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# The Role of Planning Policies in Promoting Urban Sprawl in Intermediate Cities: Evidence from Chile

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**Abstract:** Urban sprawl has been studied principally as a phenomenon produced by a lack of or weakness in urban planning, as a consequence of real estate liberalization. This article examines the Chilean case, and proposes that the state has been the engine of this phenomenon through spatial planning instruments that have both neoliberal and neostructural features, and that are best defined by the concept, new public management. The analysis tracks urban sprawl in four intermediate cities, which have experienced high rates of growth since 2000, using photointerpretation of satellite images between 2003 and 2011, and the creation of a typology to define land uses and housing types. The results show that intermediate cities follow similar trends to the capital city, Santiago, and face similar problems, in particular the concentration of services in the urban core. These similarities are produced by the application of general planning instruments: Article 55 and Decree Law 3516. While most research on urban sprawl focuses on private agency, this article highlights the role of the state in its production. It is therefore relevant to explore the nature of public agency in urban sprawl processes in different metropolitan and intermediate cities, and how planning policies can be adapted to curb the phenomenon.

**Keywords:** urban sprawl; neostructuralism; intermediate cities; urban planning; Chile

## 1. Introduction: The Production of Urban Sprawl in Chile

In the debate on urban sustainability, including the recent *New Urban Agenda* agreed at the Habitat III conference in Quito (2016), the issue of land use and infrastructure has been central, with the basic concerns that sprawl—understood as unplanned expansion—leads to demands for new infrastructure, long commute times, consumption of valuable productive land, and increased contamination from motorized transport. The recommendation is that cities should be compact, where economies of scale in infrastructure and services can be maximized, travel times shortened, non-motorized mobility increased, and land conserved for production. Despite this recognition, however, the history of urban development in the second half of the 20th century was effectively a history of urban sprawl as the private use of the car and the model of American suburbanization gathered pace in the fast-growing cities of the Global South [1–4].

In the case of Chile, this process was evident from the 1960s onwards, and it coincided in the 1970s with the beginning of a period of dictatorship that would last 17 years to 1990. During this period of dictatorship, strong centralized control of the social realm was accompanied by the intensive roll-out of a neoliberal development model led by the ‘Chicago Boy’ doctrine [5]. Land markets and urban development were not exempt from this trend. It is for this reason that this article takes the position that it was not a lack of public sector planning that led to rapid urban sprawl from the 1970s

onwards, but rather the oxymoron of ‘planned urban sprawl’, whereby the State was the principal promoter of this model of urban sprawl. It was not a deficit of social, economic, and political control over different interest groups that led to this process, but the inverse: A high level of control and the production of instruments to facilitate this process. In this sense, the Chilean experience flies in the face of the argument that urban sprawl is produced by uncontrolled, unplanned growth on the urban periphery. In this case, it was co-produced by the authoritarian State in collaboration with private interest groups who were committed to the liberalization of land and the dismissal of the limitations imposed by urban and regional planning principles; this experience provides a strong example of what has been defined as new public management.

Furthermore, while there is considerable literature on the Santiago case, the experience of intermediate cities since the 1990s has provided evidence of a replication of this Santiago model of urban sprawl in wider Chilean urban development as a product of the persistence of instruments that date from the dictatorship period. This is relevant, since Santiago presents serious problems of access to services and segregation, which are accentuated as a result of dispersed urbanization. In intermediate cities, instead of promoting models of urban development that contrast with the primate city and its ills, there is inertia due to the dominant planning instruments that have led to a mirroring of that experience.

The analysis presented here is drawn from the urban policy and planning instruments, and evidence of urban sprawl in intermediate cities: The conurbations of La Serena-Coquimbo and Temuco-Padre Las Casas, and the cities of Copiapó and Valdivia. The data were constructed based on photointerpretation of the periurban areas of these cities between 2003 and 2011; the images are from Google Earth (2011). The categories used in the photointerpretation are based on a typology initially proposed by Salinas and Pérez [6], which identifies residential use areas—differentiated by morphology (continuous or discontinuous) and density (high, medium or low) criteria—as well as categories of industrial and service areas. This typology reveals not only the urban sprawl that has taken place but also its composition: The different uses that have been developed and their forms. Rather than conventional representations of urban sprawl that often fail to discriminate between particular uses (in the style of the image in the bottom right corner of each figure, 1–4), this classification enables an analysis that reveals land use transitions through time in these cities.

The results reveal the ways in which sprawl is produced on the urban periphery. While in some cases, mainly associated with DL 3516, there is a direct link to areas of higher income groups and ‘rural residential plots’ (*parcelas de agrado*), in other cases, it is Article 55 of the General Law of Urbanism and Construction—associated to a greater extent with housing areas granted by the State to groups of lower socio-economic status—that is more prevalent. The results also show the importance of the ‘urban boundary’ as a key element of spatial planning, which separates the urban core from processes of urban sprawl. In all cases, the role of the State in producing sprawl via specific policies and instruments is explicit, and it is this role that is discussed in the following sections.

## 2. The Nature of Urban Sprawl: Neoliberalism and New Public Management

### 2.1. Understanding the Context of Urban Sprawl

The literature on urban sprawl has been a notable dimension of urban and regional planning for the greater part of the late 20th century, from Jane Jacobs’ [7] criticism of Robert Moses to contemporary discussion on the protection of green belts and wetlands [8] and planetary urbanization [9]. The American suburbia model of development facilitated by the private automobile from the 1950s and reproduced forcefully around the Global South in the following decades, compounded by peripheral informal settlements, was fully documented in terms of the new urban forms that were created. The Chicago ecological model of urban growth had to be rapidly adapted to take note of the chaotic nature of much of this expansion [10–12]. Rather than geometric forms, urban expansion in these cities had become a mosaic of social, economic, and ecological processes, uses, and functions,

according to densities, distances, and administrative divisions [13,14]. Polycentricity emerged as way of understanding and shaping these emerging forms that gravitated around one central core only [15–17].

Documenting these forms and trying to understand their design became a preoccupation of many planners and urbanists, since behind the form was the purpose. The nature of ‘urban sprawl’ is not only the form that is produced. It is the purpose that leads to this form. Although the definition of urban sprawl still requires consensus [18] (most authors refer to it as a process that is uncontrolled and spontaneous in many ways), the purpose that underlies this expansion is connected to regulation and deregulation. The period of high rates of urban sprawl equates to a period of a dominant political economy ideology relating to neoliberalism between the 1970s and 1990s [5], and which has continued strongly in most cities in the Global South since that time. During this period, the Washington Consensus had provided the concerted response to the debt crisis of the early 1980s, involving US administrations, the World Bank, and the International Monetary Fund (IMF). Thatcherite economics and Reaganomics provided the templates for these liberalization processes, and they were cemented into the structural adjustment plans that would be rolled out to ensure deregulation, privatization, and market liberalization in exchange for new loans and credit.

This process was particularly strong in Latin America, where the import substitution model was substituted by neoliberalism as early as the mid-1970s in Chile, and later elsewhere [5]. While the tonic of the previous period concentrated on promoting national industry through a strong State presence and control, the new model focused on the efficiency of the ‘invisible hand’ of the market. Thus, the State lost its central role as a decision-maker in the public sphere, to be replaced by the market. It was in Chile where the most orthodox version of this model became enshrined in the Political Constitution of 1980, providing strong protection to private property in all of its forms [5].

During the period of Latin American bureaucratic-authoritarianism, neoliberalism was the dominant economic model. However, this would change during the 1990s when the State adopted a stronger position in terms of social and environmental policy. The UN Economic Commission for Latin America and the Caribbean (CEPAL/ECLAC) defined this new model of public–private partnership as neostructuralism. Whereas the structuralism of Prebisch and Singer from the 1940s was focused on the economic consideration of import substitution industrialization [19], the neostructuralism of the 1990s provided a way of understanding growing economic heterodoxy, combined with social protection policies and environmental conservation [20,21]. A new role for the State—and a new thrust in center-left politics, e.g., Argentina and Chile, and the so-called ‘pink tide’ of administrations in Brazil, Ecuador, Venezuela, and Bolivia—was evidence of this neostructuralist shift.

Neostructuralism is characterized by adjustments to the structuralist model that preceded it, and integration with some of the base ideas of orthodox neoliberalism, such as: Market liberalization, access to global capital markets, privatization, and deregulation [22]. Thus, it sought to improve economic efficiency and productivity and increased the centrality of the State in welfare policies [23]. It is necessary to mention that neostructuralism is not in itself a new paradigm, because it is reformist. It is in this context that a series of changes in public policy can be found that favor cooperation between the public and private sectors, which are manifested in different sectors of the public sphere, such as urban planning.

## 2.2. *New Public Management in Urban Planning*

In the field of urban planning, the liberal ideas behind neoliberalism and neostructuralism were to be found in new public management (NPM) [24]. If the developmentalist and corporatist state forms of the 1960s and 1970s had led with state programs of economic development, social protection, and regulation of planning, NPM sought to dismantle this model and enable market actors to operate in more flexible spaces of property transactions and service provision [25]. It was a managerialist approach to urbanism that even relegated the word ‘planning’ in favor of urban management.

Under NPM, deregulation of markets (for production and trade) also applied to land markets. The State was regarded as an inefficient and distortionary distributor of land, hence the importance of supply and demand forces in ensuring a better, more efficient use of land (according to liberal economic dogma). If traditional urban planning regulations had depended on instruments, such as urban limits or boundaries [18], controls on heights, volumes, compensations, and the integration of housing, transport, green spaces, and services, NPM was concerned with freeing up these norms and facilitating the free rein of market actors. This deregulation exacerbated the problems that had already been identified as urban sprawl. The waste of agricultural land due to dispersed suburbanization for residents who still needed to commute to the traditional urban core [26,27], and a ‘pathology of uncontrolled development’ [28], was marked by considerable externalities, from time loss for the individual, contamination from transport, sealing of land and groundwater impacts, loss of biodiversity and wetlands, and high infrastructure costs.

These consequences of the liberalization of land markets were not assumed by the planning authorities since the dogma suggested that private actors would resolve these externalities through market instruments. However, without ‘perfect information’ and Pigouvian taxes to shape these markets, they merely became socialized by the wider population. The costs of the choices of a few, and the lack of options for others in informal settlements, would be absorbed by all through ill health, long travel times, poor service provision, and highly unequal socioeconomic outcomes. If the essence of sustainable development, according to the Brundtland definition, is intra- and intergenerational equity and opportunities [28], the nature of this liberalized urban sprawl was its antithesis [29].

The point to be made here in terms of urban sprawl is that although it may have appeared chaotic and unplanned—giving rise to a new model of urban morphology defined best as ‘leap frogs’ rather than geometric forms—it was the product of liberalization and deregulation, accompanied by urban policies, that promoted this model [30]. It was a political choice that was countenanced through NPM in concordance with the dominant political economy approach of the period. The nature of urban sprawl is, therefore, a product of market liberalization rather than the chaos of multiple individuals making uncoordinated decisions on location and activities. Deregulation involved political choices; therefore, in spite of the opposition to conventional urban and regional planning, it was in itself a planned form, which was obedient to the principles of the Chicago School of liberal economics, and Milton Friedman in particular. The urban policies of the time, formulated in 1979 and 1985, and the instruments that were designed to ground them in practice were direct interventions that produced these new urban landscapes. It was not a case of a lack of planning, but rather of State-designed sprawl. While this urban sprawl was most notable in the case of Santiago de Chile, which concentrates over 40% of the national population, during the 1980s and 1990s, the experiences of intermediate cities, which have revealed the highest urban growth rates since the 1990s, have received comparatively little attention. The central issue is to what extent they have mirrored the experience of the primate city in terms of urban sprawl.

### 3. Methodology

The analysis in this article was based on research in four intermediate cities in Chile: Two of these are conurbations while the other two, Copiapó and Valdivia, are cities with only one urban authority (municipality).

#### 3.1. Intermediate Cities as Case Studies

Intermediate cities are classified here according to the Chilean Ministry of Housing and Urbanism, which indicates that small cities have 5000–20,000 inhabitants; small intermediate cities have 20,000–100,000 inhabitants; and large intermediate cities have 100,000–300,000 inhabitants [31]. It is these larger intermediate cities that grew three times faster than the consolidated metropolitan areas of the country (Santiago and Valparaíso) from the 1990s. The cities selected here were chosen since they represent large intermediate cities in different regional economic contexts. What is of interest is not the

drivers of their growth per se, but similarities in terms of how different intermediate cities in different contexts, including two contexts of conurbation, Temuco-Padre las Casas, and La Serena-Coquimbo, have evolved as a consequence of an urban planning system that has remained relatively static in terms of major instruments since 1979. These two conurbations are based on mixed economies that include public administration alongside regional commerce, higher education, forestry (Temuco-Padre las Casas), mining, fisheries, and tourism (La Serena-Coquimbo). Copiapó associates its growth with mining specifically [32]. Valdivia also has a mixed economy of public administration, higher education, tourism, and shipbuilding [33].

### 3.2. *The Key Spatial Planning Instruments that Produce Urban Sprawl*

Spatial planning in Chile has been associated with reactive processes that seek to regulate the phenomena of urban sprawl: Known locally as ‘planning by modification’. However, urban sprawl suggests that this is not necessarily the case, since this sprawl has been promoted by planning instruments that favor certain types of land use. As mentioned in the previous section, Article 55 of the General Law of Urbanism and Construction (1976) [34] and Decree Law (DL) No. 3516 (1980) [35] are key to this process. The first allows the construction of social housing projects with State subsidies in areas outside the urban boundary. DL 3516, on the other hand, authorizes the subdivision of rural properties of up to half a hectare, which are used for residential rather than agricultural purposes.

These instruments were designed to ground the principal orientations of the 1979 National Urban Development Policy, which sought to “liberate” the growth of cities in Chile through the suppression of the urban boundary [36]. It reflected the confidence in market mechanisms as a regulator of supply and demand in terms of consumption and land prices. Another key instrument is the Municipal and Inter-Municipal Land Use Plan of each city, which defines construction standards, zoning of uses, and establishes the urban boundary. According to the general law on urbanism and construction, this boundary is defined as “an imaginary line that delimits the urban areas and areas of urban extension that comprise the populated centers, differentiating them from the rest of the municipal area” [35]. This instrument is extremely important, since it delimits spaces that are subject to urban norms, and spaces that are subject to other norms, such as those relating to agriculture, mining, or indigenous areas. This ‘imaginary line’ is a fine line that in turn creates commercial opportunities, impacts on taxation, and generates conflicts between different regulatory agencies and groups of inhabitants.

### 3.3. *Identifying and Characterizing Urban Sprawl in Intermediate Cities*

In order to identify whether the phenomenon of urban sprawl that was so apparent in Santiago in the 1980s and 1990s was mirrored in intermediate cities, a photointerpretation of the area of urban expansion between 2003 and 2011 defined by the Ministry of Housing and Urbanism for the cities of Copiapó, Valdivia, and the conurbations of La Serena-Coquimbo and Temuco-Padre las Casas was undertaken. These intermediate cities were chosen, as pointed out in the previous section, because they represent different economic and physical contexts that may in turn shape their urban development patterns and lead, potentially, to greater diversity.

The photointerpretation consisted of categorizing land uses with 2011 satellite images available in Google Earth software, based on the classification of Salinas and Pérez [6], which consists of a typology of five residential types (dense continuous, mid-dense continuous, discontinuous blocks, discontinuous low density, disperse discontinuous) and three non-residential types (industrial, services, and artificial zones). Through this classification, it is possible to identify land uses that reveal the morphological composition of urban sprawl, as fragmentation beyond the urban boundary increases. The urban boundary, defined in the Municipal Land Use Plan (*Plan Regulador Comunal*) was overlaid on the photointerpretation, in order to visualize which of the previously identified areas are outside what is defined as the urban area according to current regulations in each city. This information was complemented with spatial data on educational and health services, to reinforce the conceptualization of urban sprawl defined in the previous section.

#### 4. Urban Sprawl in Chile: Designed and Promoted by the State

The nature of urban sprawl in Chile is a product of public and private agency. In this sense, the point to make is that urban sprawl is produced rather than occurs through a lack of control on expansion. This is precisely what has occurred in Chile since the 1970s and continues today. It seems illogical to lament a phenomenon when that phenomenon is produced through the design of specific instruments and is later maintained under a different political economy model. While urbanists and planning scholars have worked intensively on the case of Santiago de Chile [18,30,37–39], there has been an emphasis on private agency rather than State planning policy, or at best a discussion of the neostructuralism implicit in public–private partnerships, such as concessions or State subsidies for mortgages that co-finance private building projects.

Although urban sprawl is an Anglo-Saxon concept, originally used to define the fragmented suburbanization of North America, as Silva points out, it is also useful for describing the Chilean case with some shared features [18]: Fragmented suburban morphology; permanent expansion outwards; presence of interstitial spaces; socio-economic segregation of high and low income groups; and increase in travel time and inefficient use of land [30]. This last point has also been reviewed from an environmental perspective, highlighting the loss of fertile agricultural land, environmental services, and control over threats of geomorphological origin, such as the case of landslides in the piedmont of Santiago (which have been accelerated by increased urbanization and land sealing) [17,30,37,38].

On the other hand, the spatial planning instruments that apply in Santiago represent the experience of the new public management of this metropolitan region since the 1970s [39–42]. However, it is important to distinguish between three periods: To 1973, 1973–1990, and 1990 onwards, since each is marked by a distinctive political economy model that in turn shaped the approach to urban development. All of them have had repercussions for intermediate cities.

Prior to the 11 September 1973 coup in Chile, when the Pinochet dictatorship was set in motion, the previous governments of Eduardo Frei Montalva (1964–1970) and Salvador Allende (1970–1973) had shared a similar approach, which had involved a strong emphasis on social housing provision [43], and sanitary and transport infrastructure. The Law on Construction and Urbanization dates from 1953 (consolidated in 1976) and it provided an instrument for planning urban development in Santiago in particular [44]. The city had been faced with high levels of rural–urban migration (which chilled the rate of expansion of small and intermediate cities) and pressures for housing, which would be satisfied with site-and-services schemes on the urban periphery for the most part [45,46]. The law also contemplated a planning framework, and the intermunicipal spatial plan for Santiago was designed in 1958 and approved in 1960. This plan reserved 4000 ha of urban and suburban green spaces and projected a population of 5.5 to 6 million for the year 2000, within an urban area of 40,000 ha [47]. This plan was not the first of its kind, since the Plan for Santiago was designed by Karl Brunner in the 1930s; however, it was the first to project the city over several decades and contemplate the need to restrict its horizontal expansion. While there were concerns for the need to densify in the 1930s [47], in order to maximize the economies of scale from investment in infrastructure and place the city in its regional setting, it would not be until 1960 that this was put into practice with a strong planning instrument. These local concerns mirrored those of international voices, such as Patrick Geddes, Lewis Mumford, and Jane Jacobs, but the 1973 coup would revert these basic principles of spatial planning.

The shift from Allende's road to socialism to Pinochet's neoliberal model was dramatic. In the field of planning, it was NPM that would provide the main driving principle. Deregulation involved opening up land for private interests, and it was a product of the close ties between the military and the economic elites who had pressed the armed forces to oust Allende. Although neoliberalism suggests the free rein of capitalist forces, the role of the military in controlling social opposition, suspending Congress and the press, and ruling by decree, was key to flexibilizing different markets, whether in mining, forestry, fisheries, infrastructure and services, health, education, or pensions. In urban development, it marked a sea-change in the approach to housing and infrastructure, with the emergence of large firms that would come to dominate these sectors and would lobby fiercely

through its association, The Chamber of Construction. Rather than the city being a social entity and a public good, the city would be transformed into a commodity and a private good. Jacobs [7] (p. 408) described this process a decade previously as: “The ruthless, oversimplified pseudo-city planning and pseudo-design we get today is a form of ‘unbuilding’ cities.” It flew in the face of the ‘right to the city’ of Lefebvre [48] (p. 158) as “a cry and a demand”. The liberalization of land markets according to the neoliberal economic principles that had been forged through the close links between the University of Chicago and the Catholic University of Chile since the 1960s were, paradoxically, outlined in a policy document: The 1979 National Urban Development Policy. This policy [36] provided the grounds for market liberalization by clearly stating that urban land is not a scarce resource and that new stocks should be added (suggesting that urban regulatory boundaries were unnecessary), and that uses should be defined by the highest returns on investment. It even went as far as to suggest that this was the best way of protecting common interests, by enabling individuals and firms to initiate their own projects and maximize their own interests by simplifying regulations: It was the antithesis of Lefebvre’s ‘right to the city’. A new policy on urban development would be developed and approved in 1985 as a means for reflecting on potential changes to the General Law on Urbanism and Construction that had been approved in 1976. This too would insist in the principle of a ‘common good’ or common interests, but that this could only be done by protecting private interests (the protection of all interests is rooted in the protection of all private interests). This went hand in hand with the constitutional defense of property rights (approved in the authoritarian 1980 Constitution: Article 9, no. 24). In the same year that the 1979 policy was published, the effects on urban planning could be seen when 64000 ha were added to the Santiago urban area through a modification approved by Decree Law (D.L. 420, 1979) [36].

What is most relevant here for the later experiences of intermediate cities is that the dictatorship approved two key instruments of land liberalization that would become central to the nature of urban sprawl over the following decades. The first of these was the Article 55 of the Construction and Urbanization law, approved in 1976. This instrument enabled the Ministry of Housing and Urbanization to access land beyond the urban boundary for social housing projects. It was only these types of projects, with state subsidies, that could be developed in periurban areas. The legacy of this instrument is evident in all the major low-income peripheral settlements that provide a concentration of urban homogeneity with poor access to the city and high levels of social exclusion: The settlements of Labranza on the outskirts of Temuco and Alto Hospicio outside Iquique are cases in point. This instrument was also part and parcel of a process of ‘cleansing’ central city locations and higher income neighborhoods of their informal settlements (*campamentos*), and increasing levels of urban segregation.

The second instrument was quite distinctive from the first, which was a mechanism for housing the urban poor on the edges of the cities. While the first was approved for the Ministry of Housing and Urbanization, the second was an instrument passed by the Ministry of Agriculture in 1980 [35]. The Decree Law 3516 was designed to enable the fragmentation of rural land beyond the urban boundary, subdivided by their owners into new lots of less than half a hectare for residential purposes. These so-called *parcelas de agrado* or rural holdings were originally designed to enable farmers to divide their land for family members or to sell part of their land, in order to maintain productive activities, such as agriculture and forestry. However, the article to ensure this productive use was easily bypassed and land subdivisions for residential uses became the principal outcome of the instrument. The consequence was the creation of what Gloria Naranjo [49] defined as the ‘infiltrated city’, and Rodrigo Hidalgo [50] as ‘the fenced city’, in reference to gated condominiums.

Both instruments reveal that the opening up of rural land on the urban periphery was a process that required specific instruments. On the one hand, it provided the dictatorship with a means for reducing the costs of social housing and related subsidies on cheaper land while at the same time overlooking the ways in which periurban areas were being converted into new areas of rural settlement for higher income groups in particular. Although the term neoliberalism is appropriate for defining the dictatorship period given its promotion of economic instruments for market liberalization, there is also evidence of new public management that sought to downgrade the role of planning

and overlook abuses in instruments, such as DL 3516. In fact, DL 3516 was an important vehicle associated with the activation of the occupation of the land opened up by the DL 420 around Santiago. The proximity of economic elites to the dictatorship created synergies in opening up markets and ensuring opportunities for the concentration of capital around land markets; however, any concerns for social and environmental impacts were responsive in nature, reflecting the dominant political economy position of deregulation rather than an enforcement of the Pigouvian principles of the internalization of externalities [51].

What is significant about the end of the dictatorship and the transition to democracy from the 1988 plebiscite to the 1990 elections that returned Patricio Aylwin at the head of a center-left coalition government is that the economic model installed in the 1970s changed little [52]. What was most significant was that the involvement of private interests became more explicit. Whereas the dictatorship period was cloaked in a lack of transparency, no independent press, and no congressional oversight, under democracy these private–public partnerships were institutionalized. Rather than NPM disappearing as a dominant (anti)planning paradigm, it was consolidated and enhanced. The failure to re-regulate the use of periurban land was a case in point, hence the persistence of the two instruments noted above.

During the 1990s and into the 2000s, despite the rhetoric of neoliberalism and the role of markets, there were in fact subtle changes in how the democratic administrations engaged with environmental and social issues, whether in terms of labor rights, indigenous rights, access to health and education, or environmental impact assessment. What is evident is that a shift from neoliberalism to neostructuralism had taken place.

By 1990, the population growth of Santiago had eased off significantly [30], and it was the intermediate cities that were showing dynamism in growth and urban sprawl. This is clear in the Census data from 1992, 2002, and 2017, with high expansion rates in cities, such as Puerto Montt, Temuco-Padre Las Casas, and La Serena-Coquimbo [53]. In the following section, four of these cities and conglomerations reveal how the legacy of land liberalization and the planning instruments introduced during the 1979–1985 period of dictatorship were key to understanding the neostructuralist urban sprawl of the later democratic period.

## 5. Urban Sprawl in Chilean Intermediate Cities

### 5.1. *The Nature of Intermediate City Sprawl*

Despite the desirability of the compact city paradigm promoted during the 1990s in international policy documents, from Agenda 21 to Habitat II, and the need to curb the inefficiencies and inequities of urban sprawl, the promotion of urban sprawl was already inscribed in Chilean urban policy and exercised via Article 55 and DL 3516 in particular [54]. Until the 1980s, the growth of intermediate cities had been relatively slow compared with Santiago and the Valparaiso-Viña del Mar metropolitan area. However, following the 1982–1983 economic crisis, there was a push towards developing new economic sectors to reduce dependency on mining exports. This led to the emergence of non-traditional export sectors, such as salmon aquaculture, cellulose production, viticulture, and fruit processing, that transformed regional economies and gave rise to particular regional centers that concentrated producer service and multiplier activities [55,56]. By the 1990s, it was these centers that were changing the debate on Chilean urban development; however, they were mimicking the Santiago experience in terms of urban form over time as a consequence of the instruments that were already in place, e.g., Los Angeles and Chillán in response to the forestry and agribusiness sectors [57]. The lack of intent on the part of the new democratic administrations to change this situation was evident in the fact that it was not until 2014 that a new National Urban Development Policy was approved. It was a sign of the persistence of NPM under the umbrella of neostructuralism.

In the figures, there is clear evidence of neostructuralist urban sprawl in the period 2003–2011 in Chilean intermediate cities (Figures 1–4). In all the cities, there is evidence of new settlement beyond



the urban boundary into the rural landscape. As with all cities, the local topography is key to understanding the forms that these cities adopt as they expand into rural areas. For example, Valdivia is defined by its estuarine location and wetlands [58] while Copiapó is located in the river valley of the same name, with steep valley sides that have pushed expansion up and down the valley (east–west) and into a further valley to the south [32].

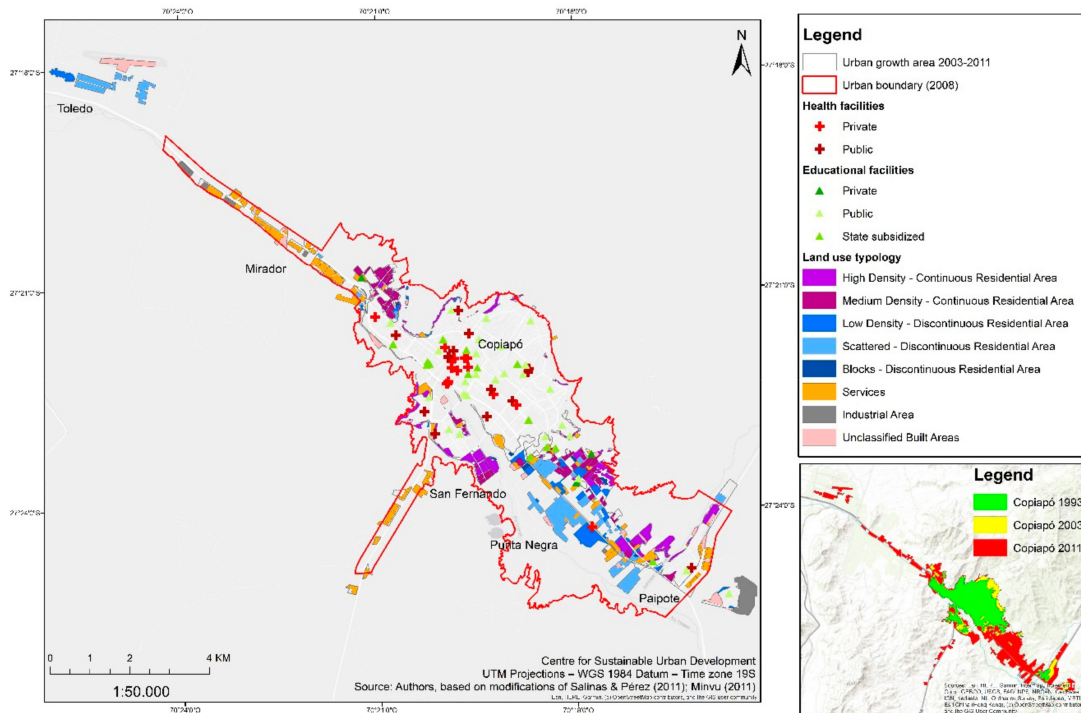


Figure 1. Urban expansion 2003–2011, Copiapó.

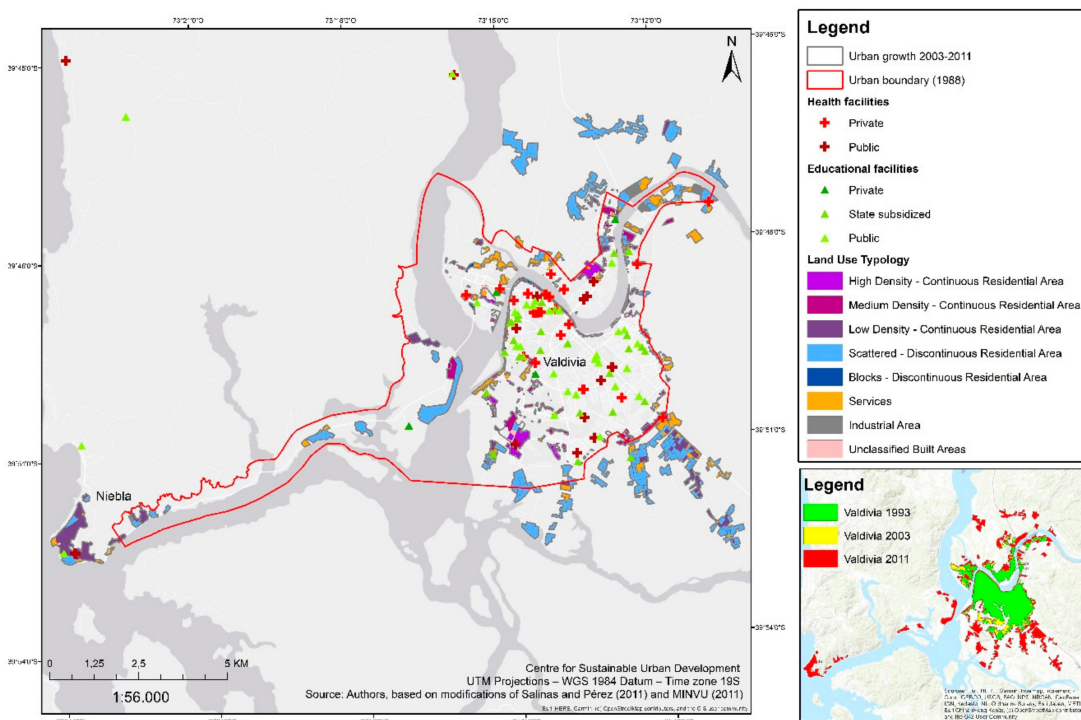


Figure 2. Urban expansion 2003–2011, Valdivia.

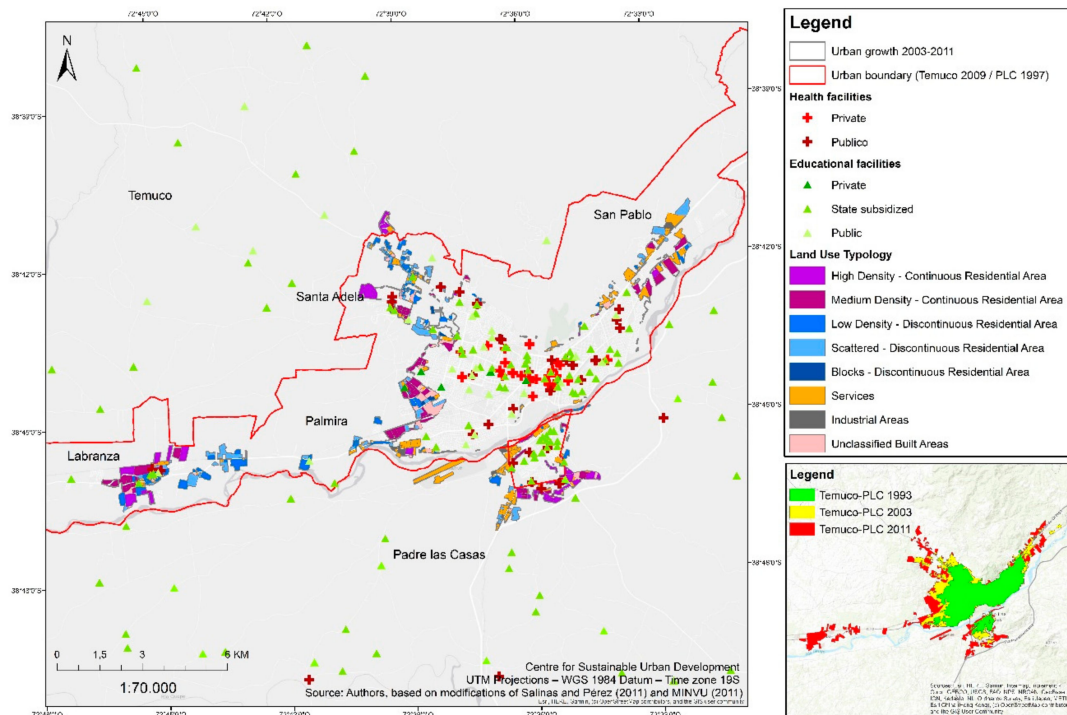


Figure 3. Urban expansion 2003–2011, Conurbation Temuco-Padre las Casas.

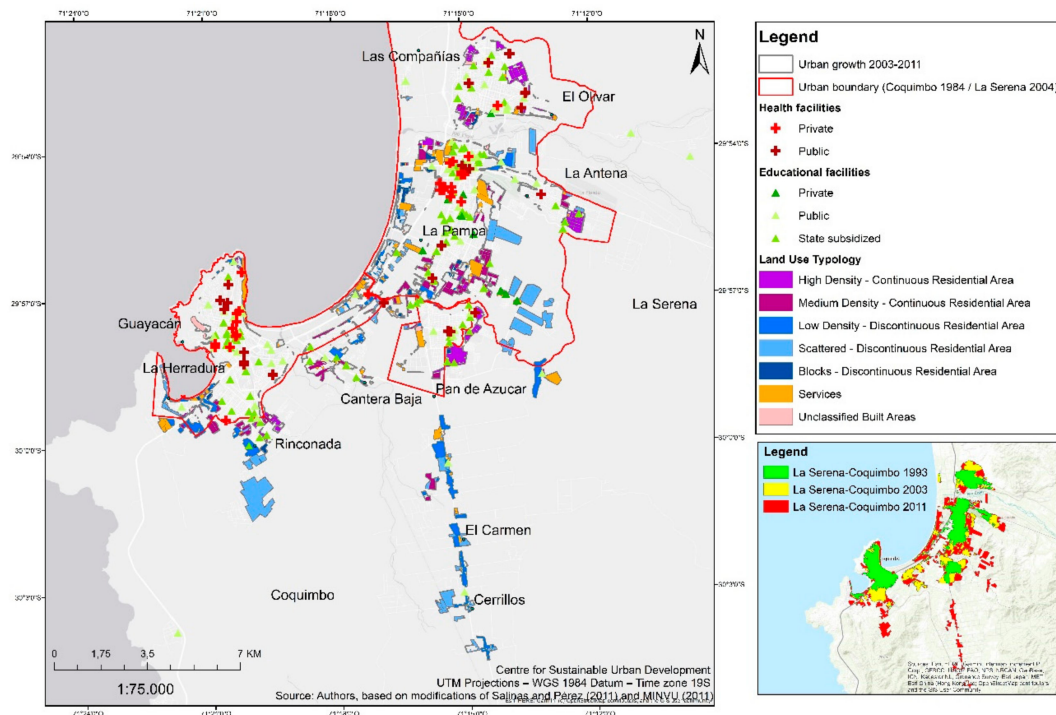


Figure 4. Urban expansion 2003–2011, La Serena-Coquimbo.

The 1979 National Urban Development Policy was designed to free up land based on the fact that it was not a scarce good. This was a direct challenge to the notion of the urban boundary, fixed in regulatory planning instruments (the PRC, or Communal Regulatory Plan), and defined as one of the core planning instruments in the 1976 Law of Construction and Urbanization. Although the concept of the boundary was retained, separating urban centers with defined land uses from rural areas (where these were lacking apart from the instruments that facilitated new residential uses), the notion that land should be used according to private demand provided the basic premise for expansion into the urban

periphery from 1980 onwards. During dictatorship, this expansion was relatively limited given the lack of investment and high levels of uncertainty, but during the democratic transition this situation would change. It is therefore revealing to see the degree and nature of urban expansion during this period.

The problematic nature of the urban boundary for the dominant NPM approach led to a relative marginalization of the PRCs. Faced with long periods of approval and high consultancy costs for the outsourcing of the design process (which would later include environmental assessment and public participation), the updating of PRCs became a bone of contention during the democratic period. The lack of updating, or the failure to create urban boundaries once towns had reached a size that required the approval of this instrument, led to criticisms of the instrument and the authorities that managed it. However, the inertia was not a restriction to the property companies who were active in buying land on the urban periphery in the expectation that new urban boundaries would increase the value of this property several-fold without a brick having been placed. In the meantime, they were active in developing condominiums for higher income groups in rural subdivided plots, or in building lower income housing based on government subsidies. Consequently, despite the inertia in PRC approvals, the real estate sector would still benefit from urban periphery construction projects. In the cases of the selected cities, the urban boundaries are quite diverse: In the case of Temuco-Padre Las Casas, the PRC dates from 1997 (and would be 'inherited' by Padre Las Casas since it did not have its own once it had officially become a new municipality in 1994); Valdivia's dates from 1988; La Serena, 2004; Coquimbo, 1984; and Copiapó, 2008. The inertia in PRCs and the fixing of urban boundaries provides a strong example of the decline of convention spatial planning into the democratic period, in favor of NPM and modification of existing planning instruments with specific articles. Only in 2012 was there a revision of the rural subdivisions legislation (not retroactive) to try to uphold the initial idea that these plots should retain a productive rather than residential purpose (Law 20.623).

## 5.2. *The Urban Sprawl and Services Paradox*

This section is structured according to the administrations of each case. While the first two cases, Copiapó (Figure 1) and Valdivia (Figure 2), represent single municipality cities, Temuco-Padre las Casas (Figure 3) and La Serena-Coquimbo (Figure 4) are conurbations of two municipalities.

### 5.2.1. Copiapó and Valdivia

The case of Valdivia with its fragile estuarine environment has been subject to intense pressure on the surrounding wetlands. The figure reveals that most of this expansion is due to discontinuous residential areas, which are typical of the rural subdivisions promoted by DL 3516, while the lower income blocks remain principally in the urban area with expansion into a more diverse area of mixed housing and services to the south-east of the city along one of the main routes out of the city. What is evident in this case and the others is the way in which services remain concentrated in the urban core rather than forming a new polycentric form that might be able to meet the demands of these rural residential condominiums (a dominant feature of the periurban areas of Santiago) [13]. Consequently, there is pressure to improve road infrastructure to link these principally vehicle-dependent families with work, study, and health facilities in the urban center. Congestion and contamination are the social externalities that have been produced as a consequence while the loss of time (a key variable in perceptions of quality of life [59]) is internalized by the commuters.

The topographical restrictions of Copiapó (Figure 1) are different from those of Valdivia (Figure 2), but the same type of higher income discontinuous development can be seen at each point of expansion east-west of the city, in particular in the areas of San Fernando and Punta Negra towards the copper refinery at Paipote (built well out of the city in 1952, and to which the city has gravitated rapidly over the past 20 years). The key difference with Valdivia, with its economy based principally on public administration, higher education, and tourism, is that the service industries for the mining industry - around the city and into neighboring municipal areas (Tierra Amarilla to the east in particular) - have concentrated on the main urban transport arteries. This ribbon development, shaped by the

topography of the valley sides, has led to the fragmentation of service and residential land uses; however, it is in the center of the city that the health and educational facilities remain concentrated. As with Valdivia, Copiapó also suffers from severe peak-time congestion, similar to that which was associated previously with the principal metropolitan areas. However, in both cities, there is an absence of potential options to reduce congestion, such as the underground metro system in Santiago, or the surface rail transit system of Valparaiso-Viña del Mar. The principal difference with Valdivia can be seen in the living conditions of the lowest income groups of the city. Whereas Valdivia, as a city with high average rainfall, has few low-income settlements (characterized in the figures as high density continuous), Copiapó has a high number of people living in *campamentos* in this arid environment, which have increased significantly over the past decade due to migration from Colombia, Venezuela, and Haiti [60].

### 5.2.2. Temuco-Padre Las Casas and La Serena-Coquimbo

The cases of Temuco-Padre Las Casas (Figure 3) and La Serena-Coquimbo (Figure 4) can be compared since they provide examples of conurbations comprised of two contiguous municipalities. Consequently, they may be understood as separate administrative entities, but they have high degrees of interdependency, whether in terms of commuter flows, the locations of low income and higher income neighborhoods, transport, sanitary and waste infrastructures, and health and education establishments. Perhaps the most significant difference between both is their recent history. Padre las Casas was part and parcel of Temuco, lying on the other side of the Cautín river, before it became independent in 1994 [61]. However, the municipalities are very different: While Padre las Casas has a large percentage of indigenous population (49% in 2017) [62], higher poverty levels, and a marked residential character [63], Temuco has a more diverse physical and socioeconomic composition as the regional capital [63]. The outcome has been a high level of interdependence but with the persistence of a low-income municipality on one bank, with few employment opportunities, and with protected indigenous areas accounting for a large part of the municipal area, compared with the regional administrative center of Temuco on the other bank. La Serena and Coquimbo, although now highly integrated in terms of flows and functions, have different histories: A historical port in the case of Coquimbo that has recently experienced a revival of its fortunes with new mining operations in the interior of the Region of Coquimbo [64]; and the tourism and viticulture city of La Serena [65], which still exhibits elements of a major modernist regeneration project from 1948 to 1952: Plan Serena. In both conurbations, two mayors and two municipal councils vie to shape spatial planning processes but fail in the face of the authoritarian planning legacy.

The case of La Serena-Coquimbo reveals a pattern of land use that is quite distinct from Copiapó and Valdivia due the diversity of uses within the urban boundaries and also on their edges. For example, the area of Las Compañías (clearly separate in the 1993 image) to the north of La Serena is an area historically associated with lower income groups who were relocated once the dense urban center just to the north of the river Elqui exhibited high levels of overcrowding [66]. However, provision was made in terms of educational and health infrastructure in this socially homogenous area of the city, since it dates from an earlier period. What is striking is how areas of higher income residential dispersed settlement, for example, the ribbon expansion to El Carmen and Cerrillos, is also mixed with lower income settlement, which is associated with the improvement of irregular settlements originally beyond the urban periphery, or original rural villages. This periurban development is starker in the case of Coquimbo due to the fact that the PRC has not been updated since the late 1980s, hence the large amount of provision, which either pre-exists the changes in instruments in the 1970s, or are developments that have been enabled by DL 3.516 or Article 55. In the case of La Serena to the north, expansion around the airport and on the higher land to the west of the city center is evident; however, there is also educational provision in these areas and good access to health centers. This situation points to the widely varying nature of urban sprawl in different cities, and the role of topography in particular.

In stark contrast with the case of La Serena-Coquimbo, the conurbation of Temuco-Padre las Casas shows a high proportion of expansion based on lower income residential forms. These are present along all the axes of development, towards Labranza, San Pablo, Santa Adela, and on the outskirts of the consolidated center of Padre las Casas. The Region of Araucania, of which Temuco is the regional capital, is the poorest region of Chile in terms of per capita incomes, and this is reflected in the types of settlements that have emerged strongly during the 2000s. Although there is evidence of a higher mixture of services with different housing types in San Pablo and Santa Adela, the case of Labranza and the urban development of Padre las Casas appears to concentrate high density continuous settlement, which suggests new concentrations of low-income groups on the urban fringes. In the case of Labranza, this concentration is not even close to the city center of Temuco, and has poor provision of public transport and health facilities. What is clear from the figure is that the concentration of health and education remains in the heart of the city but that a lot of the urban population is now distant from it. While private transport is a problem that Temuco-Padre las Casas shares with the other cases, there is a significant weakness in terms of public transport to connect the new subsidized low-income housing that has been produced under Article 55. Although interspersed with higher income condominiums in different neighborhoods, there has been a clear expulsion of low-income groups to the urban periphery. Although the 2007 PRC sought to recognize this growth and redraw the urban boundary to include the de facto expansion zone, access to services for these settlements, which depend on public services in transport, health, and education, are clearly disadvantaged, revealing the failure of any attempts to enhance integration within the urban core.

## 6. Conclusions

Research on intermediate cities in the context of urban sprawl and planning policies is necessary to uncover the relative roles of public and private agency. While the emphasis on urban management defined by the concept of new public management was dominant during the 1980s and 1990s, and provides a good example of neostructuralism as applied to urban planning, the suggestion that land market liberalization beyond the urban boundary led to land allocation according to free market forces is overly simplistic in the Chilean case.

First, while it is important to recognize the differences that these intermediate cities reveal, such as different rates and patterns of expansion, topographies, and socioeconomic and productive contexts, they do share certain features that point directly to the instruments that facilitated these patterns of urban sprawl. Article 55 and DL 3.516 are clearly present, as well as the weaknesses in updating the municipal land use plans and converting them into effective instruments for spatial organization rather than marginalized obstacles to new public management. If neostructuralism, as a political economy model that emerged in the 1990s, sought to balance the liberal economic model of market deregulation with social protection and environmental conservation, it largely failed to curb the externalities and poor service provision of these four urban complexes. What is evident is a distancing of higher income suburban condominiums and lower income subsidized housing concentrations from the principal concentration of education and health services. While low-income groups are further marginalized due to the lack of cheap and frequent public transport, the higher income groups generate congestion and contamination through their private vehicle use and demands for new road infrastructure projects.

Second, it is important to note that there are currently initiatives that are trying to outline new orientations for urban planning in Chile. The approval of the National Urban Development Policy by President Piñera in 2014 marked a key moment in Chilean urban and regional planning, and sparked a process that has led to policies on regional development, a regional decentralization law, and the proposal of a new national policy for spatial planning based on sustainable urban development principles. From 1985 to 2014, Chile had survived without a policy that defined the basic principles and criteria for how cities might evolve in the country, in one of the most highly urbanized countries in the world. Although the policy was dormant, the instruments that had been set in place in the 1979–1985 period were fully active in shaping urban sprawl. The new national policy document is

emphatic in avoiding the perpetuation of urban sprawl and is committed to promoting more densely populated and well-serviced spaces in compact areas. However, it is not specific in its diagnosis of the production of urban sprawl since the 1970s, and does not address the instruments that have played such a central role (Article 55 of the LGUC and DFL N°3516). Therefore, Chilean cities continue to be produced as a consequence of these instruments, and in spite of the neostructuralist new public management additions of participatory mechanisms, environmental evaluation, and increased private delivery of public services.

Finally, the latest attempt to highlight the importance of sustainable urban development, at Habitat III in Quito in 2016, put the issue of urban sprawl to the fore in the New Urban Agenda. At the same time, it is a return to the roots of sustainable development in the Conference on Human Settlements in Stockholm in 1972 and Habitat I in Vancouver in 1976. The Regional Action Plan for the implementation of the New Urban Agenda in Latin America and the Caribe (2016–2036) is explicit in its concerns regarding the nature of urban sprawl in the region. Of the six principal common features and goals of urban development in the region, there are parallels with the Chilean National Urban Development Policy, such as the coordination of different institutions and instruments and decentralization. However, unlike the Chilean policy, there is an explicit goal of the need for compact inclusive cities. This echoes the overarching message of the New Urban Agenda, in its call to prevent urban sprawl and its inherent negative externalities. However, this goal is also cloaked in the language of the need for planning for sustainable urban development, almost in recognition of the fact that state planning has also been a producer of urban sprawl (Article 98), as in the Chilean case. More rigorous analysis of the role of public agency in producing urban sprawl in cities of the Global South, and in intermediate cities in particular where there is relatively less research, is necessary if the goal of more compact inclusive cities is to be achieved. Public urban planning policies and instruments should be updated in order for this purpose of urban development to be translated effectively into urban form. In updating these policies and instruments, the degree to which the State has been complicit in driving the production of urban sprawl should become clearer and should lead to more nuanced understandings of the phenomenon and its drivers.

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