



LAKE FOREST SUSTAINABILITY PLAN

JULY 2016

*Created by the City of Lake Forest with support from the
Lake Forest Collaborative for Environmental Leadership*



CONTENTS

INTRODUCTION	4
CREATING LAKE FOREST'S SUSTAINABILITY PLAN	6
STORMWATER MANAGEMENT & WATER USAGE	8
ECOSYSTEM VITALITY & RAVINE CONSERVATION	11
WASTE MANAGEMENT	13
ENERGY EFFICIENCY & RENEWABLE ENERGY	15
TRANSPORTATION & AIR QUALITY	17

SPECIAL THANKS TO THE RESIDENTS OF LAKE FOREST AND THE FOLLOWING ORGANIZATIONS FOR THEIR INPUT...

American Legion, McKinlock Post #264

City of Lake Forest

Deerpath Middle School

Dickinson Hall

Elawa Farm Foundation

Gorton Community Center

GreenMinds of Lake Forest and Lake Bluff

Lake County Sustainability Office

Lake Forest Academy

Lake Forest City Council

Lake Forest Civic Beautification Committee

Lake Forest College

Lake Forest Country Day School

Lake Forest Library

Lake Forest Open Lands Association

League of Women Voters LF/LB

School District 67

School District 115, Lake Forest High School

Village of Lake Bluff

Woodlands Academy



INTRODUCTION

The 2013-2018 Lake Forest Strategic Plan includes a goal to “develop a Lake Forest Sustainability Plan to identify priorities and guide future initiatives.” The Strategic Plan further recommends that the community take a “leadership role in modeling best practices in environmental sustainability” in



collaboration with educational institutions, property owners, neighboring communities, garden clubs, and land management associations¹. These recommendations reflect the intent of the City’s original 1861 motto “Love of Nature and Science”, the desire to protect Lake Forest’s unique ecosystems, and desire to nurture pride in the community’s conservation ethic for generations to come.

In 2015, the City requested the assistance of the Lake Forest Collaborative for Environmental Leadership (“LFCEL”) to develop the Sustainability Plan. With representatives from Lake Forest School Districts 67 and 115, Lake Forest Open Lands Association, Lake Forest College, and the City of Lake Forest, the LFCEL is a volunteer organization formed to educate and engage the community in environmental action and to promote sustainable practices within the City.

The mission of the LFCEL is to combine the collective resources of its member institutions to recognize and address existing issues while identifying new programs and approaches that encourage environmental awareness and action. LFCEL’s goals include protecting Lake Forest’s unique natural heritage; enhancing residents’ quality of life; making meaningful contributions to creating a healthier community and local ecosystems; and expanding the conservation ethic and residential pride.

The purpose of the Sustainability Plan (“Plan”) is to identify the issues and opportunities most relevant to Lake Forest and its natural resources, particularly land, water and air. Building on the City’s current successes and strengths, the Plan identifies specific actions City staff, residents, and businesses should consider when addressing the issues and opportunities.

CURRENT LAKE FOREST SUCCESSES

- Named a Tree City USA for 36 years
- Finalist for “Top Transit Suburb” with high walkability
- LEED Gold certification for new Municipal Services Building
- Purchased 100% renewable electricity for 2 years through municipal aggregation saving residents >\$4 million
- Replaced streetlights with LEDs
- 43% recycling rate in 2015

¹ http://www.cityoflakeforest.com/assets/1/7/SPS_Report_2012_final.pdf



As stated in the Strategic Plan, “we must strive to sustain our natural resources and environment for future generations by ensuring that policies, activities, and operations are environmentally-responsible, efficient, and fiscally-minded.” Lake Forest’s residents, businesses, and City staff can make significant contributions by following the recommendations of the Plan and by actively participating in its implementation.

Lake Forest has a natural beauty and unique local ecosystems that first attracted our forefathers and continue to attract people to the community today. While our natural landscapes are certainly beautiful and provide wonderfully unique recreational opportunities for residents, many also support a valuable and rare biodiversity that receives the highest level of recognition in our State. It is important to preserve this natural beauty for current residents and for future generations, ensuring the community remains a highly desirable place to live, work, and raise families.

CREATING LAKE FOREST'S SUSTAINABILITY PLAN

Lake Forest joins many other organizations in creating a Sustainability Plan, as the concept of sustainability has become a strategic priority for businesses and governments around the world in the last 5-10 years.

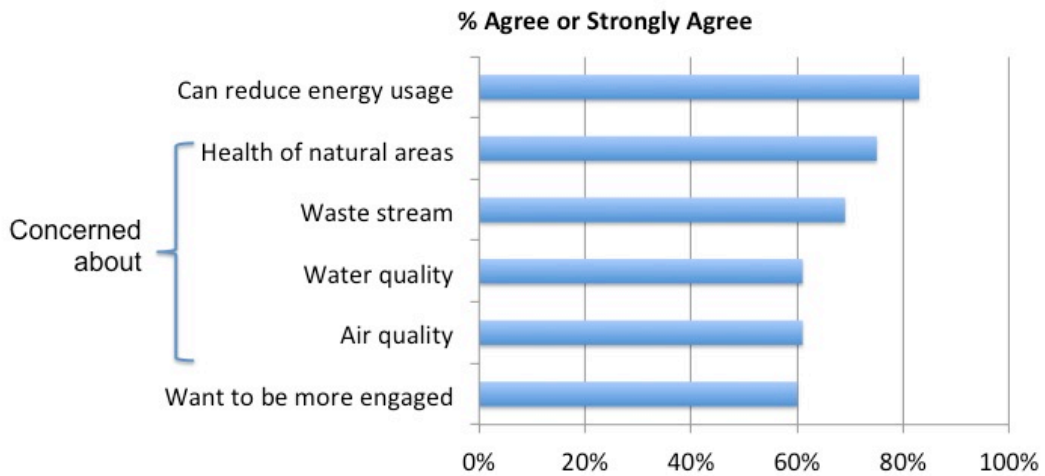
The City, together with the Lake Forest Collaborative for Environmental Leadership ("LFCEL"), began its plan development by reviewing Sustainability Plans from other Illinois communities and government organizations including the Chicago Metropolitan Agency for Planning, Lake County, City of Chicago, Highland Park, Northbrook, Evanston, Oak Park/River Forest, and Normal.

From this research, the LFCEL identified five categories and associated potential actions that are most relevant to Lake Forest, specifically:

- Stormwater Management and Water Use
- Ecosystem Vitality and Ravine Conservation
- Waste Management
- Renewable Energy and Energy Efficiency
- Transportation and Air Quality

Requesting Community input was a critical step in developing the plan. The City and LFCEL conducted an on-line survey in the summer of 2015, which included a series of questions and a request for action steps related to the five categories. Over 400 residents responded to the survey, and key results include:

- 80% of respondents agree or strongly agree that Lake Forest should create a Sustainability Plan.
- 82% of respondents agree or strongly agree with the statement "I have an opportunity to reduce energy usage in my home".
- More than 60% of respondents are concerned about the health of our natural areas, air and water quality, and Lake Forest's waste stream.
- 3 out of 5 respondents want to be more engaged in the City's sustainability efforts.
- Critical issues identified by respondents include pesticide use reduction, replanting trees in our community, preserving ravines, educating residents on the impact of non-biodegradable materials and toxins on our stormwater, polystyrene/Styrofoam elimination, bike friendly streets, and making homes more energy efficient.



2015 Lake Forest Sustainability Survey Results

To continue gathering resident input, the LFCEL hosted a Community Engagement Forum in October 2015, student forums at Lake Forest High School and Lake Forest College in February 2016, and a second Community Engagement Forum in April 2016. At each of these forums, participants shared ideas and voted on what they considered to be the highest priority and secondary priority actions in each of the five categories.

From an initial list of 66 potential actions, the participants identified 14 high priority and 12 secondary priority actions reflecting the consensus view from the various community forums.

STORMWATER MANAGEMENT & WATER USAGE

Lake Michigan and the Great Lakes are the world's largest source of fresh water with 20% of the earth's available supply. In addition to providing abundant recreational opportunities for residents, Lake Michigan is the source of Lake Forest's potable or drinking water.

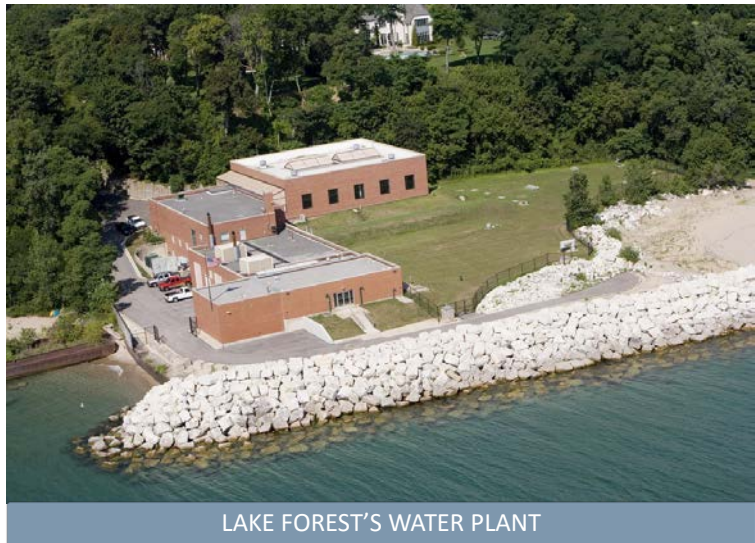
The City cleans and purifies its potable water at the Lake Forest water treatment plant, originally constructed by private residents in 1890 as the Lake Forest Water Company, and later purchased by the City in 1921. In 2004, the City converted from a sand filtration system to an ultrafiltration or membrane system, the first of its kind in Illinois. Two water intake pipes (one $\frac{3}{4}$ mile and the second $\frac{1}{2}$ mile into the lake) supply the treatment plant, which can process 12-14 million gallons of water per day.

In recent years, the water plant has nearly exceeded its capacity during the hot summer months when irrigation and lawn watering are at its peak. The City subsequently adopted watering restrictions from May 15 through September 15 to defer the need for costly upgrades to the plant and water system.

Lake Forest's wastewater – that is water flushed down the toilets, sinks and drains of City homes and businesses - flows through the City's sanitary sewer system to a large collector pipe under Highway 41 and to the North Shore Sanitary District plant on Clavey Road in Highland Park. At this plant, a series of processes separate the solid and liquid waste while cleaning and sanitizing the water to meet all applicable state and federal water standards. Ultimately, the treated wastewater empties into the Skokie River and lagoons just south of the Chicago Botanic Gardens, flowing to the Chicago River, connecting to the Illinois River, to the Mississippi River, and eventually to the Gulf of Mexico.

Lake Forest's stormwater system is completely separate from its wastewater sewer system, and two unique features distinguish stormwater flow in Lake Forest.

First, the sub-continental divide between the Great Lakes and Mississippi River watersheds bisects Lake Forest with Green Bay Road as the natural divider. This means that rainfall landing on the east side of Green Bay Road will, with assistance from the City's storm sewer system, naturally make its way to Lake Michigan. Rainfall on the west side of Green Bay Road will naturally flow through the storm sewer system to the Skokie River or the Middlefork of the North Branch of the Chicago River.





The thirteen miles of ravines in eastern Lake Forest, which serve as natural channels into Lake Michigan, are the second distinguishing feature of the City's stormwater flow. Most of the City's stormwater runoff east of Green Bay Road flows through the stormwater sewer system into the ravines before emptying into Lake Michigan.

Many of Lake Forest's buildings, streets, driveways, and parking lots are impermeable and stormwater washes over these surfaces collecting sediment, oil, chemical pollutants, and other dirt and debris. East of Green Bay Road, this polluted runoff flows directly through the ravines and directly into Lake Michigan, the source of Lake Forest's drinking water.

Increasing volumes of rain from severe storms, exacerbated by residents connecting their downspouts and draining their swimming pools directly into the storm sewer system, increase ravine and land erosion, degrade wildlife habitat, and degrade water quality.

Green infrastructure—such as trees, native plants, bioswales, rain gardens, rain barrels, permeable surfaces and green roofs— absorbs rainwater, reduces stormwater runoff, protects ravine stability and habitat health, and improves Lake Michigan water quality.

The following goals and actions reflect Lake Forest's priorities for conserving and protecting the unique water resources of our community. While Lake Michigan and the Great Lakes may currently offer an abundant supply of fresh water, we recognize that they are not infinite resources and, as a lakeshore community, must treat them responsibly. The goals and actions also reflect the importance of minimizing the downstream effects of what enters Lake Forest's wastewater and stormwater systems.

Goals

- Reduce the volume of stormwater entering the ravines, Skokie River, and Middlefork of the Chicago River North Branch using stormwater infrastructure best management practices
- Improve the quality of water entering Lake Michigan through the ravines
- Increase water conservation
- Educate residents on the importance of Lake Forest-specific water issues

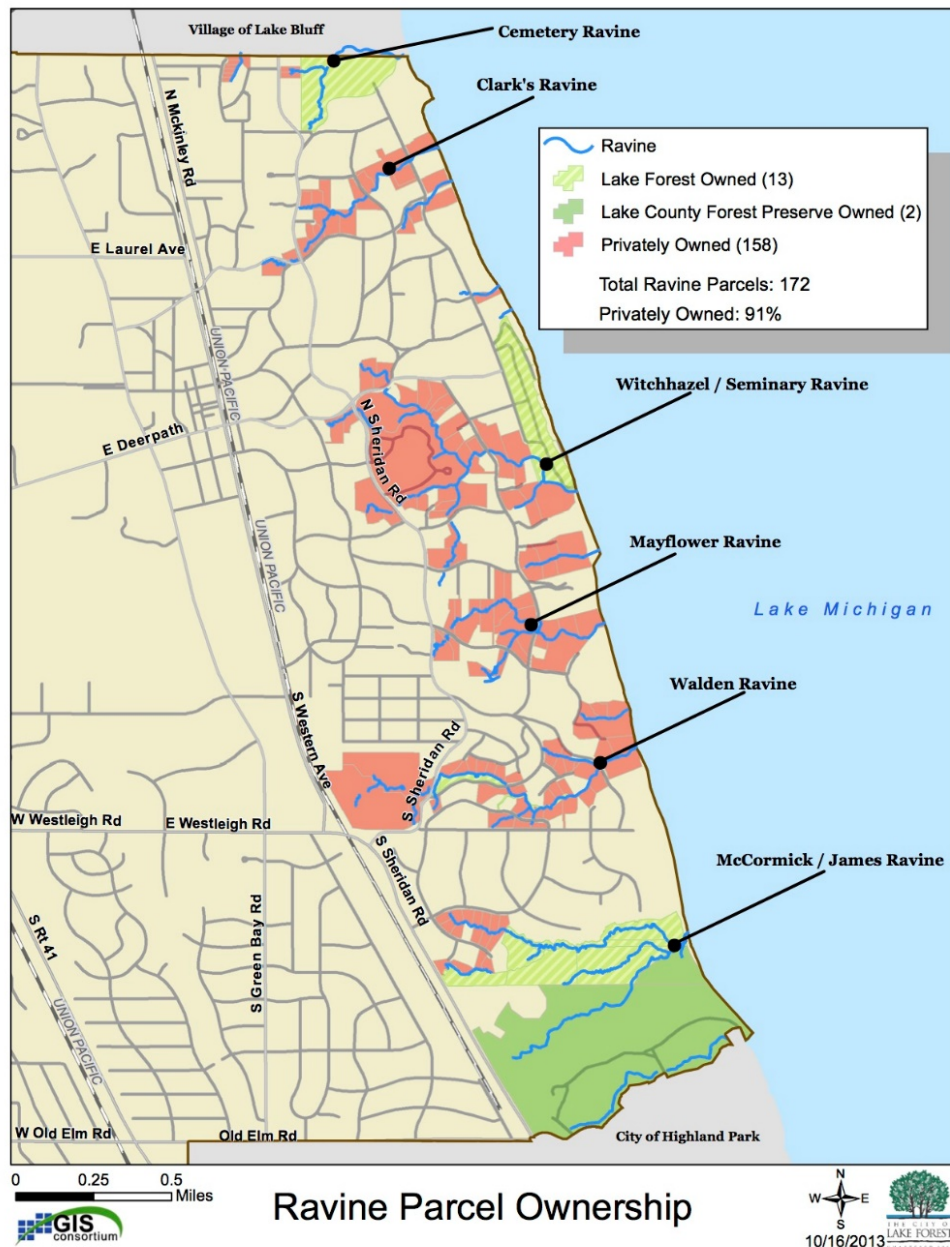
Measurements of Success

- Decreased water usage per household and business per year
- Increased number of households with downspout disconnection and/or rain barrels
- Increased square footage/number of bioswales and rain gardens
- Increased square footage of permeable surfaces
- Increased public awareness of water issues

ECOSYSTEM VITALITY & RAVINE CONSERVATION

Lake Forest has a natural beauty with abundant trees, wetlands, prairies, savannas, ravines, gardens, and parks. The City is home to 3.5 miles of lakefront, over 11 miles of bike trails, 446 acres of public parks, over 800 acres of protected open space, and 13 miles of nature preserve trails.

Lake Forest's thirteen miles of ravines, the majority of which are on private property, are a unique and beautiful natural landform that helps to define our City's character. The ravines function as natural drainage systems for stormwater runoff flowing towards Lake Michigan, habitat for many rare plants and animals, and as physical support for many homes.



Unfortunately, accelerated erosion is occurring along ravine slopes as a result of excessive stormwater runoff, residential and commercial development, and invasive species compromising the resilience of ravines to maintain their structure. The erosion from stormwater and private drainage results in slumping of ravine slopes, poor water quality, and destroyed natural habitat.

Residents can help conserve and protect our ravines by reducing the volume of water entering the City’s stormwater sewer system, limiting the watering of lawns, using organic fertilizers, planting native plants, minimizing land paving and irrigation, addressing direct drainage of pools and other stormwater, and by properly disposing of yard waste.

Lake Forest also faces a significant threat from the devastating Emerald Ash Borer, in addition to increasing threats to other tree species. Our community expects to lose over 100,000 ash trees in the next 5-10 years. Reforesting the community with diverse, native species for the future has become a critical priority for the City.

Finally, in recognition of the environmental and health benefits of locally grown food, the City has expanded its Open Air Market and increased the development of school and community gardens.

The following goals and actions reflect the City’s commitment to ecosystem vitality and preservation of our unique natural spaces.

Goals

- Preserve, protect, and when possible, expand open spaces and parks, particularly ravines
- Use sustainable land management practices throughout the community
- Increase native plantings
- Preserve existing trees and increase native tree canopy coverage, particularly oak varieties.



Measurements of Success

- Enacted Ravine Conservation/Steep Slope Ordinance, Pesticide Protocol, Landscaper Certification Program, and Noise Pollution Ordinance
- Increased linear feet of restored ravines
- Increased square footage of lawns converted to native plantings
- Increased number of school and community gardens

WASTE MANAGEMENT

Waste management includes the collection, transportation and disposal of garbage and other unwanted materials. Unless diverted through recycling, reuse, composting or other means, Lake Forest's waste ends up in a landfill where it is buried and left to decompose, a process that can take hundreds of years. Waste items made from plastic and polystyrene can take millions of years to decompose.



According to a 2014 Illinois Environmental Protection Agency report, the six active landfills serving the Chicago metropolitan region have only 13 years of capacity remaining at current disposal rates². Therefore, the continuation and expansion of recycling, composting, and hazardous and electronic waste management programs are critical to reduce the strain on existing facilities.

Lake County officials have recognized the need to significantly reduce the volume of material sent to landfills and established a goal of increasing the county-wide recycling rate to 60% by 2020.

A recent local survey reported that Lake Forest residents create 702 pounds of household waste per person annually, the second highest of seven North Shore communities analyzed³.

Lake Forest currently operates a comprehensive waste management program. City staff collects refuse from residents twice weekly and disposes it at the Advanced Disposal Services Landfill in Zion. Yard waste is also collected twice weekly, transported to Lake Forest's Compost and Recycling Center on Route 60 ("Recycling Center"), and composted on site. Recycled items are collected once per week, trucked to the Recycling Center and re-loaded into transfer trailers. The trailers are transported to the Resource Management facility in Chicago Ridge, where the material is separated and sold to other businesses worldwide.

The Recycling Center is open on weekends for residents to drop off refuse, yard waste, recyclables, metal, electronics, clothing, shoes and textiles. Residents can also pick up mulch, compost and wood chips at the center for free.

Lake Forest residents can drop off hazardous household waste - including household chemicals, oil-based paint, medications, and electronics - at the Solid Waste Agency of Lake County (SWALCO) permanent facility in Gurnee. SWALCO also holds a collection event at Lake Forest Municipal Services Building every September.

² <http://www.epa.illinois.gov/Assets/iepa/waste-management/landfills/landfill-capacity/landfill-capacity-report-2015.pdf>, p. 11

³ <http://jwcdaily.com/2015/05/07/garbage-in-garbage-out/>

The Lake Forest Police Department collects unwanted medications and prescription drugs at the Lake Forest Police Station in secure drop boxes seven days a week.

The Public Works Department provides residents with the opportunity to purchase compost containers (also termed earth machines) from the City at a below market rate. Sanitation employees deliver the compost containers to residents.

In addition to backyard composting, Lake Forest residents interested in composting food waste can have it picked up weekly or bi-weekly by Collective Resource, Inc., a food scrap pickup service based in Evanston. This company provides residents with a bucket to fill with food waste and leave at the door, reducing household garbage volume by at least 30%. Collected waste is delivered to a commercial composting site to become useful compost. Unlike backyard composting, Collective Resource has no dairy, meat, animal waste, or food-soiled paper restrictions.

The following goals and actions reflect Lake Forest's commitment to expand its existing waste management programs and to further reduce the volume of material sent to the landfill.

Goals

- Reduce the amount of landfilled waste
- Improve recycling rates and increase awareness of recycling and responsible disposal alternatives
- Increase composting
- Increase material reuse

Measurements of Success

- Recycling rate of 60% by 2020, consistent with the Lake County goal
- Increased residential and commercial composting
- Decreased use of plastic bags and polystyrene

ENERGY EFFICIENCY & RENEWABLE ENERGY

Energy is something taken for granted in our daily lives - we switch on the lights, turn on the stove, or watch television without even thinking about where the energy comes from to run them. Yet the negative air, water and climate impacts from conventional energy production are significant. Recent technology advances now provide opportunities to reduce the harmful impacts of conventional energy by decreasing our energy usage and increasing the amount of renewable energy we consume.

The primary forms of energy used in Lake Forest’s homes and businesses are electricity and natural gas. Electricity powers lighting, air conditioning, appliances, electronics, computers, and phones. Lake Forest’s electricity is currently supplied and delivered by Commonwealth Edison (“ComEd”) and usage is measured in kilowatt hours (kWh).

Natural gas is the primary fuel for furnaces or space heating in Lake Forest and is also commonly used for hot water heaters, clothes dryers, and cooking in the residential sector. Our natural gas is supplied and delivered by North Shore Gas, and usage is measured in therms.

A 2010 study by CNT Energy found that Lake Forest households use significantly more energy than the typical Lake County home, and our residents have some of the highest energy bills in the region. The average electricity usage per household in Lake Forest is 87% higher than a typical home in Lake County, and the average natural gas usage per household in Lake Forest is 120% higher than the County average. Factors that affect electricity usage include square footage; efficiency of air conditioning, lighting, appliances and electronics; and occupant behavior. Factors that affect natural gas usage include building size and age, building envelope efficiency, efficiency of the furnace and water heater, and occupant behavior.

	Lake Forest	Lake County
Average electricity usage per household (kWh)	21,571	11,524
Average natural gas usage per household (therms)	2,708	1,229

Source: CNT Energy 2010 Municipal Energy Profile Project

Lake Forest residents are aware of an energy and cost savings potential, as 82% of the 2015 Sustainability Survey respondents agreed or strongly agreed with the statement, “I have an opportunity to reduce my household’s energy consumption.”

ComEd began installing advanced digital “smart meters” in Lake Forest in 2016, which will create additional opportunities to obtain real-time energy usage information and more easily reduce household electricity consumption and peak demand.

ComEd's 2015 Environmental Disclosure Statement reveals that the fuel sources for electricity supplied to its customers in 2015 were 37% coal, 36% nuclear, 23% natural gas, and 3% wind and hydroelectric⁴.

Declining costs for solar panels and installation, together with creative financing options from developers, make solar photovoltaic (PV) an increasingly viable alternative for homes, businesses and institutions in Illinois who wish to reduce their consumption of electricity from conventional sources and increase their renewable supply.



The following goals and actions reflect Lake Forest's commitment to expanded energy efficiency and renewable energy.

Goals

- Reduce energy consumption in homes and businesses
- Expand the use of renewable energy throughout the community

Measurements of Success

- Increased number of homes and businesses with renewable energy installations
- Increased participation in ComEd's energy efficiency and demand response programs
- Installed community (shared) solar project and/or model renewable energy system at a municipal facility
- Enacted Sustainable Development Incentive Program

⁴ https://www.comed.com/documents/about-us/environmental-commitment/environmental_disclosure_12mons_ending_20151231.pdf

TRANSPORTATION & AIR QUALITY

Transportation is the largest source of air pollution in the U.S., leading to significant risks for human health and the environment. Major pollutants from the burning of gasoline and diesel fuel in motor vehicles and other equipment include:

- Particulate matter (PM). These particles of soot and metals give smog its murky color. Fine particles - less than one-tenth the diameter of a human hair - pose the most serious threat to human health, as they can penetrate deep into lungs.
- Nitrogen oxides (NO_x). These pollutants cause lung irritation and weaken the body's defenses against respiratory infections such as pneumonia and influenza.
- Hydrocarbons (HC). These pollutants react with nitrogen oxides in the presence of sunlight to form ground level ozone, a primary ingredient in smog.
- Carbon monoxide (CO). This odorless and poisonous gas is formed by the combustion of gasoline and diesel and is emitted primarily from cars and trucks.
- Sulfur dioxide (SO₂). Power plants and motor vehicles create this pollutant by burning sulfur-containing fuels, especially diesel fuel. SO₂ can react in the atmosphere to form fine particles and poses the largest health risk to young children and asthmatics.
- Greenhouse gases. Motor vehicles also emit carbon dioxide, a potent greenhouse gas.

The 2015 Urban Mobility Scorecard ranked Chicago as having the third worst automotive travel delays among very large urban areas (behind only New York and Los Angeles), with 303 million extra hours of travel time each year due to congestion⁵. This translates to 61 hours of travel delay per commuter each year and results in 147 million gallons of excess gasoline consumed.

Lake Forest experiences its own congestion, particularly on weekday mornings and afternoons during the school year. The drop off and pickup of Deerpath Middle School students leads to significant



traffic bottlenecks on Deerpath Road twice each weekday. Similarly, traffic flow on McKinley Road is impaired each school day due to the arrival and departure of the high school students.

⁵ <http://d2dtl5nnlpfr0r.cloudfront.net/tti.tamu.edu/documents/mobility-scorecard-2015-wappx.pdf>

Local air pollution also comes from idling vehicles and gas-powered landscaping equipment. Idling occurs at schools, train stations, parking lots and roadways throughout the City. With over 300 professional landscaping companies licensed to work in Lake Forest, emissions from lawn care and snowplowing are significant.

The following goals and actions reflect Lake Forest’s commitment to reduce negative air quality impacts from transportation.

Goals

- Reduce traffic congestion
- Reduce idling
- Reduce air pollution from the City’s fleet and equipment
- Increase bicycling and utilization of other non-automotive forms of transportation



Measurements of Success

- Enacted Anti-Idling policy
- Increased percentage of City fleet that is hybrid or electric vehicles
- Reduced traffic counts on Deerpath and McKinley during school days
- Achievement of the Bicycle Master Plan goals