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CITY PARKS FORUM
BRIEFING PAPERS

How cities use parks for...

Community Revitalization

Executive Summary

Parks are complex elements of a city. They can serve scores of different uses, may be specialized in their function, or can simply provide visual appeal for residents. However they work, they act to define the shape and feel of a city and its neighborhoods. They also function as a conscious tool for revitalization.

Parks can stem the downturn of a commercial area, support the stabilization of faltering neighborhoods, and provide a landmark element and a point of pride for constituents. For all these things to happen, the city needs to be open and aware of parks' potential to spur revival, and support the elements that are needed to make that happen.

Key Point #1

Parks that serve as central walking, resting, and meeting places can revive failing or threatened commercial areas.

Key Point #2

Renewal takes leadership, vision, and time; with these three ingredients, revitalization tends to attract ever more investment.

Key Point #3

Community residents and the city, working together on a neighborhood park project, can turn around a distressed residential area.

Key Point #4

Parks don't automatically lead to neighborhood revival; before investing, the city should make sure the relation of a park to its surrounding neighborhood will allow revitalization.

KEY POINT #1:

Parks that serve as central walking, resting, and meeting places can revive failing or threatened commercial areas.

In the 1960s Portland, Oregon's downtown business district began showing early signs of disinvestments, with stores starting to move to the suburbs. One suggestion to counteract the trend was to build an 11-story parking garage on the site of the old Portland Hotel. The ensuing public outcry killed the idea; instead, a square block plaza was built on the site.

Pioneer Courthouse Square, which opened in 1984, looks like a European plaza, with 66,000 bricks (each individually purchased as a fundraising device), few trees, and no grass. It functions as a public park, with streams of users walking, eating, talking, reading, watching, and listening, while professional and improvisational players perform, and events from the commercial to the political take place.

After the parking garage was defeated, Meier & Frank, the linchpin downtown retailer, considered closing its store. The city committed to building dispersed parking a few blocks away, creating a bus transit mall, and developing the MAX light-rail system to keep the retailer. Several years later, Nordstrom built a flagship store facing the square.

The momentum carried. Ever since the square officially opened in 1984 and the MAX started in 1986, the combination of central civic open space and dense transit connections has revolutionized the way Portlanders use their downtown—and how the commercial district has responded. Other retailers like Banana Republic, Gap, and Abercrombie & Fitch located there, and two shopping centers, Pioneer Place and the Galleria, were built. There is now discussion of erecting high-end, high-rise housing nearby.

Pioneer Courthouse Square, Inc., the management agency for the square, is considering putting in an ice skating rink to add another dimension to the facility's community draw. Says Square Director Karen Whitman, "My goal is to become the Rockefeller Center of the West Coast."

KEY POINT #2:

Renewal takes leadership, vision, and time; with these three ingredients, revitalization tends to attract ever more investment.

For more than 25 years, under the leadership of Mayors Bill McNichols, Federico Peña, and current Mayor Wellington Webb, Denver has been steadily restoring the South Platte River and its shoreline communities to ecological and economic health. The former misused, polluted area now features watersports, 15 new adjacent parks connected by a continuous trail, and numerous new commercial, cultural, and entertainment facilities. Its most recent park addition, opened in 2001, is the Commons, near the confluence of the South Platte and Cherry Creek.

The 23-acre Commons was placed in the Bottoms, a blighted area of the city that was the spot of Denver's 19th century founding. The naturalistic, Olmstedian park was constructed on land recycled from a former tangle of railroad tracks and warehouses. It opened 15 years after the charette that led to its vision and five years after the city bought the land. One of its edges curves along the river and is filled with native grasses in constructed wetland seeps; the other, facing the downtown streetscape, has formal walking paths flanked by carefully spaced trees.

The Commons has spurred significant residential and commercial redevelopment in the Bottoms. As of early 2002 developers have built or project building more than 1 million square feet of office space, 350,000 square feet of retail establishments, 575 hotel rooms, 928 units of condominium housing, and 782 units of rental housing. The national sporting goods company REI, which overwhelmingly locates in suburbs, is thriving in a converted power plant near Commons Park.

Downtown is walking or bicycling distance away, and an extension of the light-rail system is planned. Mayor Webb's commitment to build a park along the river seems to have been the signal the development community was waiting for. As Denver Developer Ray Suppa told *ColoradoBiz* magazine, "That was the catalyst. It's one thing to master-plan something; it's another to put in the roads and parks."

Commons Park and its surrounding neighborhood is proof of the resilience of cities, the ultimate strength of great locations, and of the ability of parks to send a profound message. It also teaches lessons about the power of following a vision and using public-private partnerships to incrementally restore the civic infrastructure in tandem with unleashing the economic vitality of a community.

KEY POINT #3:*Community residents and the city, working together on a neighborhood park project, can turn around a distressed residential area.*

Baltimore's Patterson Park, a gift in 1827 from one of the founders of the B&O Railroad, provides a dramatically different snapshot of "green revitalization." A landlocked area, its rectangular form fits squarely into the grid of the surrounding row house neighborhoods of Butcher's Hill, Washington Hill, and Greektown. With its iconic hilltop Chinese Pagoda, Patterson Park has historically played a role in the relative stability of its ethnic communities.

In the 1970s, as Baltimore's economy deteriorated, the park and the community both began going downhill. The park's lake became clogged with cattails, most of the sports field light poles short-circuited because of water leakage, and the pagoda had to be fenced off. Vandalism and arson destroyed several beloved buildings. Benches in need of repair were removed by the city. In 1985, a racially connected beating further undermined the reputation of the area.

Because of disinvestments and racial tension Patterson Park's historic cohesion had become badly shaken; but individuals and several community organizations remained committed to saving the neighborhood, and the park served as the anchor for their efforts. The Southeast Community Organization and Friends of Patterson Park worked to have a capital improvement master plan adopted, repairs and renovations were made, and private funds (such as \$100,000 from the National Football League) were raised. At the same time, several community development corporations worked to get aid for housing construction and rehabilitation, and arts organizations scheduled events in the park, including a "water ballet" in the swimming pool and a "Stars, Stripes and Snowballs" big-band concert for Independence Day.

By the late 1990s housing demand began to increase and, while still affordable, prices were rising noticeably. Between 2000 and 2001 the average home price on the north side of Patterson Park rose by 8.2 percent, and in the first three months of 2002 it rose by another 12.9 percent (In contrast, during the same period housing prices for Baltimore as a whole declined.) Many of the new purchasers are now rehabilitating their properties.

Along with the gradual stabilizing of its surrounding seven neighborhoods, the park itself is getting significant upgrades. The renovated pagoda was reopened in April 2002; \$100,000 was raised privately to restore the 1893 fountain; and new perimeter lighting was installed. Most important, the city commissioned a detailed study of capital needs for the park's renovation.

"Patterson Park has had a tremendous influence in East Baltimore," says Craig Thompson, a realtor with Long and Foster who lives in the area. "When people were scared of it, it hurt the neighborhood. Now that people's perceptions are changing, it's a great attractant. Today it's just about impossible to find a house for sale right along the park."

KEY POINT #4:

Parks don't automatically lead to neighborhood revival; before investing, the city should make sure the relation of a park to its surrounding neighborhood will allow revitalization.

There's no guarantee that a city park will be a neighborhood amenity. Shunned or poorly maintained parks can be frightening places that negatively affect their surroundings. Poorly located parks and parks that mark the edges of neighborhoods can serve as barriers or as turf markers to everyone from youth gangs to mothers with toddlers to business people walking to work.

Also, not every successful park exerts a revitalizing influence on its surrounding neighborhood. Parks that are extraordinarily popular in their own right can have almost no impact on their surrounding neighborhood. This can be due to the physical and economic shape of the built environment around the park. If there is no capacity to allow for the growth of small private entrepreneurial enterprises nearby, or nearby residential uses, there can be relatively little street life in the vicinity of the park. Especially in the case of downtown parks, often when the business day ends, the park becomes desolate.

For these reasons, parks need as much thoughtful attention to design, location, and surrounding uses as every other constructed element in the city, from housing to retail to commercial to entertainment. When careful attention is given to selective park creation or improvement, it will likely have a great impact.

Elements to keep in mind when hoping to use city parks for community revitalization:

- 1. PHYSICAL:** A park should be both a worthwhile destination in itself and an attractive walking route to use in the course of doing other business.
- 2. POLITICAL:** Creating a park – or repairing it – should provide the opportunity for people in the neighborhood to get to know each other and work together for the greater good.
- 3. ECONOMIC:** The park should create such a distinctive presence that it gives retailers an opportunity to play off the "signature" and redouble the district's vitality. For a park in a residential area, the distinctiveness should give homeowners the confidence to renovate and upgrade.
- 4. CONTEXT:** The park must be located in a community that has the physical space, economic opportunity, and political commitment to revitalize.

Resources

Courthouse Square, Portland:
www.parks.ci.portland.or.us/Parks/PioneerCourthouseSq.htm

Patterson Park, Baltimore:
www.pattersonpark.com

Commons Park, Denver:
198.202.202.66/South_Platte_River/template21140.asp


Cover photo: Commons Park, Denver, courtesy of Civitas, Inc.

Note: For an expanded discussion on this topic, please contact the author, Peter Harnik, Director, Green Cities Initiative, Trust for Public Land; 202-543-7552; www.tpl.org.

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02

CITY PARKS FORUM
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How cities use parks for...

Community Engagement

Executive Summary

Community engagement is the process of working collaboratively with individuals and groups to achieve specific goals. For parks and open spaces, community engagement allows mayors and public officials to directly involve their constituencies in the ongoing design, planning, and management of these resources. This process results in informed and engaged residents that feel better connected to their communities. While sometimes contentious, but more often productive and rewarding, community engagement is an essential ingredient of making successful urban open space.

Parks support community engagement by providing residents with a venue for participation in and attachment to their communities. They also provide a sense of place and offer essential life-enhancing qualities that aid community and individual well-being. By understanding the community benefits of parks, decision makers can develop constituencies that can sustain their urban park systems over time.

Key Point #1

Parks are one of the quickest and most effective ways to build a sense of community and improve quality of life.

Key Point #2

Parks provide places for people to connect and interact in a shared environment.

Key Point #3

Parks channel positive community participation by getting diverse people to work together toward a shared vision.

KEY POINT #1:

Parks are one of the quickest and most effective ways to build a sense of community and improve quality of life.

Parks are one of the most effective methods available within the political term of a mayor to change the character and improve the image of a community. Park improvements are often quick and tangible actions for mayors and citizens, which can work in concert with other issues such as reducing crime, eliminating graffiti, or traffic management.

Eugene, Oregon. Parks and Community Gardens

Parks in this city are used to involve residents in a variety of civic and environmental activities. Eugene's Downtown Park Blocks host one of the community's signature events, the Saturday Market, which brings people together for clothing and jewelry shopping, for produce at the farmer's market, and for food and entertainment. People also go there to see other people, hang out, eat, and listen to the music. Eugene residents also "took back" Washington-Jefferson Park from drug dealers and prostitutes by working together in a community watch. They became organized over a period of a few months, and the park's turnaround occurred within a year of residents becoming involved. Washington-Jefferson Park now is used for various recreational activities, such as late-night basketball games, and community celebrations such as Eugene's Cinco de Mayo. (www.planeteugene.com/parks)

Minneapolis: Peavey Park Community Listening and Visioning Project

In partnership with Mayor Sharon Sayles Belton and the Minneapolis Park and Recreation Board, Hope Community, Inc. led a community engagement process to bring about positive change to Peavey Park and the surrounding Phillips neighborhood. Issues common to urban parks, such as drugs, gangs, and gun violence, plagued the park's north end. Physical barriers included crossing major arterial streets for access and a barren, non-welcoming park landscape. The City Parks Forum provided grant money to enable Hope, in partnership with the city and park board, to assemble a group of community leaders to plan and conduct 18 community listening sessions revolving around Peavey Park and the Phillips neighborhood. Nearly 200 adults and children attended the sessions, conducted in several languages to allow the participation of the diverse ethnicity of the neighborhood. Next, Hope conducted several community visioning sessions. Working with an architect who attended both sessions, residents created a concept plan to revitalize their park. Following the 12-month process, community members, many of whom had never before attended a public meeting, presented their plan to the Minneapolis Park and Recreation Board. (mkeefe@hope-community.org)

KEY POINT #2:

Parks provide places for people to connect and interact in a shared environment.

Parks create a sense of place by connecting residents to one another and to their larger environment. City parks also provide residents with meaningful ways to express their concerns about the environment. They can physically reconnect communities to themselves by creating linkages or restoring historic connections broken by highways, sprawl, and poor planning decisions. Greenways, green streets, and linear parks are now widely used open space types (Smith and Hellmund 1993).

For example, a study by **Human-Environment Research Laboratory at the University of Illinois Urbana-Champaign** found that the more there is green space in inner-city neighborhoods, the more that common public spaces are used by residents (Kuo et. al. 1998). The researchers found that relationships between neighbors are made stronger by the mere presence of vegetation. Compared to residents living near barren spaces, those closer to green spaces enjoy more social activities, have more visitors, know more of their neighbors, and have stronger feelings of belonging. They found that greener common areas facilitate the development and maintenance of stronger social ties.

Davis, California: Village Homes. Village Homes is an ecological neighborhood with 242 single and multiple family houses located in the university city of Davis. The plan for the neighborhood emphasizes common open spaces designed, developed and managed by residents (Corbett and Corbett 2000). Post occupancy evaluation studies of the community show that people that live there have twice as many friends and three times more social contacts than residents in a nearby conventional neighborhood in Davis (Francis 2002). When first proposed in the late 1970s, the developers had difficulty securing financing for the project. Today, Village Homes is Davis' most desirable neighborhood with homes selling at \$10-\$25 per square foot premium in 30 percent less market time. (www.lgc.org/freepub/land_use/models/village_homes.html)

KEY POINT #3:

Parks channel positive community participation by getting diverse people to work together toward a shared vision.

The benefits of participation in the development of urban parks and open spaces include leading to a stronger sense of community (PPS 2000) and an increased sense of user or community control (Francis 1989). There are also many low cost and effective methods of community participation available including workshops, surveys, interviews, and observation (Hester 1990).

Yet participation does have risks and limits that need to be understood. Landscape architect Randy Hester suggests that participation sometimes leads to what he calls "participatory gridlock" where nothing is agreed upon or the resulting plans runs counter to established environmental or social goals. He suggests that to be effective, participation needs to be done with "a view"—a clear vision on the part of the city officials and designers of the desired future (Hester 1999). While this vision can be modified and enlarged by participants during the design and planning process, the city officials and designers need to be proactive in their approach (Francis 1999).

St. Louis, Missouri: Forest Park. Forest Park, dedicated in 1876, was host to the 1904 Worlds Fair and the 1927 homecoming celebration for Charles Lindbergh after his historic flight over the Atlantic. In need of updating and renovation, park planners with the significant involvement of a former Mayor Freeman Bosley, Jr., who had played in the park as a young child, developed a new Master Plan and vision for the park in the 1990s. More than 300 people attended an early meeting in 1993 to discuss plans for the park. The design process was "the mechanism for conflict resolution, public education, empowerment of stakeholders and citizens, and the recognition by the public of what constitutes design excellence" (Lewis 2000). (www.forestparkforever.org)

Oakland, California: Union Point Park. More than 1,000 community residents as well as 50 community organizations and local nonprofits from across Oakland contributed to developing a plan for this waterfront park. Part of the Fruitvale Recreation and Open Space Initiative (FROSI), the park is a partnership among the Spanish Speaking Unity Council, the Trust for the Public Land, and the University Oakland Metropolitan Forum. Fruitvale, the most densely populated district in Oakland, has one of the highest concentrations of children and the least amount of parks and open space. Union Point Waterfront Park proposes to transform a previous industrial site into a public, recreational waterfront serving the nearby Oakland neighborhoods and the surrounding region. The park plan includes three major design elements: a series of mounds, a pedestrian waterfront promenade, and public art to educate visitors about the surrounding community and its history. (www.unitycouncil.org/html/frosi.html)

New Orleans: Kid's Cafe Pocket Park. Mayor Marc Morial wanted to create a model for converting blighted, vacant lots in New Orleans into neighborhood assets. Using a CPF grant, Parkway Partners Inc., a partnership program of the community, set out to convert a vacant lot in the Central City neighborhood into a children's garden. Donated by a longtime resident and business owner, the lot they chose is near the Kids Café, a nonprofit project that provides inner-city children with free meals, nutrition education, and a safe environment. More than 50 volunteers joined together to build the garden. Through the collaboration of The Neighborhood Gallery, the Contemporary Arts Center, and local artists, a large mural was painted on the back wall of the garden and additional arts programs were developed. WDSU News Channel 6, another project partner, provided publicity for the program. A volunteer mentoring program, led by Parkway Partners' staff, teaches area youth about horticulture and life skills. Harvested produce is taken home by the children, taken to the Kids Café for preparation, or shared with senior citizens who visit the garden. (www.parkwaypartners.com)

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For an expanded discussion of this topic and further resources, contact the author; Mark Francis, FASLA, University of California, Davis. 530-752-6031, mofrancis@ucdavis.edu. He would like to thank Randy Hester, Marcia McNally, Stan Jones and Bill Thompson as well as several reviewers who provided useful comments while developing this briefing paper.

Cover photo: Kid's Café Pocket Park, courtesy of Parkway Partners, Inc., New Orleans

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03

CITY PARKS FORUM
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How cities use parks for...

Economic Development

Executive Summary

Parks provide intrinsic environmental, aesthetic, and recreation benefits to our cities. They are also a source of positive economic benefits. They enhance property values, increase municipal revenue, bring in homebuyers and workers, and attract retirees.

At the bottom line, parks are a good financial investment for a community. Understanding the economic impacts of parks can help decision makers better evaluate the creation and maintenance of urban parks.

Key Point #1

Real property values are positively affected.

Key Point #2

Municipal revenues are increased.

Key Point #3

Affluent retirees are attracted and retained.

Key Point #4

Knowledge workers and talent are attracted to live and work.

Key Point #5

Homebuyers are attracted to purchase homes.

KEY POINT #1:

Real property values are positively affected.

More than 100 years ago, Frederick Law Olmsted conducted a study of how parks help property values. From 1856 to 1873 he tracked the value of property immediately adjacent to Central Park, in order to justify the \$13 million spent on its creation. He found that over the 17-year period there was a \$209 million increase in the value of the property impacted by the park.

As early as the 19th century the positive connection between parks and property values was being made. Olmsted's analysis shows the real dollar amount impact of parks. His study was not a unique situation, however. Several studies conducted over the last 20 years reaffirm his findings, in cities across the country. Below are more examples of how proximity to a park setting is connected to property values.

Chattanooga, Tennessee: In the early 1980s this city was facing rising unemployment and crime, polluted air, and a deteriorating quality of life. To lure middle-class residents back, local government, businesses, and community groups decided to improve the quality of life by cleaning the air, acquiring open space, and creating parks and trails. As a result, property values rose more than \$11 million, an increase of 127.5 percent.

Atlanta: After Centennial Olympic Park was built, adjacent condominium prices rose from \$115 to \$250 a square foot. As noted on the Centennial Olympic Park website, "Thousands of people who have made the move to downtown Atlanta have chosen Centennial Olympic Park as their front yard." www.centennialpark.com.

Amherst, Massachusetts: Cluster housing with dedicated open space was found to appreciate at an annual rate of 22 percent, compared to a comparable conventional subdivision's rate of 19.5 percent. This translated in 1989 dollars to a difference of \$17,100.

KEY POINT #2:

Municipal revenues are increased.

Another component of the Central Park study was an assessment of increased tax revenue as a result of the park. The annual excess of increase in tax from the \$209 million in property value was \$4 million more than the increase in annual debt payments for the land and improvement. As a result of building Central Park, New York City made a profit.

Increased property values and increased municipal revenues go hand in hand. Property tax is one of the most important revenue streams for cities. By creating a positive climate for increased property values, the tax rolls will benefit in turn. As shown with Central Park, parks can both pay for themselves and generate extra revenue. In addition, tax revenues from increased retail activity and tourism-related expenditures further increase municipal monies.

Property Tax Benefits

Chattanooga: Improvements in Chattanooga resulted in an increase in annual combined city and county property tax revenues of \$592,000 from 1988 to 1996, an increase of 99 percent. (Lerner and Poole, 1999).

Boulder: The presence of a greenbelt in a Boulder neighborhood was found to add approximately \$500,000 in property tax revenue annually.

Sales Tax Benefits

Oakland, California: The presence of the East Bay Regional Park District is estimated to stimulate about \$254 million annually in park-related purchases, of which \$74 million is spent in the local East Bay economy.

Shopping Districts: Surveys indicate that prices for products in districts with trees were on average about 11 percent greater than in no-tree districts; the quality of products were rated 30 percent higher than in areas with no sidewalk landscaping.

Tourism-Related Benefits

Atlanta: Centennial Olympic Park has an estimated 1.5 million visitors each year, attending 175 public events.

San Antonio, Texas: Riverwalk Park, created for \$425,000, is lined with outdoor cafes, shops, bars, art galleries, and hotels, and has overtaken the Alamo as the most popular attraction for the city's \$3.5-billion tourism industry.

KEY POINT #3:*Affluent retirees are attracted and retained.*

"There is a new, clean growth industry in America today—The industry is retirement migration" (Foreward in Longino, 1995, 7).

By the year 2050, according to the U.S. Census Bureau, approximately 1 in every 4 Americans will be 65 years of age or older, creating an affluent group of retirees with financial benefits, including Social Security, military benefits, and pension plans. With an average life expectancy of between 75 and 83 years, this is a significant population group, both in size and affluence.

They are also mobile, moving to various locations across the country—places as diverse as northern Wisconsin and Michigan, the mountains of Colorado and Montana, and New England. Members of this mobile retiree cohort have been termed "GRAMPIES": (Growing [number of] Retired Active Monied People In Excellent Shape).

GRAMPIES want communities that provide leisure and recreation amenities. In a study by Miller et al. (1994), a retiree sample was asked to review 14 features and indicate their importance in the decision to move. The first three in rank order were scenic beauty, recreational opportunities, and mild climate.

Retirees bring expendable income into their communities. If 100 retired households come to a community in a year, each with a retirement income of \$40,000, their impact is similar to that of a new business spending \$4 million annually in the community. (Crompton, p. 65).

They increase the tax base and are "positive" taxpayers, using fewer services than they pay for through taxes. For example, they pay taxes to school districts but do not send children there.

Retirees transfer significant assets into local investment and banking institutions, expanding the local deposit base that can be used for commercial and industrial financing.

KEY POINT #4:*Knowledge workers and talent are attracted to live and work.*

"...cities are characterized by a sense of place, beauty in the natural environment, a mixed-use transportation system and a 24-hour lifestyle. These are the characteristics that will attract the creativity and brainpower that undergird the new economy." Steven Roulac, futurist, The Roulac Group.

A significant change has occurred in the American economy. Industry today is composed of smokeless industries, high technology, and service-sector businesses, collectively referred to as the "New Economy." The workers in the New Economy are selling their knowledge, as opposed to physical labor; as the main source of wealth creation and economic growth. These employees, referred to in studies as "knowledge workers" or "talent," work in a "footloose" sector—companies are not tied to a certain location in order to achieve a competitive advantage.

What the companies are attached to is retaining their talent and attracting more talent. As a result, several studies have been conducted to determine what factors are important to talent when they are making employment decisions.

A survey of 1,200 high technology workers in 1998 by KPMG found that quality of life in a community increases the attractiveness of a job by 33 percent.

Knowledge workers prefer places with a diverse range of outdoor recreational activities, from walking trails to rock climbing. Portland, Seattle, Austin, Denver, and San Francisco are among the top cycling cities; they also are among the leaders in knowledge workers.

Workers attracted to an area are then positioned to put money back into the local economy through jobs, housing, and taxes, which then contribute to parks.

KEY POINT #5:*Homebuyers are attracted to purchase homes.*

"Parks, ponds, bike paths." "Nearly five acres of woodland protected as a nature sanctuary" "My lake...my park...my home."

All around the U.S. real estate brokers and homebuilders are advocating parks as one of the top residential selling points. The desire to live near parks also translates into real dollars.

A 2001 survey by the National Association of Realtors (NAR) revealed that 57 percent of voters would choose a home close to parks and open space over one that was not.

In addition, the NAR survey found that 50 percent of voters would be willing to pay 10 percent more for a house located near a park or protected open space.

The National Association of Home Builders found that 65 percent of home shoppers surveyed felt that parks would seriously influence them to move to a community.

According to Economics Research Associates (ERA), a 1991 survey in Denver found that 48 percent of residents would pay more to live in a neighborhood near a park or greenway.

One of the most popular planned community models today is golf-course residential development. However, surveys have shown that the majority of people who live in golf course communities don't play golf regularly—as many as two-thirds, according to ERA. They are attracted to the dedicated open space, the expansive views, and the guarantee that both elements will stay the same. By promoting, supporting, and revitalizing urban parks, cities can help attract a significant portion of the homebuying community.

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04

CITY PARKS FORUM
BRIEFING PAPERS



How cities use parks to...

Create Safer Neighborhoods

Executive Summary

For those concerned that green spaces may foster crime and illegal activity, evidence now exists that the opposite may be true. When adjacent to residential areas, green spaces have been shown to create neighborhoods with fewer violent and property crimes and where neighbors tend to support and protect one another. These are the findings of scientists at the Human-Environment Research Laboratory of the University of Illinois at Urbana-Champaign who studied green space alongside public housing in Chicago. Other researchers who are conducting similar studies across the country are finding similar results.

The factors that explain these findings emphasize the importance of greenery in community and personal wellness. Time spent in natural surroundings relieves mental fatigue, which in turn relieves inattentiveness, irritability, and impulsivity, recognized by psychologists as precursors to violence. Green spaces also support frequent, casual contact among neighbors. This leads to the formation of neighborhood social ties, the building blocks of strong, secure neighborhoods where people tend to support, care about, and protect one another.

Key Point #1

Time spent in nature immediately adjacent to home helps people to relieve mental fatigue, reducing aggression.

Key Point #2

Green residential spaces are gathering places where neighbors form social ties that produce stronger, safer neighborhoods.

Key Point #3

Barren spaces are more frightening to people and are more crime prone than parks landscaped with greenery and open vistas.

Key Point #4

In order to make the best use of greenery and open space, it must be positively incorporated into a community's design.

KEY POINT #1:

Time spent in nature immediately adjacent to home helps people to relieve mental fatigue, reducing aggression.

The University of Illinois scientists have concluded that park-like surroundings increase neighborhood safety by relieving mental fatigue and feelings of violence and aggression that can occur as an outcome of fatigue. The three classic symptoms of mental fatigue are inattentiveness, irritability, and poor impulse control, each of which has been previously linked to aggression.

Time spent in nature relieves mental fatigue specifically by restoring directed attention capacity, which is the ability to concentrate and pay focused, effortful attention. Like a muscle, directed attention capacity fatigues with exertion (such as through working, studying, or driving in traffic) and recovers with rest. The sights and sounds of nature absorb individuals effortlessly, during which time concentration rests and renews.

In a study recently published in the *Journal of Environmental Psychology*, researchers looked at stress recovery and directed attention restoration in a group of young adults. Each subject was given an attentionally demanding task (driving to an unfamiliar site). Upon their arrival, subjects were split into two groups, with one group sitting in a room with tree views followed by a walk in a nature reserve, and the other group sitting in a viewless room and walking in an urban setting. Performance on an attentional test improved for the nature group. In addition, subjects in the nature group reported less anger and greater positive affect following the nature walk; the urban group had the opposite results.

When concentration is restored, so is the ability and willingness to handle tasks and problems thoughtfully and calmly. With convenient access to spaces that relieve mental fatigue and foster mental restoration, families and communities may become safer.

KEY POINT #2:

Green residential spaces are gathering places where neighbors form social ties that produce stronger, safer neighborhoods.

The University of Illinois researchers found that residents who live near outdoor greenery are more familiar with their nearby neighbors, socialized more with them, and expressed greater feelings of community and safety than did residents lacking nearby green spaces. Shade trees figured importantly in the use of outdoor spaces. The more trees existed in a space, the more heavily the space was used by people of all ages.

Green spaces are settings for frequent, informal interaction among neighbors that nurtures the formation of neighborhood social ties. Research has shown that these ties are the glue that transforms a collection of unrelated neighbors into a neighborhood. They are the heart of a neighborhood's strength. When ties are weak, people feel isolated and unsupported. When ties are strong, people feel empowered to help and protect each other.

The value of green space in prompting the formation of neighborhood ties is exemplified by redevelopment that occurred in the historic East Falls section of **Philadelphia** in the 1990s. The area surrounding the Chelsea apartments was converted from a scene dominated by factories and warehouses to a residential neighborhood replete with modest yet welcoming green spaces that gave residents a place in which to socialize (Rodriguez, 1996). Referring to the green space one resident said, "It's nice because often in an apartment community people don't have an opportunity to meet each other. The park gives us an outdoor area to enjoy together. It's really used a lot."

Another vital green space within this community was converted from a driveway to a series of patios shaded by pear and birch trees. The patios lie between two buildings that were converted to townhouses. The space succeeds so well as a social catalyst that residents call it the Melrose walkway after the TV soap opera, *Melrose Place* (Rodriguez, 1996).

The conspicuous presence of people outdoors contributes further to safety by increasing surveillance, which discourages criminals. More people outdoors means that threatening behavior is more likely to be observed. At the same time, potential criminals are deterred by the sense that they are being noticed and watched.

KEY POINT #3:

Barren spaces are more frightening to people and are more crime prone than parks landscaped with greenery and open vistas.

Some community leaders are inhibited from proposing new parks or supporting existing ones out of concern that parks can be settings for crime and illegal activity. However, when properly planned, parks and greenways adjacent to residential areas may help to shield against crime.

The University of Illinois researchers tested the conventional wisdom that, in the inner city, barren spaces are safer than spaces with trees and greenery that could hide illicit activity. The study compared crime rates for inner-city apartment buildings with varying amounts of vegetation and found that the greener the surroundings, the fewer crimes occurred against people and property.

The scientists compared crime rates for apartment buildings with little or no vegetation to buildings with high levels of vegetation. They found that roughly half as many crimes (48 percent fewer property crimes and 56 percent fewer violent crimes) were reported in buildings with high amounts of vegetation. In addition, buildings with medium amounts of vegetation had 42 percent fewer total crimes (40 percent fewer property crimes and 44 percent fewer violent crimes) than did buildings with low levels of vegetation. Far from shielding criminals, nearby vegetation seems to shield against them.

These findings were consistent with prior studies that found that urban residents who live in green surroundings experience fewer quality-of-life crimes such as littering and graffiti, and fewer incivilities, such as noisy or disruptive neighbors. In other studies, people reported feeling safer in residential areas that contained greenery.

In **Providence, Rhode Island**, through the early 1990s city officials launched a tree-planting program that converted barren, unused open spaces into treed oases. As a result of their efforts, a number of the oases became gathering points for neighborhood recreational and social functions (Davis, 1992).

Researchers in **Austin, Texas**, used a geographic information system (GIS) to determine if there was a relationship between the greenness of various neighborhoods and their crime levels. They found that areas with less than the average amount of greenness had more crime. (aggie-horticulture.tamu.edu/syllabi/435/article.doc)

KEY POINT #4:

In order to make the best use of greenery and open space, it must be positively incorporated into a community's design.

New parks and open space should be developed within residential developments so that nature is close to home. It is critical that these spaces are carefully designed to support the activities for which they were intended; that requires that each space have an intended purpose. If the purpose of the space is to promote social interaction, it should be located where frequent, casual encounters by neighbors are likely to occur. In addition, shade trees are proven attractants for neighbors to mingle and form social ties.

If the intention of the park or open space is to promote restoration, areas that can be left green and pervious will help people relax and will reduce feelings that lead to aggression. While law enforcement officials have historically recommended removing vegetation to eliminate cover for criminal activity, vegetation that maintains visibility actually fosters feelings of safety. Widely spaced high-canopy trees, grass, flowers, and low-growing shrubs do not block views, and allow the user to become oriented to the setting. This understanding of one's surroundings is important in that letting down one's guard and becoming absorbed in the natural environment promotes restoration (Kaplan, 1998).

Where parks already exist, their maintenance is critical. A well-maintained park or open space sends a message that someone cares about it. In turn, the message that someone cares about the park helps create a perception of safety. The greater the perception of safety, the more likely the park will be used. In addition, maintenance programs that include participation by the users help establish a sense of ownership and promote stewardship of the space.

It is also critical that the community be included in planning and programming the open space. In **Macon, Georgia**, Mayor C. Jack Ellis, the Village Green community, and Village Hope, a nonprofit organization, worked together to use a CPF grant to revive the Village Green park as a crime prevention activity. The addition of a picnic shelter, tables, and grills, a new playground unit, new basketball goals, and park beautification efforts have increased park use by more than 25 percent. In addition, the parks and recreation department, along with the police athletic league, are sponsoring athletic programs in the park. Neighborhood watch groups are coordinating programs with the police precinct assigned to Village Green, and citizens are volunteering their time at the precinct to answer phones and do other needed tasks. Citizens now care more about their neighborhood, and incidents of crime or violence have dropped by more than 50 percent!

Resources

Along with the citations below, data for this briefing paper were drawn from the Coping with Poverty archive, a multi-study research project examining the effects of the physical environment on the functioning of individuals, families, and communities residing in urban public housing.

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Of Special Note

All referenced University of Illinois studies were conducted at public housing developments in Chicago in which study participants had highly similar demographic characteristics and uniform apartments. The only factor that systematically differentiated participants was the amount of greenery outside of their apartments.

The USDA Forest Service Urban and Community Forestry Program supported much of the research noted in this briefing paper on the recommendation of the National Urban and Community Forestry Advisory Council. Findings do not necessarily reflect the views of the USDA Forest Service. The Cooperative State Research, Education and Extension Service, the U.S. Department of Agriculture, and the University of Illinois also provided research funding.

For more information on the work of the University of Illinois Human-Environment Research Laboratory, please go to www.herl.uiuc.edu or contact the University of Illinois at Urbana-Champaign, Human-Environment Research Laboratory, 1103 S. Dornier Dr., Urbana, IL 61801; phone (217) 333-1965.

The Human-Environment Research Laboratory of the University of Illinois at Urbana-Champaign is a multidisciplinary research laboratory dedicated to studying the relationships between people and the environments they inhabit. The mission of the lab is to generate information about human-environment relationships to guide policy, planning, and design of environments. The lab's scientists explore how to create environments in which individuals, families, and communities flourish, and how to better involve people in the design, management, and stewardship of their local environments.

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Photo of Mercy-Bush Park Courtesy of Bob Weaver Photography.



How cities use parks for...

Green Infrastructure

Executive Summary

Just as growing communities need to upgrade and expand their built infrastructure of roads, sewers, and utilities, they also need to upgrade and expand their green infrastructure, the interconnected system of green spaces that conserves natural ecosystem values and functions, sustains clear air and water, and provides a wide array of benefits to people and wildlife. Green infrastructure is a community's natural life support system, the ecological framework needed for environmental and economic sustainability.¹

In their role as green infrastructure, parks and open space are a community necessity. By planning and managing urban parks as parts of an interconnected green space system, cities can reduce flood control and stormwater management costs. Parks can also protect biological diversity and preserve essential ecological functions while serving as a place for recreation and civic engagement. They can even help shape urban form and reduce opposition to development, especially when planned in concert with other open spaces.

Key Point #1

Creating an interconnected system of parks and open space is manifestly more beneficial than creating parks in isolation.

Key Point #2

Cities can use parks to help preserve essential ecological functions and to protect biodiversity.

Key Point #3

When planned as part of a system of green infrastructure, parks can help shape urban form and buffer incompatible uses.

Key Point #4

Cities can use parks to reduce public costs for stormwater management, flood control, transportation, and other forms of built infrastructure.

KEY POINT #1:

Creating an interconnected system of parks and open space is manifestly more beneficial than creating parks in isolation.

No single park, no matter how large and how well designed, would provide citizens with the beneficial influences of nature; instead parks need to be linked to one another and to surrounding residential neighborhoods.—Frederick Law Olmsted²

The recreational and social values of city parks are well known. However, linking parks, greenways, river corridors, and other natural or restored lands together to create an interconnected green space system provides far greater benefits for people, wildlife, and the economy. It helps connect people and neighborhoods, provides opportunities for exercise that can counter today's trends in obesity and adult onset diabetes, and enhances emotional well-being by bringing nature "close to home." A network of parks can also provide pathways for wildlife moving from one isolated natural area to another. And just as it is necessary to design and construct road networks and other built infrastructure in advance of metropolitan growth, it is also important to plan and protect urban green infrastructure as a city grows.

Montgomery County, Maryland, initiated green infrastructure planning in the 1940s by planning a stream valley park system far in advance of the county's rapid growth. The county began buying land along all of its major stream corridors in the 1940s and 1950s—well before land development had made it impossible to preserve these ecologically important areas. Today all of the county's major stream corridors are public parks. In 2001, the county began adding to this system with a 10-year, \$100 million initiative to complete a county-wide network of open space composed of protected farmland, stream valley parks, ecological reserves, trail corridors, and green space preserves.

KEY POINT #2:

Cities can use parks to help preserve essential ecological functions and to protect biodiversity.

When managed to maintain and restore natural ecological communities, city parks can help protect the biological diversity of local plants and animals. When connected strategically with riparian areas, wetlands, and other urban green spaces, the ecological value can far exceed the value of any one park. This is because isolated natural areas can "leak" native plant and animal species and suffer from the disruption of natural ecological processes, while connected parks can thrive as a wildlife habitat system and help to restore and maintain vital ecological functions and services.

Portland, Oregon: Forest Park. Covering more than 5,000 acres and containing old growth trees and many types of wildlife, Portland's Forest Park is one of the largest natural forested urban parks in the U.S. A 1982 wildlife survey identified more than 112 species of birds and mammals in the park.³ It serves as the anchor for Portland's regional parks, trails, and greenspaces system. The Metropolitan Greenspaces Master Plan, adopted in 1992 by the Metro Council, describes a vision for a unique regional system of parks, natural areas, greenways, and trails for wildlife and people. The plan, being implemented by local park providers, schools, businesses, and citizen groups, identifies 57 urban natural areas and 34 trail and greenway corridors that define the green infrastructure for the Portland metropolitan region.⁴

Chicago Wilderness is a regional system of nature reserves that includes more than 200,000 acres of protected natural lands from southeastern Wisconsin through northeastern Illinois and into northwestern Indiana. The protected lands include forest preserves, state parks, federal lands, county preserves, and privately owned lands. Chicago Wilderness is a coalition of more than 160 public and private organizations working together to protect, restore, study, and manage the precious natural ecosystems of the Chicago region for the benefit of the public. Their vision, as described in the Biodiversity Recovery Plan, includes "a network of protected lands and waters that will preserve habitat for a complete spectrum of the region's natural communities. . . A critical mass of sites will be large enough to maintain a sustainable complex of interdependent species and natural communities. Carefully monitored habitat corridors will connect sites, both small and large, opening paths for ancient patterns of migration and dispersal."⁵

KEY POINT #3:

When planned as part of a system of green infrastructure, parks can help shape urban form and buffer incompatible uses.

Another value of interconnected urban green space systems is that they can enhance city aesthetics, help shape urban form, and improve urban quality of life. In **Seattle's University District**, residents and visitors can walk only a few blocks to descend into Ravenna Park and escape the city's hustle and bustle in a protected green oasis. Strategic design and placement of green space elements across the urban landscape can provide visual relief, separate incompatible land uses and complement the placement of new buildings, roads, and other city infrastructure.

Minneapolis, Minnesota. In 1883, the Minneapolis Board of Trade adopted a resolution to establish an independent park commission, reasoning that the rapid growth of the city "warns us that the time has come when, if ever, steps should be taken to secure the necessary land for such a grand system of Parks and Boulevards as the natural situation offers." The state legislature then authorized a voter referendum that was overwhelmingly approved that same year. One of the first acts of the newly established board was to engage the services of two well-known landscape architects of the time, H.W.S. Cleveland, the former head of the Boston park commission, and Frederick Law Olmsted. They both pressed for acquiring parklands well in advance of the existing need. The board followed their advice, acquiring large areas of land that would have been prohibitively expensive, if even available, in later years.

Theodore Wirth, parks superintendent from 1905 to 1935, was largely responsible for the development and expansion of the Minneapolis park system in its formative years. The park system he built, influenced by Olmsted's vision, reflects the individuality of the various components contained within. Today the 53-mile Grand Rounds parkway system contains numerous parks and parkways, 22 lakes within the city limits, streams and creeks, the Mississippi River, and the 53-foot high Minnehaha Falls, made famous by Henry Wadsworth Longfellow in his "Song of Hiawatha." The 6,400-acre park system is designed so that every home in Minneapolis is within six blocks of green space. The Minneapolis park system has been called "the best-located, best-financed, best-designed, best maintained public open space in America."⁶

KEY POINT #4:

Cities can use parks to reduce public costs for stormwater management, flood control, transportation, and other forms of built infrastructure.

Perhaps the greatest value of an interconnected green space system is the financial benefit that may be gained when green infrastructure reduces the need for built infrastructure. When designed to include stream networks, wetlands, and other low-lying areas, a city's green space system can provide numerous stormwater management benefits, including storing, carrying, and filtering storm runoff. American Forests estimates that the 187,767 acres of tree canopy in the Washington, D.C., metropolitan region provides 949 million cubic feet in avoided storage of water, valued at \$4.7 billion annually.⁷ Other benefits include the provision of alternative, less expensive modes of transportation. The Rails-to-Trails Conservancy estimates that one-third of weekday trail users are commuting in major urban areas with trail systems, such as Washington, D.C., Seattle, and Tampa.

Bellevue, Washington. Flood control and stormwater management in urban areas typically involve vast networks of underground storm sewers that feed into channelized streams or ditches and eventually into natural waterways. These systems are very expensive, and under extreme flood conditions they often fail. Bellevue has reclaimed its natural systems through the coordinated design of a citywide park system and a stormwater management program. In the early 1970s the city government made a decision to change its stormwater systems from an underground piped system to a less expensive surface drainage system. Today two city agencies, the Storm and Surface Water Utility and the Parks and Recreation Department, use the same land to accomplish multiple objectives. The utility bears responsibility for water resources and has a budget for land acquisition. The parks department manages much of the utility's land for parks, ball fields, playgrounds, interpretive areas, and trails. Many of these open space assets are also elements of the stormwater system. As a result of this partnership, both agencies have reduced their costs while achieving their diverse objectives.

Orlando, Florida. The Parramore Greenprint Plan blends together two essential elements for the revitalization of the Parramore neighborhood in Orlando. Former mayor Glenda Hood believed that creating park amenities was critical to stimulating private development in the community. Also critical to attracting private development was an economical and integrated stormwater management system to handle current and future development runoff and attenuation. The plan identifies strategic parcels for ponds to serve as water features in newly created parks. To maximize the benefit of the new parks, the plan identifies linkages between proposed facilities and existing sites.

When the economy is lagging and budgets are tight, park and open space funding is often on the chopping block. It is considered an unaffordable luxury. However, infrastructure is thought of as a necessity, not an amenity; something that communities must have, not just something that is nice to have. By thinking of parks as green infrastructure, communities can better understand that parks and other green spaces are a basic necessity that should be planned and developed as an integrated system.

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For a diversity of resources on green infrastructure concepts, practices, and educational opportunities, visit www.greeninfrastructure.net, a website hosted by The Conservation Fund and the USDA Forest Service.

Note

For an expanded discussion of this topic, please contact the authors, Ed McMahon and Mark Benedict, of The Conservation Fund's Center for Conservation and Development, 703-525-6300, www.conservationfund.org.

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Photo of Loring Park, Minneapolis copyright © Chris Gregerson, 2001.



How cities use parks to...

Help Children Learn

Executive Summary

Childhood is a holistic process, different for each individual child. Many children do not learn effectively exclusively within a classroom. They need alternative, hands-on learning environments to match their varied learning styles.

Test-driven education mandates often do not emphasize children's emotional and social needs and opportunities for creativity. This limits the development of unique talents and the fulfillment of individual lives, and deprives society of practical, problem-solving intelligence.

City parks, greenways, and naturalized school grounds can be a crucial antidote to these unhealthy trends. They can motivate young people to learn through the natural environment (which includes learning about the natural environment), bringing environmental education into the mainstream of state-mandated instructional programs. The informal learning, non-formal programs, and formal instruction associated with parks can reinforce each other, enhancing academic achievement.

Key Point #1

City parks offer children the daily benefits of direct experience with nature—the motivation to explore, discover, and learn about their world and to engage in health-promoting, physical activity.

Key Point #2

City parks offer children a sense of place, self-identity, and belonging as an antidote to social alienation, vandalism, and violence.

Key Point #3

City parks engage children in informal, experiential learning through play and shared experiences with peers, laying the foundation for effective formal education.

Key Point #4

City parks provide a valuable resource for closing the educational achievement gap in communities.

Key Point #5

City parks offer a vehicle for children's participation in community development, citizenship, and democratic processes.

KEY POINT #1:

City parks offer children the daily benefits of direct experience with nature—the motivation to explore, discover, and learn about their world and to engage in health-promoting, physical activity.

Like newborn animals, children are genetically predisposed to move, to explore the space around them, and to discover its contents. All parks offer physical activity and free-range learning. The richer the park environment, the richer the learning will be.

Parks are inherently attractive to children because they permit escape from the tight strictures of daily life. Located in urban neighborhoods, parks can offer every child the possibility of healthy physical activity—if networks of child-friendly, safe, accessible pathways connect homes with parks. Parks generously support the multitudinous repertoire of chase and rough-and-tumble games transmitted across the generations through childhood culture regardless of social class, ethnic background, or geography. Without opportunities to flourish, these traditions will die.

Childhood in the U.S. is in crisis. The latest Centers for Disease Control and Prevention (CDC) survey estimates that 15 percent of children 6 to 19 years old are overweight or obese. Among 2 to 5 year olds, 1 in 10 is overweight or obese.¹ Surprisingly, even in light of these frightening statistics, school districts across the country have been curtailing recess—or eliminating it altogether (www.ipausa.org).

Many children do not learn effectively exclusively within the four walls of classrooms. Additional, hands-on learning environments are required to match varied learning styles. This is particularly true of children with ADHD (attention deficit hyperactivity disorder) behaviors. An estimated 8 percent of children 3 to 17 years old have ADHD and other learning disabilities—and the numbers are still rising (probably because of improved diagnosis). Recent scientific research is beginning to demonstrate an intriguing health-promoting impact of everyday green space on child development—in particular on ADHD-like behavior.²

For the first time in history, childhood is torn between the tight space of television, couch, and computer screens, and the free-range spaces of the neighborhood: streets, school grounds, parks, greenways—and vacant lots (if they have not been "in-filled"). These spaces must be designed to be so attractive that they will help win the tug-of-war between sedentary indoor life and an active life outdoors.

KEY POINT #2:

City parks offer children a sense of place, self-identity, and belonging as an antidote to social alienation, vandalism, and violence.

To sustain multiple visits, city parks must be memorable, combining strong visual identity with striking, harmonious experiences. Recent research strongly suggests an association between experience of "nearby nature" (such as in a city park), and reduced rates of aggression for low income, inner-city populations.³

Chase Palm Park is the latest addition to **Santa Barbara's** park system. Adjacent to the beach, easily accessible to all residents, the park design contains artifacts and themes that create a physical identity based on the history of the site and its Pacific Ocean location.⁴ A full-size pod of whales spouting water appear to swim across a sea of grass. Children play with sand and water in a giant Nautilus shell created by a local artist.

Nonstandard play equipment commemorates an ancient shipwreck off the coast, its ship-like forms swarming with children. Colorful, adobe-like playhouses take the form of the City of Santa Barbara in miniature, set against a mural backdrop of the Santa Ynez Mountains. Sea caves, a lighthouse with kaleidoscope, fishing pier, and docks complete a permanent stage set for playing and learning.

Chase Palm Park is a fun place for all family members, who leave with lasting memories etched by the locally grounded design elements. These types of experiences live on in conversations at home, curricular activities at school, and during summer camp visits to the park. Its unique identity encourages repeat visits and deeper levels of learning, as children get older. Eventually, they will share memories with their own children.

KEY POINT #3:

City parks engage children in informal, experiential learning through play and shared experiences with peers, laying the foundation for effective formal education.

Children are motivated to learn when they can make their own discoveries outdoors. Computers can never substitute for hands-on, multi-sensory experiences that first fire up the mental circuits in young, inquiring minds. School parks are the most obvious places to stimulate these learning processes, but they must provide more than just additional sports facilities that serve a small minority of children.

Beginning in the 1970s progressive schools began to reconstruct and restore their school grounds as rich play and learning environments serving both school and neighborhood. The movement continues to this day in progressive school systems. In downtown **Berkeley, California**, Washington Elementary School teachers, parents, children, and local residents partnered with several local organizations, including the UC Berkeley campus, to create the Environmental Yard. An acre-and-a-half of featureless asphalt was replaced with a series of mini-ecosystems (wetland, stream, riparian woodland, redwood grove, meadow, and chaparral) reflecting the rich diversity of the San Francisco Bay region. Climbing structures and community gathering areas were also added. After school and during weekends it became a play space for all ages. During the summer, Berkeley Parks and Recreation play leaders and Project PLAE (Playing and Learning in Adaptable Environments) organized an array of arts and environment programs serving families citywide.⁵

The Yard model continues to be replicated in various forms in East Bay school systems (including Berkeley). The Martin Luther King Junior High School Edible Schoolyard is a well-known Berkeley example that links learning about health, nutrition, and food preparation directly to the hands-on gardening experiences.⁶

The model was recently replicated in **Cleveland, Ohio**, where the nonprofit organization ParkWorks partnered with the city schools, Cleveland Botanic Garden, and Kent State University's Urban Design Center to convert the 2 1/2-acre, barren asphalt yard of Orchard Elementary School into Orchard School Community Park, serving school and neighborhood. Children, teachers, parents, and neighbors all participated in the design.⁷ Cleveland schools and the city jointly funded the project (www.parkworks.org).

KEY POINT #4:

City parks provide a valuable resource for closing the educational achievement gap in communities.

Closing the Achievement Gap, a landmark study published in 1998, surveyed 40 K-12 schools in 13 states across the nation, all of whom used offsite open spaces to extend learning options for students.⁸ The results convincingly demonstrate the positive impact of hands-on learning opportunities, as measured by the standardized achievement scores of socially disadvantaged students.

Recognizing the value of urban open space as a motivator of children's learning through hands-on fieldwork, Partners for Environmental Justice (PEJ), in **Raleigh, North Carolina**, developed a master plan for the Walnut Creek Urban Wetland Educational Park. The magnificent 70-acre wetland/floodplain site bordering Walnut Creek is located adjacent to an African-American neighborhood in a previously politically underrepresented area of town. PEJ is based at an Episcopal church next to the site and partnered with nearby middle schools, the North Carolina Museum of Natural Sciences, and NC State University's College of Design to create a master plan. Many other community and educational interests were involved in a series of participatory design workshops to develop the design program and educational brief for the park, which was endorsed by the Raleigh Parks, Recreation and Greenways Advisory Board. The city has already connected the park to the Raleigh greenway system and has allocated funding for the design of an education center located on dry land in one corner of the site. Carnegie Middle School, across the street from the park, Ligon Middle School in the neighborhood, and Centennial Middle School on the Centennial Campus of NC State University (eventually to be connected to the park by a greenway) are all using the park as an educational resource.⁹

KEY POINT #5:

City parks offer a vehicle for children's participation in community development, citizenship, and democratic processes.

If children participate in the design of spaces in their neighborhood, they will value and respect them more fully. The international *Convention on the Rights of the Child* supports this democratic right of young people to be engaged, to be part of the process. (www.unicef.org/crc/crc.htm)

The Town of **Cary, North Carolina**, Parks, Recreation and Cultural Resources Advisory Board initiated the Kids Together Park because they felt the town should provide its citizens with a fully accessible, universally designed family recreation facility.¹⁰ The park was designed through a series of workshops with the participation of children, parents, and local stakeholders. Siblings represented children with developmental disabilities. A strong demand was made to retain natural features of the original site and to add many other natural elements to the design. The participatory process was so successful that a nonprofit organization was set up,

headed by two of the children who did much of the fundraising—and learned much in the process. They decided on the name "Kids Together" as an expression of the mission of the park as a place for all children, regardless of ability. Later in the process, a nonprofit, Cary Visual Art (CVA), participated in the addition of several playful "art benches" and a large sculpted play dragon named Katal (Kids Are Together at Last). Currently, CVA is producing a Kids Together Explorers educational kit, linking art, nature, and learning.

Kids Together Park has become a meeting ground for families, many of them intergenerational, extended, or visiting from out of town (a good criterion for a successful urban park). Multi-ethnic mixes of parents, who work mostly in the high tech, international industries of the Research Triangle Park, get together; swap parenting tips while their children play; and become included in the community.

Notes and Resources

1 Ogden, C., K. Flegal, M. Carroll, and C. Johnson, 2002. "Prevalence and Trends in Overweight Among US Children and Adolescents, 1999-2000." *Journal of the American Medical Association*, 288(14), 1728-1732.

2 Faber Taylor, A., F. Kuo, and W. Sullivan, 2001. "Coping with ADD: The Surprising Connection to Green Play Settings." *Environment & Behavior* Vol. 33(1): 54-77. Sage Publications, Inc.

3 See the following articles: Faber Taylor, A., F. Kuo, and W. Sullivan, 2002. "Views of Nature and Self-Discipline: Evidence from Inner City Children." *Journal of Environmental Psychology*, 22, 49-63. F. Kuo, and W. Sullivan, 2001. "Aggression and Violence in the Inner City." *Environment & Behavior*, 33(4), 543-571. N. Wells, 2000. "At Home with Nature: Effects of Greenness on Children's Cognitive Functioning." *Environment & Behavior*, 32(6), 775-795. A. Faber Taylor, A. Wiley, F. Kuo, and W. Sullivan, 1998. "Growing Up in the Inner City: Green Spaces as Places to Grow." *Environment & Behavior*, 30(1), 3-27.

4 Park designers were MIG, Inc., Berkeley, California, (www.migcom.com), with George Gervin Associates and local artists.

5 A full account of the Environmental Yard, how it was created, and its impact on the children, school, and neighborhood, is published as: R. Moore, and H. Wong, 1997. *Natural Learning: The Life History of an Environmental Schoolyard*. Berkeley, Calif.: MIG Communications.

6 See *The Edible Schoolyard*. 1999. Berkeley, Calif.: Learning for the Real World (Center for Ecoliteracy).

7 Orchard School Community Park was designed by McKnight and Associates, Landscape Architects, Cleveland, with the Natural Learning Initiative, NC State University (www.naturalearning.org) as facilitation and design consultants.

8 Lieberman, G. and L. Hoody, 1998. *Closing the Achievement Gap: Using the Environment as an Integrating Context for Learning*. San Diego, Calif.: State Education and Environment Roundtable.

9 The design program/master plan document for the Urban Wetland Educational Park can be downloaded from www.naturalearning.org.

10 Kids Together Park opened in June 2001, designed by Robin Moore (consultant); Little and Little, Landscape Architects, Raleigh, North Carolina; and Cline Design Associates, Architects.

Robin Moore, the author of this briefing paper, holds degrees in architecture (London) and urban planning (MIT). He is Professor of Landscape Architecture, and director of the Natural Learning Initiative (www.naturalearning.org), NC State University, Raleigh. His research and design activity is focused on childhood environments and ranges from play gardens to urban parks, neighborhoods, and cities. He is a principal in the design and planning firm of Moore Iacofano Goitsman (MIG), Berkeley, California. Contact information: robin_moore@ncsu.edu; 919-515-8344.

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07

CITY PARKS FORUM
BRIEFING PAPERS



How cities use parks to...

Improve Public Health

Executive Summary

People value the time they spend in city parks, whether walking a dog, playing basketball, or having a picnic. Along with these expected leisure amenities, parks can also provide measurable health benefits, from providing direct contact with nature and a cleaner environment, to opportunities for physical activity and social interaction. A telephone survey conducted for the American Public Health Association found that 75 percent of adults believe parks and recreation must play an important role in addressing America's obesity crisis.

Because of the different ways people experience parks, cities need to provide all types, from neighborhood facilities to large natural areas. In fact, many of the health benefits described below can be best achieved through small-scale, readily accessible sites. A full reckoning of the benefits of parks will better inform public policy about parks and provide a useful public health tool.

Key Point #1

Parks provide people with contact with nature, known to confer certain health benefits and enhance well-being.

Key Point #2

Physical activity opportunities in parks help to increase fitness and reduce obesity.

Key Point #3

Parks resources can mitigate climate, air, and water pollution impacts on public health.

Key Point #4

Cities need to provide all types of parks, to provide their various citizen groups with a range of health benefits.

KEY POINT #1:

Parks provide people with contact with nature, known to confer certain health benefits and enhance well-being.

Harvard University professor Edward O. Wilson, Ph. D., argues in his book *Biophilia* that human beings have a genetic tendency to seek connections with other living things. In *The Diversity of Life* he observes that the "favored living place of most peoples is a prominence near water from which parkland can be viewed," and that "in the U.S. and Canada, more people visit zoos and aquariums than attend all professional athletic events combined."

Health studies have shown that contact with nature—with plants, with animals, with pleasing landscapes, and with wilderness—offers a range of medical benefits. These include lower blood pressure and cholesterol levels, enhanced survival after a heart attack, more rapid recovery from surgery, fewer minor medical complaints, and lower self-reported stress. In children with attention disorders and in teens with behavioral disorders, contact with nature has resulted in significant improvement (Frumkin, 2001).

In fact, recent research suggests that exercise is more beneficial—leading to enhanced tranquility, and more relief of anxiety and depression—when it occurs in natural settings, like parks, rather than along urban streets (Bodin and Hartig, 2003). The opportunity for so-called "green exercise" is an important asset that city parks offer.

KEY POINT #2:

Physical activity opportunities in parks help to increase fitness and reduce obesity.

Overweight and obesity are epidemic problems across the country, and related conditions such as diabetes are on the rise. Scientists attribute these worrisome trends to two factors: more calories consumed, and fewer calories burned. A primary focus of attention is providing environments where people can be physically active. Parks offer such an opportunity.

The findings of a study of park use by older adults in **Cleveland**, published in *P&R* magazine, include:

- Active park users were less likely to be overweight than those who had longer park visits and either used the park for passive activities or did not use the park at all;
- Active park use was negatively related to visits to a physician other than routine checkups; and
- The level of physical activity was the strongest predictor of lower blood pressure. -

A study in the October 2000 issue of *The Physician and Sportsmedicine* found that physically active individuals had lower annual direct medical costs than did inactive people. The cost difference was \$330 per person, based on 1987 dollars. If all inactive American adults became physically active, the potential savings could be \$29.2 billion in 1987 dollars, or \$76.6 billion in 2000 dollars.

Certain features predict greater use for physical activity. These include accessibility, proximity, good lighting, toilets and drinking water, and well-designed and well-maintained paths, as well as attractive scenery (Frumkin, 2003).

KEY POINT #3:

Parks resources can mitigate climate, air, and water pollution impacts on public health.

Climate. The dark surfaces of rooftops, roadways, and parking lots in urban areas absorb the day's heat and radiate it at night. As a result, cities cool less at night than surrounding suburban areas, and remain hotter during the days. This urban heat island effect is a significant public health risk, as more people die in hot spells in summer than all other weather events in the U.S. combined. (Changnon, 1996). The lack of shade and evapotranspiration from plants contributes to the problem. According to the University of Washington's Center for Urban Horticulture, a mature tree canopy "reduces air temperature by about five to ten degrees."

Air. The trees in parks also help improve air quality by removing pollutants from the atmosphere. Since urban neighborhoods have especially high concentrations of pollutants related to traffic, boilers, generators, and other sources, trees are especially important to filter the air. An Urban Ecosystem Analysis conducted by American Forests revealed that in **Atlanta**, trees remove 19 million pounds of pollutants each year, providing a service valued at \$47 million.

Cleaner air offers important health benefits. Ozone threatens the health of children, the elderly, and people with asthma and other respiratory diseases. Particulate matter actually increases mortality in polluted cities, especially affecting people with underlying heart and lung disease. Toxic air pollutants increase the risk of cancer. Therefore, trees offer a wide range of health benefits by cleaning the air.

Water. **New York City** began purchasing land in upstate New York more than 150 years ago, and now satisfies its vast need for clean water from three watersheds, the Croton, Catskill, and Delaware, with a combined area of more than 2,000 square miles. This strategy—protecting source water—has saved the city billions of dollars in water treatment costs, according to a World Bank study, and has avoided countless cases of water-borne disease.

States and communities across the U.S. are purchasing open space in the watersheds that feed the water resources that provide hundreds of millions of people their drinking water each day. Public agencies in San Antonio have protected thousands of acres of open space to ensure that the Edwards Aquifer recharge zones are not developed. Failure to do so could have contaminated the drinking water for more than a million of the city's residents.

Parks along urban waterways, such as **Philadelphia's** Wissahickon Park or **Washington, D.C.'s** Rock Creek Park, help keep water clean by absorbing and cleansing the polluted run-off from impervious surfaces before it reaches the water. These parks also reduce stream erosion by maintaining steady flow volumes through the slow release of absorbed run-off.

KEY POINT #4:

Cities need to provide all types of parks, to provide their various citizen groups with a range of health benefits.

Different kinds of parks may differ in the health benefits they offer. A neighborhood park may function as a venue for social interaction, physical activity, and nature contact. Larger parks may offer these same benefits and some additional ones, such as cooling and cleaning of urban air, and protection of source water.

It is critical that a parks system provide a variety of functions because different groups of people have different health needs. People from different age, ethnic, and socioeconomic groups may have different traditions in physical activity and attitudes towards natural settings. For people who are economically disadvantaged, parks are an affordable means to healthy activities.

Play Across **Boston**, a project of the Harvard Prevention Research Center, concluded that in addition to organized league sports, it was important to provide open recreation to provide opportunities for youth to try different sports and for non-athletes to be active (Gortmaker, 2002).

On the other end of the age spectrum, researchers at the Tokyo Medical and Dental University monitored the longevity of more than 3,000 people born between 1903 and 1918 and living in Tokyo, one of the most densely populated cities in the world. The results of the study, published in the *Journal of Epidemiology and Community Health*, showed that proximity to public parks and tree-lined streets appeared to have the greatest impact on the length of pensioners' lives, even when taking into account factors known to affect longevity, such as gender, marital status, income, and age.

Ethnic groups also differ in their preferences. Race and ethnicity have been associated with choice of parks and with types of activities engaged in by park users (Hutchinson, 1987; Dwyer and Gobster, 1997; Tinsley et al., 2002). These differences may relate in part to park amenities; for example, Dwyer and Gobster (1997) found that African-Americans were more likely to use facility-based urban recreational parks while whites were more likely to use wildland parks for such activities as camping and hiking. A study of **Chicago's** Lincoln Park found that Asians, Latinos, blacks, and whites all valued certain park attributes, such as the lake, ponds, and zoo. However, the natural environment was the most frequently mentioned favorable attribute among

Asians, Latinos, and whites, while cultural facilities were most favored among blacks (Gobster, 2002). In this study, whites exhibited higher participation rates in active individual pursuits, such as biking, walking and jogging in the park, while black, Latino, and Asian park users exhibited higher participation rates in passive activities such as sitting and relaxing. Asians and Latinos participated more heavily in group social activities such as picnicking (Gobster, 2002). Another study comparing black and white park users, also found a stronger preference among whites for such activities as swimming and hiking (Floyd et al., 1999).

The 1994-1995 National Survey on Recreation and the Environment compiled trends in outdoor activities across age, sex, race, income, education, car ownership, and size of residence. While some activities, such as walking and family gathering, had high participation rates across most population segments, others did not. For instance, boating and golf activity rates were clearly tied to income levels, while outdoor team sports participation was linked to age. Equally diverse were the barriers to participation identified by those who do not engage in active outdoor recreational activities. Even as these type of national surveys are helpful, a local approach to identifying residents' needs is important to providing the most effective opportunities for health-enhancing park activities (Cordell, 1999).

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How cities use parks for...

Arts and Cultural Programs

Executive Summary

Urban parks have always been an important setting for arts and cultural programs. During the late 19th century, parks commonly hosted musical events. By the beginning of the 20th century, dance, theatre, and even the new medium of film began to be represented in parks programming.

Today, there is a tremendous flowering of artistic and cultural activity in urban parks, from large-scale performing arts festivals to long-term residencies with arts organizations. Parks and the arts have become mutually beneficial: the arts can play an essential role in revitalizing a park, and parks in turn can help solve problems faced by artists and arts organizations.

Since parks are the democratic spaces of a city, where communities can come together to express their identities, the marriage of parks and the arts makes perfect sense. Parks can be a vital place for the cultural expression of a community and a city.

Key Point #1

Cities today use parks for a wide range of artistic events and activities.

Key Point #2

Parks can provide a setting for in-depth and long-term partnerships between communities and artists.

Key Point #3

Arts activity can play an integral role in the revitalization of a park.

Key Point #4

Arts and cultural programs in parks can help arts organizations develop new audiences and can provide suitable rehearsal and performance space.

KEY POINT #1:

Cities today use parks for a wide range of artistic events and activities.

An early and popular use of urban parks was as a setting for parades, cultural celebrations, and, especially, musical events. In New York City, for example, as early as 1859, parks such as Mount Morris, Central, Hamilton Fish, and others across the city hosted concerts by military bands and popular ensembles of the day. Today, there are few large cities that do not sponsor outdoor music events, such as **Eugene, Oregon's** summer concerts that take place in Cuthbert Amphitheater.

While parks have always been a setting for monuments, the use of parks for sculpture and other outdoor installations also has a long history. The first organization created to support the placement of artwork in urban parks was **Philadelphia's** Fairmount Park Art Association, founded in 1872. In the late 1950s, again led by Philadelphia, cities created "Percent for Art" programs, which mandated that a certain percentage of the budget for capital projects had to be spent on public art, and much of that work found its way to parks and other public spaces. Today, private organizations such as **New York City's** Public Art Fund routinely plan and install temporary art installations in parks. In **Providence, Rhode Island**, WaterFire—a series of 100 bonfires that illuminate the three rivers and surrounding parks of the city, with musical accompaniment—visually transforms the downtown area on evenings throughout the summer.

As early as the 1920s, there are records of film being shown in parks. Today, technological advances have made the public exhibition of films in parks easy and cost-effective, giving cities the modern equivalent of the drive-in theater. One advantage of film programs is that they necessarily bring audiences into parks at night, when it might otherwise be difficult to create entertaining activity in the space. As part of its extensive film programming in parks, **Austin, Texas**, has created "Splash Party Movie Nights," where families can sit (or float!) in Deep Eddy Pool, while enjoying a family-oriented movie.

The technical requirements of theater and dance make outdoor presentation relatively more difficult, but there has nevertheless been an explosion of such activity in parks. In **New York City's** Central Park alone, there are dozens of alfresco Shakespeare performances every summer, from large and famous programs such as The Public Theater's Shakespeare in the Park to "Shakespeare on the Run," where the audience moves from place to place for each successive scene of the play. In **Rochester, New York**, the Rochester Museum & Science Center Players and the Friends of Mount Hope Cemetery stage dramatic walking tours and plays in Mount Hope Cemetery, the municipal burial ground of such famous Americans as Frederick Douglass and Susan B. Anthony. These programs help the city expand Mt. Hope's position to an important cultural and park resource as well as a cemetery. Cities such as **Boulder, Colorado**, and **Austin, Texas**, have strong dance programs, with lessons for kids and adults, as well as outdoor performance. A trend towards creating site-specific dance work for parks is also emerging.

Parks can also house museums and other institutions. One of the best models is Forest Park in **St. Louis**, which hosts five major institutions, including an art museum and a 10,000 seat amphitheater. While it is common for parks to have arts facilities, the concentration of so many in a single space has made Forest Park an important arts destination and has helped build a large and enthusiastic constituency for the park. In **Buffalo, New York**, the Olmsted Crescent similarly weaves together parks and cultural institutions. Recent efforts to collectively market the organizations, such as the Olmsted Crescent Cultural Pass, have been successful.

Lastly, parks—especially indoor recreation centers located within parks—provide an excellent location for arts education activities. Drumming instruction, painting classes, dance lessons, and other similar activities, especially for kids in an after-school setting, fill parks with structured activity. One of the cities with the highest ratio of recreation centers to residents is **Minneapolis, Minnesota**, with more than 50 community centers for its population of 360,000; the city fills its centers with hundreds of arts and cultural activities for kids, teens, adults, and seniors, year-round.

KEY POINT #2:

Parks can provide a setting for in-depth and long-term partnerships between communities and artists.

In **Baltimore**, the Gwynns Falls Trail, a seven-mile-long park for hiking, biking, and riding, has entered each year into a partnership with the Maryland Institute College of Art. The Maryland Institute curates a competition for Baltimore-region artists to create site-specific works for the first mile of the trail. During the two-week Art on the Trail exhibit, musical performances, children's activities, and walking tours create a festival atmosphere along the trail. Spectators are even encouraged to create their own environmental artwork, under the supervision of teaching artists.

Arts Corps is a nonprofit arts education program in **Seattle** with a simple and powerful concept: Seattle-area teaching artists are recruited to go into parks to provide free classes for kids. (While the program is citywide and takes place in a variety of locations, Arts Corps has a strong focus on community centers in parks.) Classes are offered in dance, drama, music, visual arts, and writing and last eight weeks. The program not only offers free and high quality instruction for kids, right in the neighborhoods where they live, but also creates long-term connections between artists and the parks. Approximately 1,500 kids are served each year by the program, and the demand far exceeds the current supply of teaching artists and classes.

KEY POINT #3:

Arts activity can play an integral role in the revitalization of a park.

One key to revitalizing a failing park is to create community involvement, and the arts provide an ideal tool. Arts activity can attract large numbers of people to a park, especially at night, when the space may have been previously considered foreboding and dangerous. The arts can also highlight the park's potential to be a vital community asset.

In the mid-1990s, **Reno, Nevada**, was feeling the adverse effects of a declining entertainment and gaming industry. The Truckee River, which flows through the city, linking together most of Reno's major cultural institutions, had lost its glamour and appeal. In response, city leaders created the Artown festival, a month-long celebration of the arts, to revitalize the downtown area, highlight local businesses and artists, and revitalize parks and public spaces. Today, more than 140,000 people attend Artown performances, most of which are free. One of the focal points of the festival is Wingfield Park, located on an island in the middle of the Truckee River, which has been enlivened by the arts events and now also serves as host to many other special events and activities.

Similarly, seven failing waterfront parks in **Queens, New York**, are being improved through arts activity. A recent report from the Center for an Urban Future highlighted the area as a neighborhood poised for economic development and noted that bringing existing cultural institutions together would greatly enhance the neighborhood. Through the "Living on the Edge" initiative produced by the nonprofit City Parks Foundation, film series, concerts, public art, and kids programs are connecting people and arts institutions to the parks and waterfront. Local merchants have been invited to sell their products to the audiences gathered for the arts events, thus spurring micro-economic activity. The neighborhood residents who attend these arts programs are becoming the core members of the community's park support groups.

In **Los Angeles**, ARTScorpsLA transforms abandoned lots into "arts parks," complete with environmental sculpture, holiday festivals and after-school programs. Through educational programs, kids get the opportunity to work alongside established artists, promoting community building and neighborhood pride. Three sites have already been improved through this effort.

KEY POINT #4:

Arts and cultural programs in parks can help arts organizations develop new audiences and can provide suitable rehearsal and performance space.

Two of the most important challenges facing the arts are the need to develop new audiences and the lack of suitable rehearsal and performance space. Parks can help with both of these challenges.

A landmark 2002 study by Alaka Wali and Rebecca Severson highlighted the importance of the “informal arts” —including the presentation of arts activity in easily accessible and familiar spaces such as parks—in developing artists and audiences. Boundaries of age, ethnicity, and socioeconomic status are more easily bridged in the informal arts than in established venues such as symphony halls, opera houses, and theaters. The study also found that the formal and informal arts have a deep and necessary interrelationship in developing artists and audiences of the future. Performances in parks can help artists reach new audiences and can also help audiences experience new or unfamiliar artists or art forms.

Arts organizations everywhere, but especially in cities, have difficulty finding space for rehearsal and performance. Parks can help. In **Chicago**, a program called Arts Partners in Residence systematically identified underused parks and parks spaces and then contracted with arts organizations looking for venues. Each organization agreed to provide performances and/or educational services in exchange for free space. The arrangement is strictly barter: no cash changes hands. The program has maximized the use of city-owned property, provided arts organizations with precious space, and fostered arts activity. One of the most successful partnerships is with Albany Park Theater Company, which helps kids create and produce their own theatrical productions. The program’s mentoring facet is so effective that the level of college attendance among neighborhood residents has increased, with many kids receiving theatrical scholarships.

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This briefing paper was written by David Rivel, Executive Director of City Parks Foundation, an independent, nonprofit organization founded in 1989 to offer park programs throughout the five boroughs of New York City. Questions about this briefing paper may be directed to DRivel@CityParksFoundation.org or 212.360.8275.

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Photo of the Splash Party Movie Night in Austin, Texas. Photo courtesy of Austin Parks and Recreation Department.



How cities use parks to...

Promote Tourism

Executive Summary

Public parks are often the “engine” that drives tourism in many communities. In a simplified tourism model, visitors use some mode of transportation to leave their homes and travel to attractions, which are supported by various kinds of services, such as hotels/motels, restaurants, and retailing. The attractions and support services provide information and promote their offerings to target groups they have identified as potential visitors.

Attractions activate this tourism system. Rarely do people leave their homes and travel some distance because they want to stay in a particular hotel or dine at a particular restaurant in a different locale. Most of the time, the desire to go to a destination on a pleasure trip is stimulated by its attractions.

Many of these attractions are located in parks, while some parks are themselves attractions. This leads to the conclusion that in many communities, parks drive the tourism industry.

Key Point #1

Parks provide sites for special events and festivals that attract tourists.

Key Point #2

Parks provide sites for sports tournaments, which can be major sources of tourism and economic benefits, especially for smaller cities.

Key Point #3

Large urban parks with zoos, memorials, museums, cultural and heritage artifacts, and historical sites can attract tourists.

Key Point #4

Parks with landscape planting and design that are recognized as “living works of art” can be tourist attractions.

KEY POINT #1:

Parks are sites for special events and festivals that attract tourists.

Tourists are defined as visitors who come to a community from outside of it. In this context, they come specifically to visit a park or to engage in activities that take place in a park. Since the mid-1980s, there has been unprecedented growth in the number of festivals and events. Communities organize, host, and promote festivals and special events whose objectives frequently include attracting tourists. They are perceived to create a new form of tourism attraction, which is transient and flexible, so it can be used to extend or create a community's tourism season. Parks are frequently the location of choice for festivals and events because they are often centrally located, gathering places that are intended to facilitate recreation and can accommodate temporary infrastructure without major disruption of their normal functions.

When evaluating the tourism impact of festivals and events in parks, the following points should be considered:

1. Large numbers of participants and spectators do not necessarily equate to a large number of tourists. Most people at community festivals and events are from within the community. A mega-event is likely to attract more tourists to a community than multiple smaller events. Its attraction power is likely to stimulate interest from a much larger geographic area.
2. Many people from outside the community at these events are "casuals" and "time-switchers." "Casuals" are visitors who were already in the community, attracted by other features, visiting friends and relatives, or for other reasons. The event or festival was not the reason they came to the city. "Time-switchers" are visitors who had been planning a visit to the community for some time, but scheduled the timing of their visit to coincide with the event. In both cases, the tourism impact of these visitors on the community would have occurred without the event.
3. It is difficult to estimate the number of tourists at many festivals and events because they are not gated events and do not charge admission. Thus, total attendance counts, proportion of tourists to locals, and proportions of casuals and time-switchers are simply guesses, which may be wildly inaccurate. For example, a study of Fiesta San Antonio, which is comprised of multiple events that take place over a three-week period, many of them in parks, concluded the economic impact was \$16 million. If locals from within the city, casuals, and time-switchers were included, this would lead to the economic impact being wrongly inflated to \$136 million.

KEY POINT #2:

Parks provide sites for sports tournaments, which can be major sources of tourism and economic benefits, especially for smaller cities.

Consider the scenario in which a city hosts a junior soccer tournament. Twenty-four teams from out of town play in its parks over a weekend. The economic impact scenario of these tourists is likely to resemble the following:

- Each team has a squad of 15 players who are all supported by their families, so a total of 360 families (15 x 24) come to the community.
- They stay Friday and Saturday nights and return home late in the day on Sunday.
- On average each family spends \$300 in the community for accommodations, food, entertainment, and gas during the weekend, so total expenditure in the community from the tournament visitors is \$108,000 (360 families x \$300).

The tourism and economic impact of such tournaments is maximized when all teams/players in a tournament come from outside the community, and the number of nights they have to stay in the community is high. This exemplifies the retailing principle that the longer people remain in an area, the more they are likely to spend. Increasing visitors' average length of stay is the most efficient way to increase the impact of an event on a community.

In most cases, sports tournaments will generate a greater economic impact for local communities than special events and festivals, because most attendance at the latter (unless they are "mega-events") is likely to be from locals.

KEY POINT #3:

Large urban parks with zoos, memorials, museums, cultural and heritage artifacts, and historical sites can attract tourists

Cumulative attraction, an accepted principle in tourism development, says that a cluster of proximate facilities is likely to result in greater visitation. Cumulative attraction recognizes that much tourism business is shared. An attraction secures its visitors as a result of its own generative power and as a result of the generative power of proximate attractions. Clusters of recreational facilities offer a critical mass that is not present when facilities are widely scattered. As this critical mass becomes greater, people will travel from a more extensive geographical area to visit them, visitors will stay longer in the area, and they will spend more dollars.

Hermann Park in Houston attracts 5.5 million visitors each year. The original 410-acre park site was obtained from George Hermann's estate in 1914. George E. Kessler, one of America's greatest park designers, was retained to design it, and it was completed by 1933. Over the years a host of attractions were added either in the park or on its periphery, including the Houston Zoo; Garden Center and Botanical Garden; Houston Museum of Natural Science; Miller Outdoor Theater; Planetarium; Aquarium; various monuments; and the first desegregated golf course in Texas. The cumulative impact of these attractions, together with the beauty of Kessler's original park design, have made Hermann Park a primary destination for visitors to Houston.

Balboa Park, San Diego was developed on a 1,400-acre tract of land set aside for a public park by the city of San Diego in 1870. The park is renowned for its brilliant displays of seasonal flowers, shady groves of trees, and meandering paths. However, its ability to attract tourists today owes much to the legacy of the Panama-California Exposition of 1915–16, and the California International Exposition of 1935–36.

Balboa Park hosts 15 museums, which display internationally significant art treasures, exotic animal species, unique model railroads, world folk art, sports memorabilia, and rare aircraft. Many of the museums are housed in magnificent Spanish colonial revival buildings, originally constructed for the 1915–16 Exposition. Other attractions in the park include the San Diego Zoo; the Old Globe Theater; a sports complex with championship tennis courts, athletic fields, velodrome, and swimming pool; a golf course; Starlight Bowl; and an array of institutions that reflect San Diego's diversity, including the Centro Cultural de la Raza, the World Beat Center, the Japanese Friendship Garden, and the House of Pacific Relations. Balboa Park attracts more than 14 million visits a year.

In contrast to the cultural, historical and terrestrial focus of Balboa Park, **Mission Bay, San Diego** focuses on contemporary, sporting, and water-oriented activities. It covers 4,600 acres between Mission Beach, the San Diego Sports Arena, and Sea World. Approximately half the acreage is land, and its 27 miles of shoreline include 19 miles of sandy beaches with restrooms and shower facilities. The park offers a variety of landscapes and supports all types of boating activities including sailing, waterskiing, windsurfing, jetskiing, rowing, and swimming. Bicycle paths shared with hikers and inline skaters wind all around the bay.

KEY POINT #4:

Parks with landscape planting and design that are recognized as “living works of art” can be tourist attractions.

Prospect Park in Brooklyn is widely considered to be the finest park designed by Olmsted and Vaux. Within the boundaries of the 526-acre park are a variety of natural and planned landscapes. The principal features of their design are the Long Meadow, a heavily wooded area they called the Ravine, and a 60-acre lake.

The park became so dilapidated due to lack of maintenance that by 1984, attendance had fallen to a historically low 2 million visits a year. In the 1990s, more than \$100 million of private and city investment successfully renovated the park, restoring much of its original glory. Attendance rebounded to 6 million visits a year as Prospect Park again became one of the most popular attractions for tourists in New York City.

Golden Gate Park in San Francisco covers 1,013 acres. It is approximately three miles long and one-half mile wide. William Hammond Hall designed the park in 1870, but John McLaren, his successor as park superintendent, implemented the design. Hall, inspired by the Olmsted/Vaux design of Central Park in New York City, created a hilly park with a varying landscape of lakes, meadows, ridges, and winding roads. The park now contains more than one million trees, nine lakes, several fly-casting pools, and a lily pool within its borders.

In the east part of the park are The Conservatory of Flowers, a Victorian greenhouse built around 1880 modeled after the Palm House at Kew Garden in London; the Japanese Tea Garden, which covers five acres; and the M. H. DeYoung Museum, which has a diverse collection of fine art. These latter two attractions were legacies of the 1894 Midwinter International Exhibition. Other attractions in the park include the Buffalo Paddock; Planetarium; Asian Art Museum; Aquarium; and a 70-acre arboretum. The park's meadows are used extensively for picnicking. The attractions within Golden Gate add to its cumulative impact, but it is the inherent beauty of the park that mainly attracts its 12 million annual visitors.

Grant Park in Chicago is often referred to as Chicago's “front yard.” Renowned architect Daniel H. Burnham envisioned the 320-acre park as a formal landscape with museums and civic buildings. His geometric design borrows from the great parks of Europe. A series of bridges cross railroad tracks, and the park is divided into sections with public walkways, lawns, trees, and monuments. The park's centerpiece is the Clarence Buckingham Fountain, built in 1927, which is enhanced at night with a choreography of colored spotlights.

In 2004, the park was extended by 24.5 acres when **Millennium Park** was added to its northern border; constructed over active railroad beds. Millennium Park has quickly become a major Chicago attraction, with interactive public art, ice-skating, dining, and free classical music presentations by the Grant Park Orchestra and Chorus.

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Photo of the Pedestrian Bridge in Millennium Park, Chicago. Photo courtesy of Chicago Park District, Caroline O'Boyle.

10

CITY PARKS FORUM
BRIEFING PAPERS

How cities use parks for... Smart Growth

Executive Summary

Parks are commonly thought of as the venue for “fun and games,” but that is only one role they play in a metropolitan environment. Urban parks, which broadly include parkland, plazas, landscaped boulevards, waterfront promenades, and public gardens, significantly define the layout, real estate value, traffic flow, public events, and the civic culture of our communities. With open spaces, our cities and neighborhoods take on structure, beauty, breathing room, and value.

Public understanding of the pivotal role that parks play in enhancing the quality of life in our cities is growing, along with an understanding of the links between the quality of city parks and sprawling growth on the fringe of cities. City parks are an important element of smart growth that addresses both the public’s need for greenspace and the role of greenspace in mitigating higher development density. The smart growth concerns of the public create opportunities for both public agencies and private foundations to leverage support for smart growth, “by making and “re-making” city parks that both strengthen urban cores and protect the fringe.

Key Point #1

Parks have voter support to direct public funds toward growth management strategies.

Key Point #2

Parks enhance mixed development and redevelopment strategies, offsetting higher density concerns with accessibility to greenspace.

Key Point #3

Parks can both strengthen the urban core and protect the fringe from overdevelopment.

KEY POINT #1:*Parks have voter support to direct public funds toward growth management strategies.*

Over the last decade, voters have overwhelmingly supported additional spending for parks and open space conservation. Since 1998, more than 750 measures have gone before voters across the country, with a successful passage rate of 80 percent. Nearly \$30 billion in new park and conservation funding has been created—more than \$4 billion in cities alone since 1996.

In the **November 2003 election**, voters created \$1.8 billion of new conservation funding, passing 100 out of 134 measures on the ballot. The use of new tax dollars to pay for parks and greenspace is a trend that recognizes the leveraging value of the enormous public interest in parks and greenspace. It is fueling new strategies and investments, blending regulatory and market-based tools to address the challenging issues of density, mixed use, and community livability.

This issue is important to voters from a number of smart growth angles. Voters prioritize water as a critical reason to buy land, no matter how it is expressed—from drinking water protection to protection of rivers and streams. Voters care about “natural areas,” not “open space,” which more often conveys a message of abandoned lots. And most importantly, voters care about creating parks for a reason—natural areas, recreation, and safe places for kids to play—rather than just creating parks that abstractly prevent sprawl.

In **Ann Arbor, Michigan**, 68 percent of voters approved a \$72 million bond measure for parks and open space in November 2003. The focus of the measure is to create a greenbelt around the city. “In neighboring communities there has been a very real and negative impact from sprawl, and the voters in Ann Arbor can see it themselves,” according to Doug Coverd, co-chair of the campaign. “There has been an impact on quality of life and voters have shown they are willing to pay to try and affect some positive change.” (Trust for Public Land and Land Trust Alliance, 2004.)

Miami, Los Angeles, and Raleigh, North Carolina, have also benefited from partnerships with their counties, passing park measures worth hundreds of millions of dollars which are split between counties and cities for their separate priorities. Last November, voters in Raleigh passed a \$47 million bond measure with a 69 percent margin (Trust for Public Land and Land Trust Alliance, 2004). The funds will be spent over a seven-year period, which allows the city to pay them back without an increase in taxes. These funds can be further leveraged by use of a grant fund set up by Wake County. Grants are made for both planning and land acquisition. A 50 percent local match is required. Some municipalities have been allowed to pay their portion over time through a loan from the county.

In states where state programs will match local funding, including **Florida, Massachusetts, Colorado, and New Jersey**, local ballot measures have won partly on the availability of state funding matches that leverage local buying power. In 2003, in New Jersey, 27 municipalities passed measures ranging in size from \$180,000 to more than \$9 million (Trust for Public Land and Land Trust Alliance, 2004). Now 189 municipalities in New Jersey have dedicated open space taxes, generating more than \$200 million a year in funding.

KEY POINT #2:

Parks enhance mixed development and redevelopment strategies, offsetting higher density concerns with accessibility to greenspace.

City neighborhoods need to maintain or increase their population while staying attractive and livable; however, density often remains a contentious issue for city neighborhoods of all types and sizes. Many residents oppose high density because they believe it will consume open space, exacerbate parking and traffic issues, or threaten the existing quality of life. A strong policy promoting parks and greenspace can play a crucial role in addressing these concerns.

As many now understand, density is less the issue than design and amenities. A recent study in Texas showed that people are twice as likely to accept smaller residential properties if there is a park nearby (44.3 percent versus 18.6 percent) (Waugh, 2004).

Vancouver, British Columbia, is widely recognized as a leader in making high density work. That city's efforts stem from the adoption of their Central Area Plan in the late 1980s, which shaped a growth strategy emphasizing housing and neighborhoods first, known locally as "Living First." Vancouver's focus on a core-area open space system acts to mitigate higher density, and to tie areas together by allowing people to travel on foot. As Larry Beasley, co-director of Vancouver Planning, comments, "It's about the open space and the public realm being used to contribute to neighborhood form and identity. It's not about having useless private plazas, but instead shaping buildings to emphasize the respite of open public park spaces and squares that are an integral part of every neighbourhood building cluster." (Beasley, 2002.)

One barrier to infill development is the need for upgraded infrastructure, including parks, to attract developers. Some cities are trying to address this issue. In 1998, the city council of **Portland, Oregon**, approved a systems development charge (SDC) that partly offsets the costs of services needed to support new housing. At the current rate of \$1,630 per single-family unit, the residential development fee generates about \$1.5 million a year for park capital improvements. Based on the SDC, the city developed a 20-year plan to build more capacity into the park system (www.portlandparks.org/Planning/SystemDevCharge.htm).

Across the country, 11 of the nation's largest cities, including Ft. Worth, Chicago, and Albuquerque, use impact fees to try to offset the costs of services delivered with new housing.

KEY POINT #3:

Parks can both strengthen the urban core and protect the fringe from overdevelopment.

There is an important connection between open space/park programs and urban/metro growth policy. By reducing or eliminating some of the infrastructure and financial incentives for developing low-density "edge cities" far from the centers of metropolitan areas, cities can be created that have both vitality and environmental sustainability. A dense, vital central city helps decrease the pressure for peripheral development, while policies that limit development at the edge encourage the kind of infill development that helps keep central cities alive.

Although public interest and support for new conservation programs is high, elected officials rarely leverage city park projects and other green infrastructure into regional policies that protect against sprawl.

In an attempt to persuade cities and counties to think more about smart growth, **Maryland's** Priority Places Strategy uses the "carrot" of state funding, including infrastructure funds, as incentive for local governments to redirect development to existing growth areas. The program has helped support neighborhood redevelopment as well as protection of rural and open space resources with grants for land conservation (www.smartgrowth.state.md.us/mission.htm).

Austin, Texas, is seeking to control sprawl by focusing on the protection of drinking water. After a comprehensive mapping project showed that new housing construction was negatively affecting the city's all-important drinking water source, the Edwards Aquifer, the city decided to direct its public transportation and park investments to East Austin in an attempt to attract developers to concentrate growth on the less sensitive east side of town. East Austin is not only outside the drinking water protection zone but also is an area historically underserved by parks (Blaha and Harnik, 2000). Austin's 2004 Smart Growth map shows four new destination parks, all the city's proposed new rail corridors, and proposed infill development targeted to its "Desired Development Zone" on the east side of the city, and extensive watershed protection goals for the west part of the city. Since 1998, Austin has raised \$153 million through ballot initiatives for parks, open space, and watershed protection.

Sioux Falls, South Dakota, has also been aggressive in linking neighborhood conservation and rural development in its comprehensive plan, *Sioux Falls 2015: A Growth Management Plan* (Schmidt, 2002). While managing growth at the periphery—including mandating high-density projects and investing in new parks—Sioux Falls has aggressively redeveloped brownfields and vacant lands in its central city with the help of investments in its parks and trail system.

Regional park partnerships can work for growth management when multiple jurisdictions coordinate, and sometimes collaborate, on park plans that serve multiple needs across the region. Led by the Metropolitan Council, the seven counties surrounding the Twin Cities in Minnesota work together on a regional park and greenway plan that extends from rural sites that protect water quality to neighborhood parks and playgrounds in **Minneapolis and St. Paul**.

Goals to protect natural areas in rural and suburban areas, as well as equity “gaps” in urban areas, are combined in planning and public outreach strategies. The Metropolitan Council received an award this year from APA’s Minnesota chapter for its regional growth plan, which emphasizes four smart growth policies including conservation of natural resources for parks and economic benefits (www.metrocouncil.org/parks/parks.htm).

Based on the experiences of Maryland, Austin, Sioux Falls, and the Metropolitan Council in Minnesota, a parks/growth management policy effort can be effective if it is strongly supported by elected officials, the business community, and the general public. Their leadership requires continuing efforts on the part of local planners to keep citizens involved in the planning process, and to keep parks positioned as a redevelopment and growth management tool.

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CITY PARKS FORUM
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How cities use parks for...

Climate Change Management

Executive Summary

The urban heat island effect, and its mostly negative consequences of modified temperature, wind, precipitation, and air quality patterns, is the primary instigator of local climate change. Continued urbanization of the global population will only hasten further change. The increasing impact of urban heat islands on local climates may eventually translate to more widespread climate change, possibly global, if left unchecked.

Parks are the first and best line of defense against these changes. Urban parks cool and clean the air, improve and modify local wind circulations, and better regulate precipitation patterns. Well-vegetated parks, in a variety of forms and sizes, mitigate the impact of the urban heat island and minimize local climate change. Reduced impact of the urban heat island may prolong or even prevent more widespread global climate change as cities continue to increase in both size and number.

Key Point #1

Parks moderate artificially higher temperatures from the urban heat island effect through shading and evapotranspiration.

Key Point #2

Parks enhance local wind patterns in cities through the park breeze (cooler air over parks replaces warmer air in adjacent city neighborhoods).

Key Point #3

Parks mitigate local precipitation anomalies amplified by the urban heat island effect.

Key Point #4

Parks sequester carbon and other pollutants trapped by the urban heat island that may otherwise alter local and global atmospheric composition.

KEY POINT #1:

Parks moderate artificially higher temperatures from the urban heat island effect through shading and evapotranspiration.

According to the U.S. Environmental Protection Agency (EPA), heat islands are of growing concern for millions of Americans living in and around cities (www.epa.gov/heatisland/). The urban heat island effect is a positive temperature anomaly that occurs over urban areas relative to surrounding non-urban areas. The air over cities becomes warmer due to excessive concentrations of paved surface, reflective surface (both ground and buildings), and population (Ahrens 2006). The heat island effect may generate urban temperatures 2 to 10 degrees F (1 to 6 degrees C) higher than non-urban areas.

Elevated temperatures can impact communities by increasing peak energy demand, air conditioning costs, air pollution levels, and heat-related illness and mortality. Hotter air over cities can also influence local wind and precipitation patterns.

Fortunately, increasing vegetation in cities by creating or expanding parks and open space networks reduces the higher temperature effects of urban heat islands. Urban parks and greenspace counter the effect by cooling the air through both shading and evapotranspiration (evaporation from the leafy parts of plants).

Through EPA's Urban Heat Island Pilot Project (1998-2003), several U.S. cities, such as **Chicago** and **Salt Lake City**, devised approaches to increase greenspace and tree cover in their communities to mitigate their local climate (www.epa.gov/heatisland/pilot/).

Since 1996, Chicago Public Schools has collaborated with the Chicago Park District and the Public Building Commission to create 70 new campus parks around public schools. These parks are designed to provide students and the community with landscaping, recreational opportunity, and cooling potential (egov.cityofchicago.org; www.museumsandpublicschools.org/Partners/cps.html).

One of Salt Lake City's most significant projects has been a three-acre Alpine meadow on the roof of the new conference center, a 1.5 million-square-foot building that occupies a full city block. A waterfall cascades down the front of the building, and a long-submerged creek now runs along its length on North Temple Street. The rooftop meadow is a recreation of the wild landscape of Utah mountains, and it features 21 types of Utah grasses and 300 varieties of native wildflowers. The meadow demonstrates how buildable space can mitigate urban heat (the Church of Jesus Christ of Latter-day Saints; www.lds.org/).

KEY POINT #2:

Parks enhance local wind patterns in cities through the park breeze (cooler air over parks replaces warmer air in adjacent city neighborhoods).

Wind is another important, perhaps lesser known, outcome of the urban heat island effect. Urban areas warm up much faster and tend to reach higher temperatures during the daytime than surrounding non-urban areas (Ahrens 2006). Because warmer air is lighter and less dense than cooler air, it rises and causes lower atmospheric pressure over urban areas. As it rises, warm urban air spreads out and cools, becomes heavier, and sinks over non-urban areas, creating higher atmospheric pressure. The pressure difference between urban and non-urban areas generates winds that blow from non-urban high pressure toward urban low pressure. The return of cool non-urban air to replace warm, rising urban air completes the urban breeze cycle (Spronken-Smith and Oke 1999).

Parks may act as microscale "non-urban areas" within a city and thus create an even smaller circulation known as the "park breeze." The daytime cooling that occurs due to evapotranspiration of park vegetation and the evening cooling that occurs because vegetative cover does not retain heat as well as pavement and buildings creates a "park cool island (PCI) effect" (Spronken-Smith and Oke 1999). The difference in temperature between park interiors (especially larger parks) and the surrounding city creates an atmospheric pressure difference similar to that found between non-urban and urban areas. This pressure difference creates a breeze from park interiors to city neighborhoods, modifying the urban heat island.

In the past few years, New York State has invested the lion's share of its money for **New York City** parks in two large waterfront parks that may enhance the urban breeze and park breeze circulations within the city. The state has committed half of the \$300 million cost of building the Hudson River Park (150 acres land/400 acres open water) with annual appropriations of around \$15 million to \$20 million (www.fohrp.org/fohrp.php?screen=park). Gov. George Pataki and Mayor Michael Bloomberg recently signed a memorandum of understanding in which the state pledged \$85 million and the city \$65 million toward the creation of the Brooklyn Bridge Park (85 acres) (www.brooklynbridgepark.org/).

KEY POINT #3:

Parks mitigate local precipitation anomalies amplified by the urban heat island effect.

In addition to impacts on temperature and wind, the urban heat island affects local precipitation patterns. Both relatively warmer air and higher concentrations of particulates over cities can cause more frequent precipitation events (Ahrens 2006).

Human-made modifications of the natural environment affect the thermal stratification of the atmosphere above a city as well as the local heat balance and hydrologic cycle (www.atmosphere.mpg.de/enid/3rm.html). The urban heat island effect causes the warmer air (including its higher concentrations of moisture and pollutants) to rise more readily than cooler air over non-urban areas (Oke 1987). Consequently, moisture and pollutants are transported into higher levels of the urban atmosphere. Thus, the urban heat island creates a warmer, moister atmosphere over the city. Once lifted, the air will cool and, if enough moisture is available, clouds and precipitation may form. The increased number of cloud condensation nuclei (CCN) and ice forming nuclei (IN) from urban pollution further enhances urban precipitation.

Qing Lu Lin and Robert Bornstein, meteorologists from San Jose State University, used data from meteorological stations set up during the 1996 Summer Olympics and discovered that the urban heat island in Atlanta created frequent thunderstorms (svs.gsfc.nasa.gov/stories/Landsat/atlanta_heat_background.html). Using the National Weather Service's ground-based meter to collect data (the same instrument used to forecast weather for Olympic athletic events), Lin and Bornstein found that five of nine days of precipitation over Atlanta were caused by the urban heat island effect (Lin and Bornstein 2000).

Increased thunderstorm frequency over cities has mixed blessings. On one hand, precipitation cleans the atmosphere of pollutants and cools the air over a city. However, the increased precipitation over an area of mostly impervious cover can cause greater likelihood of urban flooding. More rain over urban areas can strain already taxed urban stormwater management systems.

Urban parks reduce the precipitation anomalies of the urban heat island by cooling the air above cities and removing particulates that could potentially become condensation nuclei. Urban parks also provide the cooling effect of additional rainfall without the detrimental impact of stormwater flooding. By providing more parks, cities could better manage precipitation pattern changes.

KEY POINT #4:

Parks sequester carbon and other pollutants trapped by the urban heat island that may otherwise alter local and global atmospheric composition.

Cities are key contributors to both low-level atmospheric pollution and broader climate change through greenhouse gases such as carbon dioxide. Both results could potentially have a negative impact on urban populations. Urban air pollution from vehicles is particularly harmful, resulting in respiratory problems, acid rain, and reduction in the amount of solar radiation that can reach the earth's surface. Fortunately, research shows vegetation can act as a pollutant sink.

High levels of carbon dioxide (CO₂) and other gases trap heat from the Earth in the atmosphere and prohibit it from releasing heat into space, a phenomenon known as the "greenhouse effect." Trees remove (sequester) CO₂ from the atmosphere during photosynthesis and return oxygen back to the atmosphere as a byproduct. Trees therefore act as a carbon sink and oxygen source (www.coloradotrees.org).

Project EverGreen has supported studies showing that within one year an acre of trees can absorb enough carbon dioxide to equal the amount produced by driving a car 11,000 miles (Virginia Cooperative Extension, www.ext.vt.edu). At the same time, trees and turf in a park also return significant amounts of oxygen to the atmosphere. A turf area of only 50 square feet produces enough oxygen to meet the needs of a family of four (www.projectevergreen.com).

In addition to carbon, studies have also shown how effectively trees remove other pollutants. A 212,000-acre urban park tree cover removed 48 pounds of particulates, 9 pounds of nitrogen dioxide, 6 pounds of sulfur dioxide, 2 pounds carbon monoxide, and 100 pounds of carbon daily (Coder 1996). The U.S. Forest Service calculates that over a 50-year lifetime one tree generates \$31,250 worth of oxygen and provides \$62,000 worth of air pollution control (www.coloradotrees.org/). Yet another study found trees in New York City removed an estimated 1,821 metric tons of air pollution in 1994 (Nowak 1995).

Increasing the amount and size of well-vegetated parks can help reduce the amount of pollutants in the atmosphere. In addition to the obvious health benefits for humans, the pollutant-reducing capabilities of vegetation also bode well for climate change management, particularly with respect to the greenhouse effect.

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