CLIMATE ZONING

Christopher Serkin *

As the urgency of the climate crisis becomes increasingly apparent, many local governments are adopting land use regulations aimed at minimizing greenhouse gas (GHG) emissions. The emerging approaches call for loosening zoning restrictions to unlock greater density and for strict new green building codes. This Article argues that both approaches are appropriate in some places but not in others. Not all density is created equal, and compact multifamily housing at the urban fringe may actually increase GHG emissions. Moreover, where density is appropriate, deregulation will not necessarily produce it. And, finally, green building codes will increase housing costs and so will actually increase GHG emissions if they discourage growth in low-carbon places. Those are appealing in the abstract but are unlikely to be adopted in many places anytime soon. This Article therefore offers a set of regulatory prescriptions specifically for local governments aimed at producing density in low-carbon places and minimizing emissions in high carbon ones.

* Elisabeth H. & Granville S. Ridley Jr. Chair in Law, Vanderbilt Law School. Thanks to Sara Bronin, Caroline Cox, Nestor Davidson, John Infranca, Moira O'Neill, John Lovett, Michael Lewyn, John Nolon, J.B. Ruhl, Ganesh Sitaraman, Katrina Wyman and participants at the 2023 Progressive Property Conference. Thanks to Raghav Gupta and Samantha Shah for research help.

INTRODUCTION

Climate change is the existential challenge of our age.[1] Policy responses at the national level have come in fits and starts, with almost as many steps backwards as forwards over the last decade.[2] Even with the important Inflation Reduction Act, emissions continue to increase amid urgent calls for more dramatic cuts.[3]

In the United States, state and local governments have been leading the charge in recent years. When the Trump administration withdrew from the Paris Climate Agreement, 468 local governments committed themselves to the agreement, bypassing the federal government.[4] The Intergovernmental Panel on Climate Change (IPCC) has also identified local governments as crucial to the climate effort.[5] The built environment—where development occurs, and the form that it takes—has a significant impact on emissions and is primarily regulated by local land use controls.[6] Buildings produce almost 40% of the nation's carbon emissions.[7] Personal vehicles account for 10% of global CO_2 emissions, and the number of vehicle miles traveled (VMT) is a function of where people live and work.[8]

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1 *See, e.g.*, Intergovernmental Panel on Climate Change [IPCC], *Climate Change 2022: Mitigation of Climate Change: Working Group III Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, at v (2022) [hereinafter IPCC, *Sixth Assessment Report*] ("[G]reenhouse gas emissions over the last decade are at the highest levels in human history. . . . [and] urgent action is needed. Unless there are immediate and deep emissions reductions across all sectors, limiting global warming to 1.5°C will be beyond reach. Global greenhouse gas emissions implied by Nationally Determined Contributions announced prior to COP26 make it likely that warming will exceed 1.5°C and will also make it harder to limit warming to below 2°C.").

2 *See, e.g.*, Inflation Reduction Act, Pub. L. No. 117-169, 136 Stat. 1818 (2022); Hannah Perls, *Deconstructing Environmental Deregulation Under the Trump Administration*, 45 VT. L. REV. 591, 619–20 (2021).

3 *See* IPCC, *Sixth Assessment Report*, *supra* note 1, at 68–88.

4 *See 468 US Climate Mayors Commit to Adopt, Honor and Uphold Paris Climate Agreement Goals*, CLIMATE MAYORS, https://climatemayors.org/actions-paris-climate-agreement/ [https://perma.cc/8EJS-VNDK] (collecting mayoral signatures).

5 *See* Intergovernmental Panel on Climate Change [IPCC], *Climate Change 2007: Mitigation of Climate Change: Working Group III Contribution to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* 791 (2007) [hereinafter IPCC, *Fourth Assessment Report*].

6 *See, e.g.*, John R. Nolon, *Low Carbon Land Use: Paris, Pittsburgh, and the IPCC*, 40 U. ARK. LITTLE ROCK L. REV. 661, 664 (2018) ("Local laws and their enforcement determine how many vehicle miles are driven, how much energy buildings consume, and how natural resources that capture CO2 through biological sequestration can be preserved and enhanced.").

7 *See* U.S. EPA, EPA 430-R-23-002, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS, 1990-2021, at ES-11, 2-38 (2023).

8 *See id.* at ES-22 (noting that 28.5% of the United States' emissions came from transportation); *see also, e.g.*, JOHN DECICCO & FREDA FUNG, ENV'T DEF., GLOBAL WARMING ON

Local governments interested in taking action on climate change need better guidance about what to do. Common policy responses involve loosening regulations to allow greater density, or creating strict new green building standards.[9] But when does density make sense, and are current reform efforts that loosen zoning the best way to achieve it? Will green building codes reduce carbon, or will they shift development to even more carbon-intensive places? This Article provides a framework for climate-focused land use reforms and suggests a number of specific zoning tools to minimize emissions that vary by place. In so doing, the Article challenges some of the current deregulatory efforts and focuses on regulatory tools to promote urban growth and density.[10]

To see some of the confusion in the current debates over zoning and climate, consider recent coverage by the *New York Times*. In its oped section, and in its news coverage, the *New York Times* has repeatedly blamed zoning for restricting housing supply and has endorsed regulatory changes to unlock growth, including in the suburbs.[11] In a

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THE ROAD: THE CLIMATE IMPACT OF AMERICA'S AUTOMOBILES, at iv (2006) ("The United States has 5% of the world's population and 30% of the world's automobiles, but it contributes 45% of the world's automotive CO_2 emissions."); REID EWING, KEITH BARTHOLOMEW, STEVE WINKELMAN, JERRY WALTERS & DON CHEN, URB. LAND INST., GROWING COOLER: THE EVIDENCE ON URBAN DEVELOPMENT AND CLIMATE CHANGE 2 (2008) ("Transportation accounts for a full third of CO_2 emissions in the United States . . . .").

9 *See infra* Part II.

10 *See infra* note 27 (citing sources advocating deregulation).

11 *See, e.g.*, Conor Dougherty, *Getting to Yes on Nimby Street*, N.Y. TIMES, Dec. 3, 2017, at BU1 ("[California] wants to lead the country on actions to reduce carbon emissions, and has enacted legislation mandating a $15 minimum wage by 2022. But housing is undermining all of it."); Spencer Bokat-Lindell, Opinion, *America's Housing Crisis Is a Choice*, N.Y. TIMES (Aug. 10, 2021), https://www.nytimes.com/2021/08/10/opinion/housing-crisis-eviction.html [https://perma.cc/8UTG-YVTE] ("[S]upply issues also stem in large part from restrictive regulations—such as single-family zoning, minimum lot sizes and parking lot requirements—that artificially limit the amount of housing that can be built."); Edward L. Glaeser, Opinion, *How Biden Can Free America from Its Zoning Straitjacket*, N.Y. TIMES (Apr. 12, 2021), https://www.nytimes.com/2021/04/12/opinion/biden-infrastructure-zoning.html [https://perma.cc/JK8A-2ZNP] ("[L]and-use controls have limited the supply of affordable housing."); Margaret O'Mara, Opinion, *Don't Blame Tech Bros*, N.Y. TIMES, Dec. 1, 2019, at SR9 ("The spiraling housing costs in West Coast tech hubs are the result of 40 years of tax and land use policy . . . . This was also a time of continued activism by homeowners against higher-density zoning. Together, this has severely limited housing construction, particularly lower-cost houses and apartments."); Samuel Hammond, Daniel Takash & Steven Teles, Opinion, *Want More Affordable Housing and Health Care? Here's a Fix*, N.Y. TIMES, Nov. 19, 2021, at A23 ("Incumbent homeowners love restrictive zoning and land use regulations because they push up property values and displace development into someone else's backyard, if not prevent it from happening at all. But when virtually every local jurisdiction implements similar restrictions, the result is a crisis in housing affordability, urban sprawl, segregation, excessive energy use and moats around the nation's centers of growth and

recent article, the *New York Times* favorably covered New York Governor Kathy Hochul's plan to require suburbs to allow an additional 800,000 housing units, framing the push to loosen suburban zoning as crucial to the housing crisis.[12] Indeed, unlocking suburban growth through zoning reform has been a consistent theme of its coverage.[13] The *New York Times* has also highlighted the risks of climate change and called for reductions in carbon emissions while pointing out the high carbon costs of suburban living.[14] Notice the tension. Loosening suburban zoning might help with affordability, but it may reduce overall urban density and increase carbon emissions, since housing in New York's suburbs is among the most carbon intensive in the country.[15]

Scholars have advanced a variety of planning goals for local governments to reduce carbon and other greenhouse gas (GHG) emissions from within their borders.[16] The interrelated prescriptions

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opportunity."); Mihir Zaveri, *Rising Rents, and No Cure on Horizon*, N.Y. TIMES, Aug. 2, 2022, at B1 ("At the center of the problem is zoning.").

12 *See* Mihir Zaveri, Luis Ferré-Sadurní & Michael D. Regan, *Hochul Seeks Help from Suburbs to Fix New York's Housing Crisis*, N.Y. TIMES, Mar. 30, 2023, at A1.

13 *See, e.g.*, Mara Gay, Opinion, *To Cut New York Housing Costs, Ease Suburbs' Zoning Laws*, N.Y. TIMES, Feb. 23, 2023, at A22 ("[New York suburbs'] zoning laws are among the most restrictive in the country. They severely limit the state's housing supply, making the entire region less affordable. And they are rooted in Jim Crow."); Mara Gay, Opinion, *NIMBYs Threaten a Plan to Build More Suburban Housing*, N.Y. TIMES, Mar. 23, 2023, at A26 ("New York officials fighting to maintain [suburban] exclusionary housing policies are on the wrong side of history, defending zoning laws written to keep Black, Hispanic, Jewish, Asian and other Americans from sharing in the prosperity and opportunity of the country's suburbs."); Conor Dougherty, *Every Problem in America Is a Housing Problem*, N.Y. TIMES, Feb. 13, 2020, at BU1; Binyamin Appelbaum, Opinion, *Long Island, We Need to Talk (About Housing)*, N.Y. TIMES, Feb 26, 2022, at A21 ("What doesn't get enough attention is the need to build more housing in the suburbs, especially in Nassau and Suffolk Counties.").

14 Nadja Popovich, Mira Rojanasakul & Brad Plumer, *The Climate Impact of Your Neighborhood, Mapped*, N.Y. TIMES (Dec. 13, 2022), https://www.nytimes.com/interactive/2022/12/13/climate/climate-footprint-map-neighborhood.html [https://perma.cc/U4YL-XDPH].

15 For an example of a plan that tried to focus on both growth and density, the New York Housing Compact emphasized dense, transit-oriented development. *See* N.Y. STATE, The New York Housing Compact (2023). It did not succeed. *See, e.g.*, Eric Kober, Opinion, *Why Gov. Hochuls' New York Housing Compact Failed*, N.Y. POST (May 30, 2023, 10:45 AM), https://nypost.com/2023/05/27/why-hochuls-new-york-housing-compact-failed/ [https://perma.cc/6Q42-JV86].

16 *See, e.g.*, JOHN R. NOLON, CHOOSING TO SUCCEED: LAND USE LAW & CLIMATE CONTROL 84–88 (2021) (arguing for compactness); *see also* Sara C. Bronin, *Land Use and Transportation Policies Addressing Climate Change*, *in* GLOBAL CLIMATE CHANGE AND U.S. LAW 445 (Michael B. Gerrard et al. eds., 3d ed. 2023); Emily Guimont, Comment, *Land Use Regulations, Climate Change, and Regulatory Takings*, 52 ENV'T L. 279, 283–88 (2022) (surveying approaches); Michael Lewyn, *The (Somewhat) False Hope of Comprehensive Planning*, 37 U. HAW. L. REV. 39, 50–58 (2015) (proposing zoning reforms to reduce car dependence); Moira O'Neill, Giulia Gualco-Nelson & Eric Biber, *Sustainable Communities or the Next Urban Renewal?*, 47 ECOLOGY L.Q. 1061, 1065 (2020) ("Addressing the housing crisis and statewide

coalesce around minimizing unit size, maximizing density, and encouraging transit-oriented development, while requiring adoption of energy-saving building materials and technologies.[17] Dense housing, especially multifamily housing like apartments, use much less energy per capita than large single-family homes.[18] Density also often means less driving.[19] The easiest way to reduce the carbon emissions from development is simply to build smaller, closer together, and more efficiently.

Land use experts increasingly diagnose zoning as the principal impediment to density.[20] Single-family zones have mushroomed across

goals to reduce GHG suggests the state should invest heavily in dense residential infill TOD in metro areas."). There is a vast amount of literature on the broader but vaguer category of sustainable development. *See, e.g.*, ROBERT H. FREILICH, ROBERT J. SITKOWSKI & SETH D. MENNILLO, FROM SPRAWL TO SUSTAINABILITY: SMART GROWTH, NEW URBANISM, GREEN DEVELOPMENT, AND RENEWABLE ENERGY (2d ed. 2010); Edward J. Jepson, Jr. & Anna L. Haines, *Zoning for Sustainability: A Review and Analysis of the Zoning Ordinances of 32 Cities in the United States*, 80 J. AM. PLAN. ASS'N 239 (2014); *see also* IPCC, *Fourth Assessment Report*, *supra* note 5, at 708–11.

17 *See, e.g.*, John R. Nolon, *Land Use for Energy Conservation and Sustainable Development: A New Path Toward Climate Change Mitigation*, 27 J. LAND USE & ENV'T L. 295, 296 (2012) ("By enforcing and enhancing energy codes, encouraging the use of combined heat and power and district energy systems, properly orienting and commissioning buildings, incorporating renewable energy resources, facilitating compact, mixed-use development, and promoting transit and other methods of reducing vehicle miles travelled ('VMT'), local land use law's potential to achieve energy conservation and sustainable development can be unlocked."); Jonathan Rosenbloom & Christopher Duerksen, *Saving the World Through Zoning: The Sustainable Development Code, Regeneration, and Beyond*, 5 J. COMPAR. URB. L. & POL'Y 363, 364–65 (2022) (articulating general framework that includes "[r]emoving obstacles," "[c]reating incentives," and "[e]nacting standards"); *see also* Emily Badger, *The Missing Link of Climate Change: Single-Family Suburban Homes*, BLOOMBERG (Dec. 7, 2011, 8:30 AM), https://www.bloomberg.com/news/articles/2011-12-07/the-missing-link-of-climate-change-single-family-suburban-homes [https://perma.cc/G36B-ATXJ]; *infra* Part IV (discussing these goals).

18 *See infra* Section I.A (discussing carbon data); *see also* Paul Boudreaux, *Lotting Large: The Phenomenon of Minimum Lot Size Laws*, 68 ME. L. REV. 1, 15 (2016) ("The essence of this environmental critique is that sprawling areas consume more resources. Low density development is the culprit." (footnote omitted)).

19 *See, e.g.*, Robert Cervero & Jin Murakami, *Effects of Built Environments on Vehicle Miles Traveled: Evidence from 370 US Urbanized Areas*, 42 ENV'T & PLAN. A: ECON. & SPACE 400, 415 (2010) ("[H]igher population densities are strongly associated with reduced VMT/Cap.").

20 *See, e.g.*, EWING ET AL., *supra* note 8, at 129–30; Emily Pasi & Roberta Rewers, *Advocating for Zoning Reform*, AM. PLAN. ASS'N (May 20, 2021), https://www.planning.org/blog/9216478/advocating-for-zoning-reform/ [https://perma.cc/N8RM-Q8GY] ("Antiquated zoning laws are . . . contributing to worsening the climate crisis."); Adie Tomer, Joseph W. Kane, Jenny Schuetz & Caroline George, *We Can't Beat the Climate Crisis Without Rethinking Land Use*, BROOKINGS (May 12, 2021), https://www.brookings.edu/research/we-cant-beat-the-climate-crisis-without-rethinking-land-use/ [https://perma.cc/U2YQ-T6D8] ("Encouraging [human-centered] development should be a central part of any national climate resilience strategy."); *see also* Lauren Sommer, *Why Sprawl Could Be the Next Big Climate*

the American landscape, prohibiting multifamily housing and more compact development patterns.[21] The resulting sprawl has long been the target of policymakers and zoning reforms, although prescriptions have evolved over time.[22] Growth management efforts in the 1970s and 1980s gave way to proposals for regional and multipronged planning models reflected in the "Smart Growth" movement in the 1990s and 2000s.[23] Today, a YIMBY (Yes In My Back Yard) movement focused primarily on the housing crisis has advocated instead for loosening zoning restrictions to unlock greater density.[24] YIMBYs claim this will not only produce more housing but will simultaneously decrease carbon emissions.[25] Across the political spectrum, a growing chorus

Change Battle, NPR (Aug. 6, 2020, 9:00 AM), https://www.npr.org/2020/08/06/812199726/why-sprawl-could-be-the-next-big-climate-change-battle [https://perma.cc/QY9F-69SG].

21 *See* John Infranca, *The New State Zoning: Land Use Preemption amid a Housing Crisis*, 60 B.C. L. REV. 823, 830 (2019); Kenneth Stahl, *Home Rule and State Preemption of Local Land Use Control*, 50 URB. LAW. 179, 194–95 (2020).

22 *See infra* text accompanying notes 83–87 (providing history of the Smart Growth movement). For an insightful political economy account of sprawl, see generally William W. Buzbee, *Urban Sprawl, Federalism, and the Problem of Institutional Complexity*, 68 FORDHAM L. REV. 57 (1999). For a compelling economic explanation, see Vicki Been, *Comment on Professor Jerry Frug's* The Geography of Community, 48 STAN. L. REV. 1109 (1996) (arguing that suburban sprawl is at least partly the result of personal economic decisions that are difficult to overcome).

23 *See infra* text accompanying notes 83–87 (discussing Smart Growth).

24 *See, e.g.*, VANESSA BROWN CALDER, CATO INST., POL'Y ANALYSIS NO. 823, ZONING, LAND-USE PLANNING, AND HOUSING AFFORDABILITY (2017); NOAH KAZIS, NYU FURMAN CTR., ENDING EXCLUSIONARY ZONING IN NEW YORK CITY'S SUBURBS (2020); Morgan E. Rog, Note, *Highway to the Danger Zone: Urban Sprawl, Land Use, and the Environment*, 22 GEO. INT'L ENV'T L. REV. 707, 727–28 (2010); Devin Edwards, *Green Houses and Greenhouse Gases: Why Exclusionary Zoning Is a Climate Catastrophe*, GEO. PUB. POL'Y REV. (Nov. 5, 2019), https://gppreview.com/2019/11/05/green-houses-greenhouse-gases-exclusionary-zoning-climate-catastrophe/ [https://perma.cc/43BS-LMJK]. For a history of this approach, labeled "market urbanism," see Michael Lewyn, *Explaining Market Urbanism*, 46 REAL EST. L.J. 589, 596–97 (2018). *But cf.* Michael Lewyn & Judd Schechtman, *No Parking Anytime: The Legality and Wisdom of Maximum Parking and Minimum Density Requirements*, 54 WASHBURN L.J. 285, 286 (2015) (recognizing that compact development "can be achieved through deregulation of land use as well as through more regulatory means" and focusing on the latter).

25 *See, e.g.*, *Our Platform*, SF YIMBY, https://www.sfyimby.org/our-platform/ [https://perma.cc/T658-QMPK] (promoting loosening density limits to promote density, and identifying benefits as including "a smaller carbon footprint"); *see also NIMBYs Are Keeping Thousands of Students from Enrolling at UC Berkeley. We Have to Stop It from Happening Again.* YIMBY ACTION (Mar. 4, 2022), https://yimbyaction.org/2021/uc-berkeley-nimbys-2022/ [https://perma.cc/G9AK-6TPD] (arguing that NIMBYs "oppose exactly the kind of housing that would help reduce California's carbon emissions and build the dense, vibrant, sustainable communities we will need to survive the coming climate catastrophe"); Maanvi Singh & Oliver Milman, *Denser Cities Could Be a Climate Boon – But NIMBYism Stands in the Way*, THE GUARDIAN (Aug. 22, 2021, 8:00 AM), https://www.theguardian.com/us-news/2021/aug/22/cities-climate-change-dense-sprawl-yimby-nimby [https://perma.cc/4LWQ-3ZRF]; William Shutkin, *Enrico Moretti, The Housing-Environment Crisis and YIMBY*, LIFE AFTER CARBON

advocates for addressing climate change by adopting less restrictive land use regulations to allow more compact development patterns.[26] At the extreme, vocal neoliberals have pushed for eliminating density limits, sometimes calling for the repeal of zoning altogether.[27]

(Nov. 4, 2017), https://lifeaftercarbon.net/2017/11/enrico-moretti-housing-environment-crisis-yimby/ [https://perma.cc/6TZW-CPSX] (identifying progressive opposition to housing "as parochialism on a regional scale, with global (warming) effects [that has] got to stop, or at least evolve"); Zack Subin & Zoe Siegel, Opinion, *Infill Housing Is Critical for a Healthy Region and Climate*, S.F. CHRON. (Dec. 18, 2020), https://www.sfchronicle.com/opinion/openforum/article/Infill-housing-is-critical-for-a-healthy-region-15812757.php [https://perma.cc/G4JA-BPAT] ("Simply allowing for more people to live in Bay Area cities is one of the most potent means of reducing climate pollution with local policies."); Sage van Wing, *A Vision for the Future of Cities*, OR. PUB. BROAD. (May 27, 2022, 6:36 PM), https://www.opb.org/article/2022/05/27/a-vision-for-the-future-of-cities/ [https://perma.cc/F67L-D5R9] ("Denser housing could also help to combat climate change, and create more affordable housing to help reduce the number of people living on the streets. That's the vision of the Yimbytown movement.").

26 *See, e.g.*, MOIRA O'NEILL & IVY WANG, NYU FURMAN CTR., HOW CAN PROCEDURAL REFORM SUPPORT FAIR SHARE HOUSING PRODUCTION? ASSESSING THE EFFECTS OF CALIFORNIA'S SENATE BILL 35 (2023) ("Land use regulation that constrains housing production risks exacerbating and perpetuating economic and racial segregation, inhibiting economic growth, increasing the cost of housing, and *worsening environmental harm*." (emphasis added) (footnote omitted)); K.C. Golden, Opinion, *Housing Solutions Are Climate Solutions*, SEATTLE TIMES (Mar. 9, 2023, 4:19 PM), https://www.seattletimes.com/opinion/housing-solutions-are-climate-solutions/ [https://perma.cc/YL3F-V95F] ("Local zoning laws in most of our cities today represent a de facto mandate for harm: More sprawl, more pollution, more driving, and limits on anything but the most expensive and resource-intensive housing."); Mia Reback, *Four Lessons for Cities in the Latest IPCC Report*, ROCKY MOUNTAIN INST. (Apr. 6, 2022), https://rmi.org/four-lessons-for-cities-in-the-latest-ipcc-report/ [https://perma.cc/Z5UY-CY69] ("[A] century of exclusionary planning rules have led to both residential segregation and car dependence."); Daniel Finnegan, *How Eliminating Single-Family Zoning Can Help in the Fight Against Climate Change*, N.Y. STATE BAR ASS'N (Feb. 8, 2023), https://nysba.org/how-eliminating-single-family-zoning-can-help-in-the-fight-against-climate-change/ [https://perma.cc/LFL8-ATYQ] ("While America's zoning system receives a great deal of criticism for its pernicious, segregating effects, not enough attention is focused on the environmental damage inflicted by restrictive zoning.").

27 *See, e.g.*, M. NOLAN GRAY, ARBITRARY LINES: HOW ZONING BROKE THE AMERICAN CITY AND HOW TO FIX IT 6 (2022) ("It's high time we accept the need for zoning abolition and start thinking about what comes next."); *see also* Walter Block & Sarah Huddell, *The Case Against Zoning*, 37 INT'L J. ETHICS & SYS. 618 (2021); David R. Henderson, *The Case for Abolishing Zoning*, REGULATION, Fall 2022, at 40, 41 ("It is low-density housing that burdens the environment more."); Vanessa Brown Calder, *Housing Affordability*, *in* CATO INST., EMPOWERING THE NEW AMERICAN WORKER: MARKET-BASED SOLUTIONS FOR TODAY'S WORKFORCE 205, 212 (Scott Lincicome ed., 2022) ("At the state and local levels, policymakers must continue to find ways to relax zoning and building requirements and reduce permitting costs."); Jason Sorens, Should We Abolish Zoning? 14 (July 31, 2023) (unpublished manuscript), https://ssrn.com/abstract=4527317 [https://perma.cc/BS8L-6ADP] ("The case for abolishing zoning completely is much stronger than it seems at first glance."); Roger Valdez, *Zoning Is a 20th Century Solution to a 19th Century Problem, Let's End it*, FORBES (May 16, 2019, 9:30 AM), https://www.forbes.com/sites/rogervaldez/2019/05/16/zoning

Headlines in recent publications read, for example, "Abolish Zoning—All of It,"[28] and "Why Stop at Ending Single-Family Zoning? End All Zoning in Ann Arbor."[29]

Simultaneously, another set of regulatory interventions require heightened standards of energy conservation in buildings, especially for new development.[30] California now requires rooftop solar for new single-family and midrise construction.[31] Boston has announced that all buildings over 20,000 square feet must be net-zero for energy use by 2050.[32] Many more municipalities require that new buildings meet specified energy standards, including requirements for efficient heating and cooling systems, high thermal insulation, and electric car charging facilities, among others.[33] According to the 2019 City Clean Energy Scorecard released by the American Council for an Energy-Efficient Economy (ACEEE), at least thirty major American cities have adopted stringent building energy codes since 2017.[34] The form and enforcement of these green building codes varies tremendously, but they are proliferating across the country.[35]

-is-a-20th-century-solution-to-a-19th-century-problem-lets-end-it [https://perma.cc/ZZ8N-J8TN]. For a similar characterization of the field, see Meghan Joy & Ronald K. Vogel, *Beyond Neoliberalism: A Policy Agenda for a Progressive City*, 57 URB. AFFS. REV. 1372, 1380 (2021) ("Most proposed solutions today are neoliberal-lite and focus almost exclusively on market-based approaches to incentivize private developers to build more affordable housing.").

28 M. Nolan Gray, *Abolish Zoning—All of It*, REASON (June 21, 2022, 8:00 AM), https://reason.com/2022/06/21/abolish-zoning-all-of-it/ [https://perma.cc/JS2H-UKM8].

29 Abdulrahman Ateya, Opinion, *Why Stop at Ending Single-Family Zoning? End All Zoning in Ann Arbor*, MICH. DAILY (Feb. 20, 2023), https://www.michigandaily.com/opinion/why-stop-at-ending-single-family-zoning-end-all-zoning-in-ann-arbor/ [https://perma.cc/G245-E2J9].

30 *See* Stephanie Vierra, *Green Building Standards and Certification Systems*, WHOLE BLDG. DESIGN GUIDE (March 23, 2023), https://www.wbdg.org/resources/green-building-standards-and-certification-systems [https://perma.cc/PXR5-U4VB] (collecting green building codes and regulations); *see also Green Building: Frequent Questions*, U.S. ENV'T PROT. AGENCY, https://archive.epa.gov/greenbuilding/web/html/faqs.html [https://perma.cc/6HS9-S36Y].

31 *See* CAL. CODE REGS. tit. 24, § 110.10 (2022).

32 Scott Pruden, *Boston Enacts Building Decarbonization Ordinance*, SMART CITIES DIVE (Oct. 6, 2021), https://www.smartcitiesdive.com/news/boston-building-decarbonization-climate-change-ordinance/607471/ [https://perma.cc/7GPJ-YE4M].

33 *See, e.g.*, N.Y.C., N.Y., ADMIN. CODE §§ 28-320, -321 (2023); NASHVILLE & DAVIDSON COUNTY, TENN., CODE §§ 16.08.010–.016, 16.12.120–.140, 16.16.180–.240, .260, 16.20.040, .140–.154, .190, .195, .410 (2006 & Supp. 45 2024).

34 Peter Fabris, *At Least 30 U.S. Cities Have Adopted Stricter Building Energy Codes Since 2017*, BLDG. DESIGN & CONSTR. (Sept. 13, 2019), https://www.bdcnetwork.com/least-30-us-cities-have-adopted-stricter-building-energy-codes-2017 [https://perma.cc/SSV6-DUXF].

35 *See, e.g.*, Vierra, *supra* note 30; *see also infra* Section II.B (discussing green building codes).

This Article argues that both approaches—loosening zoning and requiring heightened efficiency standards—can be self-defeating. What is needed is situational zoning: a set of prescriptions that is different in high-carbon and low-carbon places, and that utilizes more sophisticated land use tools.[36] In short, solving the problem of carbon emissions in our built environment will require more than the steady diet of neoliberal deregulation that dominates the current discourse; land use and building code reforms are a crucial part of the mix, but not blunt ones.[37] Consider these two conventional responses through a more skeptical lens.

Not all density is created equal, and promoting density is not a climate panacea in places that should not be developing.[38] When community members in the small rural town of Marlboro, Vermont, were interested in promoting carbon-friendly development, they thought about creating a village district—decreasing minimum lot sizes to allow more housing, and encouraging compact development.[39] But those changes would not meaningfully impact GHG emissions in a town of 1,000 people, where all jobs and shopping are at least a twenty-minute drive away and where marginally smaller lot sizes will not decrease house sizes or create plausible transportation alternatives. From the perspective of carbon emissions, additional development in Marlboro should occur as close as possible to nearby jobs and not in its quaint but remote village center, if growth is to occur at all. There may be

36 The IPCC recognizes how much context matters. In the Summary for Policymakers, the Sixth Assessment Report points out, "The potential and sequencing of mitigation strategies to reduce GHG emissions will vary depending on a city's land use, spatial form, development level, and state of urbanisation." IPCC, *Sixth Assessment Report*, *supra* note 1, at 30. Some reform advocates have also grown more tempered in their proposed reforms. *See, e.g.*, Chris Elmendorf, Opinion, *Did One of California's Biggest New Housing Reforms Go Too Far?*, S.F. CHRON. (Nov. 20, 2023, 8:48 AM), https://www.sfchronicle.com/opinion/openforum/article/california-housing-reform-18498941.php [https://perma.cc/R6NR-XQA9] ("While a meat cleaver is necessary, California's Density Bonus Law is a flawed tool, in several key respects. It's too broad because it allows developers to waive even basic forms of land-use regulation required for urban connectivity. . . . It also makes no distinction between urban areas and rural areas, high-price markets and low-price markets, or fire- and flood-prone places and places well suited to dense development.").

37 *See* Joy & Vogel, *supra* note 27, at 1373 ("The puzzle for many is why the urban crisis has not led to the repudiation of neo-liberal policy and its replacement by a more radical alternative."). John Nolon is perhaps the leading proponent of using zoning regulation instead of merely deregulation to address the climate crisis. For cites to some of his writing, see NOLON, *supra* note 16; Nolon, *supra* note 6, Nolon *supra* note 17; sources cited *infra* notes 73, 87.

38 *Cf.* TODD LITMAN, VICTORIA TRANSP. POL'Y INST., EVALUATING CRITICISM OF SMART GROWTH 6, 85 (2022) ("[I]t is possible to have dense sprawl (high rises in automobile-dependent locations) and lower-density Smart Growth (mixed-use rural villages)." *Id.* at 6.).

39 Telephone Interview with Tyler Gibbons, Marlboro Selectboard (July 15, 2022).

other sound reasons to promote more clustered zoning in Marlboro—like habitat preservation[40]—but GHG emissions is not one of them.

The point is a general one. A new apartment building in the urban core will reduce net per capita carbon emissions in a metropolitan statistical area (MSA)[41] compared with the same number of units developed as single-family homes in the suburbs.[42] However, a large new multifamily development in an outer-ring suburb has more equivocal impacts. It may not produce more walkability and so may not decrease VMT.[43] And it may increase per capita carbon emissions depending on where the housing would have gone instead—for example if the housing would otherwise have been developed closer to downtown.

The same trade-offs appear interregionally as well because the carbon impact of otherwise identical buildings depends significantly on how temperate a place is and the carbon intensiveness of regional energy production.[44] An apartment building in Missouri produces more GHG emissions than the same building in Oregon because it requires more heating and cooling, and more of the power comes from coal.[45]

In many places, of course, dense development is critical for minimizing carbon emissions. In those places, however, loosening zoning limits will not necessarily produce the dense urban form that we

40 *See, e.g.*, *Critical Paths for Vermont Wildlife*, NAT'L WILDLIFE FED'N, https://www.nwf.org/Our-Work/Habitats/Wildlife-Corridors/Northeast [https://perma.cc/7EW5-YYAB] (discussing zoning for habitat preservation).

41 Christopher J. Tyson, *Annexation and the Mid-size Metropolis: New Insights in the Age of Mobile Capital*, 73 U. PITT. L. REV. 505, 524 n.80 (2012) ("The United States Office of Management and Budget (OMB) defines a Metropolitan Statistical Area (MSA) as a Core Based Statistical Area having at least one urbanized area of 50,000 or more population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties.").

42 *See* Benjamin Goldstein, Dimitrios Gounaridis & Joshua P. Newell, *The Carbon Footprint of Household Energy Use in the United States*, 117 PROC. NAT'L ACAD. SCI. 19122, 19128 (2020) ("Zoning for denser settlement patterns better incentivizes smaller homes with reduced energy demands than single-family homes on large lots.").

43 *See, e.g.*, Reid Ewing & Robert Cervero, *Travel and the Built Environment: A Synthesis*, 1780 TRANSP. RSCH. REC. 87, 92 (2001) ("[D]ense, mixed-use developments in the middle of nowhere may offer only modest regional travel benefits.").

44 *See, e.g.*, Goldstein et al., *supra* note 42, at 19122 (providing detailed data and noting that "both household energy use and emissions per square meter vary widely across the country, driven primarily by thermal energy demand and the fuel used in electricity production ('grid mix')").

45 *See, e.g.*, *id.* at 19124 ("In Missouri, an average household energy intensity (165 kWh/m^2) combines with the high carbon intensity of the Midcontinent Independent System Operator Central grid (0.74 kg CO_2-e/kWh compared to 0.48 kg CO_2-e/kWh nationally) to produce some of the most GHG-intensive households (69 kg CO_2-e/m^2) in the country.").

need.[46] Depending on the municipality, and the bluntness of the zoning reforms, relaxing density limits may increase the population in the suburbs and exurbs more than in the urban core, actually reducing overall density of the MSA.[47] Cities like Houston, Phoenix, and Nashville vividly demonstrate that looser zoning does not necessarily correlate with the dense urban development patterns that will help to reduce carbon emissions.[48]

At the same time, aggressive green building codes and other efforts to reduce the carbon footprint of new development may increase carbon emissions if they shift development to more carbon-intensive places. Green building codes can increase the costs of development.[49] California's solar energy requirement is anticipated to increase construction costs by between $8,400 and $9,500 per unit.[50] If the least carbon-intensive places adopt these strategies and some of the most

46 *See generally, e.g.*, Christopher Serkin, *Creating Density: The Limits of Zoning Reform*, 11 BRIGHAM-KANNER PROP. RTS. CONF. J. 183 (2022) (arguing that deregulation will not necessarily produce density).

47 *See* Christopher Serkin, *A Case for Zoning*, 96 NOTRE DAME L. REV. 749, 754 (2020) (arguing that zoning reform can increase demand for HOAs); *see also* Singh & Milman, *supra* note 25 (quoting Professor Christopher Jones as saying, "Also, if you build more density in the urban core it could end up in more sprawl with growth, with people wanting larger, cheaper homes and then commute [sic] into these new vibrant centers. It's a bit like pouring sand on to a map—it will keep spilling out.").

48 *See generally, e.g.*, Christopher Serkin & Kelsea Best, *Growth ≠ Density: Zoning Deregulation and the Enduring Problem of Sprawl*, 50 PEPP. L. REV. 557 (2023); *cf.* GREGORY K. INGRAM, ARMANDO CARBONELL, YU-HUNG HONG & ANTHONY FLINT, LINCOLN INST. OF LAND POL'Y, SMART GROWTH POLICIES: AN EVALUATION OF PROGRAMS AND OUTCOMES 4–5 (2009) (recognizing that density trends vary significantly by region).

49 *See* MCGRAW HILL CONSTR., GREEN MULTIFAMILY AND SINGLE FAMILY HOMES: GROWTH IN A RECOVERING MARKET 15 (2014) (listing the costs associated with incorporating "green" initiatives into building, showing additional cost in 89% of new single-family homes and 100% of new multifamily homes); *see also* HABITAT FOR HUMAN., ENSURING THAT CLIMATE CHANGE MITIGATION AND ADAPTATION EFFORTS HELP CLOSE THE HOUSING GAP FOR THE MOST VULNERABLE 1 (2021) ("[E]fforts to mitigate carbon emissions at the household level can be cost-prohibitive, as innovations frequently increase the expense of housing."). *But see* Chad Mapp, MaryEllen C. Nobe & Brian Dunbar, *The Cost of LEED—An Analysis of the Construction Costs of LEED and Non-LEED Banks*, 3 J. SUSTAINABLE REAL EST. 254, 255–56 (2011) (finding very small differences in the cost of building "green" buildings).

50 *See* Sarah Lozanova, *The California Solar Mandate: What It Is and What Solar Businesses Should Know*, GREENLANCER (Mar. 17, 2022), https://www.greenlancer.com/post/california-solar-mandate [https://perma.cc/9KCV-6DGC] ("According to its estimates, the mandate increases the cost of a new home by roughly $8,400 . . . ."); Jeff Daniels, *California Regulators Approve Plan to Mandate Solar Panels on New Home Construction*, CNBC (May 9, 2018, 9:09 PM), https://www.cnbc.com/2018/05/09/california-approves-plan-to-mandate-solar-panels-on-new-homes.html [https://perma.cc/5DKV-4PT5] ("The California Energy Commission's action is expected to add on average about $9,500 to the cost of building new houses.").

carbon-intensive do not, the resulting difference in development costs will, on the margin, encourage development in places that increase overall carbon emissions regionally and nationwide.[51]

This Article therefore sets out to provide a framework for answering a specific question: how can local land use regulations best reduce carbon emissions? Often, increasing density is the right answer. But not always. And even where it is, the regulatory tools that will produce density vary place by place. Furthermore, efforts to mitigate GHG emissions can have perverse effects in low-carbon urban centers if they shift growth out into the suburbs or into more high-carbon places.

It is important to acknowledge up front that this Article has discrete ambitions. Its prescriptions have the single-minded goal of mitigating GHG emissions. This Article does not address adaptation and the ways in which governments should respond to threats like sea-level rise or increased storms, drought, and temperature extremes.[52] There are land use strategies for those, too, like retreat from the ocean, rolling easements, and changes in building codes.[53] But those are conceptually separate issues from climate mitigation.[54]

Nor does this Article address zoning's other goals and impacts. Policymakers should undoubtedly be attentive to a plurality of interests when it comes to evaluating and reforming land use regulations. They should be concerned with issues of racial justice, housing segregation,

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51 *See* ERIC A. POSNER & DAVID WEISBACH, CLIMATE CHANGE JUSTICE 69 (2010) ("Raising the cost of energy production or consumption in one city or state will predictably cause people and businesses to migrate to other states, where they can continue to pollute."); *cf.* Daniel A. Farber, *Carbon Leakage Versus Policy Diffusion: The Perils and Promise of Subglobal Climate Action*, 13 CHI. J. INT'L L. 359 (2013) (discussing the same phenomenon on the global level).

52 For discussion of adaptation, see Barbara A. Cosens, J.B. Ruhl, Niko Soininen & Lance Gunderson, *Designing Law to Enable Adaptive Governance of Modern Wicked Problems*, 73 VAND. L. REV. 1687 (2020); Michael B. Gerrard, *Heat Waves: Legal Adaptation to the Most Lethal Climate Disaster (So Far)*, 40 U. ARK. LITTLE ROCK L. REV. 515 (2018); J.B. Ruhl, *General Design Principles for Resilience and Adaptive Capacity in Legal Systems—with Applications to Climate Change Adaptation*, 89 N.C. L. REV. 1373 (2011); Siobhan Watson, *Zoning to Adapt: Climate Change Zoning and the Lessons of Environmental Zoning Efforts Past*, *in* ZONING: A GUIDE FOR 21ST-CENTURY PLANNING 128, 129–33 (Elliott Sclar et al. eds., 2020).

53 *See* JAMES G. TITUS, U.S. EPA, EPA 430R11001, ROLLING EASEMENTS 132–36 (2011) (discussing the effects that rolling easements may have compared to other climate strategies); Gerrard, *supra* note 52, at 543–44 (discussing potential building regulation strategies to resolve the climate crisis); Katie Sinclair, *Water, Water Everywhere, Communities on the Brink: Retreat as a Climate Change Adaptation Strategy in the Face of Floods, Hurricanes, and Rising Seas*, 46 ECOLOGY L.Q. 259, 285–96 (2019) (discussing the history and theories of retreat as a climate change solution).

54 The climate change literature typically distinguishes between mitigation (reducing carbon emissions) and adaptation (responding to changes in climate). *See* Kayla M. Bright, *"In Nature, Nothing Exists Alone": The Collaborative Fight Against Climate Change*, 55 INT'L LAW. 551, 553–54 (2022).

regional inequality, and health and welfare outcomes across many dimensions.[55] They should be constrained by ecological limits and should avoid promoting growth in places that are increasingly susceptible to risks of flooding or fire.[56] These and other considerations will sometimes be in tension with zoning to minimize GHG emissions.[57] Those trade-offs are also outside the scope of discussion, except implicitly. Nevertheless, this narrow project is still ambitious because it provides important new considerations about where and how development should be encouraged and discouraged to minimize emissions. It also challenges the current density-through-deregulation prescriptions that are ascendent in many scholarly and activist circles.[58]

Part I briefly reviews the ways in which zoning and land use influence carbon emissions. Part II surveys conventional responses, including deregulating density and imposing strict new design and building codes to minimize carbon emissions. Part III presents a parable of two cities, demonstrating that both conventional responses can have perverse outcomes if deployed inappropriately. Part IV proposes regulatory approaches designed to mitigate carbon emissions.

I. THE ROLE OF LAND USE IN CARBON EMISSIONS

According to the IPCC Sixth Assessment Report, urban form and spatial planning are central to climate change mitigation efforts.[59] They affect GHG emissions in two distinct ways. First, buildings themselves have an enormous impact on carbon emissions. Building operations and construction are responsible "for nearly 40% of global

55 *See, e.g.*, Richard C. Schragger, *The Perils of Land Use Deregulation*, 170 U. PA. L. REV. 125, 134–41 (2021) (racial justice); Myron Orfield, *Land Use and Housing Policies to Reduce Concentrated Poverty and Racial Segregation*, 33 FORDHAM URB. L.J. 877 (2006) (housing segregation); Ganesh Sitaraman, Morgan Ricks & Christopher Serkin, *Regulation and the Geography of Inequality*, 70 DUKE L.J. 1763 (2021) (regional inequality); Vanessa Russell-Evans & Carl S. Hacker, *Expanding Waistlines and Expanding Cities: Urban Sprawl and Its Impact on Obesity, How the Adoption of Smart Growth Statutes Can Build Healthier and More Active Communities*, 29 VA. ENV'T L.J. 63 (2011) (health outcomes).

56 *See* Serkin, *supra* note 46, at 205–06 (discussing ecological limits); *see also* Christopher Flavelle & Jack Healy, *Eye on Water, Arizona Caps New Housing*, N.Y. TIMES, June 2, 2023, at A1; *see also generally* Eric Biber & Moira O'Neill, *Building to Burn? Permitting Exurban Housing Development in High Fire Hazard Zones*, 48 ECOLOGY L.Q. 943 (2021) (criticizing development in fire-prone parts of California).

57 *See* Serkin & Best, *supra* note 48, at 561 ("Where growth and density do not go hand in hand, liberalizing zoning may help to increase supply but might also exacerbate carbon emissions if it produces more sprawl.").

58 *See supra* notes 24–29.

59 *See* IPCC, *Sixth Assessment Report*, *supra* note 1, at 1059 ("Urban planning and design of cities for people are central to realise emission reductions without relying simply on technologies . . . .").

energy-related CO2 emissions."[60] The primary sources are heating, ventilation, and cooling; electronics; appliances; and lighting, with the first two categories responsible for nearly 70% of building energy usage.[61] Building size has a significant impact on carbon emissions.[62] By definition, smaller buildings require less building material, saving on overall life-cycle carbon costs.[63] Larger homes also require more heating and cooling.[64] But size is not everything. Detached houses also use more energy per square foot than an apartment with shared walls.[65]

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60 Thin Lei Win, *We Can't Tackle the Climate Change Crisis Without Changing Construction. Here's Why*, WORLD ECON. F. (Jan. 4, 2021), https://www.weforum.org/agenda/2021/01/planet-warming-emissions-buildings-construction-climate-goals-risk/ [https://perma.cc/37F7-CF5R]; *see also* Erik Porse, Joshua Derenski, Hannah Gustafson, Zoe Elizabeth & Stephanie Pincetl, *Structural, Geographic, and Social Factors in Urban Building Energy Use: Analysis of Aggregated Account-Level Consumption Data in a Megacity*, 96 ENERGY POL'Y 179, 179 (2016) ("In the U.S., residential and commercial buildings account for over 40% of total energy consumption." (citation omitted)); James Charles Smith, *Green Home Standards: Information and Incentives*, 54 HOUS. L. REV. 1139, 1143 (2017) ("U.S. buildings emit 40% of the nation's carbon dioxide emissions, an increase from 33% in 1980."). According to the IPCC's presentation of 2019 data, buildings accounted for "only" 21% of global GHG emissions. *See* IPCC, *Sixth Assessment Report*, *supra* note 1, at 100; *see also id.* at 31 ("In 2019, global direct and indirect GHG emissions from buildings and emissions from cement and steel use for building construction and renovation were 12 $GtCO_2$-eq. These emissions include indirect emissions from offsite generation of electricity and heat, direct emissions produced onsite and emissions from cement and steel used for building construction and renovation.").

61 Na Wang, Patrick E. Phelan, Chioke Harris, Jared Langevin, Brent Nelson & Karma Sawyer, *Past Visions, Current Trends, and Future Context: A Review of Building Energy, Carbon, and Sustainability*, 82 RENEWABLE & SUSTAINABLE ENERGY REVS. 976, 986 (2018) ("Primary energy in buildings is used for space heating, ventilation, and air-conditioning (35%); lighting (11%); major appliances (18%); and other miscellaneous loads such as electronics (36%)."); *see also* Goldstein et al., *supra* note 42, at 19122 ("Roughly 20% of US energy-related greenhouse gas (GHG) emissions stem from heating, cooling, and powering households.").

62 *See, e.g.*, Smith, *supra* note 60, at 1164 ("[T]he greenness of a home, in terms of energy consumption, inversely correlates to house size . . . .").

63 *See* Timothy Michael Carlin, Tiny Homes: Improving Carbon Footprint and the American Lifestyle on a Large Scale 9 (May 13, 2014) (unpublished manuscript), https://digitalcommons.csbsju.edu/elce_cscday/35/ [https://perma.cc/6JH4-X97L] ("According to one source, reducing home size by 50% results in a 36% decrease in lifecycle greenhouse gas emissions from materials on the house and the emissions produced by actions of the inhabitants." (citing News Release, Oregon Dep't of Env't Quality, Smaller Homes, Smaller Footprint, DEQ-Commissioned Report Shows (Oct. 26, 2010), https://web.archive.org/web/20101029230414/http://www.deq.state.or.us/news/prDisplay.asp?docID=3466)).

64 Reid Ewing & Fang Rong, *The Impact of Urban Form on U.S. Residential Energy Use*, 19 HOUS. POL'Y DEBATE 1, 8 (2008); *see also* NOLON, *supra* note 16, at 84 ("[S]maller homes have less space to heat and cool, which reduces their contribution to fossil fuel emissions.").

65 *See, e.g.*, Ewing & Rong, *supra* note 64, at 8 ("[D]etached houses require more energy than attached houses of the same size because there is more exposed surface area."); Smith, *supra* note 60, at 1154 ("In general, building in a rural location that is geographically distant from existing transportation and utility infrastructure is more costly than building

The location of buildings—reflected in overall urban form—also affects carbon emissions by influencing how much people drive.[66] Residential units that are located closer to jobs and businesses reduce vehicle emissions.[67] Likewise, access to mass transit can decrease transportation-related carbon emissions.[68] It is not surprising that residents of Manhattan have the smallest carbon footprint in the country.[69] It is slightly more surprising—but consistent with these fundamental intuitions—that the carbon footprint of households in New York City's suburbs are among the highest in the country.[70]

There is some debate about the magnitude of the effect of urban density on VMT nationwide.[71] Moreover, GHG emissions from driving might change fundamentally with the deployment of electric vehicles.[72] Nevertheless, the consensus view is that density reduces VMT,

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in an urban or suburban environment on a lot that already has ready access to such infrastructure.").

66 *See* Katherine A. Trisolini, *All Hands on Deck: Local Governments and the Potential for Bidirectional Climate Change Regulation*, 62 STAN. L. REV. 669, 710–11 (2010) (discussing relationship between sprawl and driving). Location also affects energy transmission, because energy loss increases over greater distances. Mai Huong Nguyen & Tapan Kumar Saha, *Power Loss Evaluations for Long Distance Transmission Lines*, 2009 PROC. AUSTL. GEOTHERMAL ENERGY CONF. 307, 310.

67 *But see* Ewing & Cervero, *supra* note 43, at 92 ("[T]rip frequencies appear to be largely independent of land use variables, depending instead on household socioeconomic characteristics.").

68 *See* FED. TRANSIT ADMIN., U.S. DEP'T TRANSP., PUBLIC TRANSPORTATION'S ROLE IN RESPONDING TO CLIMATE CHANGE 2 (2010).

69 *See, e.g.*, Popovich et al., *supra* note 14 ("The densest and most transit-friendly neighborhoods near the city center run deep green, with some of the lowest emissions per household nationwide."). *But see* Jonathan Rosenbloom, *Outsourced Emissions: Why Local Governments Should Track and Measure Consumption-Based Greenhouse Gases*, 92 U. COLO. L. REV. 451, 496 (2021) (arguing that ignoring consumption-based GHG emissions understates the carbon impact of urban residents); DANIEL ALDANA COHEN & KEVIN UMMEL, KLEINMAN CTR. FOR ENERGY POL'Y, FOLLOW THE CARBON: THE CASE FOR NEIGHBORHOOD-LEVEL CARBON FOOTPRINTS 2 (2019) (same).

70 Popovich et al., *supra* note 14 ("But in more distant suburbs and exurbs, average emissions per household can be two to three times as high, with some of the largest climate footprints in the nation.").

71 *See* Mark R. Stevens, *Does Compact Development Make People Drive Less?*, 83 J. AM. PLAN. ASS'N 7, 8–10 (2017) (summarizing different studies); Gilles Duranton & Matthew A. Turner, *Urban Form and Driving: Evidence from US Cities*, 108 J. URB. ECON. 170, 187 (2018) ("Urban density appears to have a small causal effect on driving.").

72 *See, e.g.*, Cervero & Murakami, *supra* note 19, at 400–01 ("Within the transport sector, one view holds that GHG-reduction targets can best be achieved through 'sustainable mobility': for example, the introduction of low-carbon fuels and new technologies that increase fuel efficiency so that Americans can continue driving their cars at will, albeit with far less GHG emissions." *Id.* at 400.).

at least to some extent, and that this is crucial to combating climate change.[73]

In combination, the carbon emissions from buildings and transportation mean that urban form—with smaller, denser development—produces much less carbon than sprawling suburban or rural development, especially in the absence of nearby mass transit.[74] While this seems obvious, it is surprisingly counterintuitive to many people. It means, for example, that living in paved, congested Manhattan is much more environmentally friendly than living in bucolic, green, and rural Vermont.[75] Vermont, with its aggressive focus on sustainability, feels more environmentally conscious than the relentlessly urban streets of New York.[76] But it is New Yorkers who are doing more to mitigate climate change.

Zoning and land use are central to climate mitigation efforts because they create the regulatory framework that controls where and how development occurs. Zoning, in its traditional form, specifies use and density limits within a municipality.[77] The broader category of land use controls includes building codes, subdivision rules, and environmental review, among other regulatory restrictions on where and how development occurs.[78] In the United States, zoning and land use

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73 *See* John R. Nolon, *Local Land Use Power: Managing Human Settlements to Mitigate Climate Change*, 51 ENV'T L. REP. 10426, 10427–28 (2021); *Developments in the Law—Climate Change*, 135 HARV. L. REV. 1524, 1599–1600 (2022); Alejandro E. Camacho & Nicholas J. Marantz, *Beyond Preemption, Toward Metropolitan Governance*, 39 STAN. ENV'T L.J. 125, 189 (2020); Litman, *supra* note 38, at 53 (criticizing, *inter alia*, Duranton and Turner for failing to recognize that density can reduce VMT in different ways); Katrina Wyman, Danielle Spiegel-Feld, Adalene Minelli & Sara Savarani, *Valuing Density: An Evaluation of the Extent to which American, Australian, and Canadian Cities Account for the Climate Benefits of Density Through Environmental Review* 4 (Lincoln Inst. of Land Pol'y, Working Paper No. WP22KW1, 2022) ("[T]here is a strong argument that increasing the density of major cities will help to lower emissions.").

74 *See, e.g.*, Grant Glovin, *A* Mount Laurel *for Climate Change? The Judicial Role in Reducing Greenhouse Gas Emissions from Land Use and Transportation*, 49 ENV'T L. REP. 10938, 10938–39 (2019) (describing relationship between sprawl and climate change); *Developments in the Law*, *supra* note 73, at 1596 ("The sprawl that restrictive zoning policies engender, combined with a lack of investment in public transit infrastructure, has fueled America's overreliance on cars, which themselves take up space." (footnote omitted)).

75 *See generally* DAVID OWEN, GREEN METROPOLIS: WHY LIVING SMALLER, LIVING CLOSER, AND DRIVING LESS ARE THE KEYS TO SUSTAINABILITY (2009).

76 *See Act 250 Program*, VT. NAT. RES. BD., https://nrb.vermont.gov/act250-program [https://perma.cc/KWU4-XEUM]; *see also* Tyla Crowhurst-Smith, *Urbanization of New York City*, ARCGIS STORYMAPS (Mar. 14, 2020), https://storymaps.arcgis.com/stories/ef1e99fc36714c8b870b5577e9a69b6c [https://perma.cc/8GRJ-V3TQ].

77 *See, e.g.*, Serkin, *supra* note 47, at 754–70 (providing a brief history of zoning).

78 For a survey of topics, see generally, for example, ROBERT C. ELLICKSON, VICKI L. BEEN, RODERICK M. HILLS JR. & CHRISTOPHER SERKIN, LAND USE CONTROLS: CASES AND MATERIALS (5th ed. 2021).

are typically regulated at the local level, making these an unexpected area for responding to the global threat of climate change. Nevertheless, as the IPCC recognizes, local governments are critical to the climate fight.[79] Scholars and policymakers have proposed local responses that have coalesced around some common elements.

II. CONVENTIONAL REGULATORY RESPONSES

Dense, urban development generally means smaller housing units, shared walls, and less driving. This contrasts with sprawling suburban and exurban development, which produces far more carbon per household. Controlling sprawl and promoting compact urban development will reduce GHG emissions.[80] Approaches to achieving these goals have shifted dramatically over time.

A. From Sprawl to Smart Growth and Back Again

Efforts to increase density and reduce sprawl are not new, although typically for reasons other than climate change.[81] Aggressive "growth management" efforts in places like Oregon in the 1970s tried to stop the rapid development of agricultural land by concentrating growth in the urban core.[82] Those goals gradually gave way to an ascendant "Smart Growth" movement in the 1990s and into the 2000s.[83]

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79 *See* IPCC, *Fourth Assessment Report*, *supra* note 5.

80 *See supra* note 17 and accompanying text. *But see* Duranton & Turner, *supra* note 71 (suggesting that any reasonable efforts to constrain sprawl will have a relatively small impact on emissions).

81 *See, e.g.*, R Pendall, *Do Land-Use Controls Cause Sprawl?*, 26 ENV'T & PLAN. B: PLAN. & DESIGN 555 (1999) (discussing costs of sprawl); Buzbee, *supra* note 22, at 69–74 (same); *see also* Andrew H. Whittemore, Review Essay, *Exclusionary Zoning: Origins, Open Suburbs, and Contemporary Debates*, 87 J. AM. PLAN. ASS'N 167, 174 (2021) ("[C]ontemporary scholarship finds that prevalent zoning practices redirect households to less desirable locations, often on the metropolitan fringe, creating costs in the form of new roads, new schools, and so on."); Michelle Wilde Anderson, *Sprawl's Shepherd: The Rural County*, 100 CALIF. L. REV. 365, 366 (2012) (describing proposals from the 1930s for rural zoning to reduce sprawl and preserve farmland). *But see* ROBERT BRUEGMANN, SPRAWL: A COMPACT HISTORY (2005) (defending sprawl); Nicole Stelle Garnett, *Save the Cities, Stop the Suburbs?*, 116 YALE L.J. POCKET PART 192 (2006) (reviewing BRUEGMANN, *supra*).

82 *See generally, e.g.*, Arthur C. Nelson & Terry Moore, *Assessing Urban Growth Management: The Case of Portland, Oregon, the USA's Largest Urban Growth Boundary*, 10 LAND USE POL'Y 293 (1993) (discussing and evaluating Portland, Oregon's urban growth boundary); *About the Transportation and Growth Management Program*, OR. DEP'T OF LAND CONSERVATION & DEV., https://www.oregon.gov/lcd/TGM/Pages/About.aspx [https://perma.cc/2RDM-HEB4].

83 *See, e.g.*, INGRAM ET AL., *supra* note 48, at 7 (chronicling the evolution of Smart Growth and noting, "[t]he second wave, from the 1980s into the early 1990s, marked a shift from controlling growth to planning for growth"); Oliver A. Pollard, III, *Smart Growth: The Promise, Politics, and Potential Pitfalls of Emerging Growth Management Strategies*, 19 VA. ENV'T

Often combined with New Urbanist design principles,[84] Smart Growth tried to address sprawl by concentrating and focusing growth, instead of resisting it altogether.[85] Smart Growth called for a regional framework for land use planning that went beyond parochial zoning controls.[86] Regional decisionmaking can integrate transportation planning, infrastructure spending, and zoning to promote mixed-use development that would be accessible to different modes of transportation, especially biking and walking, while providing a variety of housing options and economic opportunities.[87]

Smart Growth, however, has not been focused exclusively or even primarily on the problem of climate change.[88] Indeed, a common criticism of the Smart Growth movement is that its goals are vague and sometimes internally inconsistent.[89] Economic objectives can be in

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L.J. 247, 249 (2000) (discussing the history of Smart Growth movement); Mary M. Edwards & Anna Haines, *Evaluating Smart Growth: Implications for Small Communities*, 27 J. PLAN. EDUC. & RSCH. 49, 51 (2007) (discussing the history of Smart Growth).

84 *See, e.g.*, Jerry Frug, *The Geography of Community*, 48 STAN. L. REV. 1047, 1090–94 (1996) (describing New Urbanism); Doris S. Goldstein, *New Urbanism: Planning and Structure of the Traditional Neighborhood Development*, 17 PROB. & PROP. 9, 9 (2003) ("New Urbanism is a land planning philosophy advocating compact, mixed-use, pedestrian-friendly development."); James A. Kushner, *Smart Growth, New Urbanism and Diversity: Progressive Planning Movements in America and Their Impact on Poor and Minority Ethnic Populations*, 21 UCLA J. ENV'T L. & POL'Y 45, 48–49 (2002) (discussing Smart Growth); Robert H. Freilich & Neil M. Popowitz, *The Umbrella of Sustainability: Smart Growth, New Urbanism, Renewable Energy and Green Development in the 21st Century*, 42 URB. LAW. 1, 2–4 (2010) (discussing the relationship between New Urbanism, Smart Growth, and sustainability).

85 *See, e.g.*, INGRAM ET AL., *supra* note 48, at 7 (identifying Smart Growth as consisting of "policies to revitalize cities; reform local zoning to encourage compact development and infill; coordinate state agencies and their growth policies; and overhaul capital investments to align with a sustainable agenda"); Buzbee, *supra* note 22, at 76 (succinctly summarizing goals of new urbanism).

86 *See, e.g.*, Richard Briffault, *Smart Growth and American Land Use Law*, 21 ST. LOUIS U. PUB. L. REV. 253 (2002); Pollard, *supra* note 83, at 258 ("[S]mart growth focuses more on the role federal, state, and local government policies and practices play in influencing land use development patterns.").

87 *See, e.g.*, John Nolon, *Transit-Oriented Development: Clustered Zoning Approaches Reduce Congestion*, N.Y. L.J., Aug. 15, 2007, at 5; Nolon, *supra* note 17, at 319–20 (discussing transit-oriented development and citing leading sources).

88 *See, e.g.*, Alejandro E. Camacho, Melissa L. Kelly, Nicholas J. Marantz & Gabriel Weil, *Mitigating Climate Change Through Transportation and Land Use Policy*, 49 ENV'T L. REP. 10473, 10478 (2019) ("Maryland's [admired] smart growth requirements do not address GHG emissions, and they are not linked to the state's climate action plans."). Some scholarship has expressly linked Smart Growth with climate change. *See, e.g.*, Rachael Rawlins & Robert Paterson, *Sustainable Buildings and Communities: Climate Change and the Case for Federal Standards*, 19 CORNELL J.L. & PUB. POL'Y 335, 361–73 (2010). Most of the Smart Growth scholarship predates our current understanding of the climate crisis.

89 *See, e.g.*, Pollard, *supra* note 83, at 279 ("The 'smart growth' label obscures a range of assumptions and disagreements that can quickly rise to the surface when concrete decisions must be made."); Lin Ye, Sumedha Mandpe & Peter B. Meyer, *What* Is *"Smart*

tension with concerns about preserving open space and elements of transportation planning, for example.[90] Until recently, Smart Growth advocates did not even mention climate change as one of its goals, except in passing.[91]

While Smart Growth principles offer a useful set of prescriptions—some of which inform the proposals in Part IV—the Smart Growth movement has met with modest success.[92] Scholarship and other writing about Smart Growth appears to have dropped off substantially after 2010. Perhaps the mortgage foreclosure crisis of 2008 swamped concerns about development patterns. Perhaps political winds simply shifted.[93] Whatever the reason, the ascendant approach to creating density in many places today is simply to reduce or eliminate zoning limits.[94] So-called market urbanism touts the climate (and other) benefits of deregulation.[95] Recent scholars and policymakers have increasingly promoted loosening density limits to allow for more compact, urban development, and for easing or removing regulatory

Growth?"—Really?, 19 J. PLAN. LITERATURE 301, 307–08 (2005) (identifying different goals and policies in "smart growth"); Anthony Downs, *Smart Growth: Why We Discuss It More than We Do It*, 71 J. AM. PLAN. ASS'N 367, 368 (2005) ("In reality, [Smart Growth] has almost come to stand for 'whatever form of growth I like best' in the opinion of whoever is speaking."); Briffault, *supra* note 86, at 269 ("Smart growth requires a regional vision, and regional institutions and policy-making processes, in order to more effectively integrate transportation policies, affordable housing policies, environmental protection, and land use regulation across metropolitan areas.").

90 *See, e.g.*, Edwards & Haines, *supra* note 83.

91 *See, e.g.*, Pollard, *supra* note 83, at 268 (listing "global climate change" in the list of sprawl's environmental harms); INGRAM ET AL., *supra* note 48, at 8 (discussing climate as a "new rationale" for Smart Growth).

92 *See generally, e.g.*, Downs, *supra* note 89 (finding limited adoption of Smart Growth proposals); Edward J. Sullivan & Jessica Yeh, *Smart Growth: State Strategies in Managing Sprawl*, 45 URB. LAW. 349 (2013).

93 *See, e.g.*, Christopher Serkin, *The New Politics of New Property and the Takings Clause*, 42 VT. L. REV. 1, 13 (2017) (describing changes in attitudes towards land use regulations).

94 *See supra* notes 24–27 (citing sources); *see also* Lewyn, *supra* note 24, at 596 ("The market urbanist movement is partially a response to some commentators' attempts to equate sprawl and the free market. . . . [M]arket urbanists emphasize the role of zoning and other government policies in creating sprawl."). Smart Growth, itself, may have sown the seeds of this change by focusing less on regulatory responses to sprawl. *See, e.g.*, Pollard, *supra* note 83, at 256 ("[S]mart growth tends to focus less on the need to regulate land use development activity than have previous efforts to guide growth.").

95 *See, e.g.*, ORG. FOR ECON. CO-OP. & DEV., RETHINKING URBAN SPRAWL: MOVING TOWARDS SUSTAINABLE CITIES 10 (2018); Dan Grossman, *Increasing Urban Density Could Reduce Climate Change*, DENVER7 (Sept. 1, 2021, 5:41 PM), https://www.denver7.com/longform/increasing-urban-density-could-reduce-climate-change [https://perma.cc/B6EN-QWXT]; Janna Levitt & Drew Adams, *Why Zoning is Key to Combatting Climate Change*, AZURE MAG. (Feb. 19, 2019), https://www.azuremagazine.com/article/zoning-key-combatting-climate-change/ [https://perma.cc/3H8L-X97X] (discussing "unzoning"); Sommer, *supra* note 20.

barriers to development.[96] While their focus is primarily housing affordability, proponents claim emissions benefits from this approach as well.[97] The goal, in short, is to allow more people to live in places like New York City, where the per capita carbon footprint is small.[98] Zoning limits on density constrain the supply of housing in the urban core, and so it seems to follow that relaxing those limits will produce more sustainable development.

The claim is intuitively appealing. Zoning, after all, bears considerable blame for the sprawling suburban development patterns that dominate the United States.[99] The rise of protected single-family zones surrounding cities created leapfrog development patterns, where new growth occurred further and further from the urban core.[100] Other factors reinforced these pressures. White flight in the 1950s hollowed out many cities, leading to increased housing demands in the suburbs.[101] Governments invested in suburban infrastructure like highways, and promoted housing finance that favored single-family suburban homes.[102] School funding mechanisms rewarded the ascendent

96 *See supra* note 26 and accompanying text.

97 *See, e.g.*, Lewyn, *supra* note 24, at 596–97 (describing "market urbanists" who argue that land use controls prevent the market from providing adequate supply of new housing); sources cited *supra* note 25. Lowering carbon emissions is an additional benefit. *Cf., e.g.*, *Developments in the Law*, *supra* note 73, at 1609 (arguing that prescriptions for affordability and for GHG mitigation move in tandem). Some recent scholarship points out that possible tension among different regulatory priorities. *See* Stephen R. Miller, *Prospects for a Unified Approach to Housing Affordability, Housing Equity, and Climate Change*, 46 VT. L. REV. 463, 471 (2022) ("[A]ffordability activists tend to simply want more housing built anywhere; equity activists want a mix of tenure and price by location with adequate transportation servicing those neighborhoods; and environmental activists want to contain sprawl to reduce emissions."); O'Neill et al., *supra* note 16, at 1108 ("More permissive zoning that is equitably distributed coupled with financially feasible inclusionary requirements might be a better approach to achieving equitable infill development, generally. . . . This does not advance climate policy or spatial equity.").

98 *See, e.g.*, NOLON, *supra* note 16, at 85 ("In 2015, the average New York City dweller emitted 6.1 metric tons of CO_2 equivalent emissions annually. Nationally, the per capita average emission metric is 19 tons.").

99 *See, e.g.*, Watson, *supra* note 52, at 134 ("[T]he practice of zoning has promoted low-density development, separation of uses, and automobile dependence, which has resulted in sprawling development patterns."); *Developments in the Law*, *supra* note 73, at 1595; Wayne Batchis, *Enabling Urban Sprawl: Revisiting the Supreme Court's Seminal Zoning Decision* Euclid v. Ambler *in the 21st Century*, 17 VA. J. SOC. POL'Y & L. 373 (2010); Gregory H. Shill, *Should Law Subsidize Driving?*, 95 N.Y.U. L. REV. 498, 555 (2020).

100 *See* Pendall, *supra* note 81; Michael M. Maya, Note, *Transportation Planning and the Prevention of Urban Sprawl*, 83 N.Y.U. L. REV. 879, 879 (2008).

101 *See, e.g.*, Serkin, *supra* note 47, at 786–87 (describing the history of white flight and racial segregation in zoning).

102 *See* Priya S. Gupta, *Governing the Single-Family House: A (Brief) Legal History*, 37 U. HAW. L. REV. 187, 199–200 (2015); James A. Kushner, *Urban Neighborhood Regeneration and*

suburban enclaves.[103] The economic benefits of suburbia became difficult to overcome.[104] As suburbs developed to satisfy the seemingly insatiable demand, their new residents then fought to codify the development patterns through a combination of restrictive zoning and homeowner associations (HOAs).[105] Each successive wave of development then moved out to the next area of vacant land, usually further from the urban core.[106] Zoning is the linchpin of this historical account, and so it stands to reason that reforming zoning to reduce its restrictiveness will produce more compact development forms.

In this view, zoning regulations are a problem to be overcome.[107] Zoning constrains density, pushes growth out into the suburbs, and produces unsustainable development patterns.[108] Reducing or eliminating density limits, and other land use controls more generally, will unlock market forces that will push inexorably inwards and upwards, creating more density in the urban core.[109] In other words, this view anticipates that the unregulated (or less regulated) market will produce more compact development patterns. Zoning interferes with those natural market forces, and so rolling back zoning is the key to creating density.[110]

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the Phases of Community Evolution After World War II in the United States, 41 IND. L. REV. 575, 577–79 (2008).

103 *See* Derek W. Black, *Educational Gerrymandering: Money, Motives, and Constitutional Rights*, 94 N.Y.U. L. REV. 1385, 1422–24 (2019).

104 *See, e.g.*, Been, *supra* note 22 (describing the individual economic incentives to move to the suburbs).

105 *See* Sitaraman et al., *supra* note 55, at 1823–24.

106 *See, e.g.*, Peter Mieszkowski & Edwin S. Mills, *The Causes of Metropolitan Suburbanization*, 7 J. ECON. PERSPS. 135, 136 (1993) (describing "natural evolution theory" of urban growth).

107 *See, e.g.*, Serkin, *supra* note 47, at 770 & n.129 (citing sources for the proposition that "[z]oning broadly construed is often viewed as a problem that needs to be overcome"); *see also* Andrew P. Morriss & Roger E. Meiners, *The Destructive Role of Land Use Planning*, 14 TUL. ENV'T L.J. 95 (2000) (attacking zoning).

108 *See, e.g.*, JONATHAN LEVINE, ZONED OUT: REGULATION, MARKETS, AND CHOICES IN TRANSPORTATION AND METROPOLITAN LAND-USE 1–3 (2006).

109 There is some empirical support for the idea that loosening zoning restrictions will increase density of the upzoned parcels. *See, e.g.*, Hongwei Dong, *Exploring the Impacts of Zoning and Upzoning on Housing Development: A Quasi-experimental Analysis at the Parcel Level*, 44 J. PLAN. EDUC. & RSCH. 403, 411 & tbl.3 (2024) ("These findings suggest that upzoning not only sped up housing developments but also increased housing production at higher densities." *Id.* at 411.); Christina M. Locke, Van Butsic & Adena R. Rissman, *Zoning Effects on Housing Change Vary with Income, Based on a Four-Decade Panel Model After Propensity Score Matching*, 64 LAND USE POL'Y 353, 356–57 (2017). These studies do not demonstrate, however, that net density within the MSA increases.

110 *See also* John D. Landis, *The End of Sprawl? Not So Fast*, 27 HOUS. POL'Y DEBATE 659, 685 (2017) (noting that Texas experienced faster "core-area" population growth than other states and hypothesizing that it may be because of the relatively lax zoning). *But see*

Single-family zoning is the easiest and most frequent target.[111] A distinctly American phenomenon, the single-family zone all but ensures sprawling development patterns.[112] Specific density limits vary considerably, with minimum lot sizes in many communities ranging from one-tenth of an acre to two or even five (or more) acres in some places.[113] Setbacks and other density limits also constrain the number of houses that can be built per acre.[114] But regardless of these quantitative details, the overall development pattern is baked into the zoning ordinance by requiring a separate lot for each dwelling, prohibiting multifamily housing, and creating the kind of single-family-home communities that dominate much of the American landscape and that sprawl inevitably outwards, consuming vast amounts of land.[115]

In order to promote growth, and more compact development in particular, researchers and policymakers have increasingly challenged the primacy of single-family zoning, seeking to allow accessory dwelling units (ADUs), duplexes, or even modest subdivisions as of right.[116] Some cities and states have taken up the call.[117] California has adopted a series of measures that, among other things, allows ADUs in single-

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Whittemore, *supra* note 81, at 175 ("[T]he focus of so much work on market impacts and solutions has led at least one scholar to argue that criticism of exclusionary zoning is so much neoliberal piffle." (citation omitted)); Anderson, *supra* note 81, 367–69 (discussing how sprawling development in the 1940s and 1950s was the result of too little zoning, not too much).

111 Criticisms of single-family zoning are longstanding. *See* Edward H. Ziegler, Jr., *The Twilight of Single-Family Zoning*, 3 UCLA J. ENV'T L. & POL'Y 161, 165 (1983).

112 *See, e.g.*, SONIA A. HIRT, ZONED IN THE USA: THE ORIGINS AND IMPLICATIONS OF AMERICAN LAND-USE REGULATION 7, 32 (2014) (describing original zoning limits).

113 *See* Boudreaux, *supra* note 18, at 4–7 (discussing prevalence and impact of minimum lot sizes).

114 *See* Dawn Withers, *Looking for a Home: How Micro-housing Can Help California*, 6 GOLDEN GATE U. ENV'T L.J. 125, 128 (2012).

115 *See* Michael Manville, Paavo Monkkonen & Michael Lens, *It's Time to End Single-Family Zoning*, 86 J. AM. PLAN. ASS'N 106, 107 (2020) (citing rates of up to 90% single-family zoning in large U.S. metropolitan areas).

116 *See, e.g.*, SARAH GERECKE, JOSEPH SCHILLING, JUNG HYUN CHOI, LINNA ZHU, JOHN WALSH & PETER J. MATTINGLY, URB. INST., LOW-RISE INFILL HOUSING IN LOS ANGELES: CAN SB 9 MEET THE CITY'S HOUSING NEEDS? (2022) ("One part of the solution to [Los Angeles'] housing challenges is to allow additional housing to be built in single-family districts . . . ."); *Developments in the Law*, *supra* note 73, at 1601 (calling for limits on single-family zoning in order to fight climate change); Whittemore, *supra* note 81, at 174 ("Other scholars have recently argued for an end to single-family zoning, given its history and that it occupies most land area in so many localities." (citation omitted)).

117 *See, e.g.*, *Developments in the Law*, *supra* note 73, at 1601–02 (summarizing state initiatives); *see also* MONT. CODE ANN. § 76-2-304 (2023) (allowing duplexes in Montana in any city with a population greater than 5,000); Kriston Capps, *How YIMBYs Won Montana*, BLOOMBERG (Apr. 28, 2023, 9:15 AM), https://www.bloomberg.com/news/articles/2023-04-28/montana-s-yimby-revolt-aims-to-head-off-a-housing-crisis [https://perma.cc/23DC-NBS7] (describing legislation).

family zones, and even in HOAs with restrictive covenants that otherwise prohibit them.[118] There has been an uptick in ADU construction as a result.[119] Legislation allowing ADUs in single-family zones is gaining steam.[120] Other places have gone beyond ADUs to allow duplexes (or triplexes or quadplexes) in places zoned single family.[121] This potentially doubles (or triples or quadruples) the number of permissible dwelling units in what were previously single-family zones.[122]

The most extreme versions of this deregulatory approach call for dramatically loosening or even eliminating density limits more generally, not just in single-family zones.[123] Increasing or eliminating height limits or floor area ratios will allow large multifamily buildings in more places, decreasing suburban sprawl and increasing density. Expanding development potential in the urban core will, in this view, also decrease

118 *See* CAL. CIV. CODE § 4751 (West 2022); *see also* Ken Stahl, *The Power of State Legislatures to Invalidate Private Deed Restrictions: Is It an Unconstitutional Taking?*, 50 PEPP. L. REV. 579 (2023) (discussing California law). Rhode Island, too, preempts HOA covenants prohibiting ADUs, so long as local zoning allows them. *See* 45 R.I. GEN. LAWS § 45-24-73 (2023).

119 *See, e.g.*, *California ADUs 2018-2022*, UC BERKELEY CTR. FOR CMTY. INNOVATION, https://www.aducalifornia.org/adu-visuals/ [https://perma.cc/D3WR-ZEAV] (visualizing proliferation of ADUs in California by county); Vanessa Brown Calder & Jordan Gygi, *The Promising Results of Accessory Dwelling Unit Reform*, CATO INST.: CATO AT LIBERTY (June 28, 2023, 11:58 AM), https://www.cato.org/blog/results-accessory-dwelling-unit-reform-so-far [https://perma.cc/XVP5-DGYR] ("ADUs alone will be unable to make up the difference, and any massive increase in supply will require comprehensive reform, particularly comprehensive zoning reform. However, results in California, Seattle, and Portland indicate that when state and local governments remove barriers to ADU development, housing production increases.").

120 *See, e.g.*, Act of June 10, 2021, Pub. Act No. 21-29, 2021 Conn. Acts 242 (Reg. Sess.); H.R. 636, 66th Leg., 2d Reg. Sess. (Idaho 2022) (proposing legislation to guarantee ADUs as a right notwithstanding private covenants, mirroring California's law); VT. STAT. ANN. tit. 24, § 4412(1)(E) (2019 & Supp. 2023) (preventing private covenant restrictions on ADUs in single-family zoned areas but only for prospective covenants); *see also* Infranca, *supra* note 21, at 857–70 (describing legislation).

121 Sarah J. Adams-Schoen & Edward J. Sullivan, *Reforming Restrictive Residential Zoning: Lessons from an Early Adopter*, 30 J. AFFORDABLE HOUS. & CMTY. DEV. L. 161, 168 (2021) (discussing Oregon duplex law).

122 Other municipalities have taken more modest measures. For example, many local governments have eased height restrictions and limits on multifamily housing to allow mid-rise multifamily development in more places. *See generally, e.g.*, Gerecke et al., *supra* note 116, at 1 (evaluating proposals to increase mid-rise density in Los Angeles); *see also, e.g.*, GERRIT KNAAP, STUART MECK, TERRY MOORE & ROBERT PARKER, AM. PLAN. ASSOC., ZONING AS A BARRIER TO MULTIFAMILY HOUSING DEVELOPMENT (2007) (describing zoning changes to allow more multifamily housing); Kevin Forestieri, *Massive Zoning Overhaul in Mountain View Would Increase Density, Potentially Adding 9,000 New Homes*, MOUNTAIN VIEW VOICE (Apr. 15, 2021, 12:21 PM), https://mv-voice.com/news/2021/04/15/massive-zoning-overhaul-in-mountain-view-would-increase-density-potentially-adding-9000-new-homes [https://perma.cc/7Y43-ARAQ] (describing zoning changes to allow more mid-rise development).

123 *See supra* note 27 (citing sources calling for the end of zoning).

the pressures towards suburbanization.[124] Even Manhattan, the densest place in America, could accommodate many more units by building even taller and closer together.[125] The intuition here is that more people living in Manhattan will mean fewer people living in Long Island, New Jersey, Connecticut, or other places with longer commutes and more intensive energy demands.[126]

In addition to regulatory changes aimed specifically at density limits, other reform efforts have focused on streamlining the regulatory process making it easier to build, and especially to build multifamily housing.[127] Growing concern about the politics of land use decisionmaking has focused on the outsized role that NIMBY opponents of development often play in local decisionmaking.[128] In an account made famous by Professor William Fischel, homeowners often wield outsized political power, and they use it to protect their property values by resisting change.[129] From this perspective, zoning and land use regulations—including environmental regulations and historic preservation—are sources of NIMBY obstruction; they are processes that give outsized voice to neighbors who oppose development and change.[130] Dynamics around density in most places take a familiar form, with developers proposing large multifamily developments in many lots and then negotiating down to much smaller development in response to

124 *See* Lewyn, *supra* note 24, at 592–93 (introducing—before dissecting—the popular environmental claims about how urbanization is important in reducing suburban expansion, which in turn increases climate impact).

125 *See* Serkin, *supra* note 46, at 184.

126 *See supra* notes 69–70 and accompanying text (noting that per capita carbon emissions in Manhattan are among the lowest in the country while per capita emissions in its suburbs are among the highest).

127 *See, e.g.*, KATHERINE LEVINE EINSTEIN, DAVID M. GLICK & MAXWELL PALMER, NEIGHBORHOOD DEFENDERS: PARTICIPATORY POLITICS AND AMERICA'S HOUSING CRISIS 163–71 (2020) (proposing structural reforms); Infranca, *supra* note 21, at 886 (advocating for displacing certain local zoning laws that result in unnecessary regulatory barriers).

128 *See, e.g.*, EINSTEIN ET AL., *supra* note 127, at 95–106 (identifying opponents to development in the land use process in Massachusetts); Robert C. Ellickson, *The Zoning Straitjacket: The Freezing of American Neighborhoods of Single-Family Houses*, 96 IND. L.J. 395, 426 (2021) (attributing "rampant NIMBYism" in part to status quo bias); Kenneth A. Stahl, *"Yes in My Backyard": Can a New Pro-housing Movement Overcome the Power of NIMBYs?*, ZONING & PLAN. L. REP., Mar. 2018, at 1, 2–3 (discussing NIMBY opposition to development).

129 *See* WILLIAM A. FISCHEL, THE HOMEVOTER HYPOTHESIS: HOW HOME VALUES INFLUENCE LOCAL GOVERNMENT TAXATION, SCHOOL FINANCE, AND LAND-USE POLICIES 80–81 (2001).

130 *See* EINSTEIN ET AL., *supra* note 127, at 95–96; *see also* John R. Nolon, *Pandemics and Housing Insecurity: A Blueprint for Land Use Law Reform*, 46 VT. L. REV. 422, 446–47 (2022); Wendell Pritchett & Shitong Qiao, *Exclusionary Megacities*, 91 S. CAL. L. REV. 467, 491–92 (2018).

community opposition.[131] Here, too, the prescription appears to be less regulation, either by local governments themselves or by states preempting local zoning controls.[132] Streamlining the regulatory process eliminates many of the levers of neighbor power and clears the way for more building and more density, or so reformers argue.

In fact, however, these reforms are much more context dependent than advocates admit. Sometimes, loosening zoning restrictions will exacerbate, not mitigate carbon emissions, as Part III reveals.

B. Green Building Codes

In contrast to loosening zoning limits to promote density, another tactic focuses on minimizing buildings' carbon emission by adopting building codes aimed at energy conservation, so-called "green building codes."[133] Buildings' energy consumption is a function of building size and materials.[134] Techniques to reduce a building's carbon footprint include, for example, increasing thermal insulation, or adopting energy-efficient technologies like air heat exchangers or geothermal heating and cooling.[135] Green building codes ensure that new development minimizes energy usage. Net-zero buildings—defined as buildings that produce as much energy as they consume—are obtainable and are increasingly common.[136] Even if municipalities do not

131 *See* Lee Anne Fennell, *Hard Bargains and Real Steals: Land Use Exactions Revisited*, 86 IOWA L. REV. 1, 24 (2000) (theorizing about land use dealmaking); Sean F. Nolon, *Bargaining for Development Post-*Koontz*: How the Supreme Court Invaded Local Government*, 67 FLA. L. REV. 171, 194 (2016) (describing negotiating dynamics between developers and local officials). *See generally* Carol M. Rose, *Planning and Dealing: Piecemeal Land Controls as a Problem of Local Legitimacy*, 71 CALIF. L. REV. 837 (1983) (describing dealmaking in land use).

132 *See* Anika Singh Lemar, *The Role of States in Liberalizing Land Use Regulations*, 97 N.C. L. REV. 293, 297–99 (2019); KAZIS, *supra* note 24, at 33–36 (discussing preemption); *see also Developments in the Law*, *supra* note 73; Infranca, *supra* note 21, at 847–70 (discussing the "new generation" of state land use preemption).

133 INT'L CITY/CNTY. MGMT. ASS'N, PUTTING SMART GROWTH TO WORK IN RURAL COMMUNITIES 28 (2010) (discussing green building codes); Vierra, *supra* note 30 (collecting examples); *see also* FREILICH ET AL., *supra* note 16, at 199–201 (2010) (discussing local green building mandates); Danielle Spiegel-Feld & Katrina M. Wyman, *Building Better Building Performance Standards*, 52 ENV'T L. REP. 10268 (2022).

134 Other factors also include the income of residents, the building's age, and whether it is owner-occupied or rented. *See* Porse et al., *supra* note 60, at 188 ("Across L.A. County, consumption noticeably varies not only by geography, but also by income, land use, building age, and home ownership rates.").

135 *See, e.g.*, Jim Rossi & Christopher Serkin, *Energy Exactions*, 104 CORNELL L. REV. 643, 671 (2019) (surveying energy savings from different building technologies).

136 *See* IPCC, *Sixth Assessment Report*, *supra* note 1, at 440 (discussing country-specific approaches to net-zero energy buildings (NZEBs)); *see also* Na Wang, Patrick E. Phelan, Chioke Harris, Jared Langevin, Brent Nelson & Karma Sawyer, *Past Visions, Current Trends, and Future Context: A Review of Building Energy, Carbon, and Sustainability*, 82 RENEWABLE &

require such dramatic standards, half measures can still have a big impact on carbon.

Researchers point to heightened energy efficiency standards as crucial to combating climate change.[137] However, the form that green building codes should take is contested and very much up for grabs. John Nolon has described the proliferation of "energy codes" in some detail.[138] Early green building standards applied only to public buildings.[139] That has gradually changed, with increasingly complex standards that distinguish between public and private buildings, and between commercial and residential ones, for example.[140]

Today, many municipalities impose some kind of green building requirement, although the form and complexity varies considerably.[141] For example, as Nolon explains, Marin County, in California, requires energy efficiency that increases with building size: the larger the house, the more energy efficient it must be.[142] According to one study, the most aggressive efforts in the country are in New York, Los Angeles, and Denver,[143] which adopted a "green roof" requirement in 2017 for

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SUSTAINABLE ENERGY REVS. 976, 980 (2018) ("Zero-net-energy buildings have been advancing from research to reality, although the market is still very small.").

137 Porse et al., *supra* note 60, at 179 ("Improving energy conservation in buildings through new technologies and efficiency measures is an important part of managing future energy demands. . . ."); IPCC, *Sixth Assessment Report*, *supra* note 1, at 439 ("Most accelerated mitigation pathway scenarios include significant increase in building energy efficiency."). *But see* Sarah B. Schindler, *Following Industry's LEED®: Municipal Adoption of Private Green Building Standards*, 62 FLA. L. REV. 285, 300 (2010) ("In summary, requiring a single building to incorporate green elements may reduce local environmental externalities, but it will not reduce levels of global warming because the impact would be so small as to be de minimis.").

138 *See* Nolon, *supra* note 17, at 303–07.

139 *See, e.g.*, Charles J. Kibert, *Policy Instruments for a Sustainable Built Environment*, 17 J. LAND USE & ENV'T L. 379, 386 (2002).

140 *See* Nolon, *supra* note 17, at 305 (discussing Standard 90.1 for the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE), which governs commercial buildings); *id.* at 308 (discussing Massachusetts's Home Energy Rating System (HERS) and Residential Energy Services Network (RES-NET) approaches to residential development).

141 *See, e.g.*, Schindler, *supra* note 137, at 312 ("[M]any cities have now decided that affirmative requirements are needed to effect real change in the building industry, and thus also have extended green building requirements to private developers, for private projects.").

142 *See* Nolon, *supra* note 17, at 307–08 (discussing COUNTY OF MARIN, CAL., CODE § 19.04.100 (2011 Supp.) (repealed 2016)).

143 Evelyn Long, *Which U.S. Cities Are Setting the Most Ambitious Green Building Policies?*, BLDG. ENCLOSURE: BE BLOG (May 19, 2021), https://www.buildingenclosureonline.com/blogs/14-the-be-blog/post/89854-which-us-cities-are-setting-the-most-ambitious-green-building-policies [https://perma.cc/DB27-H2BT]; *see also* David Ribeiro, *US Cities Adopt Stricter Building Energy Codes*, ACEEE: BLOG (Sept. 9, 2019), https://www.aceee.org/blog

buildings over 25,000 square feet.[144] But many other places have tried to respond to the climate crisis by adopting new building codes and using other regulations to reduce the energy consumption of new housing.[145] A number of cities are even moving towards net-zero requirements for new buildings.[146]

Substantively, some municipalities look to private standards, the most notable being the Leadership in Energy and Environmental Design (LEED), the Energy Star Certified Homes program, and the Home Energy Rating System (HERS).[147] At least 108 municipalities currently require that new residential buildings comply with some degree of LEED certification.[148] Other municipalities have adopted performance standards, or specify particular building materials or elements, rather than relying on private standards.[149]

However, both the deregulatory approach to creating density and the regulatory approach to compelling energy-efficient buildings can be self-defeating, as the next Part examines.

/2019/09/us-cities-adopt-stricter-building [https://perma.cc/CW8H-PPHG] (summarizing efforts).

144 *See* DENVER, COLO., CODE § 10-301 (Supp. 144 2024).

145 *See Phoenix Green Building Program*, CITY OF PHX., https://www.phoenix.gov/pdd/services/permitservices/phoenix-green-building-program [https://perma.cc/34XN-27LY]; *Building & Engineering Codes*, CITY OF TUCSON, https://www.tucsonaz.gov/Departments/Planning-Development-Services/PDSD-Sandbox/Building-Engineering-Codes [https://perma.cc/BDG6-YV6C] (noting green building efforts related to water and energy conservation in construction); *see also* Allyson Wendt, *San Francisco Passes Stringent Green Building Requirements*, BUILDINGGREEN (Aug. 28, 2008), https://www.buildinggreen.com/newsbrief/san-francisco-passes-stringent-green-building-requirements [https://perma.cc/7YTJ-69VW].

146 *See, e.g.*, Betty Seto, Jim Leahy, Blake Herrschaft, Ben Butterworth & Sonia Punjabi, *Zero Net Energy Communities: Three Cities Leading the Way*, 2016 ACEEE SUMMER STUDY ON ENERGY EFFICIENT BLDGS. subdiv. 10. Other places do not require green building but nevertheless offer incentives for compliance with enacted standards. *See, e.g.*, Schindler, *supra* note 137, at 311–12 (distinguishing between voluntary and mandatory green building requirements).

147 *See* Schindler, *supra* note 137, at 289 n.9 (identifying municipalities); Smith, *supra* note 60, at 1147 ("The Energy Star program has captured almost the entire market for green home certification—over 98%."); *see, e.g.*, Nolon, *supra* note 17, at 308.

148 *See USGBC Public Policy Library*, U.S. GREEN BLDG. COUNCIL, https://public-policies.usgbc.org/policies [https://perma.cc/MU73-N5JK] (allowing advanced filtering to identify mandatory policies that apply to residential building).

149 Sarah Schindler cautions that LEED standards are an awkward fit for public law, and advocates instead for adoption of green building codes through local democratic processes. *See* Schindler, *supra* note 137, at 335–43. *But cf.* Smith, *supra* note 60, at 1140 (arguing that private standards are superior to the public Energy Star standard for a variety of structural reasons).

III. A PARABLE OF TWO CITIES

The last Part described an increasingly conventional set of proposals to make development more sustainable. The goal is to promote smaller, more compact, and more energy-efficient housing. The policy prescriptions focus on loosening zoning limits to allow more density while simultaneously encouraging or requiring the deployment of green building techniques. This Part problematizes both prongs of the argument, arguing that density does not always reduce GHG emissions, that loosening zoning regulations will not necessarily produce density where it is needed, and that green building codes will not always produce net energy savings. Worse, the two can work at cross-purposes, and green building codes in urban centers can exacerbate sprawl. Context and place matter.

To see this clearly, imagine a parable of two fictional and highly stylized cities, Laissez Faire and Greenville. Each wants to address climate change, but they take diametrically opposed approaches.

One geographically large city, Laissez Faire, takes the most extreme version of the deregulatory approach. It eliminates zoning restrictions on density, and indeed permits virtually unregulated development to allow the market to provide an ample supply of apartment buildings and dense multifamily housing.

While the virtual absence of land use regulation does result in new development in the urban core, it unlocks even more development at the urban fringe where land and construction are both cheaper. Worse, most of that new suburban and exurban development occurs in HOAs, which impose private land use restrictions much more stringent than the now-repealed zoning ordinance, resulting in leapfrog development far out into the suburbs and exurbs. Despite the growth in the urban core, the result of deregulation is a city that is, on balance, less dense and more sprawling than before.

The other city, Greenville, responds to climate change by imposing a set of aggressive rules for reducing GHG emissions. For example, this city requires all new buildings to be "net zero" in energy consumption, requiring state-of-the-art heating and cooling systems, as well as sustainable energy production like solar panels. In addition, Greenville adopts strict limits on the size of housing units, imposes fees on development to pay for the marginal impact of new buildings on the energy grid, forbids gas stoves and other appliances, requires electric car chargers in every parking space, and so forth.

While this significantly reduces the GHG emissions of Greenville's citizens, these regulations dramatically increase the costs of construction and result in housing prices that are so high that most prospective housing consumers decide not to move there at all and instead move to other municipalities in the area, or even choose to move somewhere

else in the country where housing is cheaper (like Laissez Faire!). Unfortunately, those substitutes are all places where per-unit carbon emissions are much higher than they would have been in Greenville, even if Greenville had not adopted its aggressive new buildings codes. In other words, strict efforts to address carbon emissions pushed people to more carbon-intensive places, perversely increasing overall carbon emissions nationally.

Consider these cautionary dynamics in more detail.

A. The Persistent Problem of Sprawl

While loosening zoning may result in more development activity in many places, it is not necessarily going to produce more density, and will sometimes have the opposite effect.[150] Consider, for example, reforms aimed at expanding development in single-family zones. One targeted approach allows ADUs in single-family zones as of right.[151] A broader approach simply replaces "single-family" zones with the right to build two or more units per lot.[152] Either of these reforms will increase—potentially even double—the density of previously single-family zones.

While this looks like a pro-density reform, the likely impact on overall density in an MSA may be less density, not more.[153] The change will have no impact on neighborhoods already zoned for more dense multifamily housing in the urban core. It will, of course, unlock development in single-family zones in the urban core. But its primary

150 *See* Landis, *supra* note 110, at 686 (examining the persistence of sprawl for 178 metros in the United States and concluding that "formal land-use policies and regulatory frameworks have far less impact on metropolitan development patterns than is usually thought"). Regulatory approaches can produce the same perverse result if governments compel growth outside the urban core, as is true of some statewide regimes that target housing growth. *See* PAAVO MONKKONEN, MICHAEL MANVILLE, MICHAEL LENS, AARON BARRALL & OLIVIA ARENA, NYU FURMAN CTR., CALIFORNIA'S STRENGTHENED HOUSING ELEMENT LAW: EARLY EVIDENCE ON HIGHER HOUSING TARGETS AND REZONING? 4 (2023) ("Many affluent cities [in California] near job centers received low housing targets, whereas low-demand cities in outlying parts of metropolitan areas were expected to plan for thousands of units.").

151 *See* Kazis, *supra* note 24, at 36–37.

152 *See, e.g.*, Gerald A. Fisher, *The Comprehensive Plan Is an Indispensable Compass for Navigating Mixed-Use Zoning Decisions Through the Precepts of the Due Process, Takings, and Equal Protection Clauses*, 40 URB. LAW. 831, 869 (2008).

153 *See, e.g.*, *Developments in the Law*, *supra* note 73, at 1601–02 (assuming that state preemption of single-family zoning will increase urban density). Presumably for this reason, California's statewide approach to ADUs is more permissive closer to transit. *See* CAL. PUB. RES. CODE § 21155 (West 2016) (specifying regulations specific to high-quality transit corridors). Nevertheless, California now allows ADUs statewide, including in suburbs and exurbs. *See generally* CAL. DEP'T OF HOUS. & CMTY. DEV., ACCESSORY DWELLING UNIT HANDBOOK (2022).

impact may be felt in suburbs, and especially outer-ring suburbs, because these are places that are likely to have more single-family zones as a percentage of overall area.[154] It is also easier to build ADUs and duplexes during development rather than retrofitting them into existing neighborhoods, and so the biggest impact of these reforms will often be on undeveloped land.[155] Increasing permissible density in single-family residential neighborhoods may therefore actually *increase* sprawl in the MSA, expanding more housing at the outskirts of the city than close in.[156]

But what's the harm? That is, even if density does not have the carbon savings in some places that it might in others, is there any harm in encouraging marginally greater density everywhere? There is, if the effect of that density is to promote growth in more carbon-intensive places. Cluster zoning can actually exacerbate land fragmentation and VMT.[157] Painting on a blank canvas, density makes good sense. If one were to design a development pattern with the goal of reducing carbon, it would undoubtedly include most people living in just a few dense places.[158] But given existing development patterns, marginal increases in density in developing suburbs can decrease the overall density of the MSA by pulling people out of the urban core.

There are many rural and even suburban parts of the country where no realistically available level of density will allow people to forgo driving and where compact development will have no meaningful effect on carbon emissions unless accompanied by reductions in

154 *See* JAKE WEGMANN, AABIYA NOMAN BAQAI & JOSH CONRAD, NYU FURMAN CTR., HERE COME THE TALL SKINNY HOUSES: ASSESSING SINGLE-FAMILY TO TOWNHOUSE REDEVELOPMENT IN HOUSTON, 2007-2020, at 32 (2023) (finding that newly permissible subdivision regulations had a much larger impact on open space development than on urban core redevelopment); *cf.* Emily Badger & Quoctrung Bui, *Cities Start to Question an American Ideal: A House with a Yard on Every Lot*, N.Y. TIMES: THE UPSHOT (June 18, 2019), https://nyti.ms/37QtS8Z [https://perma.cc/Y34S-X726] ("It is illegal on 75 percent of the residential land in many American cities to build anything other than a detached single-family home. That figure is even higher in many suburbs . . . .").

155 *Cf.* Allie Ogletree, *How Much Does an Accessory Dwelling Unit (ADU) Cost to Build?*, ANGI (Feb. 17, 2023), https://www.angi.com/articles/how-much-do-adu-costs.htm [https://perma.cc/53ZD-PCC7] (detailing cost factors for constructing an ADU on existing land, such as rerouting infrastructure and permitting, which may be simplified if planned in tandem with neighborhood-scale development).

156 Measuring sprawl is no simple task, and different studies take different approaches. *See* Landis, *supra* note 110, at 662–66 (summarizing studies).

157 INT'L CITY/CNTY. MGMT. ASS'N, *supra* note 133, at 16 (discussing cluster zoning and noting its downsides when implemented without careful regional coordination).

158 *See* Michael J. Minkus, Comment, *Fighting Uncertainty: Municipal Partnerships with Redevelopment Agencies Can Mitigate Uncertainty to Encourage Brownfield Redevelopment*, 1 GOLDEN GATE U. ENV'T L.J. 267, 269 (2007).

building size.[159] Purely residential density, far from the nearest commercial areas, will do very little to reduce VMT. And minimum lot sizes of a quarter acre versus an acre, or setbacks of five feet instead of fifty feet, will do nothing to conserve energy. Exurban density actually means a net decrease in density for the MSA that can drive up emissions. This is not a purely hypothetical concern. The development patterns in cities like Nashville often include intensive multifamily housing developments far outside the urban core that make the MSA on balance less dense.[160]

These dynamics are not inevitable. New density in the suburbs—even in outer ring suburbs—can reduce emissions if it is intensive enough to create a new self-contained commercial and residential cluster (or if it is concentrated around mass transit). Some cities, like Los Angeles and Pittsburgh, have developed this way, through a kind of hub and spoke model (sometimes called polycentric or multinucleated development).[161] This pattern can reduce carbon emissions if it reduces commuting between these spread-out hubs, and especially if the hubs are connected by mass transit.[162] But context matters. Situational zoning is important. Regulatory reforms aimed at marginally increasing density may not have that effect and may surprisingly be worse for GHG emissions if they produce islands of density far away from shopping and jobs.

The observation goes beyond single-family zoning reforms. The implicit assumption of the deregulatory movement is that, given free

159 *See, e.g.*, *supra* note 38 (discussing "dense sprawl").

160 *See, e.g.*, Serkin & Best, *supra* note 48, at 573 (discussing the density of Nashville). This is not limited to Nashville. *See* Wegmann et al., *supra* note 154, at 8 ("[C]ases in which densities within a neighborhood, let alone a whole city, have increased rather than decreased are rare, and even rarer in areas previously developed with housing as opposed to former industrial or commercial lands.").

161 *See* CITY OF PITTSBURGH, 2070 MOBILITY VISION PLAN 28 (2021) ("Pittsburgh is a polycentric city with a hub and spoke mobility system."); Reid H. Ewing, *Characteristics, Causes, and Effects of Sprawl: A Literature Review*, *in* URBAN ECOLOGY: AN INTERNATIONAL PERSPECTIVE ON THE INTERACTION BETWEEN HUMANS AND NATURE 519, 520 (John M. Marzluff et al. eds., 2008); P. Gordon, H.W. Richardson & H.L. Wong, *The Distribution of Population and Employment in a Polycentric City: The Case of Los Angeles*, 18 ENV'T & PLAN. A 161, 171 (1986) (describing Los Angeles as polycentric); *see also* Shlomo Angel & Alejandro M. Blei, *The Spatial Structure of American Cities: The Great Majority of Workplaces Are No Longer in CBDs, Employment Sub-centers, or Live-Work Communities*, 51 CITIES 21 (2016) (distinguishing between different urban forms).

162 Indeed, sophisticated measures of urban sprawl take this into account, looking not only at the overall population per acre, but factoring in walkability scores by neighborhood or otherwise examining the specific form of development patterns. *See, e.g.*, SMART GROWTH AM., MEASURING SPRAWL 2014 2 (2014) (discussing "activity centering" and "street accessibility" as factors for measuring sprawl); Ewing, *supra* note 161, at 520 ("First, sprawl is a matter of degree. The line between scattered development and so-called polycentric or multinucleated development is a fine one.").

rein, the market will produce development patterns that emanate out in concentric rings, with the urban core the most dense and the suburbs and exurbs becoming less and less dense the further out one moves, or that development will naturally coalesce into compact polycentric forms. This is overly optimistic.[163] In fact, loosening density limits or streamlining the regulatory process may accelerate development in outer-ring suburbs as much as, if not more than, in the urban core where development is easier and land is less expensive.[164]

Evidence for this concern is all around. Some of the most lightly zoned cities are the least dense.[165] Houston, of course, is the most familiar example, but it is not alone. Other Sun Belt cities, like Phoenix, also have significantly sprawling development patterns despite relatively lax zoning.[166] Mapping density against zoning restrictiveness nationwide in fact reveals that loose zoning correlates to less density, not more.[167] The correlation does not suggest causation, and the data do not support the claim that loosening zoning will decrease density.[168] But the correlation is a challenge to the claims of reformers that lax zoning will produce more density.

There are a number of reasons why loosening zoning might not increase density generally. First, developers and housing consumers may replace public zoning with private land use controls in the form of HOAs when zoning does not satisfy their regulatory preferences.[169] Two different studies—one in Florida, and one nationwide—confirm that housing in HOAs sells for a premium over other property and that

163 *See, e.g.*, Watson, *supra* note 52, at 134 (reporting findings that places that adopt strict regulations requiring density had achieved greater density than those that adopted "softer" strategies like incentives).

164 *See* Leah Brooks & Jenny Schuetz, *Does Housing Growth in Washington, D.C., Reflect Land Use Policy Changes?*, 25 CITYSCAPE 203, 205 (2023) (examining effect of loosening zoning in Washington, D.C., and observing that "virtually all the land previously zoned for single-family homes remained zoned as single-family"); Wegmann et al., *supra* note 154, at 31–32 (finding that loosening density limits in Houston to allow more "tall, skinny," *id.* at 3, townhouses produced few new townhouse redevelopments, and more townhouse development on formerly greenfield and commercial land).

165 *See* Joseph Gyourko, Jonathan Hartley & Jacob Krimmel, *The Local Residential Land Use Regulatory Environment Across U.S. Housing Markets: Evidence from a New Wharton Index* 22 (Nat'l Bureau of Econ. Rsch., Working Paper No. 26573, 2019); *see also* Serkin & Best, *supra* note 48, at 561 (discussing data).

166 *See, e.g.*, Serkin, *supra* note 46, at 186.

167 *See generally* Serkin & Best, *supra* note 48.

168 *See, e.g.*, *id.* at 571. Oddly, a leading study examining sprawl finds that aggressive antisprawl zoning results in more compact urban forms, but that "looser regulatory regimes do not contribute to more sprawl in the way that tighter regimes contribute to less sprawl." Landis, *supra* note 110, at 681.

169 *See* Serkin, *supra* note 46, at 195.

the premium increases with the permissiveness of local zoning.[170] In other words, the value of restrictive HOA covenants is greater when zoning does not satisfy housing consumers' regulatory preferences. Longitudinal data is harder to find, but it is easy to predict that developers will respond to this price premium by increasing HOA development when zoning is more permissive. Where this is true, the perverse result of zoning reform may be to encourage greater suburban HOA development, which will produce worse outcomes for density and climate in the long run because HOA regulations are typically both more restrictive and stickier than public land use regulations.[171]

Second, large, multifamily construction takes much longer than building single-family homes and usually involves much more development risk.[172] The construction time alone for multifamily housing is between one and two years.[173] In general, the larger the building, the longer it takes.[174] Single-family houses built by developers, in contrast, typically take only seven months to build.[175] Single-family development can respond more quickly to market demand. Urban development therefore often lags suburban development, meaning that new development activity does not necessarily result in a denser place overall.

Relatedly, developers will not necessarily build to the limits of allowable density all at once. Sophisticated developers are attentive to absorption rates and the pace of development, preferring to hold vacant lots or wait to develop until the timing is better before starting new projects.[176] The risk of guessing wrong is very high and goes up with the expense and complexity of development projects. Lower-cost, scalable residential development is less risky and so is often first to be

170 *See* Wyatt Clarke & Matthew Freedman, *The Rise and Effects of Homeowners Associations*, 112 J. URB. ECON. 1, 13 (2019) (finding correlation nationwide); Rachel Meltzer & Ron Cheung, *How Are Homeowners Associations Capitalized into Property Values?*, 46 REG'L SCI. & URB. ECON. 93, 93 (2014) (discussing Florida).

171 *See* Serkin, *supra* note 46, at 195 (discussing the restrictiveness of HOA covenants).

172 *See* Na Zhao, *Time to Build an Apartment Building in 2020*, NAT'L ASS'N OF HOME BUILDERS (June 13, 2021), https://eyeonhousing.org/2021/06/time-to-build-an-apartment-building-in-2020/ [https://perma.cc/LY2J-ZDSF] (summarizing data on all multifamily housing).

173 *Building a Multifamily Apartment Complex: The Timeline from Start to Finish*, HECHT GRP., https://www.hechtgroup.com/building-a-multifamily-apartment-complex-the-timeline-from-start-to-finish/ [https://perma.cc/846A-E4YH].

174 *Id.*

175 *How Long Does It Take to Build a Single-Family Home?*, NAT'L ASS'N OF HOME BUILDERS (Sept. 30, 2020), https://www.nahb.org/blog/2020/09/How-Long-Does-it-Take-to-Build-a-Single-Family-Home [https://perma.cc/BPC5-G44P].

176 *See* Cameron K. Murray, *A Housing Supply Absorption Rate Equation*, 64 J. REAL EST. FIN. & ECON. 228, 230 (2022) (discussing developers' focus on the rate at which new housing is absorbed into the market).

built. Large-scale, urban infill development follows only in the face of expectations of sustained demand.[177]

This marks something of a change. Traditional accounts of development patterns describe cities starting from the inside and pushing outwards only as the urban core became more fully built out.[178] Think, here, of eighteenth-century cities springing up around a dock or trading post and only slowly growing outwards in concentric waves or rings of development as the trade-off between congestion, land values, and infrastructure costs exert centrifugal forces on the location of new housing. Today, however, that story has reversed in many places. Reurbanization often happens from the outside in as urban amenities and the advantages of density start to exert a kind of gravitational pull—a centripetal force—that follows expansive, sprawling suburban development.

All of this is to say that the impact of zoning reform on density is likely to vary depending on local and regional context. In some places, like New York City, the economic and cultural advantages of being in the heart of the city may be sufficiently high that developers will build as much as they are allowed within the urban core.[179] Loosening density limits in the West Village—or in other places with especially high colocational value like Berkeley, California—will likely trigger new, compact growth.[180] But that is not true everywhere. Indeed, in many places, there is much less location-specific value and so there is less of a distinction between living in the urban core versus the suburbs. Where that is the case, unlocking development may well produce more suburban development than urban infill.

The City of Laissez Faire may not turn out to be denser than at least some of its more regulated peers.

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177 There are plenty of examples of places where new development exceeded demand with sometimes devastating economic results. From Las Vegas to Phoenix, overly optimistic housing production turned periods of boom to bust with high vacancy rates, abandoned projects, and often disinvestment in the urban core as people fled floundering places. *See generally, e.g.*, Craig A. Depken II, Harris Hollans & Steve Swidler, *Housing Bubbles and Foreclosures That Follow: The Case of Las Vegas*, *in* CHALLENGES OF THE HOUSING ECONOMY: AN INT'L PERSPECTIVE 47 (Colin Jones et al. eds., 2012).

178 *See, e.g.*, Mieszkowski & Mills, *supra* note 106, at 135 (describing growth of cities); *see also* Briffault, *supra* note 86, at 255 (describing the evolution of suburbs).

179 *See, e.g.*, Elizabeth Currid, *How Art and Culture Happen in New York: Implications for Urban Economic Development*, 73 J. AM. PLAN. ASS'N. 454, 460 (2007) (discussing agglomeration benefits to artists).

180 *But see* Kyle Mangum, *The Role of Housing in Carbon Emissions* 4 (W.J. Usery Workplace Rsch. Grp., Working Paper No. 2017-4-1, 2017) ("Simulations show that relaxing regulation in lower carbon places—a local land use 'subsidy,' in a sense, to low carbon locales—does little to reduce the aggregate emissions, in large part because lower rents increase the consumption of land and housing within those cities and across the economy.").

B. The Problem of Even Worse Substitutes

Return, now, to Greenville. Measures designed to reduce carbon emissions may have the opposite result by pushing development to more carbon-intensive places.

If housing demand were entirely exogenous, green building codes and other carbon-reduction strategies would constrain carbon emissions. They might increase housing costs, but emissions would decrease. Housing demand is not entirely exogenous, however.

A local government that enacts significant regulatory burdens on development—whether in the form of green building codes, or other restrictive land use regulations—will tend to increase construction costs.[181] The magnitude of the impact is contested and obviously varies depending on the substance of the requirements. One engineering firm estimates that building to LEED certification standards can increase construction costs by 10% to 30%, plus higher costs for architects and other certification costs.[182] A more recent empirical study calculated that LEED Platinum certification would increase construction costs by 9.43%, plus an additional 1.31% for "soft costs."[183] Studies are quick to point out that energy savings over the life of the building will usually repay those higher costs.[184] But this does not always translate into end consumers' willingness to pay.[185]

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181 *See* Nolon, *supra* note 17, at 307 ("Adopting stricter standards, of course, increases the capital costs of new and substantially renovated buildings.").

182 *See, e.g.*, Stephen J. Vamosi, *The True Cost of LEED-Certified Green Buildings*, HPAC ENG'G (Jan. 1, 2011), https://www.hpac.com/archive/article/20926453/the-true-cost-of-leedcertified-green-buildings [https://perma.cc/WR6Z-E2NG]; *see also* Eric Rosenkranz, *Financial Benefits of Green Buildings – Are They Expensive?*, SMART CRE (May 21, 2022), https://smart-cre.com/financial-benefits-of-green-buildings-are-they-expensive [https://perma.cc/ZM7W-2FAA] (arguing that green building increases costs by only 2%).

183 *See* Latif Onur Uğur & Neşe Leblebici, *An Examination of the LEED Green Building Certification System in Terms of Construction Costs*, 81 RENEWABLE & SUSTAINABLE ENERGY REVS. 1476, 1482 (2018).

184 *See id.*; *see also* Charles J. Kibert, *Green Buildings: An Overview of Progress*, 19 J. LAND USE & ENV'T L. 491, 495 (2004) ("[G]reen buildings make economic sense, not always on a capital or first cost basis, but virtually always on a life cycle basis.").

185 *Compare* Matthew E. Kahn & Nils Kok, *The Capitalization of Green Labels in the California Housing Market*, 47 REG'L SCI. & URB. ECON. 25, 33 (2014) (finding possible gap in construction cost and premium paid for green buildings), *with* Dena M. Gromet, Howard Kunreuther & Richard P. Larrick, *Political Ideology Affects Energy-Efficiency Attitudes and Choices*, 110 PROC. NAT'L ACAD. SCI 9314, 9317 (2013) ("More politically conservative individuals are less in favor of investing in energy efficiency than are those who are more politically liberal . . . ."). *But see* Piet Eichholtz, Nils Kok & John M. Quigley, *The Economics of Green Building*, 95 REV. ECON. & STATS. 50, 52 (2013) (finding that energy savings are capitalized into rents).

Regulatory burdens therefore operate like a kind of development tax.[186] The incidence of that "tax" depends in part on the local housing market.[187] It will be borne by some combination of developers (in higher construction costs), housing consumers (if the costs can be passed on to them), and owners of undeveloped property (land values may decline as construction costs increase).[188] But so long as there is some elasticity in the housing market, consumers can avoid some of the costs by moving elsewhere.[189]

The problem, as we have seen, is that the carbon cost of new development varies dramatically by place. If regulatory burdens in a low-carbon place like the urban core shift development out into the suburbs by making urban development relatively more expensive, the effect will likely be to increase GHG emissions.[190] Returning to the parable of Greenville, its stringent green building codes might reduce not only carbon emissions in the city but also overall development activity, displacing it into suburbs that do not have such onerous regulations and that are naturally more carbon intensive.[191] That can be a damaging trade-off.

Just as carbon emissions vary dramatically within an MSA—between a central city and its suburbs—emissions also vary across the United States. Heating and cooling are the primary sources of residential energy consumption.[192] More extreme temperature variation in places like the Midwest will require more cooling in the summer and heating in the winter, increasing energy usage.[193] Housing in more temperate places like most of California produces far less carbon per household because they have fewer heating and cooling days.[194]

Moreover, some parts of the country have been more aggressive than others at decarbonizing their energy grids. A kilowatt of electricity from coal produces much more carbon than a kilowatt from a

186 *See, e.g.*, Robert C. Ellickson, *The Irony of "Inclusionary" Zoning*, 54 S. CAL. L. REV. 1167, 1188 (1981) (identifying inclusionary zoning measures as a tax on development).

187 *See* Vicki Been, *Impact Fees and Housing Affordability*, 8 CITYSCAPE 139, 150 (2005) (describing who will bear the costs of land use exactions).

188 *See id.* at 150–53 (arguing that elasticity in housing market will determine who bears the incidence of exactions).

189 *See id.*

190 *See* POSNER & WEISBACH, *supra* note 51, at 69; *see also* Smith, *supra* note 60, at 1159 ("A home build in a rural location, twenty miles from the nearest place of employment and the nearest grocery store, qualifies for Energy Star certification as readily as an identical house that is one-half block away from a subway station and in a walkable, bikeable neighborhood.").

191 *See, e.g.*, Boudreaux, *supra* note 18, at 12 ("[C]onstraining construction in a jurisdiction tends to push the demand for housing to places further from the city center.").

192 Goldstein et al., *supra* note 42, at 19123.

193 *Id.*

194 *See id.*

natural gas, which is, of course, more carbon intensive than a kilowatt from solar, wind, or hydroelectric power.[195] Different parts of the country rely on energy sources with different GHG emissions.[196] In the Southeast, for example, coal and gas remain a significant source of energy production.[197] In contrast, the Northeast relies much more on hydroelectric power and wind.[198] The combination of these two factors means that the average house in Austin, Texas, produces significantly more GHG emissions than an equivalent house in Portland, Oregon.[199]

The regional variation in carbon emissions is not enough to overcome the carbon costs of the suburbs, however. Intracity variation in carbon emissions is greater than interregional variation. According to a leading study, the city with the lowest standardized household CO_2 emissions is San Diego, California; the city with the highest is Memphis, Tennessee.[200] Nevertheless, the per household carbon emissions in the Memphis urban core are still lower than in the San Diego suburbs. According to somewhat dated but nevertheless illustrative data, the 2013 per household carbon emissions in the Memphis urban core were 35.5 tons of CO_2 per year.[201] In La Mesa, California, a San Diego suburb, they were between 38.1 and 41.4 tons of CO_2 per household per year.[202] The suburb of Jamul, California, had even higher per capita

195 *See Carbon Dioxide Emissions from Electricity*, WORLD NUCLEAR ASS'N (Oct. 2022), https://www.world-nuclear.org/information-library/energy-and-the-environment/carbon-dioxide-emissions-from-electricity.aspx [https://perma.cc/NZ59-YBAE]; *see also* IPCC, *Sixth Assessment Report*, *supra* note 1, at 25, 41, 51.

196 *See All Energy Infrastructure and Resources*, U.S. ENERGY INFO. ADMIN.: U.S. ENERGY ATLAS (last visited Feb. 3, 2024), https://atlas.eia.gov/apps/eia::all-energy-infrastructure-and-resources (showing the various energy plants across the country and different sources). This source notably shows a concentration of coal plants in the corridor between Pennsylvania and Missouri, a large group of wind plants between Texas and Iowa, and a pattern of solar energy spanning the East Coast. *Id.*

197 *See State Electricity Generation Fuel Shares*, NEI (Aug. 2022), https://www.nei.org/resources/statistics/state-electricity-generation-fuel-shares [https://perma.cc/A3KU-5VDY] (showing for instance that 70.7% of Kentucky's energy generation stems from coal and 72.1% of Mississippi's from gas).

198 *See id.* (noting New York's 22% generation from hydroelectric compared to 0% coal generation and Vermont's combined 65.7% production from hydroelectric and wind energy).

199 *See* Edward L. Glaeser & Matthew E. Kahn, *The Greenness of Cities: Carbon Dioxide Emissions and Urban Development*, 67 J. URB. ECON. 404, 410 (2010); Goldstein et al., *supra* note 42, at 19123.

200 *See* Glaeser & Kahn, *supra* note 199.

201 *See Average U.S. Household Carbon Footprint by Zip Code*, COOLCLIMATE NETWORK (last visited Feb. 3, 2024), https://coolclimate.berkeley.edu/maps (type desired zip code into the search bar—38103 for Memphis, Tenn.; then hover mouse over map for carbon footprint data).

202 *See id.* (reporting the following data by zip code: 91941, 41.4 tCO_2e per year; 91942, 38.1 tCO_2e per year).

carbon emissions of 63.9 tons of CO_2 per year.[203] Even perfect weather year-round cannot overcome the carbon emissions associated with larger houses and the extra VMT of suburban living.

To be clear, this is emphatically not an argument against green building codes, even in low-carbon places. Where housing demand is persistent and strong, green building codes may not affect development activity very much and so will likely reduce overall GHG emissions. That is, the energy savings from sustainable development may well outweigh any marginal impact of a small number of households moving to higher-carbon places. Moreover, some consumers may well prefer a place that pursues an aggressive climate agenda, actually *increasing* demand.[204] But this is an empirical question and one that varies by place.[205] The point here is to recognize that regulatory burdens can shift development to higher-carbon places, potentially blunting or even erasing their benefits.

From the perspective of carbon emissions, then, growth should be concentrated in the urban core of cities in the most temperate parts of the country that also rely less on coal: out west and on the Eastern Seaboard from Virginia south.[206] Green building codes in downtown San Diego might actually increase carbon emissions because every forgone housing unit there will push development somewhere more carbon intensive, whether it's San Diego's own suburbs or other cities in more carbon intensive states. But similar regulations in San Diego's suburbs make for more complicated trade-offs. If those regulations marginally reduce new building supply, where will housing consumers move instead? If they move closer into the urban core, that will end up reducing emissions. If, however, they move instead to a more remote suburb, or to an equivalent suburb in an entirely different city, the results may well be worse.

This is not to suggest that any particular household is choosing between living in downtown San Diego or a suburb of Memphis. The pressures here are systemic. But all else being equal, higher costs depress demand and shift where people live. Indeed, this straightforward intuition is a staple of the zoning reform movement that blames zoning

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203 *See id.* (reporting 63.9 tCO_2e per year for 91935 zip code).

204 *Cf., e.g.*, Patrick Sisson, *Can Cities Combat 'Green Gentrification'?*, BLOOMBERG (Nov. 10, 2022, 4:35 PM), https://www.bloomberg.com/news/features/2022-11-10/a-challenge-for-cities-going-green-without-the-gentrification [https://perma.cc/J9XY-EYSX] (describing sustainable communities seeing housing price increases).

205 *Cf.* Farber, *supra* note 51, at 362 (arguing that "carbon leakage" is not inevitable and that it is an empirical question whether and when carbon-mitigation strategies will drive people to higher carbon alternatives).

206 *See* Goldstein et al., *supra* note 42, at 19123 (producing maps showing carbon impact of different regions). Of course, this may change as energy grids continue to decarbonize.

for macroeconomic impacts on GDP because of reduced residential mobility and distortions in the labor market.[207] The same systemic pressures should affect carbon emissions as well, with similar trade-offs. Every household that moves to—or remains in—a suburb of Baton Rouge because housing costs are too high in California amounts to an extra thirty to forty tons of CO_2 per year.

Ultimately, then, even the best-intentioned green building codes designed to reduce emissions can actually increase carbon emissions if they push people instead to more carbon-intensive places.

IV. CLIMATE-FOCUSED LAND USE REGULATIONS

To summarize the argument so far, housing location and size are among the key factors driving GHG emissions. Dense housing near city centers produces far less carbon per household than sprawling housing in the suburbs, and carbon emissions also vary by region. Some recent reform efforts have focused on relaxing zoning restrictions to allow for greater building density and on enacting strict new building regulations to minimize emissions. However, both of these responses are inadequate and, potentially, self-defeating. Looser zoning will not necessarily produce density, and green building codes may raise housing costs to such an extent that development will move instead to more carbon-intensive places.[208] What is needed are zoning rules better designed to promote density, and situational zoning reforms that are more attentive to place.[209]

Many proposals for curbing sprawl—a perennial focus of land use regulations—rely on regional or statewide power.[210] Indeed, there is a recurring theme in land use scholarship that its principal pathologies are a result of parochial localism.[211] The fact that local decisions have such significant externalized impacts is an argument for relocating

207 *See, e.g.*, Peter Ganong & Daniel Shoag, *Why Has Regional Income Convergence in the U.S. Declined?*, 102 J. URB. ECON. 76, 85 (2017); Edward Glaeser & Joseph Gyourko, *The Economic Implications of Housing Supply*, 32 J. ECON. PERSPS. 3, 25 (2018) (blaming zoning for a reduction of GDP between 2% and 9%).

208 *Cf.* Smith, *supra* note 60, at 1153 (noting that green building standards should vary depending on local climate).

209 *See* Landis, *supra* note 110, at 679 ("[S]tringently implemented land-use regulations do in fact contribute to *reduced* sprawl." (emphasis added)).

210 *See* INGRAM ET AL., *supra* note 48 (identifying Smart Growth's focus on regionalism); *cf.* Jerusalem Demsas, *Colorado's Ingenious Idea for Solving the Housing Crisis*, THE ATLANTIC (May 25, 2023), https://www.theatlantic.com/magazine/archive/2023/07/local-government-power-nimby-denver/674164/ [https://perma.cc/T5JV-W7PQ] (arguing that local governments have too much power).

211 *See, e.g.*, DAVID RUSK, CITIES WITHOUT SUBURBS 33–35 (2d ed. 1995); Myron Orfield, *Metropolitics: A Regional Agenda for Community and Sustainability*, 28 F. SOC. ECON. 33, 42–43 (1999).

land use decisionmaking to the state or even the federal government. The tradition of localism dies hard, however.[212] Calling on state or federal action to control development patterns would require a radical reconfiguration of land use authority.[213] The aspirations in this Part are attentive to feasibility and political reality and therefore do not propose structural changes to the allocation of regulatory power.[214] While this Part includes some specific proposals for the federal government and states, they are to supplement, not supplant, local efforts.[215] In short, the prescriptions in this Part expand the regulatory toolkit within the existing allocation of land use authority and are intended to be practical.[216]

This is not to suggest that all of the proposals below are modest or have a realistic chance of surviving the current political landscape, especially since a significant percentage of voters in many places will reject this Article's basic premise that land use regulation should try to address climate change. Nevertheless, the proposals all operate broadly within the existing allocation of regulatory power over land use controls. And when it comes to the specific prescriptions for local climate zoning, this Article offers a blueprint for individual local governments to act independently in ways that will minimize GHG emissions overall.

This Part first identifies a role for the federal government, primarily in producing data that local governments can use to adopt the

212 *See* Schragger, *supra* note 55.

213 *See id.* at 131 ("Regionalists' efforts to break down barriers between suburbs and cities have produced little in the way of substantive gains over the last seventy-five years.").

214 The approach is reminiscent of Michael Allan Wolf's recent set of proposals to reform zoning in anticipation of the next public health emergency. *See* Michael Allan Wolf, *Zoning Reformed*, 70 KAN. L. REV. 171 (2021); *cf.* INGRAM ET AL., *supra* note 48, at 15 ("Voluntary local action could arguably be as effective as the presence of statewide regulations.").

215 This resembles, to some extent, John Nolon's call for a kind of collaborative subsidiarity, where states partner with local governments in furthering state and local policies. *See* John R. Nolon, *Death of Dillon's Rule: Local Autonomy to Control Land Use*, 36 J. LAND USE & ENV'T L. 7, 35–37 (2020).

216 California has demonstrated the importance of pursuing politically pragmatic solutions to land use reform. The sweeping land use reforms reflected in S.B. 827 and S.B. 50 both failed, while powerful reforms to existing laws managed to pass, even though they had much the same impact. *See generally* Christopher S. Elmendorf, Eric Biber, Paavo Monkkonen & Moira O'Neill, *Making It Work: Legal Foundations for Administrative Reform of California's Housing Framework,* 47 ECOLOGY L.Q. 973 (2020) (describing how the state adopted meaningful land use reforms by acting within the existing legal and regulatory structure); Liam Dillon, *A Major California Housing Bill Failed After Opposition from the Low-Income Residents It Aimed to Help. Here's How It Went Wrong*, L.A. TIMES (May 2, 2018, 12:05 AM), https://www.latimes.com/politics/la-pol-ca-housing-bill-failure-equity-groups-20180502-story.html [https://perma.cc/BHT6-3AWR] (discussing the failure of S. 827, 2017–2018 Reg. Sess. (Cal. 2018)); Conor Dougherty, *California, Kills Bill Aimed at Easing Housing Crisis*, N.Y. TIMES, Jan. 31, 2020, at B1 (discussing the failure of S. 50, 2019–2020 Reg. Sess. (Cal. 2020)).

appropriate climate zoning. This Part then turns to the principal proposals for local climate zoning, divided among high-carbon and low-carbon places, and strategies that are appropriate for all local governments. The Part concludes with a brief survey of ways in which states could support those local climate zoning initiatives.

A. National Responses

The interregional differences in carbon emissions suggest that the federal government should have an interest in influencing where development happens in this country. Its toolkit is relatively limited, however, since most regulatory authority over development decisions resides in state and local governments. The federal government still has two important roles to play even without upsetting local control.

The first is in producing and providing information on carbon emissions. Key to climate zoning is an attentiveness to local context.[217] Low-carbon places should encourage development, while carbon-intensive places should resist. These dynamics create meaningful information hurdles for local governments, however, trying to understand where they are on this spectrum.

In many cities, especially in the Northeast, an MSA may consist of dozens of separate local governments, if not more.[218] The concerted efforts of one to promote density may not be effective if its neighbors take a different approach.[219] Imagine, for example, a suburb like Needham near Boston. It is traditionally an outer-ring suburb with its own commercial areas. Nevertheless, many people commute to Boston, and it is a carbon-intensive place to live. An omniscient carbon dictator would promote more growth and density in the center of Boston, or at least in closer suburbs—in places like Newton—while discouraging new development in Needham. But if Needham, acting alone, adopted antigrowth measures, chances are that development might simply leapfrog Needham even further out, to places like Dover or Wellesley.[220]

To make matters worse, in the absence of a climate dictator, places are unlikely to agree where growth and density should occur. There is

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217 *See infra* Section IV.B.

218 *See, e.g.*, U.S. Census Bureau, *Vermont: 2020 Core Based Statistical Areas and Counties*, https://www2.census.gov/programs-surveys/metro-micro/reference-maps/2020/state-maps/50_Vermont_2020.pdf [https://perma.cc/S8G4-V4SQ] (showing an MSA for Burlington that includes three counties).

219 *See, e.g.*, Boudreaux, *supra* note 18, at 15 (describing the Virginia suburbs of D.C. and observing "that Fairfax's stricter large-lot zoning laws have pushed new construction out to the more distant suburban county").

220 *See, e.g.*, *id.* at 13 ("[M]ost excluded home seekers will move *further out* to distant suburbs with relatively favorable prices or favorable zoning laws.").

almost always somewhere even closer to the urban core. This creates opportunities for political mischief. The parochial self-interest of communities like Newton and Needham may well cause them both to resist growth, arguing that more should occur closer to Boston.[221] Conventionally, in-place property owners act like a cartel and want to restrict the supply of new housing.[222] Carbon mitigation could provide a convenient scapegoat to justify all manner of exclusionary zoning.[223] An affluent suburb, for example, might point to the carbon intensity of development as a reason to impose strict zoning measures. It is not easy for voters or even policy makers to assess whether that claim is true, and whether development there will, in fact, be more carbon intensive than in other municipalities where development might otherwise occur.

Clear carbon maps would significantly reduce those information barriers and NIMBY opportunities. Scholarly versions of such data already exist and served as the source material for much of the discussion in Part I. But it is difficult to keep the data current, and the federal government should not cede methodology decisionmaking to scholars. Presenting clear, up-to-date maps will create greater political accountability, allowing sincere government actors to pursue the appropriate strategies based on the carbon intensity of local development, and revealing when carbon is being invoked in bad faith to justify NIMBY exclusion.

Granular geographic data would be most revealing. Ideally, development will occur along something like a regional level transect, with a dense urban core (or cores) and development dropping off sharply as distance from the urban core increases.[224] The data could show carbon emissions of each municipality—or even each neighborhood—to allow local governments to see exactly where they should fall on a prescribed density gradient. The United States Department of Housing and Urban Development (HUD) pursued an analogous strategy under the Obama administration, producing incredibly detailed maps to assess compliance with Community Development Block Grant

221 There are many reasons why a local government might want to resist development, including simply protecting property values. *See* FISCHEL, *supra* note 129, at 80.

222 *See id.*

223 *See, e.g.*, Michael Allan Wolf, Euclid *at Threescore Years and Ten: Is This the Twilight of Environmental and Land-Use Regulation?*, 30 U. RICH. L. REV. 961, 982 n.124 (1996) (quoting Note, *State-Sponsored Growth Management as a Remedy for Exclusionary Zoning*, 108 HARV. L. REV. 1127, 1137 (1995)); Alan Mallach, *The* Mount Laurel *Doctrine and the Uncertainties of Social Policy in a Time of Retrenchment*, 63 RUTGERS L. REV. 849, 861–62 (2011) (discussing suburban exclusionary zoning).

224 *See, e.g.*, Nicole Stelle Garnett, *Redeeming Transect Zoning?*, 78 BROOK. L. REV. 571, 583 (2013) (discussing the transect).

(CDBG) requirements to affirmatively further fair housing (AFFH).[225] Admittedly, data alone did very little to overcome NIMBY opposition to affordable housing in many places despite HUD prioritizing enforcement of AFFH mandates.[226] Still, information is a necessary if not sufficient requirement for local climate zoning.[227]

Achieving a detailed gradient from low to high density across neighborhoods and municipalities might be too difficult and complex to be useful to local governments. This granular data should also be supplemented by an intentionally oversimplified system that separates places into three zones: low carbon (growth encouraged), high carbon (growth discouraged), and average carbon (neutral on growth). This kind of rough cut would allow local officials—and residents—to easily see and interpret which broad strategy they should pursue for climate mitigation.

Importantly, those maps would have to be updated frequently. As places develop, the relative carbon emissions shift. A suburb that was high carbon can become relatively low(er) carbon if growth shifts even further outside the city, or if a suburb develops into its own commercial and business center that minimizes commuting.[228] More structurally, changes in the sources of local energy production from fossil fuels to renewable resources will dramatically shift high-carbon and low-carbon places, as will the proliferation of electric vehicles.[229] A high-carbon place at time 1 might become a relatively low-carbon place at time 2, and so information and maps—and the resulting policy implications—will need to stay up to date.

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225 *See, e.g.*, Raphael Bostic & Arthur Acolin, The Potential for HUD's Affirmatively Furthering Fair Housing Rule to Meaningfully Increase Inclusion 10 (2017) (unpublished manuscript), https://www.jchs.harvard.edu/sites/default/files/a_shared_future_potential_for_hud_affh_increase_inclusion.pdf [https://perma.cc/JV4D-DFQN] (describing the new HUD mapping tool as "a powerful resource that allows local government to quickly produce information that will facilitate meaningful conversations"). For the maps, see *Affirmatively Fair Housing*, U.S. DEP'T OF HOUS. & URB. DEV., https://egis.hud.gov/affht/.

226 For an evaluation of the AFFH requirements, see, for example, Katherine M. O'Regan & Ken Zimmerman, *The Potential of the Fair Housing Act's Affirmative Mandate and HUD's AFFH Rule*, 21 CITYSCAPE 87 (2019); Justin P. Steil & Nicholas Kelly, *Survival of the Fairest: Examining HUD Reviews of Assessments of Fair Housing*, 29 HOUS. POL'Y DEBATE 736 (2019).

227 Some states have already taken some modest steps in this direction. For example, California requires an examination of a building site's access to transportation. *See* CAL. CODE REGS. tit. 4, § 10325(c)(4)(A)(1) (2023).

228 *See supra* note 161 and accompanying text (discussing polycentric MSAs).

229 *See* Robert Sussman, *Designing the New Green Deal: Where's the Sweet Spot?*, 49 ENV'T L. REP. 10428, 10439 (2019) (noting the emission reduction strategy of transitioning to lower carbon energy sources); Michael P. Vandenbergh & Paul C. Stern, *The Role of Individual and Household Behavior in Decarbonization*, 47 ENV'T L. REP. 10941, 10950 (2017) (noting the role that electric vehicles will play in carbon reduction).

Maps alone will not solve the problem of interlocal substitution effects. One high-carbon place (say, Needham) pushing development to an even higher-carbon place (Wellesley) is a potential cost of uncoordinated local action in a way that is all but impossible to solve without coordination by some higher level of government. But it is important not to let the perfect be the enemy of the good.[230] So long as some low-carbon and high-carbon places within an MSA adopt the proposals below, the impact should be to reduce GHG emissions overall. High-quality, up-to-date carbon maps will at least reveal which strategies different municipalities should adopt to address emissions.

The second role for the federal government is using its spending power to encourage growth and density in low-carbon places.[231] The most likely existing mechanism is through changes to CDBGs.[232] This is the largest federal program providing direct funding from the federal government to local governments, effectively bypassing the state.[233] Already some scholars have advocated using CDBGs as a tool to motivate land use reform.[234] Jenny Schuetz has argued that CDBGs should be scored to give more money to local governments that engage in meaningful zoning reform to accommodate growth.[235] Her proposal is sensible but is geared towards the affordability crisis.[236] Under

230 *Cf.* Kevin M. Stack & Michael P. Vandenbergh, *The One Percent Problem*, 111 COLUM. L. REV. 1385 (2011) (arguing that climate change prevention requires regulating small contributors).

231 States have done this to some limited extent. *See, e.g.*, INGRAM ET AL., *supra* note 48, at 7 (describing Massachusetts's "Commonwealth Capital system" that distributed state funds to municipalities based in part on scoring their Smart Growth efforts).

232 *See generally* Mary Beth Johnson Pavlik, *A Look at the Recovery Act and Its Effect on the Community Development Block Grant Entitlement Program*, 62 ADMIN. L. REV. 523, 526–30 (2010) (describing the use of CDBGs to promote growth).

233 *See* Michael Wallace, *Understanding the Fiscal Year 2022 Funding Bill*, NAT'L LEAGUE OF CITIES (Mar. 25, 2022), https://www.nlc.org/article/2022/03/25/understanding-the-fiscal-year-2022-funding-bill/ [https://perma.cc/K7FB-MPQM].

234 *See, e.g.*, Jenny Schuetz, *HUD Can't Fix Exclusionary Zoning by Withholding CDBG Funds*, BROOKINGS INST. (Oct. 15, 2018), https://www.brookings.edu/research/hud-cant-fix-exclusionary-zoning-by-withholding-cdbg-funds/ [https://perma.cc/7A9V-U64R] ("Secretary Carson's first concrete step towards 'taking on the NIMBYs' was to suggest that the . . . rule should be revised to make receipt of HUD funds, particularly from the Community Development Block Grant (CDBG) program, contingent on local zoning reform."); *see also* Housing, Opportunity, Mobility, and Equity Act of 2019, H.R. 4808, 116th Cong. (2019) (proposed legislation by Rep. Jim Clyburn to condition CDBGs on inclusive zoning practices, among other affordable housing goals). Nearly twenty-five years ago, William Buzbee also advocated for leveraging conditional federal funding—although not CDBGs specifically—on local governments promoting density. *See* Buzbee, *supra* note 22, at 107–10.

235 *See* Schuetz, *supra* note 234.

236 *See id.* ("HUD can and should encourage select cities to reform neighborhood-level zoning and to build more affordable housing in affluent areas.").

her proposal, a high-carbon place could receive CDBG funding if it promoted more housing.[237] An important alternative (or addition) would be to include climate-focused zoning reform so that low-carbon places receive more money.[238]

Not only would this use of CDBGs reward low-carbon places, which are invariably city centers, it would also create an incentive to become lower-carbon. Properly designed, it would reward cities for encouraging urban growth and discouraging sprawl. It would also reward cities that adopt mass transit or clean energy with higher levels of CDBGs. Federal transportation funding, too, could be linked more pervasively to GHG emissions. Already, the Department of Transportation directs significant money to projects that reduce carbon, encouraging investment in more sustainable transportation initiatives.[239]

The principal tools for addressing the climate impacts of the built environment belong to local governments, however.

B. Local Climate Zoning

The land use strategies for minimizing carbon emissions depend for the most part on whether the specific municipality is a high-carbon or low-carbon place. At the most general level, low-carbon places should encourage growth and density, while high-carbon places should resist development so long as the likely alternative places for

237 *See id.* If HUD chose to use CDBG grants to build affordable housing in affluent areas, these areas already have higher carbon footprints due to the correlation between increased wealth and increased GHG emissions. *See* Morteza Taiebat & Ming Xu, *5 Charts Show How Your Household Drives Up Global Greenhouse Gas Emissions*, PBS (Sept. 21, 2019, 2:42 PM), https://www.pbs.org/newshour/science/5-charts-show-how-your-household-drives-up-global-greenhouse-gas-emissions [https://perma.cc/QF7M-K324] ("A household's carbon footprint generally increases with its income . . . .").

238 For an analogous proposal, some scholars have proposed allocating Low-Income Housing Tax Credits based on disaster preparedness. *See, e.g.*, Aditi Mehta, Mark Brennan & Justin Steil, *Affordable Housing, Disasters, and Social Equity: LIHTC as a Tool for Preparedness and Recovery*, 86 J. AM. PLANNING ASSOC. 75, 79–82 (2020).

239 *See, e.g.*, Valerie Volcovici & David Shepardson, *U.S. to Grant $6.4 Bln Funding for Projects to Reduce Carbon Emissions*, REUTERS (Apr. 21, 2022, 5:04 AM), https://www.reuters.com/business/sustainable-business/us-grant-64-bln-funding-projects-reduce-carbon-emissions-2022-04-21/ [https://perma.cc/N8KQ-7NUA] ("The U.S. Transportation Department said on Thursday it would award $6.4 billion over five years to states to fund projects to reduce greenhouse gas emissions."); *FHWA Steps Up Efforts to Tackle Greenhouse Gas Emissions from Highway Construction with $7.1 Million for 'Climate Challenge' Participants*, U.S. DEP'T OF TRANSP.: FED. HIGHWAY ADMIN. (Oct. 20, 2022), https://highways.dot.gov/newsroom/fhwa-steps-efforts-tackle-greenhouse-gas-emissions-highway-construction-71-million-climate [https://perma.cc/3NPQ-5P8T] (describing efforts). *But see* Brad Plumer, *Road-Happy Colorado Turns a Skeptical Eye on More Asphalt*, N.Y. TIMES, Feb. 11, 2022, at A1 (describing how federal investments in highway infrastructure could increase GHG emissions).

development are not even worse. A number of strategies are universal, however, and should be adopted by any local government. These are considered in order below. Some of the specific strategies are familiar, although not necessarily as tools to reduce carbon. Others are more innovative. The list is not intended to be exhaustive but merely illustrative. The details are less important to this project than identifying the kinds of reforms that are likely to promote GHG-reducing development patterns.

Details aside, it is important to acknowledge how this list of reforms differs from traditional approaches to zoning. The focus of early land use regulation was primarily on separating incompatible uses. Those conflicts were most likely to occur in the urban core, and so it was there that zoning was most proscriptive and had its biggest impact.[240] Rural zoning did not even exist until the late 1930s.[241] But from a climate perspective, it is rural, exurban, and suburban development that pose the greatest harms and are where regulatory restrictions should be the strongest.

1. City Centers and Other Low-Carbon Places

Regulatory Reform. The goal for the urban core should be to promote growth. Eliminating regulatory barriers to density—the primary focus of current zoning reform efforts—is an important part of the approach.[242] Efforts to promote density will fail if local zoning regulations prohibit it. Loosening height limits, floor area ratios, lot coverage restrictions, and other direct limits on density will unlock the possibility of taller and denser development.[243]

Procedural reforms are important, too. Low-carbon places should try to make development easier and faster. Land use regulations can constrain new development directly through substantive density limits, but also indirectly by imposing significant regulatory costs on development through compliance requirements or simply through delay.[244]

240 *See* O'Neill et al., *supra* note 16, at 1071–73 (describing the effects of zoning on urban sprawl).

241 *See* Michelle Wilde Anderson, *Sprawl's Shepherd: The Rural County*, 100 CALIF. L. REV. 365, 370 (2012) ("[T]he phenomenon of rural zoning by counties was so new that [a] 1938 article announced it as an innovation hot off the legislative press from Wisconsin . . . .").

242 *See* Chris Elmendorf, Opinion, *California Legislators Refuse to Fix CEQA. Here's How Newsom and the Courts Can Take Charge*, S.F. CHRON. (Jan. 14, 2023), https://www.sfchronicle.com/opinion/openforum/article/california-ceqa-environment-law-17713699.php [https://perma.cc/A4MP-LWVJ] (advocating for reform of California environmental law that currently stalls development); *see also, e.g.*, *Developments in the Law*, *supra* note 73, at 1600–01.

243 *See, e.g.*, Adams-Schoen & Sullivan, *supra* note 121, at 168.

244 *See, e.g.*, EINSTEIN ET AL., *supra* note 127, at 146–47 (discussing the impact of delay on development projects).

Delay is death for many development projects, and so the prospect of a lengthy land use process can deter development.[245] Some places have taken important steps in this direction. For example, Charlotte, North Carolina, adopted a "unified development ordinance" that synthesizes different regulatory processes, including zoning, subdivision, stormwater, and street regulations, among others.[246]

Environmental review has become a particular flashpoint for regulatory reform efforts. In California, in particular, environmental review is often used to delay and ultimately block dense urban development.[247] There is something ironic about invoking environmental concerns to resist low-carbon development. Nevertheless, as Katrina Wyman and coauthors have shown, environmental review often has this effect, even internationally.[248] Efforts to reform California's land use system have therefore focused on procedural reforms, especially around the California Environmental Quality Act (CEQA).[249] Other procedural reforms include giving a stronger builder's remedy to

245 *See, e.g.*, Katherine Levine Einstein, David Glick & Maxwell Palmer, The Politics of Delay in Local Politics: How Institutions Empower Individuals 12 (Apr. 3, 2017) (unpublished manuscript), https://sites.bu.edu/kleinstein/files/2017/05/EinsteinGlickPalmerMPSA.pdf [https://perma.cc/L54G-DV6M].

246 *See* Charlotte, N.C., Unified Development Ordinance (Aug. 22, 2022).

247 *See, e.g.*, Elmendorf, *supra* note 242; *see also* O'Neill et al., *supra* note 16, at 1067 n.21 (citing sources); M. Nolan Gray, *How Californians Are Weaponizing Environmental Law*, THE ATLANTIC (Mar. 12, 2021), https://www.theatlantic.com/ideas/archive/2021/03/signature-environmental-law-hurts-housing/618264/ [https://perma.cc/KJ69-3QUN] ("[W]hen a local nonprofit developer proposed several years ago to build a 49-unit apartment building . . . it was slammed with an environmental lawsuit."); Katie Rose Quandt, *With Stunning Irony, Environmental Review Is Being Used to Block Climate Action*, TRUTHOUT (July 12, 2022), https://truthout.org/articles/with-stunning-irony-environmental-review-is-being-used-to-block-climate-action/ [https://perma.cc/UU6U-NFHF] (discussing use of environmental review to block congestion pricing and other climate policies).

248 *See* Wyman et al., *supra* note 73.

249 *See* LEE OHANIAN, CATO INST., POL'Y ANALYSIS NO. 920, COMMON-SENSE POLICY REFORMS FOR CALIFORNIA HOUSING 7–9 (2021); Off. of the Governor of Cal. (@CAGovernor), *Governor Newsom's Statement After Court Halts UC Berkeley from Building New Student Housing*, TWITTER (Feb. 25, 2023, 5:00 PM), https://twitter.com/CAgovernor/status/1629602373319688192 [https://perma.cc/73RF-GJK3] ("Our CEQA process is clearly broken when a few wealthy Berkeley homeowners can block desperately needed student housing for years and even decades."); Editorial, *Editorial: CEQA Is Too Easily Weaponized to Block Housing and Slow Environmental Progress*, L.A. TIMES (Jan. 31, 2023, 5:00 AM), https://www.latimes.com/opinion/story/2023-01-30/editorial-ceqa-is-too-easily-weaponized-to-block-housing-and-slow-environmental-progress [https://perma.cc/8M88-S28E]; Dan Walters, Commentary, *Will California's Misused Environmental Law Finally Be Reformed?*, CAL MATTERS (Feb. 28, 2023), https://calmatters.org/commentary/2023/02/environmental-ceqa-law-reform/ [https://perma.cc/W2Y3-ZT77] (noting momentum for CEQA reform generally).

property owners, essentially empowering courts to allow a development instead of remanding a permit denial back to local authorities.[250]

As Moira O'Neill and Ivy Wang examine in detail, California's Senate Bill 35 takes an even broader approach, "preempting local power to impose a discretionary approval process on qualifying affordable or mixed-income housing" in certain localities.[251] The focus of these reforms is on housing affordability, making it easier to build in places where housing need is most acute. Shifting the emphasis to carbon would mean loosening procedural hurdles in low-carbon places to encourage development there.[252]

These sorts of reforms are by now quite conventional and well developed in the literature, even if they do not tend to focus on carbon emissions. The ones that follow are more innovative and therefore more speculative.

Maximum Unit Sizes. The average size of single-family homes has increased by more than sixty percent over the last fifty years.[253] As noted above, larger homes are more energy intensive.[254] But even more importantly here, larger units mean fewer people per acre, reducing the amount of available housing in low-carbon places.

Relaxing height and floor area ratio (FAR) limits will not result in more housing units if they are filled with ever larger apartments. This is the dynamic in parts of Manhattan, for example, where some of the tallest buildings consist of a small number of enormous apartments to cater to the very wealthy.[255] From the perspective of carbon emissions, this is a problematic development pattern. Better, by far, would be to accommodate more people in smaller units in the same footprint.

One regulatory intervention, then, would be to impose unit size maximums in multifamily housing. Maximum building sizes are, of course, a staple of zoning. The combination of FAR, setbacks, and

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250 *See* KAZIS, *supra* note 24, at 22–23 (discussing states that have adopted varieties of this approach).

251 *See* O'NEILL & WANG, *supra* note 26, at 2 (citing S. 35, 2017–2018 Reg. Sess. (Cal. 2017)).

252 *Cf.* Wyman et al., *supra* note 73, at 38 (noting the irony of environmental review that ignores the carbon costs of suburban sprawl).

253 *See* Wang et al., *supra* note 61, at 978.

254 *See* sources cited *supra* note 64.

255 *See* Stefanos Chen, *Lots of Room, but Only for Luxury*, N.Y. TIMES, Sept. 25, 2022, at RE-6 ("[O]n the Upper East and West Sides of Manhattan, a bundle of high-rise, low-density towers represent a contradiction: big towers with few units, sometimes fewer than the buildings they replace."); *see also* Shivani Vora, *What Micro Housing? The Size of an NYC Apartment Keeps Getting Bigger*, N.Y. POST (Mar. 3, 2022, 11:44 PM), https://nypost.com/2022/03/03/why-the-size-of-an-nyc-apartment-gets-bigger-every-year/ [https://perma.cc/UV7T-E8SL] ("Data collected from 765 residential Manhattan buildings shows that their apartments grew from 950 square feet to 975 square feet on average over the last five years—roughly a 5% increase . . . .").

building height limit the building shell. But these traditional bulk regulations do not limit the size of the internal units. The goal is not just to increase the developable envelope in low-carbon places, but to increase the number of units. Appropriate sizes will vary significantly by market.[256] But imagine, just for example, maximum unit sizes of 750 square feet for a studio, 1,000 square feet for a one-bedroom, and 1,500 square feet for a two-bedroom, respectively.[257]

This comes with obvious practical and conceptual costs. Practically, it may be hard to enforce. Someone wealthy enough can buy two adjacent apartments and simply connect them. But the possibility of scofflaws should not undermine the reform. Moreover, most of the prestige apartments at the high end of the market need to be designed as a single unit to be appealing. Building code administration may not prevent all workarounds but should nevertheless be able to constrain the size of most new units.

The conceptual costs relate, once again, to the problem of substitution effects.[258] The unavailability of large new apartments may push some affluent housing consumers into the suburbs instead where size maximums do not exist. There is considerable data demonstrating that more affluent people produce more carbon per household.[259] The move of the highest carbon-producing households out of the urban core and into the suburbs will increase their carbon emissions even more.[260] Nevertheless, the calculus here must include the greater number of households that can move into the urban core if maximum house sizes increase the number of units per building or per acre. Moreover, imposing unit size maximums through the zoning code will not eliminate existing large units but will apply prospectively only.[261] Therefore, large housing will still be available, although limits on new production will undoubtedly increase its price.

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256 *See, e.g.*, Taryn Williford, *What is Considered a "Small" Apartment?*, APARTMENT THERAPY (Feb. 4, 2019), https://www.apartmenttherapy.com/what-is-considered-a-small-apartment-243701 [https://perma.cc/3NA4-QAJL] ("[T]he standards for what constitutes a 'small apartment' vary wildly based on location. In New York City, a 'small' apartment may be 300 square feet. In Atlanta 300 square feet is practically unlivable.").

257 According to one nationwide study, the average studio in 2018 was 514 square feet; the average one-bedroom was 757 square feet; and the average two-bedroom was 1,138 square feet. *See* Janine DeVault, *Average Apartment Size in the United States: The Complete Guide*, FLEX (July 12, 2021), https://getflex.com/blog/average-apartment-size/ [https://perma.cc/9JKU-HM64].

258 *See supra* Section III.B (discussing the problem of even worse substitutes).

259 *See* Taiebat & Xu, *supra* note 237.

260 *See* Glovin, *supra* note 74, at 10938–39; *cf.* Christopher Serkin, *Divergence in Land Use Regulations and Property Rights*, 92 S. CAL. L. REV. 1055, 1071 (2019).

261 *See, e.g.*, Christopher Serkin, *Existing Uses and the Limits of Land Use Regulation*, 84 N.Y.U. L. REV. 1222, 1232–33 (2009) (describing the prospectivity of zoning changes).

Minimum Numbers of Units. Relatedly, local governments could zone for *minimum*, not maximum, numbers of units per lot. Traditional zoning caps the number of units per acre—it functions like a ceiling not a floor. But in low-carbon places, the regulatory objective should be reversed, with zoning designed to ensure at least minimum levels of density.[262] Michael Lewyn and Judd Schechtman briefly explored this possibility in 2015, labeling the approach as "exceedingly rare."[263]

A few places have, in fact, experimented with this approach at least for certain kinds of developments.[264] Portland, Oregon, requires a minimum of one unit for every 1,000 square feet of lot area for certain lot types,[265] and transit-oriented development (TOD) districts in Charlotte, North Carolina, had a minimum density requirement of at least fifteen units per acre.[266] Seattle, Washington, has taken a slightly different approach, imposing FAR minimums.[267]

Developers often want to build as many units as they possibly can when developing a particular parcel, so there is no need for a regulatory command in this regard. Nevertheless, developers may well prefer to build fewer larger units, set aside large amounts of space for building amenities, or otherwise design units with the goal of maximizing

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262 This resembles a recent trend to replace minimum parking requirements with maximum ones. *See infra* note 335 and accompanying text.

263 Lewyn & Schechtman, *supra* note 24, at 296.

264 *See* WELFORD SANDERS, JUDITH GETZELS, DAVID MOSENA & JOANN BUTLER, AM. PLAN. ASS'N, AFFORDABLE SINGLE-FAMILY HOUSING: A REVIEW OF DEVELOPMENT STANDARDS 20 (1984) ("Although it was usually the maximum number of units per acre that planners and developers were concerned with, two communities, Riverside County, California, and Fort Collins, Colorado, included a provision for a minimum number of units per acre in their requirements for small-lot development."); *see also* Eliot Allen, *It's Time to Talk About National Minimum Urban Density Standards*, PLANETIZEN (May 20, 2015, 7:00 AM), https://www.planetizen.com/node/77132/its-time-talk-about-national-minimum-urban-density-standards [https://perma.cc/W9VE-FH5Q] (describing minimum density requirements in Portland, Oregon and Charlotte, North Carolina, and proposing federal density requirements).

265 PORTLAND, OR., CITY CODE § 33.120.206 tbl.120-3 (2024).

266 CHARLOTTE, N.C., CODE app. A, § 9.1202 (2003 & Supp. 40 2019) (repealed 2019) ("Residential developments and residential components of multi-use developments shall have a minimum density of twenty (20) dwelling units per acre within 1 / 4 mile walking distance from a transit station or a minimum density of fifteen (15) dwelling units per acre between 1 / 4 mile and 1 / 2 mile walking distance from a transit station."); *see also* Allen, *supra* note 264 ("TOD districts in Charlotte, North Carolina . . . require[d] 20 DU/net acre for residences and 0.75 FAR for non-residential and mixed uses.").

267 Dep't of Plan. & Dev., *Minimum Density*, SEATTLE.GOV, https://www.seattle.gov/dpd/codesrules/changestocode/minimumdensity/whatwhy/ [https://perma.cc/HG5W-CBS4] ("For example, a lot of 10,000 square feet with a minimum FAR of 2 would require a building size of at least 20,000 square feet (i.e. a 2 story building that covers the full lot or a 4 story building that covers half the lot).").

profits and not necessarily the number of units.[268] Unit minimums would promote increasing the number of housing units over other considerations. It could prove useful in many low-carbon places.

Land Assembly Through Eminent Domain. The price of land drives housing costs.[269] The price per square foot can go up significantly where land assembly is difficult.[270] That is predictably the case in the urban core where large new projects often require overcoming what Michael Heller labeled a tragedy of the anticommons.[271] Where that is the case, eminent domain can be important for overcoming holdouts and assembling property economically.[272]

This is an unpopular tool. Indeed, the public outcry following the Supreme Court case *Kelo v. City of New London*[273] led to widespread adoption of strict new limits on eminent domain.[274] From the perspective of carbon emissions, however, this is a mistake. Density should beget even greater density, but the challenges of land assembly will increasingly stand in the way the denser a place becomes.[275] Limits on eminent domain disproportionately restrict development in the urban core where it is more valuable because land is more fragmented.[276]

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268 *See, e.g.*, ELLICKSON ET AL., *supra* note 78, at 586–87 (offering an illustrated design exercise demonstrating the difference between maximizing the number of units and maximizing property values and profits for developers).

269 *See* Sheharyar Bokhari, *It's Not All About Demand: Home Prices Are Sky-High Where It's Most Difficult and Most Expensive to Acquire and Develop Land*, REDFIN: NEWS (Oct. 6, 2020), https://www.redfin.com/news/value-of-house-vs-land/ [https://perma.cc/5H8Q-GRGC] (finding land costs to be 60.9% of the average home price in Los Angeles).

270 *See, e.g.*, Michael Heller & Rick Hills, *Land Assembly Districts*, 121 HARV. L. REV. 1465, 1468–69 (2008) (discussing the enormous premium for assembled property in New York City).

271 *See id.* at 1469; *see also* Michael A. Heller, *The Tragedy of the Anticommons: Property in the Transition from Marx to Markets*, 111 HARV. L. REV. 621, 639 (1998) (describing the problem of underuse that arises when too many people have the right to exclude others); Peter Hellman, *How They Assembled the Most Expensive Block in New York's History*, NEW YORK, Feb. 25, 1974, at 31 (providing a vivid example of the challenge of land assembly in the urban core).

272 *See, e.g.*, Lee Anne Fennell, *Taking Eminent Domain Apart*, 2004 MICH. ST. L. REV. 957, 974–76 (theorizing about the value of eminent domain in "thin" land markets).

273 545 U.S. 469 (2005).

274 *See generally* Ilya Somin, *The Limits of Backlash: Assessing the Political Response to* Kelo, 93 MINN. L. REV. 2100 (2009) (discussing fierce backlash to *Kelo*); Christopher Serkin, Response, *Testing the Value of Eminent Domain*, 89 TUL. L. REV. 115, 118 (2014) (discussing political divisions following *Kelo*).

275 As Michael Heller and Roderick Hills provocatively explained, if the market reflects a significant premium for assembled property, that is evidence that land in the area is underassembled. *See, e.g.*, Heller & Hills, *supra* note 270, at 1469 (discussing the breadth of the problem of underuse). To be sure, Heller and Hills are critical of eminent domain and prefer an alternative market-based method of assembling land. *See id.* at 1467–72.

276 *See* Christopher Serkin, *Local Property Law: Adjusting the Scale of Property Protection*, 107 COLUM. L. REV. 883, 898 (2007) ("A statewide redefinition of 'public use' would have

Eminent domain should therefore be readily available for the production of dense housing in the urban core. And, if eminent domain proves too challenging politically, Michael Heller and Roderick Hills proposed "Land Assembly Districts" that, in effect, allow neighbors to put themselves up for sale collectively.[277] There is room for innovation.

TDRs. Transferable development rights (TDRs) are a mechanism for transferring allowable density from one place to another.[278] For example, if a municipality designates a building for historic preservation, it might leave several floors (or some amount of FAR) of otherwise permissible development unusable. To address the perceived unfairness to the property owner, the historic preservation might be accompanied by TDRs that allow the burdened owner to sell those unused development rights to someone nearby, allowing the transferee to develop in excess of otherwise allowable zoning limits.[279] This same approach has been used with some success to protect high-carbon areas from development—say, dramatically limiting permissible development at the urban fringe—while "compensating" owners in that area by allocating TDRs to be used in low-carbon areas, closer to the city center.[280]

Using TDRs in this way produces compound political benefits. First, it blunts some of the natural political opposition to development restrictions and so makes it easier to adopt widespread regulation of sprawl.[281] But, second, TDRs may generate less political opposition in the receiving area than a more general upzoning.[282] NIMBY opponents may strenuously object to an increase in permissible nearby development, whether through an upzoning or a variance.[283] These kinds of location-specific actions tend to produce concerted political opposition. A TDR regime, by contrast, may produce less immediate

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a very different impact on New York City than it would on, say, the small upstate village of York . . . .").

277 *See generally* Heller & Hills, *supra* note 270 (proposing land assembly districts).

278 *See generally* Vicki Been & John Infranca, *Transferable Development Rights Programs: "Post Zoning"?*, 78 BROOK. L. REV. 435 (2013) (describing TDRs).

279 *See* Christopher Serkin, Penn Central *Take Two*, 92 NOTRE DAME L. REV. 913, 917–19 (2016) (describing the use of TDRs around Grand Central Terminal).

280 *See, e.g.*, INT'L CITY/CNTY. MGMT. ASS'N, *supra* note 133, at 12, 14 (discussing "purchase of development rights" and transferable development rights programs).

281 *See* Daniel A. Farber, *Public Choice and Just Compensation*, 9 CONST. COMMENT. 279, 282 (1992) (describing how compensation can disarm burdened property owners' opposition to government action).

282 *See* Serkin, *supra* note 279, at 926 ("As a result, there is little political accountability associated with [TDR] creation.").

283 *See* Vicki Been, *City NIMBYs*, 33 J. LAND USE & ENV'T L. 217, 222 (2018) (describing increasing opposition to urban development).

opposition so long as it is not entirely clear where the TDRs will be used.

This is not idle speculation. When New York City developed the High Line park, it granted extensive TDRs to abutting property owners.[284] It allowed those TDRs to be used within a specially designated TDR transfer zone, which was one avenue wide and sixteen blocks long.[285] The city's calculation was that designating a larger corridor of permissible transfers for High Line TDRs would produce less political opposition than a stand-alone upzoning of the same neighborhood.[286] And this proved to be true. There was little community opposition to the TDR regime, even though it ultimately produced significant new growth and density. TDRs can be an important tool for combating sprawl.

Just Build. Of course, zoning only seeks to create a regulatory framework within which private actors make development decisions. A more direct way of influencing development is for the government simply to build more itself.[287] Governments in this country have a bad record as property developers, and notable failures of public housing have largely driven governments out of the production of new housing.[288] But that is unfortunate and myopic.[289] The production of dense new housing in the urban core does not need to be designed as public

284 *See* VICKI BEEN, JOHN INFRANCA, JOSIAH MADAR & JESSICA YAGER, FURMAN CTR. FOR REAL EST. & URB. POL'Y, UNLOCKING THE RIGHT TO BUILD: DESIGNING A MORE FLEXIBLE SYSTEM FOR TRANSFERRING DEVELOPMENT RIGHTS 3 (2014).

285 N.Y.C., N.Y., ZONING RESOL. § 98-31 (2024); *id.* art. IX, ch. 8, app. B.

286 *See* JOSHUA DAVID & ROBERT HAMMOND, HIGH LINE: THE INSIDE STORY OF NEW YORK CITY'S PARK IN THE SKY 64 (2011).

287 *See* Joy & Vogel, *supra* note 27, at 1381 (describing efforts internationally to build more housing, especially in Hong Kong, Singapore, and Vienna); *see also* Daniel Denvir & Yonah Freemark, *Just Build the Homes*, SLATE (May 22, 2023, 10:00 AM), https://slate.com/business/2023/05/public-housing-upzoning-yimby-affordability-crisis.html [https://perma.cc/N3ZC-T675] ("[O]rganizers and policymakers are advocating for new investments in mixed-income, public housing—social housing—that can serve everyone who wants or needs it.").

288 *See, e.g.*, Ross Barkan, Opinion, *It's Time for America to Reinvest in Public Housing*, N.Y. TIMES, Jan. 5, 2021, at A19 (describing the move by the federal government, enacting the Faircloth Amendment in the 1990s, to end public housing construction and the other failures of the government to address existing public housing needs).

289 Vienna, Austria, provides a fascinating example of a city with significant publicly built housing that has dramatically shaped urban form and resulting urban rents. *See* Francesca Mari, *Imagine a Renters' Utopia. It Might Look Like Vienna.*, N.Y. TIMES MAG. (May 26, 2023), https://www.nytimes.com/2023/05/23/magazine/vienna-social-housing.html [https://perma.cc/E4UA-EBGM]. Europe, generally, is more engaged with different forms of government-directed development. *See* John A. Lovett, Responding to the Affordable Housing Crisis: A View from the U.S. and Scotland 17 (June 7, 2023) (unpublished manuscript) (on file with author).

housing or even affordable housing to be responsive to carbon emissions.

This is not a call for local governments to enter the construction business. Public-private partnerships are a good model for producing new housing, where the government uses publicly owned land and partners with a developer who may invest capital in exchange for a share of proceeds on the back end.[290] These kinds of deals can take many forms, but they provide the government, as landowner, with much more power to dictate what is developed. A city can choose to build taller, denser, and more compact than a developer might, with the goal of increasing density instead of maximizing market value.[291] This is very different from zoning, which simply limits what can be built. A city also does not need to worry about absorption rates or otherwise try to maximize profits by timing the development.

Cities have, in fact, been experimenting with public-private partnerships in the production of new mixed-use developments, often in ways designed to keep prices down. In Hawaii, for example, a private developer has partnered with the University of Hawaii in Manoa to produce 400 new housing units at a development price of less than half of the median price nearby.[292] One legislator there has called for replicating this approach a hundred times over in order to produce tens of thousands of new housing units.[293]

2. Suburbs, Exurbs, and Other High-Carbon Places

Climate zoning strategies are markedly different in high-carbon places. Here, municipalities can be much more aggressive in their regulatory efforts because there is less concern about reducing development activity altogether.

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290 *See* Norman B. Rice, *Smart Growth: A Catalyst for Public-Interest Investment*, 26 FORDHAM URB. L.J. 1417, 1420 (1999) (detailing two projects in Seattle that were made possible due to "the private investment provided through grants, low-income housing tax credits and loans"); Anne Marie Smetak, *Private Funding, Public Housing: The Devil in the Details*, 21 VA. J. SOC. POL'Y & L. 1, 25–27 (2014) (detailing a 1990s push by HUD that involved local governments leveraging capital to help revitalize and build affordable public housing).

291 This approach also has the benefit of avoiding any calculation about absorption rates that might cause a private developer to delay building in order to maximize returns by trying to time the market to avoid a glut of new housing. If effective, it could also help to moderate housing prices within the urban core, making city living marginally more attractive. *See supra* note 176 and accompanying text (discussing absorption rates).

292 *See* Stewart Yerton, *Blueprint for Hawaii Housing? UH Project for Students and Faculty Is Going Up at Relatively Little Cost*, HONOLULU CIV. BEAT (Aug. 25, 2022), https://www.civilbeat.org/2022/08/blueprint-for-hawaii-housing-uh-project-for-students-and-faculty-is-going-up-at-relatively-little-cost/ [https://perma.cc/7UEV-X5Q2].

293 *See id.*

Green Building Codes. In the parable of two cities presented above, green building codes and other energy efficiency mandates can increase overall carbon emissions if they drive development to more carbon-intensive places.[294] That worry does not exist in high-carbon places where regulatory requirements are win-win. They ensure that any new development incorporates carbon-reducing forms and technology, whether increased insulation, energy-efficient appliances, passive or active solar, heat pumps, or other building techniques that reduce overall emissions. And if these regulatory burdens deter development altogether, that is also a benefit in a high-carbon place.

The stricter the code the better. There is a voluminous scholarly literature on the form and substance of such codes, some of which was described above and does not need to be repeated here.[295] The contribution, instead, is to recognize that the value of more stringent codes varies depending on whether the municipality is a high-carbon or low-carbon place.

Energy or Climate Exactions. Impact fees, or the more general category of "exactions," are fees or in-kind benefits demanded of developers as part of the development approval process.[296] Local governments use exactions to shift some of the externalized costs of development on to developers.[297] Commonplace examples include fees to help fund transportation improvements, school funding for increased numbers of school-aged kids, dedication of land for open space, direct transit improvements, or sometimes affordable housing set asides, among others.[298]

Almost a decade ago, Peter Byrne and Kathryn Zyla proposed climate exactions, using the tool of impact fees to force developers to internalize the carbon costs of their development.[299] Building in high-carbon places or in energy-intensive ways would result in higher exactions.[300] In a more recent article, Jim Rossi and I argued that local governments should impose energy exactions, asking developers to pay

294 *See supra* Part III.

295 *See supra* Section II.B (discussing green building codes).

296 *See* Rossi & Serkin, *supra* note 135.

297 *See id.* at 654–55 (describing exactions); *see also* Vicki Been, *"Exit" as a Constraint on Land Use Exactions: Rethinking the Unconstitutional Conditions Doctrine*, 91 COLUM. L. REV. 473, 478–80 (1991) (providing history of exactions).

298 *See* Rossi & Serkin, *supra* note 135, at 644 ("Examples [of exactions] include school[]expansions[,] transportation improvements and the creation of new public spaces, to name just a few."); *see also* Mark Fenster, *Regulating Land Use in a Constitutional Shadow: The Institutional Contexts of Exactions*, 58 HASTINGS L.J. 729, 734 n.34 (2007) (listing types of exactions).

299 *See* J. Peter Byrne & Kathryn A. Zyla, *Climate Exactions*, 75 MD. L. REV. 758 (2016).

300 *Id.* at 758–59.

for the impact of the development on the energy grid.[301] While this does not go as far as Byrne's carbon-based exactions, which can include transportation-related emissions and other indirect climate impacts, energy exactions would have much the same effect on development incentives and are easier to implement and defend legally.[302] Helpfully, existing law in many states allows for this approach without any change.[303]

Notice, however, that climate or energy exactions are not always climate friendly. Exactions of any kind function as a tax on development which can bend the supply curve downwards, resulting in fewer overall housing units.[304] For low-carbon places, this can become counterproductive. If energy exactions were adopted by a low-carbon city but not by its higher-carbon suburbs, for example, these exactions would raise the cost of city housing vis-à-vis the suburbs and shift development to more carbon-intensive places. But high-carbon places can adopt them without this concern. Within any particular suburb, too, they will have the beneficial impact of discouraging development in the most carbon-intensive places and will create some pull towards more compact and energy-efficient projects.[305]

Protecting Agricultural and Other Exurban Land. In many parts of the country, significant new development occurs through the consumption of agricultural land.[306] Farmers' fields are like blank canvasses for developers and so are particularly appealing. But this kind of land-consuming sprawl at the suburban-exurban interface is among the most carbon intensive. High-carbon places should make every effort to curb these development patterns.

This can be done directly through zoning to protect agricultural or other large tracts of undeveloped land. Too often, however, agricultural zoning amounts to a kind of holding zone that local governments change upon request.[307] Restrictive zoning may simply invite a bargaining process over rezoning for residential or other more intensive use. Stronger tools are often appropriate.

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301 *See* Rossi & Serkin, *supra* note 135.

302 *See id.* at 650.

303 *See id.* at 692 (arguing that energy exactions would require no state law change in nearly half the states).

304 *See id.* at 685 ("[A]n exaction is nevertheless the functional equivalent of a tax on development.").

305 *See id.* at 675 ("[I]f developers were incentivized to internalize some of these costs, this could produce enormous benefits when aggregated at the municipal level.").

306 Robert W. Burchell & Naveed A. Shad, *The Evolution of the Sprawl Debate in the United States*, 5 HASTINGS W.-NW. J. ENV'T L. & POL'Y 137, 141 (1999) (describing consumption of agricultural land).

307 *See* Catherine J. LaCroix, *Urban Agriculture and Other Green Uses: Remaking the Shrinking City*, 42 URB. LAW. 225, 256 (2010).

A number of governments have "current use" programs designed to incentivize the preservation of undeveloped land.[308] Under "current use," property is taxed not by its fair market value—which reflects its highest and best use[309]—but instead by its actual use. Farmland, in such a program, is taxed as farmland and not for its potential as a suburban subdivision. Importantly, property owners in most states must pay a penalty if they want to remove property from current use, with the penalties generally increasing over time to reflect a kind of repayment of the foregone taxes.[310] These kinds of tax policies can affect development decisions and can help to limit development, although the details of implementation matter.[311]

Conservation easements are stronger, still. Conservation easements are, essentially, negative easements that give the holder the right to veto development on conserved land. Farmers or owners of other undeveloped land can donate conservation easements for tax benefits.[312] Local governments—and other groups—can also purchase them to protect land from development.[313] The point, simply, is to constrain the supply of exurban undeveloped land, so long as conservation efforts do not just push development even further away.

3. Universal Strategies

There are a few strategies that can be adopted everywhere, either because they are universally appropriate or because they have a differential impact in high-carbon and low-carbon places.

Siting Renewable Energy Infrastructure. The lowest possible bar for climate zoning is to ensure that zoning does not prevent the adoption of climate-friendly technologies. The most obvious climate zoning strategy is therefore to ensure that zoning rules do not prevent siting renewable energy facilities.[314] However, many local ordinances do, in

308 *See generally* Joan M. Youngman, Special Report, *Taxing and Untaxing Land: Current Use Assessment of Farmland*, 37 STATE TAX NOTES 727 (2005).

309 *See* Christopher Serkin, *The Meaning of Value: Assessing Just Compensation for Regulatory Takings*, 99 NW. U. L. REV. 677, 689–92 (2005) (discussing highest and best use).

310 *See, e.g.*, Richard W. England & Robert D. Mohr, *Land Development and Current Use Assessment: A Theoretical Note*, 32 AG. & RES. ECON. REV. 46 (2003) (describing and modeling the impact of such penalties).

311 *See* Victoria Taranu & Griet Verbeeck, *Property Tax as a Policy Against Urban Sprawl*, 122 LAND USE POL'Y art. 106335, at 6–7 (2022) (summarizing studies).

312 *See* Jessica Owley, *The Enforceability of Exacted Conservation Easements*, 36 VT. L. REV. 261, 302 n.201 (2011).

313 *See id.* at 284; *see also* Robert Liberty, *Stopping Low-Density Rural Residential Sprawl*, 15 VT. J. ENV'T L. 124, 129–30 (2013) (discussing conservation easements as a tool to reduce sprawl).

314 Zoning is only one hurdle facing renewable energy facilities. Others have been treated comprehensively in leading articles. *See, e.g.*, Garrick B. Pursley & Hannah J.

fact, make it difficult to install even modest rooftop solar panels, let alone larger energy projects.[315]

Barriers to siting renewable energy can be obvious—as when a zone prohibits solar panels—but can also be more subtle. Height limits, setbacks, and aesthetic regulations can all be used to stop deployment of solar panels and wind turbines.[316] Sometimes, regulatory ambiguity or silence creates risk and delays that can make alternative energy siting unappealing.[317] Even less obviously, regulatory benefits for carbon-intensive energy uses—oil, gas, and coal—can also place a heavy thumb on the scale against renewable energy facilities.[318] As Uma Outka has explored in detail, Florida offers centralized and fast-track land use approvals for energy facilities above a certain size, a threshold that significantly favors nonrenewables.[319]

There are meaningful opportunities for states and the federal government to smooth the siting process for renewable energy, especially for recalcitrant local governments. Many states preempt local zoning when it comes to solar and wind facilities, for example, or at least compel local governments to include renewable energy in their comprehensive plans.[320] Danielle Stokes has recently explored how the federal government can create frameworks and guidelines to coordinate siting decisions in collaboration with state and local governments.[321] Most of the prescriptions that Stokes offers are available to local governments on their own, too. For willing local officials, the list is relatively straightforward.

Wiseman, *Local Energy*, 60 EMORY L.J. 877, 901–11 (2011) (discussing requirements for distributed renewable energy); Patricia Salkin, *The Key to Unlocking the Power of Small Scale Renewable Energy: Local Land Use Regulation*, 27 J. LAND USE & ENV'T L. 339, 340–49 (2012) (discussing different regulatory regimes to support deployment of renewable energy).

315 *See, e.g.*, Uma Outka, *Siting Renewable Energy: Land Use and Regulatory Context*, 37 ECOLOGY L.Q. 1041, 1079 (2010) ("Common regulatory barriers to siting solar include private property restrictions, such as homeowners' association covenants or restrictions, and local governmental restrictions, such as building codes."); Salkin, *supra* note 314, at 351 n.87 ("For example, former Vice-President Al Gore encountered such an ordinance when he attempted to install solar panels on his Belle Meade home, and he petitioned the town board to have the ordinance altered. Belle Meade's ordinance prevented the placement of 'power generating equipment' anywhere but on the ground.").

316 Salkin, *supra* note 314, at 356–59.

317 *See, e.g.*, Outka, *supra* note 315, at 1068 ("Barriers can also consist of regulatory gaps (the absence of standards needed to support grid interconnection, for example) or regulatory weaknesses (standards that are poorly conceived or otherwise ineffective).").

318 *See id.*

319 *See id.* at 1064–65, 1068 ("The availability of statutory benefits for utility-scale projects may operate in the inverse as a measurable, if not insurmountable, barrier to smaller non-utility projects relative to their larger counterparts." *Id.* at 1068.).

320 *See generally* Salkin, *supra* note 314 (discussing state laws).

321 *See* Danielle Stokes, *Renewable Energy Federalism*, 106 MINN. L. REV. 1757, 1817–24 (2022).

First, local governments can exempt renewable energy facilities from height limits and eliminate any explicit or de facto prohibitions on siting renewable energy.[322] Second, local governments can ensure that building codes allow for renewable energy and that building inspectors know how to evaluate safe and unsafe designs.[323] Third, some kinds of renewable energy may benefit from special treatment, like land use rules exempting solar and wind from height or bulk limits, or even from historic preservation.[324] The specific rules and approaches will vary by jurisdiction, but the overall point is simply this: every local government interested in minimizing GHG emissions should promote or at least not prohibit renewable energy infrastructure.[325]

Eliminate Parking Requirements. Parking requirements are a staple of the modern zoning code.[326] Redondo Beach, California, provides that "[s]ingle-family dwellings in any residential zone shall provide two parking spaces within a private enclosed garage."[327] But minimum parking requirements dramatically reduce how many housing units can be built per acre under most zoning codes.[328] "The typical median parking required for a two-bedroom apartment in many large North American cities is more than half the size of the apartment itself."[329]

The presence of parking—especially surface parking lots—can deter more compact development by making it more difficult to walk and bike. As one article explained, "where large surface parking lots separate shops and housing from streets and sidewalks, some people who

322 De facto prohibitions include, for example, relegating renewable energy facilities to places where they are impractical. *See, e.g.*, Outka, *supra* note 315, at 1068 ("Most importantly, renewable energy facilities must be located where the resource is abundantly available. As a result, siting renewable energy often involves geographic constraints that do not apply to traditional power plants.").

323 *See* Schindler, *supra* note 137, at 315 ("Most city planners and building inspectors lack the expertise and experience in green building . . . .").

324 *See, e.g.*, Watson, *supra* note 52, at 138 (summarizing these and other approaches); Sara C. Bronin, *Modern Lights*, 80 U. COLO. L. REV. 881 (2009).

325 Michael B. Gerrard, *A Time for Triage*, 39 ENV'T F. 38, 38 (2022) ("To save the climate, we need to build so much wind and solar that some will go in bad places.").

326 *See* Lewyn & Schechtman, *supra* note 24, at 288 ("[A]lmost every American municipality has minimum parking requirements for many neighborhoods . . . .").

327 *See* REDONDO BEACH, CA., MUN. CODE § 10-5.1704(a)(1) (2024).

328 *See, e.g.*, Lewyn, *supra* note 16, at 54 ("[M]inimum parking requirements, by increasing the amount of land used for parking, artificially limit population density and thus reduce neighborhood walkability and transit use."); *see also* Simon McDonnell, Josiah Madar & Vicki Been, *Minimum Parking Requirements and Housing Affordability in New York City*, 21 HOUS. POL'Y DEBATE 45, 64 (2011) (discussing the impact of parking requirements in New York City); *cf.* DONALD C. SHOUP, AM. PLAN. ASS'N, THE HIGH COST OF FREE PARKING 185–200 (2011).

329 Jeffrey Spivak, *People Over Parking*, PLAN. MAG. (Oct. 2018), https://www.planning.org/planning/2018/oct/peopleoverparking/ [https://perma.cc/4BPU-Y8WD].

might otherwise walk to those destinations will instead drive."[330] They also inherently favor development in suburbs where land is cheaper and parking requirements are easier to satisfy.[331]

Scholars and some policymakers have taken notice.[332] Sara Bronin has done extensive work studying the impact of parking minimums on development potential and concludes that they significantly constrain density.[333] And some cities have begun to repeal parking minimums, at least for some kinds of buildings in some parts of the city.[334] This does not prohibit developers from building more than the parking minimum if they want, but it ensures that developers are not required to set aside significant amounts of property for cars. Recently, some cities have taken the more dramatic step of adopting parking *maximums,* limiting the amount of space that developers are allowed to devote to parking.[335]

An alternative third way would link the provision of parking to infrastructure exactions.[336] Zoning could eliminate or at least significantly loosen minimum parking requirements and then impose a fee

330 Lewyn & Schechtman, *supra* note 24, at 292.

331 Lewyn, *supra* note 16, at 54 ("[S]uburban developers can more easily comply with minimum parking requirements by purchasing additional land. By contrast, developers in already-developed cities and older suburbs may not [sic] able to purchase land so easily." (footnote omitted)).

332 *See supra* note 328 and accompanying text.

333 *See* Sara C. Bronin, *Rethinking Parking Minimums*, PLAN. MAG., Feb. 2018, at 9; Sara C. Bronin, *Zoning by a Thousand Cuts*, 50 PEPP. L. REV. 719, 768 (2023); Bronin, *supra* note 16 .

334 *See, e.g.*, Angie Schmitt, *Hartford Eliminates Parking Minimums Citywide*, STREETSBLOG USA (Dec. 13, 2017, 2:34 PM), https://usa.streetsblog.org/2017/12/13/hartford-eliminates-parking-minimums-citywide/ [https://perma.cc/2VKU-EBPB] ("Hartford, Connecticut, is getting rid of mandatory parking minimums citywide, the second major American city to do so in the past 12 months, following Buffalo."); Cassandra Stephenson, *Nashville Eliminates Minimum Parking Space Requirements in Urban Areas*, THE TENNESSEAN (Nov. 16, 2022, 10:21 AM), https://www.tennessean.com/story/news/local/davidson/2022/11/16/nashville-eliminates-minimum-urban-area-parking-space-requirements/69651050007/ [https://perma.cc/8P5E-FGMJ] ("Developments in Nashville's most urban areas no longer have minimum parking space requirements under a new ordinance approved by the city's council Tuesday."); David Garcia & Julian Tucker, *How AB 1401 May Impact Residential Parking Requirements*, TERNER CTR. FOR HOUS. INNOVATION (Apr. 13, 2021), https://ternercenter.berkeley.edu/research-and-policy/ab-1401-residential-parking-requirements/ [https://perma.cc/76BL-XAXQ].

335 *See, e.g.*, James Brasuell, *Nashville Sets Downtown Parking Maximums*, PLANETIZEN (Nov. 20, 2022, 11:00 AM), https://www.planetizen.com/news/2022/11/119787-nashville-sets-downtown-parking-maximums [https://perma.cc/V3X3-NYUJ]. Other researchers have advocated for acting more directly and for simply banning cars in urban centers. *See, e.g.*, Joy & Vogel, *supra* note 27, at 1391 ("To reduce air pollution and greenhouse gas emissions, local governments need to cut automobile usage by banning or severely limiting auto usage in the urban core.").

336 *See supra* notes 297–305 and accompanying text (discussing exactions).

or exaction for every parking space included in a development. That fee would be used to fund alternative transportation infrastructure. This regime would likely satisfy constitutional requirements for exactions—that they be related to the burden created by the development—because every additional car would create congestion that alternative infrastructure would help to offset.[337] Pricing the exaction to be proportional to that burden would have to happen city by city. The overall point, however, is to force developers to internalize the cost of designing for cars.[338]

This approach would be a win-win-win from a climate perspective.[339] Repealing parking minimums unlocks development in the urban core, allowing developers to build more units per acre.[340] But developers will still presumably include some parking spaces in their developments because they anticipate that some housing consumers will demand them. Exactions will then encourage developers to build in locations where more eventual residents can live without cars—places close to transit, for example—in order to reduce the number of spaces they feel they have to include in their development, and so reduce the exactions they must pay. Simultaneously, the parking spaces that are included will provide some measure of funding for transportation infrastructure.

There is a possible cost. If the absence of minimum parking requirements in fact makes parking scarcer and therefore more expensive, it might shift consumer preferences for suburbs and places where parking is easier. The birth of suburban shopping malls, for example, was at least partly attributable to easy access and parking.[341] In other

337 *See* Nollan v. Cal. Coastal Comm'n, 483 U.S. 825, 836–37 (1987) (requiring an essential nexus between legitimate state interests and a regulatory exaction). Some might object that units *without* parking spaces are the ones that are more likely to burden public transportation systems and are the ones that should pay transportation exactions. Governments are under no obligation to impose exactions on everyone, however, and imposing them by parking space should satisfy *Nollan*.

338 *Cf., e.g.*, Lewyn, *supra* note 16, at 55 (describing minimum parking requirements as artificially reducing the market price for parking and therefore acting as an implicit subsidy for driving).

339 A much smaller number of places have also begun to experiment with parking maximums. For an exploration of this more dramatic proposal, see generally Lewyn & Schechtman, *supra* note 24.

340 It will also have a distributional impact. The regulatory reform will have much less of a benefit to suburbs and exurbs where land is more abundant and so parking requirements impose fewer constraints. This is a one-size-fits-all regulatory reform that could be applied statewide and that would still have a much greater impact on cities than on suburbs.

341 *See* AM. SOC'Y OF PLAN. OFFS., INFO. REP. NO. 59, SITE DESIGN, PARKING AND ZONING FOR SHOPPING CENTERS 4 (1954) (early work detailing the planner's role in ensuring adequate parking for the optimal suburban shopping experience at the mall); Matthew Wells,

words, making urban parking more difficult might simply push more commercial and business activity to the suburbs.[342] However, governments, business improvement districts, or even specific stores can supply additional parking in a more targeted way than through parking minimums when it is necessary to compete with suburbs. This is a transit intervention better disaggregated from wholesale parking minimums.

Bike/Walk Infrastructure. Supporting alternatives to driving is helpful for carbon everywhere. Moreover, it has a naturally pro-urban impact. Bike lanes and pedestrian infrastructure, like interconnected sidewalks, improve mobility but sometimes at the expense of cars. Bike lanes may occupy what had been parking spaces or even lanes of traffic, making driving and parking more difficult. At the very least, drivers perceive it that way.[343] But this is a feature, not a bug. Making driving more difficult in the urban core increases the appeal of alternative modes of transportation and increases the convenience premium of being in a place where biking and walking are possible. The impact of bike lanes in suburbs and high-carbon places is more likely to be net negative in terms of traffic and cost, especially where biking is more of a luxury than a meaningful option for traveling the "last mile."

Cities that promote and develop biking and walking infrastructure will therefore see positive benefits. More biking and walking will make the city meaningfully easier for many people to navigate. At the same time, suburban development of walking and biking infrastructure may also replace some car trips with carbon-neutral alternatives, but will likely have a much smaller return on investment. Investing in this infrastructure is appropriate universally because it naturally benefits low-carbon places more than high-carbon ones, putting a thumb on the scale for the former.

Eliminate Single-Use Residential Zoning. Single-family zones are not only density restrictions, they are also use restrictions. Typically, single-family zones exclude all commercial uses including home

The Economic History of the Shopping Mall—and Its Future (Yes, It Does Have One), ECON. FOCUS, 3d Quarter 2022, at 21.

342 *Cf., e.g.*, Lewyn & Schechtman, *supra* note 24, at 293 ("One potential risk of [imposing parking maximums] is that tenants and customers may shift business to places where parking is plentiful and cheap, such as the suburbs.").

343 *See, e.g.*, Peter Walker, *Ten Common Myths About Bike Lanes—and Why They're Wrong*, THE GUARDIAN: BIKE BLOG (July 3, 2019, 2:00 PM), https://www.theguardian.com/environment/bike-blog/2019/jul/03/ten-common-myths-about-bike-lanes-and-why-theyre-wrong [https://perma.cc/AS7V-4QEJ] ("[T]he assumption [is] that if you take some road space from motor vehicles, you get more traffic jams—as with (a commonly used parallel) forcing water down a smaller pipe.").

businesses.[344] The traditional justification for residential-only zones was based on quite anachronistic views of the importance of separating "domestic" life from economic life.[345] Today, people are more likely to object to traffic, parking, or noise.[346]

But these restrictions come with substantial costs. More integration of businesses into residential areas—especially in suburbs—can reduce or even eliminate commutes.[347] Prohibitions on people working from home are particularly problematic from a carbon perspective because the most carbon-friendly commute is the one downstairs.

Form-based codes are one specific way of integrating different uses.[348] As their name implies, form-based codes primarily regulate the form of development and not permissible uses. The form-based guidelines are often more prescriptive than in traditional zoning and are designed to create a particular aesthetic—or feel—for a place, but then allow a mix of all kinds of varied uses.[349] This is also an appealing strategy universally because urban living already incorporates more mixed use, and so this reform naturally favors urban places over suburban ones.

Preserving Vegetation. Trees capture carbon. Preserving trees therefore acts like a carbon sink, actively removing carbon from the atmosphere.[350] Developers often remove more trees than necessary as

344 *See* Wolf, *supra* note 214, at 186–92 (discussing the proliferation of residential-only zones and proposing their elimination).

345 *See* Nicole Stelle Garnett, *On Castles and Commerce: Zoning Law and the Home-Business Dilemma*, 42 WM. & MARY L. REV. 1191, 1199–200 (2001) (describing separate spheres).

346 *See, e.g.*, Jonathan D. Epstein, *Neighbors Criticize Bevilacqua Project on Transit Road in Clarence Over Traffic Concerns*, BUFFALO NEWS (Sept. 13, 2023), https://buffalonews.com/business/local/neighbors-criticize-bevilacqua-project-on-transit-road-in-clarence-over-traffic-concerns/article_2d6791b0-a256-11ed-8ad9-d35c05d90842.html [https://perma.cc/SP3V-KXA7] ("[F]or local residents, the fight over Bevilaqua's [sic] project represents not only a routine development battle over traffic, noise and pollution, but a broader clash over the rural character of Clarence and the future of the open space that they say they cherished and chose when they moved to the town.").

347 *See* Lewyn, *supra* note 16, at 62 ("[S]ingle-use zoning also impedes neighborhood walkability by creating residence-only zones that are not within walking distance of public transit, shops, or jobs.").

348 H. William Freeman, *A New Legal Landscape for Planning and Zoning: Using Form-Based Codes to Promote New Urbanism and Sustainability*, MICH. REAL PROP. REV., Fall 2009, at 117, 120.

349 *See, e.g.*, INT'L CITY/CNTY. MGMT. ASS'N, *supra* note 133, at 27 ("Form-based codes can help a community support mixed uses, diverse housing options, and open space while also paying attention to design details such as streetscapes and façades.").

350 *See, e.g.*, Richard M. Vaughn, Mark Hostetler, Francisco J. Escobedo & Pierce Jones, *The Influence of Subdivision Design and Conservation of Open Space on Carbon Storage and Sequestration*, 131 LANDSCAPE & URB. PLAN. 64, 65 (2014) ("When land is subdivided, conserving forests and large individual trees can help minimize a development's carbon footprint by maximizing carbon storage and sequestration."). *But see* Erik Velasco, Matthias Roth, Leslie

part of the development process, often because it makes construction easier.[351] Zoning, however, can help to encourage tree preservation.[352] For example, Nashville, Tennessee, recently amended its cluster lot zoning rules to emphasize protection of sensitive natural resources and identified trees as one such resource.[353] Even more provocatively, Pasadena, California, provides modified development standards for tree preservation, potentially allowing a developer even more density by keeping trees in place.[354]

There can be a trade-off, of course. Saving a tree should not come at the expense of an extra housing unit in the urban core. The carbon savings from that extra unit will dwarf the carbon savings from preserving the tree. And so cities and other low-carbon places should not adopt tree preservation ordinances that meaningfully increase construction costs, whereas high-carbon places can be more aggressive. Nevertheless, the economic stakes are often quite low and prioritizing trees can help to reduce carbon.

C. State Responses

While the focus of this Article is on local zoning, there is a lot that states can do to supplement local efforts to reduce sprawl and increase density. For the practical reasons discussed above, this is not a call for statewide land use regulation.[355] Nor is it useful to rehash Smart Growth proposals for reducing sprawl. But it is important to briefly survey some of the best tools to supplement local land use efforts.

Norford & Luisa T. Molina, *Does Urban Vegetation Enhance Carbon Sequestration?*, 148 LANDSCAPE & URB. PLAN. 99, 106 (2016) ("[T]he impact of urban vegetation to reduce GHG emissions directly through carbon sequestration is very limited or null.").

351 *See* Vaughn et al., *supra* note 350, at 65 ("Development typically follows a pattern of clearing a site of all flora . . . .").

352 *See generally* R. Scott Wilder, *Tree Preservation Methods: Zoning Regulation vs. Conservation Servitude*, 14 J. NAT. RES. & ENV'T L. 253 (1998) (describing zoning tools to preserve trees); MARK E. HOSTETLER, THE GREEN LEAP: A PRIMER FOR CONSERVING BIODIVERSITY IN SUBDIVISION DEVELOPMENT 17–78 (2012) (describing tree preservation).

353 *See New Environmental Protections for Residential Subdivisions*, NASHVILLE TREE CONSERVATION CORPS (May 17, 2022), https://www.nashvilletreeconservationcorps.org/treenews/new-evironmental-protections-for-nashville-subdivisions-mxl7b [https://perma.cc/QYT9-Z6H5] ("For the first time, the bills recognize Nashville's trees as important natural features, rather than simply as landscaping requirements. The legislation also consolidates tree preservation and replacement codes into a single section, and updates references to tree preservation throughout Metro code.").

354 *See* PASADENA, CA., MUN. CODE § 17.44.090(D) (1976 & Supp. 71 2024). I thank Moira O'Neill for pointing me to this provision.

355 *See supra* text accompanying notes 212–17.

The most impactful is to invest in infrastructure that supports density in the urban core and that discourages driving from the suburbs.[356] This includes not only obvious—but expensive—investments in mass transit, but reallocating money away from highways and from the infrastructure of suburban commuting.[357] There is an extensive literature on the ways in which state infrastructure spending promotes suburban sprawl and reforms that will help to curb it.[358] Specific strategies vary by place but fundamentally involve making other forms of transportation easier and more appealing than driving.

There are more direct regulatory interventions that are more central to this Article's land use focus. The most notable is the creation of greenbelts or other urban growth boundaries to constrain development to the urban core.[359] An urban growth boundary (UGB) creates a regulatory line around a city, promoting development inside and designating the land outside for agricultural or other low-intensity uses. The effect is to make suburban development less appealing by requiring people to live quite far away if they want to live outside of the city. This will concentrate development pressures within the urban core.

Urban growth boundaries usually require state involvement, however, because most MSAs are highly fragmented and consist of many different municipalities. The most famous UGB, in Portland, Oregon, was created by the State in 1973.[360] Portland has also become a cautionary tale, however. Its success at curbing development turned out to be politically unstable. The effectiveness of the UGB meant that the developable property just inside the UGB became increasingly

356 *See, e.g.*, Nolon, *supra* note 17, at 320–21 (noting the need to coordinate transportation planning at a regional scale); *see also* Pollard, *supra* note 83, at 259 (discussing government subsidies that promote sprawl); Shill, *supra* note 99, at 539 (describing the impact of land use decisions on driving).

357 *See, e.g.*, Maya, *supra* note 100, at 881.

358 *See, e.g.*, Boudreaux, *supra* note 18, at 4 ("[T]he United States has spent lavishly on roads and suburban infrastructure, which allows metropolitan development to expand."); Darien Shanske & Deb Niemeier, *Subsidizing Sprawl, Segregation, and Regressivity: A Deep Dive into Sublocal Tax Districts*, 106 IOWA L. REV. 2427, 2429 (2021) (identifying sublocal tax districts as a cause of sprawl).

359 *See, e.g.*, David N. Bengston, Jennifer O. Fletcher & Kristen C. Nelson, *Public Policies for Managing Urban Growth and Protecting Open Space: Policy Instruments and Lessons Learned in the United States*, 69 LANDSCAPE & URB. PLAN. 271, 276 (2004) ("A greenbelt refers to a physical area of open space—farmland or other green space—that surrounds a city or metropolitan area and is intended to be a permanent barrier to urban expansion."). *But see* Landis, *supra* note 110, at 685 (finding lack of "consistent effect" of formal antisprawl zoning, like UGBs, on levels of sprawl).

360 *See* Bengston et al., *supra* note 359, at 276 (describing the origin of Portland's UGB). Even at its strongest, the Portland UGB has not been entirely effective at stopping sprawl, because it pushed suburbanization into neighboring Washington State, where the UGB did not apply. *See* Boudreaux, *supra* note 18, at 15.

valuable while the privately owned but largely undevelopable property outside the UGB stagnated.[361] A movement to repeal the UGB resulted in a voter referendum, Measure 37, that significantly curtailed land use regulation in Oregon.[362] While the saga was complex and did not end with that single referendum, it seemed to mark a real change in the political landscape.[363] From a climate perspective, that is unfortunate. States could act to create new UGBs or other urban containment policies.[364]

Another important reform is to loosen environmental regulations in central cities. As noted above, state environmental law is increasingly marshalled to resist development.[365] But this reform need not—and, indeed, *should not*—relax environmental rules statewide. Differential regulatory treatment inside and outside the urban core could help to fight sprawl. In particular, state environmental review can create a kind of urban carve-out, either exempting development in the urban core from environmental review or at least making the review far less searching. This would increase the regulatory costs of suburban development relative to urban development and so make urban development more attractive and cost effective.

California's Environmental Quality Act (CEQA)[366] purports to include a nod in this direction. Its Class 32 exemption exempts certain infill development from the CEQA process.[367] The objective was to streamline the approval process, making it easier to create dense, infill development.[368] It has not turned out that way. Research shows that many developers are not sufficiently aware of the CEQA exemptions, and so underutilize them.[369] Moreover, even when an agency has granted an exemption, recent litigation shows how difficult it is to streamline the regulatory process. For example, in two recent cases, Berkeley and Los Angeles both granted Class 32 exemptions, only to see neighbors raising and litigating exceptions to the exemptions, such

361 *See generally* Michael C. Blumm & Erik Grafe, *Enacting Libertarian Property: Oregon's Measure 37 and Its Implications*, 85 DENV. U. L. REV. 279, 362 (2007).

362 *See id.* at 305–07 (discussing adoption of Measure 37).

363 *See, e.g.*, ELLICKSON ET AL., *supra* note 78, at 320 (describing the history of Measure 37 and its aftermath).

364 For a survey of regulatory approaches, see Bengston et al., *supra* note 354, at 275.

365 *See* Elmendorf, *supra* note 242.

366 CAL. PUB. RES. CODE §§ 21000–21189.91 (West 2016 & Supp. 2024).

367 *See* CAL. CODE REGS. tit. 14, § 15332 (2023).

368 *See, e.g.*, Rigel Robinson, *When a Statute Loses Its Way: Fulfilling the Original Intent of the California Environmental Quality Act*, 41 YALE L. & POL'Y REV. 280, 294 (2022).

369 *See id.* at 294 n.42 (citing Casey Shorrock Smith, *Streamlined Yet Underutilized: CEQA's Class 32 Urban Infill Exemption*, REMY MOOSE MANLEY LLP, https://www.rmmenvirolaw.com/streamlined-yet-underutilized-ceqas-class-32-urban-infill-exemption/ [https://perma.cc/X3MZ-9CWG]).

as one requiring consistency with the general plan.[370] Exemptions hardly streamline the CEQA process for urban infill if they simply invite another layer of litigation.[371]

A less immediate but still impactful state action is to provide local governments with technical assistance. This can include expert help in understanding and evaluating GHG emissions data and in developing and implementing the local strategies to minimize emissions.

Perhaps the most important action a state can take, however, is empowering local governments to act. At the least, states should not prohibit local governments from adopting the climate zoning tools identified above.[372] Real or perceived risks of state preemption, or conflicts with state laws, can impede local innovation.[373] Where there are state laws that prohibit, for example, energy exactions, states should act to clear a path for local climate zoning initiatives.[374]

CONCLUSION

The built environment has an enormous impact on global GHG emissions. Local land use regulation is therefore a critical tool to addressing the climate crisis because it helps to shape where and how people live and work. This insight is not new, but the predominant responses among scholars and policymakers in recent years has been to push deregulation in order to promote density, or to aspire to strict new green building codes or statewide land use controls. These conventional responses fail to account for the different regulatory approaches that are needed in low-carbon and in high-carbon places. What local governments need, instead, is a set of prescriptions that vary by place. This more granular approach recognizes that we cannot deregulate our way out of the climate crisis, but also that more situational

370 *See* Make UC a Good Neighbor v. Regents of Univ. of Cal., 304 Cal. Rptr. 3d 834 (Cal. Ct. App. 2023) (reversing grant of Class 32 exemption); W. Adams Heritage Ass'n v. City of Los Angeles, No. B319121, 2023 WL 5119275 (Cal Ct. App. Aug. 31, 2023) (same).

371 A more recent effort to address the CEQA process in California is A.B. 1633, which effectively makes some of the discretionary CEQA exemptions mandatory. *See* Act of Oct. 11, 2023, ch. 768, 2023 Cal. Stat. 7116. For an insightful analysis of A.B. 1633, see Chris Elmendorf (@CSElmendorf), X (Oct. 12, 2023, 3:54 AM), https://twitter.com/CSElmendorf/status/1712376261463724069 [https://perma.cc/K3Y7-B4N4].

372 *Cf.* Andrea McArdle, *Local Green Initiatives: What Local Governance Can Contribute to Environmental Defenses Against the Onslaughts of Climate Change*, 28 FORDHAM ENV'T L. REV. 102, 104 (2016) ("[L]ocalities should be given broad latitude to act, to ensure sufficient flexibility and scope for responding to the climate-induced risks they face.").

373 *See generally* Nestor M. Davidson & Laurie Reynolds, *The New State Preemption, the Future of Home Rule, and the Illinois Experience*, 4 ILL. MUN. POL'Y J. 19 (2019); *see also supra* note 21 (citing sources).

374 *See* Rossi & Serkin, *supra* note 135 (proposing energy exactions and discussing changes in state law that would be required in some states to enable them).

zoning is required with a menu of options for increasing density and reducing carbon emissions.