

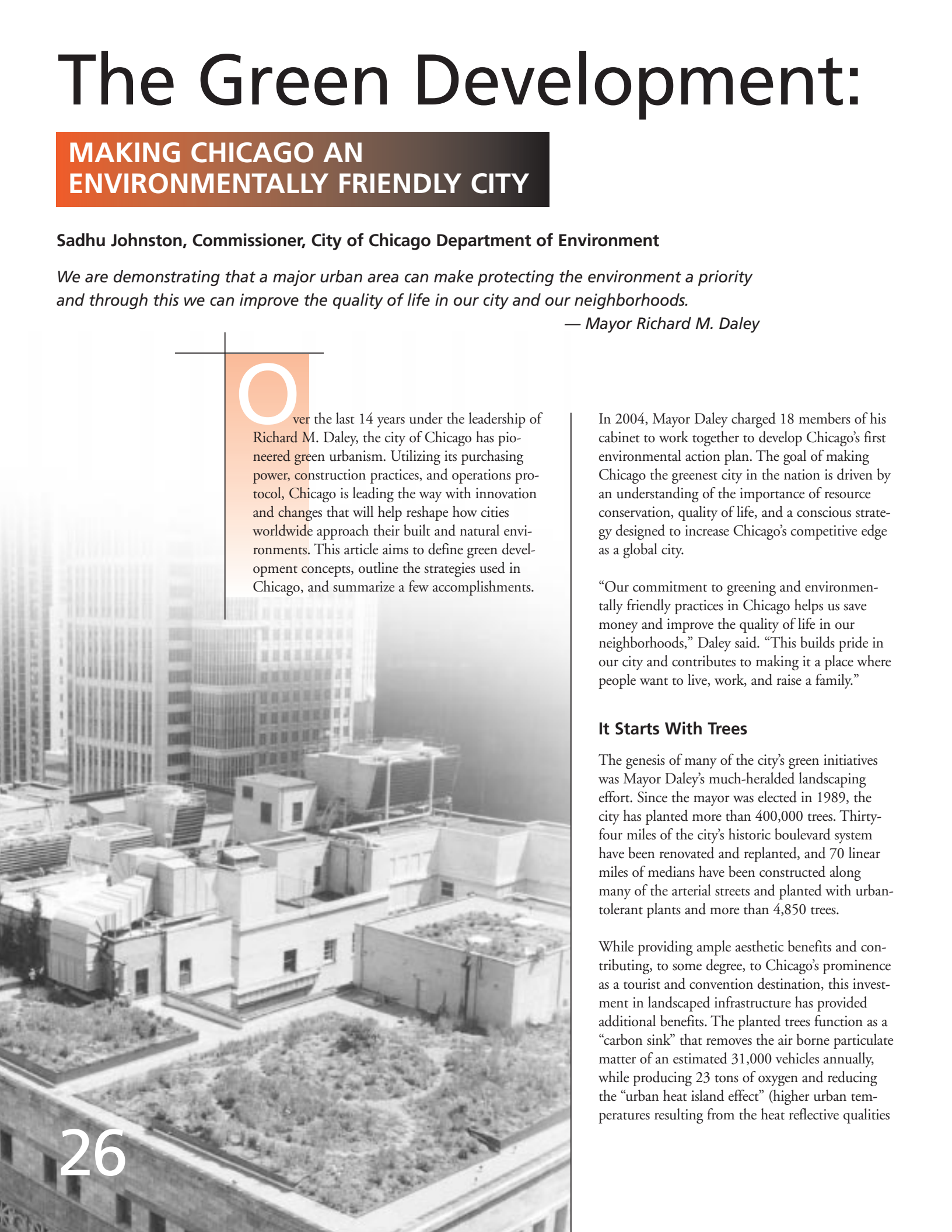
# The Green Development:

## MAKING CHICAGO AN ENVIRONMENTALLY FRIENDLY CITY

Sadhu Johnston, Commissioner, City of Chicago Department of Environment

*We are demonstrating that a major urban area can make protecting the environment a priority and through this we can improve the quality of life in our city and our neighborhoods.*

— Mayor Richard M. Daley



**O**ver the last 14 years under the leadership of Richard M. Daley, the city of Chicago has pioneered green urbanism. Utilizing its purchasing power, construction practices, and operations protocol, Chicago is leading the way with innovation and changes that will help reshape how cities worldwide approach their built and natural environments. This article aims to define green development concepts, outline the strategies used in Chicago, and summarize a few accomplishments.

In 2004, Mayor Daley charged 18 members of his cabinet to work together to develop Chicago's first environmental action plan. The goal of making Chicago the greenest city in the nation is driven by an understanding of the importance of resource conservation, quality of life, and a conscious strategy designed to increase Chicago's competitive edge as a global city.

“Our commitment to greening and environmentally friendly practices in Chicago helps us save money and improve the quality of life in our neighborhoods,” Daley said. “This builds pride in our city and contributes to making it a place where people want to live, work, and raise a family.”

### It Starts With Trees

The genesis of many of the city's green initiatives was Mayor Daley's much-heralded landscaping effort. Since the mayor was elected in 1989, the city has planted more than 400,000 trees. Thirty-four miles of the city's historic boulevard system have been renovated and replanted, and 70 linear miles of medians have been constructed along many of the arterial streets and planted with urban-tolerant plants and more than 4,850 trees.

While providing ample aesthetic benefits and contributing, to some degree, to Chicago's prominence as a tourist and convention destination, this investment in landscaped infrastructure has provided additional benefits. The planted trees function as a “carbon sink” that removes the air borne particulate matter of an estimated 31,000 vehicles annually, while producing 23 tons of oxygen and reducing the “urban heat island effect” (higher urban temperatures resulting from the heat reflective qualities

of asphalt and cement), decreasing the financial costs and pollution associated with air-conditioning systems. It is estimated that for every one degree citywide temperature is lowered, the city saves \$150 million.

In addition, the city's landscaping efforts have been credited with neighborhood revitalization. The West Loop, currently one of Chicago's hottest real estate markets, was one of the first neighborhoods to receive an investment in arterial planted medians. This area of once largely abandoned industrial buildings has since become a destination for urban professionals and the restaurants, clubs, and retail markets that serve them. In 2004, *The New York Times* reported "snickers have turned into a growing chorus of cheers as tree plantings, elaborate landscaping, and streetscape designs have become the catalyst for neighborhood revitalization."

### Green Construction

The city is also committing to building all of its facilities in an environmentally sound manner. On June 10, 2004, Mayor Daley announced the city's adoption of The Chicago Standard, a new set of construction standards guiding the design, construction, and renovation of municipal facilities. The Standard commits the city to achieving the Leadership in Energy and Environmental Design (LEED™) certification by the U.S. Green Building Council. Adoption of the Standard will result in buildings that save 15 to 20 percent in energy costs annually, conserve water and other natural resources, and provide healthier, more productive indoor environments.

The city's most notable green building effort is the award-winning Chicago Center for Green Technology, home of numerous environmentally-oriented companies and city services. Its three green libraries feature solar panels, recycled building materials, and high-efficiency HVAC systems. Several green fire stations and public schools are in development, and a new green police station is being used to monitor the cost savings of high-performance buildings. The first green buildings were constructed at a 6-8 percent premium, but as the construction industry and city staff have learned more, the additional costs for green buildings have been virtually eliminated.

The city of Chicago is also considered a leader in promoting green roofs as a sustainable alternative to the traditional roofing system. Green roofs replace traditional roofs with a growing medium and living plant life (see sidebar on page 29). Meanwhile, the Department of Transportation has implemented a series of other environmental initiatives: recycled tire rubber in the grates around sidewalk trees, recycled

asphalt in 20-30 percent of new Chicago street asphalt, recycled fly ash (a by-product of coal fired power plants) in city-poured concrete, and low-energy LED lights in stolights.

These efforts highlight another important benefit of the city's policy — economic development. Creating a market for an industry that did not exist a few years ago has led to the development and expansion of businesses and jobs that support this new economic engine as well as the development of new relationships between the roofing and landscaping industries. And a city program called Greencorps Chicago was started to train residents for jobs in the greening industry, placing close to 200 residents in landscape jobs.

### 2001 Energy Plan and Utilization of Renewable Energy

In 2001, Daley laid out a strategy to assure Chicago's energy sources would be clean, affordable, and reliable. The 2001 plan addressed the central role energy plays in the everyday life of Chicagoans and was designed to protect consumers, promote economic growth, and protect the environment.

"Using solar electricity is consistent with our goal as a city to expand the use of renewable energy. Chicago is committed to leading by example and incorporating technology that will not only save money but is good for the environment and the overall quality of life for our residents," Daley said. The city's accomplishments since 2001 include:

- Energy efficiency retrofits have been completed for over 15 million square feet of city and allied agency facilities. The city has installed LED lighting at more than 450 intersections in the city, saving over 17,000 MWh annually;
- Mayor Daley set a target of 20 percent of the city's energy to come from renewable resources by 2006; by 2003 10 percent was achieved;
- City departments have 93 Compressed Natural Gas (CNG) vehicles and 161 Ethanol (E85) vehicles. The city also uses 25 hybrid sedans for a car-sharing program for city employees, and runs a free, natural gas-powered "trolley" fleet that transports tourists and other visitors around downtown.

In addition, the city helps promote environmentally health practices by providing recycling programs. And, it provides assistance and incentives to green construction and renovation projects and works to break down barriers in the building codes that discourage environmentally friendly construction.

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The city estimates that for every one degree citywide that the temperature is lowered, the city saves \$150 million.

“Delegations come from all over the world to see these keystone projects. They are worth their weight in gold. Any money that they cost initially is paid off by the excitement that they build.”

## Green Residential Development

For years, Chicago has worked to incorporate green building into residential development through demonstration projects, programs, and policies, such as the citywide Energy Conservation Code and the green residential standards required for residential projects funded by the city.

The Green Bungalow Initiative, for example, was designed to test the feasibility of green renovations for this classic Chicago house type. Nearly one-third of Chicago’s single-family homes are bungalows. In 2001, the city employed a team of green building experts, a historic preservationist, and residents to assess and implement different green building systems. Four bungalows modeled different design techniques, testing renovation strategies like geothermal heat systems (whose savings were negligible) and high-efficiency furnaces and water heaters (which demonstrated savings of up to \$849 a year).

The city of Chicago partnered with the Historic Bungalow Association and the Illinois Clean Energy Community Foundation to provide \$5 million in grant funds to historic bungalow owners. The grants can be utilized for the installation of solar heating systems, energy and/or water efficiency improvements or other green building strategies.

The city also hosted a design competition to build five affordable green homes. Out of 73 submissions, five winning entries were built. Each highlighted different green building features: green roofs, natural ventilation, non-toxic paints and finishes, and carpets made with recycled materials. The Chicago Housing Authority and the Chicago Department of Housing integrated many of the winning entries’ concepts into the construction and rehab of nearly 25,000 housing units as part of the historic Plan for Transformation.

## The City that Bikes

The city also promotes travel by bicycle. In 2001, *Bicycling Magazine* selected Chicago as the best “big” city for bicycling in North America. This recognition was due in large part to the success of The Bike 2000 Plan. Prepared in 1992 by the Mayor’s Bicycle Advisory Council, the plan identified 31 strategies to encourage bicycling in Chicago. Almost all of these strategies have been addressed to date, including:

- Establishing a network of 100 miles of on-street bike lanes and 47 miles of off-street trails;
- Installing 10,000 bike racks — more than any other city in the United States;



Mayor Daley (right) on Chicago City Hall's green roof.

- Permitting bicycles on CTA trains and equipping the fleet of 2,000 buses with bike racks;
- Producing award-winning educational publications, including the Chicago Bike Map, Safe Bicycling in Chicago, and Kids on Bikes in Chicago;
- Staging innovative outreach programs, such as Safe Routes to School, the Bicycling Ambassadors, and the annual Bike Chicago festival, which have encouraged 750,000 Chicagoans to bicycle.

A bike commuter station located within Millennium Park is the most recent addition to Chicago's bicycle infrastructure, featuring 300 indoor secure bike parking spaces. The facility provides free parking, bike repair services, bike rentals, and equipment sales, as well as numerous membership benefits such as access to lockers and showers. Partially powered by solar panels and ventilated naturally, the facility is also home to the Chicago Police Bike Patrol.

By providing effective public transportation, and extensive bike infrastructure, Chicagoans are given an alternative to automobile ownership, which frees up funds and makes Chicago a more affordable place to live. The estimated \$6,000 annual cost of car ownership can be utilized for housing, food, or entertainment.

## A Green City Is a Healthy City

The innovation underway in Chicago and other cities demonstrates that cities can contribute positively to redefining our society's relationship to the natural world while improving quality of life and becoming more economically prosperous.

Cities can capture rainwater and utilize it as a resource instead of paying the financial and environmental costs of sending it from one pipe to another. Cities can be designed and built to encourage citizens to get out of their cars and onto bikes or the sidewalk. Cities can lead by example by incorporating cutting edge environmental strategies into our daily practices. The implications for improving the lives of billions of people around the world rely on taking these efforts to the next step. We invite you to join us in redefining how cities function and in making the lives of city dwellers even more wonderful.

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## From Deutschland to Chicagoland: Green Roofs

At the root of Chicago's green roof success lies yet another Richard M. Daley epiphany. "In the late 90s, the Mayor went to Europe and was traveling around Germany, and he saw green roofs," recalled Sadhu Johnston, Commissioner of Chicago's Department of the Environment, as he spoke to Exchange participants about the greening of Chicago. "He realized that we have some of the most prime real estate in the world, right in our downtown cities: hundreds of acres are rooftops, and they're vacant.

"The mayor knew he wanted to take this idea and bring it to Chicago. And just like when he planted the medians, just like when he took over the schools, just like with public housing, he's always got these ideas that people say are impossible, and he pursues them anyway."

The modern green roof is a lightweight mini-meadow of wildflowers and grasses, usually planted in as little as four inches of soil. They've been used for decades in Europe, and the latest technology allows them to weigh as little as 15 pounds per square foot, comparable to the weight of gravel ballast used on many roofs. In addition to looking great, proponents say they provide insulation, manage stormwater, reduce the ambient temperature around the building, and preserve the roof itself.

Chicago's first green roof went up on City Hall in 2001, installed by Roofscapes, Inc., a Philadelphia firm. Now the city requires any municipally-funded building project to include one. Johnston said that **Chicago currently has approximately two million square feet of green roofs.**

"Green roofs are being recognized as tools to solve many of our environmental problems," Johnston said. "The temperature on a green roof is about 80 degrees in the summer, where a black roof is at least 120 degrees. We figure if we can get enough of them in downtown Chicago, we can actually bring down the temperature and make the city a more comfortable place to live. They also absorb stormwater. When we get a major storm, we often get a surge of raw sewage entering the river. Green roofs catch that stormwater and they hold it for a 48-hour period."

From the surrounding office towers, City Hall's roof looks like a fuzzy green lawn. "We're saving about \$10,000 a month; we're not needing to heat and cool as much because of the insulation," Johnston said. "We've got beehives on the roof. We harvest the honey and auction it off. There's a rumor that real estate values around City Hall are going up because you've got this beautiful, 20,000 square foot meadow. Instead of looking down on a black roof with a bunch of HVAC units sticking up, there are flowers that bloom throughout the year. It's always vibrant up there. There are butterflies and dragonflies — it's a very interesting experience.

"And free press that you get!" he added. "Delegations come from all over the world to see these keystone projects. They are worth their weight in gold. Any money that they cost initially is paid off by the excitement that they build."

— Bill Hangley, Jr.