

Green Metropolis

*Why Living Smaller, Living Closer, and
Driving Less Are the Keys to Sustainability*

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Riverhead Books a member of Penguin Group (USA) Inc. New York 2009

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More Like Manhattan

My wife and I got married right out of college, in 1978. We were young and naïve and unashamedly idealistic, and we decided to make our first home in a utopian environmentalist community in New York state. For seven years we lived quite contentedly in circumstances that would strike most Americans as austere: in the extreme: our living space measured just seven hundred square feet, and we didn't have a lawn, a clothes dryer, or a car. We did our grocery shopping on foot, and when we needed to travel longer distances we used public transportation. Because space at home was scarce, we seldom acquired new possessions of significant size. Our electric bill worked out to about a dollar a day.

The utopian community was Manhattan. Most Americans, including most New Yorkers, think of New York City as an

ecological nightmare, a wasteland of concrete and garbage and diesel fumes and traffic jams, but in comparison with the rest of America it's a model of environmental responsibility. In fact, by the most significant measures, New York is the greenest community in the United States. The most devastating damage that humans have done to the environment has arisen from the burning of fossil fuels, a category in which New Yorkers are practically prehistoric by comparison with other Americans, including people who live in rural areas or in such putatively eco-friendly cities as Portland, Oregon, and Boulder, Colorado. The average Manhattanite consumes gasoline at a rate that the country as a whole hasn't matched since the mid-1920s, when the most widely owned car in the United States was the Ford Model T.¹ Thanks to New York City, the average resident of New York state uses less gasoline than the average resident of any other state, and uses less than half as much as the average resident of Wyoming. Eighty-two percent of employed Manhattan residents travel to work by public transit, by bicycle, or on foot. That's ten times the rate for Americans in general, and eight times the rate for workers in Los Angeles County.² New York City is more populous than all but eleven states; if it were granted statehood, it would rank fifty-first in per-capita energy use, not only because New Yorkers drive less but because city dwellings are smaller than other American dwellings and are less likely to contain a superfluity of large appliances.³ The average New Yorker (if one takes into consideration all five boroughs of the city) annually generates 7.1 metric tons of greenhouse gases, a lower rate

than that of residents of any other American city, and less than 30 percent of the national average, which is 24.5 metric tons⁴; Manhattanites generate even less.

"Anyplace that has such tall buildings and heavy traffic is obviously an environmental disaster—except that it isn't," John Holzcrow, who recently retired as the chairman of the Sierra Club's transportation committee, told me in 2004. "If New Yorkers lived at the typical American sprawl density of three households per residential acre, they would require many times as much land. They'd be driving cars, and they'd have huge lawns and be using pesticides and fertilizers on them, and then they'd be overwatering their lawns, so that runoff would go into streams." The key to New York's relative environmental benignity is its extreme compactness. Charles Komanoff, a New York City economist, environmental activist, and bicycling enthusiast, told me, "New Yorkers trade the supposed convenience of the automobile for the true convenience of proximity. They are able to live without the ecological disaster of cars—which is caused not just by having to use a car for practically every trip, but also by the distance that you have to traverse. Bicycling, transit, and walking support each other, because they are all made possible by population density." Manhattan's density is approximately 67,000 people per square mile, or more than eight hundred times that of the nation as a whole and roughly thirty times that of Los Angeles. Placing one and a half million people on a twenty-three-square-mile island sharply reduces their opportunities to be wasteful, enables most of them to get

by without owning cars, encourages them to keep their families small, and forces the majority to live in some of the most inherently energy-efficient residential structures in the world: apartment buildings. It also frees huge tracts of land for the rest of America to sprawl into.

My wife, whose name is Ann Hodgman, and I had our first child, Laura, in 1984. Ann and I had grown up in suburbs, and we decided that we didn't want to raise Laura in a huge city. A couple of months after she learned to walk, we moved to a small town in the northwest corner of Connecticut, about ninety miles north of midtown Manhattan. Our house was built in the late 1700s. During a rainstorm one night soon after we moved in, I stuck my head into the attic and ran a flashlight over the underside of the roof. The decking boards had been made, two hundred years before, from the broad trunks of old-growth American chestnut trees, a species that was wiped out by an imported blight in the first half of the twentieth century, and some of them were almost as broad as sheets of plywood. The rafters, which were hand-hewn, were joined not by iron nails but by wooden pegs. Carved near the ends of some of the rafters were large Roman numerals, which had been placed there as assembly aids by the anonymous eighteenth-century builder. The house is across a dirt road from a nature preserve and is shaded by tall white-pine trees, and after the storm had ended I could hear a swollen creek rushing past at the bottom of the hill. Deer, wild turkeys, and the occasional black bear feed themselves in our yard, and wildflowers grow everywhere. From the

end of our driveway, I can walk several miles through woods to an abandoned nineteenth-century railway tunnel, while crossing only one paved road.

Yet our move was an ecological catastrophe. Our consumption of electricity went from roughly 4,000 kilowatt-hours a year, toward the end of our time in New York, to almost 30,000 kilowatt-hours—and our house doesn't even have central air-conditioning. We bought a car shortly before we moved, and another one soon after we arrived, and a third one ten years later. (If you live in the country and don't have a second car, you can't retrieve your first car from the mechanic after it's been repaired. The third car was the product of a mild midlife crisis; it evolved into a necessity as soon as Laura and our son, John, became old enough to drive.) Ann and I both work at home, and therefore commute by climbing a flight of stairs, but, between us, we manage to drive more than 20,000 miles a year, mostly doing ordinary errands.³ City dwellers who fantasize about living in the country usually picture themselves hiking, kayaking, gathering eggs from their own chickens, and engaging in other robust outdoor activities, but what you actually do when you move out of the city is move into a car, because public transit is nonexistent and most daily destinations are too widely separated to make walking or bicycling plausible as forms of transportation. Almost everything Ann and I do away from our house requires a car trip. The nearest movie theater is twenty minutes away, and so is the nearest large supermarket. Renting a DVD and later returning it consumes almost two gallons of gasoline, because

Blockbuster is ten miles away and each complete transaction involves two round trips. Quite often, we use a car when taking our dogs for a walk, so that the walk can begin somewhere other than our own yard. The office of our Manhattan pediatrician was in the lobby of our apartment building, an elevator ride away; the office of my Connecticut dentist is two towns over, a round trip of thirty-two miles. When we lived in New York, heat escaping from our apartment helped to heat the apartment above ours; nowadays, many of the BTUs produced by our very modern, extremely efficient oil-burning furnace leak through our two-hundred-year-old roof and into the dazzling star-filled winter sky above.

THE HISTORY OF CIVILIZATION IS A CHRONICLE OF DESTRUCTION: people arrive, eat anything slow enough to catch, supplant indigenous flora with species bred for exploitation, burn whatever can be burned, and move on or spread out. No sensitive modern human can contemplate that history without a shudder. Everywhere we look, we see evidence of our recklessness, as well as signs that our destructive reach is growing. For someone standing on the North Rim of the Grand Canyon on a moonless night, the brightest feature of the sky is no longer the Milky Way but the glow of Las Vegas, 175 miles away.⁶ Tap water in metropolitan Washington, D.C., has been found to contain trace amounts of caffeine, ibuprofen, naproxen sodium, two antibiotics, an anticonvulsive drug used to treat seizures and

bipolar disorder, and the antibacterial compound triclocarban, which is an ingredient of household soaps and cleaning agents.⁷ Modern interest in environmentalism is driven by a yearning to protect what we haven't ruined already, to conserve what we haven't used up, to restore as much as possible of what we've destroyed, and to devise ways of reconfiguring our lives so that civilization as we know it can be sustained through our children's lifetimes and beyond.

To the great majority of Americans who share these concerns, densely populated cities look like the end of the world. Because such places concentrate high levels of human activity, they seem to manifest nearly every distressing symptom of the headlong growth of civilization—the smoke, the filth, the crowds, the cars—and we therefore tend to think of them as environmental crisis zones. Calculated by the square foot, New York City generates more greenhouse gases, uses more energy, and produces more solid waste than any other American region of comparable size. On a map depicting negative environmental impacts in relation to surface area, therefore, Manhattan would look like an intense hot spot, surrounded, at varying distances, by belts of deepening green.

But this way of thinking obscures a profound environmental truth, because if you plotted the same negative impacts by resident or by household the color scheme would be reversed. New Yorkers, individually, drive, pollute, consume, and throw away much less than do the average residents of the surrounding suburbs, exurbs, small towns, and farms, because the tightly circum-

scribed space in which they live creates efficiencies and reduces the possibilities for reckless consumption. Most important, the city's unusually high concentration of population enables the majority of residents to live without automobiles—an unthinkable deprivation almost anywhere else in the United States, other than in a few comparably dense American urban cores, such as the central parts of San Francisco and Boston. The scarcity of parking spaces in New York, along with the frozen snarl of traffic on heavily traveled streets, makes car ownership an unbearable burden for most, while the compactness of development, the fertile mix of commercial and residential uses, and the availability of public transportation make automobile ownership all but unnecessary in most of the city. A pedestrian crossing Canal Street at rush hour can get the impression that New York is the home of every car ever built, but Manhattan actually has the lowest car-to-resident ratio of anyplace in America.

The apparent ecological innocuousness of widely dispersed populations—as in leafy suburbs or seemingly natural exurban areas, such as mine—is an illusion. My little town has about 4,000 residents, spread over 38.7 thickly wooded square miles (just eight fewer square miles than San Francisco), and there are many places within our town limits from which no sign of settlement is visible in any direction. But if you moved eight million people like us, along with our dwellings, possessions, vehicles, and current rates of energy use, water use, and waste production, into a space the size of New York City, our profligacy would be impossible to miss, because you'd have to stack our houses and

cars and garages and lawn tractors and swimming pools and septic tanks higher than skyscrapers, and you wouldn't be able to build roads and gas stations fast enough to serve us, even if you could find places to put them. Conversely, if you made all eight million New Yorkers live at the density of my town, they would require a space equivalent to the land area of the six New England states plus Delaware and New Jersey.⁸ Spreading people thinly across the countryside may make them feel greener, but it doesn't reduce the damage they do to the environment. In fact, it increases the damage, while also making the problems they cause harder to see and to address.

New York City is by no means the world's only or best example of the environmental benefits of concentrating human populations and mixing uses. Many large old cities in Europe—where the main population centers arose long before the automobile, and therefore evolved to be served by less environmentally disastrous means of getting around—are less wasteful than New York, and the most energy-efficient and least automobile-dependent cities in the world include a number of Asian ones, among them Hong Kong and Singapore. But New York is a useful example because it is familiar both to Americans and to people in the developing world, and because it proves that affluent people are capable of living comfortably while consuming energy and inflicting environmental damage at levels well below current U.S. averages. And—as is the case with all dense cities—New York's efficiencies are built-in and therefore don't depend on a total, sudden transformation of human nature. Even for

people who live in sparsely populated areas far from urban centers, dense cities like New York offer important lessons about how to permanently reduce energy use, water consumption, carbon output, and many other environmental ills.

Thinking of crowded cities as environmental role models requires a certain willing suspension of disbelief, because most of us have been accustomed to viewing urban centers as ecological calamities. New York is one of the most thoroughly altered landscapes imaginable, an almost wholly artificial environment, in which the terrain's primeval contours have long since been obliterated and most of the parts that resemble nature (the trees on side streets, the rocks in Central Park) are essentially decorations. Quite obviously, this wasn't always the case. When Europeans first began to settle Manhattan, in the early seventeenth century, a broad salt marsh lay where the East Village does today, the area now occupied by Harlem was flanked by sylvan bluffs, and Murray Hill and Lenox Hill were hills. Streams ran everywhere, and beavers built dams near what is now Times Square. One early European visitor described Manhattan as "a land excellent and agreeable, full of noble forest trees and grape vines," and another called it a "terrestrial *Canaan*, where the Land floweth with milk and honey."⁹

But then, across a relatively brief span of decades, Manhattan's European occupiers leveled the forests, flattened the hills, filled the valleys, buried the streams, and superimposed an unyielding, two-dimensional grid of avenues and streets, leaving

virtually no hint of what had been before. The earliest outposts of metropolitan civilization, such as it was, were confined to the island's southern tip, but in the eighteenth and nineteenth centuries settlement spread northward at an accelerating pace. In 2007, Eric Sanderson, a landscape ecologist who was completing a three-dimensional computer re-creation of precolonial Manhattan, told Nick Paumgarten, of *The New Yorker*, "It's hard to think of any place in the world with as heavy a footprint, in so short a time, as New York. It's probably the fastest, biggest land-coverage swing in history."¹⁰ Picturing even a small part of that long-lost world requires a heroic act of the imagination—or, as in Sanderson's case, a vast database and complex computer-modeling software.

Given the totality of what has been erased, contemplation of New York's evolution into a megalopolis inspires mainly a sense of loss, and ecology-minded discussions of the city tend to have a forlorn air. Nikita Khrushchev, who visited New York in the fall of 1960, found the scarcity of foliage in the city depressing by comparison with Moscow, saying, "It is enough to make a stone sad."¹¹ In environmental triage, New York is usually consigned to the hopeless category, worthy of palliative care only. Environmentalists tend to focus on a handful of ways in which the city might be made to seem somewhat less oppressively man-made: by easing the intensity of development; by creating or enlarging open spaces around structures; by relieving traffic congestion and reducing the time that drivers spend aimlessly searching for

parking spaces; by increasing the area devoted to parks, greenery, and gardening; by incorporating vegetation into buildings themselves.

But such discussions miss the point, because in most cases changes like these would actually undermine the features that create the city's extraordinary efficiency and keep the ecological impact of its residents small. Spreading buildings out enlarges the distance between local destinations, thereby limiting the utility of walking and public transportation; making automobile traffic move more efficiently enhances the allure of owning cars and, inevitably, reduces ridership on the subway. Because urban density, in itself, is such a powerful generator of environmental benefits, the most critical environmental issues in dense urban cores tend to be seemingly unrelated matters like law enforcement and public education, because anxieties about crime and school quality are among the strongest forces motivating flight to the suburbs. By comparison, popular feel-good urban eco-projects like adding solar panels to the roofs of apartment buildings are decidedly secondary, even irrelevant. Planting trees along city streets, always a popular initiative, has high environmental utility, but not for the reasons that people usually assume: trees are ecologically important in dense urban areas not because they provide temporary repositories for atmospheric carbon—the usual argument for planting more of them—but because their presence along sidewalks makes city dwellers more cheerful about dwelling in cities. Unfortunately, much conventional environmental activism has the opposite effect, since it

reinforces the view that urban life is artificial and deprived, and makes city residents feel guilty about living where and how they do.

A dense urban area's greenest features—its low per-capita energy use, its high acceptance of public transit and walking, its small carbon footprint per resident—are not inexplicable anomalies. They are the direct consequences of the very urban characteristics that are the most likely to appall a sensitive friend of the earth. Yet those qualities are ones that the rest of us, no matter where we live, are going to have to find ways to emulate, as the world's various ongoing energy and environmental crises deepen and spread in the years ahead. In terms of sustainability, dense cities have far more to teach us than solar-powered mountaintop cabins or quaint old New England towns.

THIS WAY OF THINKING SEEMS COUNTERINTUITIVE TO most Americans, including most environmentalists. Ben Jervey, in *The Big Green Apple*, a well-intentioned but frequently misleading guide to "eco-friendly living in New York City"—a concept that Jervey himself treats as oxymoronic—repeatedly misses the point about New York. "After growing up in a small town in Massachusetts," he writes in his preface, "I went off to pastoral Vermont to study and then work, all the while developing an appreciation and concern for the fragile state of the world's ecology. But as easy as it is to don a green hat up in Vermont, the beast that is New York City has the tendency to tear that noble

lid off and throw it into a puddle of mud. Upon arriving in the big city I struggled to reconcile the environmentally concerned mind-set that comes so effortlessly in a place like Vermont with my new urban lifestyle. Of course sustainable living is easier in a Vermont township, where local produce is plentiful and every backyard is equipped with a compost bin.¹²

But this is exactly wrong. "Sustainable living" is actually much harder in small, far-flung places than it is in dense cities. Jervey cites New Yorkers' "overactive dependence" on fresh water as an example of their supposed wastefulness, and he marvels that the city's total use "amounts to well over one billion gallons per day."¹³ A billion is a big number, to be sure, but New York City's population is more than thirteen times that of the entire state of Vermont, so the city's total consumption figures in any category will appear overwhelming in any direct comparison. It's per-capita consumption that is telling, though, and by that measure Vermonters use more water than New Yorkers do. They also use more than three and a half times as much gasoline—545 gallons per person per year versus 146 for all New York City residents and just 90 for Manhattan residents—with the result that, among the fifty states, pastoral Vermont ranks eleventh highest in per-capita gasoline consumption while New York state, thanks entirely to New York City, ranks last. The average Vermonter also consumes more than four times as much electricity as the average New York City resident, has a larger carbon footprint, and generates more solid waste, backyard compost bins notwithstanding.¹⁴

Jervey is by no means alone. The prominent British environmentalist Herbert Girardet—who is an author, a documentary filmmaker, and a cofounder of the World Future Council—treats large cities mainly as environmental catastrophes. "The bulk of the world's energy consumption is *within* cities," he has written, "and much of the rest is used for producing and transporting goods and people *to and from* cities."¹⁵ He proposes dramatically reducing urban energy consumption and making city dwellers less dependent on agricultural and other inputs from outlying areas, while improving overall energy efficiency through technological innovation. He has observed that cities cover just 3 or 4 percent of the earth's land area while accounting for 80 percent of the world's consumption of natural resources—as though population density were an ecological negative, and as though there were no meaningful distinction to be made between dense urban cores and lightly populated suburbs. Urban dwellers, by his way of thinking, are environmental freeloaders, parasitically drawing sustenance from the countryside, while people living at lower densities are more nearly at harmony with nature.¹⁶ Girardet is a victim (and perpetuator) of the same optical illusion as Jervey.

New Yorkers themselves seldom fully appreciate the environmental virtues of their own way of living. On Earth Day 2007, the city announced an ambitious two-decade environmental initiative, called PlaNYC, which includes dozens of far-reaching proposals, among them the planting of more than a million trees, the collection of tolls from most private and commercial

vehicles using the most traffic-clogged parts of Manhattan during the busiest times of the day, the imposition of a surcharge on the bills of the city's electrical customers, and other measures.¹⁷ Actually implementing the plan has encountered the usual difficulties (shortly before Earth Day 2008, the state legislature killed the toll-collection scheme, which is known as "congestion pricing"), but one of the most striking features of the entire plan is how little recognition it gives to the numerous ways in which New York City's environmental performance is already exemplary, even extraordinary, at least in comparison with the rest of the United States. Shortly before the plan was made public, the mayor's office released a study showing that the city's buildings are responsible for 79 percent of its greenhouse-gas emissions—an ominous statistic, the study suggested, since the national average for buildings is just 32 percent. Daniel L. Doctoroff, a deputy mayor and the city official in charge of the plan, said, "We know we have to dramatically rethink the way we work with buildings"—probably an understatement, since the mayor's announced goal was to cut greenhouse-gas emissions by 30 percent by 2030.¹⁸

Cutting greenhouse-gas emissions is a fine idea, but in the case of the city's buildings the mayor's office obscured a far more important point. The proportion of emissions attributable to buildings in New York City is high because the number of cars, which are the main source of greenhouse emissions in the rest of the country, is extremely low in relation to the city's population: it's a sign of environmental success, not failure. Thinking

in terms of proportions can only be misleading, since there's no way to decrease the percentage attributable to one element without increasing the percentage attributable to others: they're pieces of the same pie. Bringing down overall emissions levels is a worthy goal, but the mayor's emphasis was misplaced. The proportion of greenhouse-gas emissions attributable to buildings is higher in energy-efficient old European cities, too.

Equally misguided is the plan's proposal to add a surcharge to New Yorkers' electrical bills, since New York City residents, with an average of 4,696 kilowatt-hours per household per year, already consume less electricity than the residents of any other part of the country. (The average Dallas household, by contrast, uses 16,116 kilowatt-hours, more than three times as much.)¹⁹ Many news reports about the study focused on the fact that New York City is responsible for almost 1 percent of all the greenhouse gases produced by the United States, and suggested that this share was shockingly huge—but they overlooked, or mentioned only in passing, the fact that the city contains 2.7 percent of the country's population, meaning that its carbon footprint is already remarkably low in comparison with that of other American communities. Mandating large reductions in categories in which New Yorkers already lead the nation is like trying to fight obesity by putting skinny people on diets.

Thinking of New York City's environmental record as something that might instruct and inspire others, rather than treating it as a candidate for emergency intervention, requires a major conceptual leap for many, even for those who deal directly with

the city's relationship to the environment. In 2004, I called New York City's Department of Environmental Protection and told a member of that agency's staff that I was interested in talking to an expert about what I felt were ways in which New Yorkers are better environmental citizens than other Americans are. At first, she thought I was joking; later, I think, she decided I was nuts. "Why don't you call the Parks Department?" she said, finally, happy to be rid of me.

THE HOSTILITY OF MANY ENVIRONMENTALISTS TOWARD densely populated cities is a manifestation of a much broader phenomenon, a deep antipathy to urban life which has been close to the heart of American environmentalism since the beginning. Henry David Thoreau, who lived in a cabin in the woods near Concord, Massachusetts, between 1845 and 1847, established an image, still potent today, of the sensitive nature lover living simply, and in harmony with the environment, beyond the edge of civilization. Thoreau wasn't actually much of an outdoorsman, and his cabin was closer to the center of Concord than to any true wilderness, but for many Americans he remains the archetype—the natural philosopher guiltlessly living off the grid. John Muir, who was born twenty years after Thoreau and founded the Sierra Club in 1892, viewed city living as toxic to both body and soul.²⁰ The National Park Service, established by Congress in 1916, was conceived as an increasingly necessary corrective to urban life, and national parks were

treated in large measure as sanctuaries from urban depravity. The modern environmental movement arose, in the 1960s and 1970s, when a growing sense of ecological crisis, first inspired nationwide by Rachel Carson's extraordinarily influential book *Silent Spring*,²¹ combined with other social forces, including the civil rights movement, opposition to the Vietnam War, and the power of OPEC, to create a sense among large numbers of mainly young people that just about everything wrong with the United States was urban in essence, and could be combated only by establishing, or reestablishing, a direct connection to "the land." American environmentalists in every age have tended to agree with Thomas Jefferson, who, in 1803, dismissed "great cities" as "pestilential to the morals, the health and the liberties of man."²²

Jefferson made that disparaging remark in a letter to Dr. Benjamin Rush, a fellow signer of the Declaration of Independence. Daniel Lazare, in *America's Undeclared War: What's Killing Our Cities and How We Can Stop It*, cites that letter as a key document in the history of what he identifies as an enduring national antagonism toward urban life. Recently, I asked Lazare whether he detected that same antagonism in the modern American environmental movement. "Unquestionably," he said. "Green ideology is a rural, agrarian ideology. It seeks to integrate man into nature in a very kind of direct, simplistic way—scattering people among the squirrels and the trees and the deer. To me, that seems mistaken, and it doesn't really understand the proper relationship between man and nature. Cities are much more eff-

cient, economically, and also much more benign, environmentally, because when you concentrate human activities in confined spaces you reduce the human footprint, as it were. That is why the disruption of nature is much less in Manhattan than it is in the suburbs. The environmental movement is deeply strained with a sort of Malthusian current. It's anti-urban, anti-industrial, agrarian, primitivist. Manhattan seems to be a supremely unnatural place because of all the concrete and glass and steel, but the paradox is that it's actually more harmonious and more benign, in terms of nature, than ostensibly greener human environments, which depend on huge energy inputs, mainly in the form of fossil fuels. In order to surround ourselves with nature, we get in cars and drive long distances, and then build silly pseudo-green houses in the middle of the woods—which are actually extremely disruptive, and very, very wasteful."

To be sure, there has always been plenty to loathe about urban living. The history of large cities all over the world is a history of filth and squalor and disease. Benjamin Rush placed himself at tremendous personal risk in 1793, a decade before Jefferson's letter, while attempting to combat a yellow fever epidemic in Philadelphia, which was then both the nation's capital and, with a population of 55,000, its largest city. No one in those days knew how yellow fever was transmitted, but there was no local shortage of plausible explanations. The streets of Philadelphia, like the streets of most cities, were reeking, open sewers, and that particular summer the air had been made especially rank by the arrival from the Caribbean of a large shipment of

spoiled coffee beans, which had been left to rot on the wharf and seemed to Rush to be the most likely cause of the disease.²³ Jefferson's letter made specific reference to that epidemic, which killed 4,000 Philadelphians (and caused Jefferson himself to flee the city, along with many other government officials and most of the city's wealthier inhabitants, including most of its physicians). "When great evils happen," Jefferson wrote to Rush, "I am in the habit of looking out for what good may arise from them as consolations to us, and Providence has in fact so established the order of things, as that most evils are the means of producing some good. The yellow fever will discourage the growth of great cities in our nation—a providential result, in his view. He acknowledged that cities "nourish some of the elegant arts," but stated that "the useful ones can thrive elsewhere, and less perfection in the others, with more health, virtue & freedom, would be my choice."²⁴ New York City, he wrote twenty years later, "seems to be a Cloacina* of all the depravities of human nature."²⁵

The early stirrings of industrialization magnified this sense of urban catastrophe. Human populations all over the world had always dumped their waste into the same lakes and streams from which they drew their drinking water, and the local consequences became more dire as the settlements grew, and as steady advances in human ingenuity outpaced awareness of the dangers

*Cloacina was the goddess of the Roman sewer system. The name comes from the Latin word for "sewer" or "drain."

posed by the effluents of prosperity. A source of drinking water for some early Manhattanites was Fresh Water Pond, also known as the Collect, a deep, seventy-acre spring-fed body of water just north of where Canal Street lies today. By 1800, though, the pond had become, according to various observers, "a shocking hole . . . foul with excrement, frog-spawn and reptiles," a "very sink and common sewer," and a heavily used dump for breweries, tanneries, and other toxin-generating commercial enterprises; within fifteen years it had to be filled in.²⁶ Throughout the city, the streets were mired in animal and human waste, and the air was thick with smoke and insects, and the shallow wells that provided drinking water for the city's residents were incubators of disease.

In 1832, cholera struck New York, killing 3,515, and its focus was the notorious neighborhood called Five Points, a foul slum that had arisen on the site of the filled-in Fresh Water Pond. (The same neighborhood provided the setting for Martin Scorsese's 2002 film *Gangs of New York*.) The epidemic inspired the same sort of panic and heroic but futile intervention that had characterized Philadelphia's response to yellow fever four decades earlier. A city newspaper reported, "The roads, in all directions, were lined with well-filled stage coaches, livery coaches, private vehicles and equestrians, all panic-stricken, fleeing the city, as we may suppose the inhabitants of Pompeii fled when the red lava showered down upon their houses."²⁷ It's no wonder that Jefferson felt, as he wrote to James Madison in 1787, "When we get piled upon one another in large cities as

in Europe, we shall become corrupt as in Europe, and go to eating one another as they do there."²⁸

Europeans viewed the same evolution with a similar sense of horror. In 1847, a Scottish visitor to England concisely summarized the dark side of that country's industrial progress, when he described the Irwell River as it flowed out of Manchester: "There are myriads of dirty things given it to wash, and whole wagon-loads of poisons from dye-houses and bleach-yards thrown into it to carry away; steam-boilers discharge into it their seething contents, and drains and sewers their fetid impurities; till at length it rolls on—here between tall dingy walls, there under precipices of red sandstone—considerably less a river than a flood of liquid manure, in which all life dies, whether animal or vegetable, and which resembles nothing in nature, except, perhaps, the stream thrown out in eruption by some mud-volcano."²⁹ The proposed solution was to reverse the direction of human migration—in effect, to create sprawl. In 1898, Ebenezer Howard, a British urban planner and the originator of the open-space-oriented development scheme known as the garden city movement, wrote, "It is wellnigh universally agreed by men of all parties, not only in England, but all over Europe and America and our colonies, that it is deeply to be deplored that people should continue to stream into the already over-crowded cities, and should thus further deplete the country districts." Howard, in support of this idea, quoted the cleric Frederic William Farrar, who had described large cities as "the graves of the physique of our race." Howard called the countryside "the sym-

bol of God's love and care for man," and concluded that what Britain needed was "the spontaneous movement of the people from our crowded cities to the bosom of our kindly mother earth, at once the source of life, of happiness, of wealth, and of power."³⁰

This idea—that city life is hopelessly demented and that the solution to urban problems is to spread out—has been with us ever since. It's the motivation for building suburbs, and it's still seductive; it's why I live where I live. But it's also a prescription for strip malls and expressways and tremendous waste, and it's the basis for the helter-skelter residential development which has turned out to be America's true manifest destiny. The Sierra Club has a national campaign called Challenge to Sprawl, the goal of which is to arrest the mindless conversion of undeveloped countryside into subdivisions and SUV-clogged expressways. But in a paradoxical way the Sierra Club itself has been a major contributor to sprawl, because the organization's anti-city ethos, which has been indivisible from its mission since the time of John Muir, has fueled the yearning for fresh air and elbow room which drives not only the preservation of wilderness areas but also the construction of disconnected residential developments and daily hundred-mile commutes. It also contributed to the popularity of SUVs and pickup trucks, both of which have been marketed by their manufacturers as "off-road" vehicles, designed to carry their nature-loving occupants into the great outdoors, even though just 6 percent of SUV owners ever actually operate their vehicles in four-wheel-drive mode. (Tom

McCarthy, in *Auto Mania*, points out that the names of SUVs almost always reinforce this wilderness fantasy: Blazer, Yukon, Pathfinder, Explorer, Expedition, Sierra. Among the advertising slogans for my car, a Subaru all-wheel-drive station wagon called an Outback, is "My other car is a pair of boots" and "It loves the outdoors as much as you do."³¹ Preaching the sanctity of open spaces helps to propel development into those very spaces, and the process is self-reinforcing because, as one environmentalist said to me, "Sprawl is created by people escaping sprawl." Wild landscapes are less often destroyed by people who despise wild landscapes than by people who love them, or think they do—by people who move to be near them, and then, when others follow, move again. Thoreau's cabin, a mile from his nearest neighbor, set the American pattern for creeping residential development, since anyone seeking to replicate his experience needed to move a mile farther along. Jefferson, too, embodied the ethos of suburbia. Indeed, he could be considered the prototype of the modern American suburbanite, since for most of his life he lived far outside the central city in a house that was much too big, and he was deeply enamored of high-tech gadgetry and of buying on impulse and on credit, and he embraced a self-perpetuating cycle of conspicuous consumption and recreational home improvement. The standard object of the modern American dream, the single-family home surrounded by grass, is a mini-Monticello.

Anti-urbanism still animates American environmentalism, and is evident in the technical term that is widely used for

sprawl: "urbanization." This is unfortunate, because thinking of freeways and strip malls as "urban" phenomena obscures the ecologically monumental difference between Manhattan and Phoenix, or between Copenhagen and Kansas City, and fortifies the perception that population density is an environmental ill. In 2006, Melissa Holbrook Pierson, a writer who lives in a smallish town in the Hudson River Valley, in upstate New York, published a book called *The Place You Love Is Gone*, a deeply felt paean to the lost American landscape, the one obliterated by sprawl. At one point, driven by what she refers to as "lacerating nostalgia," she describes the nightmare transformation of Akron, Ohio, where she grew up in the late 1950s and early 1960s. "I can't help it if I want to live in the past!" she writes. "It's my past, the time forty years ago when there was still some wide-open space into which to insert some dreaming, and still some darkness at night over it." She even manages to weep a little over Hoboken, New Jersey, where she lived, mostly unhappily, as a young adult. Her bitterest emotions, though, she reserves for New York City, which she accuses of having destroyed a pastoral paradise in order to create the extensive upstate reservoir system that supplies its drinking water—of "rubbing its chin in contemplation of turning faraway valleys into pipes to service its water closets." The city's early-twentieth-century planners, anticipating the population growth to come, condemned farms and rural hamlets far from the city in order to build the extraordinary chain of reservoirs without which New York City could

not exist, and Pierson describes this massive engineering project as "larceny." Her arguments persuaded Anthony Swofford, who reviewed the book in *The New York Times*. He wrote, "The story of New York City's water grab is astonishing, nearly unbelievable in its scope and greed," and he described the creation of the city's water system, as recounted by Pierson, as "rural slaughter for the survival of the city."³²

But this is wrong. If New York City could somehow be dismantled and its residents dispersed across the state at the density of Pierson's current hometown, what remains today of pastoral New York state would vanish under a tide of asphalt. Dense urban concentrations of people, along with the freshwater reservoirs and other infrastructure necessary to support them, are not the enemies of the images she clings to. It is the existence of Manhattan, not the nostalgia of Baby Boomers, that makes the Catskills possible, and it's small-town residents, not subway-riding apartment dwellers, who foster strip malls.³³ You create open spaces not by spreading people out but by moving them closer together. Pierson does write, near the end of her book, that "it is the thousands of acres of uninhabited, forested land in the buffer zones of the New York City watershed that have preserved wilderness in the midst of an inexorably creeping urbanization."³⁴ But she doesn't acknowledge the role of her own form of nostalgia in the creation of the thing she hates. Many more acres of upstate pastoral paradise were destroyed by the steady spread of towns like hers than by the creation of the water

supply system that makes it possible for New York City to exist. Building the city didn't fill the Hudson Valley with parking lots; fleeing the city did.

THE SIGNIFICANCE OF POPULATION DENSITY WAS ELUCIDATED brilliantly in 1961 in a landmark book called *The Death and Life of Great American Cities*, by Jane Jacobs.³⁵ Jacobs upended many widely held ideas about how cities ought to be put together, and she has been celebrated ever since as an urban-planning iconoclast and visionary, but she could be viewed just as easily as a pioneering environmentalist. Indeed, Jacobs's book may be most valuable today as a guide to reducing the ecological damage caused by human beings, even though it scarcely mentions the environment, other than by making a couple of passing references to smog.

The central idea of Jacobs's book is that density and diversity are the engines that make human communities work. She lived in Greenwich Village at the time,* and she had come to realize that the qualities she found most appealing about city life could be traced to the fact that she and her neighbors lived very near to one another, that their tightly spaced apartment buildings were of varying sizes and configurations, that residences were closely mixed with businesses, and that she and her neighbors

*She and her family moved to Toronto in 1968, primarily out of opposition to the Vietnam War. She died in 2006.

were not narrowly segregated by wealth. Society, she decided, has a critical mass. Spread people too thinly and sort them too finely, and they cease to interact; move them and their daily activities closer together, and the benefits cascade: their neighborhoods grow safer, they become more attuned to one another's needs, they have more restaurants and movie theaters and museums to choose from, and their lives, generally, become more varied and engaging. Jacobs's focus was on the vibrancy of city life, but the same urban qualities that she identified as enhancing human interaction also dramatically reduce energy consumption and waste. Placing people and their daily activities close together doesn't just make the people more interesting; it also makes them greener.

Unfortunately, her catalogue of the failures of modern urban planning also still applies, almost fifty years later, with little modification, all across America: "Low-income projects that become worse centers of delinquency, vandalism and general social hopelessness than the slums they were supposed to replace. Middle-income housing projects which are truly marvels of dullness and regimentation, sealed against any buoyancy or vitality of city life. Luxury housing projects that mitigate their inanity, or try to, with a vapid vulgarity. Cultural centers that are unable to support a good bookstore. Civic centers that are avoided by everyone but bums, who have fewer choices of loitering place than others. Commercial centers that are lackluster imitations of standardized suburban chain-store shopping. Promenades that go from no place to nowhere and have no

promenaders. Expressways that eviscerate great cities.³⁶ These flaws, she argued persuasively, are not unavoidable; they are merely the products of our ongoing failure to understand what we really want.

Of course, living in densely populated urban centers still has many drawbacks, even though city streets, nowadays, are no longer ankle-deep in horse manure. New Yorkers at all income levels live in spaces that would seem cramped to Americans almost anywhere else. A friend of mine who grew up in a townhouse in Greenwich Village thought of his upbringing as privileged until, in prep school, he visited a classmate from the suburbs and was staggered by the house, the lawn, the cars, and the swimming pool, and thought, with despair, You mean I could live like this? Riding the subway can be depressing even to a committed transit supporter, and during the summer it is often distressingly dirty and hot. Ann's and my apartment was fourteen floors above Second Avenue, yet the noise from the street was so loud, even in the middle of the night, that we both slept with earplugs. Joggers in Manhattan have to weigh the benefits of exercise against the dangers of inhaling bus and taxi fumes while they run.

Density, for many of the same reasons that it makes people more efficient, makes disasters more efficient, too. On 9/11, the airplane that crashed in the Pennsylvania countryside killed the occupants of the plane, while the two planes that struck the World Trade Center killed thousands and could have killed tens of thousands if the circumstances had been slightly different. New York City's water supply enters the city through three tun-

nels, the loss of which would make the city uninhabitable. Epidemics, from the Black Death down, have inflicted their highest death tolls on dense urban populations, which, for the same reasons, are highly vulnerable to biological weapons. Rising sea levels won't be a direct problem in my little town, which is more than thirty miles from the coast, but even a small rise could cripple Manhattan's sewer system, which malfunctions during rainstorms even now. The most powerful earthquake known to have occurred in the continental United States—the so-called New Madrid quake, a series of four huge shocks that struck what is now southeastern Missouri in 1811 and 1812—rerouted the Mississippi River and could be felt on the East Coast, yet it killed fewer than a hundred people because the area above the epicenter was so sparsely settled. An earthquake of comparable magnitude occurring today along any known fault in Los Angeles or San Francisco would kill hundreds of thousands and create a public-health disaster beyond comprehension.

Nevertheless, barring a massive reduction in the earth's population, dense urban centers offer one of the few plausible remedies for some of the world's most discouraging environmental ills, including climate change. To borrow a term from the jargon of computer systems, dense cities are scalable, while sprawling suburbs and isolated straw-bale eco-redoubts are not. Anti-urban naturalists like Thoreau and Muir make poor guides for anyone struggling with the increasingly urgent problem of how to support billions of mobile, acquisitive, hungry human beings without triggering disasters that can't be contained. The

environmental problem we face, at the current stage of our assault on the world's nonrenewable resources, is not how to make our teeming cities more like the countryside. The problem we face is how to make other settled places more like Manhattan, whose residents currently come closer than any other Americans to meeting environmental goals that all of us, eventually, will have to come to terms with.

NEW YORK'S EXAMPLE, ADMITTEDLY, IS DIFFICULT FOR others (or even New York itself) to imitate, because the city's remarkable population density is the result not of conscientious planning but of a succession of serendipitous historical accidents. The most important of those accidents was geographic: New York arose on a small island rather than on the mainland edge of a river or a bay, and the surrounding water served as a physical barrier to outward expansion. Manhattan is like a typical seaport turned inside out—a city with a harbor around it, rather than a harbor with a city along its edge. The deep water surrounding Manhattan and linking it to the ocean made the city easily accessible to large ships, and insularity gave the city more shoreline per square mile than other ports, major advantages in the days when one of the world's main commercial activities was moving cargoes between ships. (The sailing vessels lying at anchor along Manhattan's shoreline in that era were so numerous that they created, according to one description, "a circumferential forest of spars."³⁷) Manhattan's physical isolation

also drove early development inward and upward. The American cities with the next highest per-capita rates of transit use, San Francisco and Boston, are similarly constrained, since both are situated on island-like peninsulas, while the cities with the highest rates of automobile use—places like Atlanta, Phoenix, and Kansas City—are the ones that, throughout their history, have faced the fewest natural and political barriers to low-density horizontal expansion. The densest parts of Chicago are those abutting the western shore of Lake Michigan, which acted like a dam against the flux of population growth. Hong Kong is doubly insular, both geographically and geopolitically.

A second lucky accident was that Manhattan's street plan was created by merchants who were more interested in economic efficiency than in boulevards, parks, or empty spaces between buildings. In 1807, the state legislature appointed a local commission to "lay out streets, roads, public squares of such extent and direction as to them shall be most conducive to the public good," and the commissioners hired John Randel, Jr., a young surveyor, to create a detailed map of the island, most of which was still essentially wilderness. Randel and his assistants spent years meticulously measuring and documenting Manhattan's then complex topography—although on the plan he submitted to the commission, in 1811, the suggested street plan runs as it does now, in perfectly straight lines, forming a regular gridiron, as though the hills and streams did not exist. "The natural geography of the island was originally to be a factor in devising a street system," Robert T. Augustyn and Paul E. Cohen write in

Manhattan in Maps, "but there is little evidence in the . . . numbered parallel and perpendicular streets and avenues delineated on Randel's map that the topography of the island was even a consideration."³⁸ The plan adopted by the commissioners retained this feature, without which Manhattan's extreme density would have been harder to achieve. The plan also included only a handful of parks and public squares, all of them small. The commissioners' view regarding parks was that "vacant spaces" were made unnecessary by "those large arms of the sea which embrace Manhattan Island," thereby providing what they felt to be an adequate supply of fresh air and obviating the need to sacrifice developable real estate to recreation.³⁹ No one today would lay out such a large inhabited area with such a paucity of open space, but the relentlessness of the street plan is actually one of the keys to the city's continuing vitality—and to its greenness. One of Jane Jacobs's many arresting observations is that parks and other open spaces, if poorly planned, can actually make cities less livable, by creating dead ends that prevent people from moving freely between neighborhoods and by decreasing adjacent activity, a subject to which I'll return in chapter 4.⁴⁰ Manhattan's crush of architecture is paradoxically humanizing, because it brings the city's commercial, cultural, and other offerings closer together, thereby increasing their accessibility. It also makes the city greener, primarily by greatly reducing dependence on automobiles.

A third accident was that residential and commercial development were more thoroughly mixed in New York than they

would later become in most other parts of the United States. The city, early in the twentieth century, was actually an originator and early adopter of zoning regulations—development rules intended to create sharp divisions between what, by then, had come to be viewed as incompatible human activities, by confining residential, commercial, and industrial uses in non-overlapping districts—but many parts of the city were already such a dense and fertile jumble as to be relatively impervious to the scheming of urban planners, a trait the city shared with the older cities of Europe. The liveliest and greenest parts of New York today are the ones that least conform to received American ideas about what should go next to what. In the rest of the country, zoning schemes that were conceived and implemented early in the twentieth century are among the most significant causes of sprawl, and among the most enduring impediments to public transit, since in many cases they make even moderate density impossible. In such municipalities, John Holtzclaw has written, "zoning requires front and side yard setbacks, wide streets and two or more off-street parking places, reducing densities and separating destinations. Many suburbs prohibit sidewalks and convenient nearby markets, restaurants, and other commerce. These government mandates force destinations farther apart, lengthening trips, such that nonautomotive modes become less viable."⁴¹

A fourth accident was the fact that by the early 1900s most of Manhattan's lines had been filled in to the point where not even Robert Moses, the metropolitan area's "master builder,"

could redraw them to accommodate the automobile.⁴² Before cars, people lived close to other people to survive; with cars, proximity became less important—indeed, it became undesirable. Henry Ford, who viewed urban life with as much distaste as Jefferson had, called the city a “pestiferous growth” and thought of his cars as tools for liberating humanity. In 1932, John Nolen, a prominent Harvard-educated urban planner and landscape architect who embraced Ford’s notion of urban liberation-by-automobile, said, “The future city will be spread out, it will be regional, it will be the natural product of the automobile, the good road, electricity, the telephone, and the radio, combined with the growing desire to live a more natural, biological life under pleasanter and more natural conditions.”⁴³ This is the very formula for sprawl, and most of the country has followed it.

New York City’s apparent urban antithesis, in terms of automobile use, is metropolitan Los Angeles, whose metastatic outward growth has been virtually unimpeded by the lay of the land, whose early settlers came to the area partly out of a desire to create space between themselves and others, and whose main development began late enough to be shaped mainly by the needs of cars. But a more telling counterexample is Washington, D.C., whose basic layout was conceived at roughly the same time as Manhattan’s. The District of Columbia’s original plan was created by an eccentric French-born engineer and architect named Pierre-Charles L’Enfant, who befriended General Washington during the Revolutionary War and asked to be allowed

to design the capital. L’Enfant was notoriously hard to get along with, and he was fired after little more than a year, in 1792, but many of modern Washington’s most striking features are his: the broad, radial avenues; the hublike traffic circles; the sweeping public lawns and ceremonial spaces.

Washington is commonly viewed as the most intelligently beautiful—the most European—of large American cities, and it is, indeed, a city of restrained proportions and stirring metropolitan vistas. Ecologically, though, it’s a mess and not truly European at all. The city was designed in part to make true density impossible; and because the federal government grew more slowly than the national economy, there was no pressure to abandon that early ideal. L’Enfant’s expansive avenues were easily adapted to automobiles, and the low, widely separated buildings (whose height is limited by law) stretched the distance between destinations: keeping civilization low makes it wide. There are many pleasant places in Washington to go for a walk, but it is actually difficult to get around the city on foot. The wide avenues are hard to cross, the huge traffic circles are like obstacle courses, and the grandiloquent empty spaces thwart pedestrians. Many parts of Washington, furthermore, are relentlessly homogeneous. Dignified public buildings abound on Constitution Avenue, but good luck finding a dry cleaner, a Chinese restaurant, or a grocery store. The D.C. subway system is modern, clean, and extensive, but no one with a car feels compelled to take the train because there’s always a place to park. The city’s horizontal, airy design has also pushed development far into the surrounding country-

side. One of the fastest-growing counties in the United States is Loudoun County, Virginia, at the rapidly receding western edge of the Washington metropolitan area. When cities are built on a "human" scale, they virtually force the creation of vast suburbs, with miles of freeways, long commutes, traffic jams, and shopping malls. The District of Columbia was a thing of beauty when the region surrounding it was relatively empty of human beings, but the city, as governed by its own design and land-use rules, is structurally unable to absorb its own growth. The sprawl of metropolitan Washington is not a perversion of L'Enfant's plan; it's the logical result.

ONE OF THE MOST ABUSED WORDS IN THE ENGLISH language in recent years, without a doubt, has been "sustainable." Like "solution"—a vaporous buzzword ubiquitous in corporate slogans—it signifies both anything and nothing. Hundred-thousand-dollar kitchen renovations are described as sustainable if the doors of the new cabinets are veneered with bamboo; concept cars are called sustainable if their seats are made with soy-based foam. A similar fog of meaninglessness characterizes almost any recent marketing effort with an environmental theme. An article in *The New York Times* in 2007 provided a humorous catalogue of contradictions from the shelves of Home Depot, which was running a green promotion it called Eco Options: "Plastic-handled paint brushes were touted as nature-friendly because they were not made of wood. Wood-

handled paint brushes were promoted as better for the planet because they were not made of plastic."⁴⁴ In 2008, Discovery Communications launched Planet Green, an environmentally oriented cable-television channel, whose "exclusive automobile sponsor" was General Motors.⁴⁵ The cover story of the March-April 2008 issue of *Correctional News*, a magazine for people who run prisons, was "Greening the Big House: Sustainability in Corrections."⁴⁶ If you write to the makers of Annie's macaroni and cheese (a family favorite), they'll send you a "BE GREEN, Help the Earth Live" bumper sticker for your car, to let others know "that you're an Earth advocate, and that you care about what happens to our wondrous blue and green planet."⁴⁷

Most of the products, technologies, and practices popularly touted as sustainable are not sustainable at all. Driving a gas-electric hybrid automobile is more environmentally benign, mile for mile, than driving a Hummer, but hybrids are not sustainable, because they require petroleum and the world's supply of petroleum is finite. Buying locally grown food can put interesting, wholesome meals on people's dinner tables, but "localism" is not sustainable as a strategy for feeding the world, or even northwestern Connecticut, because spreading populations across arable regions at densities low enough to make agricultural self-sufficiency feasible would be an environmental and economic disaster. A private mini-hydroelectric plant powered by a rushing stream may enable its owner to disconnect from the public power grid, but such power plants are not sustainable for anyone but their owners, because the earth's population could not sur-

vive in any arrangement of dwellings which would enable every residence to generate its own electricity. In the very long run, of course, life itself is unsustainable, no matter what we human beings do or fail to do, because the sun will eventually burn out. Over time spans shorter than cons, though, uncertainties abound. The way we Americans live now is clearly unsustainable, since we are rapidly depleting the natural resources on which we've built our turbocharged way of life. The cherished secret hope of most of us—that some sudden technological breakthrough will enable our children and grandchildren to live the way we live now, except with smaller cars and larger recycling bins—is patently a fantasy, at least until the physicists get nuclear fusion sorted out.

The crucial fact about sustainability is that it is not a micro phenomenon: there can be no such thing as a "sustainable" house, office building, or household appliance, for the same reason that there can be no such thing as a one-person democracy or a single-company economy. Every house, office building, and appliance, no matter where its power comes from or how many of its parts were made from soybeans, is just a single small element in a civilization-wide network of deeply interdependent relationships, and it's the network, not the individual constituents, on which our future depends. Sustainability is a context, not a gadget or a technology. This is the reason that dense cities set such a critical example: they prove that it's possible to arrange large human populations in ways that are inherently less wasteful and destructive.

In 1997, in Kyoto, Japan, representatives of most of the world's countries, after two and a half years of sometimes highly contentious negotiations, adopted a protocol intended to reduce global production of greenhouse gases. The United States signed the original agreement but pulled out in 2001, becoming one of only two of the original signatories to refuse to ratify the plan, which went into effect in 2005. (The other holdout was Kazakhstan.) America's intransigence has infuriated many environmentalists, at home and elsewhere, but in practical terms the impact of our refusal to sign has been zero. So far, the most effective way for a country to cut its carbon output has been to suffer a well-timed industrial implosion, as Russia did after the collapse of the Soviet Union, in 1991. The Kyoto benchmark year is 1990, when the smokestacks of the Soviet military-industrial complex were still blackening the skies. By the time Vladimir Putin ratified the protocol, in 2004, Russia was already certain to meet its goal for 2012. The countries with the best emissions-reduction records—Ukraine, Latvia, Estonia, Lithuania, Bulgaria, Romania, Hungary, Slovakia, Poland, and the Czech Republic—were all parts of the Soviet empire and therefore look good for the same reason. Ted Nordhaus and Michael Shellenberger, in their 2007 book *Break Through: From the Death of Environmentalism to the Politics of Possibility*, write, "Germany and Britain have reduced their emissions, but most of those reductions were due to the collapse of the British coal-mining industry in the 1980s and the collapse of East German heavy industry and power generation after the reunification of

Germany. Little of the reduction in Britain or Germany is attributable to regulatory actions taken by the European Union or national governments in the effort to reduce greenhouse-gas emissions. Greenhouse-gas emissions throughout the rest of Europe and the rest of the developed world have either remained steady or increased.⁴⁸

Canada ratified the Kyoto Protocol, and its experience is suggestive because its economy and per-capita oil consumption are similar to those of the United States. Canada's Kyoto target is a 6 percent reduction from 1990 levels. By 2006, however, despite the expenditure of billions of dollars on climate initiatives, its greenhouse-gas output had increased to 122 percent of the goal. And Canada's post-Kyoto record looks even worse if you include LULUCF (land use, land-use change, and forestry), a calculation intended to reflect the greenhouse impact of timber harvesting, land clearing, and similar activities; including LULUCF, the increase in Canada's emissions was more than twice as high. In 2006, Canada's environmental minister described his country's Kyoto targets as "impossible."⁴⁹

The explanation for Canada's difficulties isn't complicated: the world's principal source of man-made greenhouse gases has always been prosperity. That relationship is easy to see, now that the global recession has flipped it onto its back: shuttered factories don't spew carbon dioxide; the unemployed drive fewer miles and turn down their furnaces, air conditioners, and swimming-pool heaters; struggling corporations and families cut back on air travel; even affluent people buy less throwaway junk. Gasoline

consumption in the United States fell almost 6 percent in 2008. That was the result not of a sudden greening of the American consciousness but of the rapid rise in the price of oil during the first half of the year, followed by the full efflorescence of the current economic mess.

What would it take, short of utter economic collapse, for a prosperous First World population to reduce its carbon output and other environmental impacts permanently? The standard prescription is familiar: less reliance on fossil fuels, more reliance on renewable energy (and uranium), increased efficiency, reduced waste, more buses, fewer incandescent lightbulbs, more recycling. These and other elements, to be sure, will become increasingly important parts of our lives with every month that passes, but decades of experience have shown that the measurable results of our conscious efforts to use less are seldom as significant as forecast, and that reductions in waste are typically offset or exceeded by increases in consumption.

These discouraging realities make urban density even more significant as an environmental tool. Cutting back overall U.S. per-capita greenhouse emissions to New York City's current level would require a national reduction of 71 percent—a feat that not even the wildest Kyoto optimist thinks is remotely achievable. Yet New York's record is not the result of a massive, expensive environmental campaign; it's the result of New Yorkers living the way New Yorkers have always lived. The city's efficiencies, like the efficiencies of all dense urban cores, are built into the fabric of the place, and they don't depend on an unprece-

dented commitment to sacrifice and compliance by environmentally concerned citizens. In fact, New Yorkers themselves, when informed that their per-capita energy consumption is the lowest in the United States, usually express surprise. They don't generate less carbon because they go around snapping off lights.

Granted, directly comparing New York's greenhouse emissions with those of the rest of the country is unfair to much of the rest of the country, because the city couldn't exist without massive agricultural, industrial, and other inputs from far beyond its borders, and is therefore responsible for emissions occurring elsewhere. But all other American communities are subject to this same interdependence, and, even if they weren't, New York's example would still be significant because the city proves that tremendous environmental gains can be achieved by arranging infrastructure in ways that make beneficial outcomes inescapable and that don't depend on radically reforming human nature or implementing technologies that are currently beyond our capabilities or our willingness to pay. At an environmental presentation in 2008, I sat next to an investment banker who was initially skeptical when I explained that Manhattanites have a significantly lower environmental impact than other Americans. "But that's just because they're all crammed together," he said. Just so. He then disparaged New Yorkers' energy efficiency as "unconscious," as though intention trumped results. But unconscious efficiencies are the most desirable ones, because they require neither enforcement nor a personal commitment to cutting back. I spoke with one energy expert, who, when I asked him to

explain why per-capita energy consumption was so much lower in Europe than in the United States, said, "It's not a secret, and it's not the result of some miraculous technological breakthrough. It's because Europeans are more likely to live in dense cities and less likely to own cars." In European cities, as in Manhattan, in other words, the most important efficiencies are built-in. And for the same reasons.

This is not necessarily a message that Americans like to hear, or that environmentalists like to give. The Sierra Club's website features a slide-show-like demonstration that illustrates how various sprawling suburban intersections could be transformed into far more appealing and energy-efficient developments by implementing a few modifications, among them widening the sidewalks and narrowing the streets, mixing residential and commercial uses, moving buildings closer together and closer to the edges of sidewalks (to make them more accessible to pedestrians and to increase local density), and adding public transportation—all fundamental elements of the widely discussed anti-sprawl strategy known as Smart Growth. In a 2004 telephone conversation with a Sierra Club representative involved in Challenge to Sprawl, I said that the organization's anti-sprawl suggestions and the modified streetscapes in the slide show shared many significant features with Manhattan—whose most salient characteristics include wide sidewalks, narrow streets, mixed uses, densely packed buildings, and an extensive network of subways and buses. The representative hesitated, then said that I was essentially correct, although he would prefer that the program not be described in such terms,

since emulating New York City would not be considered an appealing goal by most of the people whom the Sierra Club is trying to persuade. The truth, though, is inescapable. In a world of nearly 7 billion people and counting, sustainability, if it can be achieved, will look a lot more like midtown Manhattan than like rural Vermont.

The environmental lessons that New York City offers are not necessarily easy to apply—and, even to New Yorkers, they can often be difficult to discern—but the most important of them can be summarized simply:

- *Live smaller:* The average American single-family house doubled in size in the second half of the twentieth century, and the size of the average American household shrunk. Oversized, under-occupied dwellings permanently raise the world's demand for energy, and they encourage careless consumption of all kinds. In the long run, big, empty houses are no more sustainable than SUVs or private jets, no matter how many photovoltaic panels they have on their roofs. As the cost of energy inevitably rises in the years ahead, and as the long-term environmental and economic consequences of our accustomed levels of wastefulness become clearer and more dire, we are going to need to find ways to reduce the size of the spaces we inhabit, heat, cool, furnish, and maintain. (A notable counter-trend: while the typical American single-family house was doubling in size, rising real estate

values in New York City were reducing the size of the living space of the average Manhattan resident, thereby making it more efficient.)

- *Live closer:* The main key to lowering energy consumption and shrinking the carbon footprint of modern civilization is to contract the distances between the places where people live, work, shop, and play. Unfortunately, the steady enlargement of the American house was accompanied by the explosive growth of low-density subdivisions and satellite communities linked by networks of new highways and inhabited by long-distance commuters. Living closer to one's daily destinations, Manhattan-style, reduces vehicle miles traveled, makes transit and walking feasible as forms of transportation, increases the efficiency of energy production and consumption, limits the need to build superfluous infrastructure, and cuts the demand for such environmentally doomed extravagances as riding lawnmowers and household irrigation systems. The world, not just the United States, needs to pursue land-use strategies that promote high-density, mixed-use urban development, rather than sprawl.
- *Drive less:* Making automobiles more fuel-efficient isn't necessarily a bad idea, but it won't solve the world's energy and environmental dilemmas. The real problem with cars is not that they don't get enough miles to the gallon; it's that they make it too easy for people to spread out, encouraging forms of development that are inherently waste-

ful and damaging. Most so-called environmental initiatives concerning automobiles are actually counterproductive, because their effect is to make driving less expensive (by reducing the need for fuel) and to make car travel more agreeable (by eliminating congestion). What we really need, from the point of view of both energy conservation and environmental protection, is to make driving costlier and less pleasant. And that's as true for cars that are powered by recycled cooking oil as it is for cars that are powered by gasoline. In terms of the automobile's true environmental impact, fuel gauges are less important than odometers. In the long run, miles matter more than miles per gallon. As we make *cars* more efficient, we must compensate by making *driving* less so—a goal both harder to attain and less likely to be embraced by drivers themselves.

None of these imperatives will be easy to implement. But New York and the world's other dense cities point the way. Those cities' long-term value as role models has yet to be widely embraced, partly because many of the benefits of urban density are counterintuitive, and partly because most Americans, including most environmentalists, are more likely to think of places like Manhattan as exasperating environmental problems than as tantalizing sources of environmental solutions. New York is the place that's fun to visit but you wouldn't want to live there. What could it possibly teach anyone about being green?

Two

Liquid Civilization

Every serious discussion of the environment—every book, every article, every lecture, every television news report, every magazine article, every dire warning—is ultimately about oil, whether it specifically mentions oil or not. All the exasperatingly difficult environmental challenges we face today, large and small, are consequences of the explosive growth, during the past century or so, of the complex apparatus of modern civilization, and that growth has been engendered and nurtured and driven and amplified by oil, without which it could not have occurred. Most of the major environmental problems we currently face are the result of oil's prodigious abundance during the twentieth century; most of the problems we will face going forward will be the result of oil's increasing scarcity and cost during the twenty-first.