Urban partnership operations in Brazil: potentials, contradictions, and the contributions of Multipurpose Cadastre and LADM

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Keywords: Urban Partnership Operations; Multipurpose Cadastre; Land Administration Domain Model; Urban Governance; Urban Policy

SUMMARY

Urban Partnership Operations (UPOs) are among the key instruments established by the Brazilian City Statute (Federal Law No. 10,257/2001), designed to promote urban redevelopment, planned densification, and land value capture through partnerships between public authorities and private actors. Despite their transformative potential, the literature highlights significant limitations and contradictions in practice, such as the predominance of real estate interests over collective benefits, weak mechanisms for social participation, and the spatial concentration of investments. This article expands the debate by proposing the integration of technical tools — particularly the Multipurpose Cadastre (CTM) and the Land Administration Domain Model (LADM) — as supports for UPO management. Methodologically, the study adopts an analytical and comparative approach, discussing the applicability of these models in planning, definition of financial counterparts, monitoring, and transparency. The findings suggest that the articulation between Multipurpose Cadastre and LADM can overcome information fragmentation, strengthen urban governance, and enhance the social legitimacy of UPOs, thus bringing them closer to the principles of social justice and the social function of the city

Palavras-chave: Operações Urbanas Consorciadas; Cadastro Territorial Multifinalitário (CTM); Land Administration Domain Model; Governança Urbana; Política Urbana.

RESUMO

As Operações Urbanas Consorciadas (OUCs) configuram-se como um dos principais instrumentos previstos no Estatuto da Cidade (Lei nº 10.257/2001), voltados à promoção da requalificação urbana, à captura da valorização fundiária e ao adensamento planejado, mediante parcerias entre o poder público e a iniciativa privada. Apesar de seu potencial transformador, a literatura evidencia limitações e contradições na prática, como a prevalência de interesses imobiliários sobre o interesse coletivo, fragilidades na participação social e concentração espacial dos investimentos. Este artigo busca ampliar o debate ao propor a integração de ferramentas técnicas – em especial o Cadastro Territorial Multifinalitário (CTM) e o Land Administration Domain Model (LADM) – como subsídios à gestão das OUCs. Para tanto, adota uma abordagem analítica e comparativa, discutindo a aplicabilidade desses modelos na fase de planejamento, definição de contrapartidas, monitoramento e

transparência. Conclui-se que a articulação entre CTM e LADM pode contribuir para superar a fragmentação das informações territoriais, fortalecer a governança urbana e ampliar a legitimidade social das OUCs, aproximando-as de seus princípios de justiça social e da função social da cidade.

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1. INTRODUCTION

Urban Partnership Operations (UPOs) constitute one of the urban policy instruments established by the City Statute (Federal Law No. 10,257/2001). They were conceived as mechanisms of territorial intervention aimed at promoting densification, urban redevelopment, and land value capture through partnerships between public authorities and private initiatives. Despite their potential to foster significant urban transformation, the implementation of UPOs has been the subject of recurrent criticism in academic debates. The main concerns relate to the subversion of their transformative potential, as private interests to the detriment of the collectivity (Maricato & Ferreira, 2002; Alvim et al., 2011; Siqueira & Souza, 2020) often appropriate the benefits generated.

Drawing on 2015 data, Siqueira and Schleder (2022) identified that only 25.15% of Brazilian municipalities had, at that time, enacted legislation on urban partnership operations. Among these municipalities, 40.18% had up to 20,000 inhabitants, 30.84% ranged between 20,001 and 50,000 inhabitants, and 29.98% had more than 50,000 inhabitants. These results demonstrate that, although present in only one-quarter of Brazilian municipalities, UPOs had already reached territories of different demographic scales, with a noteworthy incidence in small municipalities. This evidence highlights not only the normative dissemination of the instrument but also its relevance in municipal urban policy, since it extends beyond large urban centers, which have traditionally concentrated the most complex transformations.

In Brazil, research on UPOs has been predominantly developed within the field of Critical Urbanism. This approach has been essential for exposing how different urban actors appropriate the instrument and for analyzing its concrete territorial impacts. Such perspectives have revealed the limits and contradictions of UPOs in the Brazilian context, particularly by evidencing the predominance of economic and real estate interests over broader objectives linked to social justice and the right to the city. Nonetheless, the conclusions drawn from this body of research indicate that the instrument itself should not be regarded as inherently perverse; its outcomes are directly associated with the forms of appropriation, management, and regulation established in each urban context (Maricato & Ferreira, 2002).

Despite the relevance of these critical analyses, there remains a gap in discussions concerning the technical dimensions that could enhance the implementation and management of UPOs. In this sense, the present research seeks to broaden the debate by focusing on the potential contributions of cadastral tools, such as the Multipurpose Cadastre, and management models, such as the Land Administration Domain Model (LADM). By enabling the production of precise, integrated, and up-to-date territorial data, these instruments foster conditions for greater transparency, administrative efficiency, and equity in the distribution of benefits and burdens arising from urban partnership operations. Accordingly, this article reflects on how the Multipurpose Cadastre and LADM can serve as complementary mechanisms to the consolidated

critical approaches, contributing not only to the improvement of urban databases but also to the promotion of more informed, democratic, and accountable public management.
The methodology adopted in this study is analytical and comparative, aiming to assess the implications of cadastral models for UPO management in light of the challenges and criticisms identified in the literature. The structure of the article is as follows: the first section addresses the conceptual foundations of the Multipurpose Cadastre and the LADM; the second section discusses UPOs, with emphasis on their foundations, legal framework, and the main criticisms raised regarding their implementation in the Brazilian context; the third section explores the applicability of the Cadastre and LADM in the implementation and monitoring of UPOs, highlighting their potential contributions to the enhancement of urban governance. Finally, the concluding section presents the final considerations based on the analyses developed throughout the study.

2. MULTIPURPOSE CADASTRE AND LADM: BASIC CONCEPTUAL ASPECTS

The basic conception of a cadastre encompasses the idea of a structured spatial information system that consolidates data pertaining to a given territory, as illustrated in Figure 1. Conceptually, it can be defined as the "public, methodically ordered inventory of data concerning all legal territorial objects in a particular country or district, based on the surveying of their boundaries" (Steudler & Kaufmann, 1998, p. 14).

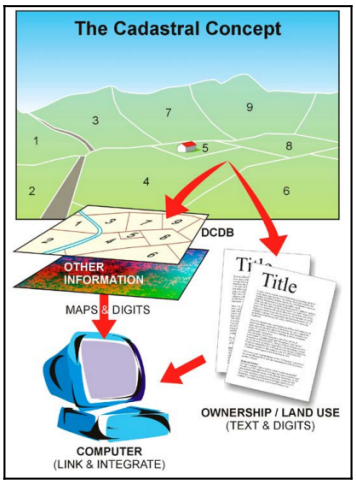

Figure 1. The Cadastral Concept. Source: Steudler, 2014

In contemporary practice, cadastres are designed to provide an integrated and continuously updated representation of urban reality, constituting a fundamental basis for land-use planning, land management, and urban policy-making. This broader scope justifies their frequent designation as Multipurpose Cadastres.
In Brazil, the current legal framework is established by Ordinance No. 3,242/2022, issued by the Ministry of Regional Development. The Multipurpose Cadastre is conceived as the official and systematic inventory of municipal parcels, creating a geometric database upon which all municipal thematic cadastres must be linked (Brasil, 2022). Figure 2 illustrates this

integration, in which the connection between cadastral and thematic data generates the geospatial database that serves as the basis for municipal land management.
It is equally important to emphasize that, according to Ordinance No. 3242/2022, the articulation of different cadastre types requires the adoption of information systems capable of ensuring interoperability among geospatial and alphanumeric databases originating from diverse sources. Furthermore, the ordinance mandates that these systems be continuously updated in order to reflect the dynamics of land occupation. In addition, the systems must be developed under principles of transparency and accessibility—indispensable conditions for strengthening social control and promoting the democratic use of territorial information (Brasil, 2022).
Another relevant aspect addressed by Ordinance No. 3242/2022 concerns the property valuation process. This procedure is particularly relevant "for tax purposes to estimate the market value, in order to ensure equity, isonomy, fiscal justice, and social justice." To this end, the ordinance recommends that municipalities update property values at least every four years, thereby preventing fiscal assessments from lagging behind real estate appreciation (Brasil, 2022).

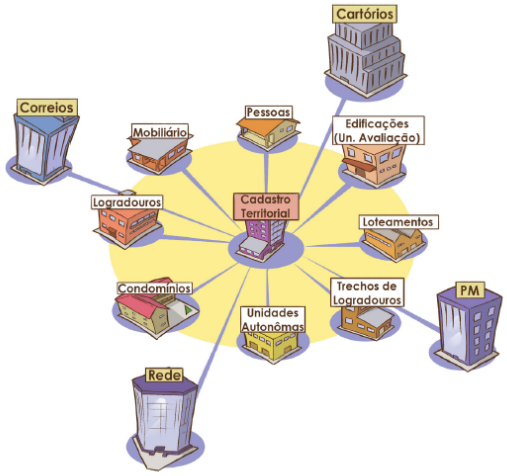

Figure 2. Data integration between the Cadastre and thematic data. Source: Silva *et al.* (2023).

The ordinance also highlights the articulation of the Multipurpose Cadastre with Real Estate Market Observatories as a fundamental operational mechanism. Through this integration, municipalities may monitor, in near real time, land value dynamics and the impacts of urban policies. A Real Estate Market Observatory is defined as an open information system dedicated to the continuous collection and storage of data related to the property market, including transaction prices, listing offers, rental values, construction costs, prior assessments, and other indicators pertinent to the real estate sector (Brasil, 2022).
Beyond its technical functions, the Multipurpose Territorial also plays a significant political-institutional role. By reducing informational asymmetries between the State, the market, and civil society, it contributes to enhancing the legitimacy of urban decision-making processes. A reliable and multipurpose cadastre strengthens the negotiating position of public authorities

vis-à-vis private actors, providing fairer and more consistent parameters for the application of urban policy instruments established by the City Statute. In this way, it supports compliance with the constitutional principles that govern land occupation and urban development in Brazilian cities.

Although Ordinance No. 3242/2022 establishes guidelines for the organization of the Multipurpose Territorial Cadastre by Brazilian municipalities, its practical implementation faces a number of challenges. Among these, one of the most critical is the integration of data produced by different institutions, each of which usually follows its own organizational logic. This challenge—shared by several countries—was one of the main motivations for structuring the *Land Administration Domain Model* (LADM), which was approved in 2012 as an international standard by the International Organization for Standardization (ISO), after more than a decade of discussions coordinated by the International Federation of Surveyors (FIG). The approval of ISO 19152/2012 consolidated these efforts.

In analyzing the organization of cadastral data in the Brazilian context, Frederico and Carneiro (2014) highlight the existence of fragmentation processes that hinder data integration. In this regard, they argue that the LADM—by providing a standardized and universal language for structuring cadastral data—offers a promising solution to this issue. Figure 3 illustrates the role of the LADM as an element that enables the integration of information from multiple sources.

Figure 3. Illustration of the role of LADM in data integration. Source: Frederico e Carneiro (2014).

From a practical standpoint, the LADM is a conceptual model that proposes a common language for representing information related to land administration, aiming to overcome the heterogeneity and fragmentation of cadastres across different countries (Lemmen et al., 2015). The model organizes territorial information into three main components:

1. Parties – referring to individuals, legal entities, or collective bodies that hold rights or responsibilities over land;

2. Rights, Restrictions and Responsibilities (RRRs) – encompassing a wide range of elements, from formally registered ownership to environmental restrictions and urban servitudes;
3. Spatial Units – including parcels, buildings, housing units, or protected environmental areas.

The Figure 4 presents the conceptual diagram of the LADM components and their relationships. In the diagram, parties are represented in green, rights, restrictions, and responsibilities in yellow, and spatial units in cyan. Elements in pink correspond to aspects of topographic surveying, while mapping aspects are represented in violet (Lemmen & Van Oosterom, 2015).

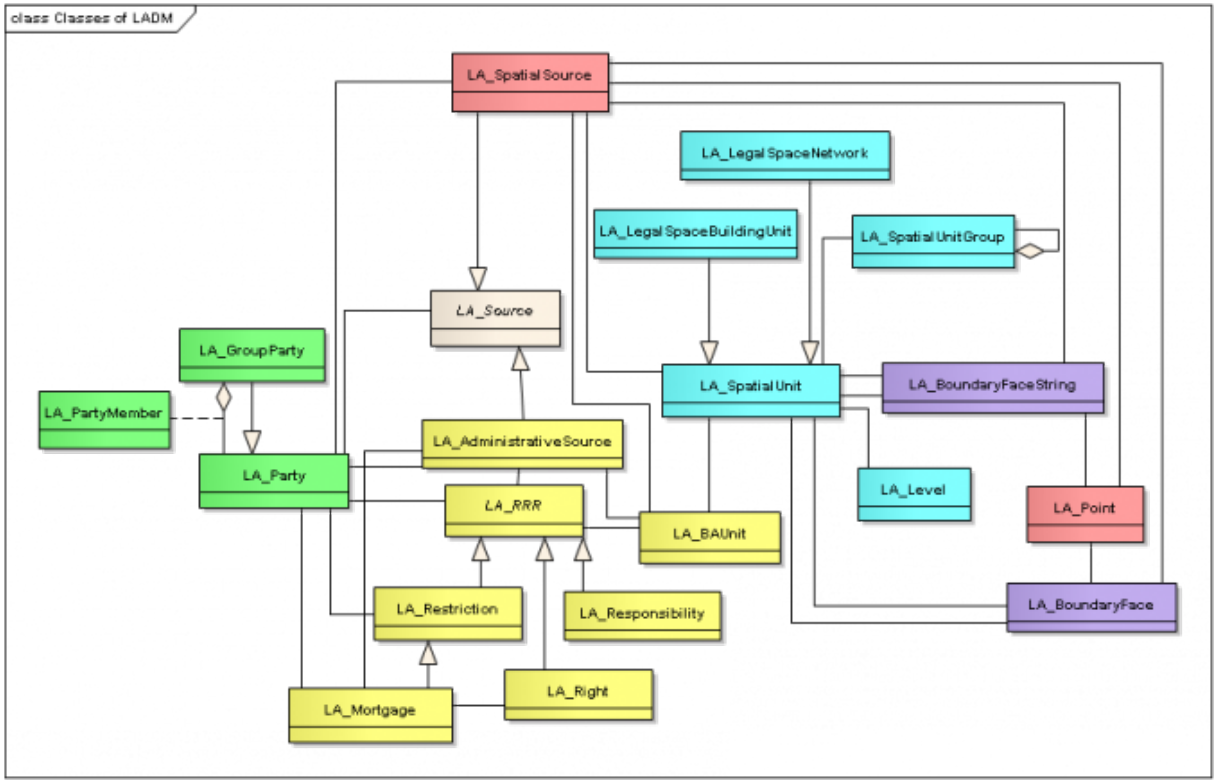

Figure 4. Conceptual diagram of LADM components. Source: ISO 19.152/2012 (2012)

The flexible structure of the LADM makes it possible to integrate different dimensions of territorial information—legal, fiscal, urban, and environmental—into an interoperable system. In countries such as Brazil, where institutional fragmentation and overlapping cadastres persist, the adoption of the LADM represents a strategic advance. By fostering harmonization among property registries, municipal fiscal cadastres, environmental databases, and urban planning systems, the model strengthens land governance, enhances the implementation of urban policies, and contributes more effectively to sustainable development.

3. URBAN PARTNERSHIP OPERATIONS: GENESIS, STRUCTURING, AND CRITIQUES

In the decades preceding the enactment of the 1988 Constitution, Brazil underwent an accelerated process of urbanization, characterized by socio-spatial segregation and the exclusion of low-income populations from the most valued areas of cities. This context gave rise to the Urban Reform movement and culminated in the incorporation of the principle of the social function of property into the 1988 Federal Constitution (Art. 182) (Brasil, 1988). Nonetheless, a regulatory framework capable of operationalizing these principles at the municipal level was still lacking. In this regard, the City Statute (Law No. 10,257/2001) emerged as a response to this gap, instituting a set of urban policy instruments designed to regulate land use and redistribute collective benefits. Among these instruments are the Urban Partnership Operations (UPOs).

The City Statute establishes that each UPO must be regulated by a specific municipal law, which defines its territorial scope, objectives, financing arrangements, and monitoring mechanisms. The municipal law must also determine the counterparts to be provided by private agents, the urban parameters subject to flexibilization, and the conditions for the execution of interventions. It is, therefore, an instrument of an exceptional character, through which ordinary urban norms may be revised to allow the implementation of strategic projects (Brasil, 2001).

In practical terms, the functioning of UPOs is based primarily on the flexibilization of urban indices—such as floor area ratio, height limits, and land-use regulations—within specific areas of the municipality. In exchange for such benefits, private agents are required to provide resources allocated to public works, including road infrastructure, social facilities, affordable housing, and environmental recovery. This arrangement seeks to reconcile public and private interests, guided by the principle of capturing part of the land value increment generated by the flexibilization of urban norms. As a mechanism of social control, the City Statute also mandates participatory instruments, such as public hearings and management councils, responsible for discussing, approving, and monitoring intervention proposals (Rolnik, 2015).

Within the Brazilian context, the municipality of São Paulo established itself as a national reference in the implementation of UPOs from the 1990s onwards—thus, even prior to the federal regulation of the instrument through the City Statute. Among its pioneering experiences are the Faria Lima Urban Operation (1995) and the Água Espraiada Urban Operation (2001). In São Paulo, particular relevance is attributed to the creation of the *Certificate of Additional Construction Potential* (CEPACs), a financial security issued by the municipality to enable Urban Partnership Operations. Each certificate corresponds to a specific quantity of additional square meters of construction rights or the possibility of altering urban parameters for a lot located within the perimeter of the operation. CEPACs are acquired through public auctions, regulated by the Securities and Exchange Commission of Brazil (CVM), and once purchased, they may be traded on the secondary market until their effective use in a real estate development (São Paulo, 1995; São Paulo, 2020).

The funds raised through the sale of CEPACs are earmarked and must be applied exclusively to the interventions provided for in the legislation of the respective Urban Operation, such as infrastructure works, urban improvements, implementation of public facilities, and redevelopment actions. In this way, the instrument enables the State to capture, in advance, part of the real estate appreciation generated by urban transformation, converting it into public investments that, in turn, reinforce the region's development process.

As an example, Figure 5 presents cartographic documentation representing the spatial boundaries of the Faria Lima Urban Operation, implemented in the municipality of São Paulo.

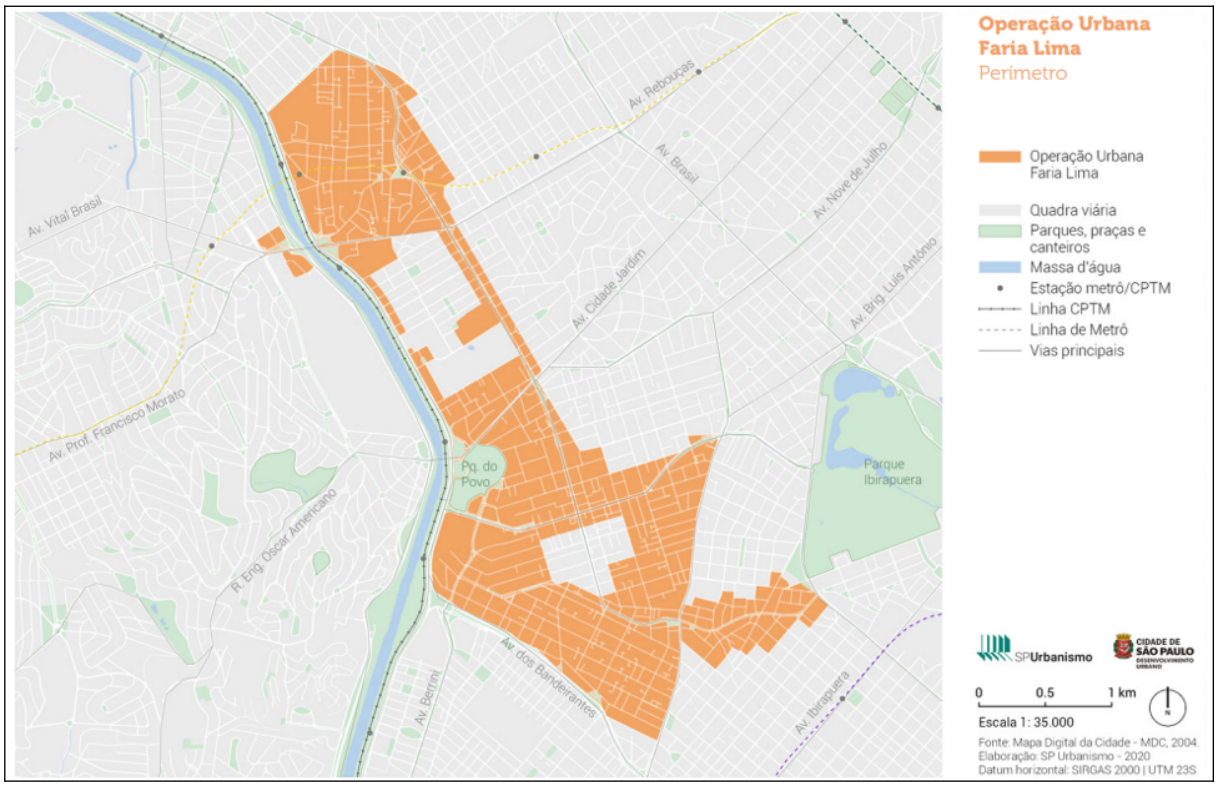

Figure 5. Delimitation of the Faria Lima Urban Operation, in the municipality of São Paulo – SP. Source: São Paulo, 2020

As of the reference date of August 2025, the Faria Lima Urban Partnership Operation had already raised approximately R$ 3.1 billion through the sale of CEPACs (São Paulo, 2020), with R$ 1.668 billion obtained in the most recent auction, held on August 19, 2025. These resources are and continue to be allocated exclusively to the interventions mandated by the operation's legislation, including infrastructure works, social housing, transportation, and the redevelopment of urban spaces.

The Faria Lima UPO can be considered a success when analyzed solely from the perspective of urban space as an economic asset, leveraged in the process of restructuring large metropolitan areas. However, the main point of critique concerns the effective socialization of the benefits generated by the operation. In analyzing UPOs in Brazil, Maricato (2011) notes that the capture of land value appreciation frequently translates into private gains, without the corresponding social redistribution prescribed by law. Similarly, Fix (2019) observes that this dynamic is evident in the Faria Lima UPO, which experienced intense real estate appreciation but invested far less than planned in social housing, directing a significant portion of resources to road and mobility interventions guided by real estate market demands, often to the detriment of social inclusion initiatives. Thus, while São Paulo's experiences introduced sophistication into urban financing mechanisms, challenges persist regarding transparency, the effectiveness of social counterparts, and the strengthening of social control. These issues

underscore the need to improve the governance of UPOs and implement complementary instruments that enhance equity in the distribution of urban benefits.

Another recurring criticism concerns the fragility of social control mechanisms. Despite legal provisions for public participation, management councils and public hearings are often heavily influenced by state representatives and the real estate sector, limiting the capacity of local communities to assert their demands. This imbalance undermines the democratic principles of urban governance and weakens the social function of the city. The spatial selectivity of UPOs is also contested. These operations are typically implemented in central or high-value areas, concentrating investments in already attractive regions while peripheral areas remain marginalized. This approach tends to reinforce socio-spatial inequalities and can induce processes of indirect displacement of vulnerable populations (Maricato, 2011).

From a financial perspective, criticisms focus on the dependence on CEPACs—or similar mechanisms—and their vulnerability to market fluctuations. During periods of economic instability, the sale of these securities may become unviable, compromising the financing of planned interventions (Fix, 2001; Sanfelici, 2013). Such dependence on external market dynamics limits the autonomy of urban planning.

Finally, from the perspective of Critical Urbanism, UPOs reveal a structural contradiction: while aiming to enable interventions in the public interest, they reinforce the centrality of real estate capital in urban space production. This logic weakens the State's capacity to mediate urban conflicts and guarantee the right to the city (Harvey, 2005; Rolnik, 2015). Accordingly, although recognized as an urban innovation, UPOs carry inherent limitations as a management model that prioritizes the articulation between public authority and market forces, often at the expense of full citizenship.

Given these criticisms, it is evident that Urban Partnership Operations, despite a robust legal framework and innovative financing mechanisms, face significant limitations related to transparency, social effectiveness, and market dependency. In this context, the qualification and integration of urban data emerge as strategic elements for enhancing monitoring capacity, ensuring greater accountability, and supporting more equitable decision-making. It is precisely at this juncture that the potential application of the Multipurpose Cadastre and the Land Administration Domain Model (LADM) becomes relevant, as complementary instruments capable of strengthening UPO governance and mitigating some of their recurring limitations.

4. THE MULTIPURPOSE CADASTRE AND LADM AS SUBSIDIES FOR UPOS

In the context of Urban Partnership Operations (UPOs), the Land Administration Domain Model (LADM) presents significant potential. By standardizing the representation of cadastral data, LADM facilitates comparability across different municipalities, enabling multi-scalar and regional analyses. For instance, it allows for the comparison of real estate appreciation generated by UPOs in different metropolitan areas using consistent calculation criteria. Furthermore, LADM is compatible with Spatial Data Infrastructure (SDI) technologies, enhancing transparency and the public availability of information.

Another key aspect is LADM's capacity to incorporate legal and environmental restrictions directly into the data model. This allows UPO planning to explicitly consider areas of permanent preservation, administrative servitudes, or zones of cultural protection. Such integration reduces the risk of normative conflicts and provides greater legal security for both public authorities and private investors.

Moreover, LADM contributes to aligning Brazil with international best practices in land administration, facilitating dialogue with countries that already employ similar standards in urban and land governance contexts. This alignment strengthens Brazil's capacity to participate in global debates on the right to the city, territorial sustainability, and cadastral innovation, while offering a practical instrument to enhance the application of urban policy tools such as UPOs.

The integration of the Multipurpose Cadastre and LADM offers a range of possibilities capable of substantially improving the formulation and implementation of UPOs. While the Multipurpose Cadastre provides a detailed and multifunctional territorial information base, LADM ensures the standardization required for interoperability between different municipalities, public agencies, and levels of government. This convergence addresses one of the main obstacles of UPOs: the fragmentation and unreliability of the information used in their management.

During the planning stage of UPOs, the Multipurpose Cadastre allows for the identification of priority intervention areas, considering not only existing infrastructure but also factors such as socio-spatial vulnerability, lack of public facilities, and potential for real estate appreciation. LADM, in turn, ensures that this information can be integrated with legal and fiscal datasets, offering a comprehensive view of the territory. This strengthens the public authority's capacity to justify UPO boundaries in a transparent and technically grounded manner, reducing the risk of decisions driven solely by real estate market interests.

Regarding the determination of financial counterparts, the integration of the Multipurpose Cadastre and LADM supports more precise calculations of the land value increments captured by public authorities. Simulation models incorporating updated real estate values, urban parameters, and socioeconomic characteristics of affected populations can serve as the basis for establishing proportional and equitable counterparts. This represents an improvement over the current model, in which calculations are often non-transparent and subject to technical and political disputes.

Another important application concerns the monitoring of UPO implementation. A continuously updated Multipurpose Cadastre allows authorities to track changes in land use and occupancy, the evolution of the real estate market, and impacts on population dynamics in the targeted areas. When organized according to LADM standards, this data can be interoperable with national registry and cadastral systems, enhancing oversight capacity. This enables the identification of deviations in resource allocation or distortions relative to the operation's original objectives.

Transparency and social control are also greatly enhanced by these tools. By making standardized and accessible data available on digital platforms, aligned with urban and real estate observatories, various social actors can monitor UPO results closely. This strengthens accountability and increases the legitimacy of UPOs, as society gains access to qualified information on resource use and territorial impacts.

From an urban governance perspective, the combined use of the Multipurpose Cadastre and LADM facilitates coordination among different levels of government and involved sectors.

Municipalities, states, property registry offices, environmental agencies, and financial institutions can share a common data language, reducing inconsistencies and promoting administrative efficiency. This interoperability also enables the integration of UPOs into metropolitan or regional urban development strategies, an aspect still nascent in Brazil.
Finally, it should be noted that the effective adoption of the Multipurpose Cadastre and LADM in the context of UPOs presents challenges. It requires substantial investments in technological infrastructure, training of technical teams, and institutional strengthening of municipalities. Furthermore, political resistance may arise, especially when increased transparency and data standardization conflict with entrenched real estate market interests. Nevertheless, the potential benefits suggest that these tools can reposition UPOs closer to the principles of the social function of property and the right to the city, reducing the asymmetries that currently characterize their implementation.

5. FINAL CONSIDERATIONS

The discussions presented throughout this work allow us to conclude that Urban Partnership Operations (UPOs) constitute an urbanistic instrument with significant transformative potential, the impact of which depends directly on how it is appropriated and implemented. The instrument is neither intrinsically positive nor negative: its effectiveness and legitimacy are contingent upon the political and institutional conditions that guide its application.
In governance contexts committed to the public interest, UPOs can facilitate structuring urban interventions, expanding infrastructure, mobility, and the provision of social housing. Conversely, when dominated by private interests or subject to political capture, they may exacerbate socio-spatial inequalities and reinforce the commodification of urban territory.
The Brazilian experience demonstrates that the capacity of UPOs to promote the right to the city does not reside in the instrument itself but in the quality of regulation, management, and social control associated with its implementation. Strengthening transparency mechanisms, ensuring the effectiveness of social counterparts, and democratizing access to information are indispensable conditions for reducing asymmetries and ensuring that the land value appreciation captured by the operations is redirected for collective benefit.
In this context, technical tools such as the Multipurpose Cadastre and the Land Administration Domain Model (LADM) can serve as strategic allies, providing robust data foundations for more equitable and balanced decision-making. Therefore, the consolidation of UPOs as instruments genuinely oriented toward the public interest depends, above all, on the articulation between technical innovations, institutional capacity, and political commitment to the social function of the city.

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BIOGRAPHICAL NOTES

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