



Chapter 10

Resiliency





Introduction

From the moment settlers arrived, the Rogers landscape has experienced continual evolution. The original composition of woods, wetlands and prairies were plowed under as settlers accessed the highly productive underlying fertile soil for survival and to make a living. As the community grew and expanded, land further evolved as it was transformed from its native habitats, and rows of crops that once dominated the previously altered landscape were replaced by rows of homes and businesses. That same productive land and natural landscapes that made Rogers attractive to settlers are still the same community characteristics that draw commerce and people to the area.

Today, we understand our connection to and reliance on those natural features to play an even greater role in the long-term health and viability of our community. Just as in the early years of Rogers, agriculture remains a steadfast industry for our local economy. Wetlands, natural areas and wildlife habitats provide essential environmental, economic and social benefits. Ecologically, these places enable water storage to reduce or prevent flooding, carbon reduction and sediment removal for clean air and water and help regulate the climate. Economically, natural areas contribute to lower energy costs, improve property values and support job creation. Socially, accessible open spaces promote physical and psychological health of those that live and work here, thereby reducing health costs, and contribute to the identity of our community by creating a sense of place.

Rogers is fortunate that its open areas and natural features remain abundant and vibrant, and a critical part of the community fabric. With continued growth projected, the value of these places to the health and well-being of our people and prosperity of our local economy are essential to our overall quality of life. The inter-dependency of these systems on each other means our **resiliency** and **sustainability** efforts over the long-term shall depend on goals, policies and outcomes that preserve, protect, restore and enhance our natural, built and social environments.

Key Definitions

Resiliency: *The ability to respond, adapt and thrive under changing circumstances, including changes to weather- and climate-related, environmental, economic or societal or other factors that can be addressed by accessing available resources to minimize the impacts of and recover quickly from the adversity facing the community.*

Sustainability: *Meeting the environmental, economic and societal needs of today without compromising the future needs of future generations.*

Adaptation: *Process of adjusting to actual or expected climate and its effects.*

Mitigation: *The intervention to reduce the sources and enhance the sinks* of greenhouse gases and other environmental impacts.*

**Sinks are features or elements that consume or remove chemical from the atmosphere. Trees and vegetation are sinks for carbon dioxide as they grow - the vegetation absorbs CO₂ and converts it to oxygen.*



Efficient Development

The Rogers population and employment base is expected to nearly double by 2040. This will increase the demand for further land consumption and place considerable stress on the City's limited financial resources. The pressure for new homes and jobs will necessitate the expansion of transportation systems and utilities. As discussed throughout the Rogers 2040 Comprehensive Plan, the City is preparing to seize opportunities to reimagine already developed areas, reusing existing infrastructure, and encouraging creativity with development designs. The value of open space to the community, home buyer trends and access to greater and more attainable housing options, and shifting lifestyle preferences create an opportunity to reimagine previously developed areas, especially Downtown Rogers and places immediately adjacent to I-94 and Highway 101.

The projected growth areas in Rogers are considerably south from existing municipal utility services and the I-94 travel corridor. As greenfield development sites, growth in those areas are largely inevitable as there is space available to accommodate a growing population and development costs are likely less than potential redevelopment within the Rogers urban core. The outward migration of the population will increase traffic miles traveled, contributing to a greater carbon footprint and increased energy consumption. As those areas are disconnected from the main commerce, recreation and employment centers for Rogers that growth also contradicts the demand for walkable neighborhoods that are conveniently connected to services and local destinations. The City, working with landowners and developers, shall maximize land resources on greenfield sites by applying similar smart growth principles and practices to be used on in redevelopment areas within the current Rogers residential and employment centers.

Flexible Growth & Renewal

Across the Twin Cities metropolitan area, the conversion of greenfield sites has lessened as the regional focus has shifted inward to the redevelopment of urban core. The projected doubling of the Rogers population, along with changes in trends and community demands, will require new greenfield development to accommodate that growth as well as provide a wide array of housing options. Yet, regionally and locally there is increasing demand for walkable, better connected housing and neighborhoods that integrate community and life experiences into places people live and work. The generations influencing urban revitalization are the Baby Boomers and Millennials. The trend in urban reinvestment has been multi-family housing that have access to urban amenities, nearby shopping and travel corridors. On the business side, evolving consumer trends and how we work have changed retail and our workplaces. Both consumers and workers are looking for places that offer unique experiences for shopping, entertainment and recreation within the living and working environment. That drive for a sense of place and connection to our communities is ever-present in Rogers. Downtown Rogers, specifically, is one area in the community well-positioned to provide those kinds of experiences. Achieving that vision will require open thought and flexibility on the part of the community.

Redevelopment, Infill & Reuse

Reuse of previously developed areas in Rogers affords the City many benefits. Whether redevelopment or infill (building on empty or underutilized lots), reimagining and remaking those areas reduce land consumption by allowing for more efficient use of the existing land by promoting compact development and the mixing of land uses. Rebuilding in previously built areas, such as Downtown Rogers, for example, enables the City to seize on opportunities to respond to market trends and demands to create new housing types and provide for more attainable housing options, and use existing infrastructure. The addition of housing near or within existing commercial districts breathe new life into these areas by allowing people to live closer to where they work or shop, and to the services they require. Increasing people and households in those areas also stimulate business



expansion and create new job opportunities. Integrating land uses also enables the City to promote healthy, active living of its residents, and moderate environmental impacts by reducing carbon emissions by decreasing vehicle miles and opening the door for new transportation opportunities. Financially, renewal efforts add new value and vitality to these areas, thereby stabilizing the existing tax base, and making the most of previous public investments in things like streets, utilities and emergency services. These same arguments apply to the development of greenfield sites.

Because the community assimilates its identity to its natural areas and rural context, preserving those open spaces are of environmental, economic and social importance to Rogers. Whether new development, or rebuilding and reinvesting in previously developed areas, the City shall encourage building and site efficiency and sustainable construction goals that protect and restore natural areas, and use them as amenities for the development. Enacting this vision will require the City to examine its regulations and streamline the project permitting and approval process so that development decisions are more timely, cost-effective, and predictable for developers. With redevelopment projects, the City will look to partner with land owners and developers to gain control property through land assembly and identifying ways to reduce development costs, whether through public assistance locally or in the form of grants or other funding sources that support redevelopment.

Environmental Quality

Maintaining a physical and social connection to the open spaces and natural areas is critical to the long-term viability of the community. Preservation of these treasured places shall define who we are and what we value, which is the health and prosperity of our people, economy and environment. Whether active parks and recreational areas or untouchable natural areas, the quality of our urban and rural landscapes contribute to our active lifestyles, stable property values, and healthy habitats that support wildlife and native plant growth. The City of Rogers shall strive to mitigate the impacts of human consumption of land and resources to improve the quality of our natural and built environments.

Healthy Environments

Urban Tree Canopy

The urban tree canopy in the City of Rogers is in need of attention. The conversion of land from its original natural landscapes to productive farmland and to satisfy the needs of a growing community has left Rogers with smaller, remnant pockets of woodlands. Developments require landscape plans, including the planting of trees. Yet, a greater, more concerted effort is necessary. A healthy urban tree canopy is one that is comprised of a diverse range of species and dispersal throughout the community. To create a resilient tree canopy, the City can monitor the inventory of tree species throughout the community, being mindful of species that may be susceptible to diseases, such as the Emerald Ash Bore.

The benefits of preserving existing trees and wooded areas as part of new development, and expanding the overall tree canopy throughout Rogers would boost community-wide benefits. Trees increase neighborhood and the overall community aesthetics. They enhance property values, and proper placement on a residential property can help reduce energy costs by providing much needed shade. A tree canopy also provides healthful benefits by reducing exposure to harmful ultra-violet rays that cause skin cancer and, with temperatures up to 20 degrees cooler in the shade, trees provide a refuge from heat stroke and heat exhaustion. Research further shows trees have other healthful benefits as they can help decrease mental stress, encourage walking and active living, and mitigate the negative impacts of noise by acting as a sound barrier.



Waste Reduction

According to the U.S. Environmental Protection Agency, in 2013 Americans generated about 254 million tons of trash, and recycled and composted another 87 million tons of materials. On average, this equated to 4.40 pounds of trash per person per day, of which 1.51 pounds was recycled and composted materials. Hennepin County has established goals through 2023 to recycle 75 percent of waste, and by 2030 send zero waste to landfills. Often times the inability to reach waste reduction goals is the result of inadequate facilities at multi-tenant properties, poor access to programs and services that enable recycling, lack of local enforcement, and the need to educate residents and businesses what items they can recycle or compost or donate for reuse. The City shall review its existing waste management policies to identify opportunities to improve its efforts to reduce waste. The City shall also take advantage of County and State programs to increase awareness of recycling programs, and enable multi-family buildings and businesses to seek assistance to complete operational assessments to improve waste-reduction and cost-savings efforts.

Water Quality

Wetlands, lakes, rivers and streams are abundant in Rogers. They are not only provide valuable habitat that support our wildlife and natural ecosystems, but also create a variety of recreational opportunities. High-quality water resources also play a major role in our local economy and livability of our community. The three lakes in Rogers – Cowley Lake, Henry Lake and Sylvan Lake – are all listed as impaired bodies of water by the Minnesota Pollution Control Agency. Thus, management of our wastewater and storm water systems are critical to the health and viability of our water resources. Where close to impaired water bodies, and where possible, the City shall work with property owners to ensure septic systems are functioning properly and ultimately connected into the municipal wastewater system as that service becomes readily available. The City shall also continue to partner with local and state water resource management agencies to comply with standards and practices to prevent further degradation of the community's water bodies. The City may also consider local policies that support pollutant reduction, increase impervious surfaces and encourage water reuse.

Air Quality

According to the U.S. Parks Service, air pollution comes from four main sources: mobile (vehicles), area (farm fields and cities), stationary (power plants and factories), and natural (wind-blown dust and weather). Each of these influence the air we breathe. The U.S. Environmental Protection Agency cites mobile sources, specifically the automobile, as the primary contributor for more than half of all air pollution in the United States. That pollution created by the human consumption of fossil fuels influences greenhouse gases, which in turn contributes to our changing climate and impacts our air quality. For Rogers, the ability to re-energize existing developed areas will not only capitalize on evolving lifestyle preferences, but also help the community reduce its carbon footprint by reducing vehicle miles and planning for alternative modes of transportation such as public transit and electric vehicles by providing charging stations.

Healthy Lifestyles

Active Living

Simply put, **Active Living** is the ability for people to integrate physical activity into daily routines to create healthy habits. That activity might be purely exercise, or it might be an alternative commuting option between home and school, work or shopping. Changing lifestyle preferences have increased our environmental awareness as to the importance of healthy environments for our ecosystems and economy. Likewise, those changing lifestyles have changed how and where, and have we live by renew our relationship between healthy, accessible environments and the physical and social fitness of our community.



Inactivity is greatest in rural areas, and among people of color, older adults, persons with disabilities and persons in lower income groups. This is largely due to access limitations caused by proximity between home and work and recreational areas, for example; income; or physical barriers that make it difficult for people to access those facilities. As the Rogers population and workforce evolve in age and composition and means, access to places and programs that enable physical activity at little to no cost will be especially important and beneficial to the long-term health of the community. Rogers has established a vision, strategies and goals for **Active Living** in Land Use, Housing, Parks and Transportation chapters aimed at preserving and maintaining access to open spaces, enhancing community parks, and building safe, accessible pedestrian and bicycle facilities that connect people to places. Cultivating a healthy community is an important part of developing resilient and sustainable community.

Climate Response

Regional Trends

Climate trends in the Twin Cities metropolitan area are consistent with expected impacts of a changing climate. According to the Minneapolis Climate Action Plan, average annual precipitation has increased 20 percent since the middle of the 20th Century, mostly due to a significant increase in heavy precipitation events. Air temperatures are increasing and are compounded in the metropolitan area by the urban heat island effect. Globally and locally, climate change poses uncertain threats to the environment and resource-based economies.

Regional Guidance

The Metropolitan Council requires communities to address climate change, energy systems, and resilience in their Comprehensive Plans. As opposed to sustainability, a resilience mentality recognizes that climate change is unavoidable, even if global fossil fuel emissions stopped tomorrow. The Intergovernmental Panel on Climate Change describes resilience as: *the ability of (a community) to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions.*

Responding to climate change at the local level requires mitigation and adaptation. Mitigation strategies seek to minimize contributions to climate change by reducing emissions directly and increasing the capacity of carbon sinks to absorb greenhouse gases. Adaptation involves changing goals and policies to adjust to the effects of climate change. Through mitigation and adaptation, Rogers can build up its climate resilience.

State Guidance

In 2007, the State of Minnesota adopted the **Next Generation Energy Act**, outlining its goals to reduce carbon emissions and increase the capacity of renewable energy. After 10 years, the State is on target to achieve its renewable energy objectives. Now, under the **50 by '30 plan**, the State aims to double its goal to achieve 50 percent renewable capacity by 2030. Accelerating the transition to renewables will improve air quality, generate new energy jobs, and further drive down the cost of renewable energy.

Climate Change Mitigation

Mitigating climate change involves reducing the volume of harmful emissions that are generated in Rogers. The planning strategies for Rogers follow two paths to reduce carbon emissions: **1. Reduce total energy usage; and 2. Increase share of energy that is generated by renewable sources.**



The community can minimize total energy usage through efficient development practices. Land use patterns play a significant role in determining vehicle miles traveled. Recognizing the influences of suburban-market development, Rogers supports orderly, compact development located next to existing development as well as redevelopment and infill as means to meet its community density targets and mitigate sprawl. Compact development minimizes energy needs – for example, by limiting energy required to pump water and wastewater – and is conducive to multimodal travel, including transit, walking, and bicycling. The 2040 Plan identifies several improvements to the local trails network that will further support alternative modes. Rogers will work to reduce vehicle miles traveled by developing local employment and housing opportunities that improve the work/housing balance and increase the share of residents that are retained in the local workforce.

In addition to reducing the impact of source emissions, Rogers is committed to strengthening the role of renewables in its energy portfolio. There are many opportunities to partner with federal and state utility programs that incentivize power generation by wind and solar. By developing a diverse supply of local and regional energy sources, Rogers can prepare for potential electrical outages and other economic shocks.

Renewable Energy Objectives

One of the biggest ways Rogers can build resilience for its long-term future is to increase its utilization of renewable energy and maintain consistency with the **50 by '30 plan**. Increasing electricity usage that is generated from renewables will decrease emissions and help insulate the City against potential economic shocks.

Solar energy is the most abundant energy source in Minnesota. There are many opportunities to promote solar buildup by the public and private sector, develop solar potential in rural Rogers and purchase solar electricity that is generated outside the City.

On-Site Solar Energy Potential

Figure 10.1 depicts an estimate for gross (total) insolation potential. This is the amount of direct-sunlight energy, in watt-hours per year that is received per unit area, given the height of the sun throughout the year and environmental limitations (i.e. wetlands, forests and shadows cast by tall buildings). Approximately 10% of this energy could be captured and put to use through local solar energy systems. With abundant open space, a lower-density development pattern, and low building heights, most of Rogers has high solar potential, excepting forests and wetlands.

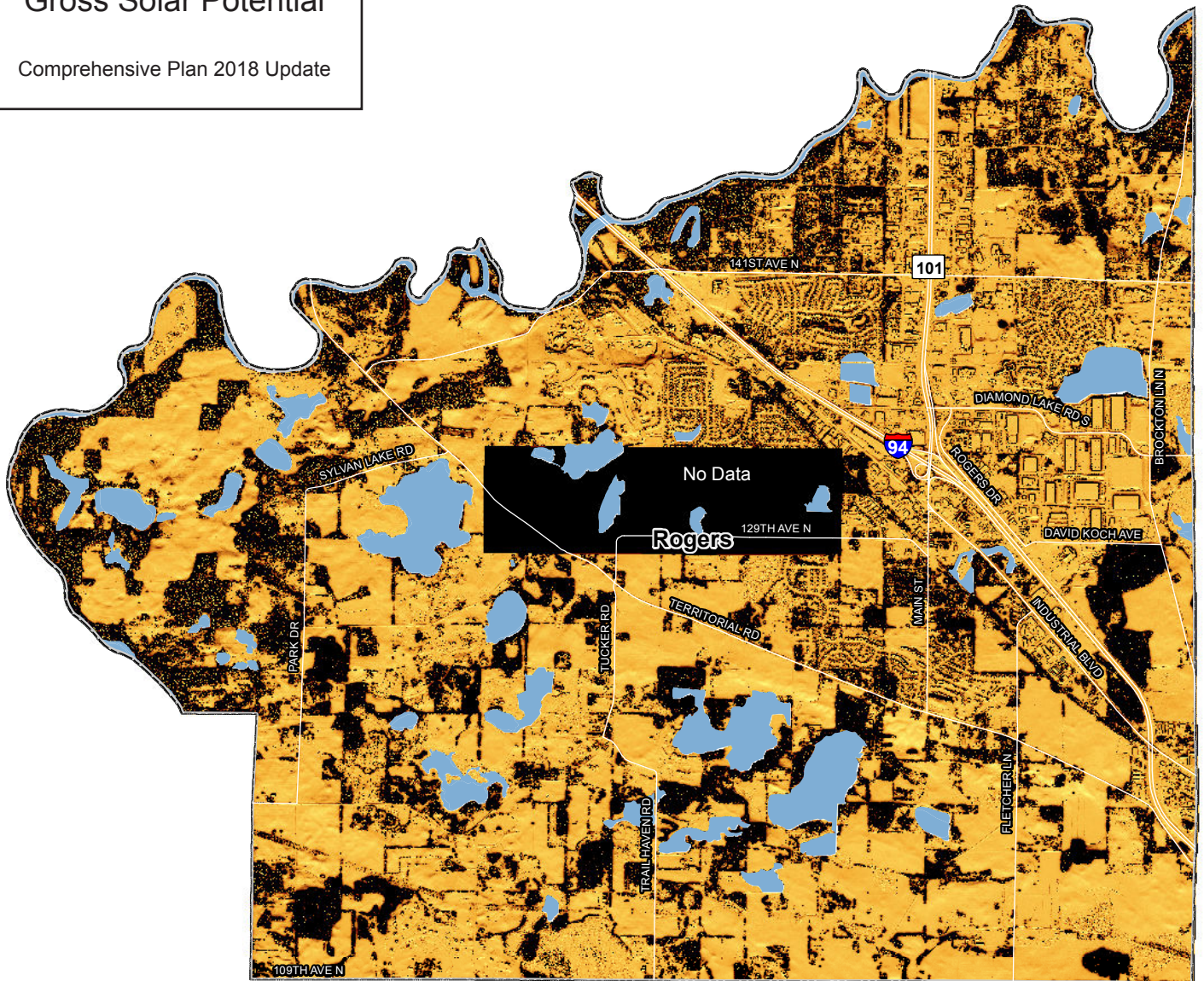
Solar Resource Calculations were developed by the Metropolitan Council that examine the estimated solar potential within the community. **Table 10.1** provides the gross potential for solar generation, but are not intended to demonstrate the amount of solar likely to develop within Rogers. Instead, these totals estimate the total potential resource before removing areas unsuitable for solar development or factors related to solar energy efficiency.

Table 10.1: Rogers Solar Potential

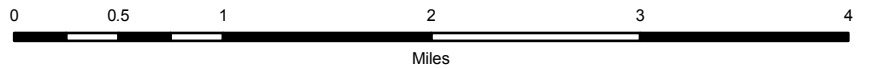
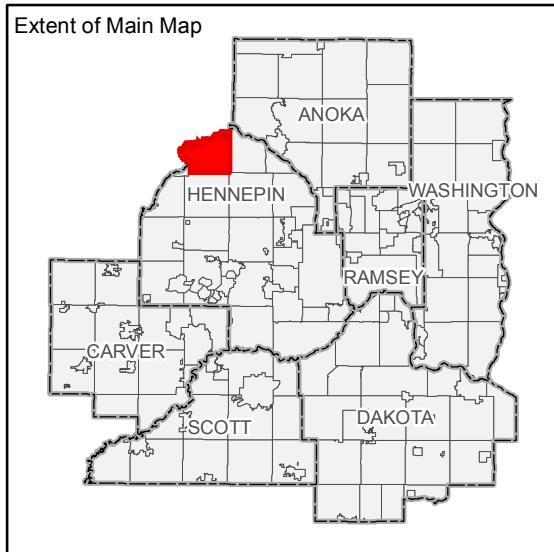
Gross Potential (Mwh/yr)	Rooftop Potential (Mwh/yr)	Gross Generation Potential (Mwh/yr)	Rooftop Generation Potential (Mwh/yr)
48,811,583	1,391,797	4881,158	139,179

FIGURE 10.1: Gross Solar Potential

Comprehensive Plan 2018 Update



1/5/2017



Gross Solar Potential (Watt-hours per Year)

High : 1269498
Low : 900001

Solar Potential under 900,000 watt-hours per year

County Boundaries

City and Township Boundaries

Wetlands and Open Water Features

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



The Metropolitan Land Planning Act (M.S. §473.859, Subd. 2) requires that local comprehensive plans include an element for the protection and development of access to direct sunlight for solar energy systems. The City will protect such access by through regulation of lot sizes, amounts of open space, setbacks and building heights. Development should not preclude the possible use of solar energy systems. Currently, the structure setback and height standards within the Zoning Ordinance are sufficient to prevent potential interference to solar collectors from adjacent structures and vegetation. If necessary, the City will review and revise the Zoning and Subdivision Ordinances to ensure protection of solar access.

Solar energy systems are a permitted use in all Rogers zoning districts, subject to approval by the zoning administrator. In accordance with Minnesota Statute, any property owner may purchase easements across nearby properties to secure access to sunlight.

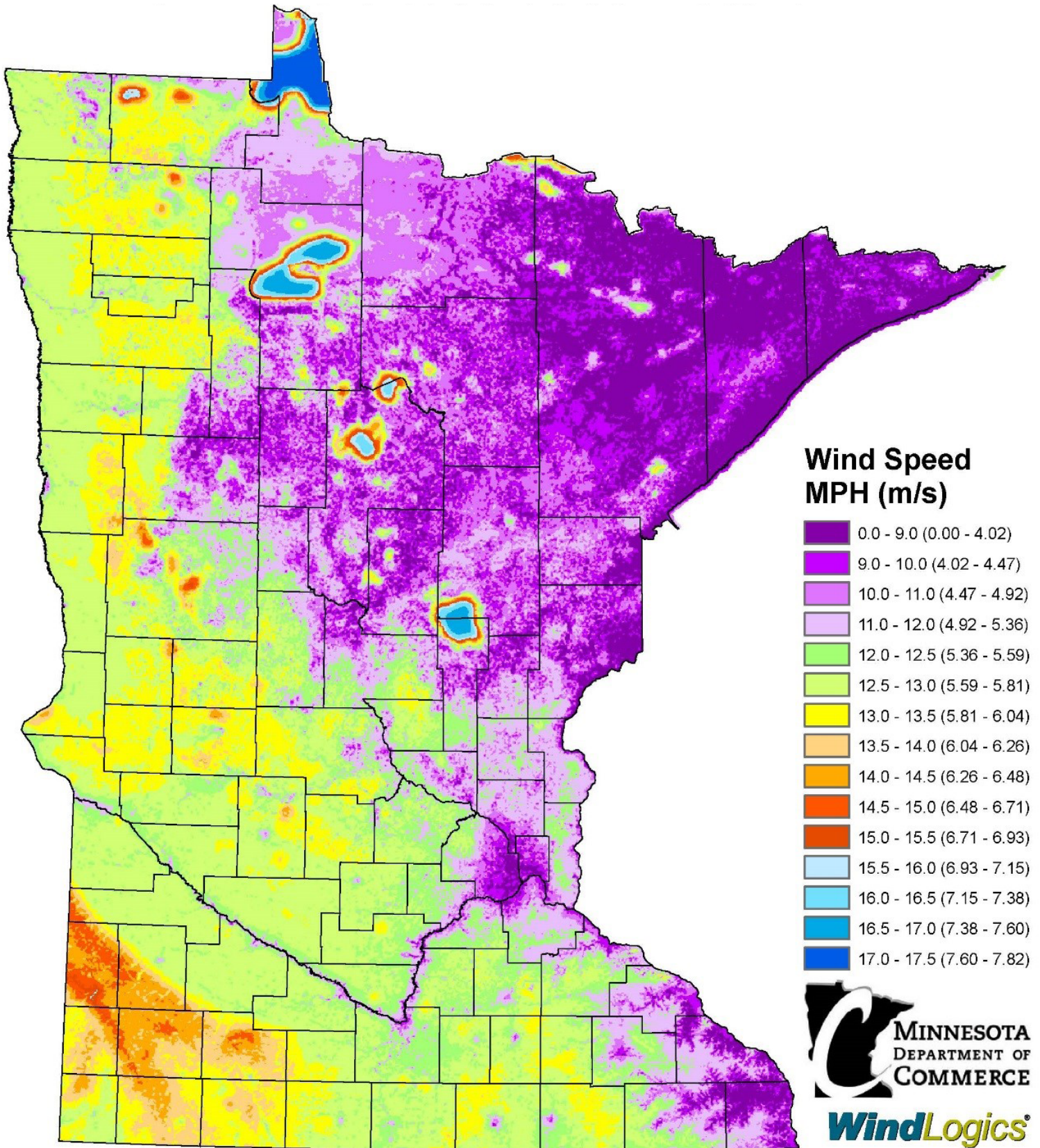
On-Site Wind Energy Potential

Figure 10.2 depicts statewide suitability for wind potential. Generally, wind speeds are greatest in rural areas, where there is more vegetation and surface water to aid circulation, and fewer buildings to act as wind breaks. As a transitional development area, wind speeds in northwest Hennepin County have slightly higher wind speeds, on average, than in eastern Hennepin County and the rest of the Twin Cities metropolitan area. For small wind turbines to be economically viable, wind speeds should average at least 11 to 13 miles per hour. The average wind speeds for Rogers fall in this range but do not exceed it. At a high level of analysis, Rogers has average suitability for wind, but solar appears to be more promising.

Rogers adopted an ordinance, permitting small wind energy conversion systems, including wind charges, windmills and wind turbines. Towers up to 130 feet are permitted as an accessory use in all industrial and agricultural districts. A conditional use permit is required for all proposed systems that exceed electrical production of 20 kilowatts.

FIGURE 10.2: Wind Energy Potential

Comprehensive Plan 2018 Update



This map has been prepared under contract by WindLogics for the Department of Commerce using the best available weather data sources and the latest physics-based weather modeling technology and statistical techniques. The data that were used to develop the map have been statistically adjusted to accurately represent long-term (40 year) wind speeds over the state, thereby incorporating important decadal weather trends and cycles. Data has been averaged over a cell area 500 meters square, and within any one cell there could be features that increase or decrease the results shown on this map. This map shows the general variation of Minnesota's wind resource and should not be used to determine the performance of specific projects.

January 2006