



CHAPTER 11 NATURAL RESOURCES & RESILIENCY

WHAT YOU WILL FIND IN THIS CHAPTER

- » Natural Resources & Sustainability
- » Wetlands
- » Surface Water, Lakes and Shoreland Areas
- » Wildlife & Natural Communities
- » Native Vegetation and Woodlands
- » Air Quality
- » Energy
- » Sustainable Operations
- » Goals, Policies, & Recommended Actions

This Chapter reviews the City of Shoreview's environmental setting and assets that will help assist in becoming more resilient in the face of an evolving climate.

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This Chapter reviews the City of Shoreview's environmental setting and assets that will help assist in becoming more resilient in the face of an evolving climate. As the City continues to develop and redevelop, it will need to adjust to factor in new growth and strains put on public facilities. As the City continues development it can lead to increased green house gases that then can increase changes in climate.

The environmental setting contributes to the quality of life enjoyed by its citizens. Wetlands, open space and lakes comprise about one-third of the City's area, much of which remains due to the City's tradition of protecting its natural resources from development. Current and future residents benefit from these past efforts. Natural resources play a part in the Resiliency of the City's public wealth and should be managed as any other asset. Another important part of resiliency is resource conservation and sustainability operations throughout the City. With the City almost fully developed, the current focus of environmental protection and resource conservation measures is to provide long-term preservation and management to these public assets.

This Chapter includes a brief overview of the City's natural setting including wetlands; surface water and shoreland; wildlife and natural communities; native vegetation and woodlands; and air quality, resource conservation, and sustainability operations. These sections include:

- » A brief discussion of the **benefits** accrued from the City's natural resources
- » An **inventory** of these resources, if available
- » A description of **existing regulations and programs**

The final section includes **goals, policies, and recommended actions** that will be pursued to help obtain and maintain the City's resiliency goals.

NATURAL RESOURCES AND SUSTAINABILITY

Watersheds

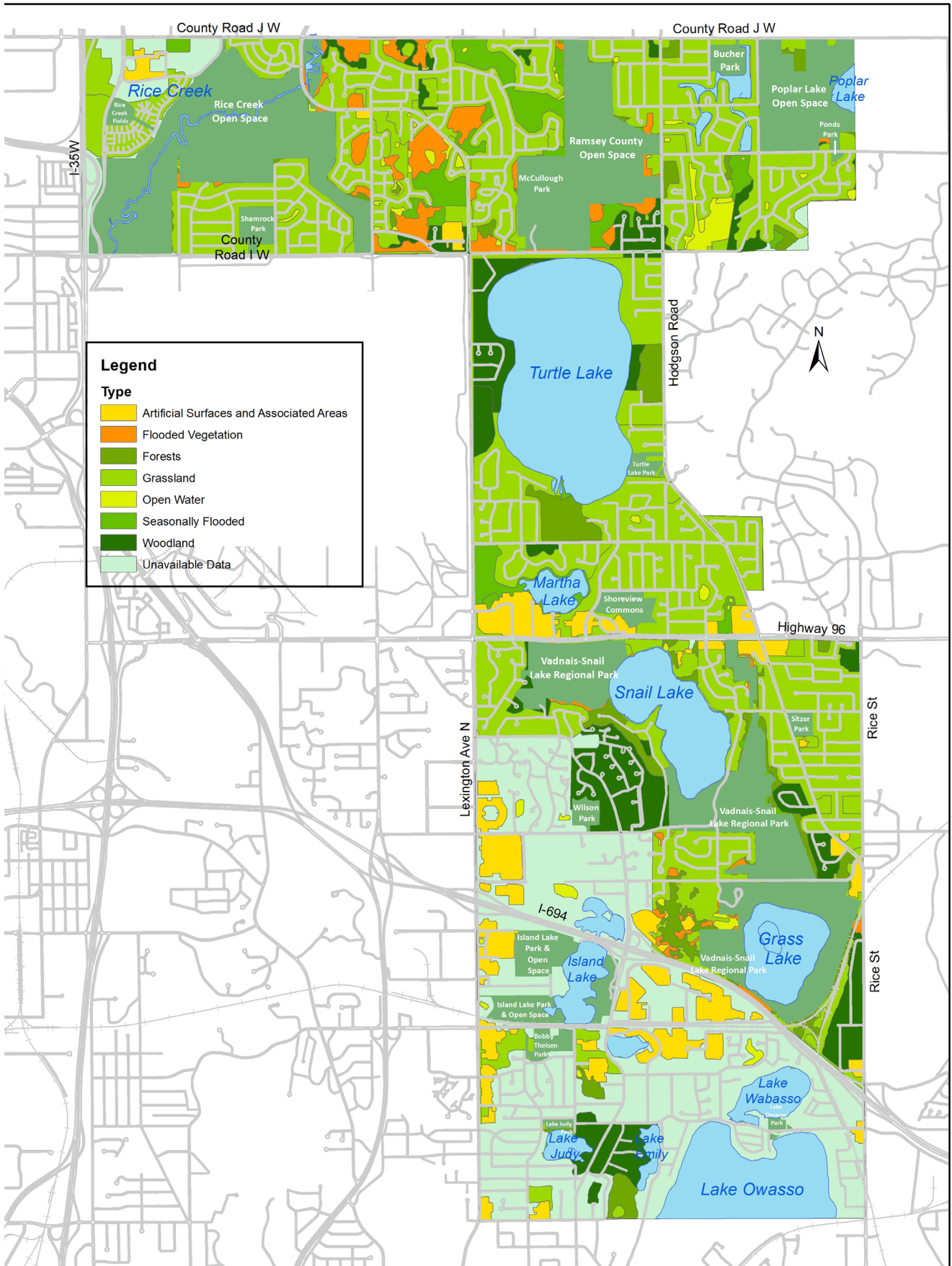
Benefit

Maintaining watersheds are an imperative to the wellbeing of the water supply and ground water. Watersheds are an area of land that drains all the streams and rainfall to a common outlet such as the outflow of a reservoir, mouth of a bay, or any point along a stream channel. Watersheds consist of surface water, lakes, streams, reservoirs, wetlands and all the underlying ground water. Watersheds are important because the stream flow and the water quality of a river are affected by things, human induced or not, happening in the land area. **Map 11.1** identifies the land cover in the City.

Inventory

Shoreview is located within the boundaries of two major watershed districts; the Rice Creek Watershed District and the Ramsey Washington Metro Watershed District. Formerly, the City was partially located within the Grass Lake Watershed Management Organization which has since been dissolved into the

Map 11.1 Land Cover



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Ramsey Washington Metro Watershed District and the Vadnais Lake Area Watershed Management Organization, which has transferred the Shoreview portion to Ramsey Washington Metro. Current watersheds and boundaries are show in **Map 11.2**.

Existing Regulations and Programs

Groundwater Conservation

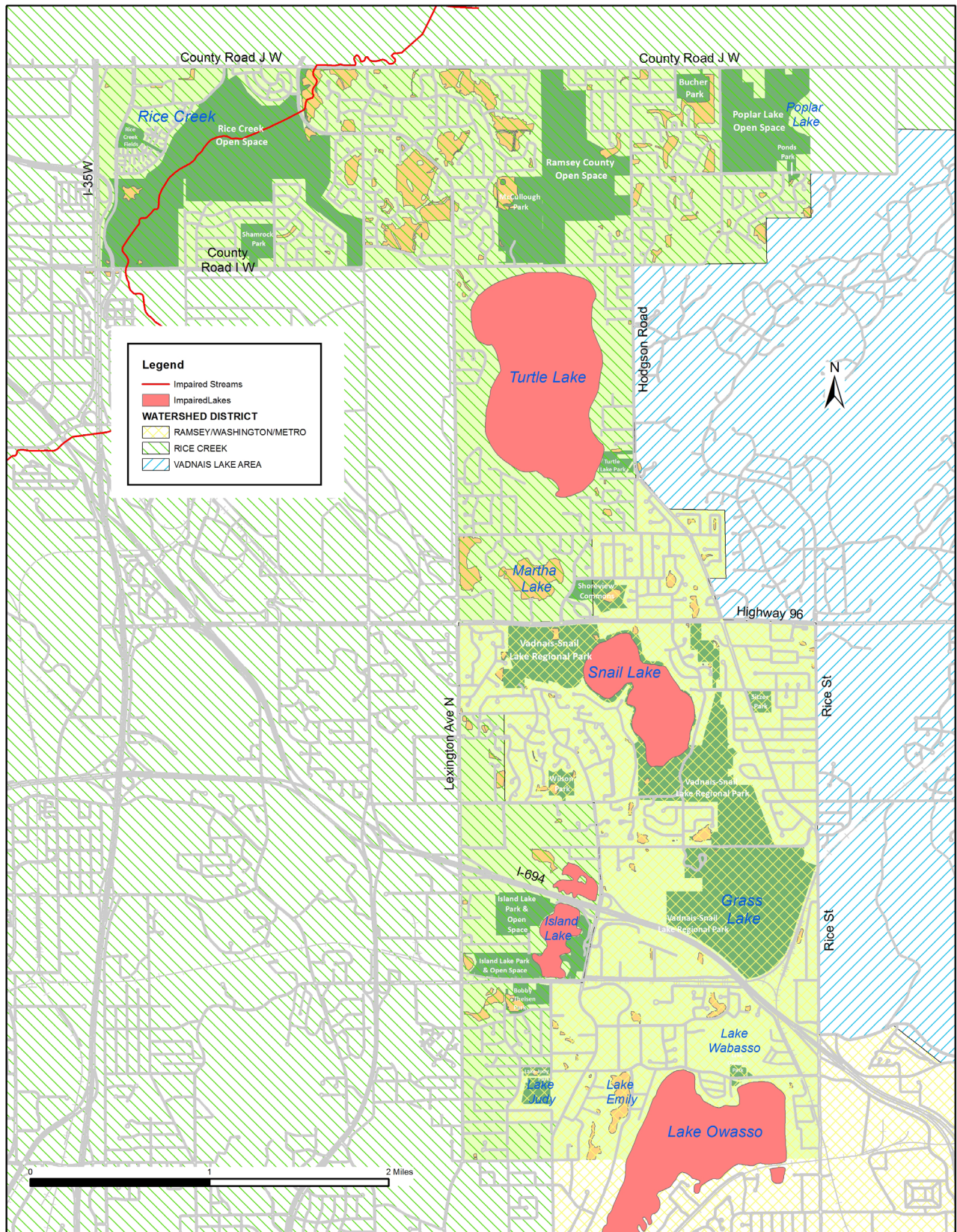
The City's water infrastructure includes 100 miles of water main pipe, 6 groundwater wells, 1,200 hydrants, and a water treatment plant. There is a one million gallon underground storage reservoir which holds water that is pumped to the two water towers and into the system. All of Shoreview's water comes from an aquifer, not surface water. Our wells have sensors that detect drops in groundwater levels, and none have been reported to date. However, there has been recent dialogue from the State Legislature, State agencies, and local governments concerning the future sustainability of our groundwater resources in Minnesota. Shoreview has led many efforts to increase conservation measures both internally and for our water customers by:

- » Transitioning from a 3 tier to a 4 tier conservation rate structure for water billing in 2013. Users using the most water pay the highest rate. Shoreview was one of the first cities to use this method.
- » Watering restrictions – City's odd/even and mid-day watering bans
- » Restriction on drilling new, private wells
- » Installation of variable frequency drive wells
- » Education efforts by Environmental Quality Committee, Slice of Shoreview, newsletters, and experts at the Environmental Speaker Series.
- » Rain water re-use system in the City's Maintenance Facility - truck washing
- » New Water Meter Installation – leak detection postcards are sent to homes which register constant water use (over 24 hours) so it can be remedied
- » Shoreview's adopted Wellhead Protection Plan involves planning to manage land use within the aquifer drainage area, as well as our Water Emergency Conservation Plan which guides water use during an emergency.
- » Reducing water consumption to below the DNR implemented regional residential consumption goal of 75 gallons per capita per day
- » Implementing a strong and successful effort to reduce the amount of "unaccounted for" water used within City limits annually

Additionally, Shoreview has also recently implemented two water conservation programs working in tandem in an attempt to increase public knowledge and engagement in terms of water usage.

The Know Your Flow Program started in 2016 and ran through 2017. Know Your Flow was funded through a \$54,000 Environmental and Natural Resources Trust Fund grant, and included approximately 400 single family residential properties. All 400 participating accounts were volunteers. Through the

Map 11.2 Watersheds and Impaired Waters



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program, “in home display” units are provided to each participant and installed in their homes. These units allow for water meter reads of household usage up to the hour, in an effort to raise awareness of water consumption and reduce overall use.

WaterSmart

WaterSmart is a software platform that gathers publicly available data on water consumption, property and home metrics such as lot size and number of bedrooms, as well as climate data in order to provide individualized “water reports” that compare each participant’s use to average and reduced water users within Shoreview. WaterSmart also provides residents with an online portal through which to view and update their information in order to get a more accurate comparison. WaterSmart is a three year program, and was implemented citywide in 2016.

The goal of the WaterSmart program is to give residents more access to their water usage data and to allow them an interface through which to ask questions and get information. Another long-term expectation that Shoreview has for the WaterSmart program is to gain insight, based on actual customer consumption behaviors, as to which types of cost sharing or retrofit programs would be the most effective to implement in the community. Similar to the Know Your Flow program, the City hopes that WaterSmart will increase resident awareness concerning their water use, and help to promote conservation.

Lawn Care

Landscaping adjacent to wetlands and lakes can also have an impact on water quality. If a manicured lawn is maintained right up to the wetland boundary, runoff containing fertilizer can overwhelm the wetland’s capacity for processing nutrients. Along lakeshores, many private property owners have extensively modified the natural vegetation and/or slopes to create a lawn area. The lack of a natural vegetative buffer increases runoff, sediment and nutrient transport to the lake contributing to algae blooms and other water quality problems. Lack of native vegetation can also encourage resident Canada geese that can add to water quality degradation.

Insecticides and other chemicals used for lawn maintenance can also harm habitat. Recent research has identified that long-term exposure to concentrated pesticides is dangerous to human health, especially children. In response, many communities have adopted ordinances limiting the use of pesticides on public property, particularly in parks and turf areas where children play. Pesticides applied on lawns and turf areas can also be carried into lakes, streams, and wetlands and have a negative impact on these ecosystems.

Shoreview is in the process of developing and implementing a Pollinator Resolution that will address the use of pesticides and herbicides on City property and encourage similar behavior from residents. This is being done both to increase pollinator habitat within Shoreview, but also as a tool to protect water quality.

Restrictions/Product Bans

Minnesota’s Phosphorus Lawn Fertilizer Restriction Laws were enacted to reduce over-enrichment of

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ivers, lakes, and wetlands with the nutrient phosphorus in 2002. Excessive phosphorus in surface water leads to an overabundance of algae and other aquatic plants. While Minnesota is still one of only a few states to enact such a ban, Shoreview was an even earlier adopter – and has restricted phosphorous fertilizers in some way since 1985.

To further protect water quality a new City Code section banning coal tar-based sealant was adopted in 2012. The City Council expressed interest in banning coal tar-based sealants to prevent contamination and costly cleanup of stormwater ponds. Coal tar-based sealants are typically used to resurface asphalt driveways and parking lot areas. Scientific studies have identified a relationship between stormwater runoff and certain health and environmental concerns. Coal tar-based sealant flakes off with use and over time the chemicals are carried to waterways.

Several other metropolitan area cities have also adopted this regulation. Most large home improvement stores no longer carry the coal tar-based sealant. Additionally, the company JetBlack announced a voluntary phase out of the product citing scientific data showing stormwater contamination concerns and costly pond cleanups at the expense of citizens.

WETLANDS

Wetlands are fully discussed in Chapter 9D - Surface Water. Please refer to that portion of the Comprehensive Plan for a detailed examination of wetland and wetland regulation, and the City's goals and policies.

Benefits

The City of Shoreview is fortunate to have an abundance of wetland resources. Wetlands provide a number of important functions in urban communities including removing sediments and nutrients from runoff water. Through a combination of filtration and percolation, wetlands are particularly effective at filtering out the fine sediments that most degrade water quality. By providing stormwater storage, wetlands help prevent flooding and related erosion. Wildlife, including migratory waterfowl, use wetlands as habitat. Near lakes, wetlands may serve as breeding grounds for fish. As an “ecotone” or edge environment between land and water, wetlands offer unique opportunities for education and research.

Inventory

A number of wetland studies have been completed within the City of Shoreview. In 1981, a wetland inventory of the City of Shoreview was completed by the Ramsey Soil and Water Conservation District in conjunction with the U.S. Soil Conservation Service. This study identified 82 wetlands within the City, ranging in size from small depressions to large peat areas of many acres. In 1995, the National Wetlands Inventory (NWI) was completed. An update to the statewide NWI began in 2013 and is expected to be completed in 2019. The NWI for the metro area, including Shoreview, was completed in 2013. The federally-sponsored study identifies wetlands using the latest method for classifying wetlands. The NWI provides a general location of identified wetlands and a description of each wetland. In 1998, the City

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Council commissioned an aerial survey of the city. This survey provided more specific wetland location information than available from the NWI. More recently, wetland resources were inventoried in 2004 during preparation of the Second Generation Surface Water Management Plan (SWMP). In addition to locating wetland areas, the SWMP mapped the drainage areas for each surface water feature and modeled important basin characteristics (**Map 9.8**). In 2018 the City issued an update to the Surface Water Management Plan. The Wetland Inventory, drainage mapping, and modeling were revised and updated as required. These data sources provide excellent information on the type and location of wetland resources in the City.

Existing Regulations and Programs

Wetlands are primarily regulated by the Wetland Conservation Act. At the local level, the Rice Creek Watershed District and the Ramsey Washington Metro Watershed District implement this Act. Other agencies involved in wetland management include the Minnesota Board of Soil and Water Resources (BWSR), the Minnesota Department of Natural Resources (DNR) and the U.S. Army Corps of Engineers.

Because other agencies may have limited resources to cover large areas, the City plays an important role in the management and protection of wetland resources. The City is involved in wetland management through its role collaborating with both watershed districts; the construction and maintenance of City infrastructure; the development review process; and the management of City-owned lands. Both the Development Ordinance and the Surface Water Management Plan include provisions and standards relevant to wetland management including flood plain management, erosion control, vegetation management, standards for treatment of runoff, and best management practices. Wetland buffers are encouraged, and sites that have been developed since adoption of the SWMP have included a 16.5 foot buffer around wetlands.

SURFACE WATER, LAKES AND SHORELAND AREAS

Benefits

The City's lakes are one of the landmark features and the most significant resources in Shoreview. Lakes provide recreational opportunities from swimming to boating to fishing, and water quality is vital to the enjoyment of these activities. Clean water allows water sports without risk to public health, and many species of desirable game fish cannot tolerate poor water quality. Location on or near a lake enhances property values, and all property values benefit from the number of public lake accesses available in the City. Lakes have great scenic value both from private and public properties. The City's lakes also serve as habitat for fish, waterfowl, and many other plant and animal species.

Inventory

The City has 11 lakes and one major stream at least partially within its borders. Lake Owasso straddles the border between Shoreview and Roseville, and Poplar Lake lies on the boundary of Shoreview and White Bear Township. Rice Creek crosses the northwest corner of Shoreview extending to the northeast into Anoka County and to the southwest to the Mississippi River.

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Figure 11.1 summarizes available lake data. **Map 11.2** shows waterbodies including impaired lakes and streams.

The Minnesota Pollution Control Agency (MPCA) compiles annual clarity data on many of the City’s lakes. Clarity is measured by using a Secchi disk, a metal disk painted in a black and white pattern. The disk is lowered into the water until it disappears from view. The depth at which the disk can no longer be seen is the clarity depth recorded. Where this data has been collected for many years, a statistical analysis can determine a clarity trend. Water clarity is linked to water quality because algae growth and sediment can reduce the depth at which the Secchi disk is visible. **Figure 11.1** provides water clarity trend information where available.

Figure 11.1 Lake Data Summary

Lake Name	Area (Acres)	Maximum Depth (Feet)	OHW Level (feet)	Clarity (feet)	Clarity Trend
Turtle	439	28	892.4	7.0	Long term increasing trend, 1974-2016.
Owasso	367	37	886.7	8.36	No statistical trend.
Snail	147	30	883.7	8.73	Long term increasing trend, 1974-2016.
Grass	154	N/A	881.9	N/A	Not available
Island	60	11	946.7	4.2	No statistical trend.
Wabasso	46	73	885.9	9.3	No statistical trend.
Martha	34	N/A	898.5	N/A	Not available.
Poplar	36	N/A	N/A	N/A	Not available.
Judy	16	N/A	943.9	N/A	Not available.
Emily	12	N/A	919.5	3.75	No statistical trend.
Shoreview	11	N/A	N/A	N/A	Not available.

Source: Minnesota Department of Natural Resources Lake Survey Database. Clarity trend data from Minnesota Pollution Control Agency Lake Water Quality Trend Data, 2017.

The Minnesota DNR also monitors invasive aquatic weeds in the City’s lakes. All five Shoreview lakes with public boat access have all been identified as containing infestations of Eurasian milfoil. Curly leaf pond weed, another invasive aquatic plant, is also present in several City lakes. Snail Lake is at risk for infestation by zebra mussels because it is supplemented by water from Sucker Lake which was identified as containing the invasive in late 2007. Impaired waters are also depicted in **Map 11.2**.

Wetlands are discussed in detail in Chapter 9D, Surface Water, and wetland areas within the municipal boundaries have been classified by type (**Map 9.9**).

Existing Regulations and Programs

Ordinances

The Minnesota DNR regulates all activities such as vegetation removal, filling, or dredging below the OHW level of protected waters. Shoreland is defined as the area within 1,000 feet of the Ordinary High Water (OHW) level of a lake or within 300 feet of a stream or floodplain, and the City has adopted a Shoreland Management Ordinance to regulate activities in those areas. The City has also adopted a floodplain management ordinance to regulate disturbance within the 100-year floodplain. This ordinance seeks to protect life, property, and environmental quality through restricting and managing uses within the floodplain. The City has a number of other ordinances related to water quality including erosion control requirements and vegetation management.

Surface Water Management Plan

In 2005, the City adopted the Second Generation Surface Water Management Plan (SWMP) to manage and protect surface water quality (see “9D - SURFACE WATER MANAGEMENT”). The SWMP provided goals, policies and implementation actions to protect and improve surface waters in the City. In September 2018, the City adopted the Third Generation Surface Water Management Plan. The plan reviewed all goals, policies, and actions proposed in 2005 while adding and updating as needed. Shoreview is also a designated Municipally Separate Storm Sewer System (MS4) permittee under the National Pollutant Discharge Elimination System (NPDES).

Direct Stormwater Discharge

In September 1998, the City completed a Direct Discharge Report, which identified all direct stormwater discharges into the City’s lakes. This report identified priorities for providing pre-treatment for these discharges. While managing “non-point” or dispersed nutrient and sediment sources (such as from lawns) is important to achieving water quality goals, eliminating direct stormwater discharges could have an immediate and significant impact on improving and maintaining water quality within the City. However, limited resources for discharge retrofits should be directed where it is most cost effective.

In 2009, Shoreview began installing permeable or pervious concrete and pavers at some of these direct discharge locations. As mentioned above, the permeable roadway materials help to infiltrate water so as to avoid directly channeling runoff into a lake or other body of water.

Illegal Dumping- Shoreview has a number of large wetland complexes. Portions of these wetlands are relatively isolated, and illegal dumping in these areas can be an issue. Illegal dumping may include trash, litter, tires, yard waste, or waste oil. Illegal dumping may create a public health concern and reduces a wetland’s ability to filter sediments, nutrients, and pollutants from incoming runoff. Trash and pollutants can harm wildlife and fisheries.

Pervious Pavement- In 2009, the City completed a pervious concrete public street project in a residential neighborhood. The project was a bold example of an innovative and sustainable approach to public infrastructure. After carefully considering alternatives for reconstructing the infrastructure, the

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City elected to replace the existing streets and eliminate traditional storm drainage infrastructure with a pervious concrete road. Due to the lack of a stormwater collection system, runoff was not controlled and caused problems for the residents by flooding low areas. The only catch basin located within the project area discharged directly into Lake Owasso and a majority of runoff from the area drained toward the lake. Water quality of the lake has been a concern to the City and residents for many years.

After careful analysis of stormwater treatment options, the City planned for the street and stormwater collection system to be combined into one system consisting of a pervious concrete road surface over a rock storage layer. Stormwater runoff from the pavement areas would pass through the pervious concrete into the rock storage layer then infiltrates into the sand sub-grade.

Several other small projects have been completed using pervious pavers since the large Lake Owasso project. These projects range from parking lots to smaller street areas where drainage and infiltration assistance was needed. The use of pervious concrete infiltration systems allows staff to remove existing direct discharges and direct overland flow that previously drained to the lake to the concrete where it is infiltrated instead. Required maintenance for the system requires a vacuum/regenerative air sweeper, and the use of a 1 ton truck for plowing. Environmental benefits include over three quarters of a mile of City streets not needing salt as an ice control method and infiltration capacity, which eliminates the need to directly discharge untreated stormwater into Lake Owasso.

Invasive Species Management- Aquatic invasive species management for the Shoreview area is mostly coordinated through the Ramsey County Conservation District as part of their aquatic invasive species program. The Minnesota DNR maintains signage and waste receptacles at the City lakes infested with Eurasian milfoil. Education material on invasive species is available from the DNR and the University extension. In 2005, the City adopted a policy to participate with lakeshore homeowners associations (HOA) that develop lake management plans and work to control invasive aquatic plants, such as Eurasian watermilfoil. The HOAs for Turtle and Owasso lakes conduct annual surveys of the lakes to identify invasive species, and develop treatment plans as needed.

- » Eurasian watermilfoil is an aquatic plant that can form thick mats that interfere with water recreation and crowd out important native plants. Eurasian milfoil has difficulty becoming established in lakes with healthy native plant populations, and usually becomes established when native plant communities are cleared for development activities. It is important to properly clean boats and equipment prior to transfer between water bodies.
- » Purple loosestrife is a wetland plant that invades marshes and shorelines replacing cattails and other wetland plants. Purple loosestrife forms dense stands unsuitable for cover, food, or nesting sites and can dominate habitat formerly occupied by many endangered plants and animals. Ramsey County has had success controlling purple loosestrife using beetles that feed on the plant.
- » Zebra mussels have been identified in nearby lakes and rivers. These small mussels can attach themselves to objects, clog water intakes, smother native mussels, and interfere with food webs of native species. Zebra mussels can disrupt ecosystems and harm the economy. It is important to follow proper protocol when removing boats, equipment and bait from lakes and streams to prevent spread. This includes cleaning and drying equipment, and properly disposing of leftover bait.

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Operations and Maintenance- The City’s Public Works Department completes normal operation and maintenance activities that help prevent surface water quality degradation. These activities include street sweeping, particularly in the spring, regular holding pond maintenance, stock pile inspections, and stormwater system maintenance. Necessary stormwater improvements are regularly programmed as part of the City’s Capital Improvement Project (CIP) process. See “9D - SURFACE WATER MANAGEMENT” for a more detailed discussion of stormwater management.

WILDLIFE AND NATURAL COMMUNITIES

Benefits

Given the lakes, wetlands and open space in the City and surrounding area, it is no surprise that Shoreview is home to a variety of wildlife including a number of rare species and natural communities. These species add to our biological wealth and diversity. Viewing wildlife and identifying plants provide recreational opportunities and enjoyment to many City residents. Wildlife and natural communities have significant value for education and research.

Inventory

Formal inventories have not been completed for most species within the City. The Minnesota DNR maintains records of sightings of rare species. The Ramsey County Biological Survey identifies significant natural communities in the county. **Figure 11.2** summarizes rare species and natural communities identified in Shoreview.

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Figure 11.2 Rare Species and Natural Communities

	Common Species Name	Status	Habitat
Plants	Autum Fimbry	Special Concern (state)	Moist, sandy soil
	Black Huckleberry	Threatened (state)	Sandy/rocky woodlands or prairie shrublands
	Small Green Wood Orchid	Special Concern (state)	Wetland meadows
	Toothcup	Threatened (state)	Sandy shorelines
	Kinnickinnick Dewberry	Special Concern (state)	Moist, sandy soil
	Swamp Blackberry	Threatened (state)	Moist, sandy oak forest
	Lance-Leaf Violet	Threatened (state)	Sandy wetland meadows
Animals	Blandings Turtle	Threatened	Wetland complexes and adjacent sandy uplands
	Least Darter	Special Concern (state)	Clear streams and lakes with cool waters, prefer dense, submerged vegetation
	Red-Shouldered Hawk	Special Concern (state)	Continuous mature deciduous forest containing wetland openings
	Pugnose Shiner	Threatened (state)	Clear lakes and low gradient, small streams
	Northern Long-Eared Bat	Threatened (federal)	Wooded areas in autumn, hibernates in caves
	Rusty-Patched Bumble Bee	Endangered (federal)	Grasslands in summer, underground in winter

Source: Minnesota Department of Natural Resources, Minnesota Natural Heritage Database, July 2017. These data are not based on an exhaustive inventory of the state. The lack of data for any geographic area shall not be construed to mean no significant features are present.

Existing Regulations and Programs

County, State and Federal Programs- State and federal laws govern protection of rare species. Management responsibility lies with the DNR at the state level and with the U.S. Fish and Wildlife Service at the federal level. Ramsey County includes protection of rare species and natural communities as one element in its management of county parks and open space. The City has no direct role in the preservation of rare species and natural communities but supports federal, state, and county efforts.

Goose Management- The City participates in the Twin Cities Metropolitan Area goose capture and removal program run by Canada Goose Management Inc. Nesting sites throughout the City are surveyed, and trapping occurs at sites where the population appears to have a negative effect on the land or aquatic environment. In 2017, approximately 60 Canada geese and goslings were captured at Island, Turtle, and Snail Lakes. Mature geese are killed, processed and the meat donated to local food shelves. Goslings are provided to the Wildlife Science Center.

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Deer Management- Ramsey County Parks Department conducts annual aerial deer surveys and operates special permit archery hunts in County parks when the number of deer exceeds the capacity of the park. In fall 2007, 22 deer were harvested from Regional Parks in Shoreview. In February 2016, there were 44 deer counted during the 2-day aerial survey of the City, and this is below average when compared to past winter deer count numbers, though no downward trend is expected. In addition to the County deer hunt, the City has also overseen a small hunt on private property. Continuation of this hunt will depend on deer population levels, interest from hunters, and willingness of property owners.

Pollinators- In order to facilitate an increase in pollinator habitat, Shoreview staff is working towards implementing a pollinator resolution. This resolution would help to increase pollinator forage, decrease the use of pesticides, and promote native plantings within City limits. By setting goals and policies focused on improving, creating, and retaining pollinator habitat, Shoreview hopes to continue to promote better planting and lawn care practices for public buildings, developers, as well as homeowners. The Shoreview pollinator resolution is expected to be considered by the City Council in 2018. Also, a beekeeping ordinance was facilitated in 2017, allowing residents to keep honey bee hives within City limits so long as they follow appropriate guidelines.

In addition to the Pollinator Resolution and beekeeping ordinance, the City also maintains a native planting demonstration with a shoreline buffer at the Haffeman Pavilion at the Shoreview Commons. This project has been recognized by the Ramsey Washington Metro Watershed District in 2013. Originally started by an Eagle Scout in 2008, the project first included a native plant buffer strip along the pond shoreline. After the Scout left the area, City volunteers stepped in to maintain the buffer, add more native plantings, and increase educational efforts.

Feeding Wild Animals- There are significant populations of deer, wild turkeys, and other species in the City, often congregating in areas near open space or undeveloped areas of the City. While the wild animals provide viewing opportunity and enjoyment, they can also damage landscaping, gardens, and affect public safety when they cross roads. The City adopted regulations in 2005 prohibiting intentional feeding of wild animals to discourage incursions into residential neighborhoods.

NATIVE VEGETATION AND WOODLANDS

Benefits

Native vegetation and wooded areas provide many benefits and contribute to the quality of life in the City, types of ground coverage is shown in **Map 11.1**. Mature trees increase property values, while trees planted in public spaces represent investments that appreciate, rather than depreciate, over time. Properly located trees can reduce heating and cooling costs, control glare, and lessen noise and sound. Trees and vegetation help control erosion by intercepting rainfall and reducing the impact of precipitation on the ground while stabilizing soil with their root systems. Trees and native vegetation can also provide food, wildlife habitat, and educational opportunities. Native vegetation can serve as attractive, hardy landscaping that requires less maintenance and watering than introduced species and few, if any, applications of fertilizer or pesticides.

The City recognizes the benefits of native plants, which generally are deeper rooted, and so require less

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watering than other types of ground cover used in residential setting. Replacing turf grasses with native plants aids in the infiltration of stormwater and reduces demand on the municipal water supply. Yards adjacent to wetlands and lakes also provide a buffer that can reduce the nutrient load on surface water, and so having a positive effect on the water.

Inventory

No citywide inventory of trees and woodlands exists, though an inventory of all trees in City Parks was completed in 2017. Completion of the Shoreview Parks tree inventory showed a primarily evergreen composition, with large percentages of spruce and pine. Oak and maple varieties constitute the majority of deciduous park trees. The Minnesota DNR maintains lists of rare plants and natural communities and their known locations (see Wildlife and Natural Communities section). Private parcels are surveyed on a project-by-project basis during the City's review process. The Ramsey County Parks and Open Space System Plan includes some information on trees and native vegetation on county land within Shoreview.

Existing Regulations and Programs

Ordinances- Shoreview staff currently works to increase native plantings at development sites by requiring the planting of natives whenever possible. These requirements are typically written into individual development agreements where a landscaping plan is provided. Any buffer areas around wetlands at development sites need to be planted using native vegetation as well. Staff has also established natural buffers around ponds that are located within City parks.

Outreach Efforts- The City has relationships with organizations such as Wild Ones, Blue Thumb, and Clean Water Minnesota. These groups can provide residents with resources on different invasive species, and they are available to assist in coordinating invasive species removal events on both public and private property. These removal events are generally focused on terrestrial invasive species. The City's vegetation management ordinance includes provisions for tree preservation and establishes replacement requirements for trees removed during development or construction. Special protection is given to "landmark", (mature) trees. Landmark trees are defined according to diameter and health for a particular species.

The City offers technical assistance to citizens on tree planting, maintenance, and care. The City also runs a tree disease management program, which seeks to identify and contain diseases such as oak wilt, emerald ash borer, and Dutch elm disease. The City annually budgets to replace diseased, dying, or damaged trees on public property, including boulevards, parks, and open spaces. In addition, the City plants trees, shrubs and annual plants as part of street renewal and other infrastructure projects.

The City participates in the Blue Thumb program, and is a member of Clean Water Minnesota. These programs offer educational resources concerning native vegetation, stormwater management, and rain garden design. The City also encourages residents to utilize technical services offered by the Ramsey County Conservation District for native planting, rain gardens and shoreland restoration projects.

- » Buckthorn is an invasive shrub that was originally used for hedges. Two prominent species of buckthorn, common (European) buckthorn and glossy buckthorn, are often found in older

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neighborhoods throughout the state. Buckthorn often establishes itself in wetlands, meadows and moist woodlands when native areas are cleared. Buckthorn control is labor intensive and usually requires mechanical removal and chemical control.

- » Garlic mustard is a noxious weed that usually grows in forested areas. It is highly competitive and grows quickly as a monoculture, disrupting natural ecosystem function. It out competes native plants, eliminating important habitat and food sources for wildlife. Garlic mustard control is labor intensive, and usually takes several years to fully eradicate seeds from a site.
- » Japanese beetles are copper beetles that feed on a wide variety of vegetation in Minnesota. They feed mostly in the fall and are strong defoliators, attacking the canopies of many urban landscape trees. Generally, healthy trees are able to recover from Japanese beetles although trees that are stressed from other factors may die. Control for Japanese beetles involves hand picking them off plants or trees or chemical control options. The state does not recommend trapping Japanese beetles as this attracts them all to one location.
- » Emerald ash borer is an Asian beetle that has spread throughout the Eastern half of the US and parts of Canada. It is responsible for killing thousands of Ash trees by feeding on the inner portion of the tree's bark. Commonly referred to as EAB, the beetle is under heavy control efforts by state and local governments. Management practices include chemical control methods such as pesticide injection, and careful adherence to state laws regarding firewood transportation. Shoreview has an annual program preventatively treating ash trees against emerald ash borer infestation. All City Park trees, and many private residence trees are treated every two years in order to maintain resistance against the beetle. This service is offered to residents interested in protecting their ash trees. The program consists of a tree injection of pesticide into the base of the trunk. The treatment is then taken throughout the tree by its vascular system. This treatment is completed by City Staff, allowing for generally reduced prices compared to private companies offering the same service.

AIR QUALITY

Benefits

Clean air is a basic need for human health. Polluted air has been linked to health problems such as asthma and pneumonia, particularly in children and the elderly. Air-borne particles and pollutants can travel long distances and be deposited on land and water thousands of miles away. Air pollutants can also have a detrimental effect on the built environment through acid rain and other corrosive processes/

Inventory

The MPCA operates a network of more than 50 sites around the state to monitor various air pollutants. This allows the state to monitor if the federal and state air quality regulations are being met, as well as tracking pollution trends over time. This monitoring network has allowed the MPCA to develop pollution prevention efforts and promote local efforts to improve air quality. The MPCA network includes monitoring sites in nearby municipalities, including St. Paul, Blaine, and Fridley. Specific air quality studies have not been done for Shoreview.

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The MPCA compiles an annual report called an emission inventory. All facilities in Minnesota that have an air emissions permit, including some in Shoreview, are required to submit an annual emission inventory report to the MPCA. Some facilities are also required to report their emissions of toxic air pollutants annually for the Toxics Release Inventory. The MPCA also encourages citizen action to maintain the high quality of air within Minnesota. Citizens can view daily air quality reports, the Air Quality Index, on the MPCA website to gain a better understanding of air quality in their community.

Greenhouse gases are produced by using fossil fuels that contribute to a changing climate which impacts air quality. The Air Quality is affected by three sources of pollution: mobile sources (vehicles), area sources (gas stations, dry cleaners) and stationary sources (factories, power plants). Weather conditions and topography can also impact air quality, specifically when pollutants are trapped or move from one area to another.

Existing Regulations and Programs

Air quality is regulated by the federal Clean Air Act and by specific state statutes. The Clean Air Act was originally adopted in 1970 and amended in 1990. In Minnesota, enforcement of all state statutes and most federal laws relating to air pollution is the responsibility of the MPCA. The MPCA helps protect the quality of the air by developing and enforcing regulations, providing education, and giving technical assistance.

Local government efforts to improve air quality are, therefore, based on land use and transportation decisions that limit congestion, reduce vehicle miles traveled, and provide options to automobile use. For example, higher residential densities are required to support transit service. Trails and carpooling are alternatives to automobile use that can be promoted through appropriate public infrastructure. See Chapter 4, Land Use, and Chapter 5, Transportation, for additional discussion of land use and transportation issues.

ENERGY

Benefits

During the 1970s, an energy shortage took place in the United States. As a result, state legislation was enacted that required all municipalities to include a solar access protection element in their comprehensive plan. Solar energy systems, either active or passive, can supply a significant portion of the heating and cooling and water heating requirements to an individual home, business, or public building. By using solar energy, natural resources such as natural gas and fossil fuels are preserved for future use.

This section of the Plan identifies existing City policies that promote the use of solar energy and explores new ways in which the City can encourage new developments and residents to include solar energy in their projects. Solar projects have become more financially feasible as technology has advanced and production costs have fallen. The environmental and economic benefits have made potential projects easier to access and pay for with quicker return time.

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Inventory

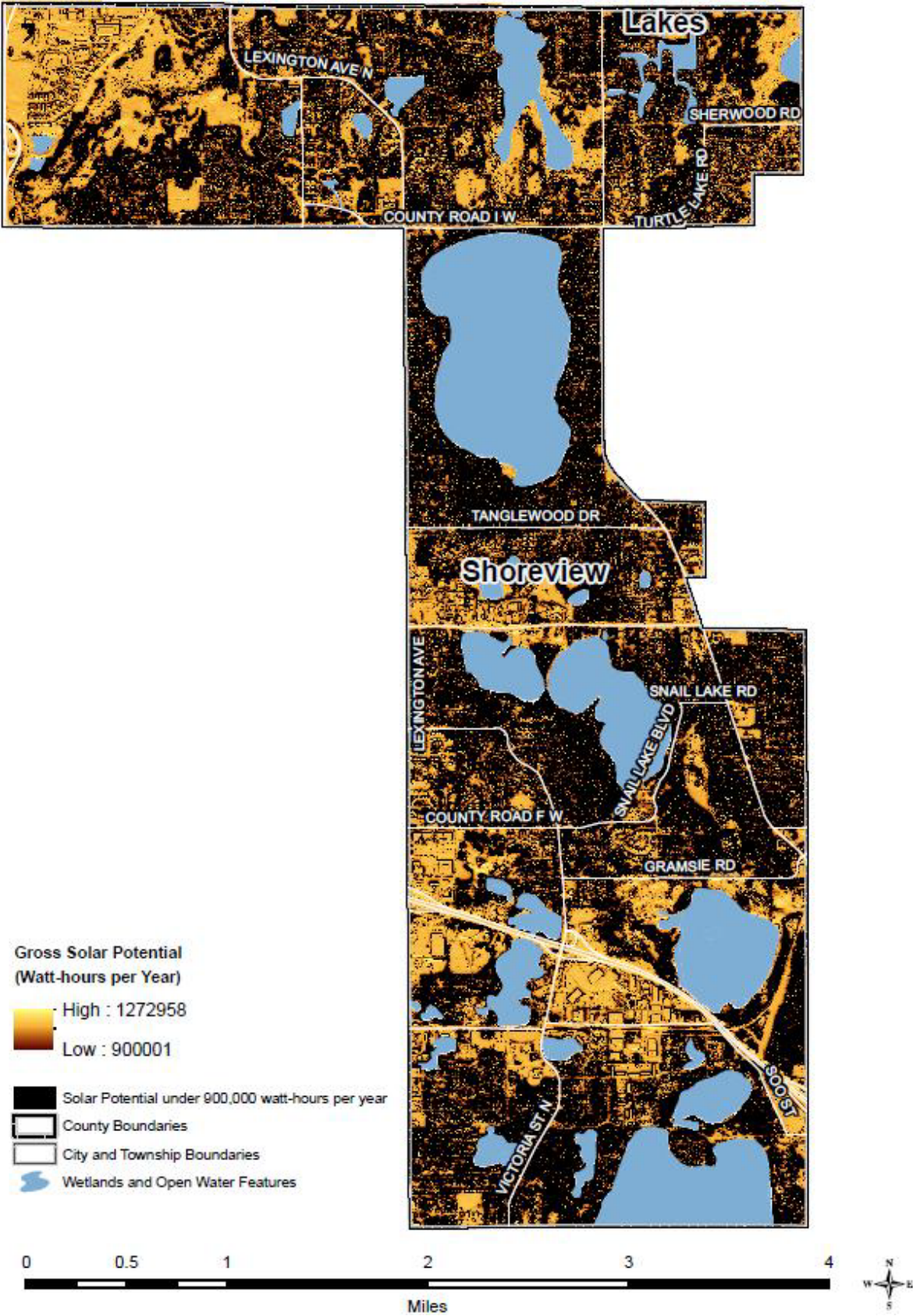
The University of Minnesota developed a high-resolution statewide solar resource map that allows cities to calculate how much electricity they could potentially receive from locally installed solar energy systems. This data was used to calculate Shoreview' solar resource, or the city's "solar reserves." The solar reserves are how much solar energy is reasonably economically available for development, similar to how oil or gas reserves are measured. The solar map, **Map 11.3**, shows the good sites for solar installations and helps identify where there may be land use conflicts with solar development. **Figure 11.3**, below, shows the amount of solar energy reasonably available for development in Shoreview. The gross potential includes the total available resource, regardless of location; rooftop capacity and generation include only the resource available on the rooftops of commercial buildings located in the city.

Currently, Shoreview has a gross solar potential of 12,089,404 megawatt hours per year, and a rooftop solar potential of 1,214,614 megawatt hours per year. The gross generation potential is 1,208,940 megawatt hours per year, with a rooftop generation potential of 121,461 megawatt hours per year. Shoreview's gross solar potential is included as **Figure 11.3**. Rooftop potential numbers are high in Shoreview when using the solar calculator of the City's solar resource. The total capacity of the rooftop solar resource in Shoreview is 93 MW, equal to approximately 53.0% of all the electricity consumed in the City (note: this is an upper limit, and does not consider individual site limitations due to roof structure, ownership, or local regulations that might limit solar installations). If buildings undergo high levels of energy efficiency investment, the solar resource could meet a higher percentage of electric needs.

Figure 11.3 City of Shoreview Solar Resources

Gross Potential (Mwh/yr)	Rooftop Potential (Mwh/yr)	Gross Generation Potential (Mwh/yr)	Rooftop Generation Potential (Mwh/yr)
12,089,404	1,214,614	1,208,940	121,461

Map 11.3 Gross Solar Potential



Source: University of Minnesota U-Spatial Statewide Solar Raster.

Existing Regulations and Programs

The City's Development Ordinance regulates solar access protection for those developments that choose to use passive or active solar energy systems. All new subdivisions and planned unit developments are encouraged to be designed to accommodate the present or future use of passive and active solar energy systems with special attention given to street, lot, and building orientation. Energy efficient buildings are also encouraged. New buildings should be designed and fitted to permit the addition or conversion of the hot water heating system to solar energy. Builders and developers must demonstrate their ability for incorporating active and passive solar energy systems in new buildings, installing energy-efficient appliances and lighting systems, and using exterior landscaping to reduce the energy demands of new construction.

The Development Ordinance also provides an incentive for developers who incorporate solar energy systems in their development projects. A density bonus of up to five percent may be given to developments that use passive energy systems on at least 80 percent of the dwelling units. And a density bonus of up to ten percent may be given to all developments that use active energy systems for space heating, air conditioning, and/or domestic hot water heating on at least 30 percent of the dwellings.

The City also enforces the State building code requirements regarding the energy efficiency of residential or commercial structures.

Existing outreach- In an attempt to increase the use of solar energy systems within Shoreview, the city's Environmental Quality Committee promotes renewable energy annually through their work plan. The Committee hosts a speaker series in January through April of every year. During that series, speakers present on a variety of environmental topics, usually including speakers on renewable resources. The Environmental Quality Committee also administers the Green Community Awards every year. These awards specifically recognize residents, businesses, and associations for their efforts to improve and/or conserve Shoreview's natural resources. Residents who have been granted City permits for solar installations in the past year are contacted and encouraged to apply.

Additionally, the City has hosted a Solar Power Hour informational session annually since 2016. That event is put on by the Midwest Renewable Energy Association and is an informational presentation on residential solar power, the benefits, and financing options. Members from financial institutions and solar companies are available to answer any questions, and several short presentations are provided. Each of these events and awards are designed to increase solar energy systems in Shoreview through education, promotion, and public recognition of those who have completed installations.

Existing Projects- City staff is currently working with members of the Environmental Quality Committee, with assistance from other cities and solar resource groups, to install a solar energy system on the roof of the LEED Gold Certified Public Works Maintenance building. An RFP was released in August 2017 soliciting bids from solar companies for either a community solar garden or a power purchase agreement site to be constructed on the maintenance building roof space. To date, several bids have come in and the City is strongly considering a power purchase agreement where the energy produced by solar panels on the roof would be used to power the Maintenance Center and other City buildings. The community solar garden option is also still being considered, but because of the limited

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space on the building roof, a garden constructed there would not allow for many subscribers.

If a power purchase agreement project is selected and approved by City Council, City staff plans to use the installation as an educational opportunity within Shoreview. The City could lead by example in terms of solar power and renewable energy, hopefully thereby encouraging residents, businesses, and associations to follow suit. The City will be accepting bids on this project until October 2017, and staff expects to have a recommendation before Council by the end of the year. If approved, expected project construction would occur in 2018.

SUSTAINABLE OPERATIONS

Benefits

Shoreview is committed to finding innovative ideas and environmentally sound solutions to difficult project situations. All Shoreview projects are evaluated for possible green initiatives or sustainable improvements. Several previous City projects have creative solutions to unique problems. Many of these projects we've tried have now become the foundation for City projects and operations. By creating a higher standard, the City is able to better serve its residents by creating long term solutions with the environment in mind.

Green building and fleet management is a whole-systems approach applying the five (5) key concepts of Green building – energy efficiency, resource efficiency (including durability), indoor environmental quality, water conservation, site and community – to the eight (8) components of the traditional building process – outdoor and site, building envelope and systems, mechanicals, electrical and lighting, plumbing systems and fixtures, finish materials and coatings, waste management – in order to improve the impact of building on individuals, their families, the community, and the environment. Effective green building can lead to 1) reduced operating costs by increasing productivity and using less energy and water, 2) improved public and occupant health due to improved indoor air quality, and 3) reduced environmental impacts by, for example, lessening storm water runoff and the heat island effect.

The related concepts of sustainable development and sustainability are integral to green building. Sustainability links the environment, economy, and social equity together, recognizing that the inter-relationship between these effect quality of life. Sustainable communities are those that contemplate the connection between these factors in their decision-making process and achieve the desired outcome without compromising the resources needed for future generations.

Existing Regulations and Programs

Fleet Management- The City of Shoreview has a wide variety of vehicles in its fleet. These vehicles are used to provide essential City services including; environmental/forestry services, the maintenance of City streets, parks and utilities including water, sanitary sewer and storm sewer operations. The City annually evaluates the fleet for efficiency improvements. The main points of the evaluation include:

- » Using the most efficient vehicle for the intended purpose

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- » Use of biofuels when most practicable
- » Replace vehicles with high efficiency, or hybrid vehicles when practicable
- » Considering implementing electric vehicles
- » Bulk storage of oil, lube, fuel and additives
- » Recycle used oil, sorbents, filters and cleaning chemicals
- » Educate drivers on responsible use of City equipment and no idling policy

The City fleet has become more efficient and environmentally friendly through these annual evaluations and changes made to City fleet management. Some of the changes result in energy and cost savings, cleaner air, and lower CO2 emissions.

Building Management- In 2010 the Public Works Maintenance Facility was completely remodeled including a 5,000 square foot addition. The project attained Leadership in Energy and Environmental Design (LEED) Gold certification through the U.S. Green Building Council. A major focus during this project was protecting the environment in every way possible. This included recycling building materials, using products fabricated in a close proximity and the restoration of adjacent lake shore. The construction accomplishments included:

- » A Construction Activity Pollution Prevention Plan to reduce pollution from all construction activities by controlling soil erosion, waterway sedimentation and airborne dust generation.
- » The project had a commissioning agent that during construction monitored the buildings energy systems and assured they were installed and calibrated for maximum manufacturer efficiency.
- » Designated areas for co-mingled recyclable collects were available during the construction.
- » 84 percent of construction waste was diverted from landfills.
- » 98 percent of the structural and envelope components of the existing building were reused. The new building additions were only 26% of the project area.
- » New material utilized in the project contained 14 percent-recycled materials.
- » 28 percent of the material used in the project were harvested and manufactured within 500 miles of the site. This protected the budget and the environment through reduced transportation costs and pollution.
- » Construction indoor air quality management plan and tested air quality during construction for construction workers and building employees who occupied the building during construction.
- » Low VOC adhesives and sealants were used exclusively.
- » Low VOC paints were used exclusively.
- » Flooring materials meet FloorScore requirements of the CRI Green Label Plus requirements. All adhesives were low VOC compliant.
- » Composite wood fiber products were all low VOC compliant.

Some of the more distinguished building outcomes of the remodel and upgrade include:

- » Storm Water Design - Quality Control

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- » Goal to treat 90 percent of runoff onsite
 - » 92 percent of stormwater is treated on site and never leaves the property
- » The addition of a rain garden
- » Pervious concrete parking lot
- » Covered salt shed with underground water runoff containment tank
- » White roof membrane to reduce heat island effect
 - » Having 84 percent of the roof area with a solar reflectance index above 78 reduced heat island effect.
- » Reduce water use / water conservation
 - » Upgrades to water efficient fixtures
 - » Plumbing fixtures were used that reduced waste water by 72 percent over a baseline building.
 - » Low water volume techniques were used to reduce total building water use, 36 percent compared to a baseline building
 - » Capture rain water runoff from the roof in an underground 24,000 gallon tank for use in toilets and vehicle wash bay.
 - » This saves an estimated 140,000 gallons a year.
- » Optimize energy performance
 - » Replacement of lighting fixtures and controls
 - » Green Power - enter into a 2 year renewable energy contract for a percent of electric consumption.
 - » All electrical power for the building is wind harvested energy. The City is in a contractual agreement with its utility to use only wind energy for this building (and all other City owned buildings).
 - » The addition of sky lights and glass overhead garage doors in vehicle area to provide natural lighting.
 - » A computerized lighting management system was used to control lighting with daylight sensors.
 - » 61 percent of the regularly occupied spaces are lit using natural light.
 - » High efficiency mechanical, electrical and energy management systems were utilized to reduce energy use by 20% compared with a typical project.
 - » All existing CFC were removed from the project.
 - » Next generation clean agent gas fire suppression was used (NOVEC 1230). This suppression gas has a global warming index of 1 and an ozone depletion potential of 0.
- » Encourage use of alternate transportation
 - » Accessible to public transportation

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- » Addition of bicycle storage and changing/locker rooms
- » Low emitting and fuel efficient vehicles designated parking

This project transformed the existing maintenance center into a more efficient and modern facility. In addition, several sustainable improvements and additions were made, many of which were being used for the first time in the State of Minnesota. For example, Shoreview broke new ground in the completion of Minnesota's first roof water collecting system to wash vehicles. This was the first time this technology had been implemented in Minnesota and there were several complications in gathering permits for the 20,000 gallon rain water storage tank system because there was no code for this type of gray water system in the State.

Community Center/City Hall Building Operations- Although the Community Center/City Hall has competing demands for different temperatures in areas as a diverse 110,000 square foot facility, the City has continuously worked on updating and modifying its control systems to increase our abilities to manage energy demands. These uses range from a pool, fitness center, locker rooms, café area, banquet rooms, office areas, and the Council Chambers. The Community Center is currently implementing an expansion project that will increase the building size by 22,000 square feet and increase associated energy usage as well.

The following sustainability projects have been implemented at City buildings during the past several years:

- » Installed a new Allerton Energy Management system that allows us to regulate temperatures in all different areas of the building based on the planned use and occupancy of these areas.
- » Replaced the chiller with a unit that uses about half of the electricity of the original building unit and received a rebate from Xcel Energy.
- » Replaced the pool pumps in the Tropics Waterpark and purchased a more energy efficient model receiving a rebate from Xcel Energy.
- » Installed four high efficiency boilers for the pool area. Excess heat from the dehumidification process is used to heat the pool space, further reducing the use of natural gas.
- » Use sphagnum moss, a natural plant product from New Zealand, for pool filtration which reduces the amount of chemical treatment needed for the pool and domestic water heater for the locker room showers. This natural product also reduces the amount of mineral build-up that occurs in the pool area, locker rooms, and pool boilers.
- » Replaced 20 500 watt incandescent underwater pool lights with LED underwater pool lights. It reduces the frequency of changing lights from every year to every three years.
- » Installed heat reflective Thermo Plastic Polyolefin film (TPO) roof on the flat roof sections of Community Center/City Hall reducing cooling costs in the summer months.
- » Using more environmentally friendly cleaning supplies throughout the building.

Energy Efficiency- The City has made several low or no cost operational changes to reduce energy costs and increase overall energy efficiency to date. Furnaces within eight park buildings (ice rink warming houses) have programmable thermostats that are set down to 55 degrees except when the facilities are open. Also, as of 2017, all City street lights in commercial areas and collector streets have

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been transitioned from 100 watt high pressure sodium fixtures to LEDs. Many residential street lights have been replaced as well, and staff maintains a continual replacement effort, with a final goal of replacing all City streetlights with LEDs.

Updated streetlight fixtures in residential areas are 40 watt LEDs, which replaced mostly 175 watt mercury vapor fixtures. In the commercial areas and collector streets, 64 watt fixtures were installed replacing mostly 100 watt high pressure sodium fixtures. The 40 and 64 watt LED fixtures have a cut-off design that provides only down light and emits almost no spilled light or light pollution. These lights are expected to operate for 15 years with no bulb maintenance, unlike the high pressure sodium fixtures which require re-lamping every 3-4 years.

Within our City Code, several incentives are offered to builders or developers for choosing more efficient energy features.

- » A density bonus of up to five percent may be given to developments that use passive energy systems on at least 80 percent of the dwelling units.
- » A density bonus of up to ten percent may be given to all energy systems for space heating, air conditioning and/or domestic hot water heating on at least 30 percent of the dwellings/developments that use active energy systems.

The concepts of green building and sustainability are reflective of Shoreview's values and are a common theme found in the Plan's policies. This effort is enhanced through the adoption of the following goals, policies and recommended actions.

GOALS POLICIES AND RECOMMENDED ACTIONS

This section is to establish the framework for the City to help protect the natural resources while promoting resiliency for the City. The goals, policies and actions are broken down into the three groups of Natural Resources, Resource Conservation and Sustainability Operations. These three category breakdowns are part of promoting Resiliency in the City.

Natural Resources

Natural Resources are an important part of the City's future and the following goals, policies and actions are a part of the City's plan to be prepared for the future. These goals, policies and actions may overlap those contained in other sections of the Plan, including Surface Water, Transportation, Parks, and Land Use.

Goals

1. Manage the City's natural resources so that environmental quality is maintained and enhanced for future generations.
2. Maintain or improve the quality of the water, wetlands, urban forest, and other natural features within the City.
3. Provide for development and redevelopment in a manner that protects the City's natural resources and environment.

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4. Reduce air pollution and ensure that land use activities maintain air quality standards.
5. Look for opportunities to combat climate change at the City and its effects on the community

Policies

- A. Protect wetlands by encouraging landscaping buffers of native, undisturbed vegetation.
- B. Promote native vegetation in the shore impact zone as a means to protect water quality, enhance habitat, and discourage geese nuisances.
- C. Continue to regulate floodplain development in accordance with State requirements and to protect life and property.
- D. Minimize impervious surface coverage where practical and relevant.
- E. Support county, state, and federal efforts to preserve rare plant and animal species and unique natural communities.
- F. Preserve remaining mature trees in the community to the extent possible and ensure appropriate replacement trees are planted where trees are removed.
- G. Consider the impacts on air quality and recognize its connection to land use and transportation planning.

Recommended Actions

1. Identify methods to promote environmental education through partnerships with State and County agencies, as well as with educational institutions or non-profit organizations.
2. Work with schools on promoting programs for outreach and promoting resiliency in the community.
3. Continue the City's annual Environmental Speaker Series and Green Community Awards programs to educate the community and highlight residents for choosing to implement sustainable best management practices on their properties.
4. Continue to support efforts by the Minnesota DNR, Ramsey County and the University Extension to control invasive species.
5. Continue to develop City Staff and various commission communications to develop and accomplish these goals and policies.
6. Review options to reduce waste, by possible options of zero waste programs, organic recycling and other possible options.

Water Quality

1. Increase education efforts about the wetland benefits, wetland vegetation buffers, and the long-term impacts of illegal dumping, impacts of residential development on surface water quality, outdoor burning and impact on air quality, in City mailings, newsletter, and other public information outlets.
2. Consider amending the City's zoning ordinance to link allowable impervious surface coverage to

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storm water management improvements. Continue to enforce existing City regulations limiting impervious surface coverage.

3. Continue to use pervious pavers and permeable concrete on City projects where it would make the most impact for stormwater management and improve water infiltration rates.
4. Continue the City's operation and maintenance activities, such as street sweeping, illicit discharge inspections, grit chamber and pond maintenance, which protect water quality.
5. Continue to reduce chloride usage when salting City streets against ice in the winter. Consider amendments to the street plowing ordinance that focus on reduced chloride use for water quality.
6. Continue City efforts to conserve water through watering restrictions, community outreach, and partnerships with organizations such as WaterSmart who work towards water conservation.
7. Consider developing an ordinance to alter regulations for wetland buffers, taking into consideration the wetland classification and purpose, and address other issues involving buffer disturbance and mitigation requirements.

Vegetation

1. Consider developing a long-term plan to replant trees throughout the City, taking care to maintain the age diversity of the urban forest, and improve species diversity.
2. Continue to enforce landmark tree replacement ratios on all development properties, and consider implementing protections for high-value landmark trees outside of the development ordinances.
3. Continue work on the public tree inventory for areas under City management, including streets, parks and open space, and incorporating this information in the City's Geographic Information System (GIS).
4. Continue implementing the City's disease tree program and work towards slowing the spread of oak wilt, Dutch elm disease and emerald ash borer through Shoreview's urban forest.

Wildlife Management

1. Continue the City's participation in the goose capture program as resident geese populations warrant.
2. Continue encouraging native species plantings during new and re-development projects, as specified in the City's landscape ordinance.
3. Consider amending the City's landscape ordinance to require or encourage shoreline buffers consisting of tall, native vegetation.
4. Consider additional native vegetation demonstration projects on City or County property to increase pollinator habitat.
5. Continue the City's management of regulated small private hunts as deer populations warrant.

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Air Quality

1. Consider local air quality impacts when making land use decisions and granting permits to businesses.
2. The City will consider acquiring low-emission vehicles and equipment, installing electric vehicle charging stations at the Shoreview Commons, and installing retrofitting devices on existing vehicles or equipment, as part of its fleet program.
3. Development projects should incorporate buffers, landscaping, erosion control and other design tools to decrease the effects of emissions, dust, dirt and other air contaminants.
4. Reduce motor vehicle trips and vehicle miles traveled through land use planning, staff coordination and transportation planning.
5. Work with the Minnesota Pollution Control Agency and other groups to identify and mitigate any air quality issues in Shoreview, and increase outreach on air polluting activities.

Resource Conservation

Resource Conservation is important aspect for allowing the City to harness potential solar. The following goals, policies and actions are a part of the City's plan to be prepared for the future.

Goals

1. To protect solar access as a means to provide an alternate source of energy for residents and businesses within the community.
2. Finalize the current Maintenance Center solar project bid process, get City Council approval, and complete project in 2018.
3. Consider actively promoting solar energy projects to Shoreview businesses through the Environmental Quality Committee.
4. Consider solar options when constructing or upgrading City buildings and facilities.
5. Continue to encourage and reward residential and business solar projects.
6. Examine opportunities for other solar installations, including community solar gardens, throughout the City.

Policies

- A. Review development proposals in accordance with the City's Development Ordinance requirements for solar access and energy efficiency.
- B. Encourage residents, builders and developers to consider alternate forms of energy, such as solar access during the development process.
- C. Educate residents and businesses of benefits provided by solar energy systems and other forms of energy.
- D. Use the Maintenance Center solar installation as a community example, provided the project gets approved and constructed.

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Recommended Actions

1. Revise the Development Ordinance to support and regulate alternative energy sources including solar energy, wind turbines and other emerging technologies.
2. Review ordinances to adjust incentives for building with more sustainable practices for commercial and residential properties.
3. Provide information materials to the general public regarding energy efficiency, solar access and other forms of energy.
4. Continue educational outreach on solar and energy efficiency topics throughout the community.
5. Evaluate all City building and facility projects for potential solar installations.
6. Promote home loans for energy efficiency in the City.

Sustainable Operations

Sustainable Operations are critical to the future of the City, and the City should look for available options to incorporate or promote Sustainable Operations as much as possible. The following goals, policies and actions are a part of the City's plan to be prepared for the future.

Goals

1. Be prepared for severe weather events with plans and strategies in place for a variety of climate circumstances.
2. Incorporate sustainable practices and green building within the City of Shoreview's local governmental organization.
3. Promote sustainability and green building in the residential and commercial development community.
4. Promote the use of renewable sources of energy in addition to solar.

Policies

- A. Make efforts to monitor climate change impacts within Shoreview and adapt operations and infrastructure accordingly.
- B. Encourage and support the efforts of local organizations, businesses, developers and residents to use sustainable design and green building in their development projects.
- C. To consider and incorporate sustainable design and green building practices, when feasible, for public projects such as road reconstructions, facility improvement and new public buildings.
- D. Encourage and support alternate modes of transportation, including public transit initiatives and travel demand management.

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Recommended Actions

1. Participate in the EnergyStar campaign, and continue to advance up the GreenStep Cities program in order to reduce local government's energy consumption.
2. When considering improvements to public facilities or new construction, incorporate green building, renewable resources, and sustainable design into the review process.
3. Encourage builders and developers to seek LEED, EnergyStar, MNGreenStar or other comparable certifications.
4. Review the City's Development Code and identify obstacles to green building and sustainable design, and amend the Code as needed to remove these barriers. Regulations should promote the use of green building and sustainable design, address how such techniques are integrated into the building and site design, and address the impact on adjoining residential properties.
5. Continue to enforce building code regulations regarding energy efficient building design.
6. Communicate strategies that can help residents and businesses incorporate sustainable and green practices into their daily lives through education and outreach via the City's modes of communication.
7. Consider developing incentives for property owners, business owners, and developers who incorporate green building and sustainable design, into their development and construction projects.
8. Continue to work with the Environmental Quality Committee and other groups such as Conservation Minnesota, and the Sierra Club to promote the benefits of sustainable design and landscaping, as well as green building within the community.
9. Continue to implement the Shoreview Green Community Awards program that recognizes residents who have incorporated sustainable and green practices into their property improvements.