

NATURAL ENVIRONMENT

VISION

Goshen will meet today's needs without compromising the needs of future generations. Goshen will respect and manage natural resources in ways that sustain, restore, and enhance the natural environment and protect our parks, wildlife, waterways, wetlands and open spaces. A percentage of the city will be sustained as open space, which will include a network of parks to provide access to nature. An urban forest will provide ecological benefits and a source of beauty for residents. Goshen will endeavor to achieve cleaner water and air and work toward less noise and light pollution. Policies, programs, and education will emphasize environmental stewardship.

Introduction

The Natural Environment element of the Comprehensive Plan provides an ecological perspective on land use and community decision-making, the relationship between people, the built environment, and the natural environment. The chapter contributes the critical “third leg” of the stool which represents the triple-bottom line approach to sustainable quality of life.

The Natural Environment chapter addresses objectives relating to preserving and enhancing natural resources, air and water pollution, open space and parks, natural habitat, species conservation, environmental education, the urban forest, energy conservation, solid waste disposal, and noise and light pollution.

E-1 Goal

Preserve and enhance community natural habitat and resources

E-1 Programs for natural habitat preservation

We recognize the Elkhart River as one of Goshen's and Elkhart County's premiere environmental assets.

1. Minimize visual and ecological impacts of any development on the river, open space, parks, or other natural resources.
2. Preserve and protect all wetlands (as defined by the Army Corps of Engineers) and natural water areas as open space, including lakes, ponds, rivers, streams, creeks, marshes, fens, swamps, floodplains, and wet prairies.
3. Create zoning overlay to include areas in need of protection.
4. Promote ecological restoration.
5. Build community awareness through education.
6. Encourage landscaping with plants native to this area.
7. Promote community's environmental assets for tourism and planning.



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- The Saint Joseph River Valley
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- What Is A Green Map?

E-1 Implementation

1. Identify “critical areas” on City zoning maps.
2. Create zoning overlays that direct various kinds of development to preferred areas especially those that need protection.
3. Amend ordinances to require consideration of ecological impacts in site plans.
4. Amend ordinances to require respect for or inclusion of bike paths, parks, and open space corridors in new development.
5. Preserve ecological integrity in riparian (river, stream, creek) corridors. Preserve and restore the habitat value of river/creek corridors through the preservation and restoration of native plants along banks. Discourage creek bank instability, erosion, downstream sedimentation, and flooding by minimizing site disturbance and vegetation removal on or near waterways, and carefully reviewing grading and drainage plans for development near waterways. Include these criteria in site plan reviews.
6. Use school classes, EnviroCorp, park department, ECSWCS, volunteers.
7. Use site plan review to prevent fencing, piping, and channelization of water ways when flood control and public safety can be achieved through measures that preserve the natural environment.
8. Use GIS mapping and “Green Map (see end of chapter) development to identify areas in need of protection, and those with restoration potential.
9. Develop “Green Map” to identify and promote community environmental features.
10. Partner with Chamber, Tourist and Convention Bureau to develop “Environmental Assets Identity.”
11. Partner with other agencies to develop restoration projects.
12. Develop resource list of native plants.
13. Provide educational services to residents and agencies.
14. Sponsor events and activities that promote native plantings.

E-2 Goal

Maintain and increase open space and parks

E-2 Programs for open space

1. Develop the Elkhart River and Mill Race as a business, aesthetic, recreational, and environmental asset, and as a model for asset-filled centers.
2. Manage existing public open space and parks and in a manner that preserves and enhances their ecological, recreational, and aesthetic value.
3. Maintain and expand the bike/pedestrian trail system to make it accessible to all parts of the city.
4. Direct growth toward existing communities and away from undeveloped space such as farmland, wetlands, forests, etc. (See Land Use chapter.)

E-2 Implementation

1. Use incentives to property owners along waterways to increase the aesthetic and natural value of land adjacent to the river system.
2. Identify grants for river cleanup and natural landscaping.
3. Promote low-impact recreational use.
4. Support regional efforts to preserve the Elkhart River, its floodplain, and its tributaries as an open space corridor.



5. Purchase land or development rights along the river system.
6. Plan riverfront development to respect and enhance waterways as community resources.
7. Support the ecological, recreational, and aesthetic values contained in the Goshen Parks and Recreation Master Plan.
8. Encourage the management of private open space in a manner that preserves its ecological, recreational, and aesthetic value.
9. Identify open space locations.
10. Use tools such as transfer or purchase of development rights to preserve open space locations.
11. Amend ordinances to include green space requirements in development.
12. Zone for “village” (or cottage) style development that includes ecological, recreational, and aesthetic amenities in redevelopment or new development projects.

E-3 Goal

Evaluate and conserve threatened and endangered species and ecosystems.

E-3 Programs to preserve species

1. Identify areas with sensitive and rare plants, animals, and ecosystems.
2. Protect sensitive and rare plants, animals and ecosystems from development.

E-3 Implementation for preserving species

1. Conduct an environmental inventory.
2. Include data in the GIS database and Green Map.
3. Develop zoning overlays that direct development to preferred locations.

E-4 Goal

Promote environmental education

E-4 Programs to promote environmental education

1. Develop environmental education through the Parks and Recreation Department, with support from the Utilities and Planning departments.
2. Work with Elkhart County Soil and Water Conservation District to promote regional environmental education.
3. Work with property owners along the river system and near open areas to promote appropriate and low-impact land use.





An early, treeless Main Street.

E-5 Goal

Create staff and incentives to maintain and enhance the "urban forest" (street trees, trees in parks and other public lands, and trees on private property).

E-5 Programs to protect Goshen's urban forest

1. Protect, revitalize, and expand Goshen's urban forest through public education, regulation, and a long-term financial commitment.
2. Create staff to promote and maintain the urban forest.
3. Create incentives for expanding the urban forest.
4. Require new development with large impervious surfaces to create zones where plantings and soils help rainwater reach aquifer directly.

E-5 Implementation

1. Continue and expand support for the Goshen Street Tree Board.
2. Convert the current street tree inventory to a format that can be added to a GIS and Green Map.
3. Encourage new commercial, multiunit, and single family housing projects to identify and preserve beneficial large trees.
4. Encourage new commercial, multiunit, and single family housing projects to provide indigenous street trees and related irrigation systems, and practice water conservation techniques.
5. Encourage new parking lots to preserve healthy, beneficial trees if possible, and if not, to provide trees within lots.
6. Plant trees at critical entryway corridors, such as the Third Street overpass and US 33 railroad right of way, to create a natural welcome mat for commuters and visitors.
7. Develop a larger volunteer pool for the tree nursery and for promoting tree use in Goshen.
8. Provide ongoing education for City staff, homeowners, and developers regarding landscaping and irrigation practices that protect the urban forest.
9. Identify, preserve, and protect trees with significant historic or aesthetic value on public and private property.
10. Expand existing City tree nurseries.
11. Continue the City program that pays for half the cost of new street trees.
12. Initiate a twice-a-year tree-planting campaign, and celebrate Arbor Day.
13. Continue to meet designation as a 'Tree City USA'.

E-6 Goal

Pursue energy conservation/renewable energy sources.

E-6 Programs for energy conservation

1. Maintain Goshen's long-term supply of electricity and natural gas while addressing environmental and economic concerns.
2. Optimize energy conservation and efficiency in new and existing residences, businesses, and industries in Goshen.
3. Invest in alternative energy sources for City use.
4. Encourage the appropriate use of alternative energy technologies.

E-6 Implement energy conservation

1. Explore feasibility for Goshen as an energy utility (perhaps the Millrace?)
2. Develop “energy credits” or other incentives, especially in low-income rehabilitation and construction.
3. Explore incentives for use and development of alternative energy.
4. Encourage RV industries to explore fuel cell or other alternative energy sources.
5. Explore the use of hybrid or natural gas vehicles in the city fleet.
6. Pursue the use of electric or alternative energy for public transportation.

E-7 Goal

Protect the community's health.

E-7 Programs to protect community health

1. Reduce toxins in the community.
2. Continue and expand community efforts to protect groundwater through proper wastewater treatment, Combined Sewer Overflow separations, stormwater management programs, etc. (See Utilities chapter.)
3. Use Centers for Disease Control recommendations to address sprawl-induced health risk factors.
4. Gather information about environment-related illness in Goshen.

E-7 Implementation

1. Work with IDEM to identify and correct sources of air and water pollution.
2. Plan development that improves safety, active lifestyles, and quality of life.
3. Create a mechanism for receiving ongoing reports from the hospital.

E-8 Goal

Use “best practices” approaches to solid waste disposal.

E-8 Programs for best practices

1. Reduce the amount of solid waste generated (“source reduction”) and promote the cost-effective reuse of materials that would otherwise be placed in a landfill.
2. Reduce solid waste generation through salvage and reuse of building materials, including architecturally and historically significant materials, when building codes permit.
3. Encourage the use of reusable, returnable, recyclable, and repairable goods through incentives, educational activities, and city purchasing practices.
4. Promote in-house source reduction programs for city departments.
5. Develop incentives for commercial source reduction, reuse, and recycling.
6. Develop educational programs for residents.
7. Develop educational programs and technical assistance for businesses.
8. Create or participate in a materials salvage, reuse, and exchange program.
9. Expand and promote composting and yard waste recycling programs.

10. Minimize the use of toxic and hazardous materials; encourage the use of alternative materials and practices that are environmentally benign. Support state and federal legislation encouraging the use of recyclable goods. Ensure the environmentally sound disposal of solid waste.
11. Continue working with appropriate agencies to clean up hazardous waste sites and contaminated groundwater.

E-8 Implementing best practices

1. Develop a source reduction program based on the model provided by the National Recycling Coalition.
2. Develop a Green Smart program to guide industry in maximizing efficiency and reducing waste based on the Hood River model.
3. Develop an 'Environmentally Preferable Purchasing' program based on EPA's EPP Guidance Program.
4. Continue to evaluate community solid waste disposal strategies and incorporate them into the Utilities Management Plan. (See Utilities chapter.)

E-9 Goal Improve water quality.

E-9 Programs to improve water quality.

1. Protect groundwater from adverse impacts.
2. Maintain a reliable, long-term supply of clean water for Goshen. (See Utilities chapter.)
3. Promote conservation and efficient use of water in new and existing residences, businesses, and industries.
4. Reduce non-point source pollution in urban runoff from residential, commercial, industrial, municipal, and transportation land uses and activities (both storm and ground water.)
5. Examine the effect of animal waste as a significant source of non-point source water pollution in Goshen
6. Limit impervious surface area in new development and public improvement projects to reduce urban runoff into storm drains and waterways.
7. Promote citizen participation in Hoosier Riverwatch and similar programs.



E-9 Implementation

1. Meet or exceed state and federal standards for addressing runoff, storm-water and ground water.
2. Work with developers to promote awareness of key principles for erosion control and stormwater management.
3. Enforce requirements in site review process.
4. Partner with county/regional organizations and landowners working to reduce non-point source pollution from rural runoff (such as agriculture).
5. Consider runoff criteria in site review process.

E-10 Goal

Improve air quality

E-10 Programs for air quality

1. Support regional, state, and federal programs that improve air quality in Elkhart County.
2. Reduce the effect of auto emissions on air quality. Buffer or otherwise mitigate all potential sources of odor and/or toxic air contaminants to avoid odor and toxic impacts that violate relevant human health standards.
3. Reduce emissions from industry.

E-10 Implementation

1. Encourage developers of new projects, including city projects, to provide improvements that reduce the necessity of driving alone.
2. Promote alternatives to automobile use, such as public transportation, sidewalks, and bike paths.
3. Include these criteria in site review process.
4. Provide incentives to attract businesses and industries that do not create pollution.
5. Provide incentives to encourage existing businesses and industries that have high emissions of air pollutants to reduce their emissions.
6. Work with existing industries to reduce the emissions of these known or suspected carcinogens.

E-11 Goal

Decrease noise pollution.

E-11 Programs to decrease noise pollution

1. Evaluate the potential for noise pollution and reducing its impact when reviewing development and activities in Goshen and surrounding areas.
2. Protect the community and especially sensitive noise receptors, including schools, hospitals, and senior care facilities, from excessive noise.
3. Require proposals to reduce noise impacts on adjacent properties.

E-11 Implementation

1. Include noise criteria in site review process.
2. Construct noise walls when compatible with aesthetic concerns.
3. Screen and control noise sources such as parking, outdoor activities, mechanical equipment, and trains.
4. Increase setbacks for noise sources from adjacent dwellings.
5. Whenever possible, retain fences, walls, or landscaping that serve as noise buffers, although design, safety, and other impacts must be addressed.
6. Use soundproofing materials and double-glazed windows.
7. Control hours of noisy operations, including deliveries and trash pickup, to minimize noise impacts.
8. Train whistles: when possible, create noise barriers to buffer train noise.
9. Work with railway companies to safely reduce whistle noise.
10. Enforce noise ordinances.

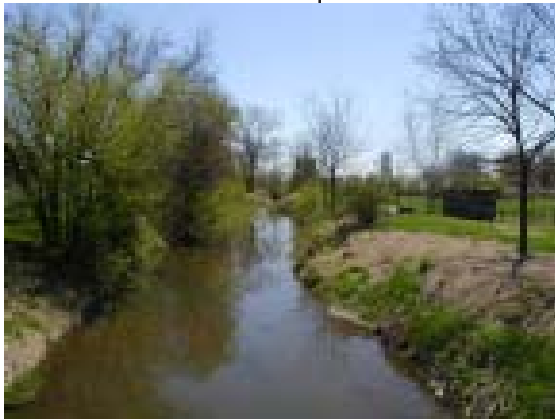
E-12 Goal Decrease light pollution

E-12 Programs to decrease light pollution

1. Promote the use of technology that minimizes waste in lighting for billboards, parking lots, and other existing sources of light pollution.
2. Require new development to minimize light pollution.

E-12 Implementation

1. Develop lighting design guidelines for redevelopment and new development.
2. Develop light pollution-related ordinances.



The St. Joseph River Valley

Goshen falls into the watershed of Rock Run Creek, Turkey Creek, the Elkhart River, and the St. Joseph River. Rock Run Creek meets with the Elkhart River on the north side of Goshen while the Turkey Creek confluence is just to the south. The Elkhart River then flows generally northwest to its confluence with the St. Joseph River in Elkhart.

The St. Joseph River basin is characterized by complex topographic features that include moraines having rugged topography and relatively level till plains interspersed among braided meltwater (outwash) channels and hummocky ridges. This terrain includes small enclosed basins occupied by lakes or marshes, as well as broad pitted outwash fans.

Soils in the basin generally fall into one of three categories: sandy or loamy soils developed on outwash and alluvium; silty or clayey soils developed on till; and muck soils developed in depressional wetland areas.

The climate of the St. Joseph River basin, classified as temperate continental, is characterized by warm, occasionally hot summers, cold winters, and considerable daily variations in temperatures.

Other climatic characteristics of the basin include moderate to high humidities, light to moderate winds (typically from the southwest), and a large proportion of partly cloudy to cloudy days interspersed with clear days.

Annual temperatures within the St. Joseph basin average 49 degrees year-round, 48 degrees in the spring, 70 degrees in the summer, 52 degrees in the autumn, and 26 degrees in the winter. January is the coldest month and July is the warmest.

The mean growing season is around 155 days and the climate of the western part of the basin is influenced by Lake Michigan with higher temperatures in the winter and higher precipitation. Annual precipitation for the basin averages 35 inches.

The surface-water system of the St. Joseph River basin is characterized by more than 200 natural lakes, approximately 27,000 wetlands, and low-gradient streams developed on outwash and till deposits. The chief tributary of the St. Joseph River is the Elkhart River, which drains 699 square miles, mostly in Elkhart County. Turkey Creek, which enters the Elkhart River just south of Goshen, drains an additional 183 square miles.

Goshen Parks and Recreation

Some background on this department:

- Park programs began in the early fifties with a summer playground program for children.
- The Park Board was founded in 1957.
- Schrock Pavilion and Shanklin Pool were constructed in 1968-69.
- Its first Superintendent was hired in 1973.
- Today its 13 parks, and a total of over 250 acres, are the setting for more than 85 programs and activities annually.



Goshen Parks and Recreation Master Plan process

The Goshen Park Department's 2004 Master Plan followed these steps:

- Staff and community input meetings (focus groups with identified populations).
- Assessment of existing park facilities and creation of an Inventory Matrix (required element of the plan by Department of Natural Resources.) Assessment based on population projections and include acreage and facilities.
- Develop action plans identified by focus groups, standards, or strategic planning.
- Prioritize action plans based on urgency and need.
- Identify funding sources.
- Submit all required state forms.
- Develop an American Disabilities Act (ADA) checklist for agency compliance (not required by the State.)

The document was prepared by Lehman and Lehman, Inc., a landscape architecture and planning firm out of Mishawaka, Ind, and is available via the Parks Department tab on the City's home page (<http://www.ci.goshen.in.us/>).

Local/Regional Environmental Programs and Resources

1. Elkhart County Department of Environmental Health reports:
 - Carcinogens come from personal vehicles, industries, municipal wastewater treatment.
 - State and Federal statutes have daily and annual standards for the release of toxic elements in water.
 - Indiana is one of six states with a reputation for poor record-keeping on toxins and related diseases.
 - 35% of homes tested in Elkhart County were positive for a toxic level of radon (naturally occurring).
2. Community Health Nursing, Elkhart County Health Dept.
3. Indiana University Center for Population Health.
4. Great Lakes Commission, Office of Air Management.
5. Indiana Department of Environmental Management (IDEM) ToxWatch reports:
 - Congress has identified 188 hazardous air pollutants known to cause serious health problems; there are no EPA standards for 182 of them.
 - The identified pollutants have been linked to cancer, respiratory, cardiovascular and developmental effects, reproductive dysfunction, neurological disorders, heritable gene mutations and other serious or irreversible chronic or acute problems.

(IDEM is responsible for tracking ozone.)
6. *State of the Environment* Report (IDEM). Using EPA's Cumulative Exposure Project Benchmarks, a hazard value has been calculated for six monitored pollutants. These include:
 - Carbon monoxide
 - Nitrogen dioxide
 - Ozone
 - Lead
 - Particulate matter
 - Sulfur dioxide

Counties in Indiana are categorized as 'attainment,' 'non-attainment,' or 'maintenance.' Elkhart County is 'non-attainment' in 2003-4.

7. IDEM Children's Environmental Health Initiatives - These include:
 - Asthma Initiative
 - Healthy Homes Initiative
 - Integrated Pest Management
 - Lead Initiative
 - "Tools for Schools" Initiative
 - Toxic Reduction Challenge
 - Simple Steps Initiative
 - Environmental Recognition for Childcare Facilities
 - Five Star Recognition for Childcare Facilities
 - Training videos, posters, brochures, fact sheets, and teachers curriculums on reducing exposure and education families.

8. Environmental Protection Agency (EPA) Integrated Risk Information System is an electronic information base on human health effects that may result from exposure to various environmental chemicals. Information is used in risk assessment, decision-making and regulatory activities.

9. **scorecard.org** –

- Provides information on levels of specific chemicals released by certain industries by county and by city.
- Ranks counties in the U.S. for dirtiest/cleanest in air and water.
- Identifies what is known and not known about chemical safety.
- Provides some information on the effect of chemicals on human health.

Air Pollution in Elkhart County: Ozone and Fine Particles

From IDEM Office of Air Quality 2004 Overview of the Eight-Hour OZONE STANDARD Elkhart/South Bend Metropolitan Statistical Area

Background

- The 8 Hour Ozone National Ambient Air Quality Standard, a health-based standard for ground-level ozone, was established in 1997.
- The standard was challenged legally and upheld by the U.S. Supreme Court in February 2001.
- U.S. EPA designated areas that attain or do not attain the standard on April 15, 2004.

U.S. EPA Designations for the Elkhart/South Bend MSA, a *nonattainment* area that includes St. Joseph and *Elkhart* counties.

Ground level ozone standard

- The 8-hour ozone standard is defined at 85 PPB (parts per billion) and is based on an average 4th-high 8-hour ozone value over a three year period.
- Counties with values exceeding this standard are considered to be in violation of the standard.

<u>County Location</u>	<u>2000-2002 Average</u>	<u>2001-2003 Average</u>
Bristol Elementary School	99	93

What does it mean to for an area to be in nonattainment?

- On some hot days air quality doesn't meet federal health standards.
- Indiana must develop a plan detailing steps necessary to comply with the standard by the attainment date.
- Stricter permitting of certain larger new and expanding industrial sources.
- Transportation activities must conform to the air quality goals established in the State's attainment plan.
- **New national and regional controls, including the nitrogen oxides control rule for power plants, new diesel engine standards and new diesel fuel standards, will aid Elkhart and St. Joseph counties to attain the standard possibly without any further local control measures.**

OZONE STATUS of Elkhart County



FINE PARTICLE STATUS of Elkhart County

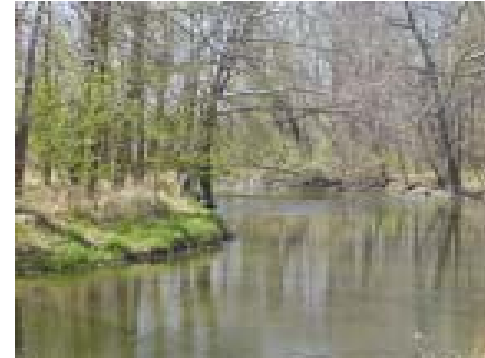
Schedule to meet 8-Hour Ozone Schedule (under the Clean Air Act)

- April, 2004: U.S. EPA makes final attainment and nonattainment designations
- April, 2004: U.S. EPA issues Final Implementation rule – Phase I
- June, 2004: Effective date of U.S. EPA designations
- Summer, 2004: U.S. EPA issues Final Implementation rule – Phase II
- Spring, 2007: Indiana's attainment plan due to U.S. EPA
- 2009: attainment deadline for Elkhart and St. Joseph counties

Where can I get more information?

Office of Air Quality 800-451-6027

**From IDEM Office of Air Quality -
Overview of the
Fine Particulate Matter (PM 2.5) Standard
Elkhart/South Bend Metropolitan
Statistical Area (North Central Indiana)**



Background

- The Fine Particulate Matter, or Fine Particles, National Ambient Air Quality Standard is a health-based standard established in 1997.
- Was challenged legally and upheld by the U.S. Supreme Court in 2001.
- U.S. EPA will make final designations of areas that attain and do not attain the standard by December 31, 2004.

Fine Particulate Matter Standard

There are two standards for fine particles. The annual standard is 15 micrograms per cubic meter (mg/m^3) and attainment is determined by taking the average of the monitor values over a three-year period. The daily standard is 65 micrograms per cubic meter (mg/m^3) and attainment is determined by taking the 98th percentile of the monitor values over a three-year period. Due to rounding, values greater than 15.0 mg/m^3 for the annual standard and values greater than 65.0 mg/m^3 for the daily standard are considered to exceed the standard. In Indiana, no monitor exceeds the daily standard. In Northwest Indiana one out of the 9 monitors exceeds the annual standard:

Elkhart County Monitor(s)	2001-2003 Annual Value
Pierre Moran School (Elkhart)	15.2 (Above Annual Standards)

Schedule to meet Particulate Matter Standard (Under the Clean Air Act)

- Feb. 2004: Indiana's attainment recommendations submitted to EPA
- June 2004: EPA proposes attainment and nonattainment designations
- Fall 2004: EPA issues proposed implementation rule
- Dec. 2004: U.S. EPA issues final nonattainment designations
- Early 2005: Effective date of designations
- Early 2005 EPA publishes final implementation rule
- Early 2008: Indiana Nonattainment Area Implementation Plan due to EPA
- Early 2010: Deadline for the area to comply with the standard

IDEM's Designation Recommendation for Northwest Indiana

On February 15, 2004, Indiana recommended Elkhart County to be the only nonattainment county within the South Bend/Elkhart (North Central) Metropolitan Area. This recommendation was based on the fact that the monitor in Elkhart County shows a violation of the annual standard while the monitors in St. Joseph County have an annual value below the standard.

What does it mean to be nonattainment?

- On certain days of the year air quality will be unhealthy for sensitive groups. People with heart or lung disease, older adults, and children should reduce prolonged or heavy exertion outdoors.
- Indiana must develop a plan detailing the steps necessary to comply with the standard by the attainment date.
- Stricter permitting requirements for new and expanding industrial sources that emit a certain amount of fine particles or pollutants that cause fine particles.
- Transportation planning activities must conform to the air quality goals established in the State Implementation Plan.

What will EPA consider in proposing designations?

- Fine particulate matter monitoring data
- Metropolitan Statistical Area (MSA) as presumptive boundary
- Emissions of fine particles and pollutants that cause fine particles in the metropolitan area
- Consistency with 8 hour ozone nonattainment boundaries
- Transportation statistics and commute patterns
- Regional employment characteristics
- Meteorological trend information (such as wind patterns)
- Expected population and commercial growth patterns

Where do I get more information?

- <http://www.state.in.us/idem/air/pm25standard/elkhartoverview.html>
- questions and comments can be shared through the on-line forum.
- contact the Office of Air Quality (800) 451-6027.



Survey of Goshen's Environmental Resources: A Model

1. Define boundaries of area of study: map out "greater Goshen"...
 - Boundaries should be west of ("new") CR 17, south of potential CR 142, east of any potential east bypass.
 - County is creating urban fringe/utility expansion areas +/- 2 miles depending on growth projections; this could be our map.
 - Take a watershed approach.
2. Create grid on aerial photo (decide size of grid quadrants).
3. Identify natural areas in grid quadrants for "ground-truthing", and pick strategic areas to make the most of our efforts.
4. Find out if there are studies on the identified sites.
5. Select three survey dates and plan a tiered approach to conduct the surveys. Lacking existing information on identified sites, volunteers will collect the following information:
 - Vegetation type: wetland (and type), forest, field, prairie.
 - Species of note and/or dominant species (could sample ecologically depending on level of detail we want, background of crew, or if we want to give students experience)
 - Rare or endangered species
 - Invasive species
 - Evidence of wildlife: birds, mammals, reptiles, amphibians
 - Historic notes (evidence of human use, e.g. old field, early successional forest, impoundment or old structure)
 - Waste, hazardous or other
 - Potential redevelopment site/vacant lot
6. On the first date, begin with 1 or 2 teams, which would have at least one person who is able to identify plants reliably, and at least one person who is able to identify birds and mammals. Several additional members participate in each team as "apprentices".
7. On the second date, apprentices from the first survey date may be able to work independently, especially if the areas they are assigned to survey are similar to areas they surveyed previously (i.e. if they apprenticed in forest, don't send them off into a wetland). Additional apprentices could work with the original teams, and (potentially) with the first survey apprentices.
8. By a third survey date (if such should be needed), have from 5 -8 teams capable of sampling areas with relative consistency.
9. If volunteers are willing, recommend that these surveys take place several times throughout the year at each site.



*Pumpkinvine Nature Trail,
Goshen*

What Is A Green Map?

The Green Map is a tool for local communities to identify ecological and cultural resources. It can be used for planning, public information, or tourism, depending on the goals of the community. Initiated in New York City in 1995, Green Maps have since been compiled and published for over 75 communities worldwide, with many other communities in the process of making Green Maps. Cities from Boston to Buenos Aires have created Green Maps, as well as small towns, counties, and even neighborhoods like Chicago's Greenside Neighborhood. Green Map System, Inc., suggests that "while the ecological problems facing our planet today are too overwhelming for most people, the condition of our cities and towns are more readily understandable and changeable."

Each Green Map is tailored to the local community and can include those features that local residents deem important. These could include:

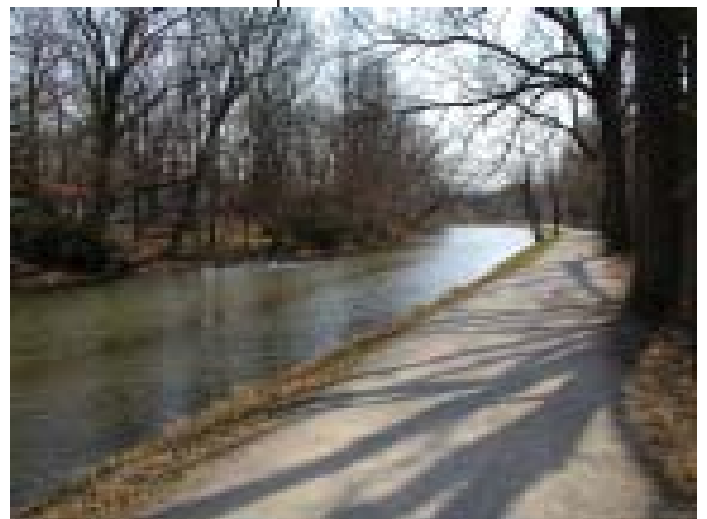
- parks, gardens, wildlife habitat, and places of natural beauty
- pedestrian zones, bike trails, and bus routes
- farmers markets and sustainable economic development
- cultural and historical resources
- environmentally sound architecture and design
- innovative redevelopment sites
- renewable energy sources
- water, power, and waste infrastructure
- toxic hot spots and pollution sources

Ideally, Green Maps are created through a partnership between government organizations, schools, and private environmental organizations. Registering with the Green Map System gives the partnering agencies access to map icons, help with the mapping process, design assistance, fundraising and outreach ideas, and other support. The final product can be:

- a printed map
- an interactive web map linked to the Green Map System website
- a CD-rom
- a map with guide book geared toward visitors to Goshen
- large poster-sized maps for educational purposes
- an updatable Geographic Information System (GIS) database

A Green Map would be a way for Goshen residents to understand and take an interest in the natural and cultural resources of their own city.

More information and examples of Green Maps can be found at www.greenmap.org.



ENVIRONMENT

IMPLEMENTATION STRATEGIES

proposed for the Goshen Comprehensive Plan 2004-2013

The implementation strategies identified earlier in this chapter are summarized here. Each strategy is listed under the numbered goal (E1, for instance) **and is evaluated for the following features (column heads):**

Funding – \$ symbols are used to indicate comparative values. A zero indicates that the strategy would fall under the responsibilities of existing City staff or is at least in part already incorporated into the budget of the lead agency. A single \$ symbol indicates that the strategy would probably cost less than \$10,000 and could be incorporated into operating budgets for lead agencies. A \$\$ symbol indicates the strategy might cost as much as \$50,000 (this includes new staff positions) but would probably be considered an operating budget item. \$\$\$ symbol indicates that the project might require capital expenditure and, in some cases (new water tower, water treatment facility upgrades) cost in excess of a million dollars. The symbols do not necessarily indicate that the City would be responsible for the costs. In many cases, state or federal funding or grant funding would be used to cover at least a portion of the expense. And as these are suggested initiatives to implement goals that may or may not be attainable, no commitment by the City or anyone else has been made toward this end, nor is one implied.

Lead Agency – This column identifies who in the community is or might be involved in providing leadership for implementing the strategy. In some cases, the lead agency is a city department. In some, City government would be the responsible party. In other cases, a community group or local agency might provide the lead for the strategy.

Partners – Listed in this column are potential partnerships that may facilitate the implementation of the strategy. The list is not designed to be all-inclusive nor is implementation dependent on the involvement of all organizations listed.

City Department – This column identifies the City department (or office) under which responsibility for the implementation strategy is most likely to fall.

New/Expanded Program – This column addresses whether the implementation strategy has been addressed in any form either at the city level or in the community. A strategy is listed as "new" if it shifts attention from existing strategies.

Ordinance Change – Each strategy is evaluated for whether it requires an ordinance change. In some cases (listed as "possibly,") ordinance requirements would be dependent on the direction that implementation takes or on the priority it receives.

Further Resources – This column refers to the need for informational resources. A strategy was listed as "no" if it was understood that all information necessary for implementation is presently available to the lead agency. The strategy is listed as "yes" if more information would be needed to implement the strategy.

Defined duration, or ongoing – A determination was made for how long it might take to implement the listed strategy. "Short" indicated that implementation could be initiated fairly immediately (within the next one to two years.) "Medium" indicated that the strategy could take from two to five years, based on a need for further information, lower priority, or hurdles to overcome in initiation. "Long" indicated that the strategy could take over five years to initiate. The terms did not indicate how long it would take to implement the strategy but were based on estimates for initiation. "Ongoing" was indicated when the strategy would continue over time once initiated.

p. 2 of Implementation Strategy <i>(Full text is earlier in this chapter.)</i>	Funds	Lead agency	Partners	City Dept (s)	New or expanded program	Change to ordinances?	More resources?	How long, or ongoing
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E1. Preserve and enhance community natural habitat and resources

1. Identify “critical areas” on city zoning maps	0	Environment al advisory council	Volunteers, community groups, Goshen College, EAC, City	Planning	New	Possibly	Yes	Short
2. Create zoning overlays that direct development to preferred areas	0	Planning	City, developers, community groups	Planning	New	Yes	Yes	Medium
3. Amend ordinances to require consideration of ecological impacts in site plans.	0	Planning	Planning, EAC, Parks, community groups	Planning, Parks, Engineering	New	Yes	Yes	Short
4. Amend ordinances for bike paths, parks, and open space in new development.	0	Planning	City	Planning, Parks Engineering	New	Yes	Yes	Short
5. Preserve and restore the habitat value of river/creek corridors...	0	Planning	City, schools, Parks, EnviroCorp, Soil and Water Conservation, community groups, conservation organizations	Planning, Engineering, Parks	New	No	Yes	Long, ongoing
6. Use school classes etc.	0	Planning, Parks	Planning, Parks, education community, City, state, conservation orgs	Parks	New	No	Yes	Ongoing
7. Use site plan review to ... preserve natural environment.	0	Planning	City	Planning, Engineering,	New	Possibly	Yes	Short, ongoing
8. Use GIS mapping, “Green Map” development (P. 16 of this chapter) ...	\$\$	Engineering	City, County, EAC	Planning, Engineering,	New	No	Yes	Medium
9. Create Green Map to promote community features	\$\$.	Engineering	City, County, EAC	Planning, Engineering,	New	No	Yes	Medium

p. 3 of Implementation Strategy <i>(Full text is earlier in this chapter.)</i>	Funds	Lead agency	Partners	City Dept (s)	New or expanded program	Change to ordinances?	More resources?	How long, or ongoing
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10. ... develop “Environmental Assets Identity”....	0	Planning, Utilities	Chamber, ECCVB, others	Utilities	New	No	Yes	Short
11. Partner with other agencies to develop restoration projects.	0	Planning	Other agencies, Redevelopment Commission, Historical Society	Planning, Parks Engineering	New	No	Yes	Ongoing
12. Develop list of native plants.	\$	Environmental advisory council	Environmental advisory council, conservation agencies, state	Parks	New	No	Yes	Short
13. Provide educational services to residents and agencies.	\$	EAC	EAC, conservation agencies, state	Parks	New	No	Yes	Short
14. Sponsor events and activities that promote native plantings.	\$	Parks	EAC, city, county, state, conservation agencies	Parks	New	No	Yes	Short

E2. Maintain and increase open space and parks

1. Use incentives to increase natural value of land adjacent to the river	\$	Building	City, property owners, Planning, Engineering,	Planning and Engineering	New	No	Yes	Short
2. Identify grants for river clean-up and natural landscaping.	\$	EAC	EAC, City, grantmakers	Planning, Parks Engineering	New	No	Yes	Medium
3. Promote low-impact recreational use.	0	Parks	City	Parks	Expanded	No	Yes	Short
4. Support efforts to preserve Elkhart River...	\$\$	EAC	City, County, land trusts, conservation organizations, EAC	Planning, Parks, Engineering	New	No	Yes	Medium
5. Purchase land or development rights along the river system.	\$\$\$	Planning	City, County, State, land trusts, conservation organizations, EAC	Planning, Parks Engineering, Legal	New	Possibly	Yes	Long
6. Plan riverfront	0	Planning	City, developers, community groups	Planning, Parks,	New	Pos-	Yes	short

p. 4 of Implementation Strategy <i>(Full text is earlier in this chapter.)</i>	Funds	Lead agency	Partners	City Dept (s)	New or expanded program	Change to ordinances?	More resources?	How long, or ongoing
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development to respect and enhance waterways...				Engineering		sibly		
7. Support ecological, values in the Park Department Master Plan.	0	Parks	City, community groups,	Parks	Expanded	No	No	Short
8. Encourage open space...	0	Parks	Parks, realtors, developers, City, Plan Commission, Redevelopment Commission	Parks	New	Possibly	Possibly	Ongoing
9. Identify open space locations	0	Planning	EAC, Redevelopment Commission, City	Parks, Planning Engineering	Expanded	No	Yes	medium
10. Use ‘Transfer of Dev. Rights’ and other tools...	\$\$\$	Land trust	City, land trust, conservation organizations, EAC	Planning, Legal	New	Possibly	Yes	Long
11. Amend ordinances for green space....	0	Planning	City, developers	Planning, Parks	New	Yes	Yes	Short
12. Zone for “village style” development that includes ecological...	0	Planning	City, developers	Planning, Parks, Engineering	New	Possibly	No	Short

E3 Evaluate and conserve threatened and endangered species and ecosystems

1. Conduct environmental inventory	0	EAC	EAC, community groups, Goshen College, schools	Planning Parks	New	No	Yes	Medium
2. Include data in GIS...	\$	Engineering	City	Engineering, Planning, Parks	New	No	Yes	Medium
3. Develop zoning overlays...	0	Planning	City	Planning	New	Yes	Yes	Medium

No implementation strategies for E4

E5 Create staff and incentives to maintain and enhance the “urban forest”

1. Continue and expand support for the Goshen Street Tree Board	0	Mayor	City	Mayor	Expanded	No	No	Ongoing
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p. 5 of Implementation Strategy <i>(Full text is earlier in this chapter.)</i>	Funds	Lead agency	Partners	City Dept (s)	New or expanded program	Change to ordinances?	More resources?	How long, or ongoing
2. Convert the street tree inventory to GIS and Green Map.	\$	Engineering	Tree Board, EAC, community groups, Engineering	Engineering, Mayor	New	No	Yes	Medium
3. Require housing projects to identify and preserve beneficial trees	0	Planning	City, developers	Planning	New	Possibly	No	Short, ongoing
4. Require...indigenous street trees...	0	Planning	City, developers	Planning	New	Possibly	No	Short, ongoing
5. Require new parking lots to preserve trees if possible	0	Planning	City, developers	Planning	New	Possibly	No	Short, ongoing
6. Plant trees at critical entryways	\$\$	Mayor	City, community groups, neighborhoods	Parks Engineering, Mayor, Planning	New	No	Yes	Short, ongoing
7. Develop volunteers for tree nursery	0	Street Tree Board	City, neighborhoods, community groups, schools, agencies	Parks	Expanded	No	No	Short
8. Provide education... landscaping for urban forest	\$	Mayor	City, community groups, neighborhoods,	Planning, Parks, Engineering, Mayor	New	No	Yes	Short, ongoing
9. Protect historic, aesthetic trees....	\$	Tree Board, City	Community input, City, neighborhoods	Mayor, Planning, Engineering, Parks	New	No	Yes	Medium, ongoing
10. Expand City nurseries	\$	Parks	City	Parks	Expanded	No	No	Medium, ongoing
11. Continue street tree subsidy	\$\$	Parks	City	Parks	Expanded	No	No	Ongoing
12. Initiate tree planting campaign and Arbor Day	\$	EAC	City, EAC, neighborhoods	Parks	New	No	No	Medium ongoing
13 Meet designation as Tree City USA	0	City	City, Tree Board	Tree Board	New	No	No	Ongoing

p. 6 of Implementation Strategy <i>(Full text is earlier in this chapter.)</i>	Funds	Lead agency	Partners	City Dept (s)	New or expanded program	Change to ordinances?	More resources?	How long, or ongoing
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E6 Pursue energy conservation/renewable energy sources

1. Explore the feasibility of Goshen as an energy utility.	\$\$\$ (initially; less over time)	Utilities	City, grants, non-profits	Utilities and Engineering	New	Possibly	Yes	Ongoing
2. Energy credits...	\$	Utilities	City, grants, non-profits, neighborhoods, agencies, community groups	Building, housing, Engineering	New	Possibly	Yes	Ongoing
3. Explore incentives for ...alternative energy...	\$	Buildings	City, grants, neighborhoods, agencies, community groups	Building, housing, Engin'g	New	No	Yes	Long
4. Encourage RV industries to explore alternative energy sources.	0	EAC	City, business and industry, Chamber, grants	Engineering	New	No	Yes	Ongoing
5. Explore hybrid or natural gas vehicles in the City fleet.	\$\$	EAC	City, grants	Mayor, Engineering	New	No	Yes	Medium, ongoing
6. Pursue alternative energy for public transportation.	\$\$	MACOG	City, County, MACOG, state, fed gov; grants	Mayor, Engineering	New	No	Yes	Medium

E7 Protect the community's health

1. Work with IDEM on air and water pollution.	0	IDEM	City, state and fed gov; grants, industry, community groups	Legal	Expanded	No	Yes	Long
2. Plan development that improves... quality of life	0	EAC	City, state and fed gov; agencies and community groups	All	New	Possibly	Yes	Medium Ongoing
3. Create a mechanism for receiving reports from the hospital.	0	EAC	City, healthcare providers, community groups	Mayor	New	No	Yes	Ongoing

p. 7 of Implementation Strategy <i>(Full text is earlier in this chapter.)</i>	Funds	Lead agency	Partners	City Dept (s)	New or expanded program	Change to ordinances?	More resources?	How long, or ongoing
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E8 Use “best practices” in solid waste disposal

1. Develop a source reduction program	0	Mayor	City, community groups, national programs	Mayor	New	No	No	Long, ongoing
2. Develop a Green Smart program	0	Mayor	City, community groups, national programs	Mayor, Engineering	New	No	No	Short, ongoing
3. Develop an ‘Environmentally Preferable Purchasing’ program	0	Mayor	City, fed gov, community groups	Mayor, Engineering	New	No	No	short
4. Evaluate solid waste disposal strategies...	0	Utilities	City, County, State	Mayor, Utilities Engineering	Expanded	No	Yes	Short

E9 Improve water quality

1. Meet or exceed standards for runoff.	0	Planning	City, State, MACOG, developers	Planning, Engineering	Expanded	No	No	Short
2. Work with developers (on) erosion control and storm water management.	0	Utilities	City, State, MACOG, developers	Planning, Engineering, Utilities	Expanded	No	No	Ongoing
3. Enforce requirements in site review process.	0	Planning	City	Planning	Expanded	Possibly	No	Short, ongoing
4. Partner to reduce non-point source pollution from rural runoff.	0	EAC	City, County, State, Conservation organizations, landowners	Planning, Engineering, Utilities	Expanded	No	Yes	Short, ongoing
5. Consider runoff criteria in site review process.	0	Planning	City	Planning Engineering	New	No	No	Ongoing Medium

p. 8 of Implementation Strategy <i>(Full text is earlier in this chapter.)</i>	Funds	Lead agency	Partners	City Dept (s)	New or expanded program	Change to ordinances?	More resources?	How long, or ongoing
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E10 Improve air quality

1. Encourage ... new projects, ...to reduce necessity of driving alone.	0	Planning	City, developers, community groups	Engineering	New	No	No	Medium, ongoing
2. Promote alternatives to automobile use	0	Planning	City, County, MACOG, neighborhoods	Engineering, Parks, Planning	Expanded	No	No	Short, ongoing
3. Include (odor, toxic release) in site review	0	Planning	City, State	Engineering, Utilities, Planning	New	No	No	Medium, ongoing
4. Provide incentives to attract business/industry that don't create air pollution.	0	Chamber	City, Chamber, community groups	Mayor	New	No	No	Medium ongoing
5. Provide incentives to reduce ...emissions.	0	Chamber	City, Chamber, Community groups, IDEM	Mayor, engineering	New	No	Yes	Medium, ongoing
6. Work with existing industries to reduce emissions...	0	EAC	City, Chamber, State/Fed gov's, community groups, industry	Mayor, engineering	New	No	Yes	Long, ongoing

E11 Decrease noise pollution

1. Include noise criteria in site review process.	0	Planning	City, community groups	Planning	Expanded	No	No	Long, ongoing
2. Construct noise walls when compatible with aesthetic concerns.	0	Planning	City, developers	Planning	Expanded	No	No	Long, ongoing
3. Screen and control noise sources...	0	Planning	City, developers, community groups	Planning	Expanded	No	No	short
4. Increase setbacks for noise sources from adjacent dwellings.	0	Building	City, developers, community groups	Planning	Expanded	Possibly	No	Short, ongoing

p. 9 of Implementation Strategy <i>(Full text is earlier in this chapter.)</i>	Funds	Lead agency	Partners	City Dept (s)	New or expanded program	Change to ordinances?	More resources?	How long, or ongoing
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5. ...retain fences, walls, or landscaping that serve as noise buffers,	0	Planning	City	Planning, Engineering	Expanded	No	No	Medium, ongoing
6. Use soundproofing materials and double-glazed windows.	0	Building	City, contractors, homeowners	Planning, Engineering	Expanded	No	No	Medium, ongoing
7. Control hours of operation	0	Mayor	City, Chamber, industry	Planning, Mayor, Engineering	New	Possibly	No	Medium, ongoing
8. Train whistles: noise barriers next to railroads to buffer train noise.	0	Mayor	City, RR companies	Mayor, Engineering	Expanded	No	No	Short, ongoing
9. Work with railway companies to reduce whistle noise	0	Mayor	City, RR companies	Mayor, Engineering	Expanded	Possibly	No	Short, ongoing
10. Enforce noise ordinances.	0	Legal	City	Mayor, Legal	Expanded	Tweek?	No	Long, ongoing

E12 Decrease light pollution

1. Develop lighting design guidelines	0	Planning	City	Planning	New	Possibly	Yes	Long
2. Develop light pollution ordinances	0	Planning	City	Planning, Engineering	New	Yes	Yes	Short, ongoing