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Physical Environment

The city of Minneapolis enjoys one of the finest urban environments in the country. The physical environment section contains information on the condition of the city, and identifies efforts to protect and enhance the city's environment.

Many sources contributed to this chapter including the following: the Park and Recreation Board; the Environmental Management division of the Department of Operations and Regulatory Services; the Metropolitan Council; the Department of Public Works; and the Center for Energy and Environment.

This chapter can also be found on the city's web site at: www.ci.minneapolis.mn.us/planning

Management of the Physical Environment
Land & Soil
Water
Air
Noise
Environmental Response
The Built Environment and Urban Character

"The chapter on the Natural Ecology focuses on the concept of sustainability and the need to frame decisions about development and growth in the context of their impact on future generations. Minneapolis will manage the use of the city's environmental resources (including air, water, and land) in order to meet present needs while considering future concerns."

The Minneapolis Plan
(adopted by the City Council and Mayor, March 2000)

There are numerous tools and strategies by which the city manages, protects, and sustains the Physical Environment. In some cases, federal, state, regional, or other mandates guide city action and policy. In others, the city has developed additional tools that help sustain a healthy physical environment that supports the current and future social, economic, and ecological wants and needs.

Environmental Coordinating Team
In 1994, the Mayor and City Council created the Environmental Coordinating Team (ECT) and charged it with the following:

- Confront the problems associated with past industrial and land use practices.
- Maintain and improve both the environmental and economic health of the city.
- Develop programs that provide for a sustainable future.

The ECT consists of the directors of the Department of Operations and Regulatory Services, the Planning Department, the Department of Public Works, the Department of Health and Family Support, the Minneapolis Parks and Recreation Board, the Minneapolis Community Development Agency (MCDA), the Fire Department, and the City Attorney.

Because of its coordinated, resource-based approach, the ECT has provided the city greater accountability on environmental matters. Previously, a department or agency dealt only with its piece of an environmental problem; none bore responsibility for the whole. The ECT approach continues to offer the hope of significant enhancements of the soil, air, water, and a healthier economy.

New Environmental Services
In 2000, as part of the reorganization of the Department of Operations and Regulatory Services, four environmental programs were combined into the new Environmental Services office: Environmental Health, Lead Hazard Control, Animal Control, and Environmental Management. The mission of Environmental Services is to protect public health and the environment by providing Minneapolis residents with safe food and water, healthy homes, a clean outdoor environment, and animal protection and control.

Sustainable Development
The city has endorsed sustainability through the ECT. The concept is also one of the essential ideas incorporated into the city's comprehensive plan - *The Minneapolis Plan*. The idea of sustainability has received broad bipartisan support. By embracing sustainability, the city joins with efforts at many levels of government, including the President's Commission on Sustainable Development, the Minnesota Sustainable Development Initiative, and the Joint Center for Sustainable Development established by the National Association of County Organizations and the U.S. Conference of Mayors.

As defined by the United Nations, a sustainable society meets the needs of the present without sacrificing the ability of future generations to meet their own needs. The idea of sustainability implies that the city and its residents should be wise stewards of natural resources, wasting as little as possible.

Some of the city's sustainable development strategies include the following:

- The city helps develop neighborhoods that include a mix of housing, employment, and services. This allows people to meet their daily transportation needs with fewer and shorter trips in vehicles and more trips by bicycle or on foot. The city believes that appropriate mixing of land uses will result in less reliance on the automobile, pedestrian and public spaces that encourage activity, a stronger sense of livability, and friendly density.
- Consistent with Policy 8.g in *The Minneapolis Plan*, the city strives to follow a policy of "transit first" in order to build a more balanced transportation system than the current one.
- The city stresses infill development and adaptive reuse of buildings.
- City regulations, policies, and practices protect ecologically sensitive areas.
- City policies and practices encourage the conservation of resources through its waste reduction and recycling programs, and the maximization of energy efficiency.

Smart Growth
A key to sustainable development is how we grow and what resources we use and conserve. Generally, development patterns in the metropolitan area indicate that the demand for housing, commercial and office space, parking, and retail goods and services results in the consumption of large expanses of land. Every day in Minnesota, an area larger than the Mall of America is developed. Abandoning established communities to build new ones carries a huge price tag. It destroys wildlife habitat, wetlands, and our sense of community, and it is expensive to service. Urban sprawl is one of the most significant causes of resource consumption and pollution. Studies show that dense urban development is significantly more energy and resource efficient and far less polluting than sprawled development. When

metropolitan growth occurs in Minneapolis, city growth strategies result in infill developments, increased density in underused areas, and adaptive reuse of existing older structures. Growth in the city means a more efficient use of the already built environment, a reinforcement of the urban fabric, and a strengthening of the entire region at its core. Minneapolis is a model of compact urban form.

There are several principles underlying Smart Growth that address issues from transportation choices to social justice. The heart of the movement is the belief that in order to avoid costly duplication of services and the costly consumption of land, society should make efficient and effective use of land resources and the existing infrastructure by encouraging development in areas with existing infrastructure or development capacity.

Environmental Review

Minnesota Environmental Review Program: The Minnesota Environmental Review Program requires that environmental reviews be completed for projects which exceed certain thresholds that deal with size and with the nature of the project (e.g. large commercial, residential or industrial projects; hazardous waste facilities; and projects that impact historic resources). In most cases, the law requires the city to be responsible for the environmental review for projects located within Minneapolis. The law defines the content and scope of the review and the process and timeline for its completion.

The purpose of the environmental review is to disclose the potential environmental impacts of the project and identify ways to avoid or minimize them. Permitting agencies, including the city, rely on this information for their permitting decisions. The environmental review program has no authority of its own to require any response to the environmental effects disclosed, no matter how significant. It is left to the regulating authorities to implement the mitigative measures identified in the environmental review.

The three most common state reviews are the Environmental Impact Statement (EIS), the Environmental Assessment Worksheet (EAW), and the Alternative Urban Areawide Review (AUAR). The EIS is a very thorough study of the potential environmental effects of the project and of reasonable alternatives to the project. An EAW is a much briefer review that is intended to screen projects that may have the potential for significant environmental effects. If the EAW leads to the conclusion that a project may pose significant environmental risks, then an EIS must be prepared as well. The AUAR is a substitute form of review that blends the requirements of the EAW and the EIS. It merges the scope of an EAW with a level of detail that is closer to an EIS. Like an EIS, the AUAR includes alternative scenarios and a very specific mitigation plan.

Environmental Review Thresholds: The following describes the thresholds for a mandatory EAW and EIS for certain project uses (refer to Minn. Rules at 4410.4300 and 4410.4400 for other uses):

	EAW	EIS
Industrial, Commercial, and Institutional (gross square feet):		
• Warehouse and light industrial	600,000	1,500,000
• Industrial, commercial, and institutional	400,000	1,000,000
Residential (dwelling units):		
• Attached units	375	1,500
• Unattached units	250	1,000

Federal Environmental Review Program, the Environmental Assessment: Like the state program, the purpose of the federal Environmental Assessment is to disclose the potential environmental impacts of a project that uses federal funds, and identify ways to avoid or minimize those impacts. Federal law delegates the review responsibility to the city for most projects located within the city.

2001 Environmental Reviews: In 2001, the city completed five federal Environmental Assessments for projects that use federal funds, and the following state-mandated environmental reviews:

AUAR for the SEMI Area: Late in 1997, the city initiated a major environmental review for the entire 300-plus-acre Southeast Minneapolis Industrial (SEMI) area using the AUAR process. The city distributed the draft AUAR on September 29, 2000 for public comment, the Final AUAR on June 1, 2001, and completed the review with its adoption on July 19, 2001. The environmental review focuses on existing land uses, soil conditions, transportation, historic resources, groundwater pollution, and potential redevelopment opportunities. It includes a refinement of the adopted master plan for the area. The AUAR will substitute for the preparation of any EAWs or EISs that would be required for specific projects within the SEMI Area, provided the projects are consistent with the assumptions made in the AUAR.

Wells Fargo Voluntary EAW: On May 18, 2001, the city approved a Voluntary EAW for the Wells Fargo project (formerly the Honeywell property) in the Phillips and Whittier neighborhoods. The proposed development will result in additions to existing office spaces (150,000 square feet), structured parking (2,580 stalls), and surface stalls (20). The project site is bounded by 26th Street East, I-35W, 29th Street East, and Fifth Avenue South.

Petition for Environmental Review for the Minnehaha Academy Expansion Project: On April 11, 2001, the city received a citizen petition to prepare an EAW for this project. The project did not trigger a mandatory environmental review. The city concluded it has several tools that are more effective than the disclosure power inherent in environmental reviews to shape projects to be more consistent with the city's comprehensive plan and other plans and policies. The city concluded the evidence presented in the petition failed to demonstrate the project, as modified by the city regulatory tools, may have the potential for significant environmental effects. Consequently, the city could not order the preparation of a Discretionary EAW for the project.

Travel Demand Management Plans

Transportation accounts for more than half of the air pollution and a significant amount of the soil and water pollution nationally. Travel demand management (TDM) plans serve as important tools for the city to minimize the polluting impacts of transportation. The city's zoning code requires developments of over 100,000 square feet to submit a TDM plan for approval by the Planning Director. TDM plans must disclose the expected transportation impacts and detail a mitigation plan. Mitigation measures to be considered include the following:

- Periodic survey of transportation behaviors and desires of the building users (completed generally every two years).
- Periodic status reports (generally every two years).
- Subsidies for users of the alternatives to the single-occupant vehicle (e.g. transit, car and vanpools, bicycles, and walking).
- On-site transit facilities and transit pass sales.
- Construction of downtown skyways.
- Preferential siting of car and vanpool stalls.
- On-site facilities for bicycle storage and for showers and lockers.
- Tenant communication and education programs focusing on the alternatives to the single-occupant vehicle.
- Creation of flextime and telecommuting opportunities.

Since 1997, the city has stepped up its efforts to negotiate stronger TDM plans from major projects. The city estimated the net present value of the private sector investments in the above mitigating measures for fourteen TDM plans for major downtown projects. The total is $9.6 million. In October 1999, the city was presented a Commuter Choice Award for its work on TDM plans. During 2001, the city approved ten TDM plans for projects.

Land and Soil

The total area of the city is 59 square miles or 37,516 acres. Residential uses represent the single largest type of land use — slightly more than 53 percent of the city's total land area. Public and recreational uses rank second in land usage. The third largest land use is industrial land. Lakes, rivers, and streams cover 6 percent.

Land Use

The Metropolitan Council provided land use information developed from air photos.

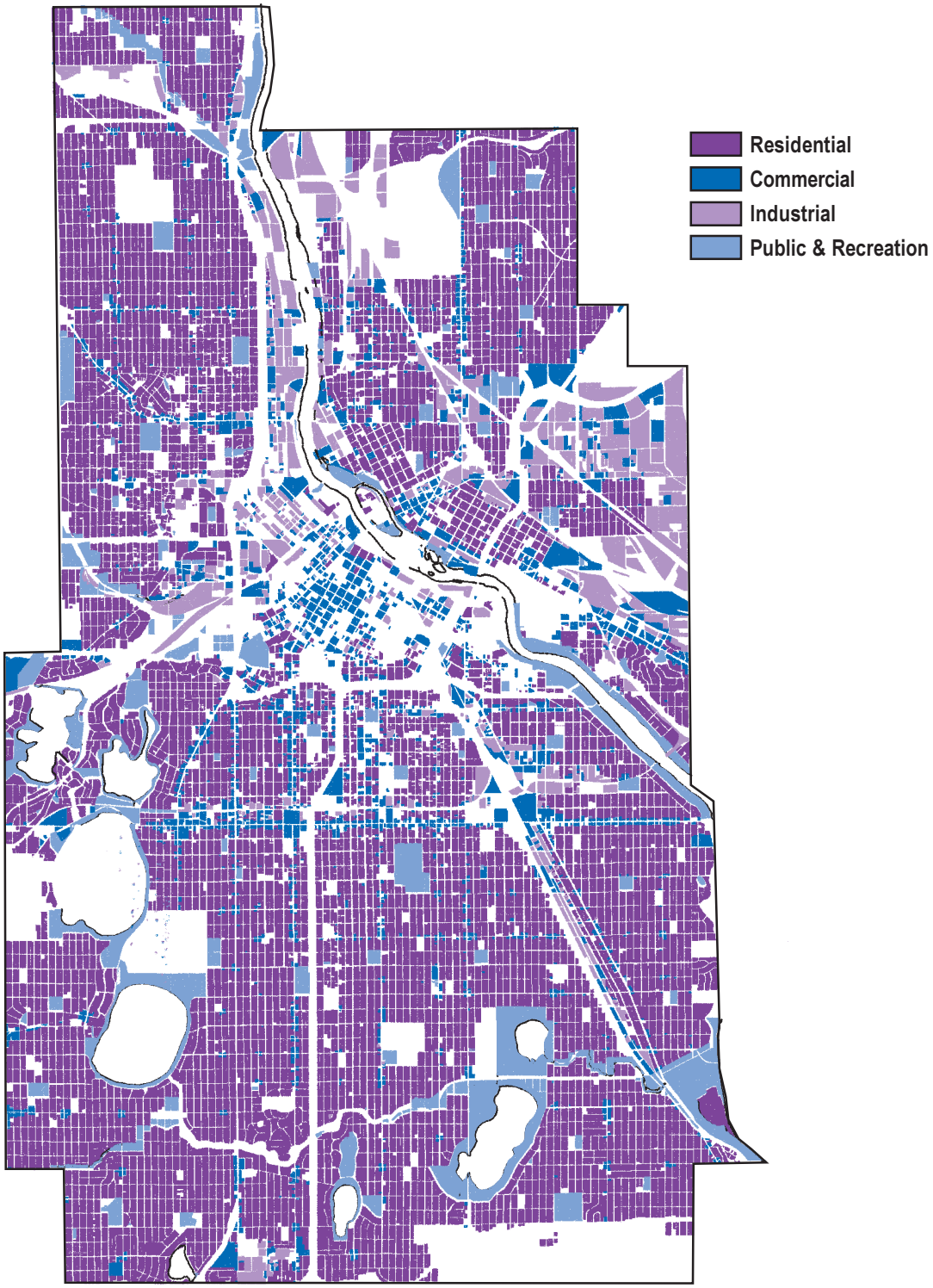
Existing Land Use: Since 1998, State of the City reports included a different land classification system than used in prior reports. The Metropolitan Council's land use coding of individual parcels is considered more reliable than the system used by the City of Minneapolis Assessor's office. The Metropolitan Council information is also valuable because it includes data from as far back as 1970. The table below shows the number of acres of land in each classification for the years 1970, 1980, and 1990.

MINNEAPOLIS LAND USAGE - 1970 TO 1990
(In Acres)

	1970	1980	1990	% of Total	Change 1970-90
Residential	19,583	19,567	19,676	53%	+ 93
Commercial	1,887	1,887	1,909	5%	+ 22
Industrial	5,448	5,503	5,460	15%	- 64
Public & Recreational (Parks)	5,913	5935	5,986	16%	+ 73
Lakes and Streams	2,248	2,248	2,271	6%	+ 23
Highways >200' R.O.W.	748	1006	1298	3%	+ 550
Non-Urbanized	1,504	1,185	769	2%	- 735
Total	37,331	37,331	37,369[1]	100%	+ 38[1]

[1]The Ryan Lake annexation occurred between 1980 and 1990.

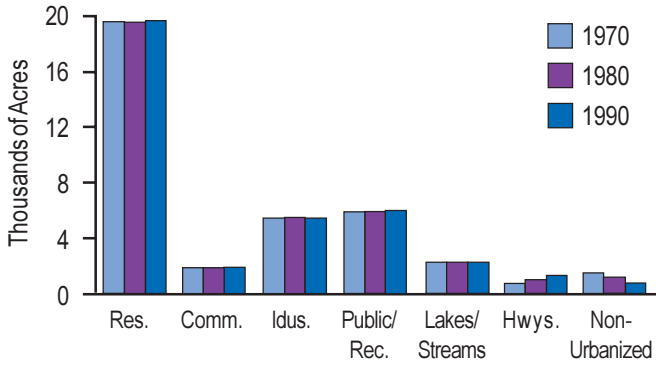
The preceding table shows that the area of the city increased slightly between 1970 and 1990 because of the addition of the Ryan Lake Annexation in the northwest corner of the city. At the request of the City of Robbinsdale, the City of Minneapolis annexed this property. Residential uses account for more than half of all land use in the city. The next largest category of uses is public and recreational. This classification includes all the schools, hospitals, cemeteries, and parks in the city. The use 'highways' had the greatest 20-year increase. Land was converted for the construction of the freeway system and Hiawatha Avenue. The amount of non-urbanized land (land that is vacant or wetlands) decreased by more than one square mile between 1970 and 1990. Only about one square mile in scattered locations throughout the city remains vacant.


Residential
Commercial
Industrial
Public & Recreation

LAND USE BY COMMUNITY
(In Acres)

Community	Residential	Commercial	Industrial	Trans., Comm. and Utilities	Social/ Cultural	Undeveloped and Unused	Total
Calhoun Isles	1,014	1,401	23	954	612	73	4,077
Camden	1,393	121	135	972	326	119	3,066
Central	131	274	156	990	110	1,844	3,505
Longfellow	1,252	149	122	858	405	18	2,804
Near North	1,192	160	194	998	237	107	2,888
Nokomis	2,027	42	8	1,895	701	9	4,682
Northeast	1,585	179	444	1,705	537	190	4,640
Phillips	335	101	45	417	92	52	1,042
Powderhorn	1,486	139	21	1,075	196	35	2,952
Southwest	2,518	127	42	1,442	667	35	4,831
University	606	364	655	1,331	323	154	3,433
Total	**13,539**	**3,057**	**1,845**	**12,637**	**4,206**	**2,636**	**37,920**

LAND USE: 1970, 1980 AND 1990



Vegetation Management

The wide range of vegetation found throughout the city creates a beautiful, functional and diverse landscape for city residents and visitors to use and enjoy. There are large expanses of turf grass and formal flower gardens. Tall stately trees grace many of the streets, boulevards, and other public spaces. Many natural areas contain native prairie, wetland, and forest species. The Minneapolis Park and Recreation Board (MPRB), responsible for managing park land and significant portions of the urban forest, uses a comprehensive and integrated approach to vegetation management. This approach enables the MPRB to address the impacts and opportunities associated with maintaining existing vegetation, and planning new projects in a balanced manner that maximizes public benefit.

Urban Forest: The Forestry Section of the Minneapolis Park and Recreation Board ensures the trees that line our streets and shade our parks receive the care they need to flourish. This is important because well-maintained trees serve many purposes. Strategic tree planting is a proven complementary approach to conserving energy because trees and other foliage provide shade and from windbreaks. Trees clean the air, help transform pollutants, and convert carbon dioxide, the primary "greenhouse" gas, into oxygen. Interception and storage of rainfall by trees helps to lower storm water runoff volume and rate. Mature trees buffer noise and beautify the city in simple and effective ways. Boulevard trees that extend their leafy canopies over streets also help calm traffic. Homes on a tree-lined street have higher property values.

In 2001, the MPRB Forestry Section planted over 3,200 new trees on boulevards and in parks throughout Minneapolis with funding provided by People for Parks (PFP), Neighborhood Revitalization Program (NRP), Public Works, private donations, state and federal funds, and the MPRB. Since 1992, over 12,000 trees have been planted using NRP funds and over 600 have been planted as part of the Department of Public Works re-paving projects.

The Official Minneapolis Arbor Day Celebration took place on Saturday, April 28, 2001 at Edgewater Park with the theme "Growing Our River Heritage." The event was sponsored by the Bottineau Neighborhood Association, People for Parks, Edgewater Park Committee, Committee on Urban Environment (CUE) and the MPRB. Over 100 new trees were planted with the help of over 200 volunteers. This was the first phase of a new master plan for the park.

Minneapolis received its 22nd consecutive "Tree City USA Award" from the National Arbor Day Foundation. The foundation presents this award to cities that display an ongoing commitment to a strong urban forest program. One way that this is measured is based on the municipal budget for a tree program. At approximately $7 million, Minneapolis adequately satisfies this requirement. In addition, Minneapolis received its seventh consecutive "Tree City USA

Growth Award." The Minnesota Shade Tree Advisory Committee presented the Forestry Section of the MPRB with the "Outstanding Arbor Day/Arbor Month Celebration Award" for the 2000 Arbor Day ceremony held at Loring Park and the "Partnership Award" for the Beautiful U Day that was held on Nicollet Island.

Minneapolis continues to combat Dutch Elm Disease (DED). The number of diseased trees has increased over the last few years but is still at a manageable level. In 2001, the MPRB removed approximately 1,100 trees from streets, parks, and natural areas. An additional 1,500 diseased trees were condemned on private property. Since 1963, over 130,000 diseased elm trees have been removed citywide. The main method used to educate residents about DED is "Elmer" the Elm Tree. This costumed mascot continues to actively provide educational programs to youth in grades K through fourth. "Elmer" also attends neighborhood celebrations, special events, and parades throughout Minneapolis.

The Forestry Section and the Environmental Operations Section of the MPRB joined forces with the Street Paul Parks and Recreation department to apply for a grant that was awarded by the USDA Forest Service. This 2001 Urban and Community Forestry Focused Funding grant will provide a total of $160,000 for the "Invasive Species Management Project." This project will help restore urban forest health by controlling woody invasive species. Results will include the creation of a model for managing such species as Buckthorn by using various control methods and reforestation.

Buckthorn and Purple Loosestrife: As of December 31, 2000 the importation, sale, or transportation of the species or any cultivar of Glossy Buckthorn (Rhamnus frangula) is illegal within and into the State of Minnesota. This includes the popular 'Tallhedge' (also known as 'Columnar') and Fernleaf ('Asplenifolia') cultivated varieties. Common Buckthorn (Rhamnus cathartica) has been removed from the nursery market since 1930.

MPRB's goal to educate and work with communities about buckthorn on private properties began as part of an USDA Forest Service Grant. In the fall of 2001, residents of the Fulton, Linden Hills, Prospect Park, and Hale-Page-Diamond Lake neighborhoods were notified of buckthorn on their property and encouraged to remove it by a free or low-cost pick-up. The response from residents has been overwhelming with participating households ranging from 50 to over 160 per neighborhood. Three neighborhood organizations have also committed to recruit volunteers and provide funds for parkland removals within their neighborhood. As such, volunteers and the MPRB Forestry and Environmental sections cleared buckthorn and other invasive plants around Lake Harriet and Diamond Lake in October 2001. Five more neighborhoods bordering the Mississippi River will participate in similar activities in the fall of 2002.

The MPRB used both bio-control methods and chemical herbicides to manage purple Loosestrife throughout the park system. In 2001, leaf-feeding beetles (Galerucella spp.) were released in Theodore Wirth Park. Currently, there are 26 beetle release sites in Minneapolis parks, which are monitored by Minnesota Department of Natural Resources staff.

Land Recycling

The soil of the city is a valuable natural resource. During the Pleistocene Period, glaciers scoured the earth's surface and deposited a fertile loam across the city. This soil is not only the foundation for structures, it also provides valuable nutrients for lawns and gardens and it purifies groundwater. Pollution threatens these important functions.

Since the city draws its drinking water from the Mississippi River, most polluted sites do not pose an immediate threat to the health and safety of the public. The contamination of these sites does, however, pose a threat to the economic viability of the city.

Often, parties responsible for contaminating the land have moved on and are no longer available to finance its cleanup. Consequently, tracts of vacant land sit idle and become targets for vandalism, illegal dumping, and blight resulting in an eroded tax base.

The Environmental Management Section of the city's Inspection Division is responsible for regulatory authority over contaminated sites in the city. The city's Contaminated Sites Working Group, composed of city staff, has been instrumental in the cleanup of contaminated land. This group has also been instrumental in developing new cleanup standards, applying cleanup technologies, and developing legislation to finance remediation efforts. The city is a national model in reclaiming industrial sites.

Superfund Site Cleanup: Minneapolis has had 25 federal or state designated Superfund sites where past contaminant releases threaten public health or the environment. Of these sites, six have been cleaned and had their Superfund designation removed. Included among these is the Whittaker site in northeast Minneapolis that was de-listed in 1999. The remaining nineteen sites are the focus of Superfund laws such as the Federal Comprehensive Environmental Response, the Federal Compensation and Liability Act (CERCLA), and the Minnesota Environmental Response and Liability Act (MERLA). Perhaps the most significant contribution of this environmental legislation is the creation of environmental awareness by industries. Industries now operate under strict environmental regulations.

Petroleum Tank Release Cleanup: Since 1979, there have been more than 825 confirmed petroleum tank leak sites in the city. Since 1987, 685 have been cleaned to standards set by the Minnesota Pollution Control Agency (MPCA). Tank owners who perform cleanups in accordance with MPCA guidelines are eligible for reimbursement up to 90 percent of the total cost of cleanup through the state-funded Petrofund program.

Effective December 1998, federal law mandates that underground storage tanks (with some exceptions) must meet United States Environmental Protection Agency (USEPA) regulatory requirements. Included are requirements for leak detection, corrosion protection, spill, and overfill prevention. Tanks not meeting state and federal standards must be excavated and removed. Tanks that have not been in service for more than one year must also be removed in accordance with the State's Uniform Fire Code and Minnesota Rules.

Voluntary Investigation and Cleanup Program: The MPCA created this program to encourage voluntary participation, investigation, and cleanup of contaminated land. A few of the wide range of possible contaminants include lead, pesticides, and wood preservatives. Participants are required to meet MPCA standards to receive a certificate of completion. The certificate is a written guarantee providing protection to property owners from future liability. Since1986, over 200 properties within the city have entered the voluntary program, and over 25 sites have received completion certification.

Brownfield Redevelopment: The term 'brownfields' refers to properties that were contaminated by a prior use and that were subsequently abandoned or underused. When cleaned up, brownfields are suitable for redevelopment. Most of these sites are the source of serious concerns regarding environmental liability for potential developers, but are not contaminated enough to immediately threaten public health or the environment. Because there are no known immediate threats, these sites are not identified as Superfund sites, and neither the MPCA nor the USEPA will act to clean them up. Without assistance or incentives, few developers are interested in doing so due to environmental liability concerns.

Minneapolis was among the first cities in the country to reclaim brownfields for productive uses. The MCDA is actively involved in remediating polluted sites for redevelopment. The Public Works Department cleans up properties owned by the city that may have been contaminated, and the Park and Recreation Board restores brownfield sites for a variety of open space uses. Since 1998, the private sector contributed nearly $77 million and the MCDA committed over $23 million in federal, state, and local funds to clean up 28 brownfield sites in the city. This effort retained 2,300 jobs and created nearly 900 new jobs.

Contamination Cleanup Grant Programs: For the spring 2001 round of funding, the Minneapolis Community Development Agency (MCDA) was awarded $2,558,059 in pollution cleanup grants under the Contamination and Metropolitan Livable Communities Grant Programs for the following projects:

- **Lupient Village at Street Anthony Falls:** The MCDA received a grant of $382,422 from the Metropolitan Council Livable Communities Grant Program and a grant of $1,252,429 from the Minnesota Department of Trade and Economic Development (DTED) to clean up petrochemical related contamination. The funds are in support of the new housing and mixed-use development near Street Anthony Falls. The project will include 174 units of rental and ownership housing, including 30 affordable units, and 45,000 square feet of new and rehabilitated office and retail space with parking.

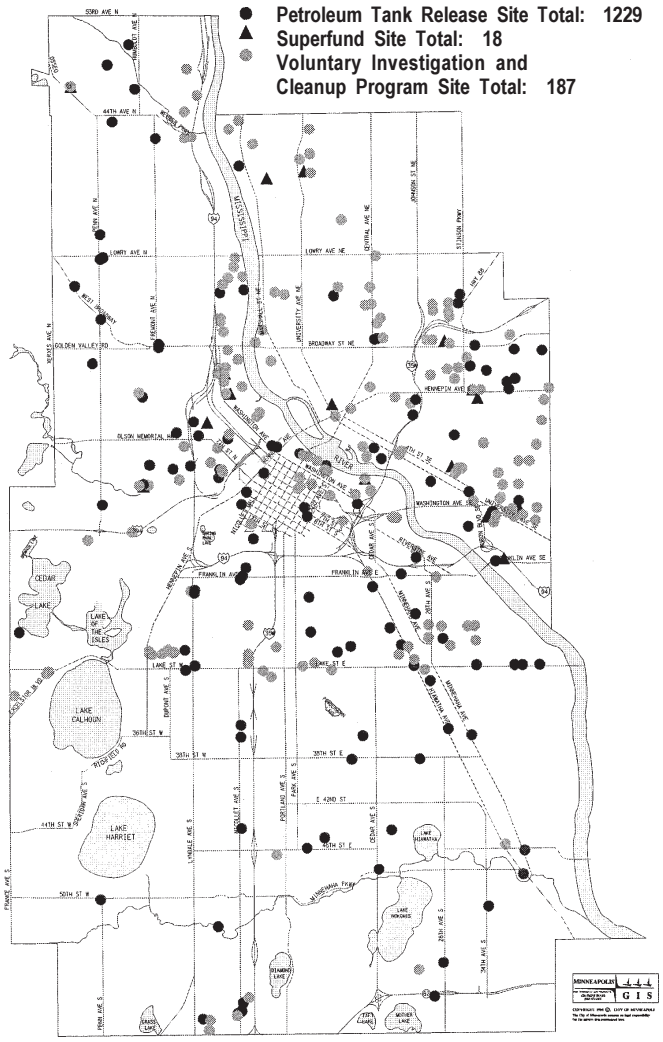
- **Near North Redevelopment:** The MCDA received a grant of $250,000 from the Minnesota DTED for the cleanup of petrochemical-related soil contamination. The cleanup will support massive redevelopment of the former Near North Public Housing area into new family housing along Olson Memorial Highway in Near North Minneapolis.

- **Seward Allweather Roof, Urban Village:** The MCDA received a grant of $635,708 from the Metropolitan Council to cleanup the former rail yards in the Seward Industrial Area. The grant enabled the city to support the new construction for the Allweather Roof facility and to retain this company in Minneapolis.

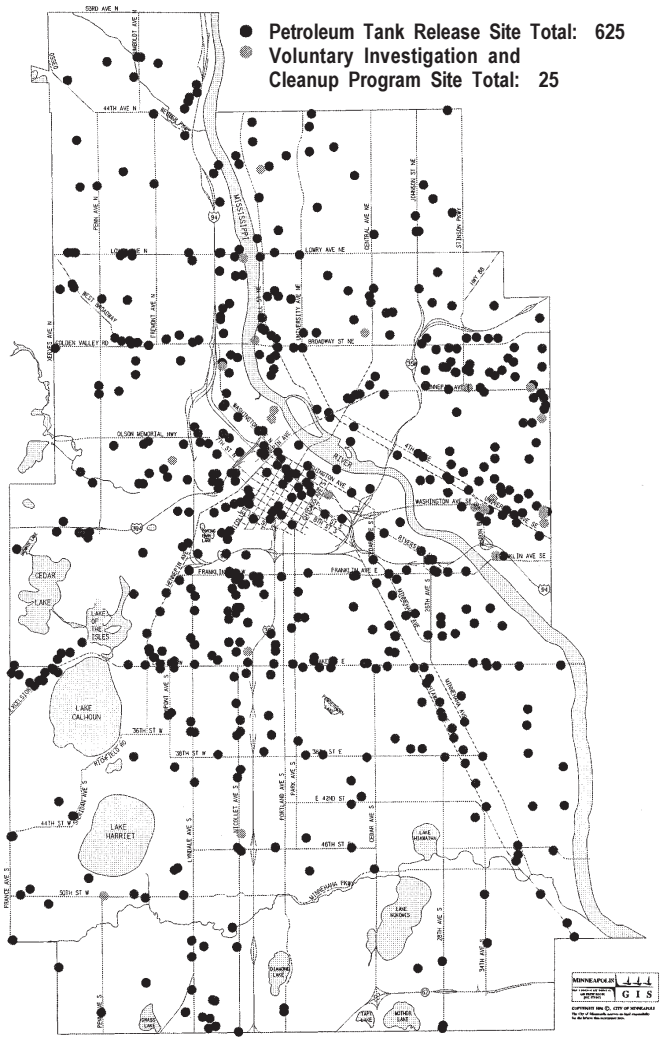
- **Plymouth Penn Investigation:** The MCDA received a grant of $37,500 from the Minnesota DTED to investigate petrochemical contamination on a potential housing and mixed-use development at Plymouth and Penn Avenues in Near North Minneapolis.

Since 1994, the city has secured nearly $23 million in grants under these contamination programs.

CONTAMINATED LAND CLEANUP: OPEN SITES



CONTAMINATED LAND CLEANUP: CLOSED SITES



Illegal Dumping

Sites used for illegal dumping often include abandoned industrial, residential, or commercial buildings; vacant lots on public or private property; and alleys or roadways. Illegal dumping can occur at any time of day but is more common at night or in the early morning hours during warmer months. If not addressed, illegal dumps often attract more waste, including hazardous wastes such as asbestos, household chemicals and paints, automotive fluids, and commercial or industrial wastes.

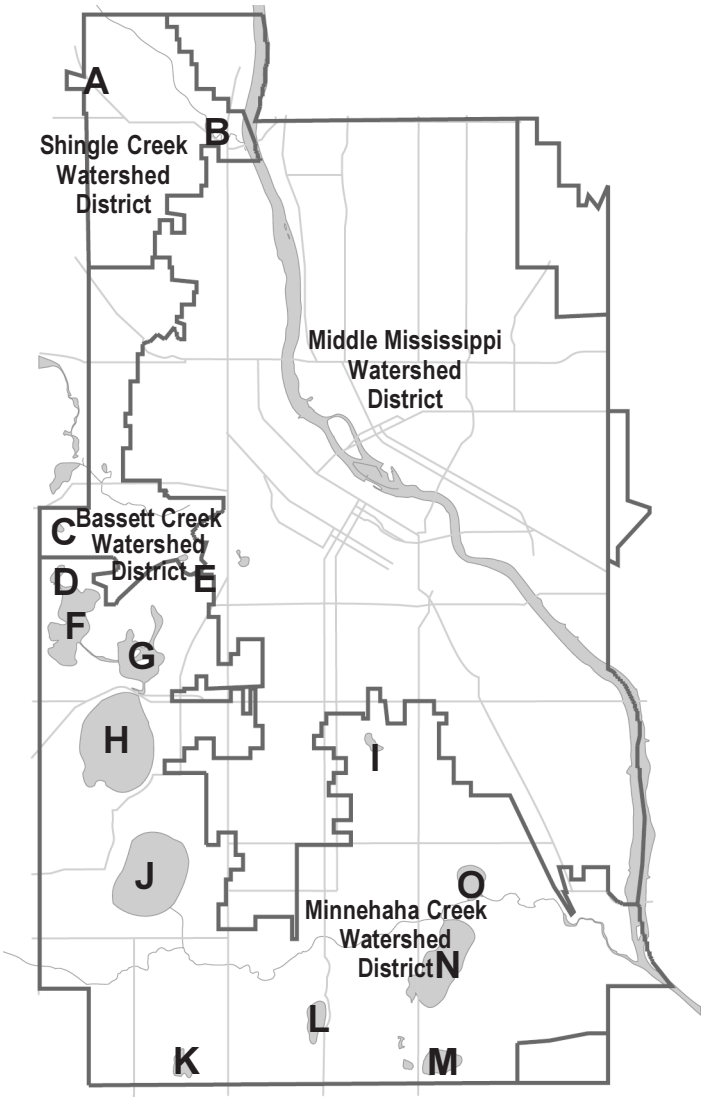
The health risks associated with illegal dumping are significant. Areas used for illegal dumping may be easily accessible to people, especially children, who are vulnerable to the site hazards such as physical hazards (protruding nails and sharp edges), and chemical hazards (harmful fluids or dust). Rodents, insects, and other vermin attracted to dump sites may also pose health risks. Dumpsites with scrap tires provide ideal breeding grounds for mosquitoes that can multiply one hundred times faster than normal in the warm, stagnant water pooled in scrap tires. Severe illnesses, including encephalitis and dengue fever, have been attributed to disease-carrying mosquitoes originating from scrap tire piles.

The problem of illegal dumping has grown. It affects every ward in the city. Many of these dumping sites result in difficult and lengthy investigations. Successful prosecution requires eyewitness identification and material evidence. Illegal dumping also strikes at the heart of neighborhood livability. No one wants to live near a site that is the target of illegal dumping. The city's Housing and Environmental Inspections and Solid Waste and Recycling departments have implemented an aggressive joint enforcement of the illegal dumping ordinance.

Minneapolis — "The City of Lakes" — has within its boundaries:

- **The Mississippi River;**
- **Bassett Creek, Minnehaha Creek, and Shingle Creek;**
- **Brownie Lake, Cedar Lake, Diamond Lake, Grass Lake, Lake Calhoun, Lake of the Isles, Lake Harriet, Lake Hiawatha, Lake Nokomis, Mother Lake, Powderhorn Lake, and Ryan Lake;**
- **Birch Pond, Webber Pond, Spring Pond, the Lake in Lakewood Cemetery; and**
- **Five unnamed wetlands.**

WATERSHED MANAGEMENT ORGANIZATIONS



A. Ryan Lake
B. Webber Pond
C. Birch Pond
D. Brownie Lake
E. Spring Pond
F. Cedar Lake
G. Lake of the Isles
H. Lake Calhoun
I. Powderhorn Lake
J. Lake Harriet
K. Grass Lake
L. Diamond Lake
M. Mother Lake
N. Lake Nokomis
O. Lake Hiawatha

Watershed-Based Management

In order to best manage its water resources, the city has adopted a watershed management perspective, using the natural drainage patterns of the land to better understand how all activities within our watersheds affect the health of our water resources. Keeping our river, lakes, creeks, wetlands, and groundwater clean and healthy involves planning on a watershed basis to prevent nutrients, pollutants, and sediments from entering our waters. Prevention is the preferred approach. Once a water body has been damaged it is expensive, if not impossible, to restore.

Four watershed management organizations participate in the administration of water resources within the city: The Middle Mississippi River Watershed Management Organization, the Bassett Creek Water Management Commission, the Shingle Creek Watershed Management Commission, and the Minnehaha Creek Watershed District. Each organization was created to protect, enhance, and restore the surface and groundwater resources within its jurisdiction through education, management, and enforcement. Environmental Management staff participate on two important committees: the Minnehaha Creek Watershed District's Project Advisory Committee for the Hydraulic and Hydrologic Study and Pollutant Loading Model for Minnehaha Creek, and the Shingle Creek Watershed 2nd Generation Watershed Management plan Steering Committee.

The Lakes and Water Quality Management

Lake scientists have monitored the city's lakes on a biweekly basis since the early 1990s as a part of the Clean Water Partnership program. By studying long-term trends in basic water chemistry, nutrient levels, overall water quality, and biological communities, lake managers can determine the most effective actions to improve the biological health and overall recreational quality of the lakes. In 2001, lake scientists from the MPRB monitored thirteen of the city's most heavily used lakes. The results were used primarily to estimate the fertility or trophic state of the lakes. By assessing lake fertility, managers can determine if algae and water plants are likely to be problems, or if a lake will be clear and beautiful.

Scientists estimate lake fertility, or trophic state, by using water quality measurements and a mathematical formula called a Trophic State Index, or TSI. Three different lake measurements comprise a TSI score: water transparency, chlorophyll content, and phosphorus levels.

- Water transparency is measured with a black and white disk called a Secchi disk. The Secchi disk is lowered slowly into the water until it can no longer be seen. The depth at which it disappears is called the Secchi depth.

- A test of Chlorophyll-a indicates how much algae is in a lake. Algae are the tiny one-celled plants that can turn lakes green. Chlorophyll is the green pigment that plants use to capture the sun's energy. By measuring the amount of chlorophyll in lake water, scientists can estimate the amount of algae. Most of the city lakes sampled had moderate levels of algae during 2000.

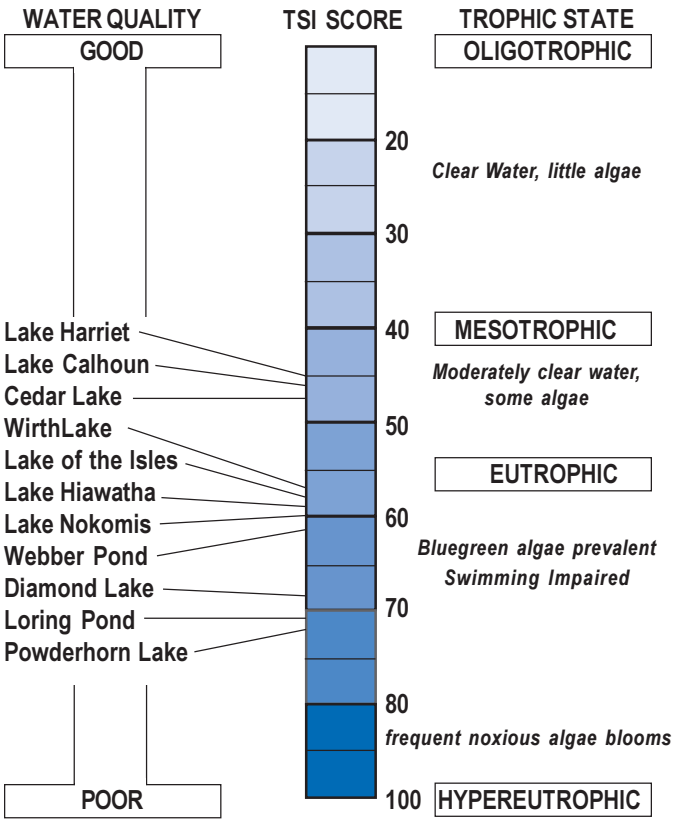
- Phosphorus is the most important type of "fertilizer" for most algae. By measuring the amount of phosphorus in the lakes, scientists can get a good idea of how much algae can grow, and if algae blooms will be likely.

TSI scores range from 0 to 100, with higher numbers indicating more fertility. Lakes with TSI scores below 25 often look like sandy swimming pools, while lakes with TSI scores above 75 will be more like pea soup for much of the summer, or will have very dense aquatic plant growth. In the Twin Cities, it is recommended that a TSI score of 59 or lower be maintained at lakes used for swimming. This recommendation is based upon the potential for degraded aesthetic appeal, not public health risks.

In addition to serving as a tool for rating water quality, the TSI is also used to classify lakes according to their trophic status. All lakes fall into one of three trophic states: mesotrophic, oligotrophic, or eutrophic. By knowing the fertility category for a given lake, lake managers can predict which problems, if any, are likely to occur and what management strategies will probably be the most effective.

Eutrophic lakes have a TSI value greater than 55 and are considered highly fertile, or productive. They often have an abundance of algae due to high phosphorus nutrient supplies. This high algal growth decreases the transparency of the water and gives the water a greenish or brown color. Mesotrophic lakes have a TSI value from 40 to 55. Due to lower nutrient availability in mesotrophic lakes, they are less productive. This decreased fertility results in less algae growth and clearer water. Oligotrophic lakes have a TSI value of less than 40. They are the least productive of the lakes and have the clearest water.

CARLSON'S TROPHIC STATE INDEX



The following table shows the trends based on average TSI score and overall trophic state.

TROPHIC STATE TRENDS FOR MINNEAPOLIS LAKES: 1991-2001

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Calhoun	54.3	58.7	50.3	45.6	48.4	46.8	43.2	48.2	46.6	46.2	46.2
Cedar	54.1	54.2	61.8	51.9	57.9	50.7	45.2	42.6	44.9	46.8	47.6
Diamond	NS	66.7	59.0	65.8	71.4	60.0	67.6	73.1	66.6	71.4	68.4
Harriet	47.3	50.5	44.6	47.4	50.6	51.7	43.1	47.2	49.4	48.0	45.0
Hiawatha	NS	58.5	58.4	57.0	59.2	59.0	58.3	58.4	58.6	64.6	58.2
Isles	55.3	64.2	64.6	58.0	59.5	55.2	51.8	55.5	55.6	53.0	57.7
Loring	NS	59.7	59.5	61.4	64.9	65.2	NS	62.7	70.7	73.3	70.9
Nokomis	NS	65.1	56.8	59.8	58.1	60.8	60.2	58.1	60.2	61.2	59.9
Powderhorn	NS	66.1	67.6	66.5	67.7	68.9	74.8	73.4	72.5	74.5	72.2
Webber	NS	58.4	57.0	58.4	57.7	59.2	48.9	51.0	45.8	55.8	61.4
Wirth	NS	63.4	63.2	63.9	60.7	57.0	58.8	61.4	60.3	58.2	57.0

Values given are the average of TSI scores for Secchi transparency, chlorophyll-a, and total phosphorus levels. Individual TSI scores were calculated from average growing season (May through September) values for each of the three measurements. (NS – not sampled enough times during the season to calculate.)

All the lakes in Minneapolis fall into either the mesotrophic or eutrophic category, which is as expected for lakes in a fully developed area. Most of the Chain of Lakes (Calhoun, Cedar, and Harriet) are mesotrophic, with moderately clear water and some algae. Isles, Wirth, Hiawatha, Nokomis, Webber, Diamond, Loring and Powderhorn lakes are eutrophic, with higher amounts of algae. The annual average TSI score over the last 10 years shows trends in lake water quality.

Lakes showing water quality improvement:

- Lake Calhoun
- Cedar Lake
- Lake of the Isles
- Webber Pond
- Wirth Lake

Lakes showing no significant changes in water quality:

- Lake Harriet
- Lake Nokomis
- Lake Hiawatha

Lakes showing water quality degradation:

- Powderhorn Lake

Aquatic Plants: Eurasian watermilfoil has been an increasingly evident problem in several Minneapolis Lakes. Milfoil causes problems on several levels. From an ecological standpoint, it out-competes native species and reduces the available habitat for fish and other organisms. From a recreational perspective, milfoil is problematic in that it forms dense floating mats that interfere with boating and swimming, reduce overall aesthetic appeal of area lakes, and wash up on shorelines as smelly green piles.

No environmentally safe method has been proven to rid lakes of milfoil, but several management methods exist to treat the symptoms of infestation. The MPRB primarily uses harvesting to control the growth of milfoil in city lakes, but is assisting the University of Minnesota in exploring the potential of using milfoil beetles (weevils) to naturally control nuisance growth. Aquatic weevils that eat Eurasian milfoil and burrow through the stems were released into parts of Cedar Lake and Lake of the Isles. Research will continue to study how these weevils affect milfoil growth. Harvesting milfoil is analogous to mowing a lawn. Only the top two meters of the milfoil plants are removed, but this temporarily allows for problem-free boating and swimming.

The Minnesota Department of Natural Resources requires a permit to remove or control Eurasian watermilfoil. These permits limit the area from which milfoil can be harvested. The 2001 permits issued to the Minneapolis Park and Recreation Board allowed for harvesting primarily in swimming areas, boat launches, and in shallow areas where dense growth occurs.

HARVESTED AREAS OF EURASIAN WATERMILFOIL IN MINNEAPOLIS LAKES

Lake	Area Harvested in 2001	Lake Surface Area
Calhoun	50.0 acres	421 acres
Cedar	30.0 acres	170 acres
Harriet	50.0 acres	353 acres
Isles	48.5 acres	103 acres

Lake Eutrophication: During their lifetime, many lakes will undergo an increase in their trophic status. In a natural setting, the process of eutrophication usually proceeds slowly, occurring on a time scale of centuries. Urbanization, or development of a lake's watershed, often results in a rapid increase in its trophic state. This process, called cultural eutrophication, prematurely ages lakes, turning clear lakes into very fertile ones in decades. Several of the lakes in the metro area have been undergoing this accelerated process of eutrophication.

In the Minneapolis area, stormwater runoff is the leading cause of cultural eutrophication. All storm drains in Minneapolis flow directly to a lake, stream, or the Mississippi River. With its high levels of phosphorus and sediment, stormwater runoff is very detrimental to water quality. Much of the current management focuses on reducing the amount of sediment and nutrients flowing into the lakes as street runoff.

Stormwater Management and Erosion Control Ordinances: The city adopted the Minneapolis Stormwater Management and Erosion Control ordinances in 1999 and 1996 respectively. The primary purpose of the ordinances is to minimize the negative impacts of stormwater runoff rates, volumes and quality on lakes, streams, wetlands and the Mississippi River. These ordinances establish standards and specifications for both erosion control and the construction and maintenance of stormwater Best Management Practice measures.

The Public Works department evaluated more than fifty stormwater management plans in 2001 for projects one acre or larger. The levels of compliance with the Stormwater Management Ordinance varied significantly. Factors such as project location, proximity to protected waters, soil types, and the relative percentage of building, parking lot, and green space contributed to this variance. The approximate increase in construction costs have ranged from zero on projects with no surface parking or rate control requirements, to $20,000 for medium-sized projects, and up to $150,000 for a large commercial projects that required pond construction and associated infrastructure upgrades. Estimates for annual maintenance costs range from $1,000 to $10,000 per year (the larger cost for sweeping programs). In cases

where on-site stormwater treatment is not practical, the city can allow the developer to contribute a comparable amount to one of the regional stormwater ponds being constructed by the city.

The Minneapolis Erosion Control Ordinance regulates everyone who disturbs topsoil. Its intent is to insure that soil does not leave the excavation site or enter any storm drain system on either private property or the public right-of-way. As a result of the city's new Zoning Code and its stronger site plan review provisions, inspection, compliance, and implementation of erosion control methods on construction sites have increased since 2000. Ongoing site inspections by Public Works and Regulatory Services Inspectors resulted in the issuance of over 400 warning notices, and work-stoppage orders on three sites due to lack of compliance.

While the city has made great strides with the adoption of these ordinances, there is a long way to full implementation. To accomplish this will require additional staff for the regulation, inspection and enforcement of these ordinances. Additionally, city departments need further education and training as to both the requirements and benefits of the ordinances as well as the methods for their implementation.

Chain of Lakes Clean Water Partnership: 2001 marked the last year of the seven-year Chain of Lakes Clean Water Partnership (COL-CWP), one of the largest urban lake watershed restoration initiatives in the US. The partnership's goal is to significantly improve water quality in the five lakes that comprise the seven thousand-acre sub-watershed of the Chain of Lakes (Brownie Lake, Cedar Lake, Lake of the Isles, Lake Calhoun and Lake Harriet). The partnership consists of the City of Minneapolis, the MPRB, the City of Saint Louis Park, the Minnehaha Creek Watershed District, Hennepin County, and the Minnesota Pollution Control Agency. An important component of COL-CWP activities is public education and information that describes specific actions area residents and businesses can take to improve water quality.

From the onset of the project, the COL-CWP has focused on the achievement of their project goals. The six-part goal set by the advisory group for the partnership, the Water Quality Management Citizens Advisory Committee is to:

- increase public awareness of water quissues;
- protect public health and safety;
- improve government management;
- reduce in-lake pollutants;
- reduce pollutant loading through the implementation of best management practices;
- monitor lake water quality and management practice effectiveness.

The CWP has spent over $11 million since 1994 to achieve these goals through the following activities:

- develop and promote public education programs;
- monitor beaches and issue fish consumption advisories when warranted;
- improve cooperation and governmental management;
- improve enforcement of existing regulations;
- implement best management practices such grit chamber installation and street sweeping.

ACTIONS BEING TAKEN ON EACH LAKE BY THE CHAIN OF LAKES CLEAN WATER PARTNERSHIP

Lake	Grit Chambers	Alum Treatment	Wetland and Ponds	Shoreline Restoration
Cedar		1996	1996	1999
Brownie				
Isles	1994, 1997, 1999	1997		1994, 1997, 2001
Calhoun	1995, 1998, 1999	2001	1998-99	1996, 1998
Harriet	1994, 1995, 1996	2001	1998	1997, 1999

The Chain of Lake Clean Water Partnership Project submitted its final report to the Minnesota Pollution Control Agency in 2001. This report summarized all the activities and expenditures from 1994 – 2001.

TOTAL INVESTMENTS BY PARTNER IN THE CHAIN OF LAKES CLEAN WATER PARTNERSHIP PROGRAM

Minneapolis Park and Recreation Board	$ 1,506,204
City of Minneapolis	2,638,401
Minnehaha Creek Watershed District	6,086,497
City of Saint Louis Park	662,730
Total Local Cost	**10,893,832**
Minnesota Pollution Control Agency CWP Grant	**1,061,682**
TOTAL PROJECT	**$11,955,514**

National Watershed Award: The Chain of Lakes Clean Water Partnership received three awards in 2001. The Project partners (City of Minneapolis, Minneapolis Park and Recreation Board, Street Louis Park, Minnehaha Creek Watershed District, Hennepin County and Minnesota Pollution Control Agency) received the Minnesota Environmental Initiative (MEI) Land Use and Community Development Award. The MEI award is presented for innovative collaborations in the environmental field.

The Partnership also received the Minnesota Governor's Award for Excellence in Waste and Pollution Prevention for efforts that avoided the generation of pollution and wastes. The Partnership also received the Minnesota Government Reaching Environmental Achievements Together (MnGREAT!) for recognition of environmental achievements by government employees.

Watershed Outlet Monitoring Program: Rain events increase river flows, cause non-point source pollution runoff from urban and agricultural areas, stream-bank erosion, habitat destruction, and flooding. During dry periods, flows may be too low to sufficiently dilute pollution and may affect habitat. The Minneapolis Park and Recreation Board operates two Watershed Outlet Monitoring Program (WOMP) stations at Bassett Creek (100 Irving Avenue North) and Minnehaha Creek (32nd Avenue South) in cooperation with the Metropolitan Council, local watershed organizations, and the engineering-consulting firms of Barr and Wenck Engineering. The purpose of these stations is to collect stormwater runoff and other physical measurements needed to help create future target pollution loads for each watershed.

Wetland and Stormwater Monitoring: In 2000, with the re-issuance of the Nationwide Pollution Discharge Elimination System (NPDES) permit for the City of Minneapolis stormwater, the MPRB has actively monitored both the stormwater and the wetlands used to treat stormwater before the water enters our lakes. For approximately 10 years, the MPRB has monitored the 44th and Harriet storm water site. Four additional NPDES sites in Street Paul and Minneapolis were added for the year 2001. These sites are representative of a variety of land uses but are not influenced by Best Management Practices or combined sewer overflows. Samples were collected once per month from May through October. MPRB staff use the data to characterize the chemical make-up of the stormwater entering our city's lakes and streams, and to develop plans to improve the quality of our waterways. The Public Works Department will include this data in an annual stormwater report they are preparing to submit to the MPCA in June 2002.

Minneapolis relies on reconstructed wetlands to remove pollutants from street runoff. Street runoff accounts for the majority of the water and nutrient fluxes to Minneapolis lakes and streams. With grant funding from the Metropolitan Council, the city monitored three storm water wetlands for stormwater treatment in Minneapolis during 2001:

- **Cedar Meadows (west of Cedar Lake) settling pond and treatment wetland:** The Cedar Meadows wetland removes pollutants from the incoming storm water. Due to structural problems with the outlets, insufficient data was collected to determine the removal efficiency in 2001.

- **Standish-Ericsson Neighborhood Association (SENA) Wetland (32nd Avenue and Minnehaha Creek):** The SENA Wetland was constructed in 1997 adjacent to Minnehaha Creek just west of 32nd Avenue South in Minneapolis. This multiple cell stormwater treatment wetland was designed to remove nutrients and debris from runoff entering the creek from a 43-acre watershed to the north. In 2001, the wetland appeared to perform well in small rainstorms and as a wildlife habitat. Preliminary results indicate that the wetland has some beneficial treatment of stormwater, but further analysis will be needed at the conclusion of monitoring. A large sand delta was removed from the wetland inlet, which should increase its treatment efficiency. Unfortunately, when Minnehaha Creek is high, the creek backs up into the wetland and mixes with stormwater. This decreases the treatment efficiency.

- **Lake Harriet Subsurface Flow Wetland (43rd and Lake Harriet Parkway, east of Lake Harriet):** The Lake Harriet wetland was constructed in 1997 to test the potential for using long subsurface flow wetlands to treat stormwater runoff entering urban lakes. The wetland receives runoff from a 24-acre residential watershed of Lake Harriet. The untreated stormwater that flows into the wetland slowly percolates through a surface layer of small gravel which filters out silt and debris, reduces flow velocity, provides more contact surface area for biological treatment activity, and acts as a substrate for wetland vegetation.

  The Harriet Wetland appears to be performing as expected. Preliminary results show there appears to be an early spring export of some phosphorus and nitrogen as the wetland plants/microbiological activity emerges. Once the communities are established there appears to be a net decrease of key pollutants (nitrogen/phosphorus). The wetland appears to remove much of the total suspended solids all year-round.

2000 Minneapolis Public Beaches Monitoring – Fecal Coliform: Staff of the city's Division of Environmental Health Services collected weekly water samples from public beaches in Minneapolis during the summer season of 2001. They analyzed these samples for bacteria to determine if a health risk was present for swimmers and reported their findings to the MPRB. Total coliform and fecal coliform levels are indicators of contamination.

High bacterial levels generally occur immediately after rain events in Minneapolis. These bacteria predominantly come from pet and waterfowl wastes that collect in yards, streets, parks, and beaches. Rain washes the bacteria into storm sewers that flow directly into city lakes. Elevated bacterial levels in lakes generally return to normal levels within 48 hours of a rain event.

The MPRB closed the following beaches this summer: Lake Hiawatha and Lake Nokomis during the summer after the sewer break on Minnehaha Creek in Hopkins on August 2nd, Lake Hiawatha from August 3rd until August 18th, and Lake Nokomis over the weekend of August 3rd.

Blue Water Commission and Partnership: The Blue Water Commission (BWC) is a citizens advisory committee, conceived by three Minneapolis neighborhood associations — Hale Page Diamond Lake, Nokomis East, and Standish-Ericsson. The group met from November 1997 through May 1998 to evaluate and make recommendations regarding water quality concerns with Lake Nokomis and Lake Hiawatha. Since then, a second group, the Blue Water Partnership, formed to implement the BWC recommendations. This group includes the City of Minneapolis, the Minneapolis Park and Recreation Board, and the Minnehaha Creek Watershed District. Construction activities began in fall 2000.

Lake Levels: In response to earlier flooding episodes, monitoring of lake levels has remained a vital aspect of lake management for the Minneapolis Park and Recreation Board. Analysis of historic lake levels in the Chain of Lakes has shown an upward trend in the average annual lake levels, and the range of lake level fluctuations. Much of this additional water is due to continued urbanization of the Chain of Lakes watershed and the increased runoff volumes and rate of runoff from storm events. Flooding in 1997 led to a redesign of the lake level management system to manage the increased amounts of runoff currently entering the Chain of Lakes.

The Mississippi River

The Mississippi River is essential to the ecological health of the region. It is an invaluable cultural, historic, and recreational resource. Minneapolis is the first major urban area graced by the Mississippi as it moves through the heart of the country. Indeed, the use of the river's Street Anthony Falls for a hydroelectric power plant, one of the first in the Western Hemisphere, was the impetus for settling the city.

Approximately half of the River frontage in Minneapolis is MPRB parkland. Several agencies monitor the health of the River including the Metropolitan Council, the Army Corps of Engineers, the Minnesota Pollution Control Agency, the US Geologic Survey, and the Minneapolis Health department.

River Water Quality: Water quality in the River has improved greatly over the last 25 years. One indicator of ecological health is the ability of an ecosystem to recover from stressors. Submersed aquatic vegetation recovered after the drought in the late 1980s and is currently abundant in the Upper Mississippi River.

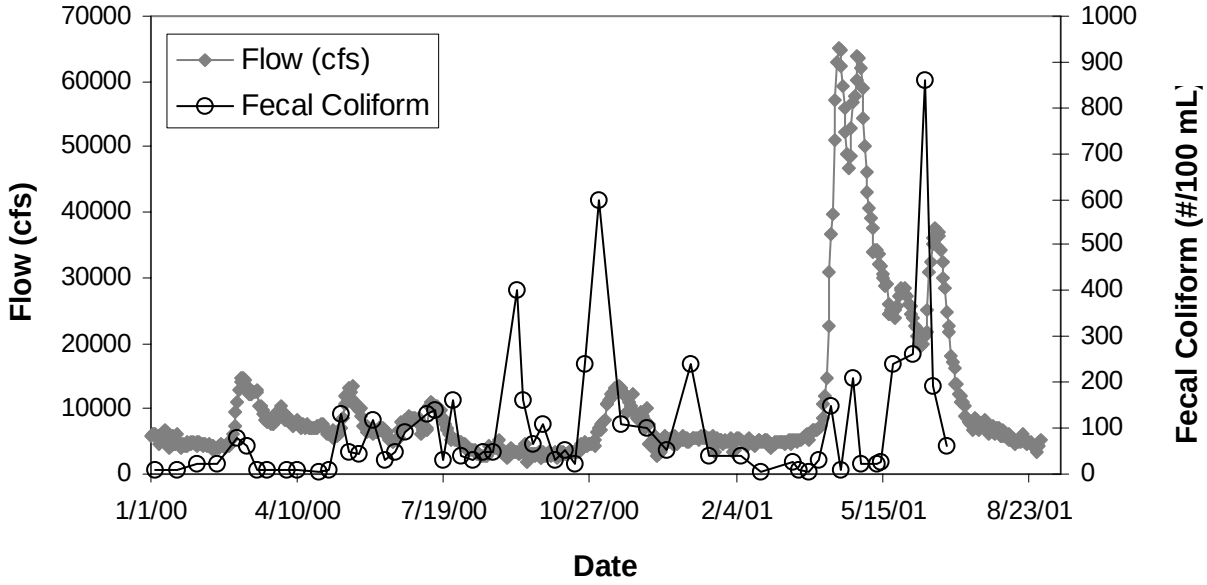
Mayflies have also demonstrated a dramatic recovery. Pollution downstream of the Metro Wastewater Treatment Plant eradicated mayflies from 1957 to 1976. In 1978, the treatment plant added secondary treatment capability and water quality began to improve by the early 1980s. In 1986 mayflies were back and recently have even reached nuisance levels.

Further improvements in water quality occurred as a result of the separation of sanitary sewers from storm sewers. Largely completed by 1995, this helps to prevent untreated sewage from overflowing into the Mississippi River during times of high rainfall volume.

The Upper Mississippi River above Street Paul has a drainage area of 12 million acres and an annual average discharge of 9,200 cubic feet per second (cfs). Flow of the Mississippi River follows a seasonal pattern (Figure 1) with increased flow in the spring due to snowmelt. Fecal coliform levels appear to somewhat follow this trend (Figure 1). Total suspended solids, nitrate and total phosphorus levels are typically high in the Mississippi River (Figure 2).

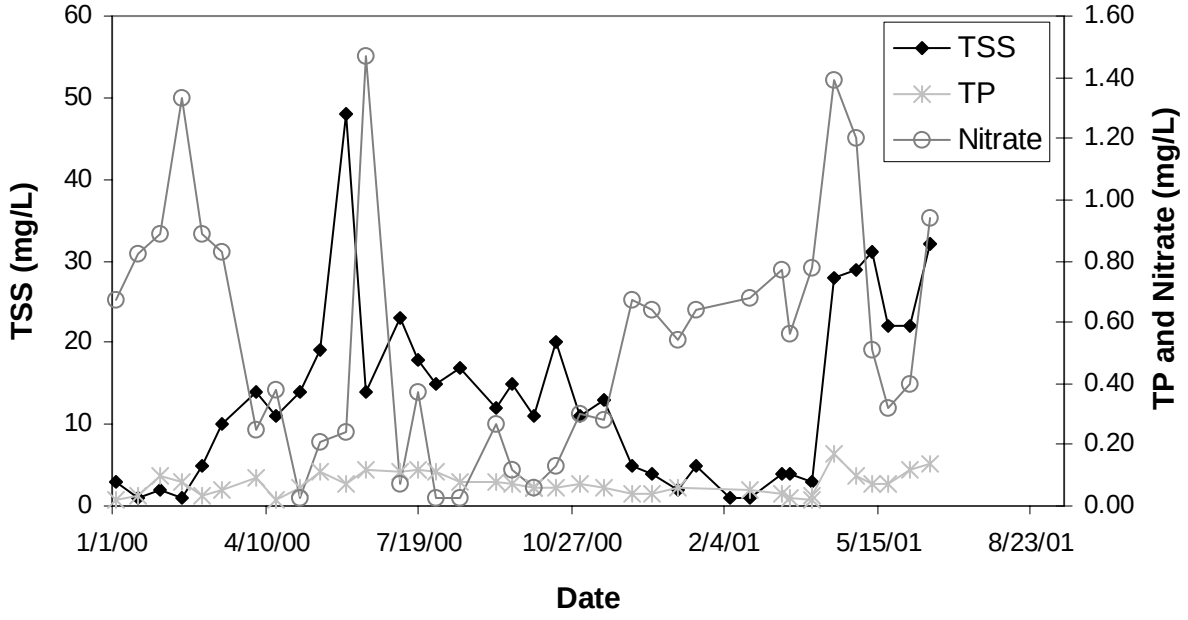
The Mississippi River is a valued water resource in Minneapolis. Approximately half of the Mississippi River frontage in Minneapolis is MPRB parkland. The Metropolitan Council, the Army Corps of Engineers, the Minnesota Pollution Control Agency, the US Geologic Survey, and the Minneapolis Health department is responsible for monitoring of the Mississippi River.

FIGURE 1
MISSISSIPPI RIVER FLOW (cubic feet per second) AND FECAL COLIFORM (number per 100 milliliter)



Flow data from the Army Corps of Engineers, river mile 853.8; fecal coliform data from Metropolitan Council Environmental Services, river mile 847.7.

FIGURE 2
TOTAL SUSPENDED SOLIDS (TSS), TOTAL PHOSPHORUS (TP), AND NITRATE IN THE MISSISSIPPI RIVER (milligrams per liter)



Note different scales on vertical axes. Data from Metropolitan Council Environmental Services, river mile 847.7 above Lock and Dam #1.

Plans for the River: In 2000, two planning documents were approved that hold the promise of positive change for the city's portion of the Mississippi River corridor: the "Middle Mississippi River Watershed Management Organization (MMRWMO) Plan," and "Above the Falls: A Master Plan for the Upper River in Minneapolis" (also known as the Upper River Master Plan). The MMRWMO Plan includes watershed management techniques and an implementation schedule for the plan's policies, programs, and projects. The Upper River Master Plan is the result of an extensive collaboration among the city, the Minneapolis Park and Recreation Board, Hennepin County, residents, and businesses. It sets forth a dramatic new vision of revitalization for the Upper River, which includes significant new open space and residential additions to the river corridor.

The river's presidential designation in 1998 as a National Heritage River, as well as earlier designations by the National Park Service (Mississippi National River and Recreation Area) and the State of Minnesota (Mississippi River Critical Area), highlight the importance of the river corridor. The city consolidated in its Critical Area Plan the policies and implementation strategies to protect the natural, cultural, historic, commercial, and recreational value of the river corridor.

River Corridor Goals: The city intends to guide the use and development of the Mississippi River corridor to achieve the following goals:

- **Natural Resources:** Preserve, enhance, and interpret natural resources. Protect and preserve the biological and ecological functions of the corridor.

- **Visual Quality:** Protect and enhance the views to and from the river, and up and down the river so that people may enjoy the natural beauty of a major waterway in an urban setting.

- **Cultural Resources:** Preserve, enhance, and interpret the archaeological, ethnographic, and historic resources of the river corridor.

- **Economic Resources:** Provide for continued economic activity and development in a manner consistent with the other goals. Protect and preserve the river as an essential element in the systems of transportation, water supply and recreation.

- **Neighborhood Revitalization and Stabilization:** Leverage the natural beauty, recreation, and economic development features of the river as a means of sustaining the quality of nearby neighborhoods and the city as a whole.

- **Outdoor Recreation and Tourism:** Enhance opportunities for outdoor recreation, education, and scenic enjoyment. Continue to make the river an important part of any visitor's appreciation of Minneapolis. Continue to build the riverfront as a major element of the local and regional parkway systems.

- **Public Understanding:** Improve the public's understanding of the river and promote public stewardship of its resources. Recognize and strengthen the public understanding of the river and the dynamic role it plays in the city's heritage, quality of life, and legacy for future generations.

Source: *Mississippi River Critical Area and MNRRA Plan,* September 15, 1998

Environmental Education

MPRB staff continued water quality education programs throughout the city. Staff created and distributed informational materials, attended neighborhood festivals and events, and continued to expand the outreach program to Minneapolis schools. This program involved the use of two costumed characters, "Crystal Clear" and "Billy Bass," who taught a thousand students from eleven Minneapolis' schools about stormwater runoff, watersheds, the water cycle, and the important role that each person plays in keeping the city's waters clean.

Citywide Public Service Announcements: This year MPRB staff worked with Clear Channel Outdoor and Transtop bus shelter advertising to develop public service announcements on water quality issues. Billboard and bus shelter advertisements were posted throughout the spring and summer informing people how things like fertilizer, pet waste, and car washing impact city lakes.

"Think Globally, Act Locally" Column: For the eighth consecutive year, MPRB staff wrote a monthly column for the *Southwest Journal* newspaper (circulation of 40,000 in south Minneapolis) called "Think Globally, Act Locally." The column highlighted water quality improvement projects and informed residents how their actions affect water quality. In addition, the MPRB mailed monthly news releases that focused on environmental and water quality problems to more than 250 local media resources including radio and television stations and newspapers.

Catch Basin Stenciling: The catch basin stenciling program educates citizens how pollutants drain into storm sewers and degrade the water quality of local lakes and streams. Stencil applications contained the message "Please Don't Pollute! Drains to River (Creek or Lake)." The MPRB cooperated with the Friends of the Mississippi River, a non-profit environmental organization in 2001.

Annual Earth Day Watershed Clean-Up: As part of the efforts by the MPRB and city to involve citizens in litter control around local lakes and streams, the sixth annual Earth Day Watershed Clean-Up was held on Saturday, April 21st. More than 1,200 participants cleaned up 7,000 pounds of trash and 2,500 pounds of metal at 17 sites including the Chain of Lakes, Shingle Creek, the Minnehaha Creek corridor, the Mississippi River corridor, Grass Lake, Lake Nokomis, Lake Hiawatha, and Powderhorn Lake. Each cleanup site had a celebration party with refreshments, live music, and prizes provided by local businesses along with an important educational component. Many organizations contributed including the Science Museum of Minnesota and the Hennepin County Master Gardeners.

Educational Partnerships: In addition to partnerships with Blue Water Commission and the Chain of Lakes Clean Water Partnership described above, the MPRB was also an active member of "Watershed Partners," which is a statewide organization that promotes partnerships in water quality education activities.

J. D. Rivers Discovery Center: This is the 20th year that the J. D. Rivers Outdoor Discovery Center has implemented environmental and horticulture programming. In 2001, 1,960 children ages 3-12, teens, adults, seniors, and adults with disabilities participated in over five programs and special events offered by the Discovery Center. Over thirty schools, social service, and youth agencies from Minneapolis participated in the 2001 program for a total of 23, 243 program contact hours. The participants of the Discovery Center reside in Minneapolis and are of diverse ethnic heritage (55 percent African American, 24 percent Caucasian, 10 percent Southeast Asian, 6 percent Multi-racial, 3 percent Hispanic, and 2 percent Native American).

Neighborhood Naturalist Programs: Each week from April 1st through October 15th, MPRB naturalists offered a wide variety of interpretive programs in the regional park system with a strong focus at Theodore Wirth Park, utilizing the Quaking Bog and the Eloise Butler Wildflower Garden and Bird Sanctuary.

The Neighborhood Naturalist Program provides fun, hands-on environmental education programs for preschoolers, school age kids, teens, adults, and seniors at the MPRB's fifty recreation centers. The goal of these programs is to help people connect with the natural world, kindle their curiosity, and promote environmental stewardship in their own "backyard." Over 2000 hours of Neighborhood Naturalist programs were provided across the city throughout the year to over 14,000 people.

Mill Ruins Park Interpretive Program: MPRB interpreters provide guided walking tours of the downtown riverfront including the Mills District, the Stone Arch Bridge, and the newest addition to the Minneapolis Park System, Mill Ruins Park. During its inaugural year, over 2,000 students and adults participated in guided walking tours and simulated archeological digs.

Air

In 1999, the City of Minneapolis created the Minneapolis Air Quality Management Authority. Toxic air pollutants emerged as a priority for environmental regulators at all levels of government. The city continued to work to address global climate change by promoting energy efficiency and reducing emissions of carbon dioxide and other greenhouse gases.

Air Quality

Our air is a resource in the city just as our water and soil. Because air is invisible, most of us take it for granted until we have a problem with odors, emissions, or smoke. Three major activities affect air quality in Minneapolis: transportation, energy production, and industry. The annual air quality reports issued by the US Environmental Protection Agency (EPA) indicate the city's airshed has seen improvements in all three areas in recent years. This has led to an overall improvement in air quality.

Minneapolis Air Quality Management Authority

The city created the Minneapolis Air Quality Management Authority (MAQMA) in 1999 as part of the effort to update the city's forty-year-old air pollution ordinance. The MAQMA is the municipal entity charged with preventing, controlling, and regulating sources of indoor and outdoor air pollution within the city. The MAQMA has developed a highly responsive air quality program that focuses on reasonable regulations; flexible permitting procedures; and an emphasis on pollution prevention, compliance assistance, and proactive enforcement. The MAQMA is actively involved on a number of fronts aimed at protecting the city's air quality including:

- controlling nuisance odors;
- regulating and reducing vehicle emissions;
- regulating industrial pollution;
- preventing indoor air pollution;
- promoting energy conservation and renewable energy; and
- educating the public about global climate change.

Air Toxics

Air toxics are a type of air pollution that are of great environmental concern because they are toxic, persistent, and they bio-accumulate. Air toxics are chemicals that are known or suspected causes of cancer, neurological changes, and reproductive problems. Air toxics may also impair the body's immune function and disrupt endocrine functioning. In addition to human health impacts, air toxics may cause damage to natural ecosystems by negatively affecting population survival, bio-diversity, and the sustainability of ecosystems. Since these pollutants are known to have the potential to cause ecological and biological damages, they are worthy of control and regulation.

It is believed that over sixty thousand chemicals are currently in commercial use, with approximately one thousand being added each year. Of these, at least five hundred are of great environmental concern due to their:

- toxicity,
- tendency to bio-accumulate,
- presence in detectable quantities in various environmental media, and
- persistence in the environment.

Like criteria pollutants (carbon monoxide, nitrogen oxide, sulfur dioxide, particulate matter, lead, and ozone), air toxics are emitted from a variety of sources including mobile, stationary, and area sources. Since a national, long-term, monitoring-and-emissions-tracking program similar to that for criteria pollutants does not exist for air toxics, little is known about their emissions and ambient air concentrations. The development of comprehensive data on air toxics is complicated by several factors: the number of chemical compounds involved; the number and variety of sources emitting the compounds; the low concentration of some toxics; and the potential for secondary formation of one toxic from other, often less-toxic, compounds.

In the past, federal, state and local environmental agencies focused most of their attention on reducing emissions of criteria pollutants from stationary sources such as manufacturing facilities, utilities, and waste incinerators. However, recent studies indicate that cars, trucks, and other very small sources are responsible for much more of the air toxics pollution problem than was previously believed. For this reason, encouraging smart growth and transit are effective strategies for controlling and reducing toxic air emissions.

In 2000, the city began working cooperatively with the Minnesota Pollution Control Agency (MPCA) to draft and issue Air Emission Permits to companies within the city. These permits incorporate specific operating and emission limits and requirements governing pollution control, pollution prevention, monitoring, record keeping, and reporting.

In addition to hazardous or toxic air emissions, the city is also responsible for investigating and resolving complaints regarding nuisance odors and smoke. These problems can arise from many sources including poorly maintained buses and mechanical equipment, restaurant exhaust, industrial processes, and construction activity.

Energy

Urban CO_2 Reduction Project: In 1991, an agency of the United Nations called the International Council for Local Environmental Initiatives (ICLEI), selected Minneapolis and Saint Paul to participate in the Urban CO_2 Reduction Project. This project was the first designed to mobilize local governments in the global effort to postpone the adverse effects of global climate change. Carbon dioxide (CO_2) emissions are the pri-

mary contributor to global warming, the "greenhouse effect." Thirteen other cities from around the world participated in the project. Currently, more than 350 local governments worldwide participate as members of ICLEI's climate change projects.

The chief product of the Urban CO_2 Reduction Project was the development of CO_2 reduction plans. In December 1993, the Minneapolis and Saint Paul City Councils adopted such a plan, titled the *Minneapolis-Saint Paul Urban CO_2 Reduction Project Plan: A Framework for Developing Strategies to Reduce CO_2 Emissions, Save Taxes, and Save Resources*. The plan calls for reducing by 2005 carbon dioxide emissions by 20 percent from 1988 levels, with an intermediate goal of 7.5 percent by 1997.

In response to the *Urban CO_2 Reduction Project Plan,* the Minneapolis City Council adopted the *Minneapolis Energy Plan* in 1996. The *Energy Plan* stressed implementation of energy efficiency measures with a payback of ten years or less as the primary implementation tool to postpone the effects of global climate change, save money, and conserve scarce energy resources.

In 1999, the Environmental Management Section evaluated some of the measures the city has taken to implement the *Urban CO_2 Reduction Project Plan* and the *Energy Plan*. The department plans to update the evaluation every two or three years. The following is a summary of the analysis for three sectors (does not include the reduction goals for the energy efficiency, energy supply, and urban reforestation sectors). The *2000 State of the City* report included the details of the analysis in the table below.

Air Pollution Reductions: The energy efficiency measures listed above have resulted in the following reductions in air pollution in Minneapolis by 1999:

Nitrogen oxides (NO_X): ..... 586 tons
Sulfur oxides (SO_X): ..... 527 tons
Volatile organic compounds (VOC): ..... 145 tons
Carbon monoxide (CO): ..... 1,447 tons
Particulate matter (PM-10): ..... 42 tons

Noise

Residents who live and work in urban environments are subjected to noise from many sources, generally categorized as construction, mechanical, transportation, and domestic sources.

Environmental Management Section Responsibilities: With the exception of airport noise, the environmental management division of the Department of Operations and Regulatory Services monitors noise in the city, responds to complaints involving noise, and works to prevent sources of noise from becoming neighborhood problems.

To address construction and amplified noise, Environmental Management staff issue permits for work done outside of regular business hours. This permit system places controls on noise sources by limiting the level and duration of noise, and by imposing other mitigating conditions depending upon the circumstances. Inspectors monitor work and take steps to revoke permits when necessary.

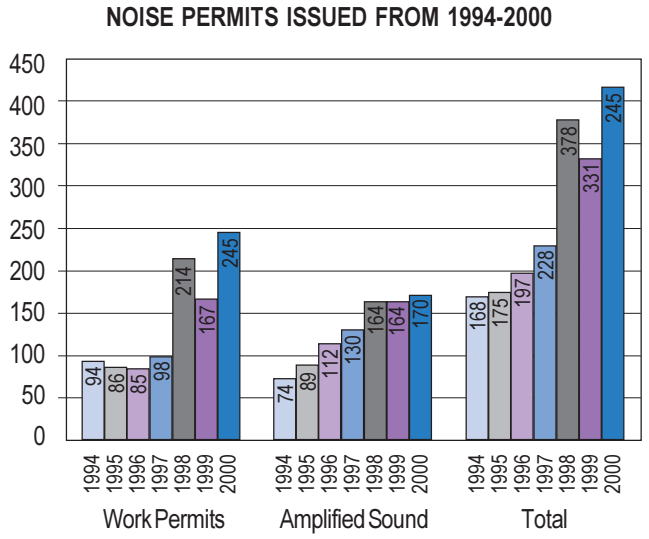
Since 1999, the city has maintained a comprehensive Noise Control Program. The program focuses on preventing noise in the first instance, and controlling or moderating it where necessary. To this end, the Environmental Inspector formed a Noise Control Steering Committee, which is working with the Police Administration, individual precincts, and CCP Safe units to enforce noise ordinances, and provide information useful to patrol officers. The city's website includes information about the city's noise ordinance, control efforts, and tips on dealing with noise problems.

CARBON DIOXIDE REDUCTION BY SECTOR (TONS OF CO_2): GOALS AND PERFORMANCE

Sector	2005 Reduction Goals	Status of Reductions (1988-1999)	Percent of Goal	Annual Savings
Municipal Strategies	118,000	52,000	44%	$ 5,490,000
Transportation	1,209,000	72,000	6%	$ 16,152,000
Solid Waste and Recycling	6,000	241,000	4017%	N/A
Totals	1,333,000	365,000	27%	$ 21,642,000

Note: Chart does not include the reduction goals for the energy efficiency, energy supply, and urban reforestation sectors.

The following chart describes recent trends in requests for after hour construction and amplified sound permits:



Mechanical noise complaints generally involve problems with roof or ground mounted mechanical equipment, such as air handling equipment or exhaust systems. The city usually mitigates these problems through regulatory orders. Corrective action varies by situation, but most commonly involves adjustment or relocation of equipment, installation of sound barriers, or, when necessary, the restriction of equipment usage hours.

Transportation complaints are among the most difficult to resolve due to the mobility of the noise source and the complexity of intergovernmental relations. Complaints generally involve motorcycles, trucks, and buses, but can also involve automobiles. The city addresses these problems through contact with owners and appropriate agencies such as MnDOT, Metro Transit, and city departments such as Public Works and Licenses and Consumer Services. Typical domestic noise issues arise over radios and stereo systems, barking dogs, chainsaws, leaf blowers, lawnmowers, and snow blowers.

In 1998, the Minneapolis City Council passed amendments to the 1997 noise ordinance. The ordinance makes it unlawful for any person to make, continue, or permit any loud, disturbing, or excessive noise that would likely cause significant discomfort or annoyance to a reasonable person of normal sensitivities present in the area.

Airport Noise (refer to Transportation Chapter for additional information on the airport): Airport noise is a significant problem for Minneapolis residents. However, the City of Minneapolis has no direct regulatory authority related to airport noise and therefore has only a limited role in its control. The city's primary role is as an advocate for measures to reduce noise impacts.

Environmental Response

Because of perceptions regarding imminent, dramatic threats to public safety, most attention and resources nationally tend to focus on preparedness and response. In addition to maintaining highly developed preparedness and response functions, the city has developed a prevention strategy comprised of education, technical assistance, facilitation, and regulatory oversight.

Minneapolis Emergency Plan

The city has a well-developed and effective emergency plan that details the city's planned responses to a range of emergency scenarios. For every natural disaster, environmental emergency, or accident, it is helpful to identify four stages that constitute the "life cycle" of the event: prevention, preparedness, response, and recovery:

- **Prevention:** Prevention activities either prevent the occurrence of an emergency or reduce the community's vulnerability in ways that minimize the adverse impact of a disaster or other emergency.

- **Preparedness:** Preparedness programs are in place before an emergency or disaster. Planning, training, and exercising are among the activities conducted under this phase.

- **Response:** Response activities and programs address the immediate and short-term effects of the onset of an emergency or disaster, reduce casualties and damage, and speed recovery. Response activities include direction and control, warning, evacuation, and other similar functions.

- **Recovery:** Recovery involves restoring systems to their normal states. Short-term recovery actions assess damage and return vital life-support systems to minimum operating standards. Long-term recovery actions may continue for many years.

Hazardous Materials

By agreement with the U.S. Environmental Protection Agency, the State of Minnesota bears direct regulatory responsibility for toxic chemicals (Minnesota Department of Agriculture for pesticides, Minnesota Pollution Control Agency and Department of Public Safety for others). However, local governments also play an important role in the regulatory process through city codes that regulate zoning, environmental matters, and fire.

Although the city faces fewer threats from toxic chemicals than other more industrialized areas of the country, potential threat to public safety are still very serious. The city's focus tends toward commercial and industrial users of pesticides and other toxic chemicals. However, because the cumulative impact of hazardous product use by households is enormous, city concerns also include the domestic consumer. It is basic public policy to prevent and minimize exposures from accidental or permitted releases of toxic chemicals including pesti-

cides. It is important to realize toxic chemicals used in the community must be safely used and stored, and when possible, replaced with safer alternatives.

In order to improve coordination and foster public awareness of hazardous materials in the Twin Cities, the local emergency preparedness community voluntarily formed the Metro Community Awareness Emergency Response (CAER). Metro CAER is a joint initiative of businesses, community members, and local government (including the City of Minneapolis) with two prime purposes:

- Foster public awareness of hazardous materials in or being transported through the Twin Cities, and initiate measures to protect the community.
- Assure emergency preparedness through the integration of private and public response agencies.

The Built Environment and Urban Character

People enjoy the urban environment in Minneapolis for the high quality of all of the features discussed earlier in this Chapter, and for its built environment and urban character.

Two important organizations actively involved in improving the city's built environment through efforts related to design, aesthetics, beautification, and history are the Heritage Preservation Commission (HPC) and the Committee on Urban Environment (CUE). They provide assistance and recommendations, and are involved in educational and outreach efforts to increase awareness of preservation, stewardship, and improvement of the urban environment.

Heritage Preservation Commission
The Minneapolis Heritage Preservation Commission (HPC) is a ten-member, citizen advisory body to the Minneapolis City Council. The primary duties of the HPC are to evaluate the architectural and historic significance of buildings, landscapes, districts, and sites; recommend buildings, districts, and sites for local historic designation; review all alterations and permit applications for designated buildings; and increase public awareness about preservation.

In March 2001, the City Council approved a new heritage preservation ordinance. The new ordinance was the culmination of a four-year effort that replaced the thirty-year-old Chapter 34 of the Minneapolis Code of Ordinances. The new regulations include the following:

- They clarify provisions in the old ordinance.
- The HPC must grant an approval before a designated property can be substantially altered or destroyed.
- They provide for interim protection for properties that are nominated but not yet officially designated as landmarks.
- In order to alleviate financial hardships, they permit development rights for historically designated properties to be transferred to non-historic "receiving" properties located within ¼ mile of the historic "sending" property.
- They state that historic properties may not intentionally be allowed to deteriorate.
- They allow owners of historically designated properties to obtain variances from the requirements of the Zoning Code in order to alleviate undue hardships caused by the unique nature of the historic property.

Between October 1, 2000 and September 31, 2001, the HPC reviewed 49 building permits, 7 sign permits, 17 demolition permits, one historic variance, and several mitigation plans. Additionally, the HPC performed 12 pre-permit reviews. In the same period, HPC staff approved 124 Certificates of No Change (CNC) for minor repair work and 150 demolition permits.

The HPC continued to offer its many education and outreach programs in 2001. In May 2001, the HPC sponsored Preservation Week. Activities included walking tours, lectures, a luncheon, and the annual Preservation Awards Ceremony. During the summer of 2001, the HPC, in conjunction with the Minnesota Historical Society and the Municipal Building Commission, offered 26 walking tours, which is nearly quadruple the level offered in previous years. Total attendance averaged about 15 persons per tour.

The Commission obtained a grant from the State Historic Preservation office to complete a survey of architectural and historic sites in Downtown Minneapolis and parts of the Powderhorn and Phillips neighborhoods.

The following property was listed on the National Register of Historic Places in 2001:

- Christ Lutheran Church, 3244 34th Avenue South

The City Council is expected to designate the following properties as local landmarks by the end of 2001:

- MacPhail School of Music, 1128 LaSalle Avenue
- Harmon Place Historic District, generally bounded by Yale Place, South 11th Street, Hennepin Avenue, and Harmon Place.

Committee on Urban Environment
The City Council formed the Committee on Urban Environment (CUE) in 1968 to foster improvement of the natural and built environment in Minneapolis. CUE is a citizen advisory committee with 29 voting members and five subcommittees (Executive, Neighborhood Environment, Shade Tree, Urban Design, and Research-Education). CUE is active in gardening, planting trees, public art, policy, preservation, teaching, and community planning. Each year it honors excellence in urban design, events, and people at the CUE Awards. This year's activities included Blooming Boulevard Awards, an Arbor Day planting event at Edgewater Park, and Minneapolis Blooms Day.

Minneapolis Blooms Day: Minneapolis Blooms Day, held each spring, is an informal gathering that recognizes the City's top gardeners and distributes plant and seed donations received from the Minnesota State Horticultural Society. CUE gave awards for nearly 2,400 gardens that were located in 81 neighborhoods and within all thirteen of the city's wards. Any front yard, back yard, boulevard, commercial, or community garden in the city that is clearly visible to the public is an eligible entry in the Minneapolis Blooms/Blooming Boulevards program.

Community Gardens: In order to balance the need for housing development and the desire for urban community gardens, the Minneapolis Community Development Agency (MCDA) currently leases over one hundred vacant lots per year to nonprofit groups for seasonal use as community gardens. In 2001, the MCDA approved an Interim Community Garden Disposition Program, which allowed selected neighborhood gardeners presently who lease MCDA properties the opportunity to purchase the property and retain it as a permanent community garden.

The MCDA made these community garden lots available for purchase by nonprofit corporations or public agencies with the capacity to manage land and coordinate community participation. Upon sale, the purchaser must place a conservation easement on the property in favor of the MCDA to preserve it as open space for community garden use only. The purchaser is also required to pay fair market value for the lot and sign an environmental liability disclaimer regarding the condition of the soil and any costs associated with soil remediation.

Gateway Project: The Urban Design Committee works to improve design and recognize design excellence. This year the committee identified twenty sites around the periphery of the city as potential gateway locations for public art, landscaping, and signage to mark major city entrances. A pilot project is planned to solicit input for design improvements to the triangular park located at the I-35W entrance into downtown, located between 4th and 5th Avenues at 10th Street.

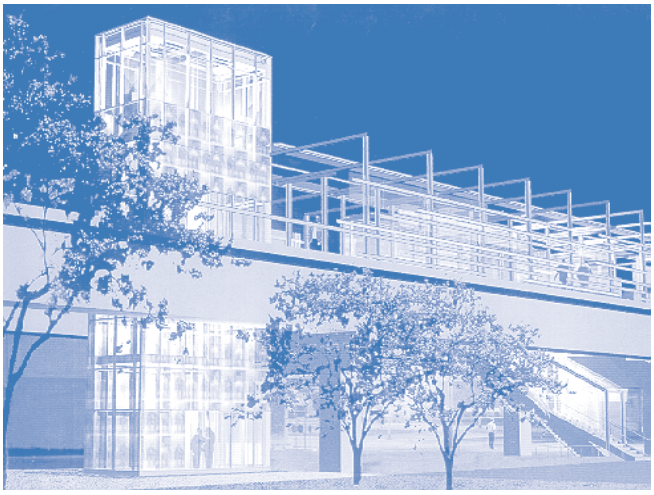
Design in Minneapolis
Last year, strides were made towards improving the character and quality of the built environment in Minneapolis. And in the coming year, improvements to the built environment can be expected on projects both large and small, projects with a high-level of visibility, and projects tucked into the corner of a neighborhood. Such enhancements fall into three categories: Citywide infrastructure improvements, specific building programs and projects, and master plans and design guidelines.

Citywide Infrastructure Improvements: In 2001, staff in the Planning and Public Works departments worked collaboratively with other governmental agencies and organizations to help shape infrastructure projects that will ultimately add to the amenity and convenience of living in Minneapolis including the following:

- **Hiawatha Light Rail Transit Line and Stations:** For the past several years, city and MCDA staff have worked closely with the Minnesota Department of Transportation, the Metropolitan Council, and the Hiawatha Project office on the design of ten light rail transit (LRT) stations proposed for the Hiawatha Line within the city of Minneapolis.

  In 2001, city staff initiated a series of public workshops to ensure that each station will meet the functional and aesthetic considerations of the neighborhood in which it is located. Specifically, design refinement was undertaken for the following stations: Nicollet Mall, Government Center, Downtown East, Lake Street, and 46th Street.

Hiawatha Light Rail Transit: Government Station
URS/BRW, Inc., Barbour Ladouceur Architects, and artist Seitu Jones



Hiawatha Light Rail Transit: Lake Street Station
URS/BRW, Inc., Julie Snow Architects, and artist Tom Rose

In spring of 2001, the MCDA took ownership of the block slated for the construction of the Downtown East Station for the purposes of building a multi-use, transit-oriented development project. The key components of the project include a development parcel for a future speculative office building, an underground public parking ramp to serve that building, the Downtown East LRT Station, and a new public plaza that will serve neighborhood residents as well as sports fans attending events at the Metrodome.

- **5th Street Streetscape:** In the Fall of 2001, the Planning department hired the IBI Group, Inc. to undertake work involved in the *Downtown East/North Loop Master Plan*. A key piece of the work in this project is to prepare a conceptual plan for a unified streetscape along the 5th Street corridor in Downtown Minneapolis. Given that the construction of the LRT line along 5th Street will change the existing use and character of the street, the opportunity exists to create a new, highly visible, easy-to-use transit and pedestrian spine that links Elliot Park and Downtown East to the Downtown Core, the Entertainment District, and the newly popular neighborhoods emerging in the North Loop. As such, the project stretches along 5th Street from the Metrodome on the east to the Ford Center on the west. Preliminary designs will be presented for public review and comment in early 2002. At present, no public revenues have been identified or dedicated for realization of this project.

- **Central Station Project:** In 2001, city and MCDA staff continued the analysis concerning a new multi-modal train station that will weave together light rail, commuter rail, and Amtrak. At present, no formal actions or approvals have been made on this project.

- **Other infrastructure additions to the city's built environment:** City staff were closely involved in the programming, design, and development of several other high-profile additions to local infrastructure. The projects added amenity to the city by simultaneously providing new green space, new opportunities for alternative transportation, and new development sites along the perimeter of these areas. Examples of such projects include:
  - Phase one of the Midtown Greenway along the 29th Street rail corridor in South Minneapolis,
  - Design for the North-South Connector in the Near North Redevelopment Project,
  - Reconstruction of Washington Avenue North in the Warehouse District/North Loop,
  - Extension of the Cedar Lake Trail into the North Loop, and
  - Design for the Humboldt Greenway in the Camden Community of North Minneapolis.

  City staff were successful in helping to achieve design programs that are both functional and aesthetically pleasing for the neighborhoods and communities served.

- **Specific Building Programs and Projects:** In 2001, Planning staff helped shape the design programs for a number of high-profile buildings projects in Downtown as well as a list of lesser-known but equally important building projects taking place throughout the city, including the following:

- **New Guthrie Theatre:** The Guthrie Theatre recently purchased several parcels of property located along the Central Riverfront in Downtown for the purposes of constructing a new regional theater complex which is scheduled to open in 2005. The three-theater complex will include approximately 2,200 seats as well as the Guthrie's administrative and production space, educational facilities, retail and restaurant space, and structured parking. In the summer of 2001, the Guthrie Theater selected the internationally renowned architect Jean Nouvel of Paris to design the new riverfront complex. Mr.

Nouvel and his office will work closely with their Minneapolis-based partner on this project, the Architectural Alliance.

- **The New Central Library Project:** In the November 2000 election, the Minneapolis Library Board successfully gathered the support needed through a referendum ballot to proceed with plans for a new Central Library to be built on the site of the existing library in Downtown Minneapolis.

  The New Central Library Project is a two-block, mixed-use program that will include a new state-of-the-art central library facility of approximately 400,000 square feet, a 200 seat planetarium, approximately 30,000 square feet of retail space, public space, approximately 200-225 new housing units, and parking. After a lengthy public process, Cesar Pelli and Associates was the architect selected to design the new Central Library. Cesar Pelli's local design partner in the project is the Architectural Alliance. Construction is expected to begin in early 2003 with completion in 2005 or 2006.

- **The Ivy Tower Project:** Throughout 2001, city and MCDA staff worked with the developer of the Ivy Tower Project to help realize a well-designed, economically sound project that will preserve and revitalize one of the city's most extraordinary structures. Located near the Convention Center, the Ivy Tower Project proposes to restore the historic Ivy Tower building, constructed in 1930. In order to accomplish this goal, the developer proposed to construct two new office towers on the north and east sides of the existing building that will set-off the gem-like qualities of the miniature skyscraper. The Ivy Tower building is ten stories tall and the proposed commercial office buildings are to be 17-21 stories tall. The development project will maintain shared vertical circulation facilities and a skyway level walkway that will connect the project to the Leamington Parking Ramp and the Convention Center skyway. The proposed development will a Minneapolis History Museum and Visitor Center as well as a deli/coffee shop and an outdoor courtyard area.

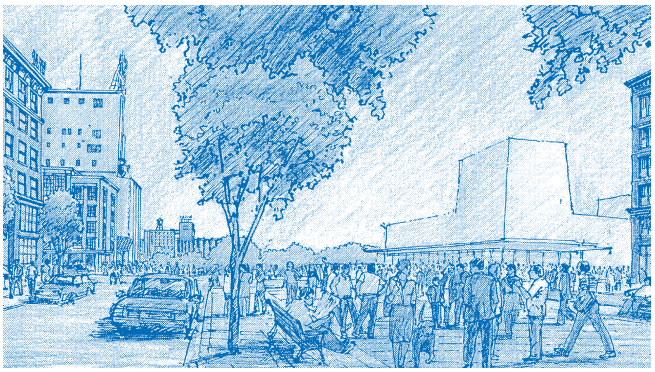
- **Site Plan Review:** Planning staff evaluate the design of projects as part of the application review process for zoning approvals and building permits. In 2001, Planning staff evaluated 145 projects for their compliance with the Zoning Code and the city's Comprehensive Plan. Planning staff worked closely with developers and their architects to help realize projects that are well designed both functionally and contextually, and that are highly sensitive to the surrounding neighborhoods.

Master Plans and Design Guidelines: One of the most productive ways to enhance the urban environment is to start early and set the long-term view for how the micro-environments of particular parcels and neighborhoods intersect with the macro-environment of the city as a whole. By working closely with other departments, agencies, business organizations, community groups, and the general public, the Planning department lead the way in shaping the "big picture" ideas for how the urban environment should grow and change in the coming decades.

- **Downtown East/North Loop Master Plan:** In 2001, the Planning department and a group of intergovernmental partners began work on the *Downtown East/North Loop Master Plan.* The intention of this project is to develop a master plan that provides a vision for how new growth should occur in the underutilized districts on the eastern and western edges of Downtown**.** The plan, scheduled for completion in the summer of 2002, will propose new opportunities for enhancing the character, function, and economic health of Downtown over a period of fifteen years.

- **Update to the Historic Mills District Master Plan:** In response to the changing development opportunities and challenges in the city's former Milling District along the eastern portion of the Central Riverfront, MCDA hired Urban Design Associates (UDA) of Pittsburgh, PA to update the *Historic Mills District Plan* by compiling a third development scenario for their original plan. Since the time when the original plan was approved in 1999, there has been significant interest among residential developers for several parcels in this part of Downtown. Also, two important decisions were made that influenced the future of the district. First, the route of the Hiawatha LRT was shifted from Washington Avenue to South 5th Street, and second, the Guthrie Theater decided to relocate along the riverfront. The Planning Commission and the City Council approved the *Update to the Historic Mills District Master Plan* in the late summer of 2001.

Chicago Avenue Today: A parking lot from Washington Avenue to the Parkway



Chicago Avenue Tomorrow: The creation of a new public space will compliment the restoration of the Historic Mills Buildings, new residential development and the Guthrie Theater

- **Skyway and Nicollet Mall Design Guidelines:** Planning staff worked closely with the Downtown Council and Skyway Advisory Committee to update the *Minneapolis Skyway System: Standards and Procedures Manual* and the *Nicollet Mall Design Guidelines*. The Skyway Advisory Committee adopted the updated skyway guidelines in the fall of 2001 and expects to adopt the Nicollet Mall update in early 2002.

Crime Prevention through Environmental Design Initiative: Crime and the fear of crime continue to impact the lives of individuals and communities. In response, the city has embarked on a new crime prevention initiative based on the field of Crime Prevention through Environmental Design (CPTED). The goal is to ensure that all aspects of the physical environment (streets, buildings, and open spaces) are designed to create safe environments.

Traditional security measures (cameras, locks, and bars) fail to address the underlying physical factors that shape the real and perceived safety of spaces. Research and recent developments in the area of CPTED show great success in creating safe environments built on the understanding of how the physical environment "naturally" impacts the behavior of people and the safety of specific environments. This is the foundation of Minneapolis' CPTED Initiative.

CPTED is simply good design focused on crime prevention. People in the course of their normal everyday activities play an essential role in creating secure physical environments. The employee behind the counter at the corner store, and the neighbors walking through the neighborhood, for example, play an important role in the safety of spaces.

CPTED promotes three principles:

- **Natural surveillance:** Promote the ability of people to observe and be observed in the course of their normal everyday activities.
- **Natural access control:** Deny easy access to crime targets and create a perception of risk among offenders.
- **Territorial reinforcement:** Clearly delineate and promote responsibility and acceptable behavior for all spaces.

Over the past five years, the city has applied CPTED principles to specific environments and reported crime rates have fallen. The city's Comprehensive Plan and Zoning Code now incorporates CPTED principles to address issues like the placement and orientation of buildings, entrances and exits, parking lots, walkways, fenestration (windows and doors), landscaping, and other physical features.

Over the past year, the city implemented a demonstration CPTED project on Central Avenue in Northeast Minneapolis. With the support of a Metropolitan Council Livability Communities Grant, area businesses worked together to do rear parking improvements utilizing CPTED principles. Improvements focused on clearly defining the parking lots and improving natural observation of the areas.

Current efforts are to further strengthen zoning code requirements and to develop more specific design guidelines. In addition, public infrastructure policies and practices are being evaluated as to their inclusion of CPTED. With expected completion of ordinance and policy changes by June of 2002, all new developments should create environments that work to naturally enhance the safety of Minneapolis communities.