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Article

Managing urban growth at the regional level: A review of the International Literature

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Managing Urban Growth at the Regional Level: a Review of the International Literature

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Abstract

Today, most countries in the Global North have developed and implemented urban growth management programs and policies aimed at mitigating the impacts of urban sprawl and achieving a more compact urban form. However, there is substantial disagreement about their effects and effectiveness. In this paper, we systematically review the extensive international literature on growth management to better understand a) the current state of the practice of urban growth management, and b) the determinants of its successful implementation. In contrast to previously available literature syntheses, which focus heavily on North American research, we also consider studies based in Europe and some Asian and Oceanic countries. From this literature, we identify several key factors for successful growth management implementation: a multi-level governance approach, intersectoral policy coordination, a regionally adapted mix of policy instruments, balancing development needs with preservation goals, and the ability to develop positive narratives around growth management.

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Keywords: Urban growth management ■ regional planning ■ land use planning ■ governance ■ literature review

Regionales Wachstumsmanagement – eine Analyse der internationalen Literatur

Zusammenfassung

In den meisten Ländern des globalen Nordens existieren heute Programme und Strategien zur Steuerung des urbanen Wachstums. Diese zielen darauf ab, die negativen externen Effekte der Zersiedelung zu mindern und eine kompakte Stadtentwicklung zu gewährleisten. Über die Wirksamkeit und die Auswirkungen dieser Programme herrscht jedoch große Uneinigkeit. In diesem Beitrag wird die umfangreiche Literatur zum Thema Wachstumsmanagement systematisch ausgewertet, um a) den aktuellen Stand der Fachpraxis und b) die Determinanten einer erfolgreichen Umsetzung besser zu verstehen. Im Vergleich zu früheren Literatursynthesen, die sich stark auf die nordamerikanische Forschung konzentrieren, berücksichtigen wir auch Studien aus Europa und einigen asiatischen und ozeanischen Ländern. Basierend auf der Literatur identifizieren wir mehrere Schlüsselfaktoren für eine erfolgreiche Umsetzung des Wachstumsmanagements: ein Multi-Level-Governance-Ansatz, sektorübergreifende Politikkoordination, ein regional angepasster Mix von Instrumenten, ein Ausgleich zwischen den Anliegen der Baulandversorgung und dem Flächenschutz sowie die Fähigkeit, positive Narrative des Wachstumsmanagements zu entwickeln.

Schlüsselwörter: Urbanes Wachstumsmanagement ■ Regionalplanung ■ Flächennutzungsplanung ■ Governance ■ Literaturanalyse

1 Introduction

Managing and mitigating the impacts of urban sprawl remain challenges for spatial planning in the 21st century. Despite a slowdown in global population growth and urbanization, rates of land consumption remain high, particularly in developing and emerging economies (Angel/Parent/Civco et al. 2011; Seto/Güneralp/Hutyra 2012; Zhou/Varquez/Kanda 2019; Güneralp/Reba/Hales et al. 2020). However, even in more developed regions, where cities and metropolitan areas have experienced population stagnation and even shrinkage in some cases, the conversion of land from non-urban to urban uses continues apace (Salvati/Morelli 2014; Wolff/Haase/Haase 2018; Taubenböck/Gerten/Rusche et al. 2019; Schiavina/Melchiorri/Corbane et al. 2022).

Although urbanization is a global phenomenon, its causes are diverse, manifold and context specific. More traditional explanations such as population growth, economic development, declining transportation costs, and technological change are augmented by changing housing consumption patterns, lifestyle preferences, and a favourable public policy environment that encourages and even subsidizes development (Colsaet/Laurans/Levrel 2018; Nuissl/Siedentop 2021). Recent developments, such as the financialization of the housing market, concerns over housing affordability (Wetzstein 2017), urban gentrification, and the suburbanization of low- and medium-income households (Hochstenbach/Musterd 2018) have increased the complexity of the urbanization process. The response to COVID-19 has only exacerbated suburbanization and development pressure (Gallent/Madeddu 2021; Jabareen/Eizenberg 2021). Much of this development has resulted in low density, automobile-dependent suburban sprawl that has produced a range of undesirable social, environmental, and economic externalities.

Over recent decades, state and local governments across the globe have increasingly employed and implemented planning, policy, and regulatory techniques to influence the allocation and distribution of new urban development across a designated area, mitigate the negative impacts of urban growth, and achieve more desirable ('sustainable') urban form. In both planning literature and practice, these efforts have been referred to collectively by a number of labels, including 'urban growth management', 'smart growth', 'urban containment', 'compact city policies' or 'sustainable land use'. In this paper, we prefer the term 'urban growth management' (UGM), which we define – following Nelson, Pendall, Dawkins et al. (2002: 2) – as “the deliberate and integrated use of the planning, regulatory, and fiscal authority of state and local governments to influence the pattern of growth and development [...]”. Simply put, urban growth

management aims at “channeling the positive externalities of urbanization and overcoming its inevitable negative externalities” (Carruthers/Wei/Wostenholme 2022: 60).

However, despite this straightforward definition, urban growth management programs differ in terms of their normative agenda, institutional context, and policy design (Addison/Zhang/Coomes 2013). In planning practice, a range of principles and goals – ‘compactness’, ‘sustainable development’, ‘polycentricity’ among others – are used to justify urban growth management, depending on the socio-economic framework, cultural values, historical experiences, planning system, governance arrangements, and institutional settings (Fertner/Jørgensen/Sick Nielsen et al. 2016; OECD 2017).

Academic interest in urban growth management experiences has considerably expanded during the last decades, with a notable peak in the 1990s/2000s, followed by a subsequent waning of interest thereafter. At the same time, it must be acknowledged that the vast majority of work has been historically focused on the North American experience (Weitz 1999; Bengston/Fletcher/Nelson 2004; Landis 2006; Boyle/Mohamed 2007; Addison/Zhang/Coomes 2013; Landis 2021; Ewing/Lyons/Siddiq et al. 2022; see also Knaap/Haccou 2007 with a critical note on the ‘insular’ nature of US planning debates and a plea for trans-Atlantic comparison). More recently, however, the issue has gained renewed interest in Europe, where current practices of urban growth management follow a longer tradition of regional planning (see for example Kühn 2003; Siedentop/Fina/Krehl 2016; Hersperger/Grădinaru/Siedentop 2020; Xie/Kang/Behnisch et al. 2020; Eichhorn/Pehlke 2022) but have also become the focus of recent efforts by the European Union (European Commission 2021). Moreover, some Asian countries have substantial experience with growth management programs in metropolitan regions (see for example Yeung 1986; Nakai 1988; Cho 2002; Frenkel/Orenstein 2012; Han 2019).

What can decades of studies tell us about the current state of the practice of growth management, and how effective have urban growth management policies been in achieving the goals they set out to achieve? In addressing these questions, the scholarly literature on growth management has had to contend with several ambiguously defined issues, and consequently there is substantial disagreement among scholars and policymakers over the effectiveness and outcomes of growth management policymaking. First, there is some disagreement about the purpose and role of growth management, and therefore what constitutes a growth management policy. As such, operationalizing growth management as part of an empirical evaluation or impact study is problematic. Second, in terms of evaluating effectiveness, critics of growth management from both the political left and the right abound. They point out the limited effectiveness of urban growth management policies as well as the unintended

Table 1 Bibliography: Regional focus and type of reviewed studies (multiple entries are possible due to comparative studies)

	Regional focus				Total
	USA/Canada	Europe	Asia/Oceania	Others	
Number of references	187	62	50	7	287
	Type of study				Total
	Literature review	Policy design and implementation		Policy evaluation	
Number of references	23	128		136	287

effects of restrictive land use regulations on housing affordability or economic growth. Consequently, debates about growth management are often politically charged and potentially biased. Third, there is a widespread lack of systematic evaluation studies that have produced generalizable results, and the empirical findings of these studies are often contradictory or ambiguous. This can be attributed to different theoretical and methodological approaches, varying scales of observation (local, regional, state) and heterogeneous data use. Carruthers' (2002: 391) review of the US literature notes that "evaluation has not kept pace with implementation" (see Diller/Eichhorn/Pehlke 2021 with a similar note for Germany), a claim that remains valid 20 years later. The evidence for assessing the effects of growth management remains rather weak.

In this paper, we systematically review the extensive literature on growth management to better understand a) the current state of the practice of urban growth management, and b) the determinants of successful urban growth management implementation. While the review studies available so far have mostly focused on the North American debate, this paper incorporates European and – to a certain degree – Asian and Oceanic experiences in growth management.

Our paper is organized in four main sections. Following an explanation of the methodological approach in Section 2, Section 3 provides a brief outline of the history of urban growth management. Several development phases are distinguished and briefly described. Section 4 presents an overview of the objectives, governance approaches and instruments of urban growth management, while Section 5 reviews the state of knowledge on the intended and unintended impacts. Here, five generalized success factors are discussed. Section 6 concludes with a brief summary and outlook.

2 Methodological approach

Our reference material includes 287 academic manuscripts (mainly peer-reviewed journal papers) which were identified through a systematic literature survey using the Clarivate 'Web of Science' database. Key terms were 'urban growth management', 'urban containment', and 'smart

growth'. We also screened the literature with policy-specific keywords such as 'urban growth boundary' and 'greenbelt' (or 'green belt', 'greenway' and 'green corridor'). Articles published before 1980 were excluded.

We limit ourselves to the Global North and to countries where spatial policymaking is the result of a democratic process of negotiation at different political levels and where growth management is a long-established policy area. We argue here that spatial policies in states with authoritarian, non-democratic forms of government (e.g., China) are fundamentally not comparable to planning experiences in Western democracies. Our focus is therefore on North America, Europe and some Asian and Oceanic countries (South Korea, Japan, Israel, Australia). Furthermore, our key aim is to discuss the effectiveness and outcomes of urban growth management at the *regional* level. More narrowly conceived forms of local growth control (such as local zoning techniques) were not considered. The same applies to studies exclusively discussing the benefits of a specific urban form (e.g., compactness or polycentricity) without considering the use of policy instruments and their effectiveness.

An initial screening of the Clarivate database revealed approximately 600 entries. Based on the abstracts, titles and keywords, this was reduced to about 440 entries. A more detailed examination of each source was carried out to ensure its relevance. The abstracts of any sources listed under forestry, agronomy, fuels, soil science, water resources, health impacts, and GIS were cross-examined and deleted if found to lack relevance. Moreover, if the title or the keywords did not contain any of the above-mentioned search terms, the respective entries were deleted accordingly. This reduced the number of documents to 287 (see the online supplementary material), of which about 130 were evaluated in detail due to their particular relevance.

Overall, we included four types of studies in our literature review (see Table 1): surveys of the literature, studies on the instrumental design and implementation of urban growth management programs, empirical studies evaluating the effects of urban growth management approaches without considering individual policy instruments, and empirical studies evaluating the effects of specific policy instruments. Book reviews, conference reports, and proceedings papers were not considered.

We note that we are well aware of the limitations and weaknesses of our method. A literature synthesis based on key words cannot identify all potentially relevant sources. This is especially true when considering language differences. In the European and Asian debates, many studies are available in languages other than English. While we did consider some German-language papers, we were unable to incorporate studies in other languages more broadly given the effort involved.

3 Evolution of growth management approaches

The emergence of modern urban and regional planning in the 19th and early 20th centuries can be understood as a response to economic, environmental, and social problems associated with the Industrial Revolution and its transformative power. Urban reformers, housing advocates, and local officials saw themselves challenged by the ‘urban problem’: rapid population growth and overcrowding in industrial cities, increased congestion and pollution, insufficient services and sanitary provision (Hall 2002), and a subsequent poor quality of life for residents, coupled with the loss of surrounding agricultural lands and environmentally sensitive areas. During the initial decades of the 20th century, early growth management efforts were often a realization that the solution to the urban problem required thinking and planning at a regional scale, as advocated by a number of urban reformers and pioneer thinkers including Ebenezer Howard, Patrick Geddes, Lewis Mumford, Patrick Abercrombie, Daniel Burnham, and Robert Schmidt.

Regional scale planning has its origins in Germany, when municipalities in both the Ruhr and Berlin metropolitan areas began to voluntarily organize themselves in the early 20th century. In Great Britain, the first regional plan was introduced by Patrick Abercrombie after the First World War, in order to address the rapid development of the coal industry. Metropolitan planning associations emerged, including London (1889), Berlin (1912), the Ruhr region (1920), and Chicago (1934), often as municipal planning institutions with rather informal forms of supra-municipal cooperation and a narrow focus. Their responsibilities were frequently limited to the protection of open spaces or the development of a regional transport network (Blotevogel 2018: 794). In the US, several regional plan associations were established in a number of cities during the 1920s (particularly influential was the 1929 “Regional Plan of New York and Its Environs”). Early local or supra-local urban development plans – such as the Plan of Chicago (1909), the *Verbandsgrünflächenplan* (Regional Green Space Plan) for the Ruhr Area (1923), the Plan for Greater London (1944), and the

Copenhagen Finger Plan (1948) – responded to localized problems of urban sprawl, were often sectorally focused, and were implemented without being formally embedded in national planning approaches and legal frameworks. This pioneering phase of urban growth management is characterized by a local ‘bottom-up’ and sectoral focus (i.e., recreation, transportation) initiatives.

It was not until the post-war period, characterized by economic growth, rising incomes, auto-dominated suburban sprawl, and the subsequent environmental impacts and concerns over quality of life in the 1960s and 1970s, that growth management policies became popularly accepted and widely institutionalized (Rome 2001). Nonetheless, van Meeteren’s (2022) historical analysis of the Randstad’s polycentricity between 1930 and 1960 emphasizes the existence of growth management policies prior to this time.

In general, the policy response to suburban sprawl and the implementation of urban growth management across the globe has not proceeded in a linear and unidirectional fashion but rather haphazardly, and has often been described in historical phases or waves (see DeGrove/Stroud 1987; Boyle/Mohamed 2007; Ingram/Carbonell/Hong et al. 2009; Chapin 2012 and Landis 2021 for the US; Blotevogel 2018 for Germany; or Hall 2002 for England). In fact, political setbacks and retrenchment are commonplace, and support for urban growth management tends to wax and wane depending on changes to the political economy. For example, there was a decline in interest in growth regulations following the Great Recession of 2008 (Anthony 2017). After serving as a leader in state growth management during the 1980s, the state of Florida gutted its growth management act in 2011. Other states experienced political backlash, a shift in policy priorities over time, or a reallocation of planning responsibilities among state, regional, and local governments (Friedmann/Bloch 1990; Porter 1999; Smas/Schmitt 2021). Globally, the institutional and instrumental performance of urban growth management was curtailed or reformed during the neoliberal-influenced 1990s and 2000s (see Tasan-Kok/Baeten 2012). Examples include the planning system in the Netherlands (Faludi/van der Valk 1994) and Spain (Cladera/Burns 2000), while attempts to institutionalize regional planning in the UK were withdrawn or severely restricted (see Glasson/Marshall 2007).

On the other hand, mitigating climate change and addressing traffic congestion provided new rationales for urban growth management. Today, the international landscape of urban growth management approaches is multifaceted and growth management is institutionally and politically established in many countries. The diversity of institutional arrangements, governance systems, and state-regulatory frameworks is enormous – not only at country level but also at state and regional levels in federal and de-

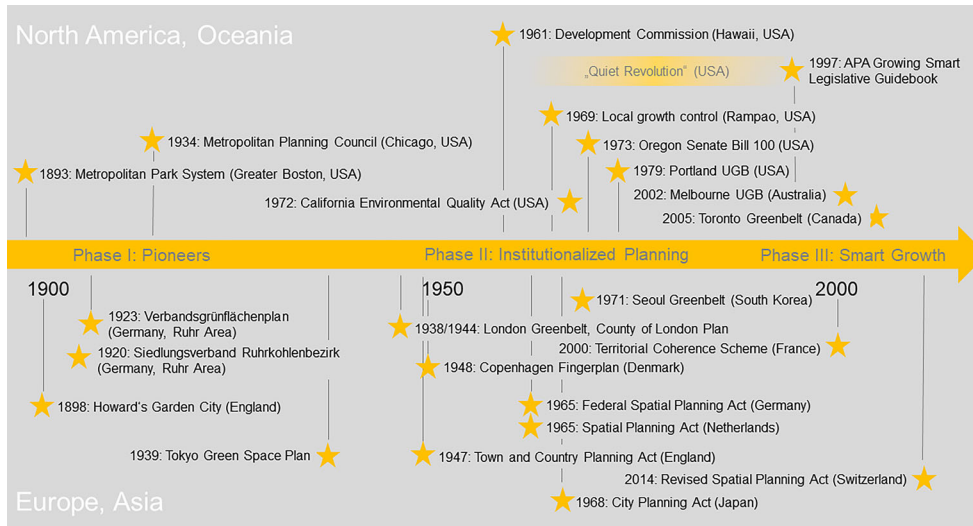


Figure 1 Evolution of urban growth management
 APA = American Planning Association, UGB = urban growth boundary

centralized political systems (Gale 1992; Wilson/Paterson 2002; Boyle/Mohamed 2007; Eichhorn/Diller/Pehlke 2021; Schmidt/Li/Carruthers et al. 2021).

Despite this great diversity, some general trends and patterns can be identified, particularly in terms of changes in the aims, scale, and scope of urban growth management as well as changes in policy styles and governance arrangements:

- The role and scope of urban growth management goals and priorities has expanded from a focus on controlling urban development and constraining growth to a more comprehensive ‘smart growth’ approach that acknowledges the need to provide for growth (both economic and population), while limiting and mitigating its undesirable impacts. Smart growth policies differ, but are generally focused on guiding development to locations where the infrastructure and services exist to support it, such as brownfield redevelopment, declining inner cities and suburbs, or transit-accessible urban areas (Bollens 1992; Hare 2001; Chapin 2012). Meanwhile urban growth management goals have evolved and expanded to include the development of polycentric and ‘balanced’ urban systems characterized by sustainable and socially inclusive urban patterns.
- The widening agenda of urban growth management in turn requires not only horizontal coordination across numerous policy fields, such as agriculture, housing, or nature conservation (MacDonald/Monstadt/Friendly 2021) and territorial collaboration among adjacent municipalities, but also increased vertical coordination in terms of governance and institutions (Schmidt/Li/Carruthers et al.

2021). Consequently, urban growth management efforts have shifted from a focus on local and regional planning efforts to the more multi-level governance approaches common today, distributing planning tasks to the state, regional, and local levels.

- One of the more significant developments involves the specific policy tools and methods employed by urban growth management approaches. Traditional top-down planning focused on land use regulation has been replaced by governance approaches that rely not only on regulatory instruments but also on economic incentives, inter-governmental cooperation, and collective learning (Bollens 1992). More flexible informal forms of decision making now stand alongside formal planning instruments (Zimmermann 2021). Altogether, the institutional complexity of urban growth management has increased considerably. This is especially true in view of the spatial shift in the focus of urban growth management literature from North America to Europe and Asia.

Figure 1 indicates important strategic plans and legislative acts that have not only influenced and framed the national practices of urban growth management to a great extent, but have also had an international impact. The figure illustrates the evolution of urban growth management through several historical phases: a pioneering phase through until the mid-20th century, an institutionalization phase in the mid-20th century, a strategic reorientation and governance innovation phase with ‘smart growth’ as a key narrative (see Landis 2021 for more detail), and finally a decline in the number of major policy initiatives in the 2000s, which could reflect changing governmental priorities. We note that this does not

claim to be an exhaustive collection. In the next section, we will discuss the aims, governance arrangements, and instrumental design of urban growth management in more detail.

4 Goals, governance, and instrumental design

As mentioned, the methods, policies, and goals of urban growth management are evolving, context specific, and diverse. Nevertheless, a commonly cited goal is a more contained, spatially compact, higher density urban pattern (Han/Graham/Tsenkova 2020; Carruthers/Wei/Wostenholme 2022). Moreover, a ‘compact’ urban form is associated with a range of desirable planning outcomes: protecting natural resources, efficient infrastructure provision, improved multi-modal transportation accessibility, increased housing choices, walkable neighbourhoods, and the redevelopment of urban cores and older urban neighbourhoods (Godschalk 2000; Pendall/Martin/Fulton 2002; Addison/Zhang/Coomes 2013; Ahlfeldt/Pietrostefani/Schumann et al. 2018). These goals often fall under a number of corresponding planning agendas: ‘transit-oriented-development’ (Ibraeva/Homem de Almeida Correia/Silva et al. 2020), ‘complete communities’ (Fox 2010; Metro Vancouver 2011), or ‘15-minute-neighbourhoods’ (Moreno/Allam/Chabaud et al. 2021). Implicit in the development of a high density, compact, and multi-nodal city is the coordination of land use and transportation decision making and the cost-efficient provision of basic infrastructures, both of which are also commonly cited core objectives of urban growth management (Burchell/Mukherji 2003; Carruthers/Ulfarsson 2003; Hortas-Rico/Solé-Ollé 2010).

Our review of the literature suggests that many of the instruments, policies, and methods employed in achieving the goals of urban growth management target one or more of the following (Godschalk 2000; Landis 2021):

- the tempo or rate of development,
- the direction or location of development,
- the amount or density of development,
- the quality or design of development,
- the cost of development.

In developing the compact and multi-nodal city, a successful urban growth management approach limits the spread of development into the suburban periphery, redirects growth to desired places, and promotes a more sustainable urban form. However, the use of policy instruments can vary widely depending on the normative approach, the national planning system, and regional or local planning cultures.

The literature contains several surveys of urban growth management planning instruments that utilize different classification systems (Bengston/Fletcher/Nelson 2004; Greiving/Dappen/Schlegelmilch et al. 2012; Siedentop/Fina/Krehl 2016; Landis 2021; Ewing/Lyons/Siddiq et al. 2022).

Ewing, Lyons, Siddiq et al. (2022: 2) (see also Greiving/Dappen/Schlegelmilch et al. 2012; Siedentop/Fina/Krehl 2016) distinguish instruments according to whether they positively direct urban growth by spatially defining where development is desirable, such as the redevelopment of an area with existing infrastructure and services (‘inside game’, ‘positive planning’, ‘positive allocative’) or whether they work negatively, prohibiting or discouraging development in an undesirable location, such as an environmentally sensitive area (‘outside game’, ‘negative planning’, ‘open space protecting’). Similarly, Pendall, Martin, and Fulton (2002) distinguish between policy tools that restrict urban development in certain areas and thus ‘push’ growth to a more desirable direction or location, and instruments that provide incentives for development in prioritized areas (‘pull’ effects). According to this approach, greenbelts and urban growth boundaries are instruments which affect the ‘push’ factors while urban service boundaries or brownfield redevelopment funds rely on ‘pull’ effects.

Other approaches tend to distinguish instruments according to specific regulatory aims and program types. For example, in addition to traditional zoning tools, Landis (2021) differentiates between policies and instruments that control either the tempo, the rate, or the density of urban development. Bengston, Fletcher, and Nelson (2004) identify an instrument-specific typology of urban growth management tools, including public acquisition of land, regulatory instruments, and fiscal incentives as the basic means to manage urban growth and protect open space.

Our taxonomy of urban growth management policies presented in Table 2 is classified according to the urban growth management goals. We distinguish, first, policies that target the rate of development, the direction and location of the development, the cost of development, the amount and density of the development, and its form and design; and, second, according to the policy, tools, and instruments used to achieve these goals, which we differentiate (similarly to Bengston/Fletcher/Nelson 2004) as regulatory, fiscal incentives, or information based. We have only considered policies that are used in at least one country. Not included are policies whose introduction is merely being discussed in academia or politics. It should be noted that some of the policies common to many countries (such as urban growth boundaries or greenbelts) may utilize names that are country specific. It is beyond the scope of this paper to explain in detail each of these approaches or instruments and how

Table 2 A taxonomy of urban growth management policies in use

Goals		Policy Approach	
Rate of development	Planning, regulatory	Fiscal incentives, purchase	Information, communication
	Growth caps, Building moratoria	Removal of active subsidies for urban sprawl	Education and advisory programs
	Housing growth targets		'Cost-of-sprawl' campaigns Evaluation of policies
Direction and location of development	Greenbelt, green wedges	Urban service boundary	Land use monitoring
	Priority areas for new development	Priority funding development areas	Brownfield inventory
	Urban growth boundary	Public land acquisition programs	Infill capacity monitoring
	Complete communities, activity centres	Brownfield redevelopment funds	Evaluation of policies
	Rezoning, Upzoning ^a	Transfer of development rights	
Cost of development	Priority areas for resource conservation	Impact fees, impact taxes ('pay as you grow')	
	Agricultural protection zoning	Purchase of open space	
	Maximum development contingents		
	Concurrency requirements, adequate public facilities ordinance		Evaluation of policies
Amount or density of development	Development fees, impact fees		
	Minimum density requirements	Funding of monument preservation	Information/negotiation on floor area uplift
	Maximum density targets Mixed use regulations		Evaluation of policies

^a Rezoning/upzoning is first and foremost a planning or regulatory tool to direct development somewhere but it is also a soft form of fiscally incentivizing landowners to develop?

Sources: Godschalk (2000); Bengston/Fletcher/Nelson (2004); Greiving/Dappen/Schlegelmlich et al. (2012); Siedentop/Fina/Krehl (2016); Landis (2021); Ewing/Lyons/Siddiq et al. (2022)

they work. We refer to the literature cited which in some cases contains detailed descriptions of the instruments.

5 Impacts of urban growth management approaches and determinants of success

5.1 Methodological approach of evaluation studies

Methods of evaluating the effectiveness of urban growth management differ primarily due to differences in research design (Frenkel/Orenstein 2012; Kim 2019; Diller/Eichhorn/Pehlke 2021). Studies differ in terms of their operationalization of growth management policies, the choice of indicators for analysing changes in urban form and land use, and the use of either quantitative or qualitative methods to analyse the effect of a policy or mix of policies. A common quantitative method involves developing a proxy for urban growth management, whether a single measure or a composite index, and regressing this on a land use variable such as urbanization rate, amount of residential development, or the loss of arable land. These studies differ in their complexity

and their treatment of endogeneity problems. Qualitative research, in contrast, operates with a broader mix of methods, including plan and document analyses and interviews with decision-makers and other stakeholders to better understand questions of process, public acceptance, and local effects.

Early studies often operationalized growth management policy as a dummy variable to represent the presence or absence of state or metropolitan level policy (Nelson 1999; Kline 2000; Anthony 2004; Yin/Sun 2007; Paulsen 2014). An obvious disadvantage of this method is that it both glossed over the nuances and variability in growth management approaches and was also incapable of assessing or evaluating the effectiveness of specific instruments or policies. To address this concern, a second group of evaluation studies attempted to analyse the effectiveness of individual policies such as urban growth boundaries (Knaap 1985; Jun 2004; Gennaio/Hersperger/Bürgi 2009; Mathur 2014; Lewis/Parker 2021) or greenbelts (Bae/Jun 2003; Bengston/Youn 2006; Daniels 2010; Siedentop/Fina/Krehl 2016; Han 2019; MacDonald/Monstadt/Friendly 2021). This allowed for a much more differentiated analysis and evaluation of specific growth management policy instruments in terms of their spatio-temporal design, restrictiveness, and outcomes.

However, isolated consideration of individual policies

does not reflect the complexity of growth management programs, which occur within the context of other planning, regulatory, or fiscal tools employed by governments to achieve a variety of goals (Song/Knaap 2004). Because of this, a third group of studies utilizes an ordinal ranked typology or composite index that allows for a differentiated and nuanced analysis of the impacts of urban growth management institutions and governance structures (Howell-Moroney 2007; Ingram/Carbonell/Hong et al. 2009; Schmidt/Siedentop/Fina 2018; Schmidt/Li/Carruthers et al. 2021). For example, Howell-Moroney (2007: 2165–2166) distinguishes US states as having “weak”, “moderate”, or “strong” growth management programs in terms of the intensity of the policies. Schmidt, Siedentop, and Fina (2018) developed an index to operationalize the restrictiveness of growth management policies for German planning regions. In the same vein, Schmidt, Li, Carruthers et al. (2021) used a composite index to proxy the degree to which land use planning systems are vertically integrated for 28 OECD countries.

As the methodological design of any evaluation study greatly influences the outcome (Kline 2000), any discussion of the effects of urban growth management policy (see Sections 5.2 and 5.3) should always include a critical reflection of the data and methods used.

5.2 Overview of impacts

A review of 287 studies affirms that urban growth management policy has a net positive effect on the rate, direction, timing, and quality of urban development, and is in principle capable of managing growth and creating more sustainable urban patterns. However, the overall state of the research suggests some ambiguity. On the one hand, scholars argue that well-designed and consistently implemented approaches to growth management are suitable for achieving identifiable local and regional goals, including:

- the reduction of land consumption and farmland loss (Bunker/Houston 2003; Daniels 2010; Frenkel/Orenstein 2012; Kline/Thiers/Ozawa et al. 2014; Eichhorn/Diller/Pehlke 2021),
- a more compact urban form and higher densities (Bae/Jun 2003; Frenkel 2004; Nelson/Sanchez 2005; Song 2005; Wassmer 2006; Howell-Moroney 2007; Yin/Sun 2007; Gennaio/Hersperger/Bürgi 2009; Woodcock/Dovey/Wollan et al. 2010; Paulsen 2014; Tiitu/Naess/Ristimäki 2021),
- transit-supportive development (Cervero/Sullivan 2011; Heinen 2020),
- the reduction of infrastructure costs (Burchell/Mukherji 2003; Carruthers/Ulfarsson 2003; Hortas-Rico/Solé-Ollé 2010),

- economic performance (Nelson/Peterman 2000) and
- the revitalization of central cities and older suburban neighbourhoods (Dawkins/Nelson 2003; Nelson/Burby/Feser et al. 2004; Hortas-Rico 2015).

On the other hand, the literature also suggests that urban growth management can fail to achieve its local or regional formulated goals if the legal-institutional framework is inappropriate or if implementation is weak (Gennaio/Hersperger/Bürgi 2009; Kim 2019; Eichhorn/Diller/Pehlke 2021). Even worse, many studies conclude that urban growth can have unintended effects, as more restrictive regulations can result in decreased housing supply and higher house prices (see Addison/Zhang/Coomes 2013 for an overview of the literature; Fischel 1990; Bae 1998; Pendall/Martin/Fulton 2002; Dawkins/Nelson 2003; Korthals Altes 2006; Millward 2006; Saks 2008). One reason could be that developers do not automatically respond to rising land prices by increasing residential density (Dawkins/Nelson 2003), or are prevented from doing so by zoning regulations (Levine 2005). Perversely, misguided growth management can actually lead to sprawl. Pendall (1999) notes that the implementation of local growth management within a fragmented jurisdictional framework that lacks state compliance mandates can actually lead to greater sprawl, as development ‘leapfrogs’ more restrictive municipalities. This is in part because local municipalities are often eager to adopt the more popular aspects of any growth management or smart growth agenda, such as open space preservation, but slow to adopt less popular components, including accommodating higher densities or affordable housing (Downs 2004; Schmidt 2008).

“The smart growth elements least likely to be adopted are those needing large public subsidies, such as revitalizing old areas, or regional action, such as building major public transit systems. Smart growth tactics most likely to be adopted are ones that can be done locally and cheaply with wide popular support, such as preserving open space and limiting outward growth in certain localities” (Downs 2004: 265).

Critics also claim that growth restrictions reduce the elasticity of regional housing markets, limiting their ability to respond to increases in demand (Saks 2008), and potentially lead to a ‘chain of exclusion’ that disproportionately excludes certain populations (Pendall 2000). This may result in limited in-migration of unskilled workers and lower income earners because they are excluded from the housing market. Glaeser and Gyourko (2018) argue that in the longer term, this can also reduce a region’s economic output. Bae and Jun (2003) have demonstrated that the Seoul greenbelt produces an intra-regional jobs-housing imbalance.

ance as households decentralize faster than employment. Vermeulen and van Ommeren (2009) provide evidence from the Netherlands that housing development tended to be insensitive to the growth of population and employment, due to the restrictive nature of urban growth management on residential development.

However, the debate about the exclusionary aspects of local urban growth management policies and the appropriate role for higher levels of government in mitigating the impact of localized implementation is perhaps most heated in the United States. Dating back to the Mount Laurel, NJ decision in the 1970s through the recent NIMBY (‘Not in my backyard’) fights in California, this tension has pitted a strange coalition of developers, affordable housing advocates, and state mandates – all of whom favour less stringent local control over land use – against environmentalists, homeowners, and home rule advocates, who are generally supportive of local controls (Holleran 2021). Additionally, increasing concerns about housing affordability have shifted governmental policy priorities away from managing growth in certain expensive metropolitan areas. Recent efforts to transcend this conflict highlight not so much the role of growth management policies per se, but rather the removal of incentives and subsidies for sprawl and exclusionary zoning practices, including the elimination of single-family, detached residential zoning in a number of large US cities (generally with bipartisan support), as well the creating of incentives for the development of accessory dwelling units, for example by California.

But despite these long-standing tensions about the effectiveness and effects of urban growth management programs, some conclusions can be drawn from the literature about what factors might contribute to effective growth management. This is presented in more detail in the following section.

5.3 Determinants of success

The following section highlights five generalized success factors of urban growth management identified in the literature: multi-level governance, cross-sector coordination, multi-instrumental approaches, balancing development needs with preservation, and positive story telling. ‘Success’ here is not judged according to a universal system of policy objectives, but by the respective aims pursued in national or regional urban growth management programs or on the basis of the evaluation criteria used in the studies considered. Naturally, this may limit the generalizability of the analysis, but we believe that the large number of studies evaluated provides an overall picture that allows for some non-contextual generalizations. To this end, we attempt to identify from a generalized perspective legal conditions,

planning institutions, actor constellations, and governance patterns that contribute to the achievement of urban growth management goals defined in state government programs and regional development plans.

5.3.1 Multi-level governance and national policy framework

One important conclusion is that effective urban growth management programs require coordinated action at multiple policy levels. Neither municipalities nor state agencies can “do the job alone” (Porter 1999: 721). Successful programs operate within a multi-level governance structure, with strategic decision making and land use planning at the state, regional, and local level characterized by intergovernmental alignment and compliance mechanisms (Heinen 2020).

A number of related factors, including a legal framework at the state level, decision making authority at the regional and local levels, mandatory policy instruments (such as comprehensive land use planning), and established ‘rules of the game’ in negotiating planning decisions have been shown to be decisive (Daniels 2001; Wassmer 2006; Han/Go 2019: 645; Heinen 2022). Without such legislation, “the home rule of local governments makes meaningful co-ordination of planning difficult and the patchwork of smart growth, urban containment, and regional and sub-regional initiatives are likely to be unsuccessful” (Boyle/Mohamed 2007: 692). Effective growth management thus contains elements of both self-regulation and state-regulation (Heinen 2020), and is responsive to political empowerment, incentives, and coercion (Filion 2009). To this end, Halleux, Marcinczak, and van der Krabben (2012) underscore the importance of a legal land-regulation regime that sets clear common interest and related limits to private property rights.

Based on OECD data on national planning frameworks, Schmidt, Li, Carruthers et al. (2021) found that more institutionalized and coordinated spatial planning systems produced a more compact urban form, whereas decentralized systems with less vertical and horizontal coordination result in less compact development (see also Carruthers 2002; Wassmer 2006). Woo and Guldman (2011) found that the effects of containment policies on urban spatial structure strongly depend on the geographical scale of implementation. Their results suggest that state-mandated urban growth management policies which enacted stronger restrictions for urban development were more effective than locally adopted growth and service boundaries.

Some scholars note the importance of regional growth strategies and regional organizations in administering metropolitan development policies (Porter 1999; Boyle/Mohamed 2007, Fertner/Jørgensen/Sick Nielsen et al.

2016; Heinen 2020). Only regionally implemented growth management can avoid the weaknesses and exclusionary outcomes of exclusively local growth management. Fragmented governance structures – where some municipalities have enacted restrictive planning policies and others have not – have proven less successful in preventing urban sprawl and ensuring affordable housing (Porter 1999; Burge/Trosper/Nelson et al. 2013; Han/Graham/Tsenkova 2020). Indeed, as mentioned above, locally enacted growth management can exacerbate sprawl particularly when the program does not influence development in adjacent jurisdictions (Pendall 1999; Bae/Jun 2003; Jun 2004; Nelson/Sanchez 2005; Ogura 2010). Urban growth management is unlikely to be effective in “porous” land markets, where developers and households will tend to favour areas that remain comparatively free from regulation (Carruthers 2002: 393; see also Snyder/Bird 1998; Jun 2004). Such forms of spillover and displacement effects (‘leapfrogging’) might have negative implications on commuting patterns, public service costs, and environmental resources due to the dispersed and scattered nature of urban growth (Siedentop/Fina/Krehl 2016).

5.3.2 Integration of sector policies

In addition to vertical coordination, the horizontal integration of sector policies serves as an essential prerequisite for an effective urban growth management strategy (Carruthers 2002). Land use decisions impact the interests of other policy areas such as housing, transportation, public services, agriculture, forestry, or economic development (Saks 2008). Appropriate intersectoral mechanisms are needed to coordinate these activities, particularly regarding the coordination of transit investments and land use planning (Margerum/Brody/Parker et al. 2013; Heinen 2020; Kießling/Pütz 2020; Tiitu/Naess/Ristimäki 2021). Based on empirical work in US and German regions (Seattle, Stuttgart, Vancouver), Heinen (2020) emphasizes the importance of a longer-term regional growth strategy that coordinates key sector policies (especially transit planning) with urban planning. Using the examples of Frankfurt/Rhine-Main (Germany) and Toronto (Canada), MacDonald, Monstadt, and Friendly (2021) point out that the distinct multifunctionality of greenbelts often results in conflicting goals with other policy agendas. They recommend institutional reforms, in particular a stronger governance framework at the state level, but also greater involvement of special-purpose bodies and civil society stakeholders such as non-governmental organizations to coordinate these agendas. This suggests that a significant prerequisite for successful growth management is regional governance capacity to coordinate varying land use interest across a number of sectors by a range of actors involved in the spatial planning process (Kießling/Pütz 2020). Addi-

tionally, informal policy instruments and collective learning processes are important complements to regulatory instruments in order to establish more effective modes of horizontal coordination (Zimmermann 2021).

5.3.3 Regionally adapted mix of policy instruments

Strong growth management does not function as a stand-alone policy intervention (Hare 2001; Eichhorn/Diller/Pehlke 2021; Liu/Nath/Murayama et al. 2022). Achieving simultaneous urban growth management goals, such as a more compact urban form *and* the protection of valuable open space is more difficult with only positive or only negative planning policies, i.e., instruments that either promote or prohibit urban development in certain places. Rather, establishing an appropriate policy mix with complementary instruments and tools supporting implementation, such as priority areas for new development (positive allocative), greenbelts (negative allocative), or growth boundaries (positive and negative) is more effective. Similarly, urban growth management goals can be counteracted by tax and fiscal policies that have contrary and defeating effects (Waltert/Seidl 2013; Margerum/Brody/Parker et al. 2013). It is particularly important to coordinate fiscal incentives for infill development and brownfield revitalization or public financing of urban renewal with urban growth management policies (Porter 1999; Hare 2001; Fertner/Jørgensen/Sick Nielsen et al. 2016).

Thus, a policy package adapted and tailored to local and regional conditions strengthens the effectiveness of an urban growth management program (Blair 2001). The appropriate combination of tools can also help to specifically avoid the potentially negative side effects of a single urban growth management tool or instrument. Using data from King County in Washington State, Mathur (2014) found that the urban growth boundary resulted in higher land prices but somewhat lower housing prices. He attributes this to the fact that rising land prices can be offset by policies aimed at expanding housing production (such as minimum density targets or zoning for higher-density housing). Anthony (2004) identifies increasing residential density as central to curbing housing costs that may result from more restrictive urban growth management policies. He also discusses the introduction of a statewide tax to financially support affordable housing. Ewing, Lyons, Siddiq et al. (2022) noted that the purchase of development rights (PDR) alone has not been effective in areas with high growth pressure. They recommend a combination of PDR with strong zoning and urban growth boundaries, thus creating a ‘package of tools’, to prevent further urban sprawl. In a comparative study of the greenbelts of Frankfurt, London, and Seoul, Xie, Kang, Behnisch et al. (2020: 11) conclude that greenbelts alone cannot prevent urban sprawl due to strong spillover effects. They recom-

mend linking negative planning instruments with positive-allocative policies such as “satellite towns”. Similarly, the Portland, Oregon urban growth boundary has been associated with spillover development in neighbouring Washington state, which has laxer development controls.

5.3.4 Balancing development needs and preservation

By design, successful growth management limits the availability of developable land thereby curbing urban sprawl. This *should* be accompanied by higher residential densities and the redevelopment and infill of older neighbourhoods. However, as discussed above, limiting development can result in decreased housing supply and increased housing values, particularly if development is constrained through low-density, single use zoning. That said, the relationship between growth controls and the housing market is complex and dynamic (Eichhorn/Pehlke 2022). Numerous other factors affect housing supply, market prices, and affordability. Regional economic and income growth, the availability of amenities, the ‘financialization’ of the housing market, and the role of real estate speculation also influence local housing markets and prices (Phillips/Goodstein 2000; Downs 2002; Nelson/Pendall/Dawkins et al. 2002; Dawkins/Nelson 2003; Taylor 2016; Wetzstein 2017). Nor do rising housing costs automatically imply a decline in housing affordability (Anthony 2004). Addison, Zhang, and Coomes (2013: 218) point out that growth constraints do not necessarily lead to shortages in housing markets, “if boundary designations and expansion plans can keep pace with population growth and market trends”. Thus, the ‘tightness’ of containment policies is critical (Woo/Guldman 2011; Siedentop/Fina/Krehl 2016). While a too limited supply of developable land might lead to negative land and house price effects, too little restrictiveness limits the effectiveness of the urban growth management.

Therefore, flexible, properly managed growth management that allows for and can accommodate additional future growth through higher densities can mitigate negative impacts (Bengston/Youn 2006). Flexible land use planning procedures that incorporate periodical re-examinations through a systematic land inventory and the use of threshold values (e.g., of land prices or affordability rates; see Lee 1999; Knaap/Hopkins 2001) can be useful for implementing a balanced growth management policy. For example, the Oregon state legislation demands a 20-year supply of land for future residential development inside the urban growth boundary.¹ However, such forecasts require monitoring of population trends, housing and land supply

as well as land market developments (Bae 1998; Knaap/Hopkins 2001; MacDonald/Monstadt/Friendly 2021). Only well-staffed and well-funded regional planning administrations will be able to meet this demand.

Urban growth management therefore requires an appropriate balance between the aims of land provision – based on land surveys, consistent monitoring, and demand forecasts – and the preservation of open space. Urban growth management should be ‘sustainability-oriented’ instead of just ‘anti-growth’ (Han/Go 2019). The potential negative effects of growth management do not necessarily depend on the *nature* of the policies but rather on the manner of *implementation* (Dawkins/Nelson 2003; Ewing/Lyons/Siddiq et al. 2022).

5.3.5 Positive story telling

Finally, successful growth management requires positive stories. The rather technical-administrative character of growth boundaries, zoning ordinances, or greenbelts and the potentially negative connotation of such concepts (‘less development’, ‘property restriction’, ‘development control’) should be translated into convincing stories about walkable neighbourhoods, balanced growth, quality of life, and sustainable communities and regions. Political opposition to growth management has generally come in the form of framing urban growth management policies as overly restrictive, a loss of local or home rule, a reduction in individual property rights, and in the most extreme cases, as a form of socialist control or social engineering. In the planning field, the importance of iconic spatial metaphors, narratives, and planning doctrines as complements to traditional planning instruments has been discussed for some time (Evers/Benzadok/Faludi 2000; Davoudi/Crawford/Raynor et al. 2018; Honeck 2018). For example, Han and Go (2019) argue that restrictions on urbanization must be accompanied by the qualification of open space. The greenbelt is “more than a mere development-restricted area, but rather a great place for the people to live, work, and recreate” (Han/Go 2019: 648; see also Kühn 2003). Such positive messages make it clear that residents have something to gain instead of a restriction of their rights. Well-known planning examples with strong metaphorical and narrative content include the ‘Green Heart’ of the Dutch Randstad region, the ‘Finger Plan’ in the Copenhagen region, and Portland’s ‘Urban Growth Boundary’ (van der Valk/Faludi 1997; Evers/Benzadok/Faludi 2000; Vejre/Primdahl/Brandt 2007; Abbott/Margheim 2008).

¹ <https://www.oregon.gov/lcd/UP/Pages/Urban-Planning.aspx> (07.11.2022).

6 Conclusions and outlook

A significant number of studies find that a well-designed and consistently implemented growth management approach is an efficient means of achieving more sustainable urban development outcomes. At the same time, many studies have found that poorly managed urban growth management policies could have negative implications for housing supply and economic development. One key conclusion is that the positive and negative effects of growth management agendas not only depend on the nature of policies but also on the institutional context of their implementation.

We have identified five key success factors from the now extensive literature. First, urban growth management cannot be accomplished with local approaches alone. It requires appropriate multi-level governance and state administration of planning competencies and tasks. Second, a regional growth strategy requires intersectoral coordination, as spatial planning alone cannot manage potential conflicts with other policy areas such as housing, economic development, and agriculture. Of particular importance is the close collaboration of transit and land use planning. Third, effective growth management requires a regionally adapted mix of policy instruments and practice to improve implementation, increase public acceptance, and reduce unintended effects. Fourth, the political and social acceptance of growth management depends on whether positive development goals, such as the provision of housing to meet demand, can be linked to land and resource conservation goals. In growing metropolitan regions, urban growth management cannot succeed if interpreted as a mere ‘anti-growth’ agenda. Finally, urban growth management should be able to tell positive stories and narratives about the opportunities to develop more sustainable and liveable spatial patterns.

What does the future hold for urban growth management? On the one hand, growth management assumes growth. What is the role of growth management in an era of shrinking cities and declining regions? There are ongoing debates about the role and purpose of spatial planning in the ‘post-growth’ or ‘degrowth’ era (Zovanyi 2004; Næss/Saglie/Richardson 2020). Certainly, there are many examples of declining rust belt cities that continue to sprawl, but it remains unclear what post-growth actually means for regional policy and planning in highly dynamic metropolitan areas. On the other hand, urban growth management has proven itself to be a dynamic concept that has evolved from its humble origins and appropriated new goals, methods, and directions (while jettisoning little of its original mission).

With an escalating climate and resource crisis, housing affordability concerns, ongoing congestion problems, and increasing social inequality and segregation, new rationales

for, and challenges to, growth management’s ambitions have emerged. While the housing affordability crisis has challenged some of the basic tenants of urban growth management (i.e., restricting development) and created new political coalitions, climate change and adaptation may result in a new generation of urban growth management concepts in which climate protection (Ewing/Bartholomew/Winkelman et al. 2007; Han/Daniels/Kim 2022) is coordinated with climate adaptation (Gill/Handley/Ennos et al. 2007). Similarly, the increasing urban-rural inequality in many parts of the world suggests that urban growth management, with its focus on regional scale interventions and spatial articulation, may have a role to play in addressing regional inequality and the ‘left-behind places’ (Rodríguez-Pose 2018), ‘peripheralized regions’ (Weck/Beißwenger 2014), and ‘geographies of discontent’ (Dijkstra/Poelman/Rodríguez-Pose 2018) in our metropolitan regions. As new forms of ‘mega-urban’ regions emerge that transcend political and administrative boundaries, a new generation of urban growth management concepts will need to be conceived at more inter-regional and national scales, particularly in the governance of inter-regional transport infrastructure planning (Innes/Booher/Di Vittorio 2011; Schafran 2014). We conclude with a quote from Edward Soja (2015: 379) that the “necessity for effective regional governance and planning” has never been so great. The challenge of increasingly globalized urbanization and complex ‘wicked problems’ calls for a new generation of urban growth management programs based on a pragmatic, adaptive, and flexible regionalism.

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