

environmental integration in transportation

Transportation Outlook 2030 Update 10.0



10.1 Introduction

Protecting environmental quality is essential to preserving a high quality of life for residents of the Kansas City metropolitan area. As numerous local and regional plans and multiple citizen surveys show, there is widespread recognition that a clean and healthy environment is a prerequisite for a high quality of life. In transportation planning, one clear question emerges. How can the alignment, design, construction and management of our region's transportation system conserve, restore or minimize adverse impacts to the natural environment? This question has become even more significant with the passage of the Safe, Accountable, Flexible, Efficient, Transportation Equity Act – A Legacy for Users (SAFETEA-LU) in 2005. SAFETEA-LU includes new LRTP requirements for environmental mitigation. The integration of MARC's environmental policies, programs and data into transportation planning will allow the region to better achieve its desired high quality of life.

Air quality constitutes one important element of the region's environmental quality. Cars and light trucks produce approximately one-third of the emissions that form ground-level ozone, a pollutant that periodically exceeds federal standards in the summer. Ozone is known to damage plants, including agricultural crops, and there is increasing scientific evidence linking urban air pollution to asthma and other respiratory problems in both children and adults. Because motor vehicles can so profoundly affect both the environment and public health, one of the primary objectives of regional transportation planning must be to minimize emissions from mobile sources.

Water quality and green infrastructure constitutes a second important element of the region's environmental quality. Transportation facilities in the region increase stormwater runoff while carrying nonpoint source pollutants into area streams. To protect the area's natural assets and to ensure compliance with the Clean Water Act, one of the primary objectives of regional transportation planning must be to manage stormwater runoff in ways that are consistent with accepted standards for watershed management and water quality protection.

Goal: Support a healthy, strong regional economy

As MARC’s Creating Quality Places initiative notes, “because a clean and healthy environment is a critical element of a quality place, the design of quality places balances environmental, economic and social considerations.” Conserving environmental quality offers unequivocal economic benefits.

Clean air and water benefit the regional economy in several ways. The first is related to public health. If area residents have cleaner air to breathe and water to drink, they are more likely to be healthy, productive workers. A high-quality natural environment also makes the region more attractive to potential job seekers who may currently live in areas with poorer air quality or in areas where local water bodies are degraded. Furthermore, areas that comply with federal environmental standards may have a competitive edge in attracting new businesses. Last, a healthy environment offers many ecosystem services that, while difficult to quantify, create the underlying basis for a sustainable economy.

Goal: Maximize access to opportunity for all area residents

A balanced transportation system that provides area residents with alternatives to driving in a single-occupant vehicle (SOV) serves the dual purpose of protecting air quality and providing opportunities for all people to move about the region easily. A reliable, extensive public transit system would increase mobility for the growing population of senior citizens, many of whom no longer drive. School-age children may also benefit from public transportation improvements. Transit may provide non-driving workers with the means to get to jobs that would otherwise be inaccessible, benefiting employees, businesses and consumers.

Goal: Support a quality built and natural environment

Integrated transportation planning offers opportunities to protect the natural environment in several ways. Transportation planning may seek to minimize pollution from on-road vehicles. Investing transportation resources to develop a better public transit system and greater opportunities for cyclists and pedestrians may encourage development patterns that are more compact and efficient. Transportation plans may also seek to minimize pollution and stormwater runoff from area roads. To fully realize the air and water quality benefits of a modally-balanced transportation system, land use, watershed and transportation planners must work together to ensure that relevant plans are developed in a coordinated, mutually compatible fashion.

MARC has developed several policies, programs and datasets to identify and assess natural resources and plan for their protection:

- **Creating Quality Places**—offers environmentally-based, context-sensitive guidelines for transportation planning and design and for subsequent program evaluation
- **Clean Air Action Plan** – creates a policy and planning framework to support investment in air-quality-friendly transportation and public infrastructure investments
- **Water Resources Policy, Planning and Practices** – build strong community consensus on three policy goals: reducing the risk of flooding, protecting water quality, and creating multipurpose community assets like greenways and trails

- **Natural Resources Inventory** – identifies valuable natural resource assets and ecological features
- **MetroGreen** – plans for an interconnected regional system of natural areas, greenways and trails
- **Green Infrastructure** – provides a conceptual framework to balance regional goals related to the built and natural environments; a planned, managed, interconnected network of natural areas like waterways, wetlands and forests; conservation lands like greenways and parks; and adjacent working lands like farms, ranches and corporate lands.
- **Paint the Town** – software to analyze and assess the impact of alternative development patterns on quality of life; regional maps show different land uses and incorporate key demographic data and other information to help update the area’s long-range forecast and analyze what factors contribute to current and future land-use challenges.

Goal: Promote the safety and well-being of the traveling public

Increasing the availability of public transit and bicycle/pedestrian facilities may help reduce emissions from SOVs, which can lead to a reduced incidence of respiratory illnesses caused or aggravated by air pollution. Using public transit is statistically safer than driving in an SOV; nationally, the automobile accident fatality rate is 90 times higher than that of transit buses per passenger mile traveled. Increasing funding for bicycle/pedestrian facilities can make non-motorized modes of transportation safer and more accessible. Equally important, bicycle/pedestrian facilities can help promote physical fitness while also conserving water quality along important stream and greenway corridors.

10.2 Air Quality Considerations in Transportation

AIR QUALITY ELEMENT ACTION TABLE

Transportation Outlook 2030 included an action plan at the closing of each chapter. This 2005 Update evaluates the progress made in each action item since the 2002 publication of *Transportation Outlook 2030*. The following table details the status of the Air Quality Action Plan.

Transportation Outlook 2030 Actions	Status		Comments
	Planning	Implementing	
Air Quality program coordination	●	●	1.75 FTE plus part-time intern currently involved in planning and implementing elements of air quality program.
Air Quality Forum	●	●	Meets monthly.
Air Quality Public Education Committee	●	●	Meets monthly.
Clean Air Action Plan	●	◐	Plan developed in 2004; draft document available early 2005; will seek Air Quality Forum and MARC Board approval upon completion.
Annual public education campaign	●	●	Ongoing; campaign runs May through September annually.



CMAQ program coordination	●	●	Air quality staff continue to coordinate with transportation staff to administer regional CMAQ program.
Technical workshops to reduce mobile source emissions	●	○	MARC will coordinate workshops to promote idling reductions, retrofits, and other strategies to reduce diesel emissions.
Workplace Initiative	●	◐	Will coordinate with MARC RideShare program staff to increase regional participation in carpool, transit, bicycle and pedestrian commuting.
Development of coordinated regional watershed management strategy	◐	○	New watershed planning and engineering design tools were completed 2003–2005. Will use tools in transportation planning to protect water quality, and heighten level of collaboration in region on integrated watershed management and MetroGreen.
<p>● = Achieved and Ongoing ◐ = In Progress ○ = Not Yet Planned/Implemented</p>			

MARC has also been responsible, under Section 176 of the Clean Air Act, for assuring that regional transportation plans do not interfere with attainment or maintenance of air quality standards. When it implemented the eight-hour ozone standard in 2004, the Environmental Protection Agency (EPA) indicated that areas like Kansas City would no longer be subject to transportation/air quality conformity requirements. A federal court ruling in December 2006 held that EPA erred in lifting the conformity requirement and, at this writing, an EPA response to the ruling is pending. MARC has conducted conformity analyses on a voluntary basis since the eight-hour standard was first implemented. However, if the EPA reestablishes a regulatory conformity requirement for the region, it will be necessary to reexamine existing mobile source emissions budgets and to ensure that the consultation process and planning assumptions meet all current federal requirements.

The Air Quality Forum, a policy committee composed of local elected officials, air quality and transportation agency personnel, and business and community group representatives, reviews regional air quality issues and makes policy recommendations regarding those issues to the MARC Board of Directors and the states of Kansas and Missouri.

10.2.1 Background on Kansas City’s Ozone Problem

Ground-level ozone is one of six common pollutants for which the EPA has set national air quality standards to protect human health and the environment. Of the six pollutants, ozone has been the only problem pollutant in the Kansas City area in recent years.

Ozone forms when volatile organic compounds (VOCs) and oxides of nitrogen (NOx) react with each other in the presence of heat and sunlight. Because of its dependence on sunlight and high temperatures, ozone is generally only a problem in the summer months. Historically, efforts to reduce ozone pollution in the Kansas City region have focused on decreasing VOC emissions.

VOCs enter the atmosphere in two ways: through exhaust from combustion processes and through evaporation (e.g., painting and printing operations result in solvent evaporation). The operation and refueling of on-road motor vehicles (cars, trucks, buses

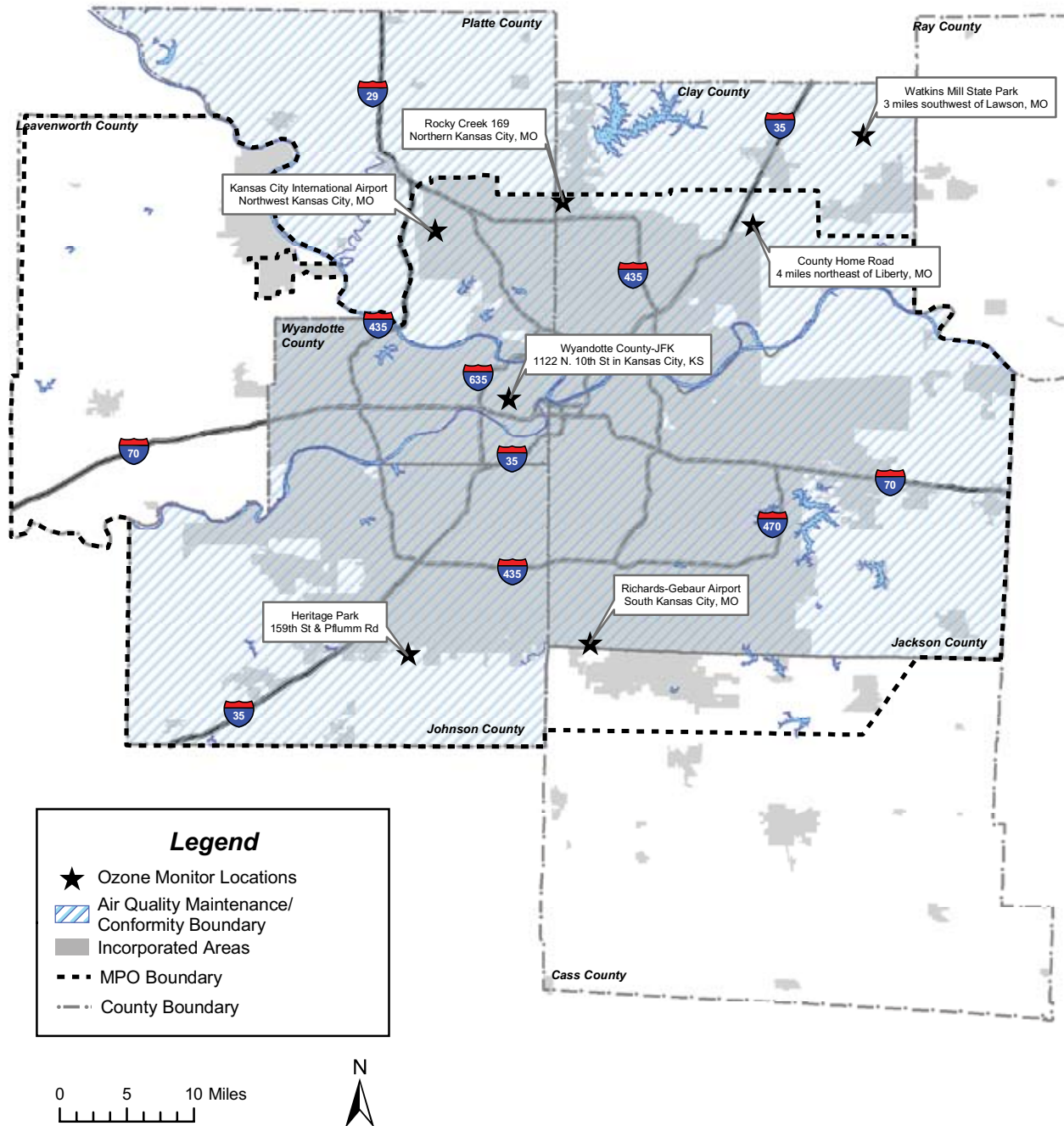
and motorcycles) is the largest source of VOCs in the Kansas City area. This source accounts for approximately one-third of all VOC emissions in the area.

Air quality modeling sponsored by MARC in 2004 shows that NO_x emissions have more of an impact on the region's ozone problem than previously thought. Ozone concentrations in the urban core appear to be more VOC-limited, meaning that reducing VOC emissions is a more effective strategy for reducing peak ozone values within the urban core. On the other hand, monitors in downwind locations, such as Rocky Creek, Liberty and Watkins Mill, appear to be NO_x-limited under most conditions. On an average high ozone day, these downwind monitors typically register the highest ozone concentrations in the region. This means that reducing NO_x emissions could have a greater impact in locations where the highest ozone concentrations tend to occur.

NO_x is generated by combustion processes. Cars and trucks account for around one-third of the regional NO_x inventory, and much of the mobile source component comes from heavy-duty diesel engines. Power plants and other large industrial combustion sources account for roughly another one-third. The remainder comes from off-road mobile sources, such as locomotives and construction equipment, and smaller stationary combustion sources.

From its designation as a nonattainment area in 1978 until the early 1990s, the Kansas City region did not meet the one-hour standard for ground-level ozone. This standard was set at 120 parts per billion (ppb) measured over a one-hour period, and any monitor exceeding this limit more than three times in a three-year period would trigger a violation of the standard. By 1992, the region's air quality had improved to the point that EPA was able to designate the region a maintenance area for ozone. The region experienced violations of the one-hour standard in the mid-1990s but was able to implement contingency measures — principally lower-volatility gasoline and a comprehensive public education campaign — that helped the region keep its status as a maintenance area.

**FIGURE 10-1
KANSAS CITY REGION OZONE MONITOR LOCATIONS**



In response to the 1995 ozone violation, the EPA directed Kansas and Missouri to update the contingency plan and to implement contingency measures accordingly. Kansas and Missouri asked the Air Quality Forum to evaluate the full range of options available to the region and make a recommendation on how the region should respond to the air quality violation. The selected strategies were to achieve the same or greater levels of emissions reductions than the strategies proposed in the 1992 contingency plan.

In July 1996, after evaluating a wide array of options for reducing summer ozone levels, the Forum recommended the adoption of several primary air pollution control strategies and supplementary measures aimed at keeping the region in attainment of the one-hour ozone standard. The recommended strategies are included in the Kansas and Missouri SIPs for ozone. The status of each control measure is described below.

10.2.2 Air Pollution Control Strategies Implemented Under the One-Hour Ozone Maintenance Plan

10.2.2.1 Air Quality Public Education. MARC and the Greater Kansas City Chamber of Commerce initiated a comprehensive regional air quality public education program in 1992 when Kansas City was redesignated as being in compliance with the one-hour ozone standard. Now known as the AirQ program, the campaign encourages citizens to take voluntary actions to reduce air pollution during the summer ozone season, especially on days when ozone levels are predicted to be high. SkyCasts issued daily during the ozone season predict pollution levels.

Under the guidance of the MARC Public Education Steering Committee and with funds provided by EPA, the U.S. Department of Transportation, state agencies and businesses, air quality public education is now a year-round effort. Major products of the education campaign have included radio and television public service announcements, print advertisements, billboards, an air quality video featuring area television meteorologists, two Kansas City Business Journal inserts devoted to air quality, a newspaper supplement, posters and pamphlets, and outreach materials designed for schoolchildren.

Surveys conducted annually since 1998 indicate that the air quality public education program has been successful not only in raising awareness but in achieving emissions reductions through voluntary action. For this reason, it is likely the program will continue to be an integral part of the region's efforts to reduce air pollution.

10.2.2.2 Fuels Strategies. In 1996, the Forum recommended decreasing the volatility of gasoline beyond the reductions previously achieved. This strategy is referred to as low RVP gasoline (RVP stands for Reid vapor pressure, a measure of volatility). In 1997, area gas retailers began selling 7.2 RVP gasoline (reduced from 7.8 RVP) during the summer months to help reduce evaporative emissions.

The 1996 Forum recommendations also included an additional fuel strategy called reformulated gasoline (RFG). RFG differs from conventional gasoline because oxygen-containing chemicals are added, resulting in more complete combustion and less exhaust pollution. RFG is formulated to reduce tailpipe emissions of NO_x, VOCs, and toxic air pollutants such as formaldehyde and benzene.

Because the Clean Air Act limited the sale of RFG to metropolitan areas with the worst ozone problems, a federal rule authorizing the sale of RFG in the region was required. In September 1998 EPA issued a final regulation that expanded the RFG program to many areas in the country which were previously not eligible, including Kansas City. In the summer of 1999, the governors of Kansas and Missouri signed letters opting in to the RFG program with the expectation that RFG would be available in the Kansas City region as early as the summer of 2000. However, in January 2000, the Washington, D.C., Circuit Court of Appeals ruled that the Clean Air Act precludes EPA from expanding the ability of areas to opt in to the program.

While efforts to implement an RFG program in Greater Kansas City failed, 7.2 RVP gas continued to be sold during the summer months through 2000. In June 2001, gas retailers began to sell an even less volatile 7.0 RVP fuel. Barring any changes to RFG program eligibility requirements, 7.0 RVP gasoline is expected to be the region's primary fuel strategy in the near term.

10.2.2.3 Non-mobile Source Emissions. After violations of the one-hour ozone standard in the mid 1990s, the two state air agencies adopted new regulations governing emissions from stationary sources. In 2001 the Missouri Department of Natural Resources (MDNR) began to enforce two new regulations. One requires major stationary sources to reduce emissions from solvent clean-up operations by 30 percent; the other mandates lower vapor pressure in solvent washers used in industrial processes. The Kansas Department of Health and Environment (KDHE) established a new regulation to control VOC emissions from commercial bakeries in the Kansas City region.

10.2.2.4 Air Quality Data Collection. MARC coordinates with MDNR, KDHE, EPA Region 7, and other agencies to collect and assess air quality data in the region. In 2004 the agencies coordinated to finish work on an urban airshed model that characterized the dynamics of ozone formation in the Kansas City metropolitan area and enabled air quality planners to assess the effectiveness of potential new air pollution control strategies.

10.2.3 Supplementary One-Hour Ozone Control Measures

10.2.3.1 Seasonal Reduced Fare Transit. Since 1999, area residents have been able to use regional transit for only \$0.25 on Ozone Alert days. Since the program began, ridership on high ozone days has been 10 percent to 15 percent above average levels. The program, which has received funding through a variety of federal sources, is expected to be ongoing.

10.2.3.2 Clean Cities Program. Part of the U.S. Department of Energy's national Clean Cities program, the Kansas City Regional Clean Cities Coalition plan encourages owners of motor vehicle fleets to use less-polluting fuels — compressed natural gas, propane, ethanol, biodiesel and electricity — as alternatives to conventional gasoline and diesel. Over 100 public and private organizations, including fleet operators, fuel suppliers, and automobile manufacturers, participate in the regional Clean Cities program through a cooperative Memorandum of Understanding. The U.S. DOE officially designated Greater Kansas City a "Clean City" on November 18, 1998.

10.2.3.3 Enhanced Traffic Signalization. Through MARC, local jurisdictions in the Kansas City region are coordinating Operation Green Light, a program to reduce congestion and associated air quality problems by improving traffic signal coordination in high-traffic corridors. The first phase of the project is currently being implemented.

10.2.3.4 Expanded Transit Program. Smart Moves, a new regional transit initiative, will introduce enhanced transit services to the region and connect them together through the use of transit centers. The plan builds and expands upon the existing transit routes and facilities operated by the Kansas City Area Transportation Authority, Johnson County Transit and Unified Government Transit, and it will use a combination of existing and new service types, vehicles and facilities to meet regional and local needs.

Since 2000, the Regional Transit Alliance (RTA), an advocacy group, has worked with transit agencies, local governments and community groups to promote and increase the availability of public transportation in metropolitan Kansas City. The RTA currently has about 550 members.

10.2.3.5 Land-Use Planning. According to an evaluation of the environmental benefits of infill versus greenfield development, siting a new development in an existing neighborhood instead of on open space at the suburban fringe can lower vehicle miles traveled by as much as 60 percent. Smart growth's emphasis on developing walkable communities and providing transportation choices — transit, walking and biking — can also reduce air pollution by reducing auto mileage and smog-forming emissions. Locally, these principles have been manifested in Creating Quality Places.

10.2.4 Kansas City's Current Air Quality Status

In July 1997 EPA updated the national ozone standard in response to research showing that the one-hour ozone standard did not adequately protect human health. The new standard, defined as 80 ppb averaged over eight hours, faced a number of legal challenges but was ultimately upheld by the U.S. Supreme Court in 2001. A 2002 consent decree required EPA to issue designations by April 15, 2004. On that date, EPA designated the Kansas City region “unclassifiable” for the eight-hour ozone standard, in part because of irregularities in monitor data collected in 2003. EPA postponed a decision about Kansas City's eight-hour ozone compliance status until the end of the 2004 ozone season.

Record cool temperatures and unsettled weather patterns in the summer of 2004 kept ozone concentrations in the region well below the eight-hour ozone standard. As a result, the region was in attainment of the eight-hour ozone standard for the 2002–2004 monitoring period. In May 2005 the EPA designated the region an ozone attainment area.

The attainment designation is good news for the region in the short term, but air quality modeling performed in 2004 indicates that the region will likely struggle to keep its attainment status. In fact, the region would have been in violation of the standard in four of the five years prior to 2004. Because the region hovers so close to the standard, and because the threat of future violations is so great, in 2003 the MARC Air Quality Forum appointed a working group to oversee the development of a regional Clean Air Action Plan (CAAP).

The CAAP is a comprehensive list of strategies the region has begun to employ voluntarily in order to provide area residents with healthier air and keep the region in compliance with the federal ozone standard. The Air Quality Forum working group held a series of meetings that culminated in a regional air quality workshop in September 2004. Over 170 people attended the workshop and provided input on a broad range of ozone-reducing strategies that could be implemented in the Kansas City region. Based on feedback from workshop participants, the working group developed a short list of strategies that have the greatest level of community stakeholder support.

As mentioned above, modeling carried out as part of the CAAP development process shows that NO_x emissions are a greater factor in Kansas City's ozone problem than previously believed. Clearly, reducing VOC emissions will still provide air quality benefits, and existing VOC reduction strategies are expected to remain in place. However, in the past the region has concentrated its efforts on reducing VOC emissions and focused less on NO_x reduction strategies. Consequently, the CAAP includes a number of voluntary strategies that primarily aim to reduce NO_x emissions. These include:

- New controls on existing power plants
- Early adoption of low-sulfur diesel fuel
- Engine retrofits for heavy-duty diesel onroad trucks
- Engine retrofits for diesel-powered construction equipment
- Truck stop electrification
- Diesel idling reduction programs
- Retrofits and idling reduction technologies for switching locomotives
- Lawn care emissions reductions through education, alternative technologies and native landscaping practices
- Increased public education for citizens and targeted audiences (e.g., commercial solvent users, emergency generator users, printers, painters)
- A voluntary gas cap testing program
- Land-use policies and transportation planning practices that reduce the air quality impacts of cars and trucks
- Urban forestry

Some of these measures — such as idling reduction programs/technologies for on-road heavy-duty diesel trucks and switching locomotives, air quality public education, and voluntary gas cap testing — are already being implemented. Others are currently unfunded and will require the regional community to create partnerships and identify funding sources before they can proceed. It should be noted that among the strategies listed above, reducing emissions from power plants would clearly have the greatest impact in reducing ozone-forming emissions. New controls on existing power plants would reduce NO_x emissions in the region by approximately 80 tons per day. It is estimated that all other measures combined would generate less than one-twentieth of this amount.

The CAAP also includes recommendations about regulatory strategies that could be implemented if the region is designated a nonattainment area by EPA in the future. These strategies include:

- Remote-sensing-based emissions testing program to identify high-emitting cars and trucks
- Mandatory gas cap replacement program
- Reformulated gasoline
- New state regulations to limit industrial/commercial VOC and NOx emissions

The CAAP currently represents the region’s best opportunity for retaining its status as an eight-hour ozone attainment area. EPA has indicated that it will require the region to develop a regulatory maintenance plan after it is designated attainment, but as of this writing it is not clear what the requirements of the maintenance plan will be or how elements of the CAAP might fit into the maintenance plan. Whatever regulatory uncertainties may exist, it is clear that the Kansas City region must begin aggressively implementing short- and long-term emissions reduction measures in order to protect the public health and to avoid the potentially significant economic consequences of nonattainment.

10.2.5 Region’s Status Under Eight-Hour Ozone Standard

In 1997, the EPA promulgated the new eight-hour ozone standard to better protect public health. The standard is 85 ppb averaged over eight hours. The EPA determines compliance with the standard based on a three-year average of readings from each monitor. If the three-year average of the fourth-highest reading from an ozone monitor equals or exceeds 85 ppb, that monitor is in violation. Even if only one monitor in the air quality boundary violates the standard, the whole region is considered to be in violation.

When the EPA designated areas under the eight-hour standard in 2004, it assigned an “unclassifiable” designation to Kansas City and deferred a final designation to 2005. In the interim, the region experienced a record cool summer in 2004, which resulted in extremely low ozone concentrations and caused the three-year average to fall below the standard. The EPA subsequently designated the region an attainment area under the eight-hour ozone standard.

The region currently maintains a tenuous grasp on its attainment status. At this writing, the metropolitan area appears poised to violate the eight-hour standard in the summer of 2007. In anticipation of a violation, Kansas and Missouri are completing regulatory plans that will contain contingency measures restricting the idling of diesel engines. If a violation occurs, the EPA could redesignate the region to nonattainment or could allow the region to keep its attainment designation contingent on the implementation of new emissions reduction strategies.

10.3 Water Quality Considerations in Transportation

WATER QUALITY ELEMENT ACTION TABLE

Transportation Outlook 2030 included an action plan at the closing of each chapter. This 2005 Update evaluates the progress made in each action item since the 2002 publication of *Transportation Outlook 2030*. The following table details the status of the Water Quality Action Plan.



Transportation Outlook 2030 Actions	Status		Comments
	Planning	Implementing	
Water Quality program coordination	●	●	1.5 FTE involved in planning and implementing elements of water quality protection.
Basin-wide coordination	●	○	Regional watershed/stormwater management action plan completed. Future coordination on basin-wide issues in major watersheds will increase through partnerships among federal state and local agencies.
Water Quality Public Education Committee	●	●	Meets monthly.
APWA Sections 2100, 5100 & 5600 and Best Management Practices Manual for Stormwater Quality	●	●	New engineering and planning standards, specifications and guidelines for stormwater management and sediment/erosion control completed in 2003 and adopted by APWA membership and MARC Board. MARC continues to sponsor appropriate training and outreach.
Annual water quality public education campaign	●	●	Ongoing; 2005 campaign will include four seasonal campaigns.
Green Infrastructure Program; Natural Resource Inventory (NRI)	●	◐	MARC sponsored numerous regional demonstration projects and educational programs related to green infrastructure planning and design. GIS-based NRI completed. Future planning will assess how NRI relates to transportation, land use and watershed planning.
Technical workshops	●	●	Ongoing; MARC will continue to coordinate workshops on a variety of technical subjects related to water quality protection.
● = Achieved and Ongoing ◐ = In Progress ○ = Not Yet Planned/Implemented			

Historically, MARC has been involved in area watershed and stormwater management issues. In August 1980 MARC adopted a model Stormwater Runoff Management Ordinance prepared by the Ad Hoc Committee for Stormwater Runoff Management in response to the 1977 flood. And, in June 1987, MARC completed a *Storm Drainage and Flooding Assessment Summary Report* that looked at opportunities for regional cooperation to resolve many problems caused by flooding. While flooding and water quality problems persist, few of the key recommendations made in previous studies were implemented.

New efforts to address flooding and water quality issues are gaining momentum. As they move forward, these initiatives will seek to develop new policies and practices that help answer key questions. For example,

- To what extent can regional transportation facilities be designed and managed to minimize stormwater runoff and reduce nonpoint source pollution?
- How can watershed planning and management be integrated with transportation, air quality and land-use planning to improve the quality of life for our region's citizens?

10.3.1 Overview on the Metropolitan Watershed and Stormwater Management Action Plan

In 2000 MARC again initiated regional discussions on stormwater and watershed management in response to severe flooding in October 1998. In partnership with the Kansas City Chapter of the American Public Works Association (APWA), MARC worked to develop consensus among local government public works and planning officials from around the region on joint actions for improved watershed planning and stormwater management in metropolitan Kansas City. This consensus was articulated in an Action Plan completed in January 2001.

The action plan identified three guiding principles to direct future program activities:

- Stormwater should be viewed as a regional asset.
- Protection of the region’s natural environment is an important overall goal.
- Local communities must change current practices to effectively address stormwater within their jurisdictions and throughout the region.

The plan also articulated a series of goals for future activities. Substantial accomplishments have been achieved with each of these goals since 2001 as shown in the summary chart. Nevertheless, additional progress will still be pursued in each area.

Goal 1: *Identify and engage local political leaders in the development and implementation of a regional watershed and management program for metropolitan Kansas City.*

Political leadership is important to any successful effort, and a plan needs to be created and implemented to include community leaders in the process of regional stormwater management.

Goal 2: *Develop a coordinated regional stormwater/watershed management system for metropolitan Kansas City through consistent performance standards.*

Recognize that for a coordinated effort to succeed, communities across the metropolitan area need to have a common vision and plan, and share information using the same methods and model approaches to maintenance, operation, monitoring, assessment and evaluation of completed projects.

Goal 3: *Coordinate watershed and land-use planning throughout the metropolitan area at the regional and local levels.*

The relationship between land use and water resources needs be acknowledged in community planning, looking toward non-structural watershed-based alternatives to capture stormwater runoff and improve water quality.

Goal 4: *Incorporate “Best Management Practices” into the scope of services for stormwater/watershed studies.*

Identify and develop shared language and resource materials to define and guide local and regional efforts in a systems approach.

Goal 5: Increase public awareness of the need for regional solutions and the concept of “Best Management Practices.”

Create and expand existing public outreach programs to increase understanding of watershed-based approaches.

The plan further recommended that MARC take the lead in convening policy and advisory committees. The APWA, public works departments, planning departments, appropriate state and federal agencies, and the consulting community will play important roles in these committees. In addition, key stakeholders like homebuilders, developers, environmental groups and citizens will be asked to provide input and feedback, and participate on task forces.

As a result, MARC formed the Water Resources Policy, Planning and Practices (WRP3) initiative. A Policy Committee composed of elected officials and an Advisory Committee comprised of public works and planning directors are supported by more focused task forces. Task forces are working on stormwater drainage standards, interjurisdictional watershed coordination and water quality education.

10.3.2 Recommended Water Quality Protection Measures

MARC’s watershed management initiatives have developed new policies and standards. The measures identified below will continue to be the focus of upcoming discussions by the various task forces and committees.

10.3.3.1 Major Watershed Management and Water Quality Protection Strategies. The Action Plan noted three key areas for future policy and program development.

- **Project Standards and Development Standards Focus Area** will support outreach and education efforts related to recently completed performance standards for stormwater projects. This focus area will also be involved in the preparation of model development standards and ordinances for local government adoption, like stream setback regulations, to promote non-structural solutions to stormwater management.
- **Communication, Awareness and Education Focus Area** will be responsible for communication and education efforts to increase awareness of the importance of regional solutions, the meaning of “Best Management Practices,” and the efforts of the regional stormwater program overall. This focus area will also be responsible for technical workshops and technical materials to inform local government and consultants.
- **The Watershed Planning and Projects Focus Area** will be responsible for devising coordinated regional watershed initiatives for implementing stormwater management solutions across jurisdictional boundaries. Through this focus area, major, interjurisdictional stormwater projects will be identified and coordinated. Much of this

effort will draw from the Regional Natural Resources Inventory to help guide regional planning efforts to conserve or restore natural assets in ways that are consistent with transportation, environmental and other community goals.

10.3.3.2 Expected Outcomes. The expected outcomes for this initiative may be modified as the plan is refined and elected leaders become involved, but at present include:

- Greater community understanding of the need for a regional approach to stormwater management.
- Greater understanding of the relationship between stormwater runoff and water quality.
- Greater recognition of stormwater as an ecological resource rather than an engineering problem.
- Preservation of natural drainage ways and natural resources as multipurpose community assets.
- Greater degree of conformity among local development standards.
- Commitment to implement best management practices.
- Increased partnering among jurisdictions to address major stormwater projects.
- Greater connection between watershed and land use planning at the regional and local levels.
- More cost-effective approaches to flooding and stormwater management.

10.3.3 Policy Recommendations. The regional water quality initiative has the opportunity to inform and impact transportation investment decisions in ways that improve environmental protection. Ongoing MARC programs will facilitate the development of coordinated watershed management policies, programs and practices. Regional initiatives will strive to achieve sustainable water resource management within the metro area in a manner that is consistent with the regional action plan's goals, that incorporates key water quality protection measures, and achieves expected program outcomes.

The resulting policy guidance on best management practices, engineering design standards and natural resource management will be used to develop regional transportation policies that minimize the impact of transportation facilities on stormwater quantity and quality. Additionally, watershed planning and management tools will be integrated with transportation, air quality and land-use planning to improve the overall quality of life for our region's citizens.

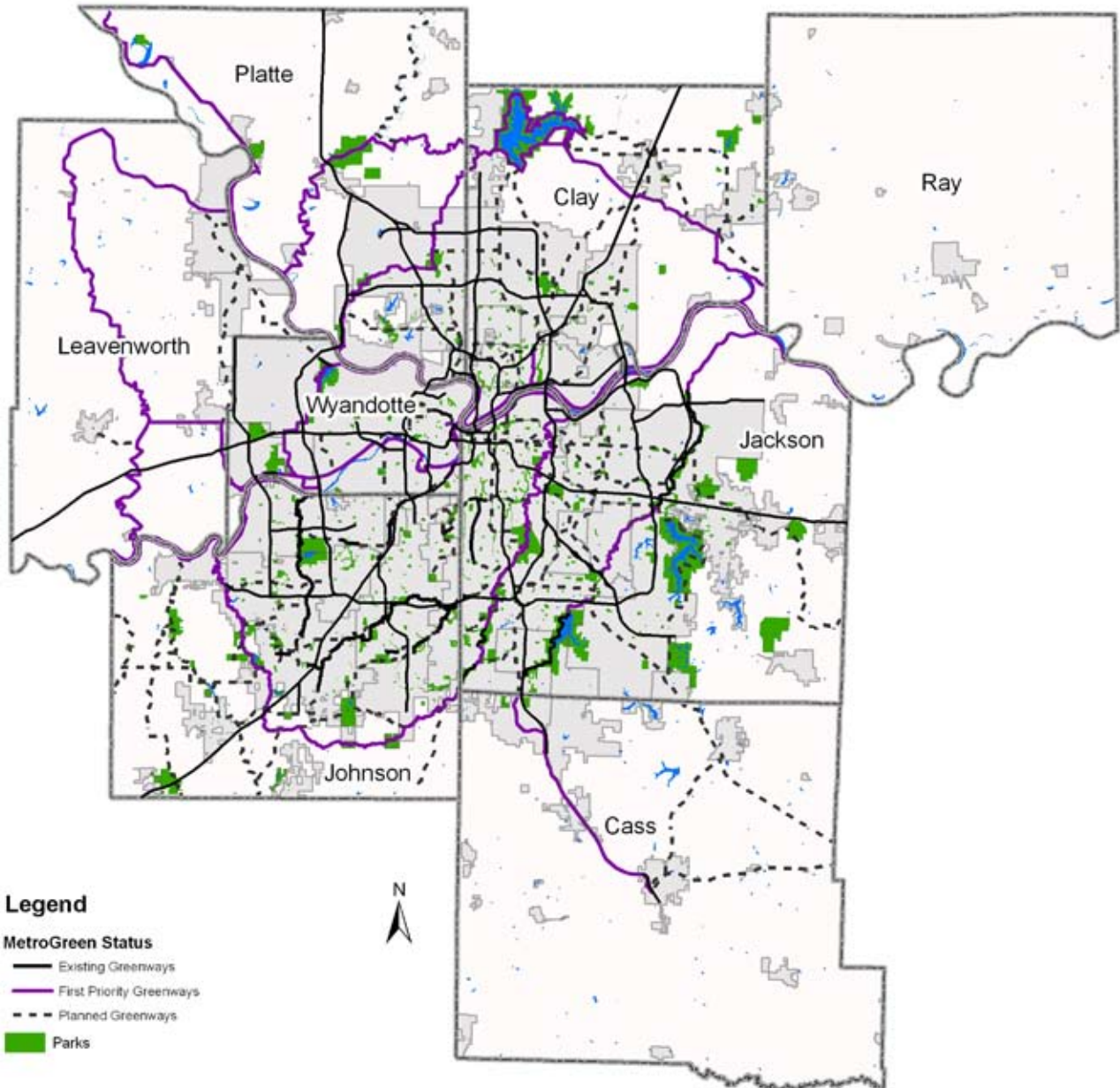
10.4 Environmental Plans & Data

MetroGreen

MetroGreen is a proposed interconnected system of public and private open spaces, greenways and trails designed to link seven counties in the Kansas City metropolitan area. The plan covers Leavenworth, Johnson and Wyandotte counties in Kansas and Cass, Clay, Jackson and Platte counties in Missouri. See Figure 10-2.

MetroGreen continues a tradition of valuing green space in the Kansas City area by extending the “parkways and boulevards” concept of the 1894 Kessler Plan for Kansas City, Mo. MetroGreen extends and enhances this commitment by identifying more than 75 separate corridors to form a regional network of greenways that connects many of the areas most valuable natural assets. The project is one of the 10 Giant Steps identified as part of the Kansas City Sesquicentennial Celebration. Strong greenway programs in many jurisdictions support regional MetroGreen implementation. Further, green infrastructure concepts and plans support local and watershed-based implementation as well.

**FIGURE 10-2
METROGREEN CORRIDORS NATURAL RESOURCES INVENTORY**



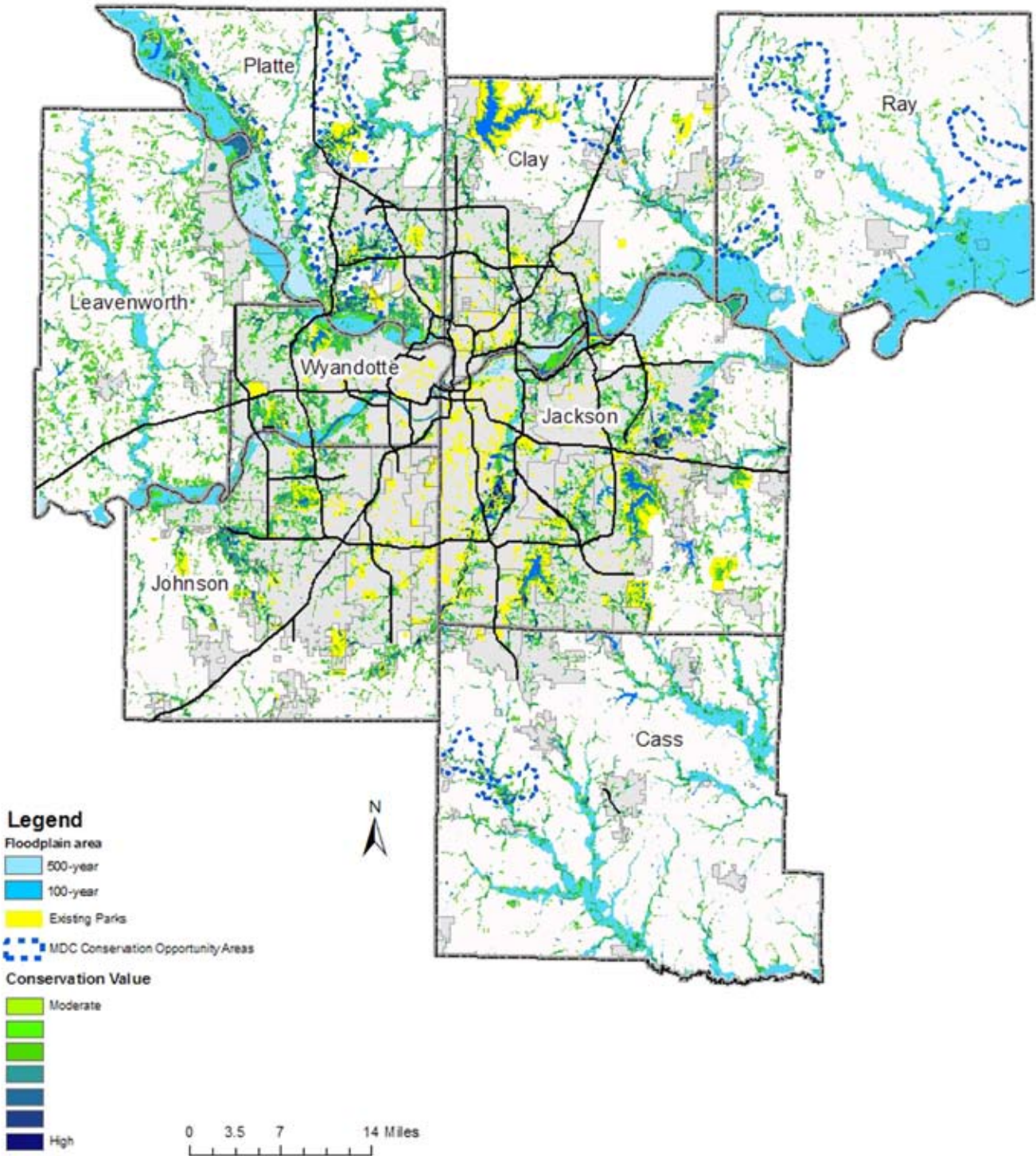
0 5 10 20 Miles



Natural Resources Inventory

MARC developed a Natural Resources Inventory (NRI), which consists of digital map data showing valuable natural resource assets and ecological features in the Kansas City region. This data provides a framework for proactive, integrated environmental planning at local and regional levels. This initiative provides the opportunity for Kansas City to use conservation planning tools to sustain future environmental quality. Further, this effort is expected to help create high-quality livable environments through coordinated conservation and economic development. The newly consolidated environmental data will help local communities proactively conserve or restore natural resources during the development process. See Figure 10-3. MARC encourages local jurisdictions to use this data in their planning processes. Detailed data and maps are available to member communities by request.

**FIGURE 10-3
NATURAL RESOURCES INVENTORY**



10.5 ACTION PLAN

1. Consult with regional stakeholders to develop regional environmental mitigation strategies in an effort to better incorporate environmental considerations in MARC's planning and programming processes.
2. Establish a new air quality conformity analysis process for all transportation plans, programs and projects.
3. Work with local governments to develop and implement greenhouse gas-reduction strategies.