Greening Buffalo: What Local Governments Can Do

A Partnership for the Public Good Report

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Executive Summary

The Green City Phenomenon

Almost every city in the Unites States is undertaking a significant green initiative. Policy makers, advocates, and citizens are realizing that the future of cities lies in sustainability, and that the future of the environment depends on urban policy.

- By 2030, the world will be two-thirds urban, with most of those people living in small and medium sized cities like Buffalo.

- How cities develop – whether they sprawl or stay compact – is one of the key determinants in how much pollution we cause.

- How much energy cities use, and what type of energy they use – in buildings, transportation, consumption patterns, etc. – will help determine whether climate change is merely bad or whether it is catastrophic.

- The federal government and many state governments have failed time and time again to take the lead on environmental issues; cities cannot afford to wait.

- US cities house many of our lowest income residents – the people who are hurt most by environmental problems such as air pollution, lead poisoning, bad water quality, and those most at risk from the impacts of global warming.

- To attract and keep residents, particularly the highly mobile "creative class" or "knowledge workers," cities need to be clean, green, and progressive.

- Living in a city is much greener than living outside of one; environmentally conscious people will increasingly live in cities and look for cities with green policies and amenities.

- Rapidly escalating energy prices will make more compact, energy-efficient living more desirable.

- Green businesses offer cities the opportunity to revitalize their economies and provide jobs for hard-to-employ workers.

Buffalo: Big Problems, Big Potential

Buffalo faces serious environmental challenges, exacerbated by our industrial history and extreme poverty in our urban core. We have unhealthy ozone and particulate pollution, serious water quality deficiencies and sewage overflow problems, a large number of brownfields, low recycling rates, sprawling development, and old building stock, much of it abandoned or at risk of abandonment. Despite our proximity to Niagara Falls

hydropower, we burn huge amounts of coals for our power. We rely heavily on cars, driving more each year, and fail to walk, ride bicycles, use mass transit, or carpool. The City signed the US Mayors Climate Protection Agreement and measured its greenhouse gas emissions, but then dropped the commitment and has no coordinated plan to reduce emissions. We are underserved by parks and fail to make use of our waterfront and other natural amenities. Buffalo has yet to appear on anyone's list of green cities and struggles to attract new residents.

And yet Buffalo's potential as a green city is remarkable. Buffalo should be one of the world's alternative energy capitals, with its abundant hydropower, high wind speed, and (for a Northeastern city) plentiful sunshine. Buffalo's old building stock is not just a liability; it is also a historical treasure, and it provides fertile ground for green jobs in weatherization, preservation, and deconstruction. With our remarkable location by the Falls and Lake Erie, beautiful natural surroundings, mild summer weather, and winter sports, Buffalo can be a hub for natural recreation and eco-tourism opportunities. Our vacant lots, mostly eyesores now, can become urban farms, community gardens, and trails for biking and walking. Our heavy concentration of academic institutions gives us the intellectual capital to help with green innovation, and our community is already alive with civic and grassroots organizations working on green programs and projects.

The environmental imperative overlaps nearly perfectly with the urban imperative. The most important thing we can do to help the environment is to revitalize our urban core – focus development on the city, bring residents back from the suburbs and exurbs, and renovate our old buildings instead of demolishing them and rebuilding them on former farms and woodlands. Furthermore, most important environmental measures are also – in the long term – cost savings measures that will help restore the city and county to fiscal health – measures that are imperative given rapidly rising energy costs.

No one can wave a magic wand to green Buffalo; it will take a massive, concerted effort by government, non-profits, schools, churches, businesses, labor unions, and individuals. Many exciting efforts are already underway. To maximize their potential, the environmental community should form a coalition with a unified, annual platform for change and a set of sustainability targets and measures used to hold the public sector accountable. Local governments should add sustainability offices and sustainability planning, integrating environmental considerations into all aspects of budgeting, planning, and reporting.

Recommendations for Local Governments

1. **Sustainability Offices, Indicators, Planning, and Reports**
    a. Create sustainability offices within local governments
    b. Develop sustainability plans with indicators, targets, and annual reporting on progress toward those targets
    c. Integrate sustainability targets into budgeting, work planning, and reporting for a all departments and agencies
    d. Develop carbon reduction plan to comply with US Mayors Climate Protection Agreement by 2012 and then cut emissions 80% by 2050
    e. Develop long-range energy efficiency plan to offset increased energy prices

2. **Development Patterns**
    a. Promptly and fully implement the Regional Framework
    b. Pass a county law, like Suffolk County's, giving Erie County more land use authority
    c. Lobby the state for aggressive anti-sprawl measures, brownfield reform, regionalism, revenue sharing, and substantial state investment in the urban core
    d. Carefully limit any further extensions of sewer, water, and roads
    e. Merge all local industrial development authorities (IDAs) into a single entity
    f. Adopt green criteria for all economic development incentives
    g. Focus development incentives on revitalizing the urban core and re-using existing buildings
    h. Focus development incentives on green businesses, eco-tourism, and locally owned, independent businesses
    i. Adopt land use and other regulations to discourage big box retail
    j. Increase the number of government functions that are handled regionally and, in particular, by the county rather than cities, towns, and villages

3. **Transit**
    a. Adopt fuel efficiency and emissions standards for all government vehicles and school buses to be met with hybrid vehicles, biodiesel fuels, and emissions control technology
    b. Adopt anti-idling policies for all government vehicles, school buses, and school areas
    c. Add bike lanes, bike paths, and bike parking and support the Buffalo Blue Bicycle bike-sharing program
    d. Create incentives for government employees and residents to use car-pooling, mass transit, biking, and walking
    e. Convert all NFTA buses to hybrids and add bike carrying capacity to all buses; in the meantime, make sure certain routes always have buses with bike carrying capacity

f. Create a walk-to-school program based on the "Walking School Bus" model
g. Use vacant lots in Buffalo to create new walking paths and bike trails, particularly leading to schools
h. Extend light rail to the UB North Campus
i. Advocate with state and federal governments to create high speed rail lines linking Buffalo with Albany, New York, Toronto, and other cities

4. **Water**
   a. Develop a comprehensive source control program, including green infrastructure, separate stormwater usage fees, and resident education, to divert stormwater from the sewer system
   b. Offer free or low cost rain barrels and downspout disconnects and phase in a requirement that downspouts be disconnected and stormwater be managed appropriately on site at all buildings
   c. Develop a water conservation program including free water use audits and rebates for water-saving devices such as low-flow faucets, showerheads, toilets, and washing machines
   d. Make all government buildings and operations "water-friendly," using techniques such as low-flow fixtures, waterless urinals, collection of rainwater for toilet flushing and irrigation, green roofs, rain gardens, rain barrels, and reduction of impervious surfaces

5. **Parks, Trees, Lots, Green Spaces**
   a. Continue comprehensive tree planting efforts
   b. Offer incentives to residents to plant and care for native trees
   c. Lobby aggressively for state brownfield subsidy reforms
   d. Work with universities on demonstration project to clean brownfield soil with phytoremediation
   e. Develop "Clean and Green" program, modeled after Philadelphia's, to improve vacant lots
   f. Assemble vacant lots for parks, paths, and playgrounds
   g. Provide additional parkland and water access to the waterfront
   h. Work with Buffalo Niagara Medical Campus to bring fruit trees back to the Fruit Belt neighborhood

6. **Buildings**
   a. Require any new buildings or major renovations that receive government subsidies to meet green criteria equivalent to a LEED Silver rating
   b. Renovate all the schools yet to be renovated by the Buffalo Joint Schools Construction Project to the equivalent of a LEED Silver rating
   c. Redirect CDBG, HOME, and other government funding programs away from new construction and toward deconstruction, rehabilitation, lead paint remediation, and weatherization for people with low incomes
   d. Work with the state to create a "Buffalo Retrofit" plan that uses future energy savings to pay for weatherization of buildings

e. Increase energy efficiency, stormwater diversion, density, and other green requirements in zoning and building codes
f. Adopt green purchasing policies favoring energy efficiency, recycled products, durable products, recyclable products, locally made products, and non-toxic products for appliances, furniture, cleaning products, technology, etc.
g. Increase energy efficiency of building and facility operations with technologies (such as occupancy sensor lights) and policies (such as turning off lights and computers when not in use)
h. Use control board efficiency grant money and create a new revolving fund for energy efficiency improvements to buildings and operations and other environmental measures that produce long-term savings to governments and residents

7. **Energy**
    a. Develop on-site wind turbines to help power Buffalo's water pumping and sewage treatment plants
    b. Add solar panels, solar hot water heating, and/or micro wind turbines to the roofs of all feasible government buildings
    c. Reinvigorate plans for district heating in downtown Buffalo
    d. Pursue NYSERDA grants for methane co-generation at all feasible sewage treatment plants
    e. Focus economic development funds and marketing efforts on making Buffalo an internationally known center for clean energy

8. **Food Policy**
    a. Develop a food policy that supports community gardens, urban farms, local produce, organic produce, non-factory farm products, and non-animal products, with special attention to the food needs of people with low incomes
    b. Green the food offerings at schools and all government venues and functions

9. **Garbage and Recycling**
    a. Hire additional staff for recycling programs, particularly for the City of Buffalo
    b. Decrease waste and increase recycling at municipal operations
        i. Use two-sided printing and copying
        ii. Substitute electronic documents for paper ones
        iii. Buy only 100% recycled paper
        iv. Compost all yard waste and organic waste
        v. Ban government use of bottle water
    c. Revise Buffalo's garbage and recycling ordinance, regulations, and policies to:
        i. Conform to state law requiring residential recycling
        ii. Enforce the current requirement for business recycling

iii. Improve collecting and composting of yard waste
iv. Require 50% recycling or re-use of demolition debris
v. Offer another small size of garbage tote, a larger recycling bin and amend tote fees to encourage recycling
vi. Introduce diversion and composting of organic waste
vii. Provide residents and community groups with more financial incentives to recycle

d. Increase recycling rate 5% per year until we reach 75%

10. **Taxation**
    a. Seek state approval to lower property or sales taxes and replace that revenue with taxes on pollution sources such as impervious surfaces, garbage, shopping bags, cigarettes, water bottles, inefficient buildings, toxic release, or carbon emissions.

11. **Education**
    a. Use government resources such as websites, cable access television, public recognition, demonstration projects, and leadership by example to educate residents about environmental problems and solutions; for example, develop a campaign to encourage residents to switch to clean energy in buying their electricity
    b. Make environmental education a central part of all public education

Global Warming

Among the many environmental issues Buffalo faces, global warming has a special place, because it can be called, without hyperbole, a planetary emergency. As Mayor Anderson of Salt Lake City put it, "Global warming is clearly the most urgent issue facing our planet – we have an enormous moral obligation to change government policy and incorporate changes in our business and government and our individual lives."[1]

Despite Al Gore's Nobel Prize, the radical threat of global warming and the radical response needed have yet to penetrate our popular consciousness and political culture. As Thomas Friedman says, "we're fooling ourselves," and we "have not even begun to be serious about the costs, the effort, and the scale of change that will be required to shift our country, and eventually the world, to a largely emissions-free energy infrastructure over the next 50 years."[2] Scientists report that the task is this: to cut emissions by 60 to 80% below 1990 levels by 2050 in order to limit warming to 2 to 3 degrees Celsius.[3]

In the absence of prompt and radical steps to reduce carbon emissions, global warming will spiral out of control. Buffalo, for example, will experience roughly 48 days over 90 degrees each year by 2100 (up from the current average of 3 days per year). Our days over 100 degrees will go from zero to 14. The type of coastal flood that currently hits New York State once per century will occur once per decade. Sea levels will rise between 10 inches and 2 feet.[4]

Buffalo and New York State will be hard hit by global warming, but more vulnerable areas of the globe will fare much worse. According to the latest report from the United Nations, up to 600 million more people will face malnutrition, up to 1.8 billion more will face water stress, and up to 332 million more will be displaced by flooding and storms.[5] Under a "business as usual" scenario, researchers estimate that global warming will kill up to 180 million people in Africa alone by 2100.[6]

For some environmental problems, economic growth can prove helpful. Essentially, as a nation grows wealthier, it can afford to devote resources to protecting the environment. Many environmental indicators have improved in the US over the last decades, including ozone pollution and water quality. Unfortunately, global warming is a different type of pollution. Average U.S. carbon dioxide emissions rose 16% from 1990 to 2003, despite growing awareness of global warming in those years and even as air quality was

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[1] Sasha Abramsky, *The Nation*, January 1, 2007
[2] Thomas Friedman, "The Power of Green," NY Times, April 15, 2007
[3] Reid Ewing et al, "Growing Cooler: The Evidence on Urban Development and Climate Change" Urban Land Institute (2007), page 1, available at www.uli.org.
[4] Union of Concerned Scientists, "New York: Confronting Climate Change in the U.S. Northeast" (2007), www.climatechoices.org.
[5] United Nations Development Programme Human Development Report (2007), http://hdr.undp.org/en
[6] Bill McKibben, *Deep Economy: The Wealth of Communities and the Durable Future*, Henry Holt (2007), page 21.

improving in many other respects.[7] Wealthier Americans may be more likely to recycle, buy organic food, and donate to environmental causes, but they drive more, fly more, and live in bigger houses with more appliances, and so their overall environmental impact is drastically worse than that of lower income Americans, and logarithmically worse than that of people in other nations.

Hence, if we want continued economic growth that does not cause disastrous global warming, we need to radically change the way we generate and use energy. Doing so is entirely possible. Going green can provide economic opportunities that far outweigh its costs, particularly as "brown" energy – oil, gas, and coal – become more and more expensive. Bill Clinton told the U.S. Conference of Mayors, responding to climate change represents "the greatest economic opportunity that we've had since we mobilized for World War II."[8] But seizing this opportunity will demand remarkable political will.

[7] Bill McKibben, *Deep Economy: The Wealth of Communities and the Durable Future*, Henry Holt (2007), page 23.

[8] Lisa Stiffler, "Clinton sees global warming fight as a way to create jobs, opportunity," Seattle Post-Intelligencer, November 2, 2007.

Green Cities

Cities are the future of the environmental movement, and the environmental movement is the future of cities. By 2030, the world will be two-thirds urban, with most of those people living in small and medium sized cities like Buffalo.[9] How these cities are organized, how they get their energy, how carefully they husband their resources will play a major role in averting or failing to avert catastrophic climate change.

Cities cannot wait for federal, or even state governments, to tell them what to do or to provide the resources to do it. The upper levels of government have failed to take the lead, and many of the most innovative and important policy changes are being led by cities. To give just one example, when President Bush failed to sign the Kyoto Protocols, Mayor Greg Nickels organized over 200 cities, including Buffalo, to sign their own version of it: the US Mayors Climate Protection Agreement. The Sierra Club now devotes much of its energy to urban issues, through its Cool Cities program and other efforts.

Urban leaders realize that their residents stand to lose or gain the most from environmental policy. Hurricane Katrina provided a vivid preview of what rising sea levels and extreme weather events can do to cities, particularly the most vulnerable residents of cities. City residents suffer the most from environmental problems such as air pollution, lead paint, brownfields, polluted water, and lack of green space.

Increasingly, cities are also competing with each other and with suburbs and exurbs for highly mobile professionals, who often choose their location based on cultural and natural amenities. As Matthew Kahn notes, "cities that attract high-skilled, creative workers typically experience greater economic growth." Mayors who "care about their tax base . . . will become environmentalists if they sense that skilled workers value such amenities."[10]

In fact, Americans do value environmental quality, and they are willing to pay for it. They want to live where the air is clean, with easy access to green space, away from hazardous wastes. Pollution depresses housing values, and hence property tax revenues. All else being equal, every ten days a community exceeds air quality standards for ozone, its home prices go 3% lower.[11] When a toxic site becomes eligible for Super Fund clean up, home prices nearby go up by 6%.[12]

Greening cities has other economic benefits, as well. Green businesses – from making windmills to weatherizing houses to growing organic produce – use more workers than non-green businesses, which tend to substitute fossil fuel energy for human labor. Thus,

[9] http://www.prb.org/Articles/2007/623Urbanization.aspx
[10] Matthew Kahn, *Green Cities: Urban Growth and Environment*, Brookings Institution (2006), page 74.
[11] Id., page 23.
[12] Id., page 23.

labor and environmental movements have formed a national coalition, the Apollo Alliance, to promote green jobs and renewable energy.

And so, across the country, cities are vying with each other to be the most green. Many publications have issued rankings of green cities. It's not just the usual suspects, such as Portland, Seattle, San Francisco, and Austin, that rank high on these charts. St. Paul, which is planning to reduce its carbon by 960,00 tons per year and save $59 million in the process, is number 4 in the Green Guide rankings .[13] Syracuse, a city not so different from Buffalo, ranks number 17 in another recent ranking – ahead of Denver.

Chattanooga, Tennessee, which once had the very worst air quality in America, has received international recognition for its environmental efforts and in particular for its waterfront revitalization: a Riverwalk, an aquarium, a pedestrian bridge over the river, and other measures sparking a downtown renaissance. Chattanooga pioneered the use and manufacture of hybrid electric vehicles, with electric passenger buses serving the downtown, manufactured by a local company. The city plans to become an international center for conferences and meetings devoted to the environment and sustainability.[14]

Chicago is considered one of the greenest cities in America. During Mayor Daley's 18 years in office, Chicago has planted half a million trees, built more than 80 miles of landscaped medians, and built or negotiated more than 2 million square feet of green roofs. Chicago has 29 LEED-certified buildings, more than any other city except Portland and Seattle.[15] Mayor Daley believed that greening Chicago was a central element in revitalizing the city, and he proved correct. Chicago did not just add a green roof to its city hall; it also added 112,000 new residents and increased its median income 12.6%, reversing years of decline.[16]

On Earth Day 2007, Mayor Bloomberg of New York announced an ambitious sustainability plan, PlaNYC, including 127 separate projects, regulations, and innovations, which he describes as the centerpiece of his remaining time in office.[17] The plan promises a 30% reduction in greenhouse gas emissions by 2030.[18] Not to be outdone, the mayor of Los Angeles has said, "We need to imagine a future in which Los Angeles is the greenest and cleanest big city in America."[19]

Toronto has taken note that, despite being a cold weather city, it has much to lose from global warming: heat-related deaths rising from 120 to 240 by 2050, 22,000 more emergency room visits brought on by asthmatics and others responding to poorer air quality, extreme weather events battering the city's infrastructure, and warmer, shallower Great Lakes and rivers, meaning poorer water quality and less power production from the

[13] "Energy & Environment Best Practices Guide," US Conference of Mayors (2007), page 34.
[14] Charlene Porter, "It Takes Us All, It Takes Forever," *Global Issues*, March 2000.
[15] Blair Kamin, "Chicago's green cred is gold, but not platinum," Chicago Tribune, October 21, 2007.
[16] Keith Schnider, "To Revitalize a City, Try Spreading Some Mulch," NY Times, May 17, 2006.
[17] Diane Cardwell, "Bloomberg o Unveil Long-Term Vision for City," NY Times, April 20, 2007, and Thomas Lueck, "Bloomberg Draws a Blueprint for a Greener City," NY Times, April 23, 2007.
[18] Ray Rivera, "At Power Lunch, Mayor Presents Wish List," NY Times, April 20, 2007
[19] Peter Dreier, "Not Just for the Gentry," *The American Prospect*, January-February 2007.

rivers. Responding to these threats, Toronto is planning an 80% cut in greenhouse gas emissions by 2050.[20]

In efforts to turn their cities green, mayors have reached out to the private sector for help. In 2005, Milwaukee Mayor Tom Barrett brought together over 80 residents from diverse sectors of business, government, academia, and non-profits to form a "green team" to map out the city's sustainability efforts in three key areas: stormwater reduction and management, smart energy policy, and stimulating green job creation. One recommendation, since implemented, was the creation of a sustainability office. The role of sustainability offices is discussed below.[21]

[20] "Project Green City Challenge," Toronto Star, March 25, 2007.
[21] http://www.milwaukee.gov/greenteam

Sustainability Offices

Models to Follow

Typically, the first step in greening a local government or any large institution is to create a special office or program with staff dedicated to making the government and the community more sustainable. A recent article in *Governing* magazine profiles John Coleman, the sustainability director for Fayetteville, Arkansas. In his first year on the job, he was paid $57,000 but saved the city $180,000 in utility costs alone. The Solid Waste and Recycling Division, for example, cut the energy costs in its offices by 40% with programmable thermostats and more efficient lighting.

Cleveland established its Sustainability Program in 2005. Its staff of two works with a steering committee of local environmental organizations (which helped to develop and obtain foundation funding for the program). The program focuses on efforts to save energy, clean the city's fleet, develop green buildings and high performance standards for city facilities, create bicycle facilities, reduce waste and increase recycling, and cultivate renewable energy opportunities. A simple example is the city's new anti-idling policy, which requires city employees to turn off engines to vehicles and equipment when not required for immediate use.[22]

Minneapolis, with two sustainability coordinators, offers an excellent model for incorporating sustainability into the daily business and decision-making structure of the city. Minneapolis passed a resolution in 2003 creating a Sustainability Plan. Based on citizen input, the city adopted 24 indicators and directed staff to set numerical targets based on those indicators and report on progress every year. Each department must incorporate those indicators into the business plan and work plan that it presents in the budget process when it asks for funds each year. For example, the police department responded to air quality targets by developing an anti-idling policy.[23]

San Diego approved a Sustainable Community Program in 2002, and measures progress with specific indicators.[24] Indicators include things like number of vehicle miles traveled, number of days exceeding air quality standards, number of transit riders, number of beach closings, and kilowatts of energy consumed, as well as non-environmental indicators on issues such as the living wage.[25]

San Francisco's Environment Department has a 32-page Strategic Plan for 2007-2009 with a great many concrete targets including a 75% recycling rate (10 times Buffalo's current rate) and a 20% decrease in greenhouse gas emissions by 2012. The Plan has sections on carbon neutrality, energy, clean air transportation, green building, urban

[22] http://www.city.cleveland.oh.us/government/departments/pubutil/sustainability/index1.html
[23] "A hundred million little issues," SustainLane Government (March 2007)
[24] http://www.sandiego.gov/environmental-services/sustainable/pdf/factsheet.pdf
[25] http://www.sandiego.gov/environmental-services/sustainable/pdf/indicators.pdf

forest, zero waste, toxics reduction, environmental justice, environmental education, and public outreach.[26]

For a nationally renowned model of a sustainability office, local governments need look no farther than the University at Buffalo, where the UB Green office has developed a wide range of tools and programs to protect the environment and reduce the University's energy costs. Particularly helpful publications from UB Green are the UB Green Climate Action Report (2007) and Walter Simpson's article, "A Facility Manager's Guide to Green Building Design."[27] The UB Green office has saved the university over $10 million per year in reduced energy costs.[28] Local governments may also wish to join the International Council for Local Environmental Initiatives (ICLEI), a highly regarded organization of cities offering best practices, software, technical expertise, publications, and events.[29]

Given the proven role of sustainability offices in saving money, the city and county should apply to their respective control boards for efficiency grant money to create them. The need for these efficiencies can only grow, as energy prices inexorably rise. Sustainability offices should work with local universities and environmental experts to create sustainability plans, targets, and measurements, and to integrate those targets into the budgeting, work planning, and reporting of all agencies and departments. In this planning, each local government should embrace the US Mayors Climate Protection Agreement goals and cut emissions by 7% below 1990 levels by 2012, and then set goals in increments to reach an 80% reduction by 2050. Sustainability offices should also be hubs for community education and public/private partnerships to green Buffalo.

Buffalo's Comprehensive Plan

For the City of Buffalo, its Comprehensive Plan, *The Queen City in the 21st Century*, which was adopted by the City in 2006, offers considerable guidance on sustainability planning and goals. According to the Plan, the City will "build a city that is a prosperous, green regional center providing livable communities for all its citizens."[30] The first of four key principles guiding the Plan is that "Buffalo's future development should be sustainable, integrating economic, environmental and social concerns."[31]

The Plan calls for initiatives to

- Reduce the consumption of energy, land and other non-renewable resources;
- Minimize the waste of materials, water, and other limited resources;

[26] http://www.sfenvironment.org/downloads/library/tegicplan0709comprehensive.doc
[27] Available at http://wings.buffalo.edu/ubgreen/content/programs/greendesign/guide_greendesign.html.
[28] http://www.buffalo.edu/youhavethepower/fastfacts.html
[29] "Cool Cities Best Practices: What Communities Across North Carolina Are Doing to Solve Global Warming," North Carolina Sierra Club 2007, page 3.
[30] Id, p. 1
[31] Id.

- Create livable, healthy and productive environments; and

- Reduce greenhouse gasses in order to assist in alleviating the impact of global climate change.[32]

The Plan calls for "leadership in ensuring the clean-up and restoration of the Great Lakes ecosystem.[33] The Plan states that "more rapid assembly and clean-up of brownfield sites is urgently needed to support the City's and region's economic development program."[34] Forty-nine of Buffalo's 56 brownfields are located in its three Strategic Investment Corridors, ranging from five acres to nearly 160 acres and totaling almost 1,500 acres.[35]

Regarding global warming, the Plan notes that Buffalo signed the US Mayors Climate Protection Agreement, promising to reduce greenhouse gas emissions to 7% below 1990 levels by 2012. Buffalo has completed its emissions inventory, showing that residential energy use is the biggest source of greenhouse gas emissions (34%) and that the City's municipal operations contribute about 15% of the City's total emissions, but that the City has not moved beyond the inventory stage (which remains true today).[36]

In its section on Green Building, the Plan notes that buildings consume more than half the energy used worldwide and states that "green building techniques and codes should also be used in the design and construction of new structures as well as the retrofitting of existing buildings."[37] Neighborhood plans should "promote energy conservation and use of alternative sources of energy."[38]

The Plan calls for "transit, pedestrian, and bicycle systems" that maximize access and mobility . . . while reducing dependence upon the automobile." It asks for neighborhoods to be "compact, pedestrian-friendly, and mixed use," with many activities of daily living within walking distance"[39] and "a range of parks, from tot-lots and village greens to ball fields and community gardens."[40]

Finally, the Plan calls for an Environmental Management System and a "full-fledged Environmental Plan." The EMS would include a "comprehensive database, and a set of indicators that would allow the City and citizens to understand environmental conditions."[41] Creating this set of indicators is vital to making progress in greening Buffalo. I have provided a very provisional set of indicators as an appendix. The University at Buffalo Regional Institute has also crafted an excellent set of environmental

[32] Id., p. 39
[33] Id., p. 5
[34] Id., p. 16
[35] Id., p. 76
[36] Id., p. 40
[37] Id., p. 51
[38] Id., p. 87
[39] Id., p. 96
[40] Id., p. 96
[41] Id., p. 101

indicators.[42] The City should work with its Environmental Management Commission and local planning and environmental experts to compile a full set of the most relevant indicators for the city of Buffalo, and other local governments should follow suit.

[42] http://regional-institute.buffalo.edu/sotr/topic.cfm?Topic=a2d5ecc2-9710-461e-8316-65dac680cd84

Development Patterns

Damaging Sprawl

Rolf Pendall has aptly summarized Buffalo's development pattern as "sprawl without growth." Between 1950 and 2000, the region gained only 80,881, but the urbanized area ("suburbanized" really) nearly tripled, going from 123 square miles to 367 square miles. What was happening? About half the people in the city moved out to the suburbs. Buffalo's population declined from 580,132 to 292,648 (a loss of 287,484), while the non-city portion of Erie County grew from 319,106 to 657,617.[43]

Even in recent years, as the region's overall population has declined, the rapid sprawl has continued. From 1980 until 2006, when the region's population was declining by 5.8%, the urbanized area grew 38%.[44] In the 1990s, housing construction in the Buffalo area exceeded household growth by nearly four to one.[45] From 1990 to 2,000, only 3,656 new units were built in the city, many of them public or publicly subsidized. During that same time, the housing stock of suburban/rural Erie County expanded by 20,134 units.[46] Buffalo lost over 1,000 city businesses between 1994 and 1999, while non-city businesses gained substantially.[47]

The number of farms in the region dropped by over 20% from 1987 to 1997, and 42,069 acres of farmland were converted to other uses.[48] Loss of local farmland is of concern for many reasons, including fiscal ones. Agricultural land generates a dollar of public revenue for every 17 to 74 cents of costs in public infrastructure and services, in addition to its environmental, social, and cultural benefits.[49]

One key result of our development pattern is much more driving. As of 2000, 41% of the households in the metro area were living at least 10 miles from the central business district.[50] Between 1984 and 1999, the average number of miles driven each day increased by 50%, from 10 to 15 miles.[51] School travel expenses in Erie and Niagara Counties increased 60%, while the number of students increased less than 7%.[52]

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[43] Final Report, Erie-Niagara Framework for Regional Growth (October 2006), p. 8, available at www.regionaframework.com.
[44] Id., p. 15.
[45] "At Taxpayers' Expense: How Government Policies Encourage Sprawl in Erie and Niagara Counties," p. 1, League of Women Voters (2006 Revised Edition).
[46] Comprehensive Plan, p. 24.
[47] Rolf Pendall, "Sprawl Without Growth: the Upstate Paradox," Brookings Institution (2003), page 6.
[48] Final Report, Erie-Niagara Framework for Regional Growth (October 2006), p. 28, available at www.regionaframework.com.
[49] Id., p.29.
[50] www.diversitydata.com, Harvard School of Public Health
[51] Erie-Niagara Framework for Regional Growth, p. 26
[52] "At Taxpayers' Expense: How Government Policies Encourage Sprawl in Erie and Niagara Counties," p. 8, League of Women Voters (2006 Revised Edition).

Between 1970 and 2000, even as the population was falling, the total miles of roads in Erie and Niagara counties rose 5,410 miles. All those road miles are expensive. To give a few figures, it costs roughly $4 million per mile to build a single lane roadway, and $4,800 per mile a year to maintain a highway.[53] A single local project, the widening of Wehrle Road near Transit will cost roughly $13 million.[54] Erie County estimated the cost of its highway and bridge projects for 2006-2010 at $685 million.[55]

As the Regional Framework explains, vehicular travel hurts the environment in myriad ways: "Pollution from motor vehicles contributes to declines in air quality, paved surfaces increase urban runoff and threaten water quality, and transportation infrastructure can fragment agricultural and forested lands and wildlife habitat."[56] Of course, driving is also dangerous: over 41,000 Americans die in car crashes each year.[57] And as oil prices continue to rise, driving will only get more expensive.

James Kunstler phrases it eloquently:

> The cost of all this driving in terms of pollution, which includes everything from increased lung diseases all the way up to global warming, are beyond calculation. The cost to society in terms of money spent building and maintaining roads and paying for traffic police, courts, accidents, insurance, is also titanic. The least understood cost – although probably the most keenly felt – has been the sacrifice of a sense of place: the idea that people and things exist in some sort of continuity, that we belong to the world physically and chronologically, and that we know where we are.[58]

We are left, Kunstler argues, with a public realm composed mainly of roads, a realm used by people enclosed in their cars, traveling alone. We spend a huge portion of our public money on those roads, and thus shortchange other public projects: buildings, for example, with the result that public buildings in recent decades have tended to be ugly and disposable.

Global warming has rendered these costs particularly unsustainable. Transportation accounts for 33% of carbon emissions in the U.S., up from 31% in 1990.[59] The U.S. Department of Energy predicts that driving will increase 59% between 2005 and 2030,

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[53] "At Taxpayers' Expense: How Government Policies Encourage Sprawl in Erie and Niagara Counties," p. 2, League of Women Voters (2006 Revised Edition).
[54] Id., p. 3.
[55] Id., p. 8.
[56] Final Report, Erie-Niagara Framework for Regional Growth (October 2006), p. 26.
[57] "At Taxpayers' Expense: How Government Policies Encourage Sprawl in Erie and Niagara Counties," p. 12, League of Women Voters (2006 Revised Edition).
[58] James Kunstler, *The Geography of Nowhere: The Rise and Decline of America's Man-Made Landscape*, Simon & Schuster (1992), page 118.
[59] Reid Ewing et al, "Growing Cooler: The Evidence on Urban Development and Climate Change" Urban Land Institute (2007), page 1, available at www.uli.org.

despite a population increase of only 23%. Even with their predicted fuel efficiency improvements of 12% over that period, then, carbon emissions will increase by 41%.[60]

In other words, more efficient cars cannot save us if we keep driving more and more. We need more people driving hybrids, but we also need more people living in cities. Suburban households drive 31% more miles per year than households with the same size and income who live in cities.[61] In general, with more compact development, people drive 20 to 40% less.[62] For example, while Atlanta averages 34 vehicle miles per person each day, Portland averages only 24 miles.[63] Smart growth could reduce transportation emissions by 7% to 10% by 2050.[64]

Of course, sprawl imposes many other costs as well: for example, extending water and sewer lines out into the countryside. Erie County's annual sewer budget for its roughly 800 miles of line is approximately $37.5 million, or $46,250 per mile or $8.76 per foot. Amherst estimates that extending sewer lines costs between $40 and $90 per foot.[65]

The Regional Framework estimates that development at densities of 1 household per acre or less costs the public $18,000 per household, while development at 6 households per acre and higher costs only $6,000 per household. Thus according to the Framework, if smart growth principles are followed from the present to 2025, the public will save $800 million [66] This is consistent with national studies showing that reducing sprawl can cut infrastructure costs by nearly half.[67]

Sprawl encourages a variety of wasteful practices: larger lots, larger homes, large impervious surfaces at parking lots and malls. It encourages national chain stores, fast food franchises, and big box retailers that drain money out of the local economy instead of re-circulating it as local owners do. Wal-Mart, for example, is planning to add eight more stores to the area in coming years, in addition to the nine already here.[68] While Wal-Mart deserves praise for increasing energy-efficiency in its stores, striving to reduce packaging waste in its suppliers, and promoting compact fluorescent light bulbs, the overall effects of Wal-Mart are far from sustainable. Wal-Marts do not add to a local economy; rather they replace older, existing stores and buildings, located more compactly, with sprawling big boxes and acres of asphalt. A new Wal-Mart eliminates

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[60] Id., page 3.
[61] Matthew Kahn, *Green Cities: Urban Growth and Environment*, Brookings Institution (2006), page 113.
[62] Reid Ewing et al, "Growing Cooler: The Evidence on Urban Development and Climate Change" Urban Land Institute (2007), page 4.
[63] Id., page 5, available at www.uli.org.
[64] Id., page 9.
[65] "At Taxpayers' Expense: How Government Policies Encourage Sprawl in Erie and Niagara Counties," p. 9, League of Women Voters (2006 Revised Edition).
[66] Final Report, Erie-Niagara Framework for Regional Growth (October 2006), p. 46, available at www.regionaframework.com.
[67] Timothy Beatley, *Native to Nowhere: Sustaining Home and Community in a Global Age*, Island Press (2004), page 14.
[68] James Fink, "Wal-Mart planning 8 stores," Buffalo Business First, April 11-17, 2008.

1.5 jobs for every job it creates.[69] According to a University of Pennsylvania study, counties with Wal-Marts have grown poorer than counties without them, and the more Wal-Marts they have, the faster they have grown poorer.[70] Adopting land use regulations and subsidy reforms that discourage Wal-Marts and other big box retailers and support locally-owned businesses will help revitalize and green our communities.

Sprawl also imposes some less concrete, but no less important, costs. As Timothy Beatley writes:

> We need particular and unique places . . . places that provide healthy living environments and also nourish the soul – distinctive places worthy of our loyalty and commitment, places where we feel at home, places that inspire and uplift and stimulate us and that provide social and environmental sustenance.
>
> The growing uniformity and anonymity of contemporary settlement patterns begets an attitude that they are disposable and interchangeable. One is just like another. Without intimate contact with real places, there is little chance that the loss of environments and the practice of unsustainable . . . consumption and resource exploitation will be reversed.[71]

Most importantly, perhaps, sprawl damages the community by encouraging the abandonment and demolition of our urban core, with all the terrible environmental and social consequences that entails. Furthermore, while suburban living may be popular now, it may become less so as gas prices rise and demographics change. In coming years, households without children will account for almost 90% of new housing demand, with single people accounting for almost one third. By 2025, the demand for attached and small-lot housing will exceed the 2003 supply by 35 million units (71%), while the demand for large-lot housing will be less than the 2003 supply.[72]

Better Development Policies

Rolf Pendall lists six policy areas contributing to upstate sprawl:

- Fiscal disparities between cities and towns. In 1999 Upstate homeowners paid $17.47 in taxes per $1,000 in assessed value if they lived in towns, but $22.15 if they lived in cities. In Ohio and Pennsylvania, municipalities are able to leaven this effect by using income taxes and not just property taxes, but upstate cities

[69] Bill McKibben, *Deep Economy: The Wealth of Communities and the Durable Future*, Henry Holt (2007), page 106.
[70] Id., p. 107.
[71] Timothy Beatley, *Native to Nowhere: Sustaining Home and Community in a Global Age*, Island Press (2004), page 2.
[72] Reid Ewing et al, "Growing Cooler: The Evidence on Urban Development and Climate Change" Urban Land Institute (2007), page 8.

lack this power. Tax rebate and incentive programs such as STAR and Empire Zones are not geographically targeted.

- Fragmented local governance, with most residents living in towns. Upstate has under 2500 persons per local government unit, less than half the rate of Massachusetts, New Jersey, and Connecticut.[73] Erie County has three cities, 25 towns, and 16 villages. Other states such as Massachusetts, New Jersey, and Pennsylvania do more land use planning at the state level.[74]

- Subsidization of suburban and rural infrastructure. For example, federal and state subsidies pay much of the cost of extending sewer lines and adding new sewage treatment plants.[75]

- Disincentives against reinvesting in cities, including building codes that make renovation and reuse of existing structures overly expensive.

- Obstacles to annexation of surrounding areas by cities.

- Exclusionary zoning in towns, which causes developers to push farther out into rural areas.

The Buffalo region's economic development regime is particularly fragmented. Rather than having a single IDA that prioritizes development in the neediest areas, Erie County has six IDAs, one for Erie County and one each in Amherst, Clarence, Concord, Hamburg, and Lancaster. The Good Jobs First study "Sprawling by the Lake," found that Buffalo, with 30% of Erie County's population, received only 17% of the IDA property tax exemptions. Buffalo had 113 IDA projects in 2005, while Amherst – no one's idea of a blighted region – had 178.[76]

Naturally, the IDAs end up competing with each other, and Amherst often wins the competition. Several years ago, the Amherst IDA awarded $1 million in tax breaks to an orthopedics practice that moved doctors from Buffalo to Amherst. Because IDAs give exemptions from county taxes, that meant that Buffalo residents were paying to move their own doctors out of town. IDA reform, including the merger of Erie County's six IDAs, and the addition of green criteria to IDA and other development subsidies, is an important part of fighting sprawl.[77]

What are some of the land use strategies that can help protect the environment? The Urban Land Institute suggests the following keys to reducing emissions through smart growth:

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[73] Rolf Pendall, "Sprawl Without Growth: the Upstate Paradox," Brookings Institution (2003), page 9.
[74] Rolf Pendall, "Sprawl Without Growth: the Upstate Paradox," Brookings Institution (2003), page 10.
[75] Rolf Pendall, "Sprawl Without Growth: the Upstate Paradox," Brookings Institution (2003), page 9.
[76] Available at www.goodjobsfirst.org
[77] For more on subsidy reform, please see Sam Magavern, "Revitalizing Buffalo," available at www.ppg-buffalo.wikispaces.com.

- Mixed use development that keeps housing, work, school, shopping, and recreation closer together;

- Streets that interconnect, rather than ending in cul de sacs and funneling people into overused arterial roads;

- "Complete" streets with safe and convenient places to ride bikes, walk, and wait for the bus;

- Condominiums, townhouses, and smaller lots;

- Building offices, stores, etc. "up" rather than "out."[78]

Buffalo is one of the few metro areas in the nation without an active regional planning organization to implement strategies such as these.[79] Recently, however, Erie and Niagara Counties adopted a Regional Framework with many important measures to promote more compact development. In the Framework, the counties "support public investment to maximize the use of existing infrastructure and facilities, improve the competitive position of underutilized lands and buildings, promote the reuse of brownfield and grayfield sites, and encourage the preservation and adaptive reuse of historic sites and buildings."[80]

The Framework includes a number of proposals to strengthen regionalism and combat sprawl, including plans to:

- Create a regional planning entity;

- Create an Erie County Planning Board;

- Encourage local Industrial Development Authorities (IDA's) to adopt formal policies favoring reinvestment, infill development, and other measures consistent with the Framework;

- Set regional priorities for state and federal funding and advocating for them as a region, rather than competing with one another. Creating a grants rating system favoring projects consistent with the Framework

- Use the new Planning Board to align the county's capital budgeting with the Framework and use carrots and sticks and participation to influence the capital budgeting of towns, authorities, and districts

[78] Reid Ewing et al, "Growing Cooler: The Evidence on Urban Development and Climate Change" Urban Land Institute (2007), page 4, available at www.uli.org.
[79] Final Report, Erie-Niagara Framework for Regional Growth (October 2006), p. 12, available at www.regionalframework.com.
[80] Id., p. 39.

- Develop a local list of Type 1 Actions that trigger full SEQR compliance, including projects in significant environmental areas, major subdivisions in rural areas, etc.

- Change the counties' definition of "subdivision" to include 3 to 5 or more lots of any size in an unsewered area, through amendments to the Type 1 Action List. Through these reviews, the County Health Department would comment on septic-related issues and limit building on prime agricultural land and unsuitable soil;

- Improve Section 239-l, -m, and –n review, which requires certain projects and actions to be referred to the county or regional planning agency for review. These should be reviewed for consistency with the Framework.

- Dedicate some of the region's transportation assistance dollars to a new grant program to help localities attract reinvestment and encourage more compact, walkable, and transit-oriented development, modeled after the Livable Communities initiative in Atlanta.

- Lobby the state for reinvestment in older areas, smart growth, and regional planning policies.

- Adjust water and sewer district limits to conform to the Framework; develop county policy on expanding and contracting them.

- Update and expand the 1999 Farmland Protection Plans and establish a purchase of development rights entity to protect prime farm land

Encouragingly, the Framework enjoys wide support, including the support of the business community's lead organization, the Buffalo Niagara Partnership. Promptly and fully implementing it should be a top priority for Erie County. The Framework mentions but does not endorse a more powerful tool that Erie County should pursue. As a charter county, Erie County has the authority to enact laws that are inconsistent with state laws but consistent with the state constitutions. Suffolk County has used this ability to allow its Planning Commission to veto town zoning changes; Erie County should do the same.[81]

[81] Id., p. 11.

Transit

Biking and Walking

We are a nation of drivers. In 2001, Americans biked and walked only 9.5% of all trips, well short of the federal goal of 15.8%.[82] The percent walking or riding to work actually fell during the 1990s, from 4.3% to 3.3%.[83] Interestingly, despite our sprawling development patterns, roughly 25% of our trips are one mile or less, and 40% are two miles or less, making walking or biking relatively easy options.[84]

Some of the principal ways to encourage biking are adding bike lanes and trails, and adding bike racks. Buffalo is currently short on both. In May 2005, the Common Council passed an ordinance requiring that new or expanded buildings that result in expanded vehicle parking provide bicycle parking, but so far its effect has been hard to see.[85] A small but symbolically important step would be to add bike racks to City and County Hall and other government buildings.

Other cities are making biking a priority. New York City plans to add 200 miles of bike lanes by 2010 and to go from 470 miles to 1,800 by 2030. New York also plans to increase bike racks from 4,000 to 5,200 by 2009. The City will pursue legislation to require large commercial buildings to supply indoor bike parking. The Transportation Department has begun to color bike lanes with bright green paint where cars and trucks have been driving or parking in them.

Chicago wants to have 5% of all trips by bicycle by 2015 and to have a bike path within one half mile of every resident. Chicago has already added 125 miles of new bikeways, 9,400 new bike racks, and a bike depot at Millennium Park with lockers, showers, bike repair, bike rental, car sharing, and valet bike parking for all events.[86] Minneapolis is adding 44 new miles of bike lanes and bike paths in the next ten years.[87] Dayton is moving police officers from cars to bikes, saving $27,000 per year and reducing carbon emissions by 7.5 tons per year.[88]

Paris has made 10,600 bikes available for $1.40 per day; you can get one by swiping your credit card at a bike docking station.[89] In the first six weeks of the Paris program, the

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[82] National Bicycling and Walking Study, Ten Year Status Report, Federal Highway Administrator (2004), page 5.
[83] Id., page 7. The U.S Census figures for 2000 work commutes show even lower numbers: 2.7% walking and 0.04% biking. See Timothy Beatley, *Native to Nowhere: Sustaining Home and Community in a Global Age*, Island Press (2004), page 158.
[84] Timothy Beatley, *Green Urbanism: Learning from European Cities*, Island Press (2000), page 189.
[85] Peter Koch, "On Board With Bikes," Artvoice v.6, no. 36.
[86] Timothy Beatley, *Native to Nowhere: Sustaining Home and Community in a Global Age*, Island Press (2004), page 114.
[87] "A hundred million little issues," SustainLane Government (March 2007)
[88] "$mart $avings: Climate Solutions for Cities," US EPA, January 1999.
[89] Timothy Williams, "To Ease a City's Traffic," NY Times, September 4, 2007.

bikes were used 1.2 million times, or an average of 6 times per day.[90] The Paris experience, like that of other cities with active bike rental or free bike sharing programs, suggests great potential for expanding the Buffalo Blue Bicycle program, which currently offers about 40 bikes for sharing.

Many localities have programs encouraging their children to walk or bike to school, an important goal not only in reducing pollution but also in improving children's health. Whereas 30 years ago, roughly two thirds of children walked or biked to school, today less than 20% of children walk or bike.[91] According to one survey, 90% of teachers said that children who walked to school were more alert in the classroom.[92] One technique is the "walking school bus," in which parent volunteers or crossing guards, instead of standing at crosswalks, go from stop to stop picking up the kids and walking them together to school. Using this and other techniques, Chicago now has 90% of its children walking to school.[93]

Davis, California has pioneered a technique with potential for Buffalo: make new bike paths, possibly through vacant lots, so that children can ride to school without facing the dangers of street traffic. Some schools have also partnered with community groups to create a program of free bikes to be borrowed by students who pledge to use them for their "commutes."

One way to make biking and using the bus easier is to make it easier to combine the two, by adding bicycle racks to buses. Currently, something under 50% of the NFTA's 325 buses have bicycle racks.[94] Unfortunately, because the buses are not assigned to the same routes every day, a rider has no way of knowing if the bus on a given route will have a rack, so the usefulness of the racks we do have is limited. According to Justin Booth of Buffalo Blue Bicycles, "There's a huge lack of connectivity of that service, and they've never done . . . public education to explain to people how to use the bike racks."[95] To make the system more viable, the NFTA need either to add more bike racks or to keep the buses that do have racks on certain routes and then advertise their availability.

Fuel and Vehicles

Many cities are taking steps to green their own vehicles. Locally, the NFTA has begun adding hybrid buses to its fleet, which should reduce fuel use by 25 to 30%.[96] According to the NFTA, "each hybrid produces 90% less hydrocarbon, 90% less carbon monoxide

[90] Charles Bremner, "Parisians show their va va voom as city rolls out 'freedom' bike scheme," The Times, August 9, 2007.
[91] Timothy Beatley, Native to Nowhere: Sustaining Home and Community in a Global Age, Island Press (2004), page 158.
[92] Id., page 180.
[93] Id.
[94] Peter Koch, "On Board With Bikes," Artvoice v.6, no. 36.
[95] Id.
[96] www.gbnrtc.org

emissions, and 50% less nitrogen oxides than their diesel counterparts."[97] Charlotte, North Carolina is switching to hybrids, having estimated that while they cost more upfront, their lower fuel costs and higher resale value will save the taxpayers $800 - $1200 per year, repaying the initial investment within 2.5 to 5.5 years.[98] Chicago added 68 hybrids to its fleet in 2005[99]; it is also building 25 compressed natural gas fueling stations; each station will have solar panels and native landscaping. Cleveland has 300 flex-fuel and 32 hybrid vehicles.[100] A number of cities, including Chicago, Boston and Medford, are retrofitting their school buses with particulate filters and/or diesel oxidation catalysts.[101]

Milwaukee's Department of Public Works has begun using a biodiesel fuel blend (B-2) in its vehicle fleet. The department also received a grant from the US Environmental Protection Agency to retrofit the exhaust system of 60 major vehicles. These retrofits will reduce particulate matter pollution by up to 50%, carbon monoxide by up to 90%, and toxic hydrocarbons by up to 70%.[102]

San Francisco now uses 20% biodiesel blend in all 1,500 of its vehicles. The City's Biofuel Recycling Program collects waste grease and cooking oil from area restaurants.[103] San Francisco's contract with its trash collector stipulates that it use biodiesel as well. In New York City, a non-profit group called RWA Natural Resource Recovery employs people who have suffered homelessness to collect free grease from restaurants and sell it to a company that converts it to diesel fuel.[104]

In addition to greening their own vehicles, some cities offer incentives for residents. Austin offers $100 in free parking (issued as a credit card to be used at Austin's meters) to cars that meet the EPA's Green Vehicle Guide criteria. Berkeley not only purchased hybrids for city use, but it shares them with residents through a car sharing program that makes them available after work hours.[105]

Car-pooling is another valuable tool, particularly given that nearly 82% of Erie County commuters drive alone to work – even higher than the national average of 77%.[106] . Ecology & Environment operates a "GreenRide" program in Buffalo as well as other cities. The local site is www.goodgoingwny.com. Users enter their information and preferences in an interactive website and get matched with potential partners. The site also offers information about mass transit and bike routes.

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[97] David Bertola, "Hybrid buses provide riders with energy-saving choice," Buffalo Business First, April 18-24, 2008.
[98] "Cool Cities: Solving Global Warming One City at a Time," Sierra Club, page 6.
[99] "Energy & Environment Best Practices Guide," US Conference of Mayors (2007), page 9.
[100] http://www.city.cleveland.oh.us/government/departments/pubutil/sustainability/index1.html
[101] "Energy & Environment Best Practices Guide," US Conference of Mayors (2007), pages 9, 32
[102] http://www.milwaukee.gov/PowerGreen13218.htm
[103] Cecilia Vega, "City-owned vehicles run on biodiesel," San Francisco Chronicle, December 1, 2007.
[104] Roja Heydarpour, "Turning Grease to Fuel, and Despair to Hope," NY Times, May 29, 2007.
[105] Kate Gordon, "High Performance Cities," Apollo Alliance, page 5.
[106] Fred O. Williams, "WNY Commuters begin to consider car pooling," Buffalo News, June 3, 2007.

Local governments are also paying attention to the operation of their vehicles. Some school districts have anti-idling policies, such as Medford's, which forbids buses and all other vehicles from idling around schools.[107] Some cities, like Minneapolis and Cleveland, have anti-idling policies for different departments or for all city employees. [108]

Mass Transit

Compared to cars, mass transit emits 5% of the carbon per passenger mile. Unfortunately, the share of Buffalo region workers commuting by public transit fell sharply from 1970 to 2000, going from 11% to only 4%. In Pittsburgh, by contrast, 8% use public transit.[109] On the brighter side, Buffalo's overall mass transit figures recently began to rise, after years of decline, going from 23,000 riders in 2003-2004 to 24,000 in 2005-2006.[110]

In many cities around the world, mass transit is cheap, convenient, and popular. In Stockholm, 40% of all trips are by public transit; in Helsinki, it is 40%.[111] Bus rapid transit, with dedicated lanes combined with timed traffic signals, is particularly efficient, delivering roughly the same benefits as a subway or light rail system at much less cost. Cleveland is attempting something along these lines: creating 5.2 miles of exclusive bus lane on its Euclid Corridor, which it expects to help revitalize the surrounding neighborhoods while also cutting pollution.[112]

In Eugene, Oregon, every city employee has a bus pass.[113]Salisbury, North Carolina offers free bus service on days where the ozone layer is unhealthy.[114] Chapel Hill and the University of North Carolina joined forces to make the bus completely free, doubling of their ridership from roughly 3 million to roughly 6 million. The students voted to increase their student fees to create some of the funding necessary.[115] The NFTA should work with the University at Buffalo to extend the light rail system to the Amherst UB campus, as originally planned, and to maximize the incentives for the students to use the system. Such a plan could be a major component to UB's own plan to cut its carbon emissions dramatically.

We should also think more ambitiously about transit. High-speed rail is more environmentally friendly than driving or flying, and it can be remarkably speedy. Buffalo should advocate strongly with the state and federal government to create high-speed rail lines linking Buffalo to Rochester, Albany, New York, and Toronto. After

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[107] "Energy & Environment Best Practices Guide," US Conference of Mayors (2007), pages 9, 32
[108] See Cleveland's policy at www.cleveland-oh.gov/government/departments/pubutil/sustainability/Anti_Idling_policy_final_1.pdf
[109] Matthew Kahn, *Green Cities: Urban Growth and Environment*, Brookings Institution (2006), page 117.
[110] www.gbnrtc.org
[111] Timothy Beatley, *Green Urbanism: Learning from European Cities*, Island Press (2000), page 109.
[112] Kate Gordon, "High Performance Cities," Apollo Alliance, page 6.
[113] "Energy & Environment Best Practices Guide," US Conference of Mayors (2007), page 30.
[114] "Cool Cities Best Practices," North Carolina Sierra Club (2007), page 5.
[115] Id., page 4.

high-speed rail was introduced between Paris and Brussels, the percentage of travelers using the train went from 24% to 43%. High-speed rail is cutting the travel time between Madrid and Barcelona from seven hours to two and one half hours.[116] Imagine a comparable cut in travel time from Buffalo to New York City. Creating such a line could be the most effective economic development tool for Buffalo since the Erie Canal.

[116] Timothy Beatley, *Native to Nowhere: Sustaining Home and Community in a Global Age*, Island Press (2004), page 115.

Water

Buffalo depends on its waterways for drinking water, recreation, tourism, and many other uses. Lake Erie is a natural resource of world importance: to give just one example, it supports the largest fresh-water fishery in the Great Lakes (an estimated 50 million to 60 million pounds of fish are caught per year).[117] Buffalo's extensive shoreline along Lake Erie and the Niagara River is one of its greatest assets. Unfortunately, of the 62 local "waterbody segments" evaluated by the DEC in 2004, 35 segments were rated "impaired." "Impaired" bodies of water have restricted or discouraged uses such as fishing, bathing or water supply.[118] Water pollution poses a particular threat to lower-income residents, who are more likely to eat fish that they catch and more likely to swim at public beaches and in creeks and rivers.

Stormwater Management

The biggest source of water pollution, in Buffalo as in many urban areas, is the sewage system. Like most older cities, Buffalo has a combined sewage system, in which sanitary sewers and storm sewers feed into the same pipes, which carry the wastewater to the wastewater treatment plant on Bird Island. Most of Buffalo's sewer system, which includes 840 miles of pipes, was built before 1910.

A small amount of rain or snowmelt is enough to overload the system. Roughly 68 times a year, a "combined sewer overflow" (CSO) occurs: the treatment system cannot handle the volume, and raw sewage – untreated human, commercial, and industrial waste –flows into Lake Erie, Niagara River, Black Rock Canal, Scajacuada Creek, and Cazenovia Creek.[119] In addition to the sanitary sewage, the storm water washes bacteria, metals, lawn fertilizers and pesticides, automobile oil and grease, toxic chemicals, and trash into the directly into the lakes.

In addition to CSOs, sewer systems often cause pollution due to leaky or broken pipes (not surprising, given the age of most systems). The EPA estimates as many as 73,000 sewer spills in the United States each year. To give an example, in 2007 a sewer spill in Yonkers from a broken pipe sent 8 million gallons of sewage into the Hudson River.[120]

One important place to measure water quality is at our beaches. Due to the sewer overflows, the County closes beaches whenever over one half inch of rain falls within 24 hours, until tests show that bacteria levels are safe.[121] During the rainy summer of 2000, Erie County's five public beaches suffered nearly 100 closings, leading the County to get labeled "a poster child for sewage problems." [122] In 2006, the closings totaled 45: Woodlawn Beach (10), Hamburg (8), Lake Erie Beach (5), Pioneer Camp (8), Evans

[117] http://oh.water.usgs.gov/nawqa/fs.94056.html
[118] "State of the Region: Environment, Stream and Lake Quality," available at http://regional-institute.buffalo.edu/sotr/Indicator.cfm?Indicator=554f5afc-1de1-4e61-839e-a10fcc1e4ef8.
[119] Buffalo Sewer Authority, System-wide Long Term Control Plan for CSO Abatement, Volume 1, 2004
[120] Thomas Rooney, "Don't Touch the Water," NY Times, May 13, 2007.
[121] Tom Earnst and Kerry Jones, "Don't go in the water," Buffalo News, July 28, 2004. See also Elmer Ploetz and Diane E. Hughes, "Great Lakes beaches causing health concerns," Buffalo News, July 1, 2002.
[122] Mary Pasciak, "A splash of safety," Buffalo News, August 23, 2002

Town Park (6) Point Breeze Camp (1), St. Vincent DePaul (4), and Wendt Beach (3). The County is not being overcautious in closing the beaches. In 2006, half of Erie County's ten beaches exceeded the Health Department's allowable E. coli level on 20% or more of the state monitoring days. Only Evangola Beach never exceeded the level.[123]

Buffalo Niagara Riverkeeper has called the Buffalo River "one giant underwater brownfield."[124] Although cleaner than it once was, and home to over 30 species of fish, the Buffalo River remains dangerously dirty. The state declares the carp and other bottom-feeding fish unsafe to eat because of the toxic sediment. In a recent report card from the Buffalo River Remedial Advisory Committee, the Buffalo River Watershed got a grade of "D" in the category of bacterial contamination (Fecal Coliform and E.Coli), largely because of its sewer overflows.[125]

The Buffalo River is polluted by 15 storm sewer overflow outlets in the city and 17 outside the city, not to mention failing suburban and rural septic systems, agricultural run-off, and other sources. In fact, these suburban and rural sources contribute 125 to 750% more pollutants than the urban sources.[126] But the urban outlets are bad enough. The Smith Street Outfall No. 26 is the third largest; discharging an estimated 350 million gallons of untreated wastewater into the River over 83 occurrences per year. No warning sign tells residents not to fish there, and so children can be found fishing directly over the outfall.[127]

Scajacuada Creek is also dangerously polluted. Starting in Lancaster, the creek is "hacked up and channeled" for flood control, then sent underground for 3.7 miles through Cheektowaga and Buffalo. Thirty outflows in Cheektowaga and 6 in Depew pollute it, as do millions of gallons of stormwater from parking lots at the Walden Galleria and other suburban malls and lots. According to the Buffalo Sewer Authority (BSA), about 300 million gallons of untreated sewage and stormwater overflow into the stream in Forest Lawn and on through Delaware Park into the Niagara River each year. Riverkeeper has found fecal contamination in all parts of the creek, and hundreds of waterfowl have died of sewage-related botulism along the creek near Hoyt Lake. The young fish in the creek have the highest level of PCB contamination of fish in any tributary of the Niagara River and Lake Ontario.[128]

The Erie Canal Commercial Slip, currently undergoing a $47 million restoration, will have to include a sign that says "Outfall No. 17," although no sign will alert people that 306 million gallons of untreated wastewater flow through it each year, based on roughly 88 overflows per year.[129] Similarly, there are three outfalls at the Erie Basin Marina, one

[123] "Testing the Waters 2007," National Resources Defense Council.
[124] Mark Sommer, "Effort to collect sediment samples from lower half of Buffalo River begins," Buffalo News, June 5, 2007.
[125] http://www.bnriverkeeper.org/programs/tributary/buffalo_river/Buffalo_River_Report_Card_2005.pdf
[126] Michael Beebe, "Urban sprawl leaves its mark on city waters," Buffalo News, September 25, 2006.
[127] Michael Beebe, "Buffalo River," Buffalo News, September 24, 2006.
[128] Michael Beebe, "Urban sprawl leaves its mark on city waters," Buffalo News, September 25, 2006.
[129] Michael Beebe, "Erie Canal Commercial Slip," Buffalo News, September 24, 2006.

of which overflows 104 times a year, and which combined send about 93.5 million gallons of wastewater into the Marina each year.[130]

These combined sewer overflows violate the federal Clean Water Act, and the BSA, like many other sewer authorities and municipalities, is negotiating with the EPA and the state DEC to come into compliance. The law requires the BSA to develop and implement a long-term control plan that explores all viable options to remedy the situation.[131] The BSA has spent $7.5 million preparing a draft control plan.[132] Unfortunately, the draft plan limits itself to massive, expensive building projects: building a huge, underground storage tank and slowly separating the sanitary and storm sewer systems. The BSA prefers the most basic alternatives, which it estimates would cost $165 million. The DEC prefers an alternative costing $524 million.[133] The BSA gives no consideration to proven "source control" methods, which are greener and often cheaper, particularly given their ancillary benefits.[134]

Source controls are ways to keep storm water out of the system altogether, often with the added benefit of using it instead of fresh, pumped water to irrigate lawns, trees, and plants and even to flush toilets. Successful methods include permeable paving surfaces, downspout disconnects, rain barrels, rain gardens, tree plantings, green roofs, and the "daylighting" of buried creeks. Many cities, including Chicago, Milwaukee, Portland, Seattle, and Washington D.C. have implemented source control programs.[135] The EPA has issued a memorandum strongly supporting the use of green infrastructure source controls.[136]

Much of the stormwater problem is caused by the explosive growth in impermeable surfaces as land is urbanized and converted into roads, parking lots, and buildings. Rain water and snow melt, instead of soaking into the ground and getting filtered by soil and plants, are swept rapidly into the sewer system or directly into waterways. Many source controls are ways to restore permeability and plant life. A "swale," for example, is a broad, shallow, planted channel that filters stormwater and reduces its velocity. Swales can be used in parking lots, alongside streets, in yards, in vacant lots, and other places all over a city. The Tampa Aquarium provides a good model; it added four-foot swales by shortening its parking spaces by two feet each, so that the cars overhang grassy spaces.[137]

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[130] Michael Beebe, "Erie Basin Marina," Buffalo News, September 24, 2006.
[131] Environmental Protection Agency, "National Pollutant Discharge Elimination System: Combined Sewer Overflows CSO Control Policy", 2002.
[132] Michael Beebe, "Foul Waters," Buffalo News, September 24, 2006.
[133] Id.
[134] Tina Meyers, "Green Infrastructure Can Combat Combined Sewer Overflows in Buffalo, New York" (2007), available at http://green-cities.wikispaces.com, citing Buffalo Sewer Authority, System-wide Long Term Control Plan for CSO Abatement (2004)
[135] Mike Plumb, "Sustainable Raindrops: Cleaning New York Harbor by Greening the Urban Landscape," page 6.
[136] Id., Appendix.
[137] Timothy Beatley, *Native to Nowhere: Sustaining Home and Community in a Global Age*, Island Press (2004), page 230.

Interestingly, native plants reduce run-off much more than turf grass, because they form a spongy layer of deep roots and air space.[138]

Green design techniques can be more efficient than new sewer projects. According to New York City Riverkeeper, a $1,000 investment in "end-of-pipe" sewer projects decreases CSOs by 2,400 gallons. By comparison, with the same $1,000 investment

- Greenstreets (medians, triangles, roundabouts, etc.) could decrease CSOs by 14,800 gallons;
- Street trees could decrease CSOs by 13,170 gallons;
- New green roofs could decrease CSOs by 810 gallons; retrofitted green roofs could decrease CSOs by 865 gallons; and incentivized green roofs could decrease CSOs by 12,000 gallons;
- Rain barrels could decrease CSOs by 9,000 gallons.[139]

The Center for Neighborhood Technology has developed a "Green Values Calculator" that allows developers, regulators, and property owners to compare costs for green versus conventional techniques.[140] Based on pilot projects, city officials in Seattle and Vancouver believe that green infrastructure costs will be similar to or slightly higher than conventional controls.[141] Of course, these calculations do not include the numerous other benefits these measures have, in addition to reducing CSOs – for example, the way that trees and plants reduce air pollution, cool cities down on hot days, and beautify a city, or the ways in which green roofs insulate buildings and reduce heating and cooling costs.

Source water management has two other advantages: (i) wastewater treatment plants are not necessarily set up to filter all of the contemporary pollutants, such as antibiotics, so it is preferable to have them filtered by vegetation and/or diverted from the water entirely; (ii) when sanitary sewers are separated from stormwater sewers, the storm water is allowed to empty directly into waterways, and stormwater carries many pollutants such as fertilizers, motor oil, and pesticides which, again, it is better to filter and divert.

Many or most Buffalo houses have gutters that feed directly into the storm sewers instead of allowing the water to be absorbed by soil and plant materials near the house (until recently, local law actually required connected downspouts). New housing should be built without these direct connections, and Buffalo should offer incentive for owners of existing housing to disconnect gutters and route them to rain barrels or rain gardens,

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[138] Tina Meyers, "Green Infrastructure Can Combat Combined Sewer Overflows in Buffalo, New York" (2007), available at http://green-cities.wikispaces.com

[139] Mike Plumb, "Sustainable Raindrops: Cleaning New York Harbor by Greening the Urban Landscape," available at http://www.riverkeeper.org/campaign.php/pollution/we_are_doing/986

[140] www.greenvalues.cnt.org

[141] Christopher Kloss et al, "Rooftops to Rivers," Natural Resources Defense Council (2006), page 12.

instead. Water from the rain barrels can be used to water grass and plants, to wash cars and sidewalks, and otherwise reduce the need for fresh water.

A Milwaukee study found that attaching rain barrels to 40,000 houses would decrease runoff by 273 million gallons per year. A Chicago study found that disconnecting all the residential downspouts in one area of the city would decrease peak flow in the outflow pipe by 20%.[142]

Portland paid $53 per downspout to disconnect over 49,000 downspouts, reducing their runoff by 1.2 billion gallons and decreasing the number of sewage overflows by 10%.[143] Chicago did extensive outreach encouraging rain barrels and rain gardens, and in fall 2004 its residents bought more than 400 55-gallon rain barrels at $15 each.[144] Milwaukee partnered with others to install more than 60 rain gardens.[145] In Pittsburgh, community groups commissioned an engineering study on where rain barrels would be most effective and then installed 500 132-gallon barrels.[146]

In Milwaukee, the Mayor has instructed his departments to cut their own stormwater runoff by 15%. The Public Works department has created an attractive pond to manage the run-off from their site and is now adding a green roof to their building. The city has funded a variety of projects in the community, including downspout disconnection in targeted neighborhoods and public housing and inlet restrictors on selected streets, as well as planting more native species on city land, boulevards, and parks. The Every Drop Counts program offers residents advice on rain barrels, downspout disconnects, rain gardens, and water conservation.[147] Milwaukee's Highland Gardens public housing project boasts a 20,032 square foot green roof and two rain gardens; rain water is also used to flush the toilets.[148] Milwaukee's sewer district is also setting aside over $27 million to buy wetlands and conservation easements for wetlands to establish greenways protecting the waterways.[149]

Philadelphia has fully embraced the idea of green infrastructure. Its Water Department includes an Office of Watersheds with a "Clean Water - Green City" mission to "unite the City of Philadelphia with its water environment, creating a green legacy for future generations while incorporating a balance between ecology, economics, and equity." Philadelphia is using tree plantings, green roofs, swales, and other green measures on public and private land to address its combined sewer overflow problems. It is

[142] Christopher Kloss et al, "Rooftops to Rivers," Natural Resources Defense Council (2006), page 19
[143] Tina Meyers, "Green Infrastructure Can Combat Combined Sewer Overflows in Buffalo, New York" (2007), available at http://green-cities.wikispaces.com
[144] Christopher Kloss et al, "Rooftops to Rivers," Natural Resources Defense Council (2006), page 19,
[145] Id., page 20.
[146] Id., page 24.
[147] http://www.milwaukee.gov/ManagingyourStormwat13217.htm
[148] "Energy & Environment Best Practices Guide," US Conference of Mayors (2007), page 70.
[149] Christopher Kloss et al, "Rooftops to Rivers," Natural Resources Defense Council (2006), page 22.

daylighting old streams that had been turned into culverts and using them to catch and filter stormwater.[150]

Seattle Public Utility has an innovative Street Edge Alternative program, in which streets are retrofitted with swales, trees, and native plantings to reduce storm run-off.[151] Its Second Avenue project, redesigning an entire bloc's streetscape, has succeeded in absorbing 99% of the potential run-off.[152] Seattle also boasts the Growing Vine Street initiative, in which water from rooftops is collected and sent along "runnels:" meandering, above ground waterways that purify the water naturally on its way to the Puget Sound.[153] Seattle's King Street Center uses three 5,400-gallon tanks to collect water from its roof and then use the water for toilets and landscaping. It reduces the fresh water used for toilet-flushing by 1.4 million gallons per year, as well as keeping that amount of water out of the sewers. Seattle has also distributed 1,500 rain barrels at reduced prices to its residents.[154]

Toronto will disconnect rainspouts for free; as of June 2000, some 20,000 homes had been disconnected. The city is committing $106 million to stream restoration. It has over 100 green roofs, including City Hall. Early findings suggest that the green roofs keep 57% more stormwater out of the sewers than conventional roofs.[155]

Minneapolis has gone from 58 million gallons of untreated water entering the Mississippi in 2000 to 43 million gallons in 2006. Minneapolis enacted a local law in which a customer's sewer bill reflects the amount of impervious surface the customer's property contains. Customers can then receive rebates for using rain gardens, green roofs, or other green source controls. The fees are meant to collect 100% of the funds needed for the city's stormwater management measures, but they are "revenue neutral," because they are offset by reductions in the sanitary sewer charge.[156] Various Florida cities, Seattle, Portland, and Milwaukee have instituted similar pricing schemes.[157] Portland, for example, provides a 35% discount in its stormwater fee for properties with on-site stormwater management.[158]

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[150] http://www.phillyriverinfo.org/CSOLTCPU/Welcome.aspx. See also Neil Pierce, "Do Sustainable Cities Have a Future," American Prospect, February 2007.
[151] Timothy Beatley, *Native to Nowhere: Sustaining Home and Community in a Global Age*, Island Press (2004), page 127.
[152] Christopher Kloss et al, "Rooftops to Rivers," Natural Resources Defense Council (2006), page 30.
[153] Timothy Beatley, *Native to Nowhere: Sustaining Home and Community in a Global Age*, Island Press (2004), page 130.
[154] Christopher Kloss et al, "Rooftops to Rivers," Natural Resources Defense Council (2006), page 31.
[155] Id.
[156] Michael Krause, "Minneapolis Earns Stars and Scars by Charging for Hardscape," Water Laws (2007), available at http://www.waterlaws.com/commentary/bulletins/GreenRooftops.html
[157] Tina Meyers, "Green Infrastructure Can Combat Combined Sewer Overflows in Buffalo, New York" (2007), available at http://green-cities.wikispaces.com.
[158] Christopher Kloss et al, "Rooftops to Rivers," Natural Resources Defense Council (2006), page 15.

Green Roofs

Buffalo is certainly not in the vanguard of the green roof movement, but three green roof projects were announced last year: the Kuebler residence in North Tonawanda,[159] Mr. Fox Tire in downtown Buffalo, and Butler Library at Buffalo State College.[160] To spur more green roofs, we need the kind of incentives and assistance offered by other cities. Chicago, which now boasts over one million square feet of green roofs, offers developers a density bonus if they use green roofs and has offered twenty $5,000 grants to residents to install green roofs.[161] New York City is planning to offer a tax abatement to offset 35% of the cost of green roofs.[162]

Green roofs pay for themselves over their lifetime. Although they cost between $6.40 and $15.30 per square foot to install, as compared to between $4.00 and $6.00 per square foot for traditional roofing, they last two to three times as long and yield energy savings as well.[163] But the higher upfront costs will discourage customers until incentives are offered and a larger market is established.

How big an effect can green roofs have? A Portland study measured 219 acres of roof space in downtown Portland available for green roofs. If they were all greened, they would capture 67 million gallons per year, reducing the flow into the storm sewers by 11 to 15%.[164] A similar study in New York City found that if all the eligible roofs were greened, they would capture 13 billion gallons per year.[165] The City of Portland also did extensive monitoring on the green roof over a residential high-rise, and found that it retained 58% of rainfall. In addition to their other benefits, green roofs are more durable, lasting 20 to 75 more years than conventional roofs.[166]

Water Conservation

Water conservation has many benefits: (i) preserving more fresh water; (ii) avoiding municipal costs for pumping, filtering, and disposing of the fresh water; (iii) reducing the energy used to do those tasks, and the pollution that energy use causes; and (iv) cutting the consumer's costs.[167]

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[159] Aaron Besecker, "Going green, 'living roof,' is environmentally friendly," Buffalo News, October 4, 2007

[160] Christopher Michel, " A business below, a garden above," Buffalo News, July 28, 2007.

[161] Christopher Kloss et al, "Rooftops to Rivers," Natural Resources Defense Council (2006), page 18.

[162] Amy Norquist, "Farmer on the Roof," NY Times, September 30, 2007.

[163] Mike Plumb, "Sustainable Raindrops: Cleaning New York Harbor by Greening the Urban Landscape," pp. 17-18, 36, n. 81, available at http://www.riverkeeper.org/campaign.php/pollution/we_are_doing/986

[164] Timothy Beatley, *Green Urbanism: Learning from European Cities*, Island Press (2000), page 226.

[165] Amy Norquist, "Farmer on the Roof," NY Times, September 30, 2007.

[166] Id.

[167] Water conservation also helps limit sewage overflows during rain events by keeping water out of the system, but this benefit is somewhat limited by the fact that 90% of the water in the system during CSOs is stormwater.

Water conservation will become increasingly important as Lake Erie water levels drop due to global warming (for a variety of reasons, some Great Lakes water levels are already far below normal).[168] Falling water levels will be ecologically, commercially, and governmentally very expensive, with major effects on fishing, shipping, recreation, wetland loss, and other systems.

A typical home uses about 72 gallons of water per day. Water saving measures can cut this by about one third.[169] Saving water does not just save money on water bills, but also on energy bills because of the energy used to heat the hot water. An Energy Star clothes washer uses 50 percent less water and 70 percent less energy per load, saving up to $100 every year.[170]

According to the Rocky Mountain Institute, replacing an old shower head with a water-saving 2.5 gallon-per-minute shower head will cost $15, and installing water-efficient faucet heads in kitchen and bathroom sinks will cost $2 each; these devices will pay for themselves in less than a year.[171] When the Buffalo Municipal Housing Authority replaced old water fixtures, it found that water efficient devices would pay for themselves very quickly: 1.6 years for low-flow showerheads, 2.4 years for low-flow toilets, and 1 year for faucet aerators.[172]

The San Francisco Public Utilities Commission has a conservation program that can serve as a model. They offer a free "Water Wise House Call," in which their staff:

- Review consumption history of each water account.
- Check toilets for leaks and determine flush volume.
- Determine flow rates of showerheads and faucets.
- Provide free high-efficiency showerheads and faucet aerators, as needed.
- Inspect landscape irrigation scheduling and maintenance of equipment.
- Teach customers to read their meters.
- Provide a report of all findings and installations done.[173]

The SFPUC also offers free low-flow showerheads and faucet aerators, $125 rebates on low-flow toilets, and $125-$200 rebates on high efficiency washing machines.[174]

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[168] Felicity Barringer, "Water Levels in 3 Great Lakes Dip Far Below Normal," NY Times, August 14, 2007.
[169] http://sfwater.org/msc_main.cfm/MC_ID/16/MSC_ID/171
[170] Energy Star: Home Improvement Tips, http://energystar.gov/index.cfm?c=home_improvement.hi_tips
[171] "Energy Efficiency: First Things First," available at www.rmi.org
[172] Modesto Candelario, Assistant Executive Director BMHA, personal communication,
[173] http://sfwater.org/detail.cfm/MC_ID/16/MSC_ID/173/C_ID/2260
[174] http://sfwater.org/msc_main.cfm/MC_ID/16/MSC_ID/171

Parks, Lots, Brownfields, and Trees

Parks, Lots, and Brownfields

Buffalo residents are "substantially underserved by public parks," with only 5.1 acres of parkland per 1,000 residents, compared to an upstate New York average of 9.2 acres.[175] Buffalo's Comprehensive Plan calls for an assessment of vacant spaces in the City for their environmental value and possible functions in the "green infrastructure, including re-use as parks, woodlots, greenways, or gardens."[176] It also calls for a new "Olmsted Park" on a 150-acre brownfield north of William Street and west of Bailey Avenue[177] and for "a range of parks, from tot-lots and village greens to ball fields and community gardens."[178]

The city's 56 identified brownfields are a key impediment to revitalization. As the City's Comprehensive Plan states, "More rapid assembly and clean-up of brownfield sites is urgently needed to support the City's and region's economic development program."[179] Brownfield redevelopment has been hampered by the state's somewhat ludicrous brownfield incentive program, which ties the amount of subsidy not to the costs of clean up but to the total cost of the project, which means that a small number of very expensive New York City area projects have vacuumed up all the funding. Reforming that program should be a key lobbying priority for the City. Stephen Banko, director of the local HUD office, has criticized the City for failing to seek funds more aggressively from HUD's Brownfields Economic Development Initiative to redevelop its brownfields.[180]

The City of Lackawana recently saw an old steel plant brownfield – a federal superfund site – become the Steel Winds wind farm, with eight turbines producing enough clean energy for 7,000 homes. As Mayor Norman L. Polanski, Jr., once a laid-off steel worker, said, "It's changing the image of the city of Lackawana. We were the old Rust Belt, with all the negatives. Right now, we are progressive, and we are leading the way on the waterfront."[181] Perhaps Buffalo can also find pioneering green uses for some of its brownfields and seek federal and state funding to make them a reality.

Other cities have witnessed visionary projects that transform brownfields and vacant parcels with a combination of affordable housing and urban farming. Examples worth studying include Troy Gardens in Madison, ReVision House Urban Farm in Dorchester, and, still under development, Via Verde in the Bronx.[182] Via Verde will include low- and

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[175] Id., p. 44. According to one source, Buffalo spends $6 per resident on parks upkeep, in contrast to Seattle, which spends $245 per resident. Lauren Weiss, "Environmentally Friendly Uses for Vacant Properties in Buffalo", p. 5, http://green-housing-buffalo.wikispaces.com.
[176] Comprehensive Plan, p. 50
[177] Id., p. 50
[178] Id., p. 96
[179] Id., p. 16.
[180] Peter. Koch, "Like Finding Money on the Street," ArtVoice volume 5, no. 2.
[181] David Staba, "An Old Steel Mill Retools to Produce Clean Energy," NY Times, May 21, 2007.
[182] See www.troygardens.org and www.vpi.org/Re-VisionFarm

moderate-income housing bound together by courtyards and roof gardens to be used for everything from harvesting rainwater to growing vegetables and fruit. It will feature an outdoor amphitheater, apartments designed for breezes, a fitness center, wiring for Internet access, "live-work units" for people who work at home, stoops with photovoltaic canopies, and even a Christmas tree farm.[183]

We might not get a Via Verde in Buffalo in the near future, but in the meantime, there are many simpler measures we can take to clean up our brownfields. One way to begin brownfield clean-up is phytoremediation: the process by which plants such as sunflowers, poplar trees, Indian mustard, alpine pennycress can be used to absorb chemicals such as lead, arsenic, zinc, and DNT.[184] The City could work with local universities on a phytoremediation demonstration project.

In addition to our brownfields, as of 2000, Buffalo had 10,170 vacant residential lots: eyesores that can be turned into assets. Buffalo has over 40 community gardens, but it has the potential for much more. Even without full-scale gardening, a simple "Clean and Green" program modeled after that of Philadelphia can have remarkable effects in turning neighborhoods around. Studies have shown remarkable differences in property values from simple, inexpensive clean up and maintenance projects. Buffalo should also begin assembling vacant parcels for bike trails and walking paths.

One huge, local greening project that is well underway is the Niagara River Greenway, which has $9 million in annual funding from the New York Power Authority for projects along the length of the river from Lake Erie to Lake Niagara. The Niagara River Greenway Commission is a public benefit corporation created in 2004 and charged with developing a greenway of interconnected parks, trails, and river access points. Making sure these projects benefit low-income residents, who often lack safe, healthy recreational options, can make a dramatic difference in our quality of life.

Trees

Even before the October 2006 storm, Buffalo was lacking in trees. The City had 20,000 trees in parks and 65,000 along streets,[185] resulting in a 12% tree canopy. The national average for tree canopy is 30%, and the recommended level is 40%.[186] The Olmsted Park and Parkway system had 12,000 trees, down from its former level of 40,000. The City estimates that the October storm destroyed or damaged the vast majority of city trees, including 80 to 90% of the trees in the Olmsted system. The City states that 1,600 to 2,300 trees must be planted to return the Olmsted system to pre-storm levels.[187]

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[183] www.plannyc.org/project-106-Via-Verde---New-Housing-New-York-Legacy-Project
[184] See *Using Vegetation to Enhance in situ Bioremediation*, Erikson et al, and *Phytoextraction of Metals from Contaminated Soil*, M.M. Lasat, Journal of Hazardous Substance Research (2000).
[185] Id., p. 47
[186] "Urban Ecosystem Analysis: Buffalo-Lackawana Area," American Forests (2003), p. 3, p. 6
[187] "Mayor Brown Announces City Grant to Support Olmsted Parks," Office of the Mayor

Trees are vital in reducing air pollution and controlling storm water. Buffalo's trees remove 335,000 pounds of pollutants from the air each year, a service valued at approximately $826,000.[188] They also provide storm water control value of $34,286,526 (the amount of money it would take to build storm water facilities to process the water that the trees currently retain).[189] And they store 133,878 tons of carbon and sequester 1,042 tons of carbon per year.[190]

Trees provide value in many other ways as well. Property tax yields from homes near park are significantly higher. According to one study, tree-lined streets increase property values by roughly 15%.[191] According to another, homes with a tree in front sell for 1% more than homes without.[192]A study done for the New York City park service found that the city received $5.60 in benefits for every dollar that it spent on trees.[193]

Recognizing the value of trees, the City of Buffalo, the Olmsted Conservancy, and partners such as Re-Tree WNY are planning to plant some 40,000 trees, including 2,9000 this year.[194] In addition to replanting street trees and park trees, the City can help incentivize trees in residential lots. In Minneapolis, the city and all its partners planted over 6,000 trees in 2006. Rather than planting them all itself, the City offered residents $80 trees for $15 each to plant in their yards. The advantage is that the resident is then responsible for maintenance.[195]

Buffalo should also develop a comprehensive plan for planting trees in vacant lots, where, in addition to all their other benefits, the trees will help to fight blight and restore impoverished neighborhoods. A particularly good goal would be to restore fruit trees such as apples, cherries, and pears, to the historic Fruit Belt neighborhood near the Buffalo Niagara Medical Campus. BNMC, as a center for health, should have a particular interest in helping make that happen.

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[188] Id., p. 3.
[189] Id.
[190] Id.
[191] Neil Pierce, "Do Sustainable Cities Have a Future," American Prospect, February 2007.
[192] David K. Randall, "Perhaps Only God Can Make a Tree, but Only People Could Put a Dollar Value on It," NY Times, April 18, 2007.
[193] David K. Randall, "Perhaps Only God Can Make a Tree, but Only People Could Put a Dollar Value on It," NY Times, April 18, 2007.
[194] "Restore the Urban Forest," Editorial, Buffalo News, April 13, 2008.
[195] "A hundred million little issues," SustainLane Government (March 2007)

Buildings

Americans are slowly realizing that pollution does not just come out of tail pipes, smoke stacks, and sewer pipes. The way we build, operate, and demolish our buildings may be the single most important cause of pollution.

- Buildings account for 48% of the nation's energy consumption, well ahead of transportation (27%) and industry (25%).[196]

- Housing accounts for 21% of energy consumption and 17% of greenhouse gas emissions.[197]

- Buildings account for 30% of landfill waste and 12% of potable water consumption.[198]

- Energy use by buildings in North America has increased 30% since 1990.[199]

Responding to global warming, the American Institute of Architects has called for an immediate 50% cut in the fossil fuel use of all new and renovated buildings, followed by additional reductions of 10% every five years to reach carbon neutrality by 2030.[200]

Behind the Green Curve

Many local governments, including the City of Buffalo, Erie County, the Buffalo Municipal Housing Authority, and the Buffalo Public School District, have done extensive work to improve the energy efficiency of their buildings and facilities, generally through the use of guaranteed energy service performance contracts with private contractors and often with the help of incentive money from NYSERDA. Taken jointly, these projects have saved the taxpayers millions dollars while also reducing pollution. In 2007, Erie County passed a local law requiring that county building projects over 2,500 square feet be certified LEED Silver or higher, which, although it has not affected any current projects, may prove important in the future.

And yet, when it comes to buildings, Buffalo is, as the *Buffalo News* recently put it, "behind the green curve." Only seven local projects have been LEED-certified (LEED is the most commonly used system to verify green building practices).[201] Local building codes and development regulations, criteria, and incentives to not, in general, require or

[196] Neil Pierce, "Do Sustainable Cities Have a Future," American Prospect, February 2007.
[197] www.hud.gov/utilities
[198] "Developing Green Building Programs: a Step-By-Step Guide for Local Governments," Global Green USA, page 1.
[199] "North American Carbon Budget and Implications for the Global Carbon Cycle," US Climate Change Science Program
[200] Dennis Andrejko, "Energy bill must push construction of 'green' buildings," Buffalo News, December 13, 2007.
[201] James Heaney, "Developers here slow to adapt," Buffalo News, April 13, 2008.

even encourage green design. The United States Green Building Council lists only three LEED-Certified architects in Buffalo, compared with 17 in Cleveland and 22 in Pittsburgh – two comparably sized Rust Belt cities.[202]

While a small number of home-owners have "greened" their homes, no housing developer has produced a significant green project in the Buffalo region. One of the area's most important developers, Carl Paladino, has said, "We have no interest in pursuing green buildings because the bureaucratic requirements are a nightmare. It's another cottage industry legislated for the benefit of special interest consultant types who live off the fat of the land."[203]

Most disappointing, the Buffalo School District, which is in the middle of a $1 billion project to renovate its schools, has not chosen to make a single one of them LEED-certified or significantly green. The district attempted to make one school LEED-certified, but the attempt fell short. The district's associate architect says that the schools did not consider building to LEED because it's "significantly more expensive." However, the developer of the downtown HealthNow office building, which is LEED Silver certified, reports that greening the building added only 1 to 2% to upfront costs, and that the energy savings will total roughly $166,000 per year.[204] Interestingly, the owner of one of the area's other LEED buildings, the Audubon Machinery building, is County Executive Chris Collins, a man famous for his cost-cutting zeal.

The District apparently did not consider the health benefits to the children and community, and the educational benefits to the children and community, from green measures such as solar power and hot water heating, green roofs, rain gardens, daylighting, and other techniques used by schools around the country. Many schools have incorporated green design into their educational mission. More than 60 schools around the nation have attained LEED certification, and over 400 more have now applied, with the number of applications rising one per day.[205]

The Calhoun School in New York City has a "Green Roof Learning Center" which teaches students and others about sustainability even as it reduces run-off by 40% and reduces heating and cooling bills significantly. Fifty schools in New York State benefited from NYSERDA's "School Power . . . Naturally" program and received solar energy and data collection systems worth about $24,000 each.[206]

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[202] www.usgbc.org/myUSGBC/Members/MembersDirectory.
[203] Dale English, "Green building concepts embrace many factors," Buffalo Business First, November 2, 2007.
[204] James Heaney, "Developers here slow to adapt," Buffalo News, April 13, 2008.
[205] Winnie Hu, "Schools Embrace Environment and Sow Debate," NY Times, October 25, 2007.
[206] Andrew Zemrac, "Sustainable Roofs for Buffalo Schools" (2007), available at http://green-cities.wikispaces.com.

Better Cost-Benefit Analyses

The problem with most cost-benefit analyses of buildings is that they include only up-front costs and not lifetime costs, much less the costs and benefits to the health of the occupants and the community, much less the costs and benefits when global warming and other, long-term environmental consequences are considered.

A comprehensive life-cycle analysis of sixteen green affordable housing projects found an average net present value benefit of $15,363 per unit from the use of green techniques.[207] The average benefit to the resident was $12,637; the average benefit to the developer was $2,725. To achieve these benefits, the developers paid an upfront cost, or "green premium," averaging 2.4% of total development costs.[208] On average, the developer still came out ahead. But even in those cases where the developer failed to recoup the green premium, the residents recouped it many times over.[209]

Many energy efficiency measures add to up-front costs, but pay for themselves over time. To give a few examples, a solar hot water heater has an average installed cost of $2,500, but it saves $303 per year, and thus pays for itself in 7.4 years.[210] The payback period for adding insulation to a home is typically about five years.[211] An Energy Star clothes washer uses 50 percent less water and 70 percent less energy per load, saving up to $100 every year.[212]

Even some of the more expensive items are actually cheaper than conventional alternatives in the long run. For example, the average payback for converting to solar power is 14 years.[213] That is a long time, but much shorter than the life of the solar power system. While a typical residential solar system in New York may cost roughly $17,000 to install, New York State will pay 40% to 70% of the cost and help finance the remainder through the New York Energy Smart Loan Fund.[214] Even green roofs pay for themselves over their lifetime. Although they cost between $6.40 and $15.30 per square foot to install, as compared to between $4.00 and $6.00 per square foot for traditional roofing, they last two to three times as long and yield energy savings as well.[215]

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[207] William Bradshaw et al, "The Costs and Benefits of Green Affordable Housing," New Ecology Institute (2005), p. 166.
[208] Id., p. 163.
[209] For a detailed analysis and recommendations regarding affordable housing, please see Sam Magavern, "Affordable Housing and the Environment in Buffalo, New York" (2007), available at http://ppg-buffalo.wikispaces.com.
[210] Rocky Mountain Institute, Home Energy Brief #5, available at www.rmi.org
[211] Rocky Mountain Institute, Home Energy Brief #1, available at www.rmi.org
[212] Energy Star: Home Improvement Tips, http://energystar.gov/index.cfm?c=home_improvement.hi_tips
[213] Damon Darlin, "Financially, Solar Power for the Home is a Tough Sell," NY Times, April 14, 2007
[214] "New York State is Making Solar Electric Energy For Your Home More Affordable Than Ever"
[215] Mike Plumb, "Sustainable Raindrops: Cleaning New York Harbor by Greening the Urban Landscape," pp. 17-18, 36, n. 81, available at http://www.riverkeeper.org/campaign.php/pollution/we_are_doing/986.

The City of Portland concluded that bringing three standard buildings up to LEED levels would produce lifecycle savings of 15%.[216] The State of California developed a cost/benefit analysis of green building that included environmental and health costs. California's study concluded that the overall financial benefits of green state buildings, including lower emmissions and better health and productivity, were $48.87 per square foot for LEED certified and LEED silver buildings, and $67.31 for LEED gold and platinum buildings.[217]

Retrofitting and Weatherizing

The most important green policy regarding buildings is to renovate old buildings instead of building new ones. Buildings account for 40% of all raw materials used in the United States.[218] The energy used to extract materials, process them, and transport them amounts to ten times the energy they will use once constructed.[219] And, of course, demolishing old buildings is energy intensive and one our biggest sources of garbage. For these reasons, saving and renovating Buffalo's old building stock instead of demolishing it and recreating it in the suburbs and exurbs is perhaps the single biggest environmental priority we face.

An important part of saving them is weatherizing them, which not only adds to their life but also makes them more affordable, decreasing the risk that they will be abandoned. Nationwide, the average home spends $1,500 per year on energy bills. In Buffalo, the average cost is 34% higher: $2,267 per year.[220] Weatherizing a home that heats with natural gas saves an average of $461 per year[221] and reduces carbon dioxide emissions by one metric ton per year.[222] Weatherization is also a good source of jobs, including entry-level, skill-building jobs. The Department of Energy estimates that every $1 million invested in weatherization creates 52 jobs directly and 23 jobs indirectly.[223]

The Center on Wisconsin Strategies (COWS) has a fascinating proposal titled "Milwaukee Retrofit." COWS estimates that making energy efficiency improvements in 210,000 units of Milwaukee's aging housing stock (all rental units and all pre-1960 owner occupied units) would take a one-time investment of $243 million but generate as much as $83.3 million in annual savings ($482 per unit for rental housing and $265 per unit for owner occupied). COWS suggests a variety of funding strategies, including issuing bonds which would be repaid out of the energy savings. One method would be to have the utility bill the customer at a higher rate per unit of energy once the retrofit was

[216] "The Costs and Financial Benefits of Green Buildings," A Report to California's Sustainable Building Task Force," 2003.
[217] "The Costs and Financial Benefits of Green Buildings: a Report to California's Sustainable Building Task Force" (2003), p. ix
[218] Neil Pierce, "Do Sustainable Cities Have a Future," American Prospect, February 2007.
[219] James Heaney, "Developers here slow to adapt," Buffalo News, April 13, 2008.
[220] DOE Home Energy Saver, http://hes3.lbl.gov/hes/hes.taf?f=top
[221] Meg Power, "FY 2006 Energy Bills Forecast: the Impact on Low-Income Consumers," p. 10
[222] http://www.nrel.gov/docs/fy02osti/30700.pdf
[223] Id., p. 10

complete. If a customer who cut usage 30% were billed at 120% of the original rate, the customer would still see a 16% reduction in her bill, while the extra revenue could repay the bond.[224]

The City of Houston partnered with a utility to weatherize 600 homes for seniors and people with low incomes, focusing on a single neighborhood. Each of the 1400 homeowners in the neighborhood was contacted; 600 of them took the offer. The program cost was roughly $1000 per home. The average weatherized home reduced consumption 14% in summer months, for an average savings of $160 per home.[225]

The Nassau County Executive, Thomas Suozzi, became inspired during a dinner conversation with a friend to make Levittown, the nation's "first suburb," its first "green suburb." The county is developing an innovative approach in which it partners with eight, energy, home improvement, and financial services companies to offer services to residents aimed at reducing carbon emissions from energy use by 20% in one year. The effort will focus on installing new boilers, making energy-efficient home renovations, adding solar heating, switching to compact fluorescent lighting, and other measures. The goal is to reach 5,000 homes. The campaign will begin with canvassers from the non-profit Citizens Campaign for the Environment calling on all 17,000 homes in Levittown and inviting them to have a home energy audit, costing about $300.[226]

Operations and Purchasing

In addition to the buildings themselves, local governments are paying increasing attention to the products and the people in those buildings. The City of Chula Vista cut its energy use substantially through measures such as using less lighting, turning off office machines when not in use, implementing software to put computers in sleep mode when unattended for more than ten minutes, and prohibitions on adjusting thermostats.[227]

Many governments have green purchasing policies, with preferences for energy-smart appliances, non-toxic cleaning supplies and paints, recycled paper, duplex printers, recycled flooring materials and furniture, etc. In 2007 Erie County passed a local law mandating that the county (including every county office, board, commission, institution of higher education, etc.) would purchase Energy Star products whenever available. New York State has just initiated a more comprehensive Green Purchasing policy. Given the environmental and economic benefits of supporting our local businesses, our local government should also explore adding preferences for local goods and services.[228]

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[224] "Capturing Home Energy Savings in Milwaukee," Center on Wisconsin Strategies (2007), available at www.cows.org.
[225] "Energy & Environment Best Practices Guide," US Conference of Mayors (2007), page 44.
[226] Linda Saslow, "Nation's 'First Suburb' Aims to Be Most 'Green'", NY Times, December 16, 2007.
[227] www.chulavista.gov
[228] For a discussion of the potential for local preferences here, see Amy Kedron, "Local Advantage in a Global Era: Making Local Procurement Work for New York" (2007), available at http://green-cities.wikispaces.com

Other Examples of Green Building Initiatives

- In Cincinnati, homes that are built or renovated to LEED standards will get a full property tax abatement for 15 years.[229]

- Baltimore County, Maryland, offers a ten year 100% property tax credit to commercial buildings rated LEED Silver or higher.[230]

- Seattle has created a mixed-income/public housing community, using federal HOPE VI funds, that includes old trees, creative plantings, a thriving community garden, a "natural" drainage system for stormwater, and energy-efficient buildings.[231]

- Boston received a $2 million grant to green its affordable housing, including solar power installations on approximately 200 housing units.[232]

- Arlington Texas has installed 170 occupancy sensors on light switches in city buildings, which turn the lights off if no motion is detected in ten minutes. The total cost is $8,500; the city estimates that the sensors will pay for themselves in five years, having saved 70,000 kWh of electricity.[233]

- The city of Duluth maintains its own revolving fund for energy efficiency improvements, in which 50% of the savings from each project are made available for future projects.[234] Chapel Hill voters passed a $500,000 bond referendum for a similar "Energy Bank" program.[235]

Recommended Measures

Local governments should emulate their peers and move aggressively to green our area's building stock. In particular, we should:

- Require any new buildings or major renovations that receive government subsidies to meet green criteria equivalent to a LEED Silver rating;

- Renovate all the schools yet to be renovated by the Buffalo Joint Schools Construction Project to the equivalent of a LEED Silver rating;

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[229] Charisse Jones, "Eco-friendly homes move into mainstream," USA Today
[230] "2007 Final Report of the Green Building Task Force," State of Maryland, page 24.
[231] Neil Pierce, "Do Sustainable Cities Have a Future," American Prospect, February 2007.
[232] "Energy & Environment Best Practices Guide," US Conference of Mayors (2007), page 68.
[233] "Energy & Environment Best Practices Guide," US Conference of Mayors (2007), page 6.
[234] Kate Gordon, "High Performance Cities," Apollo Alliance, page 8.
[235] "Cool Cities Best Practices," North Carolina Sierra Club (2007), page 8.

- Redirect CDBG, HOME, and other government funding programs away from new construction and toward deconstruction, rehabilitation, lead paint remediation, and weatherization for people with low incomes;

- Work with the state to create a "Buffalo Retrofit" plan that uses future energy savings to pay for weatherization of buildings;

- Increase energy efficiency, stormwater diversion, density, and other green requirements in zoning and building codes;

- Adopt green purchasing policies favoring energy efficiency, recycled products, durable products, recyclable products, locally made products, and non-toxic products for appliances, furniture, cleaning products, and technology.

- Increase energy efficiency of building and facility operations with technologies (such as occupancy sensor lights) and policies (such as turning off lights and computers when not in use);

- Use control board efficiency grant money and create a new revolving fund for energy efficiency improvements to buildings and operations and other environmental measures that produce long-term savings to governments and residents.

Renewable Energy

Our use of "dirty" energy such as coal for power has huge impacts. Nationally, burning coal for electricity is the cause of about 35% of the nation's carbon emissions.[236] Burning coal causes many other environmental harms, as well. For example, the nation's 1,100 coal burning power plants emit 48 tons of mercury each year, poisoning waters, wildlife, and human beings (an estimated 410,000 children are born with unsafe mercury levels each year in the US).[237] The coal mining process itself causes grievous damage to mountains, rivers, animals, and humans.

Despite our hydropower, wind power, and nuclear power, nearly 59% of New York's power comes from burning hydrocarbons (coal, oil, and gas) to make electricity.[238] Locally, consider the fact that the Huntley Generating Station in Tonawanda is by far the largest source of toxins in Erie County, releasing 2,642,883 pounds per year (the next largest source, the 3M plant in Tonawanda, releases 684,005 pounds).[239]

Buffalo-Niagara is an EPA non-attainment area for ozone pollution.[240] Erie County has the fourth worst air quality of counties in New York, with 6,589,051 person days exceeding national air quality standards for ozone.[241] For many types of emissions, including carbon monoxide, nitrogen oxide, and sulfur dioxides, Erie ranks in the worst ten percent of counties in the nation.[242]

Increasingly, local governments are turning to clean energy sources. In 2001, for example, San Francisco voters approved, with 73 percent in favor, a ballot initiative allowing the city to issue $100 million in revenue bonds to finance enough renewable energy to supply 25% of the government's needs, with $50 million for solar arrays on government buildings, $30 million for wind turbines on city and county owned land, along with $20 million in energy conservation and administration costs.[243]

Erie County recently took a step in this direction as well. In 2007, County Legislators Whyte and Kennedy submitted a resolution directing the County to buy renewable energy "with a goal" of 8% by 2009, 16% by 2011, and 25% by 2013.

Promoting clean energy makes sense as a job creation strategy for western New York. A study by the Blue-Green Alliance identified 217 companies in Erie and Niagara counties that could benefit from renewable energy work – such as machine shops that could

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[236] http://www.ecology.com/archived-links/greenhouse-gases/
[237] Page 18, Waterkeeper Magazine (Spring 2008).
[238] "New York's Solar Road Map," Solar Initiative of New York (May 2007), page 7.
[239] www.scorecard.org
[240] http://www.scorecard.org/env-releases/cap/naa-counties.tcl?naa_id=018
[241] This measures the number of days when a pollutant level went over national air quality standards, multiplied by the number of people in the county. See http://www.scorecard.org/env-releases/cap/rank-counties-risk.tcl?fips_state_code=36.
[242] http://www.scorecard.org/env-releases/cap/county.tcl?fips_county_code=36029#air_rankings
[243] http://www.newrules.org/electricity/rmandatesanfran.html

supply parts for wind turbines, solar panels, and other green technologies.[244] Environmental workers already outnumber pharmaceutical workers in the Unites States.[245] Green energy is job intensive. Whereas natural gas creates 1.1 jobs per megawatt of power, solar power creates 22.4, wind creates 6.4, and geothermal creates 10.5.[246] Given these multiple benefits, we should make sure that all of our economic development programs and subsidies aggressively promote green energy for or region.

Wind

No project has made our region's green potential more tangible than the Steel Winds wind farm on the old Bethlehem Steel site in Lackawana. These eight 410-foot high turbines with 153-foot blades were developed by BQ Energy and UPC Wind. Wind and solar projects are exempt from property taxes, but the developers are apparently paying Lackawana $100,000 per year.[247] Bill Nowak of Wind Action Group estimates that wind energy could supply more than one fourth of Buffalo's electric power, if fully developed.[248] Buffalo is the fourth windiest major city in the United States, with an average wind speed of 11.9 miles per hour, making it a natural spot for wind power.[249]

Engineers have cut the price of wind energy by about 80% over the last 20 years. President Bush, no friend to green energy, has said that wind could supply 20% of the nation's energy.[250] There are now 80,000 wind turbines in the world, and the number is rising rapidly.[251] Energy experts expect the wind industry to triple in size by 2015.[252] Germany has 20,000 turbines, generating 5% of its electricity.[253]

One intriguing possibility for wind turbines is to use them for on-site power generation at large municipal facilities. Lake Effect Energy has suggested that Buffalo build turbines on-site to help power the Colonel Ward water pumping station and the Bird Island waste treatment plant. There are various ways to finance projects such as these, including Clean Renewable Energy Bonds (CREBs), and long-term energy purchase contracts.[254]

In addition to commercial-scale turbines, there is a growing market for small turbines. The American Wind Energy Association expects about 10,000 small turbines – up to 100 kilowatts, enough to power a small school – will be sold in the US this year. About half of them will be residential turbines, typically 33 to 100 feet tall, with outputs of 2 to 10

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[244] Fred Williams, "Enviro-labor group urges national 'green' energy goals," Buffalo News, November 10, 2007.
[245] Laura MacInnis, "Millions of jobs at risk from climate change," Reuters, November 12, 2007.
[246] "Community Jobs in the New Economy," Apollo Alliance (2007), page 7.
[247] Maki Becker, "Powering up 'Steel Winds'", Buffalo News, February 21, 2007
[248] Bill Nowak, "Opportunity Knocks," Buffalo News, February 4, 2007.
[249] "Wind Energy Initiatives for Greater Buffalo," University at Buffalo Department of Planning, page 33.
[250] Matthew Wald, "It's Free, Plentiful, and Fickle," NY Times, December 28, 2006.
[251] Bill Nowak, "Opportunity Knocks," Buffalo News, February 4, 2007.
[252] Elizabeth Olson, "A Future With Wind," NY Times, January 6, 2007.
[253] Mark Landler, "Sweden Turns to a Promising Power Source, With Flaws," NY Times, November 23, 2007.
[254] Personal communication, David Bradley. See www.crebs.org and www.lakeeffectenergy.com.

kilowatts. They cost between $12,000 and $55,000, but New York offers up to 50% cash back and low interest loans to make them more feasible.[255] They can save consumers between 30% and 90% on their electric bills, and make no more noise than an air conditioner.[256] The City of Chicago is putting four micro wind turbines on one of its buildings.[257]

Solar

The solar power industry remains tiny in the United States, providing less than 0.01% of our electricity in 2006. Although improvements have been rapid, scientists have not yet found a truly efficient way to convert sunlight to energy. The energy is there – a half hour of the sunlight hitting earth has far more energy than all humanity can use in a year; but the efficient conversion of it on a large scale remains elusive, and, in the US, under-researched. In the last fiscal year, the US Energy Department spent $159 on solar research and development, compared to $303 million on nuclear, and $427 on coal.[258]

Although it may be a small part of the solution, solar energy is an important one. It lends itself particularly well to integration with buildings. Many municipalities have found ways to integrate solar power into their systems. Hayward, California, for example, has a 276 kW solar array which produces enough power during the day to power 275 homes.[259]

Solar power has a relatively long payback period, averaging about 14 years.[260] But that is much shorter than the life of the system; over the long term, it is cost effective, and it is very clean energy. Even in Buffalo, solar panels can supply most of a house's needs. Walter Simpson's home in Amherst has modest solar panels, purchased and installed for an out of pocket cost of $5,000, which – with all the other efficiency improvements he has made – are able to supply 75% of his home's electricity needs.[261]

Solar hot water heating is also an increasingly efficient tool for both individuals and municipalities to explore. The Simpson house in Amherst also includes solar hot water heating panels on the roof, which heat most of the water necessary for the home. Lakeland, Florida installed 55 solar hot water heaters, at a cost of $2200 each for purchase and installation, on the roofs of residential customers. The City meters them and charges the residents based on the metering. The customers get hot water without paying purchase or maintenance costs.[262]

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[255] Kristina Shevory, "Homespun Electricity, From the Wind," NY Times, December 13, 2007, and Sara Schaefer Munox, "A Novel Way to Reduce Home Energy Bills," Wall Street Journal, August 15, 2006.
[256] Sara Schaefer Munox, "A Novel Way to Reduce Home Energy Bills," Wall Street Journal, August 15, 2006.
[257] "Energy & Environment Best Practices Guide," US Conference of Mayors (2007), page 40.
[258] Andrew Revkin, "Solar Power Wins Enthusiasts but Not Money," NY Times, July 16, 2007.
[259] "Energy & Environment Best Practices Guide," US Conference of Mayors (2007), page 43.
[260] Damon Darlin, "Financially, Solar Power for the Home is a Tough Sell," NY Times, April 14, 2007
[261] Stephanie Sciandra, "Practicing what you preach," The Spectrum Online, March 19, 2008.
[262] "Energy & Environment Best Practices Guide," US Conference of Mayors (2007), page 45.

Methane

Methane is gas made up of hydrogen and carbon.[263] It is the principal ingredient in natural gas, and it is a major contributor to global warming, with each ton of methane the equivalent to 21 tons of carbon dioxide. Methane rises naturally from wetlands, oceans, and various animals (especially termites!), but 60% of methane emissions relate to human activities. The largest human contributors, in order, are livestock farming, landfills, natural gas systems, coal mining, and wastewater treatment plants.

Big producers of methane are typically required to "flare" or burn it to reduce pollution and the chance of explosions from methane accumulation. Increasingly, landfills and wastewater plants are realizing that it makes sense to turn the burning of methane into a power source, typically using the electricity generated to power their own operations. Methane recovery and co-generation is a triple win: it reduces the methane and its greenhouse effects; it reduces the burning of coal and other "dirty" power sources; and, by doing it on site, it reduces waste. Over time, methane co-generation can also save a facility money, as the facility generates its own power instead of buying it from the grid.

Wastewater plants are energy intensive. NYSERDA estimates that 35% of a municipality's energy use is for drinking water and wastewater processes. Methane co-generation can supply a substantial amount of that energy. The Town of Lewiston has a relatively small plant, processing roughly 2 million gallons per day. The methane-powered micro turbines Lewiston installed in 2001 supply roughly 25% of the plant's electricity needs, saving between $39,000 and $43,000 per year in electricity costs. This project was funded fully by New York state.

The Town of Amherst also received state money ($1.35 million) to implement methane recapture; the project has been slowed by technical difficulties, but Amherst estimates that it will eventually save more than $500,000 per year in energy costs. Gresham, Oregon has a cogeneration system that supplies 55% of its plant's needs, saving $208,000 per year. The initial cost was $1.1 million.

The Buffalo Sewer Authority operates the state's second largest wastewater plant on Bird Island, with the capacity to handle 369 million gallons per day. The BSA does not currently burn methane for electricity; rather, it burns it for heat which it uses to heat its digesters, fire its sludge incinerator, and heat the facilities. The BSA plans to overhaul its sludge incinerator, allowing it to run on its own sludge, freeing up methane that could be used for co-generation, perhaps enough to completely offset the annual $1.2 million electricity bill for its aerator.

Erie County has eight sewer districts with seven wastewater plants. Currently, only the Lackawana plant has the anaerobic digesters that make methane cogeneration possible. The County believes that the payback period for adding methane cogeneration to the

[263] All of the information in this section comes from Priscilla Hampton, "Methane and Cogeneration Technology: Renewable Energy Opportunities for Erie County Wastewater Treatment Plants" (2007), available at htttp://green-cities.wikispaces.com.

Lackawana plant is too long – at least 20 years – making the project not viable at this time. Given the environmental benefits and long-term savings, however, one might ask whether 20 years is really too long, particularly given the availability of state incentive money

"Clean" Coal

NRG Energy is currently proposing a new 630 MW coal-fired plant in Tonawanda to replace some of the old station's capacity. NRG is proposing an integrated gasification combined cycle (IGCC) or "clean coal" plant. The project may be unlikely, since it apparently requires $1.5 billion in subsidies from New York State, which is currently in the midst of a budget crisis. Whether to support such a proposal is a complex question beyond my expertise, but statements from the local Sierra Club persuade me extreme caution is required.[264] No "clean coal" plant has been built in the United States, and it is not at all clear that the technology is feasible and more cost effective than investing in clean energy sources.[265]

Ethanol

Buffalo is also the site of a proposed ethanol plant by a local company, RiverWright. The company plans to produce 110 million gallons per year, which regional customers could use instead of importing ethanol from the Midwest.[266] Currently, about half the motor fuel sold in New York has a 10% ethanol blend to help it burn more efficiently and lower its emissions. About 200,000 cars in the state are equipped to burn an 85% ethanol blend, if it becomes available.[267]

The RiverWright project is environmentally friendly in its reuse of abandoned grain storage facilities in the City of Buffalo. It also promises to employ 65 people. Many environmentalists do not favor corn-based ethanol in general, because of the amount of fossil fuel energy needed to produce it and the negative effects if land is cleared to grow crops. Furthermore, as food prices around the world have soared recently, some food specialists have come out against biofuels; research suggests that one quarter to one third of recent price increases stem from biofuel production.[268] These general considerations, however, cannot answer all the questions about an individual project. The RiverWright

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[264] "The Trailblazer," Niagara Group of the Sierra Club, April 2008.
[265] See Matthew Wald, "Cleaner Coal is Attracting Some Doubts," NY Times, February 21, 2007; "Coal's Energy Potential is an Engineering Challenge Now," May 1, 2007; and "New Type of Coal Plant Moves Ahead, Haltingly," December 18, 2007.
[266] http://www.buffaloethanol.com/projectoverview.html.
[267] Fred Williams, "Ethanol plant backers woo investors," Buffalo News, April 19, 2007.
[268] Andrew Martin, "Fuel Choices, Food Choices and Finger-Pointing, NY Times, April 15, 2008. See also Elizabeth Rosenthal, "Studies Call Biofuels a Greenhouse Threat," NY Times, February 8, 2008; Andrew Martin, "The Price of Growing Fuel," NY Times, December 18, 2007; and David Bertola, "Viability of ethanol fuels clash over corn," Buffalo Business First, February 1-7, 2008.

project should be evaluated carefully on its own merits to see if its net environmental effects are positive or negative.

Biomass and District Heating

Minneapolis is building a biomass energy plant which will serve up to 18,000 households.[269] St. Paul's combined heat/power district energy plant supplies heat to more than 80% of downtown and adjacent areas, using heat from a biomass fired electricity generating plant. The plant saves its customers $10 million per year and keeps 280,000 tons of carbon out of the air. Soot emissions are reduced by 50%[270]

Helsinki doubled its fuel efficiency by adopting district heating, which it now uses for 91% of its buildings.[271] Jamestown's district heating system, using the waste heat from its power plant, serves over 60 customers and saves them 25 to 50% on their heating and hot water bills.[272] Buffalo has a natural gas district heating system for City Hall and a cluster of other downtown buildings. A proposal for a larger district heating system for downtown has languished; it should be reevaluated.

Snow Power!

In a project that seems particularly relevant to Buffalo, the city of Sundsvall Sweden stores its snow and uses it for cooling its hospital building as it melts. The project paid for itself in only three years.[273]

[269] www.ci.minneapolis.mn.us/mayor/news
[270] "Energy & Environment Best Practices Guide," US Conference of Mayors (2007), page 48.
[271] Timothy Beatley, *Green Urbanism: Learning from European Cities*, Island Press (2000), page 259.
[272] "Energy & Environment Best Practices Guide," US Conference of Mayors (2007), page 45.
[273] Timothy Beatley, *Native to Nowhere: Sustaining Home and Community in a Global Age*, Island Press (2004), page 305.

Food Policy

Few of us realize the environmental impact of the ways we grow, raise, process, transport, package, and consume food. Because of the many ways our food system causes pollution, it is not always easy to tell which product is more sustainable. For example, how does one choose between a local, non-organic product and an organic product from far away? The answers vary with the product, but, in general, it is safe to say that organic is better than non-organic, local is better than far away, less packaged is better than more packaged, small farms are better than factory farms, and vegetables, fruits, and grains are better than animal products.

One of the least publicized facts about global warming is the role of livestock. The United Nations has reported that cattle rearing generates more greenhouse gases than transportation, as well as being a major source of land and water degradation. Cattle rearing accounts for 9% of the carbon, 65% of the nitrous oxide, 64% of the ammonia, and 37% of the methane that human activities produce. Nitrous oxide, which comes mostly from manure, has 296 times the global warming potential of carbon, and methane, which comes from manure and bovine digestive gases, has 23 times the warming potential.

Global warming is only half of it. Livestock now uses 30% of the earth's land surface for pasture and feed production; it is a major cause of deforestation, especially in Lain America, where 70% of the Amazon has been converted to grazing land. Animal waste, antibiotics, hormones, tannery chemicals, fertilizers, and pesticides used on feed crops are major sources of water pollution.

According to the USDA, growing crops for animals takes up 80% of US agricultural land; animals raised for food eat 90% of the soy, 80% of the corn, and 70% of the grain. It takes 5,214 gallons of water to produce one pound of beef, compared to 25 gallons to produce one pound of wheat. Omnivores require 13 times the water to produce their food than vegans do. Producing a hamburger requires 27 times as much petroleum as producing a soyburger.[274] And the problems are accelerating, with global meat and milk production expected to double from 2000 to 2050.[275] Meat production already increased more than 60% from 1961 to 1999.[276]

The way we farm is vastly different today than in any period of the past. Essentially, we have replaced people with machines powered by petroleum and further increased yields with synthetic fertilizers, pesticides, and lots of irrigation water from our waterways and our underground reserves (70% of human water use is for irrigation).[277] Much of the

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[274] Jolia Allen, "Can Vegetarianism Save the Planet," *VegNews*, May/June 2007.
[275] "Rearing cattle produces more greenhouse gases than driving cars," U.N. News Service, November 29, 2006, citing Henning Steinfeld, "Livestock's Long Shadow – Environmental Issues and Options,"
[276] Diana Deumling et al, "Eating Up the Earth," Redefining Progress Agricultural Footprint Brief, July 2003), page 4.
[277] Bill McKibben, *Deep Economy: The Wealth of Communities and the Durable Future*, Henry Holt (2007), page 62.

agricultural sector is controlled by a few giant companies: 81% of US beef is slaughtered by only four companies; Cargill and Archer Daniels control 75% of the world's grain trade; 70% of milk sales are controlled by four multinationals.[278]

Agriculture is massively subsidized, with $42 billion going to corn, wheat, rice, soybeans, and cotton.[279] Forty percent of industrial agricultural income comes from government subsidies.[280] Almost three fourths of the subsidies go to the largest 10% of farm businesses; almost one third go to the largest 2%.[281] Our subsidies are destroying farmers around the world. Mexicans can grow corn for 4 cents a pound. US farmers grow it at 6 cents a pound, but subsidies bring the price down to 3 cents a pound: a fact which, since NAFTA, has destroyed 1.3 million small Mexican corn farms.[282]

Our industrial agriculture and our subsidies have brought us low food prices. Americans now spend 11% of their paychecks on food, less than half of the percentage they spent before World War II.[283] But this cheapness masks the basic inefficiency of massive scale monoculture. According to the USDA, smaller farms produce far more food per acre, using land, water, and oil much more efficiently.[284]

How we grow our food is just the beginning. Eighty to ninety percent of the fossil fuel use in the food system occurs post-production: in processing packaging, transport, storage, and retailing. The energy required to produce a can of corn and get it to a customer's dinner table is six times the food energy contained in the corn itself. An average food item in the US travels 1500 miles. Ninety percent of all fresh vegetables in the US are grown in the San Joaquin Valley of California.[285]

A University of Chicago study found that the average American diet produced the equivalent of an extra ton and one half of carbon emissions, when compared to a vegetarian diet. By comparison, the average American produces between 1.9 and 4.7 tons of carbon by driving for a year. Interestingly, eating fish is just as bad as eating red meat, when it comes to carbon emissions, particularly if one eats the larger, predatory species such as swordfish.[286] Cutting down from the national average of 27.7% animal products in a diet to 20% is equal to the difference between driving a Camry and a Prius.[287]

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[278] Bill McKibben, *Deep Economy: The Wealth of Communities and the Durable Future*, Henry Holt (2007), page 52.
[279] Michael Pollan, "Weed It and Reap," NY Times, November 4, 2007.
[280] Diana Deumling et al, "Eating Up the Earth," Redefining Progress Agricultural Footprint Brief, July 2003), page 9.
[281] Bill McKibben, *Deep Economy: The Wealth of Communities and the Durable Future*, Henry Holt (2007), page 86.
[282] Id., page 192.
[283] Id., page 54.
[284] Id., page 67.
[285] Diana Deumling et al, "Eating Up the Earth," Redefining Progress Agricultural Footprint Brief, July 2003), page 4,
[286] "Study: vegan diets healthier for planet, people," University of Chicago News Office, April 13, 2006, citing Gidon Eshel, "Diet, Energy, and Global Warming."
[287] Jolia Allen, "Can Vegetarianism Save the Planet," *VegNews*, May/June 2007.

Of course, much depends on what type of farming is involved. Factory farms are particularly dangerous. Cattle who are fed corn produce more methane than cattle who graze. Manure produces far more methane when it is aggregated in massive "lagoons." Penning animals closely together means using antibiotics to keep disease from spreading; hence, factory farms now account for at least 70% of the antibiotics used in America.[288] Factory farm antibiotics are a major source of water pollution and also create breeding grounds for antibiotic-resistant diseases such as MRSA, which is now killing more Americans each year than AIDS (MRSA caused 19,000 deaths in 2005).

Urban farming can supply a surprising amount of a city's food needs. Shanghai grows 60% of its own vegetables and 90% of its milk and eggs within city limits.[289] Havana grew 300,000 tons of food last year: nearly all its vegetables.[290] Urban farming serves an amazing number of policy goals at once:

- Re-using blighted urban land;
- Employing urban youth and other workers;
- Generating healthy, organic produce for people with low incomes;
- Avoiding the pollution caused by packaging, storing, and transporting food long distances over long periods of time;
- Knitting neighborhoods together (for example, shoppers have ten times more conversations at a farmers market than at a supermarket.)[291]

Buffalo already has organizations doing excellent work on food issues. The Massachusetts Avenue Project has won significant federal and other funding for programs including:

- Healthy Eating By Design, based at Bennett Park Montessori school, which promotes healthy eating and active living, including the children growing and eating their own vegetables at a school garden;
- Growing Green Works, a program in which urban youth grow and sell organic vegetables, herbs, and fruit on formerly vacant city land;
- The Buffalo Grown Mobile Marketplace, which will bring local, organic food, education, and other resources to low-income neighborhoods.[292]

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[288] Michael Pollan, "Our Decrepit Food Factories," NY Times, December 16, 2007
[289] Bill McKibben, *Deep Economy: The Wealth of Communities and the Durable Future*, Henry Holt (2007), page 82.
[290] Id., p. 75.
[291] Id., p 105.
[292] www.mass-ave.org

The Queen City Farm would like to bring an urban farm comparable to MAP's to the east side of Buffalo, where the organizers propose a 2.25 acre farm on currently abandoned lots. QCF has purchased its first parcel, including a blighted house which it has begun to restore and green space where the first planting will take place. QCF has aided Community Action of Erie County in establishing an urban nursery at its headquarters on Harvard Place. QCF also hopes to buy and restore a beautiful, historic home on the site that is currently boarded and abandoned.[293]

Increasingly, governments and other institutions are developing environmental food policies. Over 200 universities have food policies favoring local foods.[294] Local food policies should discourage factory farms (Erie County has five factory dairy farms and one factory egg farm)[295] and encourage family, organic, and urban farms as well as community gardens. San Francisco's food policy can serve as a model. It supports local and organic food purchases by city agencies and service providers.[296] It also calls for long term plans and funding strategies to promote urban farms, community gardens, and school yard gardens, and farmer's market in a low-income community.[297]

[293] www.queencityfarm.org
[294] Bill McKibben, *Deep Economy: The Wealth of Communities and the Durable Future*, Henry Holt (2007), page 84.
[295] www.factoryfarmmap.org
[296] http://www.sfenvironment.org/downloads/library/tegicplan0709comprehensive.doc, page 19.
[297] Id., page 25.

Garbage and Recycling

The Problem with Garbage

The U.S. leads the world in producing garbage, producing 4.5 lbs of waste per person per day. Germany and Sweden produce less than 2 lbs per person per day. In 1960, the U.S. itself produced less than 2.7 lbs per person per day.[298] The average American consumer uses nearly 20 tons of raw materials each year.[299] Americans throw out twice as much packaging as they did in 1960 (30% of municipal solid waste is packaging).[300]

Garbage is an environmental problem for many reasons:

- Landfills leak pollution into the soil, water, and air;
- Incinerators emit toxic chemicals such as dioxin. After incineration, roughly 25 to 30% of the material remains in the form of ash, often toxic, which must still be disposed of.[301]
- Hauling garbage causes vehicular pollution.
- Throwing things out instead of re-using them means that more raw materials must be extracted, manufactured, processed, packaged, and transported to new users.
- Much garbage ends up neither in landfills nor incinerators but in roadways, waterways, fields, woods, etc., where it poses hazards to flora, fauna, and humans.

Among other things, creating less garbage and diverting more waste to recycling is an important climate change strategy. Nationwide, increasing our recycling rate by five percentage points would reduce greenhouse gasses as much as taking 7 million cars off the road in one year.[302] Recycling is also a good jobs generator: sorting and processing recycling sustains ten times more jobs than landfilling or incineration.[303]

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[298] www.buffalorecycles.com
[299] "How to Reduce Waste in Municipal Government: a Guide to Source Reduction," City of Newton (2005), page 10.
[300] Id.
[301] Id., page 13.
[302] Id., page 10.
[303] Brenda Platt and Neil Seldman, "Wasting and Recycling in the United States 2000," Institute for Local Self-Reliance, available at www.grrn.org

Buffalo's Garbage and Recycling

The City of Buffalo discards about 136,000 tons of garbage per year.[304] Buffalo recycles about 6.5% of its solid waste, well below the national average of 27%.[305] Surprisingly, Buffalo's percentages have been falling, rather than rising, from a peak of about 14% in the mid 1990s. According to acting Public Works Commissioner Steven Stepniak, "In the last few years, no one has really thought much about recycling."[306] "We've failed," comments Council President David Francyzk, saying that the City's efforts had been torpedoed by complacency.[307]

In sharp contrast, the Northwest Solid Waste Management Board, which includes the City of Tonawanda, the towns of Amherst, Grand Island, and Tonawanda, and the villages of Kenmore and Williamsville, reports a rate of 42%, and the remaining 36 municipalities report a combined rate of 42% as well.[308] The City of San Francisco's Environment Department plans to reach 75% recycling by 2010.[309]

The City has put very few resources into its recycling program. It pays one fourth of the costs of a small recycling program it shares with the County, with an annual budget of roughly $115,000 per year. By contrast, Syracuse, a much smaller city with similar economic challenges, employs a staff of eight in its recycling office.[310]

Increasing the City's recycling rate has the potential to save the City money. Currently, the City pays landfill fees of roughly $4.8 million,[311] and it spends $800,000 more on garbage collection per year than it is collecting from its user fee.[312] The City pays $43 per ton to tip its garbage, $25 to $30 per ton to tip its yard waste, and it is paid $10 per ton for its recyclables. Thus, shifting waste from garbage to recycling saves $53 per ton. Each percentage point that the recycling rate goes up saves the City roughly $82,000 per year.[313] Given these cost savings, the City should apply to its control board for an efficiency grant to hire more recycling staff and do a comprehensive overhaul of its garbage and recycling systems.

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[304] Ryan Haggerty, "Don't Pay for Your Neighbor's Garbage" (2007), available from the author.
[305] www.buffalorecycles.com. According to another source, the figure is closer to 8%. See Brian Meyer, "City recycling effort given failing grade," Buffalo News, January 9, 2008. Another source puts the national average at 32%. See Peter Koch, "It's Not Easy Being Green," Artvoice v. 6, no. 34.
[306] Brian Meyer, "City recycling effort given failing grade," Buffalo News, January 9, 2008.
[307] Id.
[308] Andrew Goldstein, "Recycling in Erie County," handout, available from the author.
[309] Strategic Plan, 2007-2009, Department of the Environment, City and County of San Francisco.
[310] Personal Communication, Andrew Goldstein, Erie County Recycling Coordinator.
[311] City of Buffalo 2007-2008 Budget
[312] Brian Meyer, "City recycling effort given failing grade," Buffalo News, January 9, 2008.
[313] "Recycle the recycling plan," Editorial, Buffalo News, January 15, 2008.

The Legal Framework

New York state law requires each municipality to enact a local law or ordinance requiring that garbage be "separated into recyclable, reusable or other components for which economic markets for alternate uses exist." "Economic markets" means instances in which the "full avoided costs of proper collection, transportation and disposal of source separated materials are equal to or greater than the cost of collection, transportation and sale of said materials less the amount received from the sale of said material."[314]

Buffalo enacted a law that appears to comply only partially with state law. Buffalo's ordinance requires all commercial users to separate out recyclable material.[315] However, it does not appear to require its residential users to recycle. The Code has only this enigmatic provision: "All recyclable materials . . . placed for collection at the curbline or other location by residents for collection pursuant to the curbline programs established pursuant to this chapter shall be prepared for collection in accordance with regulations promulgated by the Commissioner."[316]

Furthermore, it does not appear that Buffalo has ever enforced the ordinance requiring commercial users to recycle. Most businesses are probably not aware that the requirement exists. The Street Sanitation division's web-page includes a list of "Local Laws for Refuse and Recycling Collection" but makes no mention of this requirement.[317]

Policy Changes

A simple reminder notice and other publicity regarding the law would make a good start. Westchester County recently saw a dramatic increase in its recycling rates after sending a letter to residents and doing other inexpensive publicity, reminding them of the law.[318]

The City offers free recycling to businesses, but only if the business pays the user fee for the City's garbage removal service. In part because the City discontinued its dumpster service, many businesses choose not to use the City. The City may want to consider getting back in the dumpster business and/or allowing businesses to contract with the City for recycling separately, for a small user fee. The City might also consider requiring businesses to use the City's garbage and recycling services, to more easily enforce the requirement that recyclables be separated from garbage (which is very hard to do if the garbage collector is private). Alternately, the City might choose, as Chicago has done, to pass a local law requiring private garbage haulers to offer recycling services.

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[314] NYS General Municipal Law § 120-aa(2)(a)
[315] Buffalo Code § 216-43(A)(B)
[316] Buffalo Code § 216-40
[317] http://www.city-buffalo.com/Home/Leadership/City_Departments/Street_Sanitation/LocalLawsForRefuseAndRecyclingCollection.
[318] For Westchester's webpage on enforcement, see www.westchestergov.com/environment_recyclingenforcement.htm.

The City could also provide recycling containers in public spaces. New York City recently began a test program to do so, with bright blue bins for bottles and cans and green bins for paper in parks and near transit stations. These bins will also serve as visual reminders to residents to sort their recycling at home.[319]

Yard Waste

One major source of garbage is yard waste. Nationwide, 56.3% of yard trimmings are recycled.[320] Locally, the percentage appears to be far lower. For example, Erie County recycles 66,605 tons of yard waste per year, whereas Memphis (population 645,978) recycles 108,330 tons.[321]

Buffalo has a contract with a company that turns yard waste into mulch. The City pays this company $25 to $30 per ton to take the yard waste, substantially less than the $43 per ton that the City pays to tip its garbage. Thus, diverting yard waste has the potential to save the City money. The problem is how to collect that waste in an efficient way, since roughly two thirds of the City's costs are from collection, and only one third from tipping fees.

The City requires residents and businesses to place "grass clippings, weeds, and leaves" in plastic bags and "other vegetative waste" in "compact bundles no longer than four feet."[322] Somewhat oddly, this yard waste is classified as "bulk trash," and a user is only allowed to put out two pieces of bulk trash per week. Technically, then, under the ordinance, each fall a user would have to put all the raked leaves in plastic bags and then set them out two bags at a time or call the City and schedule a special bulk trash pick up for a fee starting at $82.[323]

In practice, some people put their leaves into clear plastic bags, some put them in opaque plastic bags, some put them into their totes, and some rake or blow them into piles on the street or adjacent to the street. At most times, the bagged leaves are collected along with the regular garbage and sent to the landfill. In the fall, Public Works sometimes sends the garbage trucks on separate pick-ups to collect the bagged leaves for delivery to the composting facility. There is no announced schedule for this leaf pick up, and a user has no way of knowing if her leaves will get picked up with the garbage or separately. It appears that this separate collection happened only once in the fall of 2007.

The bags present a problem, as they must be separated from the leaves. To avoid this problem, some localities require the leaves to be sorted into garbage bins, rather than bagged, while others allow users to rake them to the street in piles.

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[319] Diane Cardwell, "The City is Pushing Recycling Again, and with New Bins," NY Times, March 29, 2007.

[320] hwww.buffalorecycles.com/home-facts.php

[321] Erie figures from Andrew Goldstein, "Recycling in Erie County," handout, available from the author. Memphis figures from "Municipal Recycling Survey," WasteNews.com.

[322] Buffalo Code § 216-44

[323] www.city-buffalo.com/Home/Leadership/City_Departments/Street_Sanitation/LocalLawsForRefuseAndRecyclingCollection.

If a user puts her un-bagged leaves in the street, then technically she is breaking the law. At least she knows the leaves will not get thrown out with the garbage. But putting leaves in the street takes up parking spaces, makes a mess, and sends leaves into the storm sewer system, where they can clog sewers grates and where they must be treated by the sewage treatment plant or discharged into the waterways.

Ideally, the City would offer bi-weekly or at least monthly collection of yard waste in spring, summer, and fall, so that users could put out their yard waste and know that it would get recycled rather than landfilled. Fall is the big season, but it accounts for only roughly two thirds of yard waste. The City may also want to explore alternatives to bagging the waste, or set a policy that the collectors will un-bag the waste as they collect it. The City may want to consider setting up its own composting facility in the city at a convenient location and then selling or giving the compost to city residents. The City could explore options with some of its non-profit gardening organizations, such as Grassroots Gardens, the Massachusetts Avenue Project, and the Urban Roots Cooperative.

Electronic Waste

New York City has passed a law, similar to laws passed in 10 states, requiring manufacturers to be responsible for recycling electronic goods. To be phased in over 10 years, the law requires manufacturers to collect annually enough discarded electronics to equal 65% of the average weight of the goods they sold in the city in the previous three years. Mayor Bloomberg has vowed to ignore the law, arguing that it violates laws on interstate commerce.[324] Buffalo should press New York state to solve the controversy by passing statewide legislation comparable to New York City's bill.

Tires

Rubber tires are among the most vexing types of garbage. Tires cannot be placed with regular garbage; rather, the City requires users to drop them off at the Broadway garage on four special tire drop off days throughout the year. Tires must be clean and off the rim, and each user can bring only four tires.[325] Because tire disposal is inconvenient, limited, and little publicized, tires are among the items most frequently dumped in vacant city lots, creekbeds, rural roadsides, woods and fields, and other locations around the region. Dumped tires are a blighting influence, and they are expensive to collect.

Recently, a Lockport business, RubberForm Recycled Products, began to do the east coast and Midwest manufacturing for Rubbersidewalks, Inc..[326] Some 60 North American cities have installed rubber sidewalks. Each square foot of sidewalk uses almost one discarded tire. Rubber sidewalks are more expensive to install than concrete. The City of New Rochelle estimates that it paid $20 per square foot compared to $8 per square foot for concrete. However, rubber sidewalks may be cheaper when they save the

[324] Ray Rivera, "Mayor Calls Electronics Recycling Bill 'Illegal'", NY Times, February 15, 2008

[325] www.ci.buffalo.ny.us/files/1_2_1/city_departments/public_works_and_streets/2007_Bulk_Trash_Schedule.pdf

[326] April Amadon, "Lockport: a 'Green' Partnership," The Journal-Register, February 2, 2007.

City from having to remove trees, because they can be installed over tree roots. The District of Columbia used rubber sidewalks to save up to 35 old trees, which the city valued at $40,000 to $50,000 each. Rubber sidewalks may also cut down on maintenance costs (D.C. spent $7 million on concrete sidewalk repair in 2005) and cut down on slip and fall lawsuits.[327] Now that rubber sidewalks are a regional business, it may make sense for local governments to begin using them in certain locations, especially to save trees, which, of course, have a host of environmental benefits themselves. Rubber mulch and rubber surfaces can also be used for playgrounds – something which Buffalo neighborhoods lack and which they can easily accommodate in their vacant lots.

Chicago runs a "Tire Bounty Days" program in which non-profits, community groups, and churches collect tires and are paid 50 cents per tire by the City. Since 1992, Chicago has collected and recycled over 900,000 tires.[328] Perhaps Buffalo could emulate Chicago and then partner with RubberForm Recycled Products on an end-use for the recycled tires.

Beverage Bottles

One of the most ubiquitous and unnecessary forms of waste is beverage bottles. Local governments should support reform to New York State's bottle deposit policy, which currently does not cover water, iced tea, sports drinks, and juices (only carbonated soft drinks, sparkling water, beer, and wine cooler bottles can be redeemed). Since the original bottle bill was passed, of course, the sale of these non-covered items has exploded, as has their presence in litter and in garbage. The "Bigger Better Bottle Bill" that failed in the state legislature last year was expected to add 3.5 billion cans and bottles to recycling each year and provide over $100 million a year to clean up the environment.[329]

Using less bottles is as important as recycling them. More than 90% of the environmental harm caused by a bottle occurs before the customer opens it, including the oil used for plastic, for shipping, and for refrigeration.[330] Many cities have taken aim at bottled water, a particularly useless and wasteful product. Americans drank about 6.9 billion gallons of bottled water in 2004, disposing of 60 million plastic bottles per day (requiring 1.5 million barrels of oil per year just to make the bottles).[331]

The City of Chicago created a 5-cent surcharge on every bottle of water bought in Chicago, which will generate an estimated $10.5 million in tax revenue each year.[332] San Francisco and Salt Lake City have banned their own departments and agencies from

[327] Matt Bradley, "Rubber sidewalks go where concrete fears to tread," Christian Science Monitor, July, 12, 2006.
[328] http://egov.cityofchicago.org/
[329] "Don't Discard the Bottle Bill," Editorial, NY Times, April 8, 2007
[330] Bill Marsh, "A Battle Between the Bottle and the Faucet," NY Times, July 15, 2007.
[331] R. Lawrence Swanson, "Turn on the Tap," NY Times, April 22, 2007.
[332] Retailers have threatened to sue the city over the ordinance; see Karoun Demirjian, "Food and beverage retailer alliance plans to sue Chicago over bottled water tax," Chicago Tribune, December 27, 2007.

buying bottled water.[333] (San Francisco discovered that it had paid more than $2 million for water, cups, and dispenser rentals in recent years).[334]

Organic Waste

Organic waste, such as food scraps (and not including yard waste), makes up 12.4% of the total waste stream in the U.S.[335] Several cities, including San Francisco and Toronto, have begun attempts to reuse organic waste. Toronto's "Green Bin" program allows residents to recycle all organic waste, including food, animal waste and bedding, pet food, soiled paper products, and even dirty diapers. Organic waste is picked up weekly (other garbage only biweekly). The program has enrolled over 500,000 residences and 1,500 businesses and succeeded in diverting over 100,000 metric tons each year.[336]

Paper

Many cities, businesses, and schools have switched to recycled paper and found ways to use less paper. In 2002, Cornell University switched from 30% to 100% recycled paper, which is 3.5% more expensive. However, Cornell has made up for the costs by installing duplex printers. Over a six-month period, roughly 29% of pages were duplexed, saving over 239,000 sheets of paper.[337]

Some cities have run campaigns to help their residents stop junk mail. Junk mail accounted for 43% of all mail in the US in 2003.[338] About 44% of junk mail is not even opened. Each person who stops their junk mail saves approximately one and one-half trees.[339] Stopping much of one's junk mail is quite easy; one simply fills out an online form or sends a note to the Direct Marketing Association. Catalogchoice.com also offers a convenient way to get off lists of mail order catalogs.

Plastic Bags

Americans throw away about 100 billion plastic bags each year, mountains of plastic that take about 1,000 years to decompose. Plastic bags litter our cities and countryside and kill and injure birds, turtles, fish, and other flora and fauna. The problem with bags is that we do not pay for them, so we have no incentive not to use them. Once Ireland began to tax them, use dropped by 90% almost immediately. Once Ikea stores started to charge for bags, their shoppers cut their use by 80%.[340]

The problem with banning plastic bags, as San Francisco did, is that paper bags are not much better, and may be worse. Seattle's Mayor, therefore, is proposing a 20 cent fee for

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[333] "In Praise of Tap Water," Editorial, NY Times, August 1, 2007.
[334] Cecilia Vega, "Mayor to cut of flow of city money for bottled water," San Francisco Chronicle, June 22, 2007.
[335] http://www.epa.gov/msw/facts.htm
[336] Peter Koch, "It's Not Easy Being Green," Artvoice v. 6, no. 34
[337] Leslie Intemann, "CIT's Netprint increasingly finds ways to turn white paper into green," Cornell Chronicle, March 22, 2007.
[338] http://en.wikipedia.org/wiki/Direct_mail
[339] "How to Reduce Waste in Municipal Government: a Guide to Source Reduction," City of Newton (2005), page
[340] "Bagging Eternal Plastics," Editorial, NY Times, April 15, 2007.

every plastic or paper bag, similar to what was done in Ireland. Seattle expects to raise $10 million per year from the charge, with $1 million going to distribute free reusable bags to every home in the city.[341]

Construction and Demolition Debris

Construction and demolition debris accounts for a huge amount of the nation's waste stream. In California, the estimate is 22%;[342] in Massachusetts, the estimate is 36%.[343] C&D debris comes from demolition (48%), renovation (44%), and new construction (8%).[344] Concrete and mixed rubble make up 40-50% of it, followed by wood (20-30%), drywall (515%), asphalt roofing (1-10%), metals, bricks, and plastics.[345] These statistics do not include debris from roads, bridges, and other infrastructure projects.

Given Buffalo's vast supply of abandoned buildings, and its plan to demolish 1,000 per year for ten years, the salvage or recycling of building materials is one of the most pressing priorities for the city. Almost all of these materials are recyclable, but given the low tipping fees for landfilling them, there is little incentive to recycle them.

The simplest way to promote more recycling is to require it. Chicago passed an ordinance which required 25% recycling, measured by weight, on demolition projects in 2006 and then raised the requirement to 50% in 2007.[346] Erie County could also investigate imposing an environmental impact fee on the tipping of C&D debris (or all garbage) and using the proceeds to subsidize recycling, so that the net impact on prices would be minimized.

Even better than recycling the materials is reusing them: for example, instead of chipping the wood, salvaging it for reuse in a home renovation. Buffalo now has a functioning deconstruction organization, Buffalo ReUse, and the City has marked ten buildings for deconstruction instead of demolition this year. In assessing its houses for demolition, Buffalo could take a more nuanced approach that factored in the type and condition of the building. Tara Stahl has prepared a simple set of rankings and protocols by which the city could assess each building and determine what percent of it should be salvaged and/or recycled instead of demolished.[347]

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[341] William Yardley, "For Seattle Shoppers, Paper or Plastic Could Come With a 'Green Fee'", NY Times, April 5, 2008.
[342] http://www.epa.gov/ne/solidwaste/cnd/index.html
[343] http://www.ciwmb.ca.gov/condemo/
[344] "Characterization of Building-Related Construction and Demolition Debris," Franklin Associates (1998), page 8.
[345] Ken Sandler, "Analyzing What's Recyclable in C&D Debris," BioCycle, November 2003, page 51.
[346] Chicago Code 11-4-1905(2).
[347] Tara Stahl, "Integrating Deconstruction and Recycling Into the Demolition Process in Buffalo, NY," available at http://green-cities.wikispace.com.

Prices and Incentives

Buffalo charges $145.36 for a 35-gallon tote, $162.80 for 65 gallons, and $170.24 for 95 gallons.[348] This represents a baseline fee of $110.06 per year to cover the cost of collection, plus an additional fee to cover the costs of tipping the garbage. The fee structure is biased in favor of the bigger tote users, offering them a "volume discount" and failing to reflect the fact that it costs more to collect their garbage, not just more to tip it. The current fees work out to 70 cents per gallon for the 35-gallon tote, 63 cents per gallon for the 65-gallon tote, and 50 cents per gallon for the 95-gallon tote.[349]

Not surprisingly, since users have little incentive to use the smaller totes, they prefer the larger ones. Users currently have 100,539 95-gallon totes, 6,207 65-gallon totes, and 15,576 35-gallon totes.[350] The average Buffalo resident puts out 50 gallons of garbage and 3.76 gallons or recyclables each week.[351] Thus, he or she has plenty of room in his 95-gallon tote, and no incentive to shift materials to the recycle bin. If Buffalo supplied a bigger recycling bin, and made the 35-gallon tote drastically cheaper than the 65 and 94-gallon totes, then residents would have a much stronger incentive to use the smaller tote and to divert materials into recycling in order to fit their garbage into the smaller tote.

Seattle, which has a 44% diversion rate, offers 12, 20, 32, 64, and 96-gallon tiers and charges double the baseline fee for the two larger tiers. San Francisco, which has a 75% diversion rate, offers 20, 32, 64, and 96-gallon tiers and also charges double for the larger sizes.[352] Toronto charges $62 per year for a 4-gallon bin, $103 for a 32-gallon tote, $163 for a 63-gallon tote, and $213 for a 95-gallon tote.[353]

The City should also explore creating additional incentives to recycle. Currently, Buffalo offers block clubs a $50 Home Depot gift certificate for pledging to recycle. Buffalo may want to compare its program to that of Leicester, England, which has a material recovery center at which community groups get cash credit for bringing in recyclable materials. Over 1,000 groups have established member accounts.[354]

RecycleBank is a private company that installs computer chips in recycling collection equipment to measure the weight of the material in bins. Users than get coupons to spend at local retailers or donate to local charities, based on the amount of weight they recycle. Residents earn an average of $8 per week.[355] RecycleBank charges municipalities (or private haulers) $24 per household, and guarantees that the municipalities will save that much in tipping fees, as materials are diverted out of the garbage stream. RecycleBank

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[348] Buffalo began charging a garbage fee in 1996 as a way to get churches and other nonprofits who do not pay taxes to help pay garbage costs. Fees rose by over 46% from 2003 to 2005 and have since remained the same. See Brian Meyer, "Mayor's budget plan keeps user fee level," Buffalo News, May 1, 2007.
[349] Ryan Haggerty, "Don't Pay for Your Neighbor's Garbage" (2007), available from the author.
[350] Id.
[351] Id.
[352] Id.
[353] Peter Koch, "It's Not Easy Being Green," Artvoice v. 6, no. 34.
[354] Timothy Beatley, *Green Urbanism: Learning from European Cities*, Island Press (2000), page 242.
[355] Katheleen Conti, "You could be paid to recycle," Boston Globe, January 21, 2007.

did a pilot program with the City of Philadelphia in which they increased recycling rates in two Philadelphia neighborhoods from 35% and 7% to 90%.[356]

Source Reduction

Some keys to source reduction are using reusable instead of disposable materials and buying more durable and recycled products. Simple examples include things like leaving grass trimmings on lawns to decompose and fertilize the soil, and buying products in bulk or with minimal packaging. The City of Newton has a comprehensive source reduction policy that can serve as a model. It includes the appointment of waste prevention coordinators in every department and school, who are responsible for spearheading efforts and making annual reports on progress. The policy is filled with concrete ideas such as requiring double-sided copying, forgoing fax cover sheets, reusing paper for fax reception, teaching citizens how to stop junk mail, etc.[357] It boasts many successes, including reducing the amount of trash generated by city hall by 10%.[358]

[356] Bonnie DeSimone, "Rewarding Recyclers," NY Times, February 21, 2006

[357] "How to Reduce Waste in Municipal Government: a Guide to Source Reduction," City of Newton (2005).

[358] Id., page 106.

Taxation

Perhaps the most efficient tool a government has is taxation. When a product becomes more expensive, customers use less of it and search for alternatives. Companies begin to devote more of their research and development dollars, and more of their marketing, to the alternatives. Local governments, which have traditionally relied on property and sales taxes for the bulk of their revenues, are becoming more sophisticated in their approach to taxation. To give one example, in 2002, New York City added a tax of $1.42 to a pack of cigarettes. After two years, the City had collected a large amount of revenue, and smoking had declined roughly 20%, meaning some 200,000 fewer smokers.[359]

Erie County should seek state approval to lower its sales or property taxes (perhaps for properties worth less than $100,000), and replacing those revenues with taxes for fees on pollution. One possibility, already mentioned, would be a tax on landfill disposal, at least on certain types of waste, which would encourage recycling. The county could also emulate Chicago and place a tax on bottled water. It could take Seattle's lead and tax paper and plastic shopping bags, or use Portland's idea of a fee for non-energy-efficient buildings.

Pollution is terrifically expensive. China's government estimates that the health problems, environmental degradation, and lost work days from pollution cost China $64 billion in 2004 – over 3% of its total economic output. Some experts believe the true cost is closer to 10%.[360] This does not include long term costs, or costs that are created for people in other countries, such as global warming.

The former chief economist for the World Bank, Sir Nicholas Stern, has called global warming "the biggest market failure the world has ever seen" and called for worldwide carbon taxes to help address it.[361] The problem, put simply, is that the prices for energy (gas, electricity, heating fuel, etc.) do not come close to incorporating the costs that generating and using that energy impose on society. Some estimate, for example, that if the price of gasoline incorporated its social costs, it would be $7 or $8 per gallon.[362]

Do taxes and efforts to limit consumption kill private initiative or stifle growth? Japan has some of the world's highest gasoline taxes and most stringent fuel efficiency standards, along with the world's most profitable and innovative car company, Toyota.[363] California's economy has been booming, despite the fact that California, due to its stringent efficiency standards, has managed to keep per capita energy consumption almost flat in the last thirty years, while in the rest of the nation it has gone up 50%.[364]

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[359] http://www.cdc.gov/MMWR/preview/mmwrhtml/mm5624a4.htm
[360] Thomas Friedman, "The Power of Green," NY Times, April 15, 2007.
[361] Edmund Conway, "Stern Favors World Carbon Tax," UK Telegraph, January 24, 2007.
[362] Bill McKibben, *Deep Economy: The Wealth of Communities and the Durable Future*, Henry Holt (2007), page 27.
[363] Thomas Friedman, "The Power of Green," NY Times, April 15, 2007.
[364] Id.

The most directly effective tax would be a "carbon" tax on energy consumption. Boulder has already initiated such a tax. San Francisco's Mayor has proposed one as well: he plans to increase the commercial utilities tax by 5%, but to keep the measure revenue neutral by cutting the payroll tax by 1.5%. He has also proposed cutting payroll taxes further for businesses that move more of their employees from cars to mass transit, and raising garbage fees to encourage more recycling.[365]

[365] Lisa Leff, "SF mayor proposes carbon tax to curb global warming," AP, December 6, 2007.

Education

Local governments have an important role in educating their residents and leading by example. Many cities have webpages filled with useful information about what individuals, businesses, and organizations can do to help the environment and make a more sustainable city. Albuquerque has a particularly simple and appealing green guide that could serve as a model.[366]

San Francisco's strategic plan for the environment includes a host of education initiatives. Here are just a few:

- Creating and distributing 1,200 curriculum packets;
- A Food to Flowers lunchroom composting and recycling program;
- Technical assistance to 45 schools to implement school recycling and composting programs;
- 84 field trips to environmental gardens and parks, 120 field trips to its garbage and recycling plant and 45 field trips to SCRAP (The Scroungers Center for Reusable Arts Parts).[367]

One of the simplest things local governments can do is urge their residents to convert to green energy for their homes and businesses. Currently, only about 1% of state residents have chosen to pay slightly more for their power each month in order to have it purchased from a clean source such as wind or biomass.[368] Making the switch is easy and relatively inexpensive.[369] Green power costs from 0.6 to 2.5 cents more per kilowatt hour. If your household is using 400 kilowatt hours per month, and your clean power choice costs 2 cents extra, then you would pay $8 more per month for clean power.[370]

Every city or county-sponsored event could include brochures on why and how to make the switch, and the information could be prominently displayed on the governmental websites, cable access shows, and other outlets. The City of Houston developed a website and media campaign that explains green energy choices.[371] Medford also created a website and did an extensive clean energy campaign, with posters, banners, direct mail, events, and other methods, reaching about 39,000 residents.[372]

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[366] www.cabq.gov/sustainability/greenguide
[367] http://www.sfenvironment.org/downloads/library/tegicplan0709comprehensive.doc, page 28.
[368] Tim Murphy, "Selling a lofty concept (clean energy)," NY Times, July 15, 2007.
[369] http://www.nypirg.org/energy/green_electricity/green.html#what
[370] "Green Power Buyer's Guide," http://ubgreen.buffalo.edu/greenpower/greenpowerchoice.html
[371] www.houstonconsumerchoice.com.
[372] "Energy & Environment Best Practices Guide," US Conference of Mayors (2007), page 47. See also medfordcleanenergy.org.

Portland created a $500,000 TravelSmart program to reduce car trips, using direct mail, individualized marketing, and hands-on clinics and workshops to help residents who wanted to walk, bike, take transit, or carpool more often. It reached over 20,000 households, of which 35% actively participated. Results included reducing solo car trips by 9%, increased biking by 23%, increased transit by 41%, and increased walking by 7%. The program reduced over 24 million vehicle miles and 13,600,000 pounds of carbon emissions.[373]

Education can be a very effective tool in improving water quality. Residents can be taught about using less fertilizer, using natural fertilizer, maintaining septic systems, properly disposing of animal waste, litter, household toxics, and motor oil, and conserving water. They can also be taught about rain gardens, rain barrels, and other techniques. Many cities have extensive education campaigns to train citizens on these issues. Buffalo need not reinvent the wheel; it can use resources like "Water: From Trouble to Treasure," a "pocket guide to 'green' solutions" created by the Center for Neighborhood Technology in Chicago.

Most importantly, perhaps, we need to teach our children about environmental problems and solutions at every level of their education. In Southern California, students in 26 schools have replaced over 15,000 incandescent light bulbs with compact fluorescents. In Maryland, 163 schools have been recognized as green by the Maryland Association for Environmental and Outdoor Education. Scarsdale has hired a sustainability education coordinator and added a budget of $140,000 for sustainability projects.[374] Every local school district should have a comprehensive environmental education plan; it is hard to imagine a more important and useful subject.

[373] "Energy & Environment Best Practices Guide," US Conference of Mayors (2007), page 26.
[374] Winnie Hu, "Schools Embrace Environment and Sow Debate," NY Times, October 25, 2007.

Appendix

Sample Environmental Indicators and Targets

Environmental Indicator	Current	2009	2010	2011
Development Pattern				
Urban/suburban population ration				
Urban/suburban job ratio				
Urban/suburban poverty rates				
Urban/suburban development subsidies				
Sewer miles extended				
Water miles extended				
New road miles				
Transit				
Vehicle miles traveled				
% Trips by car				
% Trips by bike				
% Trips by walking				
% Trips by mass transit				
% Trips by carpool				
% Children walking to school				
Miles of bike lanes				
Miles of bike paths				
Bike racks				
% of fleet hybrid				
% of fuel biodiesel				
Average mpg of fleet				
Unhealthy ozone days				
Water				
Combined sewer overflow events				
Beach closings				
Green roofs				
Rain gardens				
Rain barrels				
Water-savings devices distributed				
Water-savings devices installed				
Trees, Parks, Lots				
Total trees				
Trees planted				
Street trees planted				

Park trees planted				
Private trees planted				
Vacant lot trees planted				
Number of parks				
Playgrounds				
Water access points				
Vacant lots cleaned and greened				
Brownfields remediated				
Buildings				
Total LEED-Certified Buildings				
LEED Platinum				
LEED Gold				
LEED Silver				
Energy Star Buildings				
Other Green Buildings				
Occupied buildings rehabbed				
Abandoned buildings rehabbed				
New builds				
Buildings weatherized				
Low income residents weatherized				
Energy				
KW from coal				
KW from solar				
Solar water heaters installed				
KW from wind				
KW from biomass				
% Govt energy renewable				
% Private energy renewable				
# Employed in clean energy				
Food				
Farmers markets				
Community gardens				
Urban farms				
% School food locally grown				
% School food organic				
% School food non-animal				
Small Farm acreage				
Factory farm livestock				
Factory farm poultry				
Organic farm acreage				

Garbage/Recycling				
Garbage tonnage				
Recycling tonnage				
% waste diverted				
Yard waste recycled				
Organic waste composted				
C&D debris diverted				
Buildings demolished				
Buildings deconstructed				
Shopping bags used				
Govt paper used				
Global Warming				
Total greenhouse gas emissions				
Govt emissions				
Transportation emissions				
Residential emissions				
Commercial building emissions				
Industry emissions				

Partial List of Buffalo Environmental Groups

- Buffalo Audubon Society, www.buffaloaudubon.org
- Buffalo Blue Bicycle, www.buffalobluebicycle.org
- Buffalo First!, www.buffalofirst.org
- Buffalo Niagara Riverkeeper, www.bnriverkeeper.org
- Buffalo ReUse, www.buffaloreuse.org
- Citizens Campaign for the Environment, www.citizenscampaign.org
- Citizens Regional Transit Corporation, www.citizenstransit.org
- Community Action of Erie County, www.caoec.org
- Daemen Center for Sustainable Communities, www.daemen.edu/sites/CSCCE
- Grassroots Gardens, www.grassrootsgardens.org
- Green Gold Development Corporation / Wind Action Group, www.greengold.org
- Massachusetts Avenue Project, www.mass-ave.org
- New Buffalo Impact, www.newbuffaloimpact.com
- Queen City Farm, www.queencityfarm.org
- Sierra Club, Niagara Group, www.newyork.sierraclub.org/Niagara
- UB Green, http://wings.buffalo.edu/ubgreen
- Urban Roots Community Garden Center, www.urbanroots.org
- WNY Climate Action Coalition, www.wnyclimateactioncoalition.org
- WNY Land Conservancy, www.wnylc.org
- WNY Sustainable Energy Association, www.nesea.org/about/chapters.html