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# The metropolitan production of “urban” sustainability: Exploring industrial regionalism across the Puget Sound

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This article engages governance visions for green urbanism and sustainability through the concept of “industrial regionalism”. Bringing together emerging research on the importance of manufacturing to inclusive economies and critiques of “methodological cityism”, we explore the relational production of the iconic “green city” of Seattle. Here we consider how secondary cities, suburbs, and other peripheral spaces get subsumed within the metropolitan production of “urban” sustainability in ways that go unacknowledged and underappreciated. By absorbing tasks of production and social reproduction, such peripheral spaces may enable primate cities like Seattle to claim the mantle of sustainability, highlighting the rain gardens, bike lanes, urban green spaces, and other infrastructures that score high on walkability indices. In contrast, the working-class livelihoods on the periphery are often marginalized from sustainability discourses, if not actively disparaged for their inability to measure up to the green city ideal. This paper aims to offer a corrective by exploring how peripheral spaces are involved in the production of primate city sustainability. Employing the concept of intra-regional relationality, and drawing from census and geospatial data as well as regional planning analyses and reports, we illustrate that “urban” sustainability is produced regionally and relationally. The aim here is to consider how the “industrial region” might gain purchase as an important component of the governance of urban sustainability.

## KEYWORDS

urban sustainability, industry, regional equity, metropolitan regions, Greater Seattle, relational theorization, governance

“In Seattle especially, where rent for industrial space is skyrocketing, companies are being pushed to [suburban] Kent and Renton. And the city risks losing the blue-collar jobs so crucial to shoring up its middle class.”

— Burton, 2017, p. 2

## Introduction

The urban contribution to global sustainability has emerged in recent decades as one of the signature themes in comparative urban studies. The city is now performing as an “international” green actor (Herschel and Newman, 2017); the environmentalization of global politics dating from the early 1970s has steadily urbanized since the late 1990s (Dierwechter, 2018); “Emerald cities” (Fitzgerald, 2011) are generating new kinds of “greenovation” (Fitzgerald, 2020). While some practitioners provocatively argue that primate cities like Barcelona, Toronto, or Copenhagen have “solved” the climate crisis, in theory if not “at scale” (Miller, 2020), the fast-growing empirical literature on the remarkable rise of cities in global environmental politics and policy-making is more equivocal. At best, *some* cities are progressing in *some* sectors (e.g., energy grids, district heating, transit, waste, etc.). *Some* neighborhoods in *some* cities are carbon-friendlier (e.g., Vauben, Freiburg; Dockside Green, Vancouver). *Some* systems in *some* cities advance notable behavioral changes (e.g., high BRT usage in Curitiba). Why such limited gains? And how do we *get to* a broader and more enduring urban sustainability, wherein environmental, economic and equitable outcomes reinforce new spaces and possibilities? Few questions loom larger in the early 21 century. Yet as this special issue makes clear, “urban” sustainability—even when functionally incomplete and spatially selective—does not really happen “in one place” (cf., Miller and McKibben, 2020). Put another way, it does not explain itself (Dierwechter, 2018). *Urban* sustainability instead is a multi-scalar, relational, and difficult governance achievement, connecting cities (and places within them) to one another through territorialized networks—whether far away (through transnational municipal climate networks) or, as we prefer here, within polynucleated, functional metropolitan regions.

In the context of this *relational* and *metropolitan* framework of theoretical analysis, we suggest here that secondary cities, suburbs, and other so-called peripheral spaces are typically subsumed within the metropolitan production of “urban” sustainability in ways that too often go unacknowledged and underappreciated. We explore our overall argument with empirical reference to the Puget Sound Region (a.k.a. “Greater Seattle”) in the US state of Washington. Rather than focusing on just the “superstar city” (Gyourko et al., 2013) of Seattle, which regularly features as a serious or successful green city in scholarly and professional literatures, as well as in the public imagination, our regional emphasis explores the broader contributions to Seattle’s green notoriety. By absorbing tasks of production and social reproduction, we consider whether peripheral spaces across the region help to *enable* primate cities like Seattle to claim the valued (and valuable) mantle of urban sustainability, highlighting the rain gardens, bike lanes, urban green spaces, clean-tech jobs, and other infrastructures that score high on

green city indices (Dierwechter, 2017). In contrast, the working-class livelihoods on the periphery—the blue-collar industrial jobs that keep the city and region moving and make room for the iconic green city practices in the center—are inadvertently marginalized from most urban sustainability discourses. Our relational and metropolitan framework thus actively explores not only the importance of wider functional regions to primate cities but the importance of production to consumption—and specifically industrial production to green consumption. Industrial regionalism across the Puget Sound, we conclude, is an important way for us to interrogate the metropolitan production of urban sustainability in one of America’s putatively greenest and most innovative cities—Seattle.

The remainder of the paper is divided into three sections. The next section situates our concern with linking industrial regionalism to the problem of how green primate cities emerge within wider theoretical debates about urban relational thinking in industrial regionalism. Here we highlight the importance of economic activities in the industrial space-economy to what we call the metropolitan production of urban sustainability, wherein cities and “their” regions cannot be separated. The discussion then turns to a detailed empirical analysis of “industrial regionalism” across Puget Sound in Washington state. Using industrial production data from select Puget Sound locations, we raise questions about whether industrial activities being shed by Seattle are absorbed by secondary cities and other spaces on the urban periphery and what that could mean for the governance of urban sustainability in the Puget Sound. We conclude with reflections on how the regionalization of industrial production might gain recognition within sustainability discourses in ways that elevate the contributions being made outside of the regionally dominant iconic city of Seattle.

## Thinking urban regions relationally: Green primate cities and peripheral industrial spaces

Miller and Dierwechter note in their overview article to this special issue that relational urban theorization follows Doreen Massey’s rejection of “the ‘container view’ of cities as bounded territories” (Rafferty, 2022, p. 186). Such urban relationality is also crucial for us here. To paraphrase and qualify Amin and Thrift (2002, p. 2) influential theoretical work, the “city” may not be “everywhere,” but the “urban” is increasingly “in” everything—challenging scholars “to go beyond the city-as-territory” (Jacobs, 2012, p. 412) without necessarily accepting all the claims of planetary urbanization theorists about the effective evaporation of the rural or the relevance of distinct cities as urban places. Escaping what Angelo and Wachsmuth (2014, p. 16) call methodological cityism, this means foregrounding the dimensions of urbanization “that exceed the confines of

the traditional city.” Networks between cities have long shaped local urban geographies; inter-place flows of goods, ideas, technologies, diseases, etc. have concomitantly shaped larger world development patterns, from the diffusion of ancient innovations like Sumerian writing (and state formation) to more modern green imaginaries and policies.

Work on the rise—the return—of cities is now a significant theme in Urban Studies. Because cities are constituted by differently scaled relationships, they are also viewed by many as inherently creative laboratories for social innovation and global policy progress (Rosenzweig et al., 2018). Assemblage through mobility begets enhanced creativity in place (McCann and Ward, 2011). Accordingly, cities are now imagined as cradles for global answers rather than only sources of wicked problems (Barber, 2013). Cities provide “solutions” to climate change, for example, because of the propinquity of accountability; the efficiencies of agglomeration economies; and/or the intensity of everyday communicative exchange (Taylor, 2012; Barber, 2013; Miller, 2020). These qualities lead many urban observers to consider global green advances, as Angelo and Wachsmuth (2020) observe, through sprawl reduction, better-managed informality, and/or transnational urban climate action. For these reasons, Taylor (2012) sees all cities as invariably “extraordinary.” His relational work on histories of cities over the *longue duree* bridges theoretical and methodological debates in Urban Studies between advocates of “ordinary” cities, “worlding” cities, and “provincializing” cities with proponents focused more on the comparative rise of global city-regions that, in Scott’s (2001, 2011) judgment, represent empirical divergences “from a set of fundamental principles” (Schwanen, 2019, p. 2, 3).

Despite the various refinements, however, we recognize that relational thinking about global city-regions, or metropolitan areas as they are typically called in the United States, has not sufficiently explored the *intra*-regional dimensions of urban sustainability. Often overlooked are the complex roles that secondary cities, suburbs, and other so-called peripheral spaces play in the sustainability of primate cities like Seattle—and vice versa (for the latter view, see Pendras and Williams, 2021 on “regional second cities” and patterns of borrowed size). New work in sustainability studies has moved beyond sustainable cities *per se* to explore questions around “sustainable suburbs” (Garren and Brinkmann, 2020), sometimes in the context of regional growth policy frameworks (Dierwechter, 2020). Moreover, older and ongoing work in new regionalism (or city-regionalism) has highlighted metropolitan-scale patterns of green governance, climate action, and city-suburbs relationships (Rainnie and Grobbelaar, 2005; Dierwechter, 2010; Rosan, 2016; Herrschel and Dierwechter, 2018). But little work so far, as and Mossner and Miller (2015) argue in their critique of Freiburg, Germany, has emphasized the rise of green cities *in relation to* city-regional or metropolitan patterns of development.

Even less work has explored urban—or “primate” city—sustainability in relation to patterns of *industrial development*,

at least within the space-economies and functional geographies of metropolitan regions themselves. Some discussions have emerged at the global scale, with attention to the many ways urban deindustrialization (and/or urban greening) in the Global North often involve the concomitant “off-shoring” of fordist-style production (and carbon pollution) to emerging cities in the Global South. Here rich cities get greener as they export production and reclamation processes to poor cities. Empirical work on global e-waste circuits, as one specific example, has traced trans-border shipments from the United States, Europe and China “to accumulation sites in particular networked cities in Africa and elsewhere” (Grant and Oteng-Ababio, 2012, p. 1). Such “accumulation sites” are not only part and parcel of the greener urban geographies of Northern digital consumption but also of the related casualization in Southern labor through subcontracting and other arrangements that usually stretch across the globe “in embedded hierarchies, divisions, and various subdivisions” (Grant and Oteng-Ababio, 2012, p. 2). These dynamics produce what Söderström (2014) calls “cities-in-relations.” E-waste analysis furthermore reflects a growing concern with “life-cycle assessment,” which moves well beyond the production site *per se* to follow related environmental, social, and economic impacts of manufactured goods over time and across space for the whole life of a fabricated, consumed, and then discarded artifact (Petite-Boix et al., 2017). This in turn shapes—or should shape—how a legally bounded city’s carbon budgeting is realistically calculated: after all, much consumption *in situ* starts off as production *ex loco*.

Another expression of industrial dimensions of sustainability, which involves a more localized application of life-cycle assessment, is found in recent concerns with industrial ecology. In this work, industry and nature are reimagined through the relational model and frame of nature’s eco-systems. Resource “inputs” from nature to industry that become waste—wood, metals, heat, sludge, etc.—instead become “roundputs.” Individual firms on their own might adopt green technology to pollute less and/or operate more efficiently; but industrial ecologies refer to clusters of local firms that cooperate operationally to compete globally— an idea that theorizes hopeful “win-win-win” scenarios for integrated ecology, economy and equity goals. Gibbs (2008) first narrowed this in Urban Studies research to the challenge of industrial symbiosis, which “fosters cooperation from firms as opposed to focusing on action of the individual firm” (p. 1,140). In practice, industrial symbiosis has only (partially) occurred at the highly circumscribed scale of single industrial parks, such as Kalundborg, Denmark, where new relationships between ecology and industry merge with life-cycle assessments and conscious efforts between interacting firms and governments to reduce the production of distant “accumulation sites” long associated with linear economies. In theory, Gibbs argues, symbiotic practices extend to wider spaces, gradually remaking *extant* firm linkages in ways that suggest a new (green-symbiotic) type

of “industrial regionalism.” While no such form of industrial regionalism yet exists anywhere in the world, the [Washington Department of Commerce \(2019\)](#) nonetheless has suggested that industrial symbiosis should now operate at the regional scale. “Regional industrial symbiosis activities, especially when supported by dedicated facilitation,” one recent study concludes, “can result in even greater aggregate regional benefits” (p. ii).

This literature is useful for our purposes here (and this special issue as a whole) for four key reasons: (1) it is explicitly relational and in multiple ways (e.g., nature/industry; city/region; local/global, consumption/production; market/non-market; nodes/networks, etc.); (2) it foregrounds the operational scale of the entire metropolitan region as a functional space-economy rather than only “contained” primate cities like Seattle; (3) it highlights the need to see better and value more dearly *industry* in green theorisation and urban sustainability discourses of development; and, not least, (4) it emphasizes the importance of governance processes—or “dedicated facilitation”—to desired transitions in the city-regional economy, including those focused on improved symbiosis and greening and more just vertical integration. Put simply, existing scholarship opens space for attention to industrial regionalism as an important dimension in how sustainability might be achieved over time in any given urban locality—at least in broad theoretical terms.

That said, our narrower concern is that industrial regionalism across the Puget Sound area is currently far less about global e-waste circuits or nascent forms of inter-firm symbiosis—however theoretically welcome as a long-term goal for sustainability—than about deeply embedded relationships of *urban shedding and peripheral absorption*. In other words, we are mostly concerned here with mapping the relationality of core and periphery within the integrated spatialities of a single industrial region (visualized in [Figure 2](#)). As the tasks of both production and social reproduction get absorbed by peripheral spaces, primate cities like Seattle are free to pursue more visible and celebrated expressions of green urbanism—the green infrastructures and “clean” jobs that have become popularly synonymous with urban sustainability. So hypothesized, the contributions of manufacturing livelihoods on the production periphery to the iconic green city images in the center, are obscured and excluded from the green city celebrations. When seen relationally, though, such discourses of celebration and failure make little sense—in much the same way that isolating global “accumulation sites” of e-waste from Northern consumption warps our geographical understanding of urban sustainability. We aim to explore this specific idea in the next section, focusing on three main empirical themes. After briefly establishing the ongoing relevance of industry in US metropolitan regions, we outline the broad parameters of Seattle’s well-known reputation for progressive sustainability policies. Without rejecting the green agency of individual cities, we seek to reframe Seattle’s successes through a relational and

metropolitan lens that connects with peripheries of production. Accordingly, we then shift to the empirical question of what we call industrial shedding and absorption, showing that while many industrial activities may have left Seattle, they have not necessarily left the region.

## Exploring industrial Puget Sound

We start our empirical analysis here with a well-known truism: the \$25 trillion, service-dominated, American economy—the largest in the world—is much less defined by manufacturing *employment* than it once was. At the same time, the United States is today the world’s second largest manufacturer—in 2020 producing \$2.3 trillion of goods. This figure is higher in value terms than in 1980, 1990, or 2000 (measured in constant 2015 dollars). Tangible things are still made in American metropolitan space-economies. Establishments are engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products, and, as of 2010, nearly 80% of this manufacturing activity takes place in metropolitan areas ([Helper et al., 2012](#)). This matters for ongoing urban economic stability, as manufacturing activities across the country generate considerable ancillary employment: \$1 worth of manufactured goods, for instance, creates on average an additional \$1.34 of value elsewhere in the regional economy—the largest “multiplier” effect of any major economic sector ([Manufacturing Institute, 2022](#)). Such realizations have fueled recent investigations into cities as sites of renewed manufacturing investments, whether through maker spaces and infrastructures ([Eisenburger et al., 2019](#)), vertically integrated factories ([Rappaport, 2015](#)), industrial mixed use ([Grodach, 2022](#)), or transit oriented manufacturing ([Dierwechter and Pendras, 2020](#)).

New production in cities thus matters and has attracted attention from urban economic development officials—but often in ways that do not go fully recognized or appreciated by *urban sustainability* scholars. As [Leigh and Hoelzel \(2012\)](#) note, this is an oversight. While low-wage manufacturing clusters do characterize smaller metropolitan areas like Winston-Salem, NC, industrial sectors are typically celebrated in economic development circles for their contribution to inclusive economies—the “equity” leg that so often gets overlooked in sustainability studies and that we wish to bring here to the center of “green city” explorations, in Seattle no less than elsewhere.

## Reputational seattle: From emerald city to elite emerald

For the past 30 years, the city of Seattle has enjoyed a global reputation for “taking sustainability seriously” ([Portney, 2003](#)). Popular, if often methodologically opaque, rankings



of the “greenest” US cities typically list Seattle at or near the top of larger communities committed politically and culturally to a green urban policy agenda (see e.g., <https://parade.com/1191546/kmccleary/greenest-cities-in-the-us/>).

This is understandable—and in many ways justified. Seattle’s longer history of conservation efforts coupled with national investments in regional hydropower grids explain part of this reputation (Klinge, year). So too does Seattle’s pioneering 1994 local comprehensive plan, which integrated a still relatively new sustainability philosophy across key planning elements; the plan did much, for example, to institutionalize the long-term coordination of mixed land-use regulations with public transit commitments through a necklace of “urban villages” (Godschalk et al., 2006).

Seattle’s local eco-activist community is politically robust, connecting anti-highway movements in the late-1960s with more recent “kayaktivist” protests against big oil (Burkett, 2016). As a result, since 2006, Seattle has strongly pursued global climate goals (City of Seattle, 2006)—integrating mitigation and adaptation policy; advancing national and transnational climate action networks; linking adaptation policies with long-term resiliency; cogenerating risk information; and focusing on locally disadvantaged populations (Dierwechter, 2021). Key changes have occurred in green energy programs, transit lines, and smart grids—prompting the Obama administration to champion Seattle repeatedly as a national leader with lessons to teach others. Since 2013, moreover, Seattle has started to focus on the sober reality of local adaptation, in general, and to political concerns with the socially exclusionary effects of what Rice (2010) has called its emerging “carbon territories,” in particular. In these many and various ways, the city of Seattle has done much to earn the Emerald City moniker that symbolizes its green city status (Dierwechter, 2017).

This isn’t to say that Seattle has been successful in all of its sustainability efforts. Despite the gains made, Seattle has faced notable struggles with sewage management, water treatment, housing affordability, income inequality, and traffic congestion, among other challenges. However, whether Seattle truly *deserves* the title of “green city” is not our main concern here; debates abound regarding the appropriate criteria and accounting tools to assess a city’s green credentials, as already mentioned with reference to industrial symbiosis. What matters for the present work is that Seattle has gained a widely recognized reputation for sustainability, a reputation that both fuels and is fueled by a variety of carbon reduction initiatives (see, for instance, Dierwechter, 2021, chapter 3). And in the anti-industrial environment of the post-industrial city, removing carbon from territory is often associated with active industrial displacement to other areas and the attendant redevelopment of brownfields or underdeveloped industrial zones with new spaces of consumption and reproduction. This type of green gentrification has received significant attention from scholars in recent years, raising concerns that green cities are also becoming

increasingly *exclusive* cities (Curran, 2007; Abel et al., 2015). The exclusivity of the green city is also associated strongly with new land use demands that emanate from proportional changes in municipal-scale employment structures. These occupational changes are illustrated in Table 1 below, which compares shifts in the importance of key economic sectors between 2010 and 2020 for the city of Seattle and the Puget Sound Region as a whole (“Metro Area”). Changes in occupational structure imply broader changes to the city’s population and demographic composition.

For context, it is important to note at the outset that Seattle has been one of the most dynamic large cities in the United States for several years (Balk, 2020). Absolute job *growth* has characterized multiple (if not all) economic sectors. In 2010, the full-time, year round civilian employment population over 16 years of age in Seattle was 221,080. By 2020, it was 320,566—1.45 times larger in absolute terms. But as Jacobs (1969) memorably argued in *The Economy of Cities*, there is a major difference between growth and development. Growth, she observes, is just “more of the same”: more oil, more cars, more health care, more widgets. In contrast, the *development* of an urban economy suggests qualitative shifts in inherited structures, ideally (for Jacobs) a more refined differentiation in the local grain of economic activity; but often development simply means a shift in the relative importance of key employment sectors. As global information-economy corporations like Microsoft and Amazon emerged in the 1980s and nineties, manufacturing employment became less regionally *determinant* to overall growth rates, economic identity, and economic geographies of wealth generation. Nevertheless, manufacturing employment is still growing—especially across the wider region.

Between 2010 and 2020 the city of Seattle largely maintained (or “grew”) its regional importance in education, health, and information sectors. There were still many good jobs in these critical economic sectors; but they did not restructure the urban economy. At the same time, however, Seattle became increasingly defined by far faster employment growth in the (related fortunes) of management of companies positions; professional and scientific jobs; and retail. Put differently, the absolute growth in management and professional jobs in Seattle far outpaced the absolute growth in, for instance, public administration or, indeed, manufacturing, which experienced some stability but nothing in comparison to the growth of new management and professional positions inside the city. This is the transition that has signaled Seattle’s aforementioned rise to superstar city status. Once defined by the Boeing Base—the many and various manufacturing jobs that enabled the Boeing Company to become a global leader in the production of airplanes—Seattle has continued its steady development away from blue collar production and fabrication into a new kind of city. Seattle has become, increasingly: a professional town; a managerial town; a technical town; an educated town—and,

TABLE 1 Changes in key economic sectors in Seattle and the Puget Sound Metro region from 2010 to 2020 (Source: US Census Table S2404, 2010 and 2020 Census of employment; [data.census.gov](https://data.census.gov)).

Economic sector	Puget sound region		City of seattle	
	2010	2020	2010	2020
Full-time, year-round civilian employed population 16 years and over	1,203,654	1,545,487	221,080	320,566
Agriculture, forestry, fishing and hunting, and mining:	6,472	7,920	596	1,060
Agriculture, forestry, fishing and hunting	5,732	7,141	542	1,034
Mining, quarrying, and oil and gas extraction	740	779	54	26
Construction	88,955	108,659	9,598	10,858
Manufacturing	179,653	190,348	20,627	24,395
Wholesale trade	45,882	46,947	6,744	7,023
Retail trade	122,581	168,984	21,102	40,477
Transportation and warehousing, and utilities:	68,320	86,402	9,144	12,120
Transportation and warehousing	58,627	74,452	7,841	10,429
Utilities	9,693	11,950	1,301	1,691
Information	45,717	48,438	10,671	15,923
Finance and insurance, and real estate and rental and leasing:	91,677	97,489	17,928	20,937
Finance and insurance	61,172	61,182	12,115	12,635
Real estate and rental and leasing	30,505	36,307	5,813	8,302
Professional, scientific, and management, and administrative and waste management services:	172,269	279,260	44,290	81,081
Professional, scientific, and technical services	125,030	218,484	36,902	1,173
Management of companies and enterprises	1,942	4,263	584	71,137
Administrative and support and waste management services	45,297	56,513	6,804	8,771
Educational services, and health care and social assistance:	197,731	281,392	44,725	62,206
Educational services	69,009	99,670	18,196	25,574
Health care and social assistance	128,722	181,722	26,529	36,632
Arts, entertainment, and recreation, and accommodation and food services:	68,206	93,677	16,401	22,996
Arts, entertainment, and recreation	20,254	25,983	4,465	6,044
Accommodation and food services	47,952	67,694	11,936	16,952
Other services, except public administration	47,074	56,118	9,694	11,066
Public administration	69,117	79,853	9,560	10,424

consequently, a higher-end “consumption zone” with more retail amenities fed by the steady acceleration of the very high-income residents in these same sectors. Again, within the anti-industrial development narrative, these changes take on the luster of progress; “dirty” industrial jobs are replaced by “clean” professional services, at least locally. Capturing the knowledge economy and reshuffling the messiness of the making of things out-of-sight and out-of-mind has enabled Seattle to position itself as an icon of urban sustainability.

## Regional manufacturing: “Scaling out” from Seattle

However, much these developments are bundled with Seattle’s meteoric rise to superstar city status, they have major consequences for local socio-economic conditions, along

with implications for our collective understanding of urban sustainability. Like many other primate cities around the United States, the knowledge economy’s voracity for commercial space in Seattle has brought tremendous pressures to urban real estate markets. Rent for industrial space in the city has exploded. One recent article laments that industrial firms are being “pushed” to nearby suburbs: in consequence, “the city [of Seattle],” as the head quote to this paper notes, “risks losing the blue-collar jobs so crucial to shoring up its shrinking middle class” (Burton, 2017).

This is worth briefly teasing out. The concept of the “rent gap” that Smith (1979) used to explain residential gentrification extends easily to capture the pressures leading to industrial gentrification and industrial displacement: centrally located industrial areas are scrutinized for potential other uses (Curran, 2007). As Janos (2020, p. 2,295) explains, focusing specifically on manufacturing industrial centers (M/IC) in Seattle, since “[r]eal estate rents are greater for commercial buildings... the

pressure of real estate capital on the fringes of the M/IC has resulted in the conversion of M/IC into rent seeking investment development” (Janos, 2020, p. 2,295). From new sport stadium proposals (Martin, 2016), to expanded residential and commercial development (Pyne, 2008), to the cleanup of the downtown’s central industrial waterway (Beekman, 2015), the occupation changes discussed above thus bring intense new land use pressures. And despite the valiant efforts from the city to preserve these valuable industrial spaces through reinforced zoning codes, clear and well-funded visions of alternative (post-industrial) land uses in the urban core fuel conflicts over the industrial future of the city. Spaces of production, and the jobs that accompany those spaces, struggle to compete for attention and support against high-end reproduction and consumption in the existing narrative of urban sustainability.

“Scaling out” from the city of Seattle, though, Figure 1 shows the quantitative importance of manufacturing jobs across the entire Puget Sound region. While the Puget Sound region has a long history of transportation-related production (especially aerospace) as well as a range of diversified manufacturing clusters, contributing to one of the *highest* average annual manufacturing earnings in the United States (Helper et al., 2012, p. 23), the relative importance of manufacturing *outside* of Seattle has grown in recent years. For every one manufacturing job in Seattle listed in Figure 3, eight others remain located elsewhere in the Puget Sound region (i.e., outside of Seattle but still within the region). Thus, as the regional economy has shifted, manufacturing has become proportionately more important outside of Seattle than in it—representing more than 12% of jobs to only 7% for the city of Seattle in 2020. Reynolds (2017: p. 32) posits that such trends are consistent with patterns experienced more generally across the US, as “central cities have lost a higher percentage of these jobs relative to the metropolitan area as a whole, with a steady shift of manufacturing jobs from the central city toward inner and outer-ring suburbs fanning out into the larger MSA.”

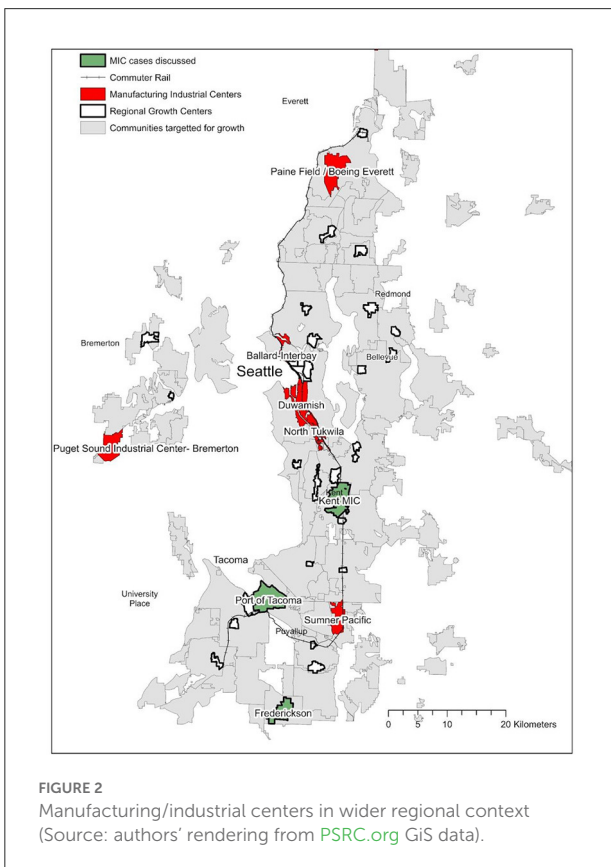
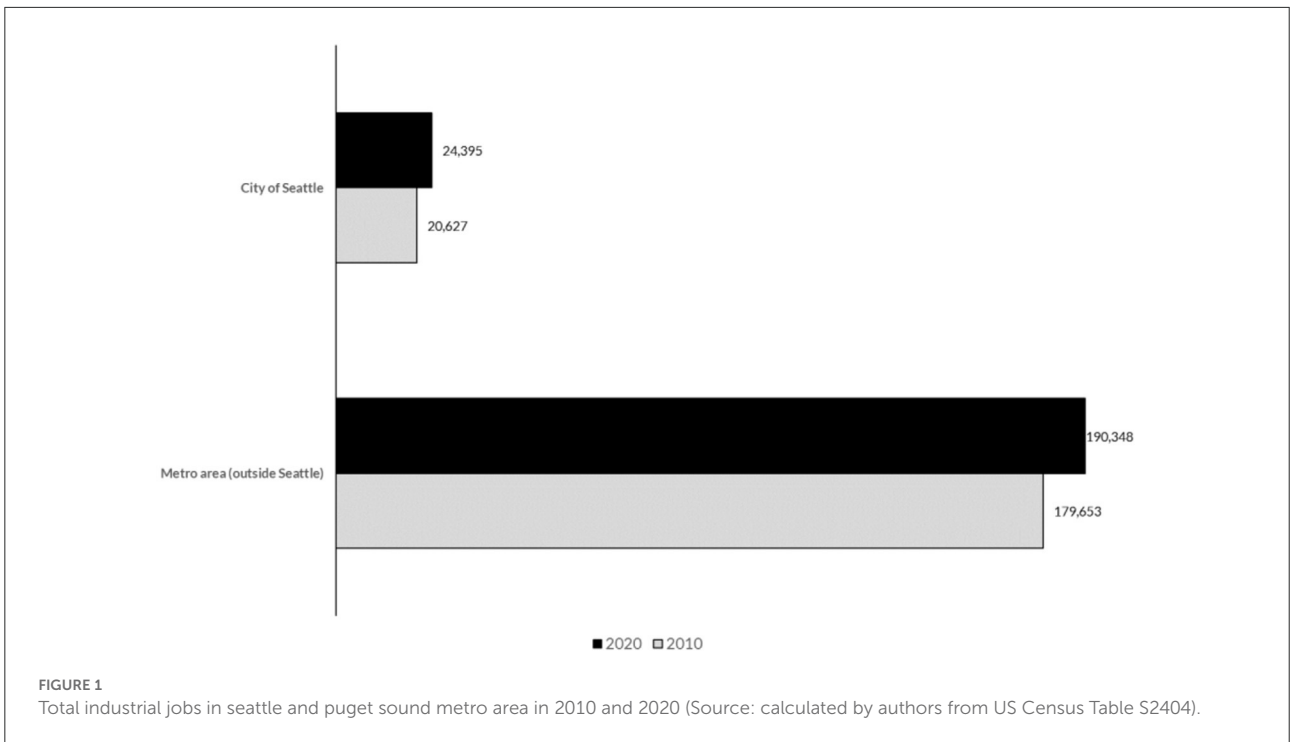
We develop this last point here. After shaking off the Great Recession and before the still-emerging implications of COVID-19 global pandemic, regional policy-makers turned more policy attention to better coordinating overall growth policies with a renewed concern to protect and expand industrial activities. The pandemic and now much clearer structural problems in China—including an aging and more expensive workforce—has accelerated renewed discussions of “reshoring” production (Talton, 2022) as well as already-existing interests in facilitating greater industrial symbiosis (see, for example, Puget Sound Regional Council, 2015). In 2019, one study highlighted the ongoing importance of protecting and expanding the region’s 109,000 advanced manufacturing jobs, including strong locational specializations (ie. high Location Quotients) in aerospace product and parts manufacturing (regional LQ = 11.8) as well as Navigational, Measuring, Electromedical, and Control Instruments Manufacturing (LQ =

1.52). Moreover, smaller sectors with notable growth potential for the region as a whole included Medical Equipment and Supplies Manufacturing. The region’s 1,000 “advanced” manufacturing firms made about 27% (or \$11.2 billion) of their supply-side purchases from local firms, stimulating not just other input manufacturers but various business service providers (Jobs, 2019, p. 5, 6).

The most important regional policy-makers tracking and managing these trends are associated with the federally-designated Metropolitan Planning Organization—the Puget Sound Regional Council (PSRC). Focused on coordinating local growth management/land use decisions, major transit investments, and economic development strategies, Figure 2 below shows how prominently manufacturing spaces figure into the PSRC’s long-range vision of a “sustainable urban region” (Puget Sound Regional Council, 2020, p. 5). In particular, “manufacturing/industrial centers” represent an integrated network of crucial development nodes that impact wider concerns with livability and, more recently, urban climate action and social equity. The sustainable urbanized region emerges through older and long-standing planning techniques, such as concurrency provisions, transit-oriented development, and regionally-coordinated urban growth boundaries (Dierwechter, 2008); but also, and more importantly for our argument here, through explicit concerns with industrial retention and expansion.

In the latest metropolitan-scale plan, called *VISION 2050* (Puget Sound Regional Council, 2020), urban and regional development policy emphasizes the shifting supply and demand for industrial land across all industry sectors; supporting emerging industrial uses as both technology and markets co-evolve, and, not least, crafting strategies to preserve, protect, and enhance industrial lands, jobs, and businesses in coordination with municipal efforts to support local industrial land bases (p. 80). Although automation and other changes have clearly reduced the employment effects of industrial land around the Puget Sound (as elsewhere in advanced economies), manufacturing preservation policies seek to support the region’s existing industries and furthermore offer sites for new economic opportunities for manufacturing. Accordingly, the PSRC is concerned with protecting production spaces *from* incompatible adjacent uses—an interesting “about-face” from the original motivation for Euclidean zoning (see e.g., Puget Sound Regional Council, 2020, MPP-Ec-22, p. 91).

This regional governance work is important; it advances a *regional* vision for industry that recognizes the importance of cities outside of Seattle maintaining their industrial activities. While the challenges to these retention and mixing policies are considerable, they nonetheless demonstrate the wider policy importance that the metropolitan region attaches (at least implicitly) to better balanced industrial development for urban sustainability goals. As Seattle’s superstar status congeals in place, peripheral “blue-collar” spaces that



maintain economic diversity become increasingly important to broader sustainability goals. Indeed, the alternative—“regional growth centers” that simply provide condominiums targeting (youngish) tech and professional workers who then commute to unaffordable Seattle—does little to mitigate carbon or deepen sustainable behaviors.

This explicit governance link between industrial regionalism and local sustainability goals becomes even clearer when we look more closely at specific “peripheral” spaces in the region, such as the Frederickson Manufacturing/Industrial Center located at the extreme south end of the regional economy. A Census Designated Place (CDP) rather than incorporated municipality, the Frederickson Manufacturing/Industrial Center was originally established in 2003 “in anticipation of development” (Puget Sound Regional Council, 2015, p.3–5) and now hosts a higher percentage of manufacturing jobs than Seattle, even though it is ostensibly “suburban” or more accurately “exurban” in physical location. It lacks the physical and cultural urbanism of core cities. It still sends more workers “out” than it welcomes “in.” But Frederickson’s relatively strong manufacturing/industrial character distinguishes it from a classic residential suburb where the population goes up at night and down during the day. This is especially true when we consider how it is viewed in policy terms by the region. For example, Frederickson sends 9,585 workers to other communities every day but already attracts 5,000 workers, whereas nearby University Place (a more traditional suburb)



attracts a similar number of workers but sends over 13,500 workers out (data for both communities derived from: <https://onthemap.ces.census.gov/>). In terms of the work taking place there, the PSRC notes that “[t]he area is dominated by Boeing’s production of key components for commercial airliners, as well as the company’s premier carbon-fiber component manufacturing plant.” (Puget Sound Regional Council, 2015, p. P-21). Importantly, in the most recent plan review certification report of Frederickson, the PSRC affirmed Frederickson’s contributions to environment and climate change goals associated with, *inter alia*, critical/environmental sensitive areas, stormwater management, air pollution/GHG emissions and retrofitting: “The Frederickson Community Plan effectively addresses the environment and climate change [and land use development pattern] provisions of the VISION consistency tool, [including...] goals and policies that persevere industrial land uses and...limit non-industrial growth in the center.” (Puget Sound Regional Council, 2022, p. 3, 4). In short, we are struck here by the policy importance attached to Frederickson’s ongoing industrialization, and also by its compatibility with wider sustainability objectives, though cities like Frederickson rarely receive attention from sustainability scholars.

A second example from another “peripheral” space reinforces these same patterns. The steady movement of production firms from Seattle to adjacent communities is especially evident in places like Kent (Figure 3). “The Kent Industrial Valley,” as the city’s 2015 comprehensive plan notes, is an epicenter for much of Puget Sound’s advanced manufacturing activity...with leading employers in retail and outerwear, logistics, aerospace, food processing and establishments in related sectors. Investments in outdoor recreation amenities, sponsoring of thematically related industry cluster activities or networking events, provision of incentives to regional industrial clusters and continued support for the Center for Advanced Manufacturing in Puget Sound are all example actions in support of retaining and growing businesses within these major clusters (City of Kent, 2015a, p. 135).

Accordingly, in addition to job-rich branches of the Boeing Space and Defense corporation, Kent hosts Blue Origin, the aerospace company launched by Jeff Bezos. Relatedly, Kent includes ThyssenKrupp Aerospace, which engineers and manufactures carbon fiber on a variety of Boeing products, including commercial aviation aircraft, military aircraft, and space and communications systems. Other high-tech manufacturing firms include X10 Wireless Technology, which fabricates and markets wireless video cameras and LaserMotive, which develops and manufactures technologies for transmitting power *via* lasers. Kent’s Omax Corporation is the second largest water jet manufacturer in the US; in turn, the Seattle-Tacoma Box Company produces shipping containers, crates, boxes, and other wooden products; Door to Door Storage offers portable, containerized storage. Notable



FIGURE 3  
Kent, Washington’s spatial structure: broadening sustainability relationally? (Source: Good Earth).

food manufactures include the Oberto Sausage Company, which makes beef jerky, pepperoni and snack sausages and the Pacific Coast Condensed Milk Company, which manufactures evaporated milk. Finally, Kent hosts Diamondback, Raleigh, Redline, and Novara bicycle manufacturers as well as Torker, a firm that makes bicycles, unicycles, strollers, trailers, and cycling clothing. Taken together, Kent is today “the second largest manufacturing and warehouse center on the West Coast” (City of Kent, 2015b, p. 131), evolving from a rural hamlet in the 1890s to a suburban municipality in 1960s to now a major industrial employment center, welcoming 68,000 workers every day while exporting 50,000 commuters (calculated from <https://onthemap.ces.census.gov/>).

Viewed in isolation, Kent looks like a carbon-heavy sustainability nightmare, dominated by low-density warehouses, relying heavily on interstate (I-5) and state highway (167) connections for competitive transportation advantages and daily logistics (see Modarres and Dierwechter, 2015), pumping out trucks that clog transportation corridors. As Figure 3 shows, Kent’s “spatial structure” hardly matches the water-colored renderings of New Urbanist designers or smart growth advocates, even when modified to suit how suburban locations can and do contribute to sustainability goals (Garren and Brinkmann, 2020). But that isn’t the only way to see or evaluate a city like Kent. As inequality mounts in the city of Seattle, whose Gini coefficient topped 0.47 in 2021, places like Kent should be recognized more clearly for the relational work they do it helping to secure what Benner and Pastor (2015, p. 178) have called “an historic pattern of relatively inclusive growth” across the wider metropolitan area. When viewed relationally, in other words, Kent’s absorption of the region’s industrial needs and provision of well-paid jobs that are widely accessible by local residents, can be recognized as *part of* Seattle’s green transition.

One final example is worth noting here. For nearly 100 years, the Ports of Seattle and Tacoma (roughly 30 miles south of Seattle) have been competitors, with dueling natural deep-water ports well-suited to classic working waterfront activities: ship-building, lumber processing and exporting (in the early days), and eventually containerized cargo shipping and, most recently, at least in Seattle, cruise terminals. After decades of competition against *each other* the two ports decided to join forces to compete against *other* west coast ports presenting much more existential threats: Los Angeles/Long Beach, San Francisco/Oakland, and the Canadian ports of Vancouver/Prince Rupert. Joining together as the “Northwest Seaport Alliance” allows the two ports to manage and coordinate their activities at the regional scale, sharing resources and expertise to gain efficiencies and become “the third largest container gateway in North America” (Garnick, 2015: p. 1).

As one can imagine, the details of the alliance are complex. The alliance relationship covers all “marine cargo” connected with the two ports, and each port manages non-marine cargo related activities outside of the alliance: “Kept out of the alliance are both ports’ grain terminals, Seattle’s aviation division, marinas, Fishermen’s Terminal and cruise terminals, as well as some real estate that does not support the maritime cargo. In Tacoma, the assets outside the alliance are industrial real-estate facilities” (Garnick, 2015: p. 3). In addition to the recognition that these port industrial facilities need to be managed on a regional scale, we note the space this alliance opens for a regional division of industrial labor. While the Port of Seattle is adamant that it will not be getting out of the cargo shipping business, it is also shifting attention to its growing cruise industry, which experienced enough steady growth up to the onset of the COVID-19 pandemic to warrant construction of “a fourth cruise terminal to open in time for the 2022 cruise season” (Northwest Seaport Alliance, 2019: p. 3). Though the detailed schedule for the terminal remains uncertain, the *intention* to expand cruise capacity remains; and as the space for cruise ships expands, the space needed to accommodate more traditional cargo handling tasks in Seattle has become increasingly difficult to find, putting pressure on other areas to absorb that activity. For example, of the 7,102,533 square feet of warehouse and distribution space the Alliance had planned or under construction in 2018, only just over 1 million was targeted for Seattle, with over 4 million slated for Tacoma and the rest in other peripheral locations in King and Pierce Counties (Northwest Seaport Alliance, 2018). The justification for these patterns is clear: “The recent growth in the Seattle region has driven demands for more distribution capacity and transloading services. As a result, developers are taking advantage of available land for new development in places like Kent and Puyallup River valleys, and more recently in the South Sound” (Northwest Seaport Alliance, 2018). The establishment of the Seaport Alliance, in other words, opens peripheral industrial spaces to absorb growth pressures “fanning out” from Seattle.

In each of the examples provided in this section we have emphasized the “push” factors—the shifting priorities, land use pressures, new developments—that have caused Seattle to shed blue collar jobs and activities that then get absorbed by peripheral spaces within the region. That is not to deny or overlook the “pull” factors—tax breaks, land assembly, zoning changes, infrastructure projects—that peripheral spaces may employ to draw industrial development to their jurisdictions. Indeed, the economic development plans and policies in these peripheral cities clearly signal their efforts to make themselves more attractive to industrial interests. And the PSRC’s regional planning visions clearly aim to facilitate the distribution of industrial activities throughout the Puget Sound region so as to discourage the concentration of those activities in Seattle. In this regard, we need to see peripheral spaces as agents in this process and not simply the powerless victims of Seattle’s green ambitions. But for our purposes here, we more directly want to call attention to the extent that the industrial activities expanding in peripheral spaces are *part of*, if not *integral to* Seattle’s emergence as an icon of green urbanism. We can continue to debate whether Seattle’s green city status is deserved or accurately measured; and we can dive deeper to interrogate the relative influence of push vs. pull factors on the region’s industrial development patterns. But the point we want to emphasize is that Seattle’s current “green city” notoriety is rooted in a degree of intra-regional relationality that has been otherwise overlooked.

## Discussion and conclusion

Examples of industrial absorption by peripheral locations within the Puget Sound region raise questions about how we make sense of this type of industrial regionalism. Our primary focus here has been on the observation that industrial activity—particularly manufacturing and warehousing—has become more dominant *outside* the territorial boundaries of Seattle, as other economic activities—the knowledge work, professional services, entertainment and consumption, and green infrastructure so central to urban sustainability models—have become more dominant in the city. These patterns are neither especially new nor surprising, as they fit with characterizations of “global,” “creative,” and “superstar” cities that have dominated the literature in recent decades (Sassen, 2001; Florida, 2002; Rousseau, 2009; Rodriguez-Pose, 2018), as well as longer running theorizations of post-fordist industrial decentralization (Christopherson and Storper, 1987; Scott, 1988). So what is new here?

We see three primary contributions of our work. The first is challenging the tendency to conceive and measure urban sustainability narrowly as “sustainability in one place,” with its accompanying emphasis on “trait geographies” that involve the cataloging of the special qualities of special places. As noted in earlier sections, there has been growing

recognition in sustainability studies of global and otherwise multiscalar relations that impact “footprints,” “impacts,” and other measurements of urban sustainability—e-waste circuits, commodity chains, life-cycle assessments, etc. However, we see less attention directed at regional scales—the aspects of intra-regional relationality that contribute to the *metropolitan* production of what is typically represented as *urban* sustainability. However, one may choose to theorize the *economic* motivations behind shifting patterns of industrial organization—industrial decentralization, flexible specialization, hub-and-spoke districting—it is important to consider how the activities taking place in primate cities and those in secondary cities and other regionally peripheral locations fit together to create one ‘urban’ sustainability picture that depends on contributions from multiple sites throughout the metropolitan region.

The example of industrial decentralization, and the absorption on the periphery of industrial activities shed by core, evokes the second intended contribution of the present work: elevating industrial practices in sustainability discussions. This emphasis on industry in connection with sustainability is largely driven by a desire to forefront the “equity” dimension of sustainability, as industrial jobs have historically provided accessible jobs, good wages, and opportunities for social mobility for workers, as well as a degree of economic diversity for cities (Curran, 2007; Leigh and Hoelzel, 2012; Leigh et al., 2014; Gibson et al., 2015). It goes without saying that under conditions of the growing climate crisis and other mounting environmental problems, advancements aimed at managing the environmental impacts of industrial production are essential. However, those gains are not achieved by simply pushing industrial production out of primate cities to the vast peripheral “elsewhere” of the world. Cities depend on industrial production. As sustainability scholars, we need to do a better job of incorporating that reality into the ways we think about, measure, and advocate for urban sustainability, a point we share with scholars such as Abel et al. (2015). In addition, growing income inequality intersects with deepening problems of racial injustice. Foregrounding industrial production in the political economy of working-class livelihoods thus helps to strengthen extant movements between racial justice and environmental conservation—or what Sanders (2010) sees as the “roots” of Seattle’s specific vision of urban sustainability.

These two intended contributions—foregrounding intra-regional relationality and industrial production in urban sustainability discussions—contribute to the third goal of our work here, which is to consider the implications of these patterns for the governance of urban sustainability. As we call attention to the peripheral spaces that help enable primate city sustainability, we are also compelled to then consider the intra-regional politics of these relational dynamics. Which peripheral spaces take on (or absorb) which types of work in service of regional sustainability goals? How does learning to see and value

industrial work on the periphery as *part of* and *integral to* our more popular and traditional sustainability metrics—even when those peripheral activities appear directly contradictory to those metrics—impact regional governance?

The governance aspect of this question brings to mind Clark (2013) research on “working regions” and concerns over the management of industrial activities that are distributed across regional space. Recognizing the steady vertical *disintegration* of production at the level of the firm in recent decades, she argues for greater appreciation of the benefits of vertical integration of industrial production at the regional scale. Combining different aspects of the production process within specific regions, Clark argues, avoids the creation of different “classes” of regions that specialize in different aspects of the production process. As she puts it (p. 39), “for a region to work it has to link research and manufacturing activities—innovation and production—in the same place. These functions do not necessarily need to be vertically integrated within the same firm. However, they do need to be vertically integrated within the same region as a system of design, development, and production for places to benefit from sustainable job creation as well as the wealth generation that comes from consistent innovation.” While this kind of regional vertical integration can emerge through private sector relationships between individual firms, it is more likely to result from intermediary organizations whose specific charge is to facilitate those connections, and “the state has a role in facilitating and investing in the intermediaries that build these innovation systems and firm networks” (Clark, 2013, p. 29). In short, in Clark’s vision of the successful (and equitable) working region, industrial activities are vertically integrated on a regional scale, intermediary organizations help to create that integration, and the state facilitates and coordinates (governs) the system. The problem, Clark (2013, p. 89) concludes, is that this doesn’t happen very often; in fact, the inverse is more often the case: “The crucial empirical point is that high-technology services and advanced manufacturing do not appear to converge on single regions specialized in a given sector. Instead, evidence suggests sites of production and sites of innovation are diverging. This divergence produces a dilemma for policy.”

What Clark calls “a dilemma for policy,” we would characterize instead as a dilemma for politics, specifically the politics of what Jonas (2012: p. 823) refers to as “distributional struggles within city-regions.” Governance here is about management and coordination, but it is also about navigating questions of who gets what within the region, where different activities are located, how those activities are valued, and whether and how resources, power, and decision making are shared. A “working region” that manages these relationships through policy has the potential to create an economically diverse and socially balanced region. We would extend that argument to include a more accurate and more inclusive conceptualization of “urban” sustainability. In the absence of that more expanded system of management and coordination,

we are faced with the familiar prospect of uneven development within the region.

## Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

## Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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