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## Coastal Smart Growth

Randolph R. Lowell

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# Coastal Smart Growth

BY RANDOLPH R. LOWELL<sup>1</sup>

I. Coastal Smart Growth.....	231
II. What is Smart Growth? .....	233
a. Incentives and Disincentives.....	236
i. Economics .....	239
ii. Zoning .....	241
iii. Housing.....	243
iv. Roads .....	243
v. Water and Sewer .....	246
vi. Air .....	247
b. Land Use Planning .....	248
III. Growing—and Growing Smart—on the Coast .....	249
IV. Growing Smart on the South Carolina Coast .....	252
V. The Future of Coastal Development .....	258

*“Growth for the sake of growth is the ideology of the cancer cell.”<sup>2</sup>*

## I. COASTAL SMART GROWTH

Development pressure on the United States coast is increasing. Nineteen of the twenty largest counties in the country are on the coast.<sup>3</sup> The 559 counties in the United States located within eighty kilometers of an ocean or the Great Lakes “account for just 13 percent of the continental U.S. land area but 51 percent of 2000 population and 57 percent of 2000 civilian income.”<sup>4</sup> In fact, “[e]conomic density in the United States is overwhelmingly con-

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1. B.A., College of Charleston; M.P.A., University of South Carolina; J.D., University of South Carolina; LL.M., The George Washington University. Mr. Lowell was the Randolph C. Shaw Fellow while at The George Washington University and practices with the law firm of Willoughby & Hoefer, P.A., in Columbia, South Carolina. He also serves as a vice-chair for the ABA’s Special Committee on Smart Growth and Urban Policy.

2. EBEN FODOR, BETTER NOT BIGGER 38 (1999) (quoting Edward Abbey).

3. DANA BEACH, PEW OCEANS COMMISSION, COASTAL SPRAWL 1 (2001), available at [http://www.pewtrusts.org/pdf/env\\_pew\\_oceans\\_sprawl.pdf](http://www.pewtrusts.org/pdf/env_pew_oceans_sprawl.pdf).

4. JORDAN RAPPAPORT & JEFFREY D. SACHS, THE U.S. AS A COASTAL NATION 1 (2002), available at <http://www.kansascityfed.org/publicat/reswkpap/pdf/rwp01-11.pdf>.

centrated at its ocean and Great Lakes coasts.”<sup>5</sup> The attractiveness of coastal areas and their relative affluence reflect the principle that living near the coast increases quality of life.<sup>6</sup> But there needs to be a place for all these people. Thus, the population increase leads to an increased land development, which in coastal areas exceeds the rate of population growth.<sup>7</sup>

The most unique characteristic of coastal areas is their ecosystems. A coastline provides a significant amount of natural capital. A coast is inherently valuable. This increases the complexity of development and growth in coastal areas. The differing tide, climate, and geology all contribute to varying coastal ecosystems in the United States.<sup>8</sup> The rainfall in the Southeast, for example, presents a different coastal environment than the arid climate in southern California; and thus a comparison of the issues and solutions for South Carolina and California will likewise vary. Nevertheless, uniform principles can be applied to each individual situation by local governments, which are the greatest factor in shaping the nation’s coasts,<sup>9</sup> to balance the need for development and accommodation of the increasing population with the preservation of the natural resources and minimizing disturbance to the very features that render the coastal area so productive and attractive. Coasts also transcend political boundaries, and thus the governance of coastal areas is subject to the ebbs and flows of the relationships between numerous governmental entities. A quick glance at an overlay of a map of any watershed and the corresponding political jurisdictions results in a rainbow of often competing interests.<sup>10</sup> To successfully move towards productive and sustainable growth, the political jurisdictions need to integrate and cooperate in the decision-making processes for the entire area to apply uniform principles of sustainable development. These uniform principles fall under the ambit of “smart growth.”

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5. *Id.* at 28.

6. *Id.* at 4, 28.

7. BEACH, *supra* note 3, at 4-5.

8. *See* BEACH, *supra* note 3, at 7.

9. F. JOHN VERNBERG & WINONA B. VERNBERG, *THE COASTAL ZONE* 144-45 (2001).

10. *See* John H. Tibbetts, *Managing Ecosystems across Watersheds*, 19 COASTAL HERITAGE 12 (Fall 2004), available at [http://www.scseagrant.org/library/library\\_coaher\\_fall04.htm](http://www.scseagrant.org/library/library_coaher_fall04.htm); *see also* A. Dan Tarlock, *The Potential Role of Local Government in Watershed Management*, 32 ENVTL. L. REP. (Envtl. L. Inst.) 11,273 (2002).

## II. WHAT IS SMART GROWTH?

The adverse effects of uncontrolled and unmanaged growth in America are deteriorating the economic and environmental quality of life for many citizens—the same quality of life that attracted many of these citizens in the first instance. “Sustainable development”<sup>11</sup> and “smart growth”<sup>12</sup>—the buzz words for remedying this uncontrolled growth—encompass the same panoptic ideas and rely on the concept of coordinated planning and management for the future allocation of resources. Generally, sustainable development and smart growth reflect commitment to the goals of the present without compromising the needs of future generations.<sup>13</sup>

These adverse effects are collectively referred to as sprawl. At its basest level, sprawl is the product of the inherent conflict between increasing needs and decreasing resources. In 1789, Thomas Malthus first warned of population demands outstripping resources and food, a concept commonly known as the Malthusian Principle.<sup>14</sup> The equation is rather simple—there is an increasing demand on decreasing resources. “Ultimately the only way there can be more and more people is for each person to have less food and fuel energy, and less and less physical space. Absolute limitations on growth are imposed both by thermodynamics and by

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11. The meaning of “sustainable development” is most often associated with the United Nations Brundtland Commission’s definition of “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” WORLD COMM’N ON ENV’T & DEV., OUR COMMON FUTURE 43 (1987).

12. Although no generally accepted definition of the term [smart growth] exists, the concept of smart growth embodies the development of a new growth management paradigm resulting in higher density, mixed-use (i.e., residential and commercial) development patterns with integrated mass transit. In addition, smart growth places a greater emphasis on protecting natural resources, preserving open space, and revitalizing existing urban cores.

Eric M. Braun, *Smart Growth in North Carolina: Something Old or Something New?*, 35 WAKE FOREST L. REV. 707, 708-09 (2000).

13. This notion of an obligation towards future generations is often referred to as an “intergenerational social contract.” This term basically holds that the present generation has a contractual obligation to future generations, and in terms of the environment it is used to justify the idea that the present generation should “sustainably develop” to leave a livable environment and adequate resources for future generations. This is an equitable idea (hence “social” contract in the tradition of philosophers Thomas Hobbes and Jean-Jacques Rousseau) that in economic terms may be analogized to cost-shifting for long-term liability.

14. THOMAS ROBERT MALTHUS, AN ESSAY ON THE PRINCIPLE OF POPULATION 15-21 (Philip Appelman ed., 1976) (1789).

space.”<sup>15</sup> Population growth and resource consumption go hand-in-hand with increased air and water pollution. As the population increases, so does the demand on resources, and growth and development spread.

Sprawl embodies the most destructive and all-encompassing product of unmanaged growth.<sup>16</sup> Sprawl has no strict definition, but generally consists of “haphazardly planned, low-density residential development interspersed with strip commercial and retail development linked by a vast street and highway system that overemphasizes automobile use and de-emphasizes mass transit.”<sup>17</sup> Sprawl patterns typify American development.<sup>18</sup>

The following six “crises” have been identified as the result of sprawl: “(1) central city and . . . suburban decline; (2) environmental degradation, through loss of wetlands, sensitive lands, and air and water quality degradation; (3) massive gasoline energy overutilization; (4) fiscal insolvency, infrastructure deficiencies, taxpayer revolts; (5) devastating agricultural land conversion; and (6) housing inaffordability.”<sup>19</sup> The cumulative impacts of these crises can be measured in dollars. These measurements demonstrate that unplanned, sprawling development is more costly to citizens and communities than planned growth.<sup>20</sup> “[T]he studies are overwhelmingly consistent in their conclusion that sprawl is a more costly form of development than compact alternatives.”<sup>21</sup>

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15. Edward J. Kormondy, *We Propose and Nature Disposes*, in G. TYLER MILLER, JR., *LIVING IN THE ENVIRONMENT* 171 (8th ed., 1994).

16. For a comprehensive assessment of the costs of sprawl, see ROBERT W. BURCHELL, ET AL., *COSTS OF SPRAWL – 2000* (2002). See also LEWIS MUMFORD, *THE CITY IN HISTORY* 184 (1961) (“If [a city] overpasses the bounds of growth, absorbing more people than it can properly house, feed, govern, or educate, then it is no longer a city; for its ensuing disorganization keeps it from carrying on a city’s functions.”). “Economically, environmentally, and socially, sprawl is spawning some of the costliest problems America faces.” Edward T. McMahon, *Stopping Sprawl by Growing Smarter*, 26 PLAN. COMMISSIONERS J. 4 (Spring 1997), available at <http://www.plannersweb.com/articles/look26.html>.

17. Braun, *supra* note 12, at 708; Matthew W. Ward et al., *National Incentives for Smart Growth Communities*, 13 NAT. RESOURCES & ENV’T 325 (Summer 1998).

18. Ward, *supra* note 17, at 325.

19. Robert H. Freilich & Bruce G. Peshoff, *The Social Costs of Sprawl*, 29 URB. LAW. 183, 184 (1997); ROBERT H. FREILICH, *FROM SPRAWL TO SMART GROWTH* 16 (1999).

20. See Eben Fodor, *The Three Myths of Growth*, 21 PLAN. COMMISSIONERS J. 18 (1996), available at <http://www.plannersweb.com/wfiles/w178.html> (discussing the cost of sprawl in the environmental, housing, and infrastructure areas).

21. F. KAID BENFIELD ET AL., *ONCE THERE WERE GREENFIELDS* 94 (1999); see Donald D.T. Chen, *The Science of Smart Growth*, SCI. AM. Dec. 2000, at 86 (“Numerous fiscal-impact studies have found that low-density, noncontiguous growth [i.e., sprawl]

Sprawl and unmanaged growth are economically bad policy.<sup>22</sup> A New Jersey study estimated that over a twenty-year period, capital costs associated with sprawl would exceed \$1.3 billion with annual maintenance costs of over \$400 million.<sup>23</sup> Even with an influx of 500,000 people over that time, each house would cost \$12,000 to \$15,000 more than with more compact development.<sup>24</sup> From a public service perspective, the simple truth is that sprawl is expensive. While rising expectations and increased regulation played some role in the increase, "a major part of the cost is due simply to the fact that we are spreading out. It just costs more, on a per unit basis, to serve families who are widely dispersed . . ." <sup>25</sup> Further, the declining quality of life that accompanies sprawl adversely affects the community and the businesses in the community.<sup>26</sup>

The costs go beyond dollars and cents. Spreading out also creates more air pollution from automobiles, more lake degradation from development runoff, and more fragmentation of wildlife habitats. There are social costs, such as the isolation of the poor and elderly in cities, and the disruption of traditional farming and forestry activities in the countryside.<sup>27</sup>

The practical solution is short- and long-term planning using smart growth principles on a regional level.<sup>28</sup> The EPA's ten generally accepted principles for smart growth follow:<sup>29</sup>

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is more likely to generate higher costs for municipal services and infrastructure than more compact forms of development.").

22. See BENFIELD ET AL., *supra* note 21, at 75-77; see also ME. STATE PLANNING OFFICE, *THE COSTS OF SPRAWL* 5 (1997), available at <http://mainegov-images.org/spo/landuse/docs/costsofsprawl.pdf>.

23. Shelby D. Green, *The Search for a National Land Use Policy: For the Cities' Sake*, 26 FORDHAM URB. L. J. 69, 76 (1998).

24. *Id.* (citing Kevin Kasowski, *The Costs of Sprawl, Revisted*, in DEV., THE NAT'L GROWTH MGMT. LEADERSHIP PROJECT NEWSLETTER 3 (Center for Urban Studies at Rutgers U.) (Sept. 1992)).

25. ME. STATE PLANNING OFFICE, *supra* note 22, at 7.

26. NAT'L ASS'N OF LOCAL GOV'T ENVTL. PROFS. AND SMART GROWTH LEADERSHIP INST., *SMART GROWTH IS SMART BUSINESS* (2004), available at <http://www.sgli.org/SGisSBfinal.pdf>.

27. ME. STATE PLANNING OFFICE, *supra* note 22, at 5.

28. FREILICH, *supra* note 19, at 5 ("Without the capacity to plan effectively for solutions of sprawl, local governments cannot deal with the inherent difficulties of modern urban life.").

29. EPA, EPA231-F-01-001A, *WHAT IS SMART GROWTH* (2001), available at <http://www.epa.gov/dced/pdf/whitissg4v2.pdf>. In August 2004, the EPA issued a new Smart Growth Strategy, focusing on five target areas: (1) promoting infill and redevelopment; (2) catalyzing smart growth transportation solutions; (3) partnering for innova-

- (1) Mix land use;
- (2) Take advantage of compact building design;
- (3) Create a range of housing opportunities and choices;
- (4) Create walkable neighborhoods;
- (5) Foster distinctive, attractive communities with a strong sense of place;
- (6) Preserve open space, farmland, natural beauty, and critical environmental areas;
- (7) Strengthen and direct development towards existing communities;
- (8) Provide a variety of transportation choices;
- (9) Make development decisions predictable, fair, and cost effective; and
- (10) Encourage community and stakeholder collaboration in development decisions.<sup>30</sup>

Through intergovernmental coordination and intelligent analysis, local decision makers can address the problems of population, pollution, economics, and the other policy issues associated with sprawl and smart growth in an effective manner for future generations.<sup>31</sup>

### a. Incentives and Disincentives

"Governments at all levels make and carry out the basic rules under which people and business in communities make decisions, and can create legal structures that either foster or impede sustainable development."<sup>32</sup> Managing growth is directly controlled from the bottom-up, but is indirectly controlled from the top-down. The federal government has not adopted a formal, overarching land use policy to impose upon the states.<sup>33</sup> This leaves the ulti-

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tive development and building regulations; (4) supporting state smart growth initiatives; and (5) ensuring EPA policies recognize the environmental benefits of smart growth. EPA, Michael Leavitt, Memorandum, *EPA Smart Growth Strategy* (Aug. 9, 2004), at <http://www.epa.gov/piedpage/pdf/Admin%20Smart%20Growth%20Strategy%20Memo.pdf>. For a list of EPA's smart growth publications, go to <http://www.epa.gov/smartgrowth/publications.htm> (last updated Jan. 14, 2005).

30. *Id.*

31. Freilich & Peshoff, *supra* note 19, at 195 ("The only proven method of controlling the negative effects of sprawl is through a regional growth management system that determines which areas are appropriate for development and should be protected from development, analyzes corridor location and capacity, and identifies appropriate development patterns.").

32. John C. Dernbach & Scott Bernstein, *Pursuing Sustainable Communities: Looking Back, Looking Forward*, 35 URB. LAW. 495, 501 (2003).

33. Leaving land use decisions to the states and local governments seems to be the overwhelmingly dominant position. *But see* LYNTON KEITH CALDWELL & KRISTIN

mate land use decisions in the hands of those closest to the circumstances—state and local governments. Nonetheless, the federal government has had an extensive effect on land use, even if indirectly. The profound effect federal policies have on planning is not one of substance but of influence, especially in fiscal matters.

At the federal level, the “United States has no national strategy for sustainable development, much less a specific strategy for fostering or encouraging sustainable communities.”<sup>34</sup> Instead, the federal government over the years, especially since the end of World War II, has enacted numerous policies in discreet subject areas that, when taken in combination, provide a synergistic effect more often than not encouraging sprawl development.<sup>35</sup> Some of these federal programs encouraged or even involved planning, such as the TVA project<sup>36</sup> and the Housing Acts of 1949 and 1954, which provided federal funds for comprehensive plan preparation.<sup>37</sup> However, it is the paradox of the planned economic expansion combined with the unplanned physical growth inspired by other federal highway and housing programs that has created the quagmire of today.<sup>38</sup> With the proliferation of highways and the introduction of the interstate system in 1956, the growing population spread throughout the American countryside, where urban planning often did not reach.<sup>39</sup>

The federal government’s policies encouraged housing and transportation in a piecemeal fashion without a coherent land use policy, relying instead on the state and local governments.<sup>40</sup> State

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SHRADER-FRECHETTE, *POLICY FOR LAND: LAW AND ETHICS* 245-60 (1993) (discussing an alternative view that argues for a national land use policy by the federal government).

34. Dernbach & Bernstein, *supra* note 32, at 505.

35. Cf. TOM MARTINSON, *AMERICAN DREAMSCAPE* (2000).

36. JOHN M. LEVY, *CONTEMPORARY URBAN PLANNING* 53 (5th ed. 2000); see also David E. Lilienthal, *Planning and Planners*, reprinted in *CLASSICS OF PUBLIC ADMINISTRATION* 138 (Jay M. Shafritz & Albert C. Hyde eds., 3d ed. 1992) (1944) (describing TVA as a planning agency and elaborating on the word “planning”).

37. JULIAN CONRAD JUERGENSMEYER & THOMAS E. ROBERTS, *LAND USE PLANNING AND CONTROL LAW* 25 (1998); see 42 U.S.C. §§ 1441, 1450-1469 (2000).

38. See generally FREILICH, *supra* note 19, at 3, 5 (“The net effect of these zoning tools promoted sprawl and did not effectuate proper growth management techniques.”).

39. See Green, *supra* note 23, at 70-71.

40. See RUTHERFORD H. PLATT, *LAND USE AND SOCIETY* 393-469 (1996) (discussing the federal policies and programs that have influenced and affected growth in the United States); PIETRO S. NIVOLA, *LAWS OF THE LANDSCAPE: HOW POLICIES SHAPE CITIES IN EUROPE AND AMERICA* 12-34 (identifying national policies in transportation, energy, housing, taxation, and other government subsidies as proponents of sprawl).



and local governments rely heavily on federal funds to enact and administer programs to improve the quality of life for their citizens. The federal government subsidizes water projects, roads, housing, economic development, and infrastructure.<sup>41</sup> Examples abound where the federal government, through environmental laws or other legislation, influences state and local governments' behavior with the carrot of money.<sup>42</sup> Since the state and local governments rely heavily on these federal funds,<sup>43</sup> the threat of making state and local governments fund projects themselves to meet the federal mandates serves as the stick.

But the state and local governments maintain the most direct control over the incentives and disincentives for growth and development. Generally states implement federal environmental legislation such as the Clean Water and Clean Air Acts. Many of these incentives and disincentives focus on infrastructure. New development requires public infrastructure in the form of roads, sewers, water, electricity, schools,<sup>44</sup> parks, police, fire protection, and other services. If new development does not pay the full cost of its impact on the community, then the public subsidizes growth.

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41. See Jason C. Rylander, *The Emerging Federal Role In Growth Management*, 15 J. LAND USE & ENVTL. LAW 277, 283-89 (2000) (discussing the federal government's policies and involvement in land use); ROBERT GOTTLIEB, *A LIFE OF ITS OWN* 35-112 (1998) (detailing the history of the water industry and describing the impact of government subsidies on the water industry and farming); Kenneth T. Jackson, *Crabgrass Frontier: The Suburbanization of the United States*, reprinted in *A PROPERTY ANTHOLOGY* 407-11 (Richard H. Chused, ed., 2d ed. 1997) (discussing federal government housing policy).

42. For example, highway funds are tied to conformity under the Clean Air Act, and funds for water treatment plants are linked with conditions under the Clean Water Act. See generally HENRY L. DIAMOND & PATRICK F. NOONAN, *LAND USE IN AMERICA* 47 (1996) (federal legislation "requires state and local governments . . . to develop comprehensive plans for any transportation projects receiving federal funding."); Michael R. Yarne, Note, *Conformity as Catalyst: Environmental Defense Fund v. Environmental Protection Agency*, 27 *ECOLOGY L.Q.* 841, 853 (2000) (exploring conformity under the CAA and federal transportation law influencing regional governments). These grants form a substantial part of the EPA's budget. "In thirteen of the past twenty-five years these grants have accounted for more than half the EPA budget. . . ." J. CLARENCE DAVIES & JAN MAZUREK, *POLLUTION CONTROL IN THE UNITED STATES* 20 (1999).

43. See generally EPA, EPA310-R-99-001, *PROFILE OF LOCAL GOVERNMENT OPERATIONS* app. A, at A-17, A-22 (1999), available at <http://www.epa.gov/Compliance/resources/publications/assistance/sectors/notebooks/complete.pdf> (over 35 percent of county government revenues come from intergovernmental sources, including federal grants).

44. EPA, EPA231-R-03-004, *TRAVEL AND ENVIRONMENTAL IMPLICATIONS OF SCHOOL SITINGS* (2003), available at [http://epa.gov/dced/pdf/school\\_travel.pdf](http://epa.gov/dced/pdf/school_travel.pdf); see SMART SCHOOLS, SMART GROWTH INITIATIVE, at <http://www.smart-schools.org> (last visited Apr. 13, 2005).

Public funds are depleted and taxes increased.<sup>45</sup> The residents of that community ultimately bear the financial burden and other hardships wrought by unplanned and unmanaged development.<sup>46</sup> In short, infrastructure controls growth,<sup>47</sup> and the state and local governments control infrastructure.

### i. Economics

One cannot seriously attempt to formulate any semblance of a plan for addressing sprawl and growth issues without an inventory of the natural resources and a consideration of their value in economic terms. This is a necessary step to prioritize goals and establish an order of rank to address the most pressing problems within a cost-benefit criteria. While this may seem self-evident, short-term interests have often taken precedence over long-term values because of differences in applying the elements of a cost-benefit analysis, especially with regards to discounting.<sup>48</sup> However, as one economist has pointed out:

[T]he value of a sawmill is zero without forests; the value of fishing boats is zero without fish; the value of refineries is zero without remaining deposits of petroleum; the value of dams is zero without rivers and catchment areas with sufficient forest cover to prevent erosion and siltation of the lake behind the dam. Empty verbiage about the intergenerational invisible hand and the near-perfect sustainability or man-made for natu-

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45. Fodor, *supra* note 20.

46. One study discussing rural development cautions citizens about the perceived versus real cost of development: "Those outside investors can usually be counted upon to make development happen, but with the exception of their vested interest in infrastructure, they may have little or no interest in assuring the development is compatible with the best interests of longtime local residents." JAMES C. HITE ET AL., SOUTHERN RURAL DEV. CTR., *LAND PRICES AND THE CHANGING GEOGRAPHY OF SOUTHERN ROW-CROP AGRICULTURE* 17 (1999), available at <http://www.strom.clemson.edu/publications/hite/rowcrop.pdf>. Note that one of the principles of smart growth is higher density. As one might expect, the per capita cost of public services declines with increased density, lessening the economic burden on the citizen. John I. Carruthers and Gudmundur F. Ulfarsson, *Urban sprawl and the cost of public services*, 30 ENV'T AND PLANNING B: PLANNING AND DESIGN 503 (2003).

47. See DOUGLAS R. PORTER, *MANAGING GROWTH IN AMERICA'S COMMUNITIES* 117-46 (1997).

48. See Timothy J. Brennan, *Discounting the Future: Economics and Ethics*, in THE RFF READER IN ENVIRONMENTAL AND RESOURCE MANAGEMENT 35 (Wallace E. Oates, ed., 1999).

ral capital is just the usual confused attempt to give a technical nonanswer to a moral question.<sup>49</sup>

Hence, meaningful planning and growth management must take place with an understanding of the value of the ecosystem. After all, if resources were unlimited and their destruction did not really matter, then the allocation of these resources would not be an issue.<sup>50</sup>

One of the fundamental problems of the market in any economic regime is the valuation issue.<sup>51</sup> "The economic approach to sustainability considers only economic activities and excludes many important individual and collective activities and processes."<sup>52</sup> Undervalued resources are often wasted; therefore, the proper pricing signals must be sent to support sustainable development.<sup>53</sup> An undervaluation of resources encourages pollution, especially common pool resources such as water. Any valuation method applied to the environment will necessarily involve shadow pricing and the quantification of qualitative goods and services.<sup>54</sup> For example, one study placed the value of the earth's ecosystem at about \$33 trillion per year.<sup>55</sup> As expected, this study soon became the center of vocal criticism for its meth-

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49. HERMAN E. DALY, *BEYOND GROWTH* 221 (1996). A recent manifestation of the problem with substituting man-made for natural resources is the genetically modified food controversy. See Erik Millstone et al., *Beyond 'Substantial Equivalence,'* 401 NATURE 525 (1999); Dan Ferber, *GM Crops in the Cross Hairs*, 286 SCIENCE 1662 (1999).

50. CHRISTOPHER D. STONE, *EARTH AND OTHER ETHICS* 26 (1987) (citing David Hume).

51. Oscar Wilde wrote that a cynic is one who knows the price of everything and the value of nothing. That would make ours the most cynical age in history. Because not only the legal profession but every corner of our swollen economy as well is busy reducing human endeavor to quantifiable units . . . The fabric of our society is appraised by the price of each thread.

DAVID LEBEDOFF, *CLEANING UP: THE STORY OF THE BIGGEST LEGAL BONANZA OF OUR TIME* 74 (1997).

52. NAT'L RESEARCH COUNCIL, *NATURE'S NUMBERS* 185 (1999).

53. R. KERRY TURNER ET AL., *ENVIRONMENTAL ECONOMICS* 252-66 (1993).

54. See *id.* at 123-31 (1999); MARK SAGOFF, *THE ECONOMY OF THE EARTH* 74-98 (1988); R. KERRY TURNER ET AL., *ENVIRONMENTAL ECONOMICS* 108-27 (1993); David M. Driesen, *The Societal Cost of Environmental Regulation: Beyond Administrative Cost-Benefit Analysis*, 278 LAND USE & ENVTL. L. REV. 369 (1998).

55. Robert Costanza et al., *The Value of the World's Ecosystem Services and Natural Capital*, 387 NATURE 253, 253 (1997) ("For the entire biosphere, the value (most of which is outside the market) is estimated to be in the range of US\$16-54 trillion (10<sup>12</sup>) per year, with an average of US\$33 trillion per year. Because of the nature of the uncertainties, this must be considered a minimum estimate. Global gross national product total is around US\$18 trillion per year.").

ods,<sup>56</sup> but it serves to prove the point. The valuation problem, whether the object is air, water, or property, remains as the single largest obstacle for resource economics.<sup>57</sup>

## ii. Zoning

Inherent in growth management is regulation. Zoning is the most familiar tool used by planners and governments today to guide, limit, control, or allow development.<sup>58</sup> It received the United States Supreme Court's blessing in 1926 and has dominated land use planning since.<sup>59</sup> Why? Because local planners have traditionally used zoning and building codes to protect property owners from their neighbors and provide for safety from property uses that may lead to adverse economic, environmental, or social effects.<sup>60</sup> This includes exclusionary zoning against classes of people, such as minorities and the poor.<sup>61</sup> Zoning has been especially important in the last generation, with 80 percent of everything built in the United States occurring in the last fifty years under zoning schemes that encourage the separation of uses.<sup>62</sup>

Zoning is not planning,<sup>63</sup> however, and is really just "an exercise in the art of rational line drawing . . ."<sup>64</sup> by the local governments that utilize it. Zoning is one aspect of planning, but should

56. See *Audacious Bid to Value the Planet Whips Up a Storm*, 395 NATURE 430 (1998) (discussing various criticisms of the study).

57. See generally NAT'L RESEARCH COUNCIL, *supra* note 52, at 44 ("For practical accountants, the most daunting obstacles are empirical and data problems involved in estimating quantities of stocks and flows and providing monetary valuation . . .").

58. "[Z]oning is the most widespread local land use control tool, in use in every major city . . ." PLATT, *supra* note 40, at 216-17.

59. See *Vill. of Euclid v. Ambler Realty Co.*, 272 U.S. 365, 394-95 (1926).

Ever since 1926, when the Supreme Court in the landmark case of *Village of Euclid v. Ambler Realty Co.* recognized municipal planning and regulation of land use as a valid exercise of the police power of the states, these activities have gained increasing acceptance by communities and the courts.

Charles M. Haar, *In Accord With a Comprehensive Plan*, 68 HARV. L. REV. 1154 (1955).

60. John Turner & Jason Rylander, *Land Use: The Forgotten Agenda*, in THINKING ECOLOGICALLY 60, 63 (Marian R. Chertow & Daniel C. Esty eds., 1997).

61. See Robert C. Ellickson, *Alternatives to Zoning: Covenants, Nuisance Rules, and Fines as Land Use Controls*, 40 U. CHI. L. REV. 681 (1973), reprinted in A PROPERTY ANTHOLOGY 551, 555-58 (Richard H. Chused 2d ed., 1997).

62. Turner & Rylander, *supra* note 60, at 65, 75.

63. Haar, *supra* note 59, at 1156 ("[Z]oning is but one of the many tools which may be used to implement the plan. Warnings have constantly emanated from the planners that the two must not be confused.").

64. PLATT, *supra* note 40, at 240.

not be confused with planning.<sup>65</sup> It is a highly subjective process and can lead not only to, but promote, inefficient use of the land.<sup>66</sup> "[L]ocal planners have increasingly used zoning regulations to separate arbitrarily residential and commercial uses of land," leaving the mixed-use developments that attract tourists and thrive as historic urban centers, such as Charleston, South Carolina, prohibited by most local codes.<sup>67</sup> Indeed, zoning has outlived its usefulness as a *singular* planning mechanism, having been overwhelmed by growth and urbanization.<sup>68</sup> Zoning generally serves to maintain the *status quo* and vindicates existing land uses<sup>69</sup> rather than advance a progressive public policy. Nevertheless, it bears repeating that zoning is only one tool of planning; it is not planning itself.<sup>70</sup> Zoning and the local governments that utilize it extensively as a means of planning have been unable to rationally and effectively handle growth and sprawl.<sup>71</sup> In dealing with growth intelligently, other mechanisms are necessary to complement zoning.<sup>72</sup> These include development impact fees, transferable development rights, urban growth boundaries, community impact statements, environmental impact statements, and tax in-

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65. "It is difficult to see why zoning should not be required legislatively and judicially to justify itself by consonance with a master plan as well." Charles L. Siemon, *Successful Growth Management Techniques: Observations from the Monkey Cage*, 29 URB. LAW. 233, 234 (1997).

66. "The problems caused by fractionalized governments and local parochialism translated into a lack of local governments' ability to coordinate necessary planning strategies throughout the region." FREILICH, *supra* note 19, at 3. See PLATT, *supra* note 40, at 296 ("Zoning has particularly been criticized for procedural inadequacies: lax enforcement, favoritism, lack of consistency with planning, and excessive rigidity in some cases and undue flexibility in others.").

67. Turner & Rylander, *supra* note 60, at 63.

68. See PLATT, *supra* note 40, at 296-97.

69. JUERGENSMEYER & ROBERTS, *supra* note 37, at 23; LEVY, *supra* note 36, at 38-39.

70. PLATT, *supra* note 40, at 255 ("It is axiomatic that land use zoning is subordinate to planning." (Citing R.F. BABCOCK, *THE ZONING GAME* 120 (1966))). See Richard A. Epstein, *A Conceptual Approach to Zoning: What's Wrong With Euclid*, 5 N.Y.U. ENVTL. L.J. 277 (1996), in *A LAND USE ANTHOLOGY* 87 (Jon W. Bruce, ed., 1998) ("In many ways the entire zoning process fundamentally misunderstands the way in which individuals wish to integrate and coordinate their activities."); Bradley C. Karkkainen, *Zoning: A Reply to the Critics*, 10 J. LAND USE & ENVTL. L. 45 (1994), in *A LAND USE ANTHOLOGY* 104 (Jon W. Bruce, ed., 1998) ("[I]t is not clear that zoning has ever been well-integrated with the other tools at a planner's disposal . . .").

71. FREILICH, *supra* note 19, at 3, 5.

72. See generally J.B. Ruhl, *Taming the Suburban Amoeba in the Ecosystem Age: Some Do's and Don'ts*, 3 WIDENER L. SYMP. J. 61 (1998) (discussing sprawl and its effects on land use management at the local level).

centives;<sup>73</sup> and can be implemented and coordinated through a comprehensive plan.

### iii. Housing<sup>74</sup>

Housing the increasing population opens an issue of fairness. Ideally, housing is offered for all income spectrums. This provides for more economical use of resources in providing the goods and services in any local economy. For example, when affordable housing is unavailable for lower income ranges, then those individuals require more resources to support their endeavors, such as transportation needs for work, which are often subsidized by the government vis-a-vis tax revenues.<sup>75</sup> This also increases the cost to the individual, which creates a perpetual cycle limiting class movement. In other words, smart growth principles seek to provide a more equitable base for the citizens.<sup>76</sup>

Another issue is not just what kind of housing, but where. With the increase in the number of units, the land consumption increases as well.<sup>77</sup> One solution to this is an increase in housing density. But it is one of the great paradoxes of land use that Americans hate two things equally—sprawl and density. We live in bigger houses farther apart today than in the past. As population increases, so does the need for housing and conversely the need for land, which is a finite resource.

### iv. Roads

"Today, the nerve center of the metropolitan area is the highway, not the center city."<sup>78</sup> Since the end of World War II, the accepted solution to transportation problems has been to build more roads to connect a spreading America and accommodate the

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73. See generally S. ENVTL. L. CTR. & ENVTL. L. INST., *SMART GROWTH IN THE SOUTHEAST: NEW APPROACHES FOR GUIDING DEVELOPMENT* (1999), available at [http://www.selcga.org/Projects/proj\\_land\\_southeast.pdf](http://www.selcga.org/Projects/proj_land_southeast.pdf) (suggesting strategies for controlling growth).

74. See SMART GROWTH NETWORK, *AFFORDABLE HOUSING AND SMART GROWTH* (2001), available at [http://www.smartgrowth.org/pdf/epa\\_ah-sg.pdf](http://www.smartgrowth.org/pdf/epa_ah-sg.pdf).

75. *Id.*

76. *Id.*

77. EPA, EPA231-R-04-002, *PROTECTING WATER RESOURCES WITH SMART GROWTH* 9-10 (2004), available at [http://www.epa.gov/smartgrowth/pdf/waterresources\\_with\\_sg.pdf](http://www.epa.gov/smartgrowth/pdf/waterresources_with_sg.pdf).

78. John H. Tibbetts, *The Freeway City*, 17 COASTAL HERITAGE 4 (Winter 2002) (quoting Robert F. Becker), available at [http://www.scseagrant.org/library/library\\_coaher\\_win02.htm](http://www.scseagrant.org/library/library_coaher_win02.htm).

automobile.<sup>79</sup> America has become a nation dependent on the automobile for nearly everything.<sup>80</sup> This dependence has led to increased single-use development planned with commuting in mind, despite the fact that most Americans favor mixed-use planning and living closer to work. It has also become a symbol of independence imbedded in the American psyche. Transportation policies, or the lack thereof, have increased pollution and energy consumption and encouraged individual vehicle use.<sup>81</sup> For example, in 2001, 78 percent of working Americans commuted to work alone.<sup>82</sup> This dependence on private motor vehicles is making it difficult for policymakers to implement changes in transportation while respecting environmental policy. Planning procedures for the future must consider these environmental concerns when addressing transportation issues.<sup>83</sup>

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79. See F. KAID BENFIELD ET AL., *supra* note 21, at 30 ("As we spread ourselves farther and farther apart, it becomes inevitable that we must travel longer distances to work, shop, enjoy recreation, and visit family and friends . . . . The only good choice for most suburbanites is to drive, and to drive a lot."); Emil Frankel, *Coexisting With the Car*, in THINKING ECOLOGICALLY: THE NEXT GENERATION OF ENVIRONMENTAL POLICY 198 (Marian R. Chertow & Daniel C. Esty, eds. 1997) ("The dominance of the automobile in post-World War II America has been a critical factor in shaping a society of mobility and independence and in making a livable environment accessible to many people.").

80. See SURFACE TRANSP. POL'Y PROJECT, DRIVEN TO SPEND: THE IMPACT OF SPRAWL ON HOUSEHOLD TRANSPORTATION EXPENSES 5 (2000), available at <http://www.transact.org/report.asp?id=36> ("Sprawl makes driving the only practical form of transportation . . . ."); NIVOLA, *supra* note 40, at 13-14 (detailing the federal government's commitment to building and funding highways); Craig N. Oren, *Getting Commuters Out of Their Cars: What Went Wrong?*, 17 STAN. ENVTL. L.J. 141, 160 (1998) (discussing the upswing in automobiles and associated factors).

81. F. Kaid Benfield, *Running On Empty: The Case For a Sustainable National Transportation System*, 25 ENVTL. L. 651, 655-657 (1995) (discussing the consequences of expanded transportation systems on energy and air pollution); F. KAID BENFIELD ET AL., *supra* note 21, 55-63. Ironically, the last twenty years have seen an overwhelming increase not only in pavement but in off-road vehicles designed to go into the places left that are not paved. See Jake Page, *Ten Mediocre 20th Century Inventions*, 5 SCIENCE 84, at 28-29 (Nov. 1984).

82. USDOT, BUREAU OF STATISTICS, NAT'L TRANSP. STATISTICS tbl 1-38 (2003), available at [http://www.bts.gov/publications/national\\_transportation\\_statistics/2003/html/table\\_01\\_38.html](http://www.bts.gov/publications/national_transportation_statistics/2003/html/table_01_38.html).

83. [D]ependence on private motor vehicles must be reduced, rather than increased, if the U.S. is to implement the Clean Air Act, Intermodal Surface Transportation Efficiency Act, and its pledge to abide by the Agenda 21 goals of the UN Conference on the Environment in Rio, aimed at slowing global climate change.

MICHAEL REPLOGLE, ENVIRONMENTAL DEFENSE FUND, TRANSPORTATION CONFORMITY & DEMAND MANAGEMENT: VITAL STRATEGIES FOR CLEAN AIR ATTAINMENT, MOTOR VEHICLE USE AND THE CLEAN AIR ACT: BOOSTING EFFICIENCY BY REDUCING TRAVEL app. 2 (Oct. 1, 1993), at <http://www.tmp.fhwa.dot.gov/clearinghouse/docs/airquality/vsca/>.

For years, this causal relationship between transportation and land use planning was acknowledged, but it was ignored because transportation planning was the domain of engineers, and land use planning was the domain of local governments.<sup>84</sup> Problems with this disjointed relationship expanded in direct proportion to the monopolization of the automobile on life and society,<sup>85</sup> and transportation began guiding development, rather than development guiding transportation.<sup>86</sup> Vehicle miles traveled ("VMT") between 1970 and 2002 increased from 1.1 billion VMT to 2.85 billion VMT.<sup>87</sup>

Congress has recognized this gap between land use and transportation planning and through several bills, notably the Intermodal Surface Transportation Efficiency Act ("ISTEA")<sup>88</sup> enacted in 1991, the Transportation Equity Act for the 21st Century ("TEA-21") enacted in 1998,<sup>89</sup> and the Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003 ("SAFETEA"), has given states and local governments more flexibility and encouraged coordinated planning efforts. The legislation also requires regional planning for long-term transportation planning that accounts for land use planning. TEA-21, for example, relies on statewide planning as the primary decision-making mechanism and encourages state and local planning coordination.<sup>90</sup> The legislation provides strong economic incentives for re-

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84. See James Lighthizer, *Transportation: A Key Element in Sustainable Communities*, in HENRY L. DIAMOND & PATRICK F. NOONAN, *LAND USE IN AMERICA* 173 (1996).

85. See Christopher B. Leinberger, *Metropolitan Development Trends of the Late 1990s: Social and Environmental Implications*, in HENRY L. DIAMOND & PATRICK F. NOONAN, *LAND USE IN AMERICA* 203, 209 (1996).

86. See Lighthizer, *supra* note 84, at 173. "Transportation should be a servant of community development, not its master."

87. USDOT, BUREAU OF STATISTICS, NAT'L TRANSP. STATISTICS tbl 1-32 (2003), available at [http://www.bts.gov/publications/national\\_transportation\\_statistics/2003/html/table\\_01\\_32.html](http://www.bts.gov/publications/national_transportation_statistics/2003/html/table_01_32.html).

88. Intermodal Surface Transportation Efficiency Act, Pub. L. No. 102-240, 105 Stat. 1914 (1991); see U.S. OFFICE OF MGMT. & BUDGET, *BUDGET OF THE UNITED STATES GOVERNMENT: FISCAL YEAR 1999*, at 87 (1999), available at <http://www.gpoaccess.gov/usbudget/fy99/budget.pdf>.

89. Transportation Equity Act for the 21st Century, Pub. L. No. 105-178, 112 Stat. 107 (1998).

90. See USDOT, TEA-21 FACT SHEET: STATEWIDE PLANNING (Sept. 14, 1999), available at <http://www.fhwa.dot.gov/tea21/factsheets/statepln.htm>; USDOT, TEA-21 FACT SHEET: METROPOLITAN PLANNING (Sept. 14, 1999), available at <http://www.fhwa.dot.gov/tea21/factsheets/metropln.htm>; USDOT, TEA-21 FACT SHEET: ENVIRONMENTAL STREAMLINING (Sept. 14, 1999), available at <http://www.fhwa.dot.gov/tea21/factsheets/envstr.htm>.



sponsible planning and includes cooperative programs that speak to both urban and rural transport issues.<sup>91</sup>

Sustainable development and smart growth simply cannot occur without effectively addressing transportation issues, and vice versa.<sup>92</sup> "In short, there are no 'magic bullet' solutions to transportation problems, but a great need for developing multi-faceted strategies encompassing changes in transportation and land use pricing policies, regulations, street-space allocation, infrastructure spending priorities, urban design, and land use patterns."<sup>93</sup>

## v. Water and Sewer

The Clean Water Act ("CWA") can affect industrial siting through its total maximum daily load ("TMDL") program, among other programs.<sup>94</sup> The TMDL program effectively limits the amount of industrial discharge in waters by working with the current CWA national pollution discharge elimination system ("NPDES") permit program. Other federal subsidies provided in the CWA give infrastructure capitalization to states for wastewater and drinking water treatment plants and facilities that affect the community's carrying capacity for population and development.<sup>95</sup>

Another adverse byproduct of increased development is an increase in impervious surfaces, which increases runoff and nonpoint source pollution, leading to a deterioration of water quality. The threshold percentage for damage is somewhere between 10 and 15 percent of impervious surface area.<sup>96</sup> Once that thresh-

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91. See USDOT, TEA-21 DELIVERS: ONE YEAR ANNIVERSARY (June 1999), available at <http://www.fhwa.dot.gov/tea21/t2lanniv.htm>.

92. See generally JACK FAUCETT ASSOC. & SIERRA RESEARCH, INC., EPA, EPA420-P-99-028, GRANTING AIR QUALITY CREDITS FOR LAND USE MEASURES: POLICY OPTIONS (Sept. 1999), available at <http://www.epa.gov/otaq/transp/traqsusd.htm> (analyzing policy options for recognizing and granting credit for sustainable land use activities); ARLENE S. ROSENBAUM & BRETT E. KOENIG, EPA, EPA420-R-97-007, EVALUATION OF MODELING TOOLS FOR ASSESSING LAND USE POLICIES AND STRATEGIES (1997), available at <http://www.epa.gov/otaq/transp/transcont/lum-rpt.pdf> (evaluating the impact of land use policies and strategies designed to reduce travel demand).

93. REPLOGLE, *supra* note 83.

94. See generally OLIVER A. HOUCK, THE CLEAN WATER ACT TMDL PROGRAM: LAW, POLICY, AND IMPLEMENTATION (1999) (detailing the history and current issues and framework of the program).

95. See U.S. OFFICE OF MGMT. & BUDGET, BUDGET OF THE UNITED STATES GOVERNMENT: FISCAL YEAR 2005, at 113 (2005), available at <http://www.whitehouse.gov/omb/budget/fy2005/pdf/spec.pdf>.

96. EPA, *supra* note 77, at 9-10; see BEACH, *supra* note 3, at 7-12.

old is reached, then the runoff from the impervious surfaces adversely affects habitat quality, water quality, and aquatic life.<sup>97</sup>

Water supply is inextricably linked to land conversion, and thus water supply should be incorporated in land use planning and growth management strategies.<sup>98</sup> In coastal areas the issue is more pronounced because, ironically, while there is more water it is generally saltwater or brackish and unsuitable for use. This problem takes on different faces in different environments, depending on whether an area receives its drinking water, for example, predominantly from surface water or groundwater sources.

Wastewater treatment and disposal play vital roles in the assimilative capacity of communities to accommodate growth. Section 208 of the CWA provides for coordinated planning of these facilities.<sup>99</sup> The capacity and location of these facilities often dictates the direction and pace of development. A community without a sewer line, for example, must rely on septic tanks, which necessarily dictates a lower density development than could otherwise be achievable with a sewer line. Thus, this type of infrastructure often precedes large developments and any type of growth management system must address the coordination of water supply and wastewater treatment.<sup>100</sup>

## vi. Air

The Clean Air Act ("CAA")<sup>101</sup> was developed to protect the public health and does so primarily through an extensive regulatory system that governs the emissions from pollution sources (generally business and industry). The country is divided into air quality control regions ("AQCRs"),<sup>102</sup> and each region is designated as nonattainment or attainment for six criteria pollutants pursuant to the National Ambient Air Quality Standards ("NAAQS") established by the EPA.<sup>103</sup> Each state then develops a state implementation plan ("SIP") or a federal implementation plan ("FIP") for the area that specifies how a state will implement either the nonattainment program (to make the state's AQCRs

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97. BEACH, *supra* note 3, at 7-12.

98. See generally URBAN LAND INST., WATER AND THE FUTURE OF LAND DEVELOPMENT (Nov. 2002), available at [http://www.uli.org/AM/Template.cfm?Section=search&section=policy\\_Papers2&template=/CM/ContentDisplay.cfm&ContentFileID=683](http://www.uli.org/AM/Template.cfm?Section=search&section=policy_Papers2&template=/CM/ContentDisplay.cfm&ContentFileID=683).

99. Clean Water Act § 208, 33 U.S.C. § 1288 (2000).

100. EPA, *supra* note 77, at 23.

101. Clean Air Act, 42 U.S.C. §§ 7401-7671q (2000).

102. See ARNOLD RIETZE, JR., AIR POLLUTION LAW § 2-5, at 73 (1995).

103. *Id.* § 2-3, at 54-57.

conform to the NAAQS) or the prevention of significant deterioration ("PSD") program (for those areas in attainment), to keep them from violating the applicable NAAQS.<sup>104</sup> Most states have been delegated authority to administer these programs in lieu of having the EPA administer them. In administering these programs, the states may indirectly prohibit development in some areas and place restrictions on development in others because of the regulatory requirements based on an area's classification.<sup>105</sup> These restrictions generally apply to industrial and commercial sources, but the ripple effect impacts land use planning for local governments in industry recruitment and transportation planning, as certain nonattainment designations may trigger "conformity" requirements for transportation planning.<sup>106</sup> These emissions limit the siting possibilities of economic investments.<sup>107</sup> In fact, these restrictions encourage development in greenfields and discourage redevelopment, which is contrary to the principles of smart growth.<sup>108</sup>

## b. Land Use Planning

What is this "planning" that can lead to sustainable development and smart growth? Simply put, planning decides what will be where.<sup>109</sup> In the legal arena, planning falls within the rubric of land use law. "Land use law . . . addresses *how* desirable uses of land may be achieved, and *who* has the authority to decide among competing uses. . . . A primary purpose of an organized society is to use law to facilitate the efficient and productive use of land."<sup>110</sup> As a general concept, smart growth or sustainable development

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104. *Id.* § 3-1(a), at 82.

105. The EPA has documented the intersection of air quality, transportation policy, and land use planning in a document that details strategies for gaining SIP credits with sustainable practices. JACK FAUCETT ASSOC. & SIERRA RESEARCH, INC., *supra* note 92; see also JACK FAUCETT ASSOC. & SIERRA RESEARCH, INC., EPA, EPA420-R-98-012, BACKGROUND INFORMATION FOR LAND USE SIP POLICY (1998), available at <http://www.epa.gov/otaq/transp/transcont/siprptv3.pdf>.

106. For example, one of the criteria pollutants is carbon monoxide, and vehicles are the primary source of emissions for carbon monoxide. See Arnold W. Reitze, Jr., *Transportation-Related Pollution and the Clean Air Act's Conformity Requirements*, 13 NAT. RESOURCES & ENV'T 406 (Fall 1998).

107. Daniel P. Selmi, *Impacts of Air Quality Regulation on Economic Development*, 13 NAT. RESOURCES & ENV'T 382 (Fall 1998).

108. Ward, *supra* note 17, at 327; see generally CURTIS MOORE, SMART GROWTH AND THE CLEAN AIR ACT (2001).

109. ARNOLD W. REITZE, JR., ENVIRONMENTAL PLANNING: LAW OF LAND & RESOURCES One-1 (1974).

110. PLATT, *supra* note 40, at 29.

planning for the land and for society are universally heralded as a good thing. But sustainable development, planning, and smart growth are terms difficult to precisely define.<sup>111</sup> Smart growth requires a notion of who will do the planning, what kind of planning will occur, how much is needed, and where it should be implemented.<sup>112</sup> Planning happens regardless of what we call it or how well it is done.<sup>113</sup> The goal in planning should be to reduce humankind's "ecological footprint" as much as possible,<sup>114</sup> furthering the policy of sustainable development and smart growth, while at the same time maximizing the efficient use of the natural resources. How this goal is accomplished must be through state and local government cooperation and planning through a meaningful commitment to the establishment of long-term goals and smart growth principles.

### III. GROWING—AND GROWING SMART—ON THE COAST

The coast presents a unique landscape for development. Development is locked in one side; it can only move landward. And while the interior of the country has natural barriers to development, such as mountains, deserts, and a lack of access to water, coastal areas are often flat and within easy reach of resources, making the areas natural places for habitation and settlement. Coastal communities are increasingly attractive places to live and vacation.<sup>115</sup> "Coastal areas hold the nation's fastest growth rates

111. "Apparent agreement masks a fight over what exactly 'sustainable development' should mean—a fight in which the stakes are very high." DALY, *supra* note 49, at 1. "Sustainable development is a term that everyone likes, but nobody is sure of what it means." *Id.* See Michael A. Toman, *The Difficulty in Defining Sustainability*, in THE RFF READER IN ENVIRONMENTAL AND RESOURCE MANAGEMENT 251 (Wallace E. Oates ed., 1999).

112. REITZE, *supra* note 109, at x. See David E. Lilienthal, *Planning and Planners*, reprinted in CLASSICS OF PUBLIC ADMINISTRATION 138 (3d ed. 1992) (1944) ("The question for us is not: Should we plan? but: What kind of plans should we make?").

113. See DIAMOND & NOONAN, *supra* note 42, at 7. "[A]s long as we have purposeful human activity, we will have planning. The goal obviously must be to improve the quality of the planning." REITZE, *supra* note 109, at x.

114. See generally MATHIS WACKERNAGEL & WILLIAM REES, OUR ECOLOGICAL FOOTPRINT: REDUCING HUMAN IMPACT ON THE EARTH (1996) (discussing the impact of urban growth on the environment and its costs to society).

115. Structures within 500 feet of the shoreline:

	Atlantic Coast	Gulf of Mexico	Pacific Coast	Great Lakes
Number	170,000	44,000	66,000	58,000
% of Total	50%	13%	20%	17%

and the largest urban centers. . . . Coastal areas also support some of the most densely populated areas in the country."<sup>116</sup> This press then supports the need for the application of smart growth principles to preserve the coast in a useful and sustainable manner.<sup>117</sup>

The significant presence of water gives the coastal area its unique character, but also presents unique challenges. Nonpoint source pollution is one of the major problems with coastal waters. Agricultural practices and septic tanks, for example, have contributed to the degradation of water quality,<sup>118</sup> and pristine waters are the hallmark (and the value) of any coastal area. This type of contamination can lead to hazardous algae blooms and red tide as well as the presence of other pathogenic bacteria and viruses.<sup>119</sup> Wetlands are ecologically important.<sup>120</sup> They provide habitat for biological diversity and for stability for plant life. Wetlands are also efficient at denitrification and pollutant removal. For example, an EPA report demonstrated that the wetlands in the Congaree Bottomland Hardwood Swamp in South Carolina serve the same function as a \$5 million wastewater treatment facility.<sup>121</sup> Wetlands also mark some of the most valuable waterfront real estate for development. Floodplains perform a similar service protecting humans from natural hazards, and the development of floodplains significantly increases the risk and severity of flooding.<sup>122</sup>

Dunes systems on beaches are necessary to maintain the integrity of the beach. Many coastal areas have setback requirements prohibiting development within a certain area of the dune

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TIMOTHY BEATLEY ET AL., AN INTRODUCTION TO COASTAL ZONE MANAGEMENT 69 tbl. 3.3 (2d. ed. 2002).

116. Carolina Kurrus, *Living on the Coast: Smart Growth Tools on the Internet*, 2000 APA National Planning Conference (Apr. 16, 2000), available at <http://www.asu.edu/caed/proceedings00/KURRUS/kurrus.htm>.

117. The National Oceanic and Atmospheric Administration (NOAA), in recognition of the need for smart growth development on the coast, has boiled down the smart growth principles into three points: (1) know your place; (2) design for people; and (3) build for the future. *Id.* See NOAA, NOAA COASTAL SERVICES CENTER STRATEGIC PLAN 2001-2006 (2001), available at [http://www.csc.noaa.gov/strategic\\_plan.pdf](http://www.csc.noaa.gov/strategic_plan.pdf).

118. VERNBERG & VERNBERG, *supra* note 9, at 102-06.

119. *Id.* at 107.

120. See *id.* at 52-54.

121. EPA, WETLANDS AND PEOPLE, available at <http://www.epa.gov/OWOW/wetlands/vital/people.html> (last updated March 23, 2005).

122. "Development activities can destroy floodplains, decrease flood storage, increase runoff, and decrease water quality and quantity." JOHN R. NOLON, ED., NEW GROUND: THE ADVENT OF LOCAL ENVIRONMENTAL LAW 28 (2003).

system to preserve and protect those essential elements. As tourism increases with development, public beach access, which is a necessity for a strong tourist economy, is vital to the coast. This creates two issues. The first is beach access for the public, and the second is assuring that there is a beach to visit. The coastline is always in a state of flux through erosion and accretion. This uncertainty in the landscape does not bode well for the tourism industry, so efforts are made to ensure that a beach is maintained; one of the methods for that is beach renourishment, which is expensive and short-lived.<sup>123</sup>

In recognition of these distinctive traits, there is one primary statute aimed at addressing these problems and securing and protecting the coastal resources. The federal Coastal Zone Management Act ("CZMA"),<sup>124</sup> enacted in 1972, seeks "to preserve, protect, develop, and where possible, to restore or enhance, the resources of the Nation's coastal zone for this and succeeding generations."<sup>125</sup> Unlike traditional command-and-control environmental laws, participation by states under the CZMA is voluntary. If a state meets certain criteria and follows established guidelines, the federal government provides funds for the implementation of the coastal program under the CZMA.<sup>126</sup> An additional carrot to states to undertake a CZMA plan is that federal activities must be consistent with the state plan, giving states a stake in federal permitting activities.<sup>127</sup> Amendments in 1990 focused on this federal consistency requirement, clarifying its scope and application, and also introduced a coastal non-point source pollution control element for state plans. Thirty-four states administer coastal programs under the CZMA, covering over 99 percent of the nation's shoreline.<sup>128</sup>

The CZMA requires the management agency in the state to establish an "effective mechanism for continuing consultation and

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123. BEATLEY, *supra* note 115, at 73, 118-19.

124. Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464 (2000).

125. *Id.* § 1452.

126. The CZMA program is not administered by the EPA, but by the National Oceanic and Atmospheric Administration's ("NOAA") Office of Ocean and Coastal Resources Management within the Department of Commerce.

127. 16 U.S.C. § 1456(c). A body of caselaw exists regarding conflicts between federal permit applicants, the federal government, and state governments related to consistency determinations, but those issues are outside the scope of this article.

128. OFFICE OF OCEAN AND COASTAL RES. MGMT., NOAA, CELEBRATING 30 YEARS OF THE COASTAL ZONE MANAGEMENT ACT, *available at* <http://coastalmanagement.noaa.gov/czm/> (last revised May 13, 2003). The only eligible state that does not have a CZMA program is Illinois.

coordination . . . with local governments, interstate agencies, regional agencies, and areawide agencies within the coastal zone to assure the full participation of those local governments and agencies in carrying out the purposes of this title.”<sup>129</sup> This mechanism addresses the problem of intergovernmental cooperation, and implicitly recognizes sovereignty of local governments on land use issues which consequently affect coastal development. The CZMA also provides for Special Area Management Plans that can be used to address sprawl and growth issues and provide a mechanism to increase intergovernmental communication.<sup>130</sup>

The nature of the coastal area and the importance of water offers a natural unit to use as a unifying force—and the touchstone for planning—the watershed. All governmental units within the watershed have some incentive to cooperate and work together because their fates are all tied to the watershed. An example of a watershed-type approach at the federal level but with a regional impact is the implementation of the National Estuary Program (“NEP”),<sup>131</sup> which evolved from the success of the Great Lakes and Chesapeake Bay programs, and takes a holistic approach to hydrologic ecosystem management. Twenty-eight Comprehensive and Conservation Management Plans (“CCMPs”) have been established under the NEP, with varying successes.<sup>132</sup>

#### IV. GROWING SMART ON THE SOUTH CAROLINA COAST

South Carolina has a 182-mile shoreline and more coastal wetlands than any other state on the Atlantic Coast.<sup>133</sup> The eight coastal counties experienced a population increase of approximately 17.3 percent between 1990 and 2000.<sup>134</sup> South Carolina’s coastal zone is home to about one million residents, sees fourteen million tourists, is home to over 300,000 acres of wetlands, pro-

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129. 16 U.S.C. § 1455(d)(3)(B) (2000).

130. *Id.* § 1452(3).

131. 33 U.S.C. § 1330 (2000).

132. See EPA, NATIONAL ESTUARY PROGRAM SUCCESS STORIES, available at <http://www.epa.gov/owow/estuaries/success.htm> (last updated Feb. 2, 2005).

133. URBAN LAND INST. & S.C. REAL ESTATE CTR., GROWING BY CHOICE OR CHANCE: STATE STRATEGIES FOR QUALITY GROWTH IN SOUTH CAROLINA 18 (2004).

134. Cf. S.C. BUDGET & CONTROL BOARD, OFFICE OF RESEARCH & STATISTICS, COMPARISON OF 1990 AND 2000 POPULATION AND PERCENT CHANGE, available at [http://www.ors2.state.sc.us/census2000/1990\\_2000\\_County\\_Compare.htm](http://www.ors2.state.sc.us/census2000/1990_2000_County_Compare.htm) (last visited Mar. 16, 2005).

duced over \$40 billion of economic output in 2000, and accounts for 25 percent of the state's employment.<sup>135</sup>

Between 1992 and 1997, the percentage of increase in developed lands was 30 percent, the sixth highest in the country, which is more than twice the development rate between 1987 and 1992.<sup>136</sup> When calculated as acres developed per person, South Carolina ranks fourth in the nation in development.<sup>137</sup> One study concluded that "the high rates of land conversion are irrevocably changing the character of this state," and the "infrastructure costs of servicing this low density development pattern will be staggering."<sup>138</sup> A South Carolina scholar summed up the survey of the literature:

Unplanned, unregulated development is costly to local and to state governments, almost always increasing costs of service provision more than the revenue that results from the development . . . . If one clearly and carefully assesses the full costs of servicing new developments, particularly residential developments, then city and county governments are better off with farm land than they are with housing developments.<sup>139</sup>

One projection suggests that between 1995 and 2015, the population of South Carolina will increase 27 percent, which translates into an additional one million people.<sup>140</sup> The total cost of infrastructure to South Carolina over that same span of 1995 to 2015 was estimated to be \$57 billion, about 58 percent of which (\$33 billion) is related to new growth.<sup>141</sup> This number is espe-

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135. S.C. DEPT. OF HEALTH & ENVTL. CONTROL, COUNCIL ON COASTAL FUTURES, SETTING A NEW COURSE FOR THE COAST 3, 5 (May 2004), *available at* <http://www.scdhec.gov/environment/ocrm/pubs/reports.htm#ccf>.

136. JAMES B. LONDON & NICOLE L. HILL, LAND CONVERSION IN SOUTH CAROLINA: STATE MAKES THE TOP 10 LIST 3 tbl. 3 (2000), *available at* <http://www.strom.clemson.edu/publications/london/conversion.pdf>.

137. *Id.* at 2 tbl. 2.

138. *Id.* at 4.

139. Holly Hewitt Ulbrich, Fiscal Impact of Conversion of Prime Lands 10 (Feb. 2000) (unpublished manuscript, on file with Strom Thurmond Institute, Clemson University).

140. ADVISORY COMM'N ON INTERGOVERNMENTAL RELATIONS, S.C. BUDGET & CONTROL BD., SOUTH CAROLINA INFRASTRUCTURE STUDY 36 fig.2 (May 1997), *available at* <http://www.ors.state.sc.us/Digital/scinfra.asp>.

141. *Id.* at 41. (The infrastructure costs are spread over twenty-eight elements, grouped into seven main categories: transportation [51 percent or \$28.8 billion]; commerce [7 percent or \$3.9 billion]; public safety, administration, and welfare [5 percent or \$2.6 billion]; education [18 percent or \$10.2 billion]; health [14 percent or \$7.8 billion]; recreation and culture [2 percent or \$1.5 billion]; and environment [3 percent or \$1.9 billion]).



cially important to local governments, as they shoulder the majority of the burden for the infrastructure development that supports growth. For example, sprawl in Dorchester County (a coastal county) led it to condemn a rural farm in order to build a new sewage treatment plant to attract industry and facilitate growth.<sup>142</sup> From 2015 to 2025, additional infrastructure for the state will require an investment as high as \$29 billion, and transportation infrastructure requirements based on a 2003 multimodal plan predicts a need of \$57 billion through 2023.<sup>143</sup> Between 1990 and 2002, the VMT in South Carolina increased from 34 to 47 billion, with a projected increase to 67 billion by 2020.<sup>144</sup> As a state, South Carolina has all the hallmarks of sprawling development, and the coastal areas, with the increasing population and development pressures, is facing all the challenges posed by rapid, expansive growth.

In 1924, South Carolina enacted various enabling act provisions throughout the South Carolina Code that delegated zoning authority to local governments. These laws remained on the books until 1994, when the legislature repealed all the former statutes and consolidated planning authority into a single act—the South Carolina Local Government Comprehensive Planning Enabling Act of 1994 (Planning Act).<sup>145</sup> The Planning Act compels counties and local governments to establish planning commissions and adopt a comprehensive land use plan before May 1999 as a prerequisite for zoning.<sup>146</sup> The adoption and implementation of the plan are left solely to the governing body, and participation is voluntary,<sup>147</sup> although to implement any zoning a local government must have a comprehensive plan under the statute. Forty-

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142. Sammy Fretwell, *South Carolina v. Sprawl: 'They're Taking My Land,' It Was Never for Sale, But Widow's Farmland Falls to Development*, THE STATE (Columbia), Feb. 21, 1999, at D1.

143. URBAN LAND INST. & S.C. REAL ESTATE CTR., *supra* note 133, at 15.

144. THE ROAD INFORMATION PROGRAM, SOUTH CAROLINA'S TRANSPORTATION SYSTEM 3 (March 2004), available at <http://www.tripnet.org/state.htm>.

145. S.C. CODE ANN. §§ 6-29-310 to -1200 (Law. Co-op. 2004).

146. See generally MUN. ASS'N OF S.C. & S.C. ASS'N OF COUNTIES, COMPREHENSIVE PLANNING GUIDE FOR LOCAL GOVERNMENTS (1994) (explaining how to bring local planning into compliance).

147. However, for many counties, particularly those containing urban centers, the plan is, for all practical purposes, mandatory because they must adopt a plan in order to continue zoning. In fact, all but three counties prepared plans of some sort. S.C. ASS'N OF COUNTIES, SURVEY RESULTS: COUNTY ZONING/COMPREHENSIVE LAND USE PLAN BY COUNTY GOVERNMENTS ii (1999).

five of forty-six counties now have comprehensive land use plans.<sup>148</sup>

However, no state coordination exists for planning. In 1998, the South Carolina Budget and Control Board created the Office of Regional Development ("ORD") to assist in the coordination of planning and in planning itself.<sup>149</sup> However, after five years of impotence and under-funding, the ORD was officially dissolved in 2003.<sup>150</sup>

It is axiomatic that land use is local. But one overarching theme in smart growth is regional cooperation and coordination. Without a regional approach, smart growth cannot occur.<sup>151</sup> This is especially true in states such as South Carolina that follow home rule.<sup>152</sup> This can create problems. It can contribute to a lack of focus by local governments to environmental problems because states have been tasked with that responsibility. A lack of coordination between the multitudes of local governments whose individual decisions lead to effects beyond their own political boundaries can create a classic Tragedy of the Commons dilemma.<sup>153</sup> Each local government, in maximizing its own needs, adversely affects the common natural resources when that individual decision or action is combined with the individual decisions and actions of other local governments affecting the same natural resource. This is evident in the disconnect that exists between local land use decisions and environmental permitting decisions. In a home-rule state such as South Carolina, the local land use decision-maker rarely accounts for environmental concerns, deferring to the state, while the state does not consider local land use issues, deferring to the local government. This can lead to divergent policies on the same issues that affect growth and development. This stark contrast between local government policies affecting infrastructure and the environment can be seen in the sewage policies of two cities outside Charleston. The Isle of Palms enacted an or-

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148. *Id.*

149. See JEFF BEACHAM, SOUTH CAROLINA TRANSPORTATION AND COMMUNITY AND SYSTEM PRESERVATION (TCSP) PILOT PROGRAM PROJECT EVALUATION 37 (2004).

150. *See id.*

151. For a more thorough treatment and discussion of regionalism, see PETER CALTHORPE & WILLIAM FULTON, *THE REGIONAL CITY* (2001) and MANUEL PASTOR, JR., ET AL., *REGIONS THAT WORK* (2000). See generally EPA, EPA231-R-04-002, *supra* note 77, at 11 ("Regional efforts are often needed to effectively coordinate local approaches to development and achieve better watershed-wide results.").

152. S.C. CONST. art. VIII, §§ 7, 9.

153. Garrett Hardin, *Tragedy of the Commons*, 162 SCIENCE 1243 (1968).

dinance that requires a homeowner to tie-in to an adjacent sewer line and encourages the use and expansion of sewer systems.<sup>154</sup> The City of Folly Beach, however, favors the use of septic tanks and discourages any expansion of the existing sewer system to control growth, despite the environmental risks inherent with significant septic tank usage.<sup>155</sup>

One of the governing mechanisms currently in place is the use of regional planning through councils of government ("COGs"), of which South Carolina has ten.<sup>156</sup> These are regional governmental authorities that include among their members several counties. However, COGs often lack the political and enforcement power to actually *do* anything.<sup>157</sup> They currently develop inter-county plans for managing waste, under statutory mandate, but are generally ineffective with regards to a true comprehensive land use planning policy because they have no authority to compel action and enforce sanctions.

A recently convened statewide committee in South Carolina recognized ten principles of quality growth to apply in the state.<sup>158</sup> They are:

- (1) Preserve and enhance South Carolina's quality of life;
- (2) Encourage comprehensive land use planning;
- (3) Enhance and revitalize existing communities;
- (4) Develop mixed-use communities;
- (5) Coordinate transportation investments with land use decisions;
- (6) Preserve open space, natural resources, and the environment;
- (7) Make development decisions predictable, fair, and cost-effective;
- (8) Respect private property rights;
- (9) Foster governmental collaboration and coordination; and
- (10) Encourage education and community participation.<sup>159</sup>

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154. ISLE OF PALMS, S.C., CODE § 5-4-12(e) (2003).

155. CITY OF FOLLY BEACH, S.C., CODE § 52.104 (2005); *Sunset Cay, LLC v. City of Folly Beach*, 593 S.E.2d 462 (S.C. 2004) (upholding the ordinance).

156. South Carolina Reference Room—Regional Councils of Government, *available at* <http://www.state.sc.us/scsl/sccogs.htm> (last updated Oct. 20, 2004).

157. See AM. PLANNING ASS'N, *GROWING SMART LEGIS. GUIDEBOOK PHASES I & II INTERIM EDITION* 6-10 (1998); *ULI Leadership Counterpoint*, in URBAN LAND INSTITUTE, *LAND USE IN TRANSITION* 27 (1993).

158. URBAN LAND INST. & S.C. REAL ESTATE CTR., *supra* note 133, at 4-5.

159. *Id.*

One of the recommendations of the statewide committee is to “encourage interagency and interjurisdictional cooperation and coordination in land use planning, infrastructure spending, and environmental protection.”<sup>160</sup> These recommendations fall in line with the EPA and other iterations of smart growth principles, and are especially applicable to the coast. However, it will require significant willpower and an impetus currently absent to prompt the numerous local governments in the coastal area to act in concert, and there is no legal or otherwise enforceable mechanism to implement these recommendations. From an environmental perspective, the South Carolina Pollution Control Act<sup>161</sup> provides the general authority and power for the implementation of the federal Clean Water Act<sup>162</sup> and Clean Air Act.<sup>163</sup> South Carolina’s coastal zone management plan is implemented under the authority of the South Carolina Coastal Tidelands and Wetlands Act,<sup>164</sup> enacted in 1977, which created the South Carolina Coastal Council, the predecessor to the current Office of Coastal Resources Management under the Department of Health and Environmental Control.

There are several neighborhood coastal development projects that have adopted smart growth principles. For example, Dewees Island in South Carolina can only be reached by a ferry and bans automobiles altogether. It is a walkable community and the developer took pains to minimize disturbance of the natural resources, recognizing that the natural resources could add economic value to the project.<sup>165</sup> And they have. Dewees is a community for the affluent, raising the specter of housing affordability and social equity issues in the voluntary implementation of smart growth principles and practices on the coast. In fact, the location on the coast exacerbates these problems because of the increased value of an undisturbed or natural setting on the water. This increase in the value of the land and the concomitant increase in taxes and insurance can in turn push long-time residents or lower income families inland and away from the coast.

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160. *Id.* at 35.

161. S.C. CODE ANN. §§ 48-1-10 to 48-10-350 (Law. Co-op. 2004).

162. 33 U.S.C. §§ 1251-1387 (2000).

163. 42 U.S.C. §§ 7401- 7671q (2000).

164. S.C. CODE ANN. §§ 48-39-10 to 48-10-360 (Law. Co-op. 2004); 24 S.C. CODE ANN. REGS. 30-1 to 30-21 (2004).

165. *See* Dewees Island, at <http://www.deweesisland.com/> (last visited Apr. 27, 2005).

The coastal area in South Carolina is resort-oriented, creating a question of housing affordability.<sup>166</sup> Aside from the booming tourism industry on the coast, South Carolina ranks high among retiree relocations.<sup>167</sup> Most of the migration to South Carolina is to the coast, with increasing numbers of retirees and second homes.<sup>168</sup> However, tourism and the services for these retirees and summer owners is generally low-wage work. The workers in these industries simply cannot afford to live on that coastal area, which means they must live further inland and commute.<sup>169</sup> This creates a housing inequity, expands the development area, and increases both the consumption of resources and the production of wastes, all of which must be assimilated in the coastal environs.

The coastal counties of South Carolina face increasing pressure. Collectively, the coastal counties have not taken active, progressive steps to implement smart growth principles on a meaningful scale. The pristine South Carolina coast is in danger of losing its unique character, and it is left ultimately to the citizens to force the issue and press for a change in the status quo and move towards a sustainable development to preserve the coastal assets.

## V. THE FUTURE OF COASTAL DEVELOPMENT

The coast is a special place with special considerations and special needs to preserve the integrity of its ecosystem for the years to come. A zero-growth policy on a coast is unrealistic. Instead, local governments should adopt a process that begins with community involvement and education to decide where growth is appropriate and where it is not. Priority areas of growth and investment should be identified. In implementing the smart growth principles on the coast, the community should look from a regional perspective. "[P]reserving land that serves strategic ecological functions (e.g., wetlands, buffer zones, riparian corridors, floodplains) is critical for regional water quality."<sup>170</sup> There are several mechanisms peculiarly appropriate for coastal areas. First, limit floodplain development.<sup>171</sup> Second, efforts should be made to ac-

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166. URBAN LAND INST. & S.C. REAL ESTATE CTR., *supra* note 133, at 10.

167. *Id.* at 11.

168. *See id.* at 8, 11.

169. *See* John H. Tibbetts, *The Coast's Great Leap*, 19 COASTAL HERITAGE 6-8 (Fall 2004).

170. EPA, EPA231-R-04-002, *supra* note 77, at 20.

171. *Id.* at 25.

quire and conserve land, especially in light of the valuable services that areas such as wetlands can perform in their natural state. The use of infrastructure to redirect growth is a vital component in the implementation of any smart growth principles or plans on the coast.<sup>172</sup> In particular, water, sewer, and transportation provide the means to ultimately control growth. This can be measured and limited based on the carrying capacity of some necessary component of the infrastructure, which could be the assimilative capacity of the wastewater treatment plant, the availability of an adequate drinking water supply, or even the road capacity on an evacuation route.<sup>173</sup> All of these provisions should take place within the context of a coordinated plan amongst the local governments with state and federal government involvement.

Proper planning provides economic and environmental benefits for both the present and future generations through achieving a closer balance of resource consumption and protection. This allows for a more efficient allocation of resources. This can be achieved through comprehensive land use planning, which takes an inventory of the present (a result of the past) and applies growth management principles to arrive at a future destination.

Sustainable development and smart growth policies face many challenges despite the fact that everyone agrees they are a good thing.<sup>174</sup> Better planning will only be achieved by bringing together decision makers from a broad spectrum of backgrounds and fields to foster an understanding of development patterns and the effect on natural systems.<sup>175</sup> Sustainable communities are created from the bottom up, not the top down. The coast presents matchless problems and issues that will require equally matchless solutions, especially given that each coastal ecosystem is as unique as it is delicate. There is a certain connection that many people feel with the coast, and it is the desire to protect those resources and that connection that must drive the application of

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172. BEATLEY ET AL., *supra* note 115, at 228-231.

173. *Id.* at 217.

174. See UNIVERSITY OF SOUTH CAROLINA, INSTITUTE OF PUBLIC AFFAIRS, GROWTH IN SOUTH CAROLINA 14 (2000) (South Carolina survey results demonstrating overwhelming support for growth management policies); SMART GROWTH AMERICA, GREETINGS FROM SMART GROWTH AMERICA 2-3 (2000) (national survey results demonstrating overwhelming support for growth management policies).

175. Turner & Rylander, *supra* note 60, at 60, 66 ("Transportation planners, educators, recreational experts, financial experts, health providers, and government officials must learn to come together and trade valuable information in a public format with farmers, businessmen, water quality specialists, wildlife biologists, and environmentalists.").

sustainable principles for sustainable development to maintain the integrity of both the coastal community and the coastal resources.