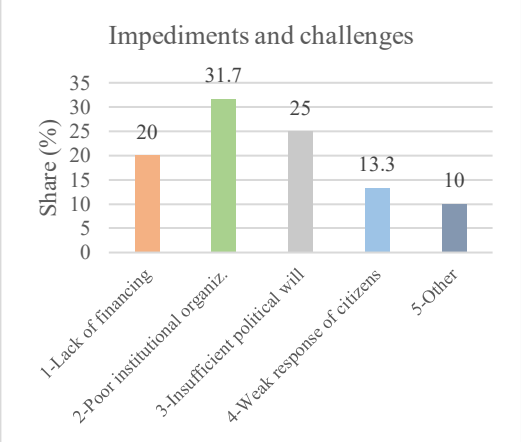


Chart 5.



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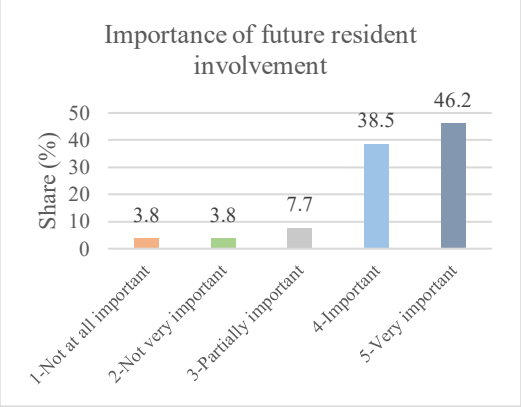

Chart 7.

Charts 1-7. The results of residents' survey. Source: Charts by authors

Question 7. Who maintains POS, to what extent, what are the issues, and are there any resident initiatives?

Responses regarding maintenance were inconsistent. Some residents identified Public Utility Company Mediana and the Public Utility Company Parking Service as responsible, while others claimed that tenants maintain the space themselves or that no one is effectively in charge. Although paid parking in the western neighbourhood was supported by some residents as a solution to parking shortages, maintenance of greenery was widely perceived as inadequate.

Regarding the issues in POS maintenance, residents identified a wide range of problems. In the western neighbourhood, these include poor construction quality, problematic traffic organization, unclear road markings, difficult use of garages, insufficient emergency access, reduced parking capacity near remaining green areas, and continued encroachment of open space. Greenery is poorly maintained, and no amenities for social interaction were introduced; community meetings are held in front of buildings. Additional concerns include poor lighting that contributes to neighbourhood vandalism, safety risks due to mixed pedestrian and vehicular traffic, rodent issues linked to poor hygiene and waste management, and noise from late garbage collection. Furthermore, residents emphasized insufficient communication with local authorities, weak institutional cooperation, and low resident engagement in resolving POS issues. In the eastern neighbourhood, residents reported pigeon-related hygiene problems, unregulated parking by non-residents, and neglected trees threatening building foundations. The mixing of pedestrian and car traffic led to resident protests, after which protective posts were installed to restrict vehicle access in some areas.

Opinions on resident initiatives varied. One resident mentioned that some resident initiatives exist but are rarely considered by the city. Some respondents noted that proposals were even submitted during regeneration but not adopted. Others described general demotivation and weak engagement, particularly among newer residents. One long-term resident recalled earlier periods of stronger tenant involvement, including collective planting of birch, plane, and fir trees.

Question 8. What factors, in your opinion, limit the realization of POSs the most? (circle all that apply)

From 26 interviewees, 60 responses were recorded. Institutional and political barriers were perceived as the primary constraints to POS realization (Chart 6). Poor institutional organization was most frequently cited (31.7%), followed by insufficient political will (25%) and lack of financing (20%). Weak citizen response accounted for 13.3%, while other factors (10%) included low public awareness, corruption, financial misconduct, and inefficient use of available funds due to lack of knowledge. Overall, the findings suggest that the challenges are primarily systemic, rooted in inefficient governance and limited commitment from decision-makers, rather than in the local community itself. Strengthening institutional coordination, ensuring consistent political support, and establishing sustainable funding mechanisms would therefore be essential to improve the implementation of POS projects.

Question 9. To what extent is it important for citizens to be involved in future POS projects?

There was strong consensus on the importance of participation (Chart 7). Nearly half of respondents (46.2%) rated it as very important and 38.5% as important. Only small shares considered it partially important (7.7%) or not important (7.6%). Nevertheless, two respondents expressed skepticism, noting that residents should not be sole decision-makers or doubting that their opinions would genuinely influence outcomes. These findings clearly indicate that residents value participation and wish to play a more active role in shaping their local environment. Strong support for participation highlights a significant potential for building more inclusive and collaborative planning processes in the future. Notwithstanding, there remains a lack of trust in the effectiveness and influence of such involvement within existing institutional frameworks.

Question 10. Are there positive examples in your neighbourhood or other parts of the city that could serve as a best practice model?

More than half of respondents stated that no positive examples exist in their neighbourhood or that they were unaware of any. A single respondent identified the organized parking as a positive aspect. However, all other respondents agree that successful POS practices are found elsewhere in the city. Several respondents identified POS in socialist-era neighbourhoods along Bulevar Nemanjića and the Nišava riverfront as a good example of POS planning. Regarding new residential developments, a couple of interviewees mentioned a small POS in social housing complex in Duvanište settlement, which has been partly arranged and landscaped despite the space's shortcomings in size, organization, and equipment. This POS features well-organized parking and small fragmented green areas, such as a rose garden maintained by the residents. Others pointed to larger recreational areas and public spaces adjacent to major public facilities, such as Čair Park, the new park near the Delta shopping center, the open space next to the elementary school, and several central city areas, which

are perceived as examples of well-designed and functional POSs. One respondent emphasized that the most successful examples are those where property ownership over POS has been clearly resolved. Overall, residents perceive a lack of positive POS examples in their immediate surroundings but recognize better practices elsewhere in the city. The findings suggest that residents identified clear ownership, thoughtful planning and regular maintenance of POS as key factors contributing to best practice models.

4. DISCUSSION: THE EFFECTS OF IMPLEMENTATION, KEY FINDINGS AND RECOMMENDATIONS

Regarding the overall implementation of the standing Plan of general regulation, it can be assessed as weak and selective. Although the PGR Medijana formally provides the planning framework for residential POS, and sets the planning context for the Urban design project, its limited specificity and uneven zoning have allowed car-oriented, program-driven interventions to dominate implementation. As a result, POS regeneration has produceded outcomes that residents perceive as incomplete, poorly coordinated, and misaligned with social and environmental needs.

When reviewing the implementation of the standing Urban design project, it appears that it was not taken into account in the reconstruction of POS in this LHE. It is evident that the realized transformation of open spaces in both neighbourhoods differs from the standing Urban design project and the solutions proposed for POS. The authorities claim that they performed such redevelopment to accommodate as much parking as possible, in line with the requests of residents. On the other hand, while the interviewed residents state that there is improvement regarding their parking needs, they are dissatisfied with the overall result of the regeneration. Given the fact that the Project of implementation was never available to the general public, it feels that the construction works were performed in a rather ad hoc manner.

Regarding the implementation of the current Program, it can be assessed as effective in delivering rapid, technically executed interventions, but weak in terms of integration, quality, and responsiveness to local needs. While the Program enabled the realization of POS regeneration through dedicated funding and institutional coordination, its project selection and execution remained largely sector-driven and focused on short-term problem solving, particularly parking provision. The lack of alignment with planning intentions, limited transparency, and absence of resident participation resulted in outcomes that failed to enhance the social, environmental, and functional performance of POSs.

The results of residents' survey provide insight into their perceptions and experiences, revealing how regeneration efforts have been communicated, implemented, and experienced at the neighbourhood level. As the main barriers to implementing POS-related plans, projects and programs, this study has identified poor stakeholder communication, low transparency, low citizen participation, and weak institutional coordination and accountability. Residents are often uninformed or only formally involved, and therefore lack trust in institutions. They express willingness to participate, but their involvement remains unstructured and largely symbolic, while their feedback has little real influence in decision-making. Overall, the process lacks inclusiveness, trust, and effective collaboration between authorities and the community, leading to inefficient implementation and dissatisfaction with outcomes.

Moreover, several problems are also identified in the management of POS – the site suffers from poor maintenance, insufficient amenities, and conflicts in space use caused by inadequate planning and lack of regulation. Residents report unclear responsibilities and limited communication with local authorities, while their initiatives are rarely acknowledged or supported. In the absence of a clear maintenance framework, the encroachment of green areas for parking and the lack of safety and hygiene further reduce the quality and usability of POS.

Overall, the analysed case reveals systemic governance issues and poor community engagement in the implementation phase of urban planning and design, which further extends into the phases of POS realization and maintenance.

Table 1 presents the main findings gained in this study, as well as the recommendations devised in order to enhance the implementation of POS plans and projects within LHEs in the city of Niš.

Table 1. Findings and recommendations for enhancing POS-related implementation in inherited large housing estates in Niš

Findings	**Recommendations**
Inconsistent/incomplete framework for POS in planning documents	Properly designate land-uses for all plots in PGRs to eliminate undefined or ambiguously zoned areas that enable misinterpretation.
Disregard of the adopted Urban design project during actual construction phases	Enforce compliance with approved Urban design projects in all implementation stages through binding mechanisms.
	Introduce a mandatory *Design audit* before, during, and after construction, to ensure alignment with approved plans and projects, and prevent deviations without public review.
Weak institutional coordination with fragmented responsibilities	Strengthen interdepartmental coordination (planning, design, and implementing departments), and designate a single body responsible for managing POS projects.
Ad hoc execution of urban plans and projects for POSs	Establish a coordination body consisting of city representatives and residents' councils to oversee all POS projects, from planning and design to realization and maintenance.
Car-oriented design with no improvements in social or recreational function of POS	Integrate open spaces for recreation, social interaction and children's play as mandatory design standards in implementation projects.
Environmental degradation with excessive hard surfacing and loss of green areas	Mandate the integration of NbS systematically in planning and design documents and all future urban interventions to restore environmental balance.
Poor awareness of residents about plans and projects for POS	Enhance communication and information sharing with residents throughout all stages of public space projects, from initial planning to implementation.
Limited or no participation in decision-making	Involve all relevant stakeholders and define decision-making mechanisms that take into account the perspectives of different participants.
	Make the decision-making process inclusive and transparent.
	Organize meetings and workshops with residents to foster participation.
	Institutionalize collaboration with residents by establishing a dedicated liaison unit to connect public authorities, citizens, and other stakeholders.
	Develop feedback systems that track and report how citizen input is integrated into planning and decision-making.
Lack of residents' confidence in the impact of their involvement	Rebuild trust through small-scale participatory projects that deliver visible improvements and demonstrate institutional responsiveness.
Weak realization of planned activities (according to respondents' opinions)	Improve project implementation mechanisms through clearly defined responsibilities, financial planning, timelines, and reporting procedures.
	Enhance public-private partnerships in the provision and maintenance of POS.
Dissatisfaction with the executed state, as well as with the condition and use of the space	Establish a system for collecting information from residents not only during POS planning but also during the use of existing spaces, to better understand residents' habits, preferences, and needs.
Poor POS maintenance and unclear responsibility	Establish shared maintenance models between the city, public utility companies, and residents, and define responsibilities for POS maintenance.

	Assign maintenance responsibility to public utility companies with defined Key Performance Indicators for biodiversity, climate resilience, safety, and functionality.
	Determine residents' rights and obligations regarding the land surrounding their buildings.
	Educate residents about their rights and responsibilities concerning land use, and launch awareness campaigns about the role of residents in POS upkeep.
	Develop support and incentive programs for residents involved in POS maintenance, while also establishing penalties for neglecting maintenance.
	Introduce participatory budgeting for POS upgrades and maintenance.
Limited awareness of sustainable urban planning and design practices	Provide training for municipal staff and residents on NbS and sustainable management.
	Develop monitoring protocols for implemented NbS projects, and promote the results regarding ecological benefits and social use.
Safety and hygiene issues affect security and quality of life	Improve control over communal areas by communal police, and ensure regular sanitation and infrastructure check-ups.

5. CONCLUSION

This study evaluated the impact of urban planning and design documents on the shaping of POS in multi-family residential areas, and explored the effects of programmatic implementation. The analysed site dates back to the socialist period, when it featured well-planned green areas integrated into the housing environment. Over time, post-socialist densification, increased motorization and infrastructural neglect led to the significantly declined spatial quality, leaving the site with multiple challenges prior to revitalization.

The analysed case study in the city of Niš showcases a POS redevelopment that was initiated by the local authorities. Although a formal planning and design framework existed through the PGR Medijana and the adopted Urban design project, their influence on realized outcomes has been marginal. Instead, implementation has been largely driven by a sector-based program, prioritizing traffic and parking solutions over social, environmental, and spatial quality. There is an evident implementation gap between planning and realization phases. Moreover, inconsistencies between adopted urban design project for POS redevelopment and its actual realization point to weak enforcement and fragmented responsibilities among municipal departments. While programmatic implementation has enabled rapid physical transformation, it has failed to deliver cohesive, socially functional, and environmentally resilient POSs. Such approach to implementation represents a missed opportunity to harness the full potential of POS in the regeneration of inherited LHEs. POS is perceived as leftover space rather than planned public infrastructure, resulting in underdeveloped areas. Ineffective regeneration outcomes further weaken residents' sense of responsibility for their surroundings, making the maintenance of building-oriented POSs especially challenging. From the perspective of citizen engagement, the process lacks inclusiveness, trust, and effective collaboration between authorities and the community, often leading to dissatisfaction with the outcomes, re-active forms of participation, and overall inefficient implementation.

This study reveals systemic governance issues concerning the implementation od POS plans and projects, and future POS management. Furrthermore, it emphasizes the need for clearer institutional roles, community engagement, and continuous collaboration between residents and local authorities in order to preserve and enhance POS in residential environments. Further studies should build on the established recommendations to devise a more integrated, participatory, and accountable implementation model that aligns urban plans, projects, and programs, and recognizes residents as active partners in the long-term use and maintenance of POS.

Acknowledgement

This research was supported by the Science Fund of the Republic of Serbia, #GRANT No 7572, Reclaiming Public Open Space in Residential Areas: Shifting Planning Paradigms and Design Perspectives for a Resilient Urban Future - RePOS.

This research was also supported by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia, under the Agreement on Financing the Scientific Research Work of Teaching Staff at the Faculty of Civil Engineering and Architecture, University of Niš - Registration number: 451-03-34/2026-03/200095 dated 05/02/2026.

Research is linked to Sustainable Development Goal 11: Make cities inclusive, safe, resilient and sustainable, Target 11.7: By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities.

For further reading on reclaiming public open space in residential areas, please visit the RePOS project website: https://www.repos-project.rs/

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