



SMART GROWTH  
NETWORK

# Getting Smart about Climate Change



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# Getting Smart about Climate Change



In recent years, the debate over the causes and potential consequences of climate change has evolved into a dynamic discussion of how government at all levels should respond. On the local level, policy makers have begun to recognize that many of the nation's current challenges—such as climate change, public health, and dependence on foreign oil—have revealed how unsustainable traditional development patterns and the policies that support them can be. As a result, a growing number of local governments across the United States are using smart growth approaches in their efforts to address climate change in their communities.

In urban and suburban areas, in small towns and rural areas, and in every region of the country—from Keene, New Hampshire, to Sarasota County, Florida, to Sacramento, California, to Tacoma, Washington—local government professionals are incorporating smart growth principles into their climate protection plans. The leadership is coming from small towns such as Carbondale, Colorado, and from larger metropolitan areas such as Kansas City, Missouri–Kansas, where local officials assembled citizens and the full range of stakeholders to develop creative solutions and build consensus around programs and strategies.

ICMA's membership has called sustainability, which they define as balancing economic development, environmental protection, and social equity

goals while maintaining financial viability, “the issue of our age.”<sup>1</sup> Addressing climate change is a key component of creating more sustainable communities, and smart growth offers practical guidelines for communities looking to develop sustainably: it addresses new growth and development in a way that reduces their impact on the environment and their contributions to global climate change while supporting economic development and social equity-related goals.

This report outlines nine strategies for successfully applying smart growth principles to climate concerns on the local and regional levels:

1. Create more sustainable and resilient communities
2. Green the local economy
3. Engage the community in the climate change planning process
4. Approach climate change planning on a regional level
5. Address transportation through transit-oriented development and complete streets
6. Promote density through infill development and brownfield redevelopment
7. Adopt green building policies
8. Preserve and create green space
9. Plan for climate adaptation.

## WHAT IS SMART GROWTH?



The Smart Growth Network has created a set of ten principles, based on policies and practices from communities across the country, that provide a framework for smart growth:

1. Mix land uses
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
10. Encourage community and stakeholder collaboration in development decisions.

Source: Smart Growth Network, [www.smartgrowth.org/about/default.asp](http://www.smartgrowth.org/about/default.asp) (accessed March 11, 2010).

## 2 Getting Smart about Climate Change

It begins by examining the role that local governments can play in addressing climate change through smart growth strategies and land use decisions, and it notes how communities are getting started in their climate protection planning process. It then discusses nine specific strategies for integrating smart growth into successful climate change plans and presents several short examples of local governments that have adopted these strategies. The final section provides in-depth case studies of communities that have made this commitment, illustrating how these smart growth strategies can be combined or adapted for individual communities to create successful plans that address climate change.

*Just as the original suburban ideal promised a better life, we need to be enunciating a clear vision of a better America with smart growth.*

—Rick Cole, city manager, Ventura, California

## A Movement Emerges

The old saying, “think globally, act locally,” has new resonance. While climate change is a global issue with widespread ramifications, it is also an issue that requires action on the local level. Local governments can play an important role in reducing greenhouse gas (GHG) emissions and mitigating climate change by adopting small measures that address their own operations, such as installing energy-efficient LED (light-emitting diode) traffic signals, adopting green building standards for public facilities, and purchasing hybrid vehicles for municipal fleets. They can also implement broader planning and policy tools that support compact development and carefully planned transportation systems across communities and regions. Many cities and counties that are already working to reduce GHG emissions and address climate change–related challenges are finding that such broader land use and transportation decisions, which shape how and where housing, commercial development, schools, and other public facilities—as well as the transportation systems that serve them—are designed and built, have been



### CLIMATE CHANGE BY THE NUMBERS

The news is full of stories about rising temperatures, more extreme heat waves, and heavy precipitation events, as well as a widening of areas affected by drought, melting glaciers and ice cover, and rising sea levels. At the root of these changes, which will affect communities across the country, are increasing concentrations of greenhouse gases (GHGs), particularly carbon dioxide (CO<sub>2</sub>), in the atmosphere as a result of human activities.

- The natural range of CO<sub>2</sub> in the atmosphere over 650,000 years has been between 180 and 300 parts per million (ppm).<sup>1</sup>
  - By 2006, the CO<sub>2</sub> concentration in the atmosphere was 430 ppm and rising at a rate of 2.3 ppm a year.<sup>2</sup>
  - Scientists agree there is a general warming trend under way as a result of these increasing CO<sub>2</sub> concentrations, with temperatures expected to rise between 2.4 and 6.4 degrees Celsius by 2100.<sup>3</sup>
  - Between 1970 and 2004, GHG emissions related to human activities increased by 70 percent, with CO<sub>2</sub> emissions increasing by 80 percent.<sup>4</sup>
  - Between 1990 and 2008, CO<sub>2</sub> emissions from the combustion of fossil fuels increased by 41 percent.<sup>5</sup>
- Between 2000 and 2008, CO<sub>2</sub> emissions from the combustion of fossil fuels increased by an average of 3.4 percent a year, compared to just under 1 percent a year over the 1990s.<sup>6</sup>

1 Rick Duke and Dan Lashof, *The New Energy Economy: Putting America on the Path to Solving Global Warming* (New York: Natural Resources Defense Council, June 2008), 8, [www.nrdc.org/globalWarming/energy/eeconomy.pdf](http://www.nrdc.org/globalWarming/energy/eeconomy.pdf) (accessed January 29, 2010).

2 Nicholas Stern, *Stern Review: The Economics of Climate Change* (London: HM Treasury, October 2006), 3, [webarchive.nationalarchives.gov.uk/+http://www.hm-treasury.gov.uk/stern\\_review\\_climate\\_change.htm](http://www.hm-treasury.gov.uk/stern_review_climate_change.htm) (accessed January 29, 2010).

3 Intergovernmental Panel on Climate Change (IPCC), “Summary for Policymakers,” in *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge, UK, and New York: Cambridge University Press, 2007), 13, [www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf](http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf) (accessed January 29, 2010).

4 IPCC, “Climate Change 2007: Synthesis Report, Summary for Policymakers,” 5, [www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4\\_syr\\_spm.pdf](http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf) (accessed January 29, 2010).

5 Corinne Le Quéré et al., “Trends in Sources and Sinks of Carbon Dioxide,” *Nature Geoscience* 2 (December 2009), 831.

6 *Ibid.*, 831.

## THE U.S. ROLE IN CLIMATE CHANGE



- The United States has only 5 percent of the world's population, but accounts for 25 percent of both energy consumption and greenhouse gas emissions.<sup>1</sup>
- Eighty-five percent of the energy consumed in the United States is generated with fossil fuels.<sup>2</sup>
- Between 1980 and 2007, the amount of driving Americans do has risen at three times the rate of population growth and twice the rate of vehicle registrations.<sup>3</sup>

1 Funders' Network for Smart Growth and Livable Communities, *Energy and Smart Growth: It's about How and Where We Build* (Coral Gables, Fla.: Funders' Network, 2004), 3, [www.issuelab.org/research/energy\\_and\\_smart\\_growth\\_its\\_about\\_how\\_and\\_where\\_we\\_build](http://www.issuelab.org/research/energy_and_smart_growth_its_about_how_and_where_we_build) (accessed January 29, 2010).

2 Ibid.

3 Reid Ewing et al., *Growing Cooler: The Evidence on Urban Development and Climate Change* (Washington, D.C.: Urban Land Institute, 2008).

among the most effective approaches for them to take. Smart growth strategies, which can be applied at both the local and regional levels, can be integrated into sustainability, climate protection, and climate action plans, as well as into long-range comprehensive plans.

Several national campaigns have been launched to coordinate and assist with climate change planning efforts on the local level. Over 1,000 cities have signed the U.S. Conference of Mayors Climate Protection Agreement or have joined the closely linked Cool Cities campaign.<sup>2</sup>

In 2007, counties—led by King County, Washington; Fairfax County, Virginia; and Nassau County, New York—began signing on to a similar Cool Counties initiative.<sup>3</sup> In so doing, they are agreeing to look into and take steps to reduce county government GHG emissions—and to strive for an 80 percent reduction by 2050. They are also agreeing to identify and prepare for regional climate change impacts through a process known as climate adaptation planning.

Over 500 local governments are also participating in the Cities for Climate Protection (CCP) Campaign as part of ICLEI (originally, the International Council for Local Environmental Initiatives) Local Governments for Sustainability. The CCP offers cities and counties assistance with inventorying emissions, adopting reduction goals, creating and implementing climate action plans, and monitoring the results.<sup>4</sup> ICLEI has also created new Climate Resilient Communities (CRC) program in response to members' requests for help with adaptation planning.<sup>5</sup>

## Smart Growth Strategies (and More) in the Struggle against Climate Change

Local governments in every region of the country are developing and working to implement action plans to mitigate and adapt to a changing climate. Using a variety of strategies, they are targeting different goals and priorities to ensure that their plans reflect local conditions and community characteristics. To that end, they see policies and practices that reduce automobile dependence, protect green space, and direct well-planned development to appropriate locations where communities can make the most efficient use of existing infrastructure and other resources as the best way to reduce GHG emissions and prepare for the environmental, economic, and social impacts of climate change. This section describes the nine smart growth-related strategies introduced above that communities across the country are using to address this complex issue.

### 1. Create More Sustainable and Resilient Communities

*See case studies on Sarasota County, Florida; Santa Monica, California; and Kansas City, Missouri (pages 10–13).*

Many local government leaders who are actively planning for climate change are doing so within the larger context of planning for long-term community sustainability. In these communities, climate-related goals, along with other goals related to community sustainability, are being outlined in climate action and community sustainability plans as well as integrated into comprehensive master plans. In addition to planning for sustainability, these communities are adjusting their policies to allow for more sustainable practices to be implemented. These policy changes include adapting zoning codes to allow for increased density and mixed-use development; building multi-modal transportation systems; implementing energy-related measures that allow residents to install solar panels, rain barrels, and wastewater recycling systems; and supporting the development of infrastructure for pedestrians and bicyclists, including sidewalks, bike lanes, and crosswalks. Planning for climate change and sustainability and adopting policies that support those goals can help build communities that are not only more socially, economically, and environmentally

## 4 Getting Smart about Climate Change

sustainable, but also more resilient to challenges—climate related or otherwise—that may arise.

Newburgh, New York, for example, focuses its master plan on overall community sustainability, examining issues of social equity, long-term economic viability, community building, and environmental

### SUPPORT FOR SMART GROWTH



The Growth and Transportation Survey, sponsored by the National Association of Realtors and Smart Growth America, shows support for smart growth and public transportation. In a survey conducted in 2007,<sup>1</sup>

- Eighty-one percent of respondents said that they would prefer to see the redevelopment of older communities instead of new development on the suburban edge
- Eighty-three percent responded that new communities should be designed so that residents can walk more and drive less
- Seventy-one percent were concerned about the link between land use and climate change
- Fifty-seven percent expressed a preference for more compact, mixed-use neighborhoods, where stores and shops are within walking distance of homes and businesses. Then, in a survey conducted in 2009,<sup>2</sup>
- Sixty-seven percent of respondents supported improving public transportation over expanding the road system to relieve traffic congestion
- Fifty-eight percent indicated that they think construction should be limited in outlying areas and encouraged in areas that have already been developed
- Seventy-five percent responded that building and improving rail systems, including commuter rail, light rail, and subways would be the best way to accommodate increasing transportation demands resulting from population growth
- Seventy-five percent agreed that transportation investments should support the goal of reducing greenhouse gas emissions.

1 Smart Growth America, "Survey Shows Americans Prefer to Spend More on Mass Transit and Highway Maintenance, Less on New Roads," <http://www.smartgrowthamerica.org/narsgareport2007.html> (accessed January 29, 2010).

2 Transportation for America, "Americans Agree: Smart Growth Approach to Transportation Helps Build Communities" (February 26, 2009), [t4america.org/tag/realtors/](http://t4america.org/tag/realtors/) (accessed January 29, 2010).

stewardship. *Plan-it Newburgh*, the city's thirty-year comprehensive plan, was drafted following nine months of public workshops, focus group meetings, and community surveys. Formally adopted in 2008, it is an excellent example of how traditional master plans can be used to create a strong agenda for community sustainability.<sup>6</sup>

## 2. Green the Local Economy

*See case study on Tacoma, Washington (page 14).*

Many cities and counties are approaching their climate-related policies and programs not only as an environmental strategy but also as an economic development strategy. They have found that employers are attracted to the image of a sustainable community, and that businesses are often responsive to the incentives they are introducing to engage the private sector in advancing community climate protection goals. As part of this strategy, communities are focusing on creating "green-collar" job growth by attracting businesses whose products and services focus on clean energy and other aspects of climate protection.

To attract these businesses, however, it is important for communities to show their commitment to sustainability by adopting green practices. Thus, Middlesex County, New Jersey, established a Green Economic Development Zone Committee, whose members have worked to attract high-tech green businesses to the area by using tax incentives and business development grants,<sup>7</sup> and Rockford, Illinois, has incorporated the greening of the local economy into its Rockford Region Indicators Project.<sup>8</sup>

## 3. Engage the Community in the Climate Change Planning Process

*See case studies on Carbondale, Colorado, and Cambridge, Massachusetts (pages 15–16).*

Community engagement is essential to creating effective climate action and climate protection plans that have a high degree of support from the local stakeholders who will ultimately be affected by them. Because community and stakeholder engagement helps ensure that the proposed outcomes address community needs, builds trust by offering an increased degree of transparency, and creates sustained community involvement that carries into the implementation phase,<sup>9</sup> it should be central to realizing local solutions for the controversial and complex challenges posed by climate change.

*Nothing can be solved, nothing can be addressed, nothing can be healed without bringing the community to the table.*

—Jim Keane, city manager of Palo Alto, California

In 2008, Montgomery County, Maryland, put together a twenty-six-person Sustainability Working Group, with fifteen representatives from city and county government and eleven from the community. The group gathered additional public input and drafted a Climate Protection Plan with fifty-eight concrete recommendations.<sup>10</sup> In fall of 2008, Fayetteville, Arkansas, held a Sustainability Summit to educate residents about the sustainability efforts that the city and its business partners are making and to engage them in the conversation about local sustainability initiatives. The all-day summit was free and open to all interested citizens.<sup>11</sup>

#### 4. Approach Climate Change Planning on a Regional Level

See case studies on *Research Triangle–Durham, North Carolina, and Sacramento, California* (pages 17–18). Collaboration across jurisdictions can help create successful plans and policies for addressing climate change. Working with other jurisdictions, as well as with regional businesses and community stakeholders, allows local governments not only to share knowledge and resources and build connections, but also to coordinate economic development, open space, land use, and transportation planning strategies. Regional approaches, including setting regional emissions reduction targets and adopting regionwide goals, can help increase the overall efficacy of a climate action plan. As a result, regional planning commissions and metropolitan planning organizations (MPOs) are working to address climate change on the regional scale.

In July 2009, the Delaware Valley Regional Planning Commission, which serves a nine-county area in southeastern Pennsylvania and southern New Jersey, adopted *Connections: The Regional Plan for a Sustainable Future*.<sup>12</sup> The long-range plan defines policies and an agenda for the region around four main themes: creating livable communities; managing growth and protecting resources; transitioning to

an energy-efficient economy; and building a strong, multimodal transportation system. The plan advocates smart growth as an approach to creating a sustainable region.

#### 5. Address Transportation through Transit-Oriented Development and Complete Streets

See case study on *Arlington County, Virginia* (page 19).

The transportation sector accounts for one-third of all CO<sub>2</sub> emissions from fossil fuel combustion—more than any other single end-use sector.<sup>13</sup> (End-use sectors exclude electric generation.) Federal transportation policies and subsidies have largely supported the expansion of the nation’s roads and highways at the expense of other forms of transportation. Our current transportation systems help cars move quickly and efficiently from place to place, but the land uses and designs of the developments that accompany this system tend to be low density, single function, and unable to support transit. Strategies such as transit-oriented development (TOD), which promotes denser, mixed-use developments in walking distance of transit, and complete streets, which are safe and accessible to all users, can go a long way toward reducing dependence on the personal automobile and, thus, vehicle miles traveled (VMT) and overall GHG emissions.

**Transit-Oriented Development** A common element in local government climate action plans has been the focus on encouraging the use of alternative modes of transportation and promoting development patterns that support walking, biking, and the use of public transit. TOD is a strategy that incorporates all these efforts by placing compact, mixed-use, walkable developments on transit-accessible sites.<sup>14</sup> Cities, including San Francisco, California, and Portland,

*The majority of Americans have spent the bulk of their lives in drivable suburban places. So it's legitimate. It's an option that should exist. It's just that we've built too much of it. The most pent-up demand is for high-density, walkable smart growth development.*

—Christopher Leinberger, visiting fellow, Metropolitan Policy Program, Brookings Institution



## TRANSPORTATION AND CLIMATE CHANGE

- Transportation accounts for one-third of all greenhouse gas (GHG) emissions, more than any other single end-use sector.<sup>1</sup>
- Between 1990 and 2006, GHG emissions from the transportation sector accounted for 47 percent of the increase in overall U.S. GHG emissions.<sup>2</sup>
- Highway on-road vehicles, including cars, trucks, and SUVs, account for 79 percent of GHG emissions in the transportation sector.<sup>3</sup>
- By 2004, Americans were driving 38.4 percent more than they did in 1991—an average rate of 2.4 percent a year.<sup>4</sup>
- Between 1980 and 2005, vehicle miles traveled (VMT) increased at a rate of three times the rate of the population and at twice the rate of vehicle registrations.<sup>5</sup>
- VMT peaked in August 2007, began to decline with the beginning of the recession in late December 2007, and continued to decrease through August 2009.<sup>6</sup>

1 U.S. Environmental Protection Agency (EPA), *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007* (Washington, D.C.: EPA, April 2007), ES-8, [epa.gov/climatechange/emissions/usinventoryreport.html](http://epa.gov/climatechange/emissions/usinventoryreport.html);

2 Cambridge Systematics, *Moving Cooler: Surface Transportation and Climate Change* (Washington, D.C.: Urban Land Institute, 2009).

3 Ibid.

4 Robert Puentes and Adie Tomer, "The Road ... Less Traveled: An Analysis of Vehicle Miles Traveled Trends in the United States," *Brookings Institution, Metropolitan Structure Initiative Series* (December 2008): 7, [www.brookings.edu/~media/Files/rc/reports/2008/1216\\_transportation\\_tomer\\_puentes/vehicle\\_miles\\_traveled\\_report.pdf](http://www.brookings.edu/~media/Files/rc/reports/2008/1216_transportation_tomer_puentes/vehicle_miles_traveled_report.pdf) (accessed February 3, 2010).

5 Ewing et al, *Growing Cooler*.

6 This is based on cumulative decreases in vehicle miles. Increases over the previous year's total VMT began in May 2009; see FHWA, "December 2008 Traffic Volume Trends," [www.fhwa.dot.gov/ohim/tvtw/08dectvt/page3.cfm](http://www.fhwa.dot.gov/ohim/tvtw/08dectvt/page3.cfm) (accessed February 3, 2010).

Oregon, have rewritten zoning codes and developed community design guidelines and incentives to promote TOD and minimize the need for residents to drive from place to place.

In 2006, the Portland Development Commission established a TOD Property Tax Abatement for up to ten years to support high-density, mixed-use development on vacant or underused sites along existing transit corridors.<sup>15</sup> Recognizing the importance of TOD in addressing the regional housing shortage, creating density that supports transportation, and protecting open space, the Metropolitan Transportation Commission in the Bay Area adopted a TOD policy for transportation expansion projects in 2005.<sup>16</sup>

**Complete Streets** Complete streets refers to streets that are designed to be multimodal. Unlike traditional street design, which focuses entirely on motorized transportation, complete street design is planned from the outset to safely accommodate pedestrians, bicyclists, public transit, and cars. The design takes into account placement of transit stops, bicycle infrastructure, and benches as well as transitions from one mode of transportation to another. It also incorporates a number of design and traffic-calming features, including raised medians, pedestrian islands, and curb extensions. Complete streets help to improve safety, build community, and address climate change through VMT reductions.<sup>17</sup> As of 2009, sixteen states and state

departments of transportation<sup>18</sup> and 120 communities had adopted complete streets policies or resolutions.<sup>19</sup>

Boulder, Colorado, has made complete streets a central part of its transportation planning strategy since the early 1990s. The city focused its work on 28th Street—the portion of U.S. Route 36 that runs through town—by adding bicycle lanes and pedestrian facilities and improving public transportation options. As a result of these efforts, Boulder has seen a significant decline in people who drive alone and an increase in the number of residents walking and biking to their destinations, and transit ridership has nearly doubled.<sup>20</sup>

## 6. Promote Density through Infill Development and Brownfield Redevelopment

*See case study on Atlanta, Georgia (page 21).*

Smart growth recognizes the value of revitalizing older communities through infill development and brownfield redevelopment. These strategies promote density and make full use of existing buildings and infrastructure, thus preserving the embodied energy that went into their construction.<sup>21</sup> Denser development patterns create the population densities needed to support mixed-use development and transit, reducing both the need to drive from place to place and the average distance of trips; they have the potential to reduce transportation-related GHG emissions by 7 to 10 percent

*The original green building concept is reusing existing buildings, not only because they're cool, and they're nice, and they're in the right place, but also from a climate change perspective.*

—Harrison Rue, former executive director of the Thomas Jefferson Planning District Commission

in 2050.<sup>22</sup> Denser development patterns can also help reduce the environmental impacts of development by preserving open space and important ecological areas, as well as by protecting water resources, particularly on a regional scale.<sup>23</sup>

**Infill Development** As a result of the benefits of higher-density development, many cities are beginning to reevaluate traditional development patterns. They are focusing on denser, infill developments, which make use of vacant and underused properties in already developed areas. Between 1990 and 2007, urban core communities in about half of the nation's fifty largest metropolitan regions greatly increased their share of residential building permits, with the central city doubling or tripling its share of permits in twenty-six cities since 2000.<sup>24</sup> Infill sites can provide numerous community and environmental benefits, including revitalized and better connected neighborhoods, but to do so they need to be thoughtfully designed with respect to site conditions and community characteristics.

While urban infill is a strong strategy for reducing the negative environmental impacts of development, local codes and regulations can often make it difficult, particularly for higher-density infill. To guard against this, local governments can create a policy structure

that supports increased density. In Austin, Texas, where city officials realized that increased density was the only viable way to address a rapidly increasing population, zoning codes for the North Burnet/Gateway neighborhood have been amended to create a zoning overlay.<sup>25</sup> This means that specific properties with multiple zoning purposes (e.g., neighborhood residential for commercial mixed-use) can overlay the general designation of the area as a whole, allowing for increased flexibility in types of development.

**Brownfields Redevelopment** Redeveloping brownfield sites, like infill development, provides opportunities to reuse both the land and the existing infrastructure, including roads, underground utilities, and streetlighting, rather than developing greenfields. Depending on their initial level of contamination and the level of remediation, brownfields can be converted for numerous uses, including parks and mixed-use developments. Redeveloping brownfields offers communities a range of benefits: improved environmental conditions on the site, more jobs, increased property values on the site and surrounding properties, and an opportunity to engage the community in a discussion about sustainable redevelopment patterns.<sup>26</sup>

The Denver area has a number of new residential developments on vacant properties and brownfield sites. Among these is Stapleton, a development on the site of the city's former airport, which was closed in 1995. Developed as a "sustainable community," the 4,700-acre development has five mixed-use neighborhoods, with a mix of single- and multifamily homes and a large central park. It also has three business campuses, ranging from a high-rise "urban campus" to a low-rise, freeway-adjacent campus.<sup>27</sup> The development promotes walkability and provides residents with a number of transportation choices. In addition, developing the former airport site to accommodate

## RESIDENTIAL DENSITY AND CLIMATE CHANGE



- Residential buildings account for 21 percent of all CO<sub>2</sub> emissions.<sup>1</sup>
- A detached single-family home uses 54 percent more energy for heating and 26 percent more for cooling than a multifamily home.<sup>2</sup>
- Homes in compact developments use, on average, 20 percent less energy than homes in sprawling development.<sup>3</sup>

1 This number represents CO<sub>2</sub> emissions from fossil fuel combustion by end-use sector; see U.S. Environmental Protection Agency (EPA), *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007* (Washington, D.C.: EPA, April 2007), ES-8, [epa.gov/climatechange/emissions/usinventoryreport.html](http://epa.gov/climatechange/emissions/usinventoryreport.html) (accessed February 2, 2010).

2 Reid Ewing and Fang Rong, "The Impact of Urban Form on U.S. Residential Energy Use," *Housing Policy Debate* 19, no. 1 (2008): 20, [www.mi.vt.edu/data/files/hpd%2019.1/ewing\\_article.pdf](http://www.mi.vt.edu/data/files/hpd%2019.1/ewing_article.pdf) (accessed February 2, 2010).

3 *Ibid.*, 21-22.

## 8 Getting Smart about Climate Change

increased demand for housing and office space prevented the development of undeveloped land in the city's metro area.

### 7. Adopt Green Building Policies

*See case study on Santa Fe, New Mexico (page 22).*

Green building approaches, particularly the Leadership in Energy and Environmental Design (LEED) standards developed by the U.S. Green Building Council (USGBC), have gained significant attention because they produce increased energy efficiency and reduce environmental impact. While the initial costs of green building can be higher than those of traditional construction, the costs are outweighed by the life-cycle savings: the average premium for green buildings is just below 2 percent—or \$3–\$5 per square foot—most of it realized in the architectural and engineering design phases, while the life-cycle savings from increased energy efficiency and reduced electricity consumption average around 20 percent of total construction costs.<sup>28</sup> Increasing numbers of new commercial and residential buildings and mixed-use developments are following green building guidelines, and with residential and commercial development accounting for nearly 40 percent of all CO<sub>2</sub> emissions in the United States,<sup>29</sup> there are many potential benefits of investing in green elements, both in new construction and in retrofitting existing buildings.

Because of these benefits, many cities are incorporating green building approaches into their zoning codes. Boston, Massachusetts, adopted a green building zoning code in 2007 to promote less energy-intensive development; the code requires that all large construction projects over 50,000 square feet adhere to a set of adapted LEED standards.<sup>30</sup> (Because they can be adapted, the standards are not required to achieve LEED certification.) Chicago, Illinois, amended its zoning code to include green roofs as a public amenity and the city offers density bonuses to developers that include public amenities, thus facilitating the construction of green roofs.<sup>31</sup>

### 8. Preserve and Create Green Space

*See case study on Minneapolis, Minnesota (page 23).*

In addition to green building practices, smart growth recognizes the value of protecting green space. Green space supports climate protection in a number of ways: urban forests and street trees play a role in sequestering CO<sub>2</sub> and providing shade to moderate

the urban heat island effect; and community gardens, wetland buffers, and other green spaces recharge groundwater and improve storm-water collection and retention, supporting water conservation and helping minimize the energy needed for storm-water management.<sup>32</sup>

Many communities are working to preserve existing green space, viewing it as a valuable community resource. Philadelphia has adopted GreenPlan Philadelphia, a long-term, collaborative, citywide initiative for acquiring, preserving, and managing green space within the city and encouraging residents to make use of these parks and open spaces.<sup>33</sup> Faced with a declining population and an abundance of abandoned industrial sites, Youngstown, Ohio, has started disconnecting infrastructure and transforming the former sites into a series of pocket parks.<sup>34</sup>

### 9. Plan for Climate Adaptation

*See case study on Keene, New Hampshire (page 24).*

While many local governments are working on climate action and sustainability plans, their focus has primarily been on climate mitigation, or reducing GHG emissions, rather than on climate adaptation, or taking action to make communities more resilient to the projected changes in climate. Research has demonstrated that even if GHG concentrations in the atmosphere were to remain at current levels, climate change has already been set in motion and some degree of change will occur. These changes, which will vary by geographic region, will include increases in temperatures, decreases in rainfall, and rises in sea level, as well as increases in intensity and duration of climatic events, such as hurricanes.<sup>35</sup>

Increasing numbers of state and local governments have begun to consider adaptation planning as part of their climate action process. Eight states (Arizona, Colorado, Iowa, Michigan, North Carolina, South Carolina, Utah, and Vermont) recommend planning for it in their climate action plans, and ten more (Alaska, California, Florida, Maryland, Massachusetts, New Hampshire, New York, Oregon, Virginia, and Washington) either are in the process of creating an adaptation plan or have already completed one.<sup>36</sup> Communities across the country have also started to incorporate climate adaptation strategies into their sustainability plans. As more cities and counties look at climate change-related goals in their planning for growth, climate adaptation planning will likely become more common.

ICLEI ran a Climate Resilient Communities pilot program in four communities: Homer, Alabama; Fort Collins, Colorado; Miami-Dade County, Florida; and Keene, New Hampshire.<sup>37</sup> Following the pilot program, Miami-Dade County created a task force to develop new standards for infrastructure to address the rising sea level, and Homer created a climate resiliency plan that addresses diversifying the fishing-based local economy and preparing for climate refuges. Recognizing that some degree of climate change is inevitable, Seattle, Washington's climate action plan, adopted in 2006, outlines a strategy to incorporate climate impact scenarios into city policies. The initial focus of its adaptation planning was placed on the hydrology cycle in the Cascade Mountains, on which the city depends for its water supply and hydroelectric power. Additional areas of climate adaptation planning noted in the plan include storm-water management, urban

forestry, building codes, rising sea levels, and heat waves.<sup>38</sup>

## Case Studies

The following case studies of diverse communities from across the country—small towns, big cities, counties, and regions—exemplify the strategies discussed in the previous section. These communities have integrated elements of smart growth into their climate action and climate protection plans, recognizing that where people live and work, and how they get from place to place, can dramatically alter a community's footprint and contribution to climate change. They have created a framework for success by acting early and aggressively, setting clear goals and targets, and using innovative strategies that they have adapted to their unique local contexts.

# 1

## Create More Sustainable and Resilient Communities

Cities and counties across the country have found that implementing smart growth strategies can help create communities that are more sustainable and resilient overall. In Sarasota County, Florida; Santa Monica, California; and Kansas City, Missouri, clear goals have been adopted for addressing climate change and reducing GHG emissions.

**Sustainable Community Planning in Sarasota County, Florida** Sarasota County has a long history of addressing its environmental, economic, and social challenges with consideration for how policies to address these issues will affect future generations.<sup>39</sup> Although the county began developing a climate action plan in 2008, it addressed the issue two years earlier in its “Roadmap to Sustainability.” The roadmap, which was presented to the Board of County Commissioners in 2006, is a guiding document that outlines a way of thinking about growth management that has evolved over many years.<sup>40</sup> It notes Sarasota’s decision to adopt the Architecture 2030 Challenge, which is built around the goal of achieving carbon neutrality for county operations by 2030.<sup>41</sup> In recognition of the priority its citizens’ place on protecting the



Photo courtesy of Sarasota County

**Sarasota County began developing a county-wide climate action plan in 2008, following its “Roadmap to Sustainability,” which was adopted by the Board of County Commissioners in 2006.**

area’s natural systems, the county has also developed a 2050 plan to guide its growth through midcentury with a focus on managing sprawl and habitat corridors. The plan proposes the development of “2050 Villages”—compact developments designed to preserve open space and reduce driving—as well as an initiative emphasizing strong transit connections and TOD.

The 2030 commitment to becoming carbon neutral provides some insight into the county’s approach to planning. As staff members began examining what it would take to succeed on that challenge, they quickly realized that land use and community design were every bit as critical to carbon neutrality as energy use in public buildings. In just one example of how that realization translated into a different way of thinking about policy, county staff members looked at the amount of driving that residents were doing and saw that it was largely predetermined by the pattern of development. The task of reducing VMT became not



**Sarasota County’s sustainability plan covers a wide range of measures, including green building, water and energy conservation, and sprawl management. The county also encourages residents to follow green practices has begun recognizing green businesses through its Green Business Partnership Program.**

Photo courtesy of Sarasota County

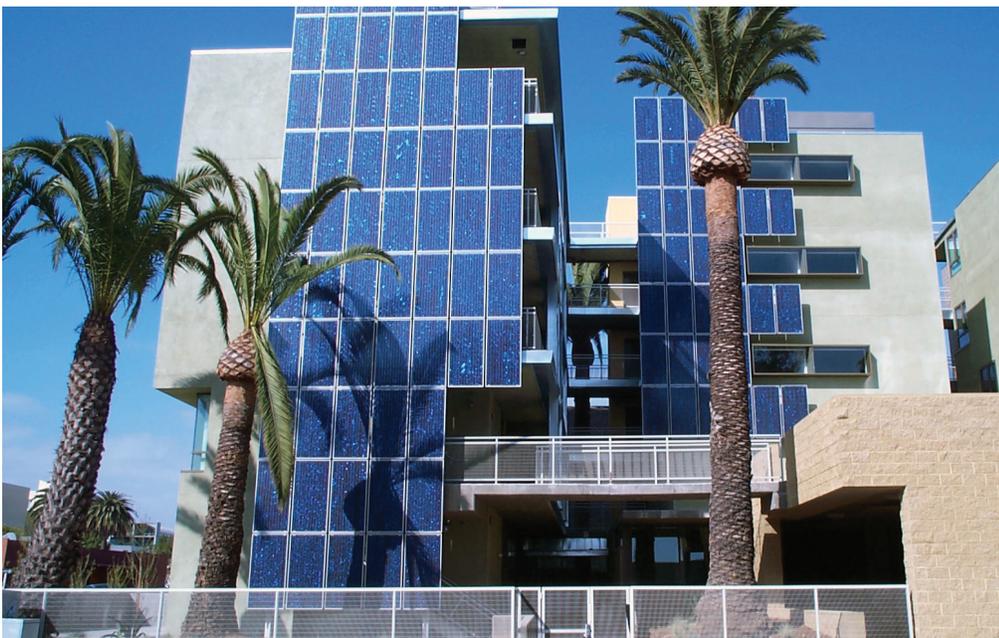
just an issue of housing demand but also a matter of housing need: where does the county need to locate housing and what form does the housing need to take?

In recent years, Sarasota has begun to study affordable housing, which has traditionally been focused on the housing stock and not the location. Currently, little of the county's affordable housing is located near where people work or run errands. As a result, people have to drive to get to these destinations, and as the county's affordable housing stock has increased, so too have VMT. As with its shift from examining housing demand to considering housing needs, the county came to see the value of shifting away from affordable housing and toward the concept of affordable living, ensuring that affordable housing is located within walking distance of jobs, basic services, and transit.

Sarasota County has engaged in numerous sustainability efforts that are relevant to climate planning, including the promotion of green building standards, water conservation, energy management and outreach, and landscaping with native plants that need less water and fertilizer. The county also promotes green living among its residents as a way to save money, and has developed its Green Business Partnership to certify businesses that follow sustainable practices.<sup>42</sup> Certification brings these businesses a marketing edge with consumers who want to support environmentally friendly practices and products. By implementing the program's energy and water conservation measures and waste reduction practices, they also save money.

**Sustainable City Planning in Santa Monica, California** Like Sarasota County, the city of Santa Monica has long anchored its growth management practices in sustainability. The city first inventoried its GHG emissions in 1990 and adopted the Santa Monica Sustainable City Program in 1994. Today the city is pursuing sustainability with diverse initiatives targeting everything from housing and transportation to economic development and community education.<sup>43</sup> Many of these efforts, including green building requirements that apply to all commercial construction, major renovation projects, and multifamily housing projects with more than three units, aim to reduce emissions.<sup>44</sup>

Since the early to mid-1990s, Santa Monica has been working to reduce emissions with the use of renewable energy and alternative fuel vehicles, as well as with strategies to minimize the amount of solid waste going to landfills. In terms of land use, the city emphasizes mixed-use development in its downtown and in areas along transit corridors. It has also tapped into economic development opportunities, teaming up with the chamber of commerce to promote the community as a "green destination" with certified green hotels and a reliance on solar energy, among other green features. And the city is working to engage local businesses in these efforts through its Green Business Certification and Sustainable Works Business Greening programs, which promote and recognize sustainable business practices.<sup>45</sup>



**The city of Santa Monica has taken a multi-faceted approach to reducing its GHG emissions. Measures include using alternative fuel vehicles, emphasizing mixed-use development, and adopting green building requirements. The green building requirements promote the use of renewable energy, such as the photovoltaic cells shown here.**

Photo courtesy of the city of Santa Monica

## 12 Getting Smart about Climate Change

Santa Monica puts a lot of emphasis on evaluating and reporting its progress in achieving its sustainability goals. In a fifteen-month update of its sustainability efforts that reflected broad public input and culminated with the city council's adoption of the Santa Monica Sustainable City Plan in February 2003, the city presented a series of updated goals, along with indicators and targets by which it would measure the effectiveness of actions taken to reach these goals. Every year, the city council gets a report on these indicators, which include GHG emissions and VMT, as well as other measures related to climate change, including waste recycled or composted and tree cover. The results are also summarized in a "Sustainable City Report Card," which is intended to give community members a reference guide to the city's progress and has proven to be a valuable tool for educating and engaging residents.<sup>46</sup> Using these community data, the city adopted ambitious emission reduction targets in 2006—30 percent below 1990 levels for city operations by 2015, and a 15 percent reduction for the community overall.

Through its two decades of sustainability planning, Santa Monica has learned that there is a strong fiscal case to be made for most of what local governments are trying to accomplish on climate action. "The majority of the things you're going to do at the municipal level to address climate change are going to save you money," Dean Kubani, the city's environmental programs manager, said. He added that any actions taken to improve energy efficiency, in particular, have "a very short pay-back period."

**As part of its sustainability efforts, Kansas City has installed bioswales, which help with stormwater management.**



Photo courtesy of the city of Kansas City



Photo courtesy of the city of Kansas City

**Kansas City has a number of new green buildings. The Convention Center Ballroom, shown here, is certified as LEED silver.**

### **Sensible Sustainability and Regional Collaboration in Kansas City, Missouri**

Kansas City has emerged as a leader on climate change in the Midwest. The city adopted a comprehensive climate protection plan in 2008 that includes smart growth-related recommendations for urban forestry, neighborhood food production, and complete streets planning, and has taken the lead in promoting the importance of regional collaboration in climate protection planning.

Kansas City moved quickly to develop a climate change plan after its former mayor, Kay Barnes, signed the U.S. Conference of Mayors Climate Protection Agreement in June 2005. The mayor and city council followed up in August 2006 by adopting a resolution directing City Manager Wayne Cauthen and the city's chief environmental officer, Dennis Murphey, to initiate a climate protection planning process. The mayor appointed a steering committee representing various community stakeholder groups to address the issue.

In November 2006, the city's Environmental Management Commission issued a progress report outlining an approach and the recommended components of the plan. The four broad recommendations, which include more than thirty specific measures to reduce emissions, ranging from the development of a stream setback buffer ordinance to the expansion of an existing urban forestry program, received unanimous approval from city council. The report described the development of the climate protection plan as "a work in progress" that would continue even as the city moved on the initial recommendations. The commission had the support of Barnes's successor, Mayor



Photo courtesy of the city of Kansas City

**Over 100 people participated in the creation of Kansas City's climate protection plan over a period of 18 months.**

Mark Funkhouser, who also signed the mayors climate protection agreement, and of the newly elected council members.

In the first phase of its work, the commission focused on actions that the city could take to address climate practices within municipal operations. In the second phase, it worked to identify measures that would result in community-wide GHG reductions. Smart growth measures, including the implementation of “climate-friendly” land use policies, were prominent among the strategies considered.

The Kansas City Climate Protection Plan, adopted by the mayor and city council (with another unanimous vote) in July 2008, commits the city to reducing community-wide GHG emissions by 30 percent below year-2000 levels by 2020 and aspires to an 80 percent reduction by 2050. It identifies smart growth goals, including efforts to reduce dependence on driving by

increasing public transportation and building homes and workplaces in proximity, as “critical” to climate protection. It also proposes ongoing oversight of the plan’s implementation by a steering committee.

In addition, Kansas City’s climate protection plan recognizes the importance of regional collaboration. Although the city anchors a large metro area spanning western Missouri and eastern Kansas, it accounts for only one-quarter of the metro area’s population and an even smaller share of its total emissions. Thus it has focused on developing regional partnerships to address climate change, including staff members from the regional planning agency in the development of the climate protection plan, and making a point of being responsive to inquiries from other jurisdictions about its climate protection planning.

Other jurisdictions in the metro area have, in turn, have recognized the value of adopting a strategy to become “America’s Green Region.” Nineteen mayors across the area signed the mayors climate protection agreement in 2007, and the Greater Kansas City Chamber of Commerce launched its own climate protection partnership initiative, which encourages metro-area employers to commit to assessing and lowering their GHG emissions. As of spring 2009, more than 160 businesses and organizations representing more than 100,000 employees had joined the partnership, and the chamber is seeing economic benefits from having repositioned Kansas City as a green community that is addressing climate change.

Kansas City is also working collaboratively on Energy Efficiency and Conservation Block Grant (EECBG)-funded projects,<sup>47</sup> partnering with the Mid-America Regional Council and the other EECBG formula grant recipients in the metro area to implement a regional energy framework to reduce energy use and GHG emissions. And it is using its \$4.8 million formula grant to implement several measures in its climate protection plan, including updating its new development code to promote energy-efficient transportation.

*We're well under way in addressing climate protection and incorporating the triple bottom line approach to sustainability (i.e., simultaneously achieving economic vitality, social equity, and environmental quality) into city government operations. And the groundwork has been laid for Kansas City to work with the business community and other governments in the metro area.*

**—Dennis Murphey, chief environmental officer, Kansas City, Missouri**

## 2

## Green the Local Economy

In addition to the environmental benefits it provides, greening communities can be a successful local economic development strategy, helping to attract green businesses that are looking to locate in climate-friendly cities. In Tacoma, Washington, climate action planning has emerged as an economic development strategy to help attract green businesses to the city.

**Greening Economic Development in Tacoma, Washington** Climate protection planning in Tacoma originated with the city’s economic development efforts and examining the potential of marketing the city as a green economy to attract green industries and drive economic growth. “The roots of this whole effort were very much with the city council looking out on the horizon, and asking what are the opportunities to develop a new business sector in Tacoma,” said Alisa O’Hanlon, the city’s government relations coordinator. The economic development department conducted an inventory of local businesses focused on sustainability and found that the sector had promise for growth.

In April 2006, the council adopted a resolution recognizing climate change as a significant community issue and instructed the economic development and public works departments to pursue the issue by conducting an inventory of GHG emissions and research on green industries. It also decided to establish a

**Tacoma, Washington, has invested in greening the city as an economic development strategy.**



Photo courtesy of the city of Tacoma



Photo courtesy of the city of Tacoma

**As part Tacoma’s efforts to green the city, the Park Plaza South parking garage underwent a renovation and reconstruction. It is now the Pacific Plaza Building, a mixed-use complex that has received LEED platinum certification.**

Green Ribbon Climate Action task force of community stakeholders, including representatives from both the business and environmental sectors, to work with city staff. And as the city council realized that to attract green businesses, it would have to establish itself as a green community, it began work on its climate action plan.

Over time, as the city developed its climate action plan through a series of public meetings with the task force, the economic development message strengthened. The chamber of commerce, which had several members on the task force, became a major proponent of the city’s sustainability efforts. The chamber would share stories from members who had succeeded in lowering costs and improving profits with various sustainability measures, such as the case of a window manufacturing plant that benefited from installing more efficient lighting. “That (story) really paid great returns,” O’Hanlon said. “Our chamber was great at digging up examples like that and sharing them with the business community.”

## 3

## Engage the Community in the Climate Change Planning Process

Community engagement can help build public support for climate plans and can lead to more successful, context-sensitive plans that address the specific needs of individual localities. In Carbondale, Colorado, climate change planning has proven to be a successful community-building strategy, bringing residents together and getting them involved in their community. In Cambridge, Massachusetts, engaging the community has helped bring additional expertise to the table.

**Creating Community (and Green-Collar Jobs) in Carbondale, Colorado** Carbondale, a town in the heart of the Central Rocky Mountains with fewer than 6,000 residents, stands out for the broad participation of its citizens in climate protection planning. In the summer of 2005, shortly after the town had joined the Cities for Climate Protection Campaign, its Environmental Board, a volunteer citizens group, took on the task of creating an energy and climate protection plan. The following November, the town invited its citizens to weigh in on how it should reduce emissions and ended up hosting more than 150 residents for what was billed as the first Energy Extravaganza, where they brainstormed ideas for an energy plan. “It was open to anyone who chose to show up,” said Tom Baker, the town manager. “People were really jazzed about it, and the interest is only gaining momentum.”

The board continued to gather public input after the extravaganza, and it worked with energy experts,

*The lesson that we keep learning is that we've got such a reservoir of talented people. If we invite them to participate in public policy work, we get amazing results. Don't underestimate the depth of public support. People are sometimes concerned that there will be special interests involved with citizen advisory groups. But the talent that's out there is unbelievable. If you just trust in your community you'll be rewarded many times over.*

—Tom Baker, Carbondale town manager



Photo courtesy of Brent Moss

**Carbondale Recreation and Community Center, shown here, opened in January 2009. It is one of two buildings in Colorado to have received LEED Platinum certification.**

elected officials, and the Community Office for Resource Efficiency to develop a plan. Its principle goal was to lay out steps for Carbondale to become more energy independent with a greater reliance on renewable energy and to reduce its GHG emissions while also growing the local economy.<sup>48</sup>

With the town's historic roots in agriculture and mining, local leaders have focused on clean energy as a key component of their climate protection plan, which carries the subheading “Creating a Strong Carbondale Economy with Clean Energy.”<sup>49</sup> They have worked to foster the development of solar power and other renewable energy businesses. Having been built around nearby coal operations in the Crystal River Valley, which began to decline in the 1980s, the town's economy is now being redefined by its growing green-collar job market. Today, Carbondale is known for its local and regional expertise in solar energy, in particular, and for its leadership on green building requirements.

With “clean energy” lying at the heart of their plan, town officials were happy to hear from the USGBC in January 2009 that the new Carbondale Recreation and Community Center had received LEED platinum certification. Only the second building in Colorado to obtain LEED platinum certification, the

facility garnered acclaim for its energy-efficient design, materials, and other features that help minimize its carbon footprint. The facility was opened in March 2008 in a strategic downtown location that is accessible from the town’s central business district and an adjacent walkway leading to a popular bike trail.

**Cambridge, Massachusetts, Brings Local Expertise to the Table** Cambridge is another city that has benefited from strong public participation in developing its climate action plan. Soon after Cambridge joined ICLEI’s Cities for Climate Protection campaign in 1999, the city manager appointed a climate protection advisory task force of nearly two dozen citizens to provide guidance on the development of the climate protection plan. The city found the group, which included university and business representatives, to be extremely helpful. “The people who volunteer here have incredible credentials,” said Susanne Rasmussen, director of environmental and transportation planning in Cambridge. “Their level of expertise is extremely high.”

Cambridge’s residents are supportive of climate protection and sustainability planning. When the climate protection plan was adopted by the city council in December 2002,<sup>50</sup> the city already had a strong transportation demand management program for large employers. In place since 1998, the program focuses on reducing single-occupant vehicle travel. And the city enjoys some advantages over other U.S. cities, such as the fact that nearly half of its residents work



**Cambridge’s residents have largely been supportive of measures to address climate change, and the city has worked to recognize businesses, organizations, and individuals who are working to address the issue.**

in the city, and about 25 percent walk to work.

Following the adoption of the climate protection plan, the committee reconstituted to focus on implementation. The city now has a standing advisory committee, which meets monthly. Comprising residents who are interested in climate change and have applied for appointment through the city manager’s office, the committee helps evaluate how the plan’s effects are measured, performs community outreach, and makes recommendations on building efficiency and emerging climate-related issues. Results of its work are published in annual reports.<sup>51</sup>



**Cambridge has found that involving residents in planning for climate change has helped to bring additional expertise to the table. Here, MIT students examine photovoltaic cells.**

Photo courtesy of the city of Cambridge

## 4

## Approach Climate Change Planning on a Regional Level

Durham, North Carolina, and Sacramento, California, have recognized the importance of regional collaboration in addressing climate change. Regional collaboration is particularly relevant when considering transportation policies and larger land use and growth management policies.

### Regional Planning in the Research Triangle: The City and County of Durham, North Carolina

The city and the county of Durham, North Carolina, have approached climate change planning as a region, with the city, the county, and the Durham–Chapel Hill–Carrboro Metropolitan Planning Organization (MPO) jointly developing and adopting an emissions inventory and local action plan in the fall of 2007. The collaborative approach, which reflects the way the region already does business, made sense for many reasons. The city of Durham is the only city in Durham County, and the two local governments share a planning department. In addition, the city’s transportation planner and bike/pedestrian planner both hold the same positions at the MPO, and as of April 2008, they share a sustainability manager whose primary responsibility is to implement the plan.

The city got an early start on climate change planning, joining ICLEI’s CCP campaign in 1996 and developing a plan to reduce GHG emissions by 1999. However, the issue did not have a very high profile at the time, so the plan never got any traction and was not adopted. It was not until 2005 that the city decided to recommit to the issue, and in this second round, it decided to partner with the county in developing a joint plan. The MPO sponsored their work in producing the second plan, which involved an advisory committee of elected officials, citizens, and representatives of environmental groups, utilities, area universities, and the business community.<sup>52</sup>

Durham was able to build on a number of strong, existing policies, such as a countywide requirement for any employer with over 100 employees to create a trip reduction plan and conduct annual surveys of employees to track the impact of the plan. The business community has also been another regional force for mitigating climate change, with the local chamber



Durham, North Carolina has taken a regional approach to sustainability. The city, county, and MPO have collaborated to create a joint local action plan, adopted in 2007. The Durham Station Transportation Center, shown here, opened in 2009, is across the street from the train station and is designed for pedestrian, bicycle, and bus (local, regional, and inter-state) travel.

of commerce working with its counterparts in nearby Chapel Hill–Carrboro to develop a green certification process.

Tobin Freid, the sustainability manager for Durham City and County, shares a valuable lesson that the region learned in this second attempt to take action on climate change. “Don’t let perfection be the enemy of the good,” she said. Freid cautioned against getting too focused on perfecting the emissions inventory, noting that it is not a static number. “You can’t spend all of your time trying to nail down that number at the expense of addressing it.”

### Aspiring to Become America’s Green Region: Sacramento, California

Sacramento’s regional approach to planning has been evolving as a result of the city’s close collaboration with other local governments in the development of a long-term growth plan, “The Sacramento Region Blueprint: Transportation/Land Use Study.”<sup>53</sup> The Blueprint Project was led by the Sacramento Area Council of Governments (SACOG), with more than two years of workshops,

*It will allow us to achieve the goals of accommodating population and job growth in key areas, without sprawling, in a way that revitalizes older areas that need a shot in the arm. That kind of land use story plays well into our climate action efforts and our efforts to work with pieces of state legislation that are coming down.*

—Tom Pace, long-range planning director for Sacramento

regional conferences, Web-based dialogue, and surveys that involved more than 5,000 residents, elected officials, and business leaders. The project used modeling tools and interactive software to enable participants to see the effects of different land use decisions on transportation, air quality, and the regional economy. In December 2004, after gathering extensive public input and hosting its first ever Elected Officials Summit with participation by all of the cities and counties in the Sacramento region, the SACOG approved the final product, the “Preferred Blueprint Alternative.”

The city of Sacramento developed its own plan for growth independent of the Blueprint Project, and it started working on a climate action plan in spring 2009. It had adopted a sustainability master plan in December 2007, taking the same path as Sarasota County and other local governments in building their vision for long-term growth around the concept of sustainability.<sup>54</sup> And in March 2009, the city council adopted the Sacramento 2030 General Plan, which



Photo courtesy of the city of Sacramento

**Sacramento’s 2030 General Plan incorporates many smart growth related goals and policies. Among these, two-thirds of planned growth through 2030 will be infill development near planned or existing light-rail stations.**

contains detailed policies and goals to guide the city’s growth.<sup>55</sup>

While these planning processes did not directly involve the county and neighboring municipalities, Sacramento’s sustainability vision and general plan were informed by the city’s experience with the Blueprint Project. “We were big supporters of the regional blue print,” said Tom Pace, the city’s long-range planning manager, noting that Sacramento launched its general plan effort at the same time. “Our intention was to base our growth plan on the blue print model.”

Sacramento’s general plan, which incorporates many smart growth goals and policies that are critical to reducing GHGs, has helped the city lay the groundwork for climate action as well. The overall goal of the plan is to direct growth to areas where the city can take advantage of existing transportation facilities and to protect open space and farmland. Two-thirds of the city’s growth through 2030 is to be accommodated with infill development in downtown Sacramento and four other existing communities that are located near planned or existing light-rail stations. These neighborhoods, which today are older, second-tier suburbs that could benefit greatly from reinvestment, are reenvisioned as very walkable, mixed-use, high-density areas.



Photo courtesy of the city of Durham

**The Durham region has made itself bicycle friendly. Here, bicyclists ride through the city’s downtown area.**

## 5

## Address Transportation through Transit-Oriented Development and Complete Streets

Smart growth can have a profound impact on how people travel. Arlington County, Virginia, has found that focusing on building a multimodal transportation system and orienting new residential and commercial development around it helps reduce VMT and GHG emissions, and makes the county a more sustainable place.

**A National Model of TOD in Arlington County, Virginia** Arlington County, which is located across the Potomac River from Washington, D.C., has earned recognition as a smart growth leader that can teach important lessons to local governments looking to create climate-friendly land use and transportation policies. The county has received national acclaim, winning the U.S. Environmental Protection Agency’s first Overall Excellence in Smart Growth Award in 2002<sup>56</sup> and recognition from the American Planning Association’s Great Streets Program,<sup>57</sup> and regularly drawing visits from planners and local elected officials from across the country and overseas.

Arlington’s investment in smart transportation policy began in the mid-1970s, when county leaders actively began pursuing the goal of making the county the first suburban link in Washington, D.C.’s new Metro subway system. County leaders were strategic in ensuring that transit would become a strong community asset, pushing to have the subway line built underground along the Rosslyn-Ballston Corridor—the most intensely used commercial corridor in Arlington—rather than along the median of Interstate 66.

*Having the guts to stick with your plan and sometimes say no is one of the critical lessons you learn. The decisions that we make are the decisions we’re going to have to live with for the next generation. Making the right decisions about design becomes more important. And the most important part of design is what happens at the street level.*

—Ron Carlee, former Arlington County Manager and ICMA Director of Strategic Domestic Initiatives



**In the 1970s, when Arlington County leaders began looking into bringing Metro stations, development in Arlington was low-density and car-oriented. Today, it has some of the highest metro ridership in the Washington region.**

The county took advantage of this accessibility, redrawing plans to create mixed-use developments around each planned Metro station, which would ensure around-the-clock activity and strong transit ridership.

To increase transit ridership, Arlington had to gain its residents’ support for high-density development around the Metro stations. This support is evident in one of Arlington’s smart growth success stories: the redevelopment of Shirlington. A traditional suburban neighborhood to the south that is not Metro accessible and was anchored by an aging strip mall, Shirlington presented the type of redevelopment challenges common in many communities. County leaders knew that community input would be vital to gaining public support for the greater residential density needed to support new retail, restaurants, and other neighborhood activity. They worked closely with Shirlington residents and the Shirlington Village developer in the early part of the decade to develop a successful plan for revitalizing the area.

Their efforts paid off and this former “greyfield” is now the site of Shirlington Village, a mixed-use TOD with 634 new apartments and condominiums, a



## ARLINGTON'S TRANSIT-ORIENTED DEVELOPMENT STORY

- Arlington's two metro corridors (Rosslyn-Ballston and Jefferson Davis) have seen strong growth. In 1970, the corridors had 6.9 million square feet of office space and 10,348 housing units. By 2009, there were 34.2 million square feet of office space and 41,655 housing units.<sup>1</sup>
- Metro ridership steadily increased between 1980 and 2008 along both metro corridors, with weekday boardings increasing from just over 40,000 in 1980 to just under 80,000 in 2008 (slight declines were seen in 2009).<sup>2</sup>
- Slightly less than half of the people living on Arlington's Metro corridors drive to work, while nearly 40 percent rely on public transportation.<sup>3</sup>

1 Arlington County Department of Community Planning, Housing and Development (CPHD), "Profile 2009: Fall Update," 8, [www.arlingtonva.us/departments/CPHD/planning/data\\_maps/profile/file72015.pdf](http://www.arlingtonva.us/departments/CPHD/planning/data_maps/profile/file72015.pdf) (accessed February 3, 2010).

2 Ibid., 9.

3 Arlington County CPHD, "Means of Transportation," [www.arlingtonva.us/departments/CPHD/planning/data\\_maps/Census/commuting/Censuscommuting.aspx](http://www.arlingtonva.us/departments/CPHD/planning/data_maps/Census/commuting/Censuscommuting.aspx) (accessed February 3, 2010).

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195,000-square-foot office building, and 60,800 square feet of retail space. A new county library and performing arts center have also opened on the site. Arlington built its first fully enclosed bus transfer station near the Village in 2008. The Shirlington Transit Station has greatly increased Shirlington's transit accessibility, connecting residents to bus lines and providing access to Arlington's Metro stations. In addition to the new bus station, Arlington invested about \$4 million to connect a regional trail network in Shirlington, built new sidewalks and intersections, and introduced car-sharing spaces in the area. Shirlington Village is now a vibrant, transit oriented-community, and county officials estimate that the project will add more than 1,000 jobs and about 1,000 new residents to the area.

Shirlington Village illustrates the kind of transformation that is vital to getting people out of their cars—an important way to make a significant reduction in emissions—and provides a model that other communities can follow: "Any place in America could do what we've done in Shirlington," said Ron Carlee, Arlington's former county manager.

Arlington's experience demonstrates that TOD is one of the most promising strategies a local government can employ to reduce GHG emissions. The county reports high levels of transit ridership, with 25.4 percent of residents using public transportation to get to work in 2008, compared to 13.4 percent in the Washington, D.C., metro area and 5 percent nationally.<sup>58</sup>

Photo by Steve Uzzell



Photo courtesy of The JBC Companies

**Over the last three decades, Arlington has invested in smart growth policies, winning national acclaim for its efforts. Arlington's smart growth plans will continue into the future, with more mixed-use, high-density development.**

## 6

## Promote Density through Infill Development and Brownfield Redevelopment

Development patterns that are more compact reduce overall energy usage and affect transportation patterns. Infill development and brownfield redevelopment projects make use of existing infrastructure and can help revitalize communities. In Atlanta, Georgia, an infill project has become a thriving community.

**Mixing It Up in Atlanta, Georgia** The cleanup and redevelopment of the former Atlantic Steel mill site into a mixed-use community called Atlantic Station exemplifies the benefits of urban infill and redevelopment. People living in this new community near Midtown Atlanta can easily walk to its stores, restaurants, and offices, or take a free shuttle to the MARTA (Metropolitan Atlanta Rapid Transit Authority) Arts Center subway station about a mile away for trips elsewhere in the city. The shuttle service has been popular, transporting, on average, more than 900,000 riders annually.

The climate protection benefits of living in Atlantic Station are clear. In 2008, residents drove an average of 13.9 miles daily, well under half the average of 33.7 miles a day driven by residents of the Atlanta metro area. Of all the trips made to, from, or within the community by the roughly 11,000 people who live and work there, slightly more than half were made by some means other than single occupant of a motor vehicle.<sup>59</sup>

Atlanta is one of several regions in which clear ties between smart growth features, reduced VMT, and overall lower GHG emissions have been documented. Lawrence D. Frank, Bombardier Chair in Sustainable Transportation at the University of British Columbia, served as the principal investigator in a compre-



**Atlanta's Atlantic Station is a successful example of infill development. Residents of Atlantic Station drive less than half as much as residents in other parts of the Atlanta Metropolitan Area.**

sive planning study in Atlanta known as SMARTRAQ (Strategies for the Metro Atlanta Region's Transportation and Air Quality.) The study began in 1998, after the region's transportation plan was forecast to violate emissions standards under the Clean Air Act. The SMARTRAQ research team analyzed travel survey data from more than 8,000 households and land use data from thirteen counties, and found a strong connection between the walkability of a neighborhood and the amount of time spent in the car. Among other findings, SMARTRAQ found that people living in neighborhoods that were rated as the least walkable drove about 30 percent more—and produced about 20 percent more GHG emissions—than those living in the areas rated most walkable.<sup>60</sup>

### ADVANTAGES OF BROWNFIELD REDEVELOPMENT

- The U.S. Environmental Protection Agency estimates that there are 450,000 brownfields in the United States.
- As of January 2010, the EPA Brownfields program has leveraged 61,023 jobs in communities across the country since its inception in 1995.
- Redeveloping brownfields can increase property values on properties surrounding the site by 2 to 3 percent.
- The greater location efficiency offered by redeveloped brownfields can reduce VMT by 33 to 58 percent over greenfield developments.<sup>1</sup>

<sup>1</sup> U.S. Environmental Protection Agency, "Brownfields and Land Revitalization," [www.epa.gov/brownfields](http://www.epa.gov/brownfields) (accessed March 22, 2010).



Because green buildings can be less resource and energy intensive than traditional buildings, green building approaches have been adopted in many cities and counties. In Santa Fe, New Mexico, the city's sustainability plan includes recommendations for green building, development, and zoning.

### City Embraces Sustainability: Santa Fe,

**New Mexico** The city of Santa Fe adopted its Sustainable Santa Fe Plan in October 2008. While it is a broad sustainability plan that extends to issues beyond climate change, it does focus on climate-related action, particularly green building and development. The Sustainable Santa Fe Plan, which tailors broad sustainability principles to the city's unique conditions and resources, as well as to its history, culture, and values, begins with the goal of looking "to the history and culture of Santa Fe," incorporating such values as the commitment to "distribute the benefits and costs of moving towards sustainability in an equitable way."<sup>61</sup> Like other local governments that have sought public input on climate change, Santa Fe engaged residents through the Sustainable Santa Fe Commission, a nine-member group representing different stakeholder interests and guided by a "green team" of city staff members. The city also engaged a parallel youth advisory board to provide input, recognizing that engaging the community's youth was central to ongoing sustainability efforts.

The Sustainable Santa Fe Plan focuses on green building and development steps appropriate to the city's desert setting; such steps include water conservation, energy conservation, and the development and use of renewable sources of energy such as solar and wind power. To address these issues, the city has developed a residential green building code for single-family homes. The code drew some controversy because it adds cost to housing, which is both expensive and a fundamental need, but the city addressed these concerns by looking at the potential for the increased housing cost to be balanced out by long-term cost savings on utilities.

The code, which was adopted and went in to effect on July 1, 2009, focuses on six green building cat-

### ADVANTAGES OF GREEN BUILDING



The green building market has grown rapidly in recent years, increasing from 2 percent of non-residential construction starts in 2005 to a predicted 20-25 percent in 2013. The estimated value of green building market is also increasing, and is predicted to grow from \$36-49 billion in 2009 to an estimated \$96-\$140 billion in 2013.<sup>1</sup> Green building offers a number of advantages:

- Compared to traditional commercial buildings, green buildings consume 26 percent less energy and result in 33 percent less greenhouse gas emissions. They also result in lower maintenance costs and higher occupant satisfaction.
- Improvements to indoor environments resulting from green building can lead to savings from health gains (\$17-48 billion) and improvements to worker performance (\$20-160 billion).
- Building green can result in sale prices up to 10 percent higher per square foot than in conventional buildings.
- Green building is expected to support 7.9 million jobs between 2009 and 2013.<sup>2</sup>

1 U.S. Green Building Council, "Green Building Facts," [www.usgbc.org/DisplayPage.aspx?CMSPageID=1718](http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1718) (accessed March 22, 2010).

2 Ibid.

egories: project implementation and lot development, resource efficiency, water efficiency, energy efficiency, indoor environmental quality, and ongoing sustainable practices. It has eight levels of green building certification, ranging from silver (lowest) to emerald plus (highest), and requirements for the level required vary based on housing size. Houses under 3,000 square feet must meet silver-level standards, while those over 8,000 square feet must meet the requirements for emerald-level certification.<sup>62</sup> The sustainability plan also includes recommendations to amend development and zoning codes to promote investment in green building and development practices, including solar panel installation and the reuse of wastewater from sinks, showers, and laundry machines (greywater).<sup>63</sup>

## 8

## Preserve and Create Green Space

Preserving and creating green space serves important environmental purposes and can also increase overall community quality of life. Minneapolis, Minnesota, has made protecting its existing parks and open spaces and creating new green spaces a priority in its sustainability plan.

### Parks as Part of Sustainability Planning in Minneapolis, Minnesota

Minneapolis has been a leader in the Midwest on smart growth and sustainable practices. When the city adopted its 2030 master plan, “The Minneapolis Plan for Sustainable Growth,” in October 2009, it emphasized the importance of planning for a sustainable future and preventing the adverse effects of sprawling development patterns. The plan addresses land use and transportation practices, as well as environmental goals related to GHG emissions, sustainable design and development practices, and the expansion of renewable energy resources. It also emphasizes the protection of existing parks and open spaces within the city, as well as the creation of new green spaces.

The city park system in Minneapolis, which was designed in the late 1800s, serves 400,000 city residents and has grown to include 6,400 acres of parks, greenways, public plazas, community gardens, and recreational facilities. Seven of the city’s parks and three trails are also part of the Regional Parks System, which serves over 3.1 million residents in the metro area. Minneapolis has received national acclaim for its park system, including a four-star rating (the highest awarded) from the Trust for Public Land, and its sustainability plan recognizes the importance of parks and open space not only in promoting community health and well-being, but also in “supporting plant and animal life and . . . improving natural systems degraded by urban land uses.”<sup>64</sup> It also addresses the possibility of developing green infrastructure, including green roofs and rain gardens, in the future.<sup>65</sup>



Photo courtesy of the Metropolitan Design Center, used with permission.

**Minneapolis, which has an extensive and award-winning parks system, has made preserving and creating green spaces within the city a central part of its 2030 master plan.**

The Midtown Greenway, a five-and-a-half-mile-long former railroad corridor in the southern part of the city that has walking and biking trails, connects into a larger greenways network called Metro Greenways. The Metro Greenways Program was started in 1997 following a report by the Greenways and Natural Areas Collaborative to address rapid growth and sprawl in the Minneapolis–St. Paul metropolitan region. The report, *Metro Greenprint: Planning for Nature in the Face of Urban Growth*, recognizes the natural heritage of the Twin Cities region; it notes the importance of that heritage in the regional culture and economy, as well as the roles that greenways play in providing environmental benefits to the region.<sup>66</sup> Metro Greenways, which is administered by the Minnesota Department of Natural Resources, began in the seven-county region encompassed by the Twin Cities metro area and has since expanded to twelve urban and urbanizing counties. It has involved fifty-seven local governments in protecting over 600,000 acres of open space while also creating a regionwide recreational amenity.<sup>67</sup>

# 9

## Plan for Climate Adaptation

While reducing climate impacts (climate mitigation) is important, cities and counties also need to create plans that will help them adapt to future changes, both locally and regionally. Addressing these changes early will help them withstand the changing climate and is central to community sustainability. Keene, New Hampshire, is one of the national leaders in climate adaptation planning.

**Planning for a Changing Climate in Keene, New Hampshire** Keene, a small city in the southwest corner of New Hampshire, is quietly pushing the leading edge of local government action on climate change. Even before local leaders began to focus on the issue in the late 1990s, smart growth was well ingrained in the city’s historical development patterns, with most neighborhoods having been built around the downtown core. Since the late 1990s, the city has inventoried its GHG emissions, set targets for reductions, and developed strategies to achieve those targets, adopting a climate protection plan in early 2004. Keene has also advanced to another phase of climate change action: developing an adaptation action plan aimed at preparing the city for the impacts of a changing climate that



Photo courtesy of David Bergeron

The frequency and severity of storms is expected to increase with climate change. Whitcomb Mill Road in Keene, New Hampshire was damaged by floodwaters following heavy rains in 2005, providing a sobering view of what Keene can come to expect.

city leaders say the region is already beginning to see. In adopting a climate adaptation plan, Keene joins a small but growing group of local jurisdictions that is dominated by some of the nation’s largest, including



Photo courtesy of Keene Fire Department

The city of Keene has three round-a-bouts. Innovative traffic management is part of Keene’s greenhouse gas emissions reduction strategy as well as part of its traffic calming measures.

New York, Chicago, and King County, Washington, home of Seattle.

Keene began adaptation planning after being invited by ICLEI to pilot its new Climate Resilient Communities (CRC) program in July 2006. ICLEI's adaptation planning outreach was well timed, coming less than a year after Keene had seen major flooding due to heavy rain in October 2005. The city moved quickly to begin the next phase of climate change planning by convening a CRC committee made up of local elected officials, the city manager, the assistant city manager/health director, the police and fire chiefs, the public works director, and representatives of local colleges and the regional planning commission. The committee spent two days in training with climate scientists to get the latest climate data and predicted impacts for the region. Committee members then went on to assess Keene's vulnerabilities and the possible impacts of climate change.

Keene's city council unanimously approved the new plan, titled *Adapting to Climate Change: Planning a Climate Resilient Community*, in November 2007.<sup>68</sup> The plan contains detailed goals and strategies for adapting to the expected impacts of climate change on the city's built, natural, and social environments. It also highlights a clear consensus that the city needs to do more, suggesting incentives and regulatory changes to encourage smart growth and promote infill development within defined growth boundaries, to increase local food production, to improve storm-water management, and to attract and support environmentally sustainable businesses.

Keene started taking steps to implement the adaptation plan in the spring of 2008, incorporating discussions of climate adaptation goals into a community visioning process that was part of updating



Photo courtesy of Keene Fire Department

**Keene's Annual Pumpkin Festival draws over 80,000 visitors to the city's compact center to view one of the largest gatherings of simultaneously lit jack-o-lanterns in the country.**

the city's comprehensive master plan. That update, which engaged nearly 1,200 community members in small-group discussions, provided an ideal opportunity to get community input on how to integrate climate protection and adaptation planning with other policies that will guide the city's future. The vision statement, adopted in November 2008, includes the city's overarching goal of becoming a carbon-neutral, climate-resilient community, as well as climate change goals related to housing, transportation, and energy use. "It's not just climate change, but overall sustainability," said of Mikaela Engert, the city planner who has coordinated Keene's climate planning efforts, of the themes that emerged in the community visioning discussion. "For planners, it's a unifying issue [integrating the plans]. Climate change puts more weight behind the arguments."

## Conclusion, Observations, and Resources

Climate change, while a global issue, is intensely local. Americans will experience the ramifications of climate change in their communities, and so these issues need to be addressed on a local level. Local governments are in a unique position to do this: they can control the built environment, which, in turn, influences the choices made by residents about where they live and how they travel. Moreover, changes made on the local level will largely determine changes in the nation's overall GHG emissions. In this context, it is appropriate that climate change be addressed not solely in a top-down manner but also through a bottom-up approach that comes directly from communities and incorporates the on-the-ground perspective of city and county managers.

A growing number of local government leaders across the country are doing just that as they make a strong case for more sustainable communities. Smart growth, with its compact residential neighborhoods within walking distance of transit and workplaces, shopping, and schools, is becoming a key component of sustainability plans. By supporting development patterns designed to reduce GHG emissions and be more resilient to a changing climate, smart growth provides a viable strategy that creates vibrant, livable communities while also mitigating the effects of climate change and reducing GHG emissions.

As our case studies show, incorporating smart growth into climate change plans can have a number of benefits for communities. Not only can it help reduce factors that contribute to climate change and prepare communities for coming changes, but it can also make communities more sustainable in the broader sense. As Atlantic Station in Atlanta and Arlington's TOD story illustrate, land use planning affects daily travel. People who live and work in pedestrian-friendly, mixed-use communities and communities that support strong public transportation systems drive less than people living in conventional subdivisions, resulting in an overall reduction in VMT. TODs and communities with strong multimodal transportation systems can also reduce air pollution and promote walking and biking as alternatives to driving.

As demonstrated in Sarasota County, smart growth, through its emphasis on mixed-use and compact development, can also provide a better mix of housing types and help ensure that affordability and accessibil-

ity go hand in hand. It can help support local economic development, both through the revitalization of vacant or abandoned properties, as Arlington County did with Shirlington Village, or by attracting green business and industry, as Tacoma did. By using these smart growth-based land use and transportation planning strategies and policies to address climate change, local governments have also found a practical means of reducing public service costs, increasing community cohesion, cultivating or preserving a clear identity and sense of place, and protecting important natural and cultural resources.

As communities adopt these policies to mitigate and adapt to climate change, however, it is important to ensure that individual, short-term decisions are consistent with strategic, long-term goals. Decisions about street design, minimum parking requirements, zoning codes, transportation infrastructure investments, and the location of schools and other public buildings should support a community's overall goals for mobility, accessibility, and quality of life. These decisions should ensure long-term environmental, economic, and social sustainability.

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