2040 Washington County Comprehensive Plan

Frozen floodplain in Afton

Chapter 9 – Resilience and Sustainability

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Executive Summary

The world today is changing more rapidly than ever before: severe weather events are becoming more frequent, our communities are becoming more diverse, and our systems and political climates are evolving. These changes, and those that will continue to occur, will require communities to be well-prepared and adaptable, to be successful for generations to come. For Washington County to continue to be a great place to live, work, and play, it is crucial to develop and maintain sustainable and resilient systems.

Resiliency means having the capacity to respond, adapt, and thrive under changing conditions and realities. It seeks to address how communities can reduce the vulnerability of individuals and local systems to the impacts of changing weather, climate, and environmental, societal and economic challenges. This involves not only preparing for the impacts of natural or man-made disasters and reducing greenhouse gas emissions, but also adopting policies to reduce energy consumption and automobile dependency, protect valuable infrastructure assets, and preserve open space and natural resources, among others. In short, resiliency is focused towards increasing a community's ability to survive a sudden disruption and to anticipate, adapt, and flourish in the face of change.

Balancing resilient and sustainable communities must also be viewed through a social equity lens. In that respect, communities should ensure all people can live healthy lives by expanding their choices for things like homes, jobs, healthy food options, and recreational opportunities. The Resilience and Sustainability chapter has recognized some of these challenges by identifying potential demographics (e.g., race, class, age, and education attainment) that are more at risk, and most likely to be negatively impacted during times of change. These disparities are further recognized by embracing the region's goals for a more prosperous, equitable, livable and sustainable future. A community is only as strong as its most at-risk or vulnerable residents. A resilient community is one that recognizes this and actively works to enhance social equity and opportunity for all residents.

The following statement provides further clarification on what resiliency, sustainability and social equity means to the County.

Washington County will strive to maintain its identity, high quality of life, and access to a healthy lifestyle for current and future residents, by embracing resiliency and sustainability in future decision making. Efforts will be made to ensure resiliency through the county's ability to react, adapt and thrive in the face of environmental, social, and economic changes. Healthy and vibrant communities are those that are prepared and have the capacity to evolve. Washington County will support the development of a community that is equipped to respond to change with diverse solutions and redundant systems by enhancing social capital and equity through the sharing of risks and opportunities. The ability to mitigate the effects of these changes and disruptions over a long period of time will protect Washington County's regional vitality for future generations by preserving the capacity to maintain a sustainable future.

The Washington County 2040 Comprehensive Plan integrates resilience and sustainability throughout the plan and in the goals, policies and strategies of the eight chapters. While resilience and sustainability are new concepts to comprehensive planning, these concepts are widely included in current County operations. Elements that support a resilient and sustainable future throughout the Comprehensive Plan are identified with the symbol to the left, with text highlighted in a light green.

The Resilience and Sustainability chapter is dedicated to specifically recognizing four key areas that are linked in some form to a resilient, sustainable and equitable future and are not included in other plan elements:

- Hazard Mitigation/Community Vulnerability
- Healthy Communities
- Energy
- Solid Waste Management

These four key areas are also new to the comprehensive plan; however, they have been a core part of the Washington County's planning activities. Past planning initiatives have included programs and strategies that address themes such as emergency preparedness and community health. The following are examples of these initiatives:

- The adoption and implementation of an *All Hazard Mitigation Plan* and an *Emergency Operations Plan*, based on best practices set by the Federal Emergency Management Agency (FEMA).
- Carrying out a *Community Health Assessment*, *Community Health Improvement Plan*, and promoting healthy activities through partnerships like *Living Healthy in Washington County*.
- The development of the *Washington County Energy Plan*, which promotes policies related to energy reduction in county buildings, modes of transportation, waste removal and water resource management.
- The development of the *Washington County Waste Management Master Plan*, which guides county waste management activities and identifies specific opportunities and challenges important to the county. The plan includes strategies to address from most preferred, such as waste reduction, recycling, organics management, and waste-to-energy, to least preferred such as land disposal.

Hazard Mitigation and Community Vulnerability

Washington County and local community Comprehensive Plans address the projected population and demographic changes in many ways. A critical facet in all aspects of planning for any size population should include consideration of risks and vulnerabilities inherent to Washington County communities and their level of emergency response capabilities.

Preparing communities to be resilient to disasters takes place at both the household and workplace as well as at the local and county level. History has shown that Washington County is vulnerable to the effects of natural disasters such as extreme temperatures, extreme precipitation events, high winds, floods, tornadoes, winter storms and fires. Washington County is also vulnerable to a variety of human-caused hazards such as major transportation accidents, civil disorder, terrorism, and hazardous material events which may present risks to the community through potential exposures in the air, surface water, groundwater or soil.

Climate and Precipitation Trends and Health Effects

While the population of the county is expected to grow and change, climate trends suggest that in the next 50 years Minnesota will experience increased precipitation, hotter summers, warmer and wetter winters, and more severe weather events. Growing seasons are becoming longer, earlier ice-outs and thaws are occurring earlier in the spring, and “mega” rain events are becoming more frequent.

The average annual temperature for the Twin Cities region, including Washington County, is rising. Figure 1 indicates a gradual increase in the annual average temperature for the Twin Cities region from 1873 to 2016. The temperature has been rising 0.5 ˚F per decade, since 1960, with nine of the ten warmest years on record occurring within the last three decades.

The average annual precipitation for Washington County (near Stillwater) is 33.94 inches. This represents a 30-year average (1987-2016) based on data from the Minnesota Department of Natural Resources. The (Washington Conservation District) WCD recalculates this average every year. Figure 2 shows the long-term precipitation since 1891. Average precipitation amounts are increasing as well. On a statewide basis, Minnesota’s precipitation patterns are changing. From 1895-1959, annual precipitation decreased about 0.2” per decade, while from 1960-2016, annual precipitation increased 0.5” per decade. From a regional perspective, the upper Midwest has seen a 37 percent increase in heavy precipitation events from 1928 – 2012. Seven of the fifteen Minnesota “mega rain events” have occurred since 2002. In addition to two major rivers in the county, the St Croix and Mississippi, which already see flood events at varying times, the county also has many land-locked water basins that can cause more localized flooding, particularly during mega rain events.

Figure 1: Annual Average Temperature: Twin Cities Region: 1906-2016

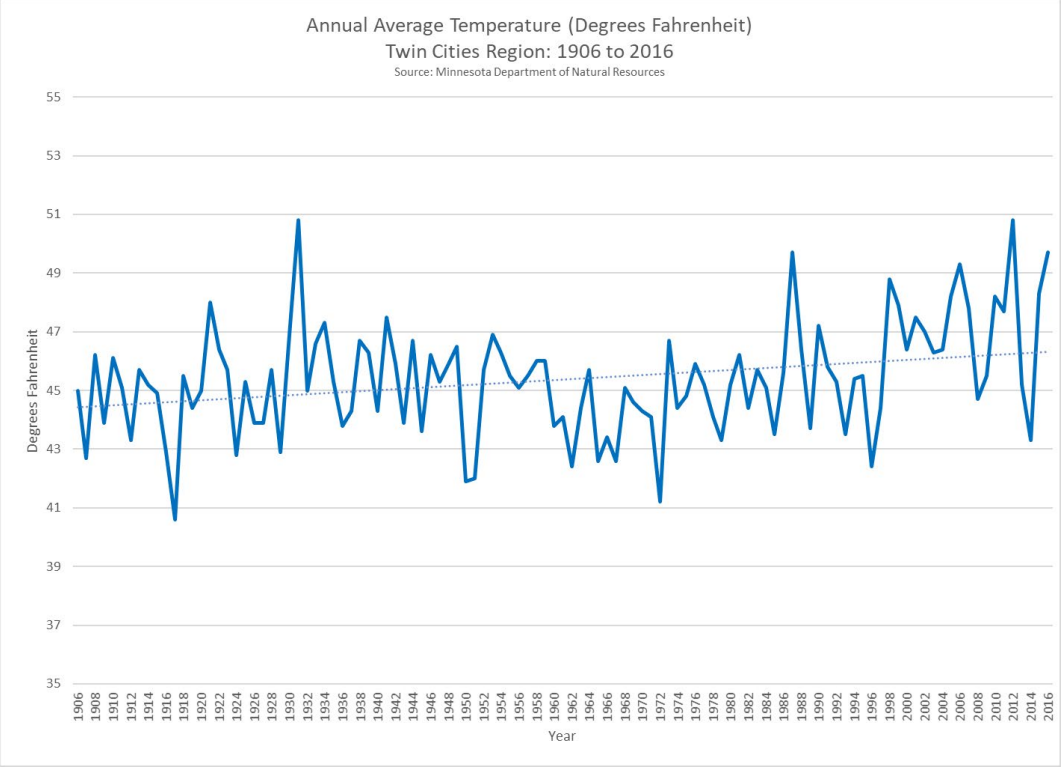
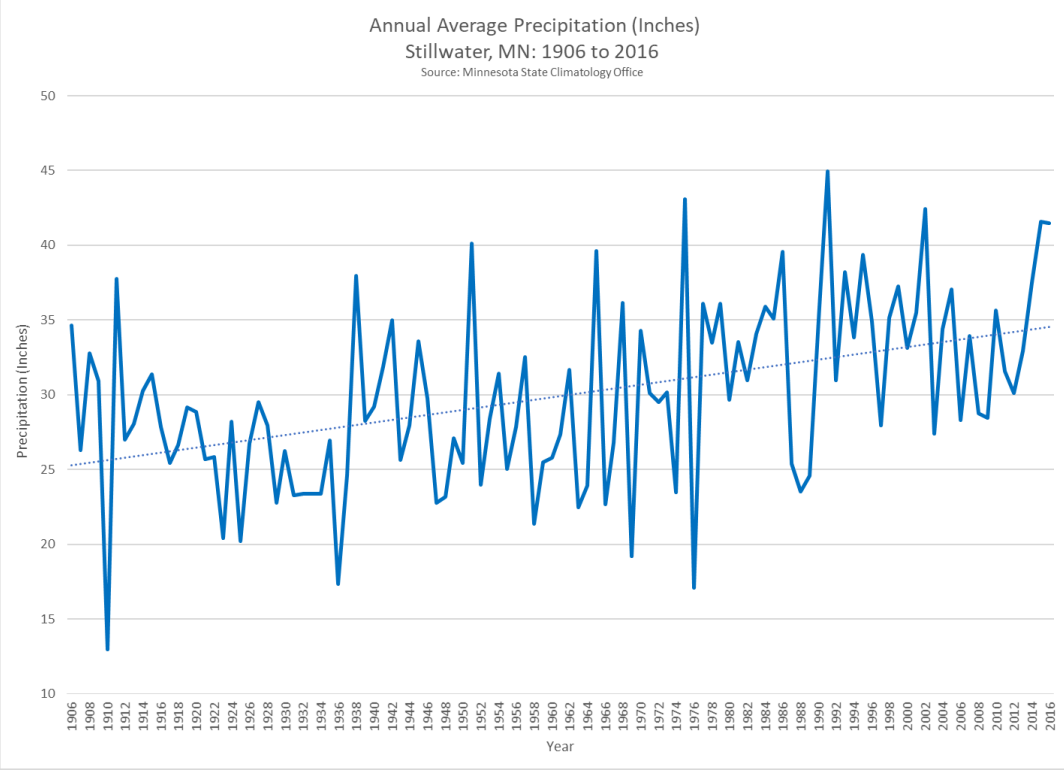
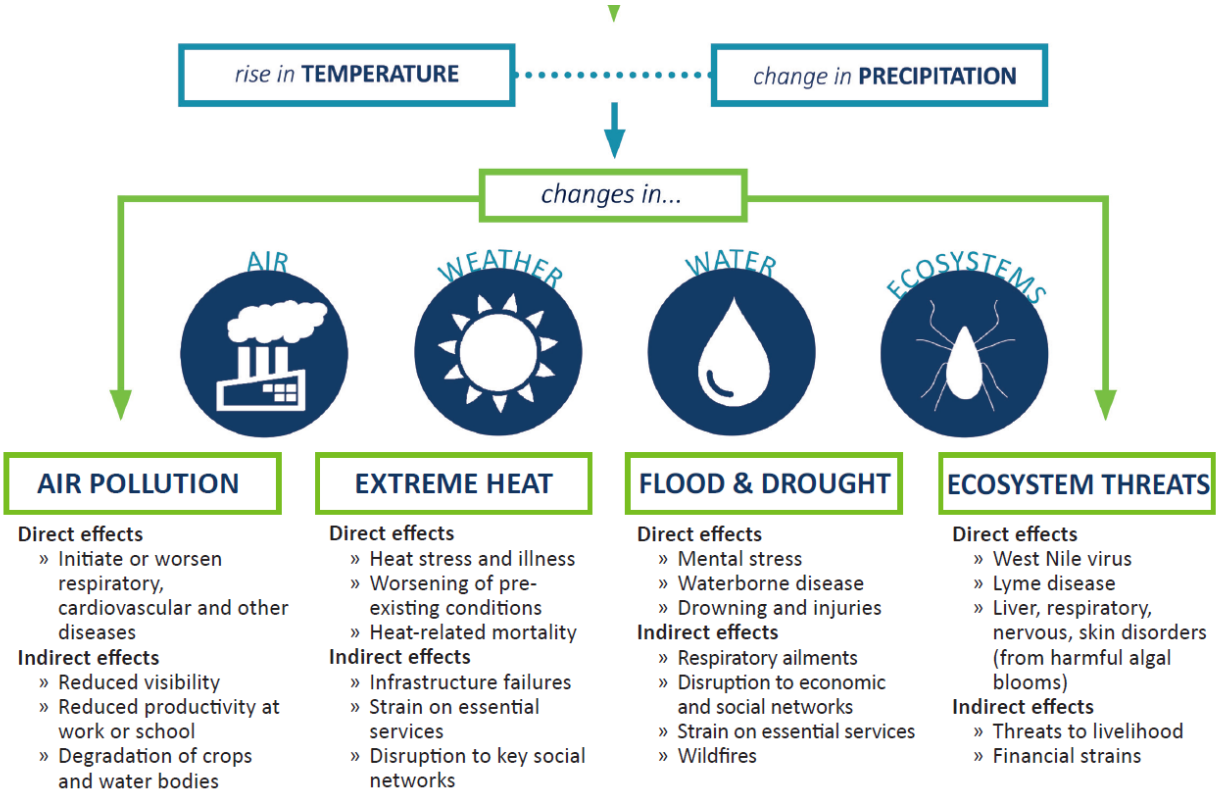


Figure 2: Annual Average Precipitation: Stillwater, MN: 1906-2016



Changes in our climate can lead to direct and indirect consequences for the health of our communities. Rise in temperature and changes in precipitation can lead to changes in air pollution, extreme heat days, flood and droughts, and ecosystem threats. Extreme heat, for example, includes direct effects of heat stress and illness, worsening pre-existing conditions, and heat-related mortality. Indirect effects from extreme heat include infrastructure failures, strain on essential services, and disruption to key social networks. Below, Figure 3 provides an overview of some of the direct and indirect effects expected from these climate disruptions.

Figure 3: Climate and Health Effects



Graphic courtesy of Minnesota Department of Health. See http://www.health.state.mn.us/climatechange/ for more information.

A statewide climate vulnerability assessment conducted by The Minnesota Department of Health (MDH) in 2014 found that Washington County has five to six identified climate hazards, which included events like Lyme disease incidence, extreme heat events, and flash floods. More recently, in 2017, the county participated, along with several local partners, in a resilience workshop hosted by South Washington Watershed District. County staff and stakeholders identified extreme wind, increased rainfall, warmer winter and ice storms as the top climate hazards in the county. In addition, county staff were able to develop recommendations for addressing these hazards. Efforts from this workshop helped identify resilience goals and strategies identified in this comprehensive plan.

Vulnerable Populations

When threats from climate-related events and natural and man-made disasters are considered, evidence has shown that certain populations are more vulnerable than others. These include those who are economically disadvantaged, those with chronic health conditions or disabilities, children, and other groups who require

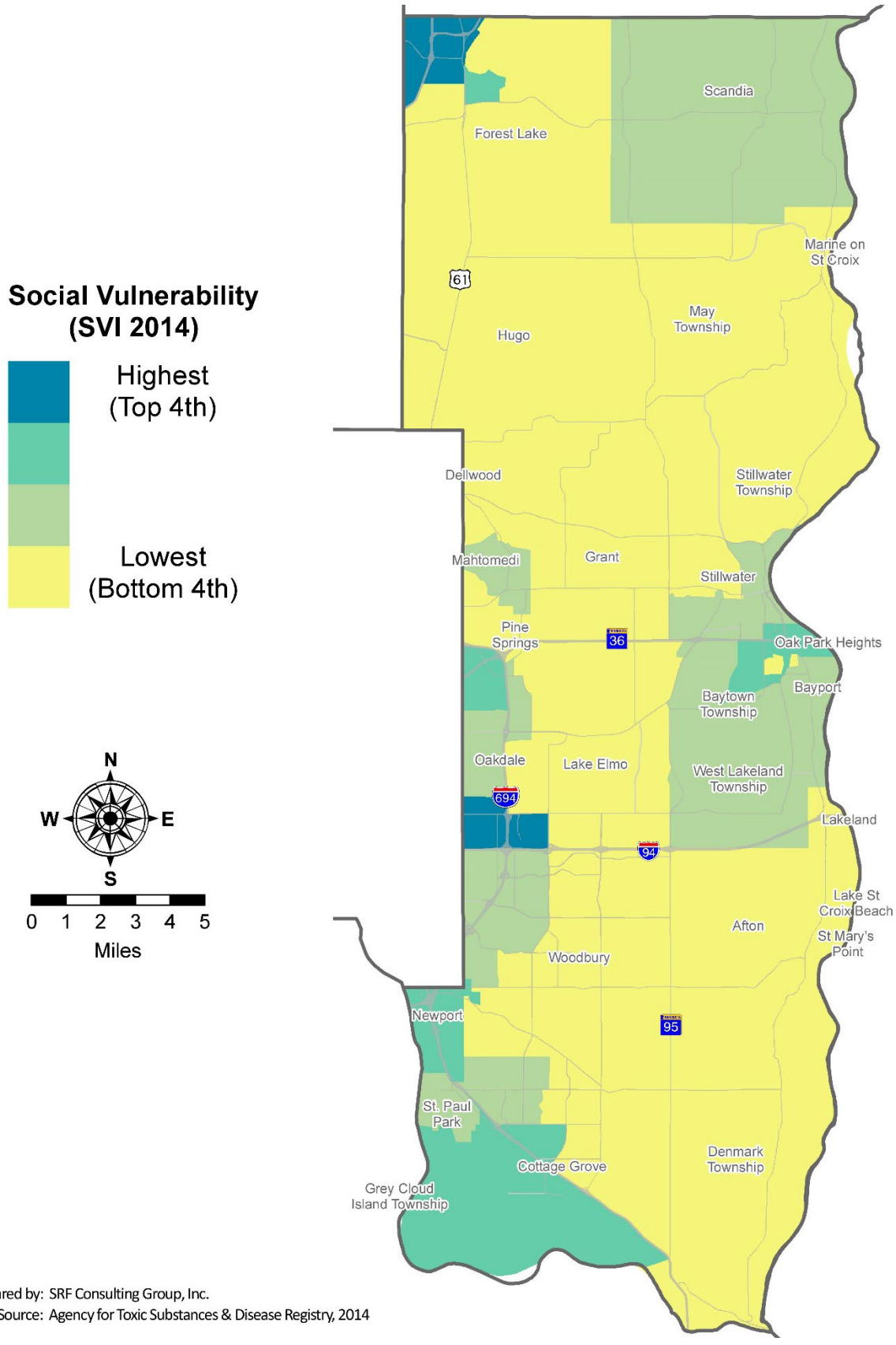
additional assistance beyond that of the more resource-rich population. In emergency preparedness planning, the county and respective communities are tasked with identifying any functional needs of a population, and identifying various vulnerable populations. The elderly, for example, will be more directly affected by certain events, like extreme heat days. Vulnerable populations require additional considerations in all five phases of all hazard emergency events - planning, preparedness, response, recovery, and mitigation.

A report on social vulnerability, compiled by the Center for Disease Control and the Department of Health and Human Services, describes the areas and residents of Washington County most at risk based on the following metrics: socioeconomic status (poverty, unemployment rate, per capita income, high-school diploma attainment), race/ethnicity/language (minority, English Language Ability), household composition (aged 65 and over, aged 17 and younger, single-parent household, aged 5 and over with a disability) , and housing/transportation (multi-unit home, mobile home, density, no vehicle). When these metrics are placed together, Washington County fares well and as a result is one of the least socially vulnerable communities in the seven-county Metro area (see Figure 4). That being said, the county will continue to see demographic shifts including an aging population, and will need to plan for these changes and the needs of these populations.

Infrastructure

One of the most important aspects of maintaining a resilient system is maintaining a strong physical, social and economic infrastructure. The chapters on Housing and Economic Competitiveness discuss resilience and sustainability through the lens of those respective systems. A primary example of contributing to a resilient system includes workforce development for Washington County's growing economy. Ensuring that an available and skilled workforce is critical for the sustainability of the county's economic centers. Our physical infrastructure, both natural and manmade, is at risk from flood events, precipitation changes and other climate trends. The Transportation chapter provides an overview of the county transportation system, and includes a wide range of policies and strategies aimed at strengthening the county's existing road system, while also diversifying opportunities for alternate modes of travel including transit, biking and walking. Building this type of diversity into the transportation system helps add redundancy, a key characteristic of a resilient and sustainable community. Washington County must also consider climate resilience in our water and natural resources management. For example, integrating green infrastructure principles into county plans and projects will help the county and communities address issues related to storm water management, and urban heat island effects.

Figure 4: Social Vulnerability Composite Map of Washington County



Prepared by: SRF Consulting Group, Inc.
Data Source: Agency for Toxic Substances & Disease Registry, 2014

Current Planning Efforts

The communities within Washington County are diverse in size, population, resources, threats, vulnerabilities, and preparedness. The way in which each city and township, as well as the county as a whole, chooses to become more resilient and sustainable may be as diverse as the communities themselves.

Local communities, both in the private and public sector, increase their resilience to disasters through planning, training and exercising. Various Washington County departments organize and run exercises annually to become more efficient at providing necessary support during an emergency event. Communities have leveraged available grants and implemented effective mitigation projects such as installation of an outdoor lightning detection system at a large outdoor gathering space, purchase and installation of backup generators for critical facilities, purchase and installation of outdoor weather sirens, and the building of safe rooms for use in high wind events for slab on grade residential structures, to mention a few. The purchase of repetitive loss structures in communities such as Newport and St. Paul Park as well as the retrofitting of residential homes in other Washington County communities has been an effective way to reduce the impact of past extreme rain and/or snow melt events. The implementation of mitigation projects increases the resilience of a community by reducing or eliminating negative financial, emotional, and social implications caused by a disaster.

Washington County Sheriff's Office maintains an Emergency Operations Plan (EOP) to address planning for, responding to, and recovering from disasters within the county. In addition, a countywide All Hazard Mitigation Plan is kept up to date and compliant with regards to FEMA regulations. This plan identifies past and current mitigation efforts and future mitigation projects for thirty-one cities and townships within the county. In addition, Washington County maintains an annual Threat and Hazard Identification and Risk Assessment (THIRA) both at the county and metropolitan area level. Because the county is subject to a variety of disasters, both man-made and natural in nature, these imperative plans are maintained to provide an effective response to all five phases of disasters – prevention, protection, response, recovery, and mitigation. By planning, training, and exercising plans at all levels, those involved improve their resilience to a variety of emergencies.

Washington County as an organization has and maintains a Continuity of Operations Plan (COOP). This plan identifies the essential functions that must be continued should an emergency occur that creates a challenge to normal daily operations. The process of planning and exercising the Washington County COOP increases the county's resilience to disasters and will likely reduce service interruptions by identifying and addressing potential gaps in continuity. These actions reduce the perceived and actual impacts to the county's constituents and stakeholders.

Healthy Communities

Introduction

The natural and built environment provides the opportunity to support or limit healthy behaviors and active lifestyles. Our health begins with decisions on where to place things such as county facilities and services, transit routes, parks, trails, and highway investments. County operations, public entities and community organizations and businesses should be encouraged to consider community health as early as possible in the decision-making process to ensure all residents can lead healthy lives. The health in all policies approach recognizes that

community leaders, planners and engineers are in a unique position to improve the county's health by shaping the environments where people live, work and play.

The Minnesota Department of Health (MDH) and the Metropolitan Council have recognized the impacts the built environment can have in achieving healthy communities and have identified numerous practices that can be implemented to promote a healthier environment for our residents. Comprehensive planning can draw upon these connections and put policies in place to support healthy communities. However, the county's role in shaping the built environment from a healthy community's perspective may be limited in certain areas, such as land use control. Therefore, the Washington County Comprehensive Plan has started the healthy community discussion by recognizing existing programs and initiatives, as well as highlighting health inequities, chronic disease prevention (e.g., active living and tobacco use) and access to healthy foods.

Existing Conditions

Existing Plans and Efforts

Washington County is part of a larger statewide effort to make long lasting and economic health impacts. This program is known as *Living Healthy in Washington County (LHWC).* LHWC helps create health-friendly policies, while providing resources that make it easier for residents to incorporate healthy actions into their daily routines. This partnership is supported by the Minnesota State Health Improvement Partnership (SHIP), a statewide funding program. From better nutrition in schools, child care facilities, emergency food programs and homes to more physical activity and reduced tobacco exposure, LHWC strives to make positive difference across the community for all ages and abilities.

Washington County also tracks and monitors the health of the county from a public health lens. In this way, the county's overall health is defined based on various health metrics such as rates of chronic disease, drug and alcohol use, and access to nutritious food options, to name a few. These findings are primarily detailed in the following documents: **Community Health Assessment (CHA):** The CHA is updated every five years. The CHA discusses a wide array of information about the conditions and factors affecting health, as well as indicators of population health status. It represents a snapshot in time of the health of people and environments in Washington County, and identifies the top health priorities for community action.

- **Community Health Improvement Plan (CHIP):** The CHIP is a long-term, systematic effort to address public health priorities identified in the county. The CHIP is used by the Department of Public Health and the Environment (PHE) and community partners to set priorities, coordinate resources, develop policies, and sets actions to protect and promote health.
- **Metro SHAPE 2014 Adult Survey:** Metro SHAPE is ongoing metro-wide public health surveillance and assessment project to periodically survey and report on the health of children and adults. Figures 5 and 6 show the demographics of 2014 Metro SHAPE survey respondents.
- **Targeted SHAPE Sample:** In 2014, the county conducted an oversample of low income and vulnerable populations in the county, which, as indicated in Figures 5 and 6, are not typically well represented in the overall Metro SHAPE survey. Results from this targeted sample provided a unique window into health behaviors and disparities of low income and underserved communities within the county.

Figure 5: Demographics of 2014 Metro SHAPE Adult Survey Respondents

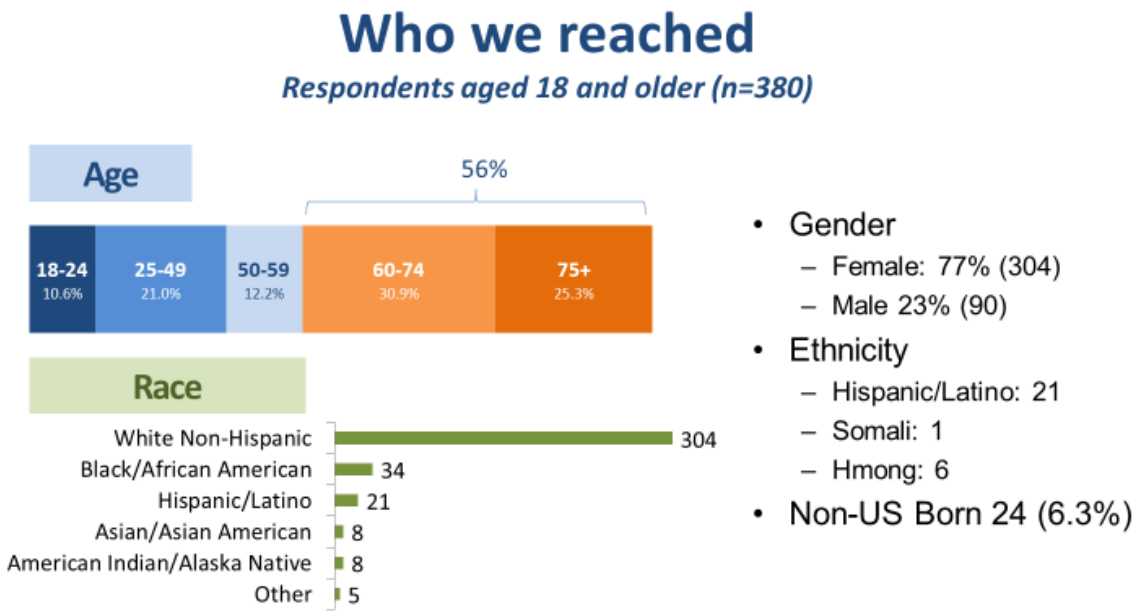
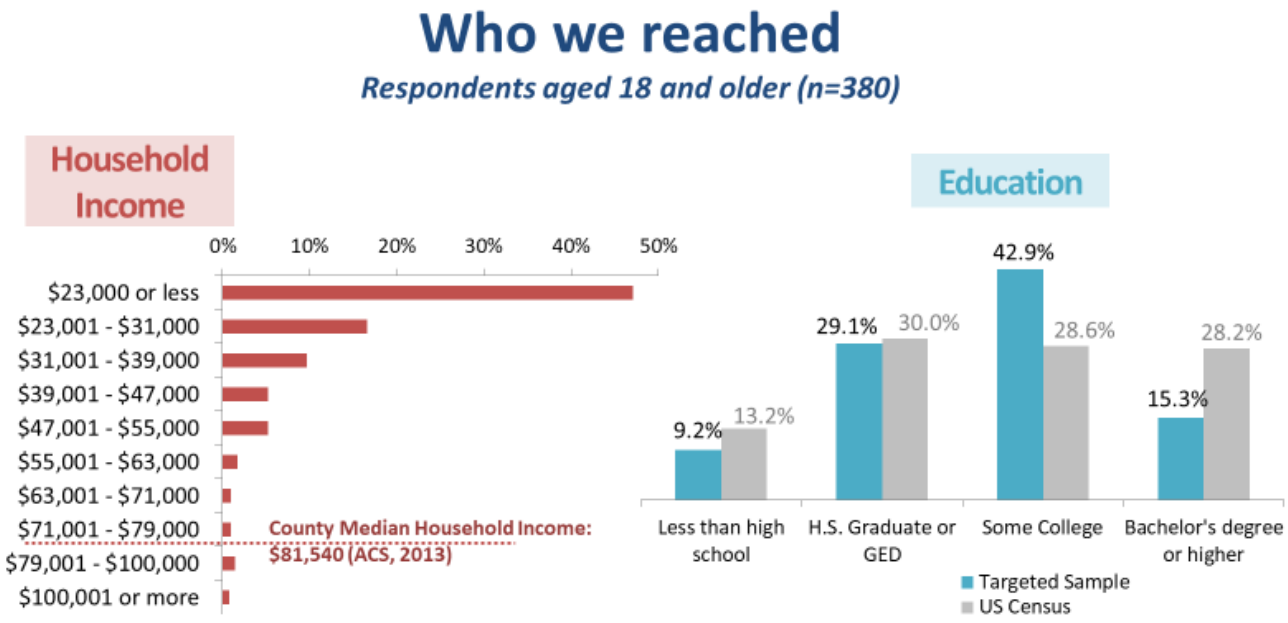


Figure 6: Income and Educational Attainment of 2014 Metro SHAPE Adult Survey Respondents



In recent years, Washington County has also embraced healthy community themes in transportation plans. An example includes the Health Impact Assessment (HIA) completed for the METRO Gold Line (previously known as the Gateway Corridor). The HIA serves as a resource for those seeking to protect and promote health through evidence-based land use decisions along the Metro Gold Line.

Health Data and Health Disparities

Although Washington County consistently ranks as one of the healthiest counties in the state, some residents in the county are still affected by poor health. Age, race/ethnicity, income, and mental health status all impact opportunities for individuals to maintain or improve their health. Thus, Washington County will be challenged to find ways to prevent these differences from creating higher health risks and poorer health outcomes for residents. These findings are documented in the County's CHA and CHIP, Metro SHAPE 2014 Adult survey, and the targeted Metro SHAPE survey, in addition to other public health resources. Below are a sample of these data points regarding existing conditions:

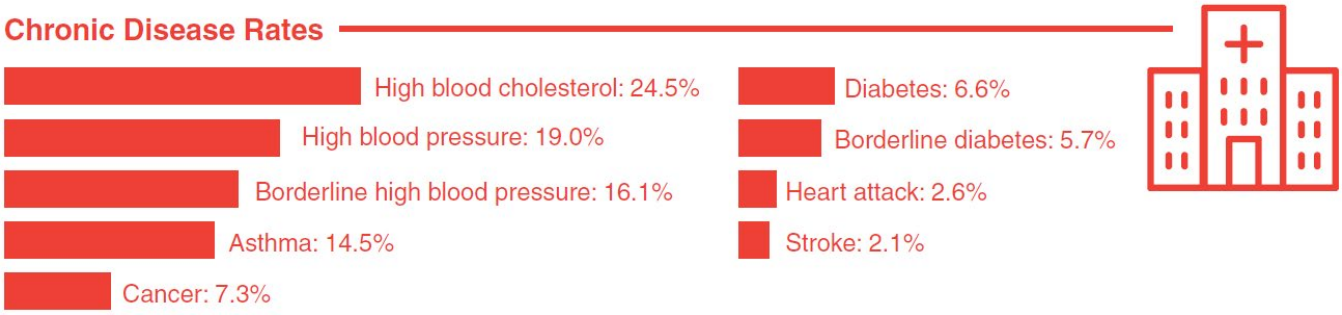
- Washington County is 3rd best amongst Minnesota counties in overall health factors in 2017 (health behaviors, clinical care, social and economic factors, and physical environment).[1]
- Fourth amongst Minnesota counties in overall health outcomes in 2017 (length of life and quality of life).[2]
- Low percentage of residents who are uninsured (6.9 percent within Washington County versus 10.3 percent statewide in 2010).[3]
- Good access to healthcare (one primary care physician for every 897 residents in Washington County, compared to every 1,116 residents in Minnesota).[4]
- High median household income ($77,000 within Washington County versus $57,000 statewide in 2011).[5]
- Poverty disparity between white and minority residents is high (over 20 percent of all minorities in Washington County live at 200 percent below the federal poverty line, compared with 6.5percent of white residents).[6]
- Obesity rate for Washington County was 23.5 percent, which compares favorably with the statewide average of 29.2 percent. However, the rate for low income residents jumps to 41.4 percent.
- High rates of lung cancer as proportion of total cancer deaths (nearly 30 percent in 2010).[7]
- Low percentage of children who get the proper number of minutes per day of physical activity (53 percent of 6th graders and 49 percent of 12th graders).[8]
- High rates of acute drinking among adults (22.5 percent in Washington County compared with 17.2 percent in Minnesota in 2010).[9]
- Rates of alcohol use by students (6th - 12th grades) has decreased, but remains relatively high (43 percent of 12th graders reported using alcohol one or more times in the past month in 2010, compared with 51 percent of 11th graders in 2007).[10]

[1] County Health Rankings. University of Wisconsin Population Health Institute and the Robert Wood Johnson Foundation. 2017.
[2] County Health Rankings. University of Wisconsin Population Health Institute and the Robert Wood Johnson Foundation. 2017.
[3] U.S. Census Bureau Small Area Health Insurance Estimates. 2010.
[4] Health Resources and Services Administration (HRSA). 2010.
[5] U.S. Census Bureau Small Area Income and Poverty Estimates. 2011.
[6] Minnesota Compass. 2013.
[7] Minnesota Department of Health. 2011.
[8] Minnesota Student Survey. 2010.
[9] Minnesota Department of Health. County Health Tables. 2010.
[10] Minnesota Student Survey. 2010.

- Average rates of adult smoking (17.5 percent in Washington County compared with 17.1 percent in Minnesota in 2013 and 21.6 percent for SHAPE Targeted Sample in 2014).[11]
- High rates of food access. However, approximately 7.6 percent of residents (17,000 individuals) lack the resources to adequately access food on a daily basis. This number increases to 52.9 percent of residents within the SHAPE Targeted Sample.[12]

Chronic Diseases

Through data collected in the Community Health Assessment (CHA), the most common types of chronic disease identified are heart disease, cancer, stroke, diabetes and arthritis. These and other chronic diseases can cause illness, disability and death. Seven out of ten deaths among Americans each year are from chronic diseases. Following these national trends, the leading causes of death in Washington County are cancer, heart disease, Alzheimer's disease and stroke. The increased risk of chronic disease is caused primarily by behaviors such as inactivity, poor diet, smoking and tobacco use, and excessive alcohol use. Opportunities to support modifying these behaviors through healthy choices at the community level can work to prevent disease and promote health equity.



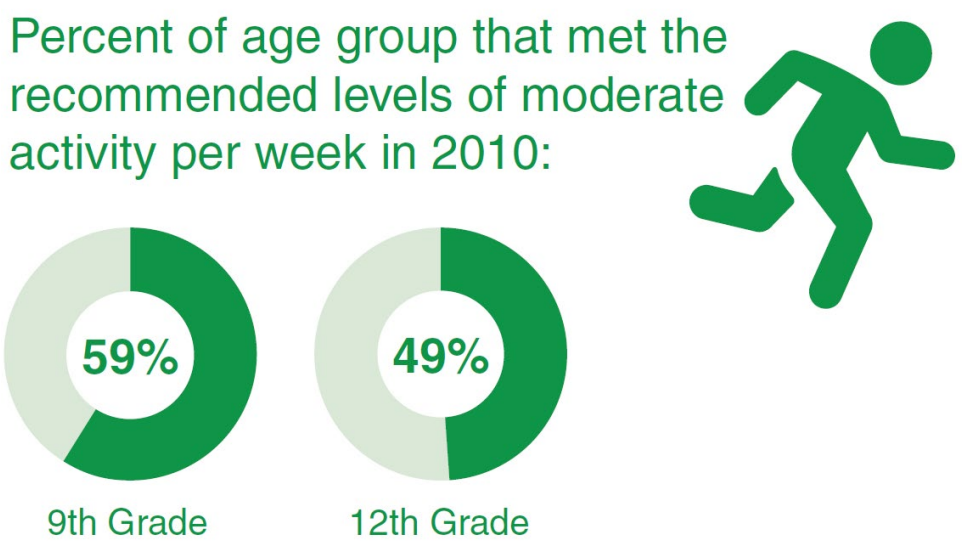
Active Living

Residents who can easily and comfortably move on foot in their neighborhoods tend to get more physical activity and feel safer. To be active, one must have safe and convenient access between neighborhoods, jobs, services, and recreational activities. Being able to reach these types of destinations is essential for healthy communities. For example, adequate pedestrian, bicycle, and transit infrastructure is necessary to create safe connections for all users, including people who do not own a vehicle. Ample parks and open spaces also provide residents with opportunities to integrate physical activity into their daily habits.

Geographically, Washington County is a large county comprised of many community designations (e.g., urban, suburban, and rural). Each of these designations capture the county's varying landscapes and densities. Some areas are better served by the county parks and trail networks, providing unique conditions for active living across the county. For example, St. Paul Park and Stillwater are more urban in nature, and provide supporting infrastructure (e.g., city sidewalks) to incorporate active living into daily habits. These habits could include biking and walking to work; whereas Scandia, Hugo, and Denmark Township are more rural in nature, and therefore present different challenges in incorporating active living opportunities into daily habits. These parts of the county offer better access to county parks and regional trails that support recreational activities.

[11] Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System. 2013.
[12] Washington County Community Health Assessment. 2013.

Healthy Living

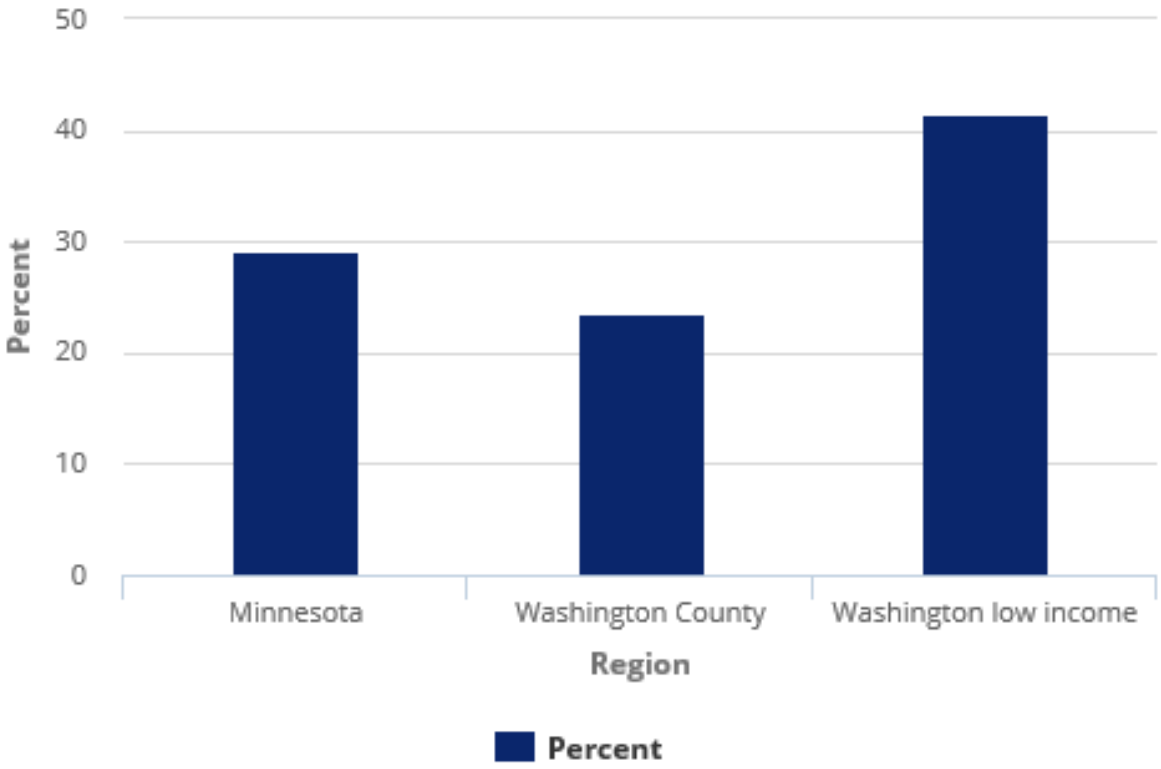


Washington County's park and trail system is highlighted below:

- Washington County provides more than 4,100 acres of park space, 47 miles of walking and hiking trails, and over 70 miles of bike routes
- Washington County provides four designated bicycle loops between communities and key destinations. These bicycle loops include:
  - **Loop #1:** Scandia, William O-Brien State Park, Square Lake Park, Big Marine Park Reserve
  - **Loop #2:** Square Lake Park, Stillwater Township, Pine Point Park
  - **Loop #3:** Pine Point Park, Gateway State Trails, Historic Courthouse in Brown's Creek Trail
  - **Loop #4:** Lake Elmo Regional Park Reserve

The county parks and regional trails will help foster active lifestyles, specifically helping address some of the county's healthy disparities. Some of these disparities can be found in the 2014 Metro SHAPE survey. The survey found that among minority populations and those living in poverty, obesity rates are much higher than the county average (23.5 percent) (see Figure 7).

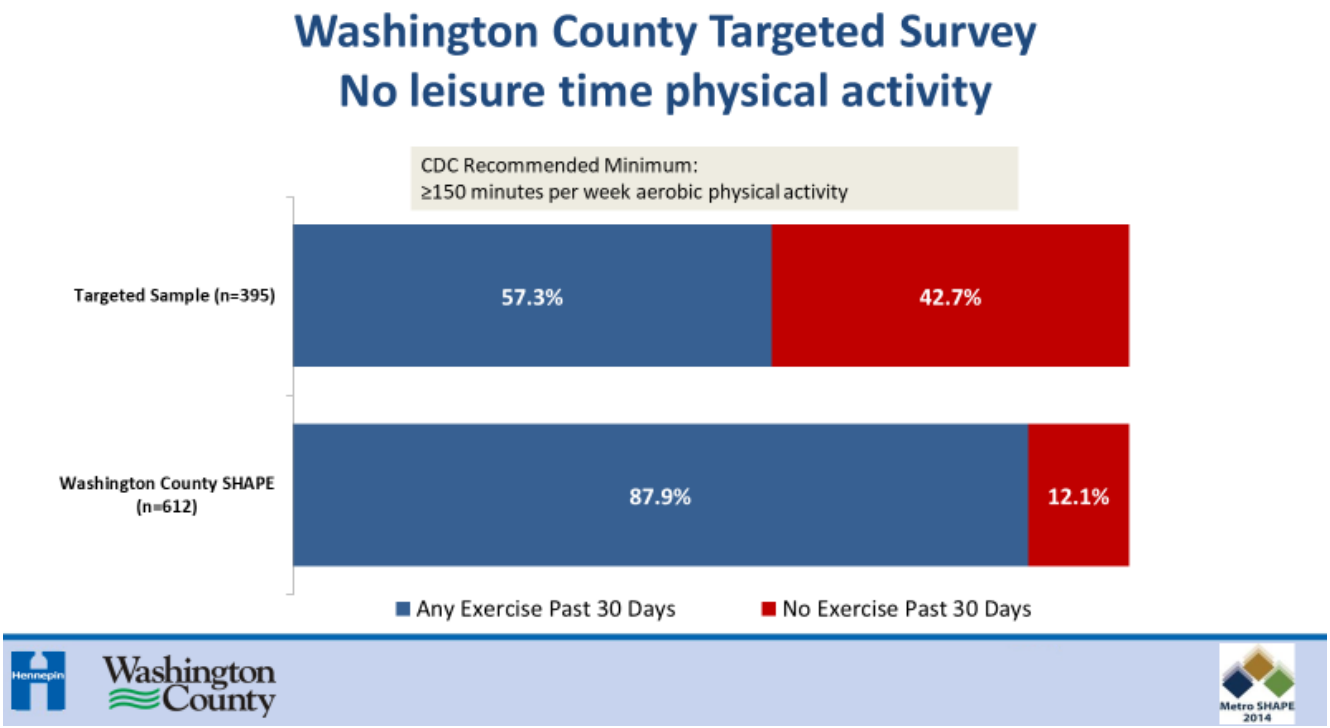
Figure 7: Percent of adults who are obese



Survey findings also included:

- Obesity rates are particularly high in the African-American community (46.4 percent of adults).
- African-American residents were three times more likely to have not participated in a physical activity during the course of the previous month.
- Over 40 percent of residents that made up the SHAPE Targeted Sample were recorded as having not participated in any physical activity within the previous 30 days (see Figure 8).
- In households where the income is less than $23,000 annually, obesity rates were 35.5 percent for adults, much higher than the county average.

Figure 8: Exercise Habits of Survey Respondents - 2014 Metro SHAPE Adult Survey Targeted Sample



Tobacco Use

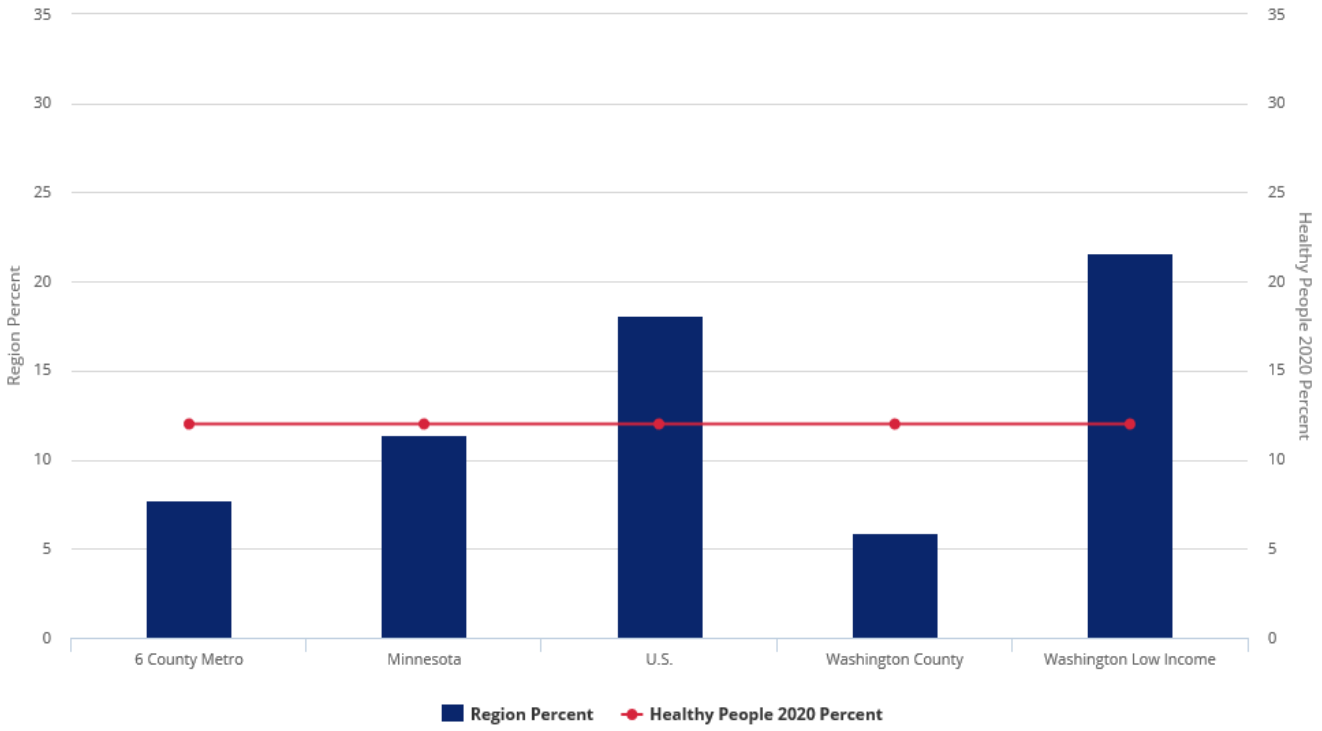
One of the leading causes of preventable deaths throughout the nation is linked to tobacco use. Tobacco use in Minnesota has been responsible for over 6,300 deaths and $3.2 billion in excess medical costs per year. The State of Minnesota and Washington County have partnered to help address these issues through the State Health Improvement Partnership (SHIP). SHIP works to reduce secondhand smoke exposure and access to commercial tobacco products throughout the state. Through these efforts, SHIP is helping provide Minnesotans with smoke-free homes and reducing the likelihood that young people will eventually start using tobacco. SHIP efforts in Washington County (known as *Living Healthy in Washington County*) have focused on supporting smoke free multi-unit housing programs to tackle the burden of tobacco use and exposure in the county.

As part of the *Living Healthy in Washington County* programs, Washington County now has the third-lowest percentage of adult smokers in Minnesota, and rates of tobacco use have been at their lowest in decades. Throughout the program's successes in reducing tobacco use there are still health disparities linked between targeted demographics and tobacco use. Overcoming these disparities can be achieved through continued SHIP and *Living Healthy in Washington County* initiatives. Targeted efforts should focus on communities in which rates of tobacco use are much higher than the county average.

Recognizing and understanding the racial and class disparities that exist among communities will allow Washington County to more effectively address tobacco use in future policy decisions. Some disparity factors include residents living in poverty, residents who have not attended college, residents with frequent mental distress, and African-Americans. These disparities are found in the 2014 Metro Survey, CHA, and the 2013 Minnesota Student Survey. Below are a sample of these data points:

- Over 50 percent of individuals within the SHAPE Targeted Sample responded as current or former smokers. This number is significantly higher than the 31.5 percent of the general population who responded as current or former smokers.
- The county average for smoking is low (6 percent) compared to the statewide (16.3 percent) and national (18.1 percent) averages. The average for the low income targeted sample was 21.6 percent (see Figure 9).
- The smoking rate for African-Americans was 14.4 percent in 2014.
- The smoking rate for households with annual incomes of $23,000 or less was 18.8 percent.
- Nearly 40 percent of residents who have not attended some form of college currently smoke.
- Over 15 percent of residents who have frequent mental stress currently smoke.
- In 2013, 14.4 percent of 11th graders reported smoking in the past 30 days, compared with 35 percent in 1998.

Figure 9: Percent of adults who are current smokers



Healthy Food Access

The ability to easily access basic needs and services influence a person's social, economic, physical, and mental well-being. How connections (e.g., roads, sidewalks, paths, transit) to basic goods and services are designed determines how easily people can benefit from the availability of these resources. Access to healthy foods can

reduce the rates of preventable diseases, improve the county's overall health, aid in community and economic development initiatives, and promote equity for all residents. To achieve these benefits, safe and convenient

transportation (e.g., walking or biking) options must be linked to more people and interwoven between healthy food environments.

The Minnesota Food Access Planning Guide by the Minnesota Food Charter, defines food access and healthy foods as follows:

- **Food Access**: The ability of a person or group of people to obtain healthy food, depending on factors such as physical access, seasonal availability, affordability, knowledge, or cultural attitudes.
- **Healthy Food:** A diverse selection of nutritious foods that nourish the body and promote health.

A quality transportation system is important for residents of all backgrounds and incomes to have access to healthy foods. Washington County's many miles of highways provide access to grocery stores, farmers markets, and other healthy food locations to those who drive as their primary mode of transportation. However, it is also important to consider the needs of residents who do not own or travel by car as their primary mode. Often, those who travel by bus, bicycle, or by foot have lower access to healthy food options.

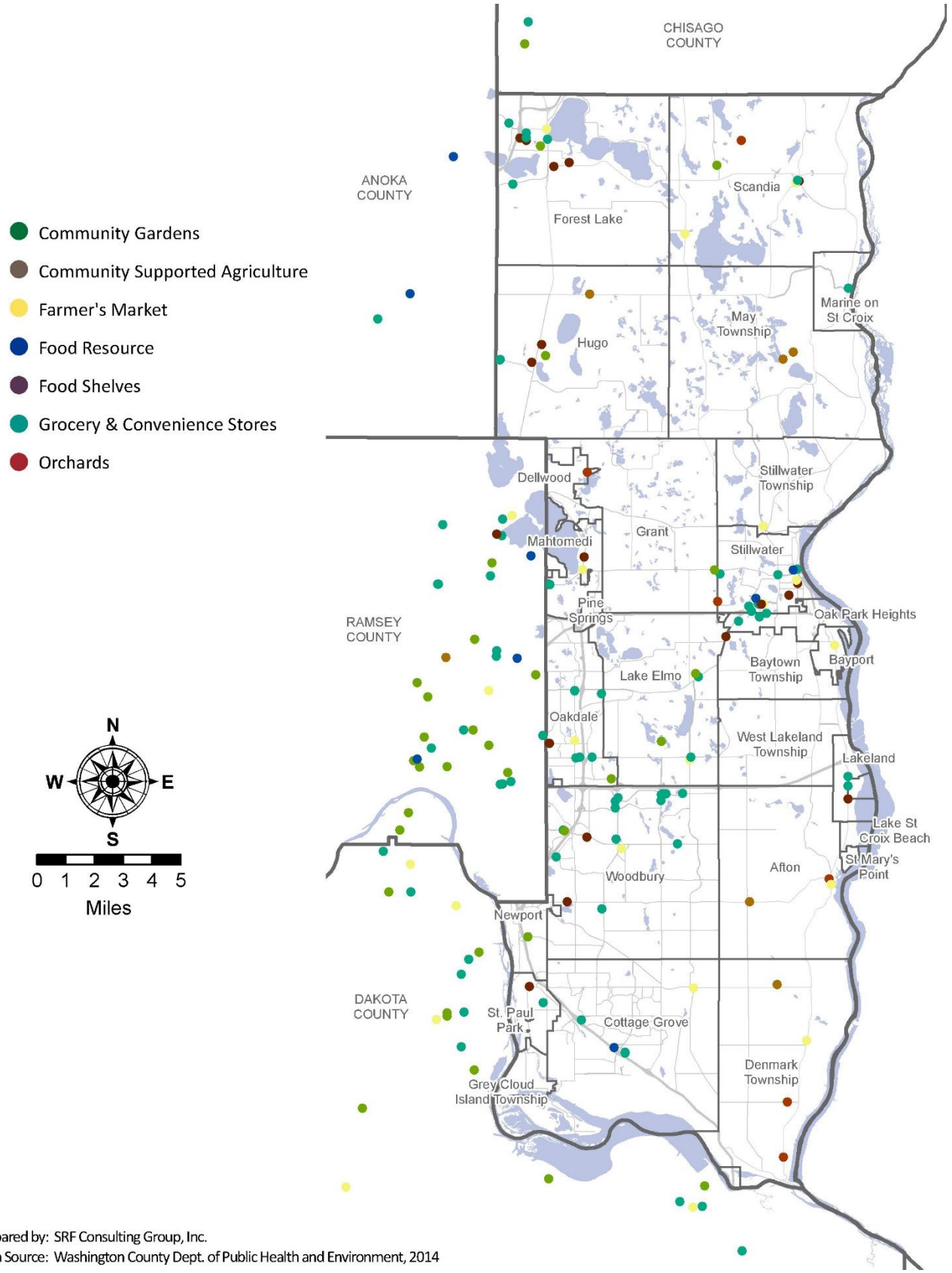
There are health disparities in Washington County when comparing demographics to lifestyles from a healthy food perspective. For example, the 2014 Metro SHAPE survey found disparities among Washington County residents, particularly African-American residents and those living in poverty (200 percent below the federal poverty line). These residents were twice as likely to consume sugar-sweetened beverages and nearly 1.5 times less likely to consume two or more servings of fruit per day. The Targeted SHAPE survey also found that 52.9 percent of this targeted population had experienced, or were experiencing, food insecurity.

Food Security

About **7.6%**, approximately 17,000 people, lack the resources to consistently get adequate food.

To address these needs, Washington County has invested in improving the transit system by placing stops and stations near healthy food options and continuing to build off-street trails to make local streets safer and more accessible for bicyclists and pedestrians. These improvements allow those without vehicles to safely and efficiently access healthy food options within Washington County. Food access locations in Washington County and surrounding areas is shown in Figure 10.

Figure 10: Food access locations in Washington County and surrounding areas.



Prepared by: SRF Consulting Group, Inc.
Data Source: Washington County Dept. of Public Health and Environment, 2014

Energy Efficiency and Conservation

Washington County is committed to promoting and expanding the use of renewable energy resources and energy efficient practices by reducing energy consumption and increasing the use of clean energy resources. This energy use profile illustrates the county's energy consumption and greenhouse gas emissions from buildings and transportation and reviews the status of efficiency, solar, wind and biomass resources.

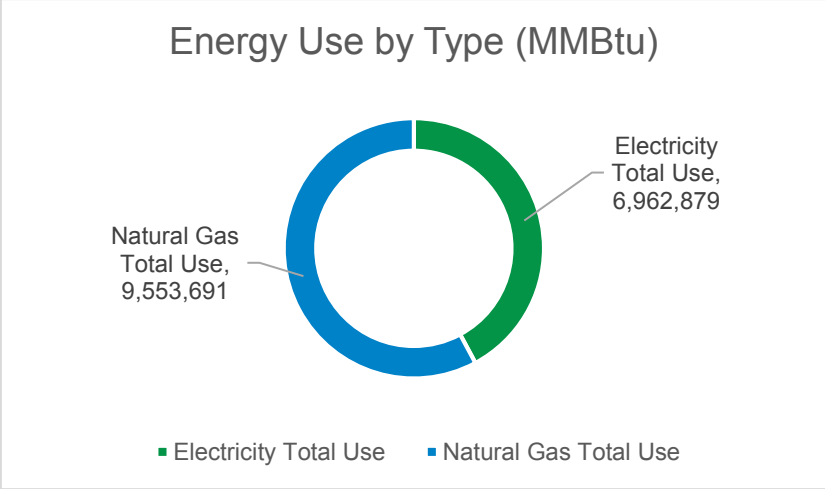
Energy Use Profile

Nearly all of Washington County is served by Xcel Energy for electricity and natural gas. A small percentage (3 percent) is delivered by Connexus Energy, an electric co-op. Xcel Energy provides energy consumption data by sector for communities within its territories and is the primary source of data for this profile.

Buildings and industrial processes in Washington County primarily use electricity and natural gas as energy sources. While other fuels (heating fuel for residential use) are also used, they are not captured in this assessment. Figure 11 shows that consumers use more natural gas than electricity, with 58 percent of energy consumed being natural gas. Natural gas is primarily used for water and space heating, cooking, and some industrial processes. Electricity is used for appliances, water and space heating, lighting and other electronic devices. Streetlights are included in electricity consumption and are less than one percent of electricity consumption.

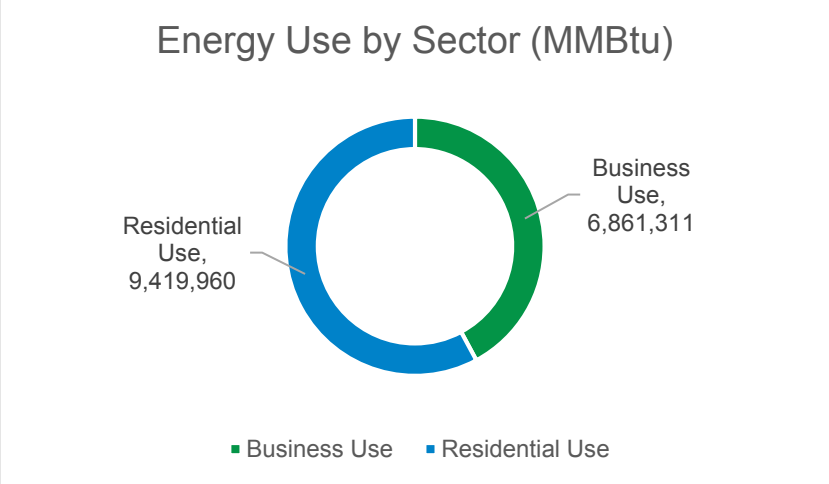
Figure 12 illustrates that residential consumers use a greater share of energy than commercial and industrial consumers. However, it is important to note there are more than 92,000 residential customers in Washington County as compared to 9,600 commercial and industrial customers. The Xcel Energy Community Energy Report indicates utility electricity consumption costs Washington County residents and businesses $217.1 million each year; an average of $1,200 per household and $11,000 per business. According to the Energy Information

Figure 11: Energy Use by Type (MMBtu)



Data Source: Xcel Energy 2016 Community Energy Report and Minnesota Department of Commerce Electric Utility Annual Report

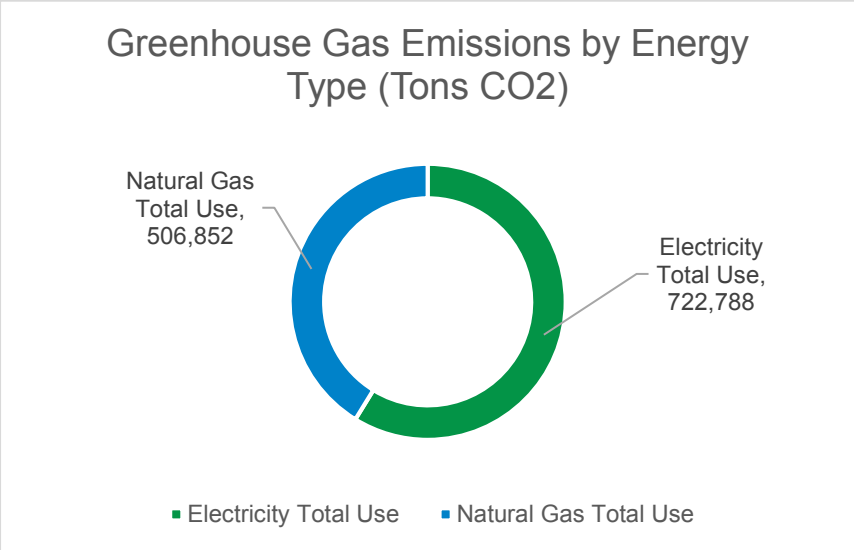
Figure 12: Energy Use by Sector (MMBtu)



Data Source: Xcel Energy 2016 Community Energy Report

Administration, Minnesota households spent $1,108 on electricity and Minnesota businesses spent $7,585, on average, in 2015. Greenhouse gases (GHG) are emitted from burning conventional fuels like coal and natural gas to produce electricity. Electricity generation is growing increasingly cleaner as utilities add renewable energy sources each year. However, electricity is currently more carbon intensive than natural gas. So, while more natural gas is used in the county (in terms of MMBtu), electricity has higher total emissions in tons of CO_2 (see Figure 13). Greenhouse gas emissions from electricity and gas use by buildings can be reduced by expanding clean energy and improving energy efficiency.

Figure 13: Greenhouse Gas Emissions by Energy Type (Tons CO2)



Data Source: Xcel Energy 2016 Community Energy Report

The residential and business sectors each make up about half of the GHGs emitted from building energy use.

Transportation Energy Use Profile

Transportation energy is almost exclusively attributable to car and truck travel, and is estimated by vehicle miles traveled (VMT) within the county boundaries (regardless of through traffic or with an origin or destination in the county).

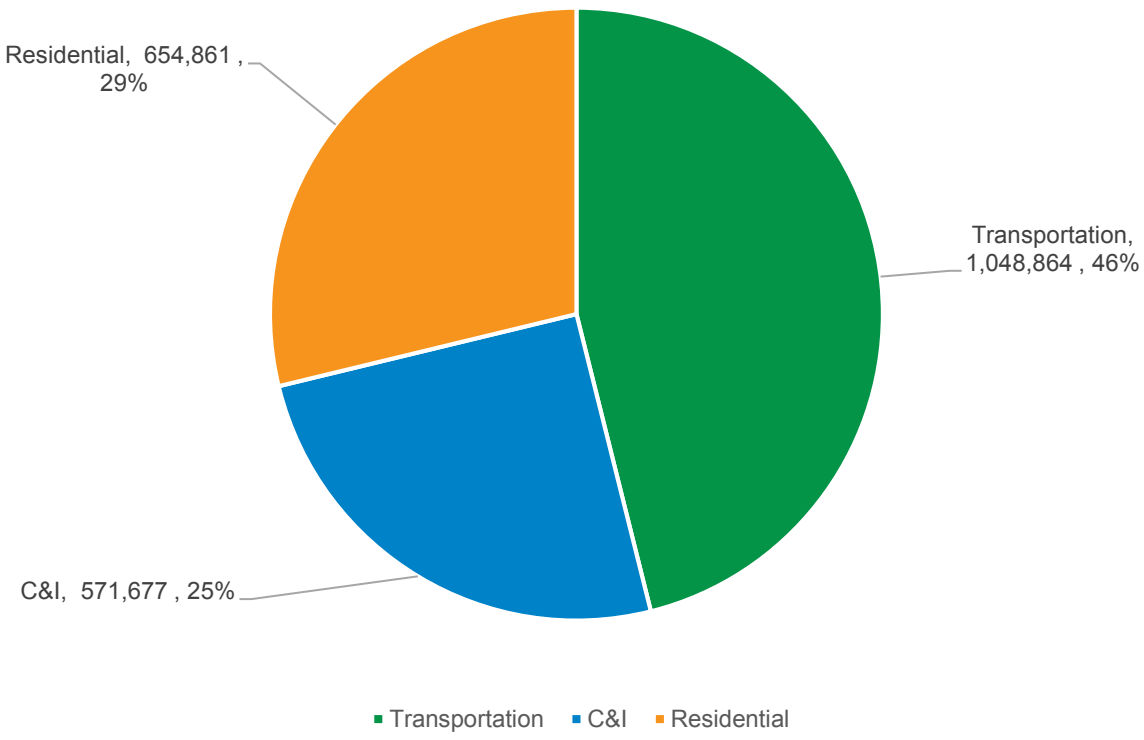
VMT includes commercial and freight vehicles, personal cars, and mass transit vehicles. VMT does not capture energy attributable to rail and airplanes, but those are generally a very small portion of transportation energy use. Minnesota Department of Transportation (MnDOT) data show 2,349,079,167 vehicle miles are traveled annually in Washington County. This is a 63 percent increase from 1992 to 2014, making it one of the highest county VMT growth rates. The greenhouse gas emissions associated with this travel are approximately 1,048,864 tonnes of CO_2e, or almost half of the county's total GHG emissions. Transportation fuels also represent a significant portion of total energy expenditures in the county and provide an opportunity for cost-savings through efficiency and fuel-switching to less expensive or cost-volatile fuels.

Greenhouse Gas Emission Summary

The energy use data gathered for building energy consumption and transportation illustrate a clear picture of the major sources for GHG emissions across the county (see Figure 14). Residential (29 percent) and Commercial Industrial (25 percent) building energy consumption together result in 54 percent of total emissions. Transportation emissions make up the other 46 percent of total emissions.

GHG emissions from air travel, waste and wastewater treatment processes are not included in this graph and will require further data analyses or a community-wide GHG inventory.

Figure 14: Greenhouse Gas Emissions by Sector (Tons of CO2)

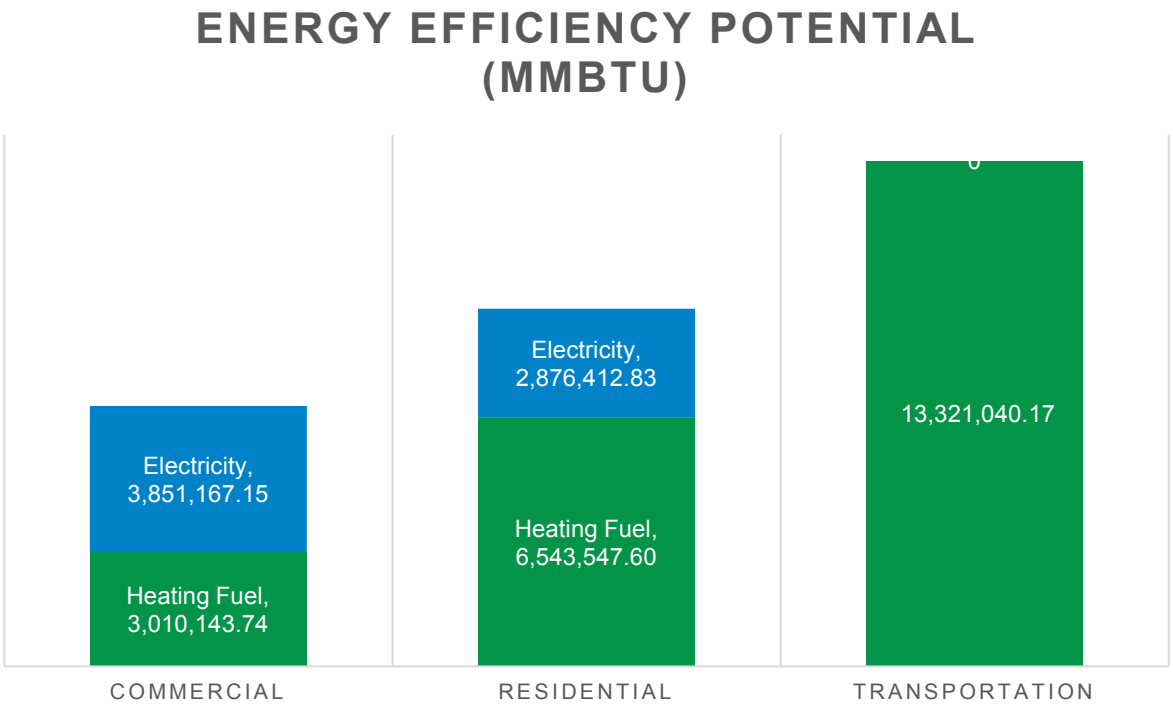


Data Source: Xcel Energy 2016 Community Energy Report, Minnesota Department of Transportation Roadway Data

Efficiency Resource

The county's efficiency resource is measured by looking at current energy use. The greater the energy consumption, the greater resource available for Washington County to be more efficient. As noted in the energy use profile, the utility energy use and therefore the efficiency resource is greater among households as compared to businesses. However, because energy use per customer is higher in the business sector, there is opportunity to have a bigger impact in energy reduction by working with large commercial users. Focusing on commercial and industrial building energy use is a potentially high-impact strategy for capturing the county's efficiency resource; a single successful efficiency investment in a commercial building could reap the efficiency benefits of dozens of residential investments.

Figure 15: Energy Efficiency Potential by Sector in Washington County



Xcel Energy offers incentives to residential and business customers to help increase energy efficiency action. Participation rates for these programs can be found in Xcel's Community Energy Reports. For Washington County, 2016 participation rates by businesses and residents were:

Table 1: Participants in Xcel Energy's Rebate Program

Sector	Rebates Given	Electricity Savings (kWh)	Natural Gas Savings (Therms)
Business	411	16,115,437	477,643
Residential	8,412	3,996,174	716,980

Utility companies can manage the electric load through demand response programs. These programs incentivize consumers to allow the utility to ramp down appliances (e.g., Saver's Switch® for central air conditioning) or other larger electric equipment to relieve pressure from the grid during times of high use. In Washington County, more than 1,098 businesses participate in such programs, creating 44,731 kW of available capacity; 41,986 residential customers participate, creating a load management resource of 23,222 kW.

Conservation Improvement Program

Under the Next Generation Energy Act of 2007, Minnesota requires "electric and natural gas utilities to achieve annual energy savings equal to 1.5 percent of annual retail energy sales of electricity and natural gas directly through energy conservation improvement programs and rate design, and indirectly through energy codes and appliance standards…"

Transportation efficiency is another significant resource, comprising almost half of the county's GHG emissions and a significant portion of energy expenditures.

GHG emissions related to transportation can be reduced in three ways by:

1. switching to a low-carbon or carbon-free fuel
2. improving efficiency (miles per gallon) or right-sizing vehicles according to their use
3. mode shifting, or increasing use of non-motorized or transit options

The county is already active in working with its cities, townships and the Metropolitan Council in encouraging transit use and expanding the reach of multi-modal transportation infrastructure. Electric vehicle markets are poised for rapid expansion over the next decade. Improved efficiency in vehicles is likely to occur through increased use of hybrid and electric vehicles. Hybrid vehicles still burn gasoline, but have long-ranges and now come in a variety of vehicle types used by residents and businesses. Electric vehicle models are becoming increasingly available in the marketplace, mileage ranges continue to improve and charging stations continue to grow in number.

Solar Resource

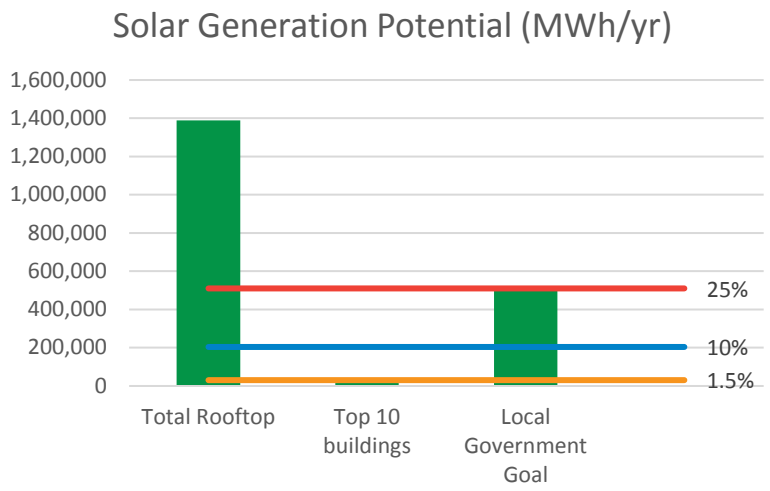
In accordance with the Metropolitan Land Planning Act, all communities are required to include an element for protection and development access to solar energy in their comprehensive plans. The Metropolitan Council has developed a solar resource calculator and map to help communities determine how much solar energy is available for development, identify good sites for solar development, and signal where there may be land use conflicts. Washington County's available solar resource is as follows:

Table 2: Washington County Rooftop Solar Resource

Community	Gross Potential	Rooftop Capacity	Rooftop Generation Potential	Solar Potential of Top 10 Rooftops
Washington County	624,704,100 MWh/yr	1,069 MW	1,389,643 MWh/yr	29,049 MWh/yr

The total capacity of the rooftop solar resource in Washington County is 1,069 MW, equal to approximately 68 percent of the electricity consumed in the county. This means that if the county wanted to maximize its entire rooftop solar resource, it could set a goal of up to 68 percent on-site solar generation. The solar resource does not include potential energy efficiency measures that need to be implemented, resulting in an increase of the share of electricity that could come from rooftop solar.

Figure 16: Example of Solar Potential and Community Goal



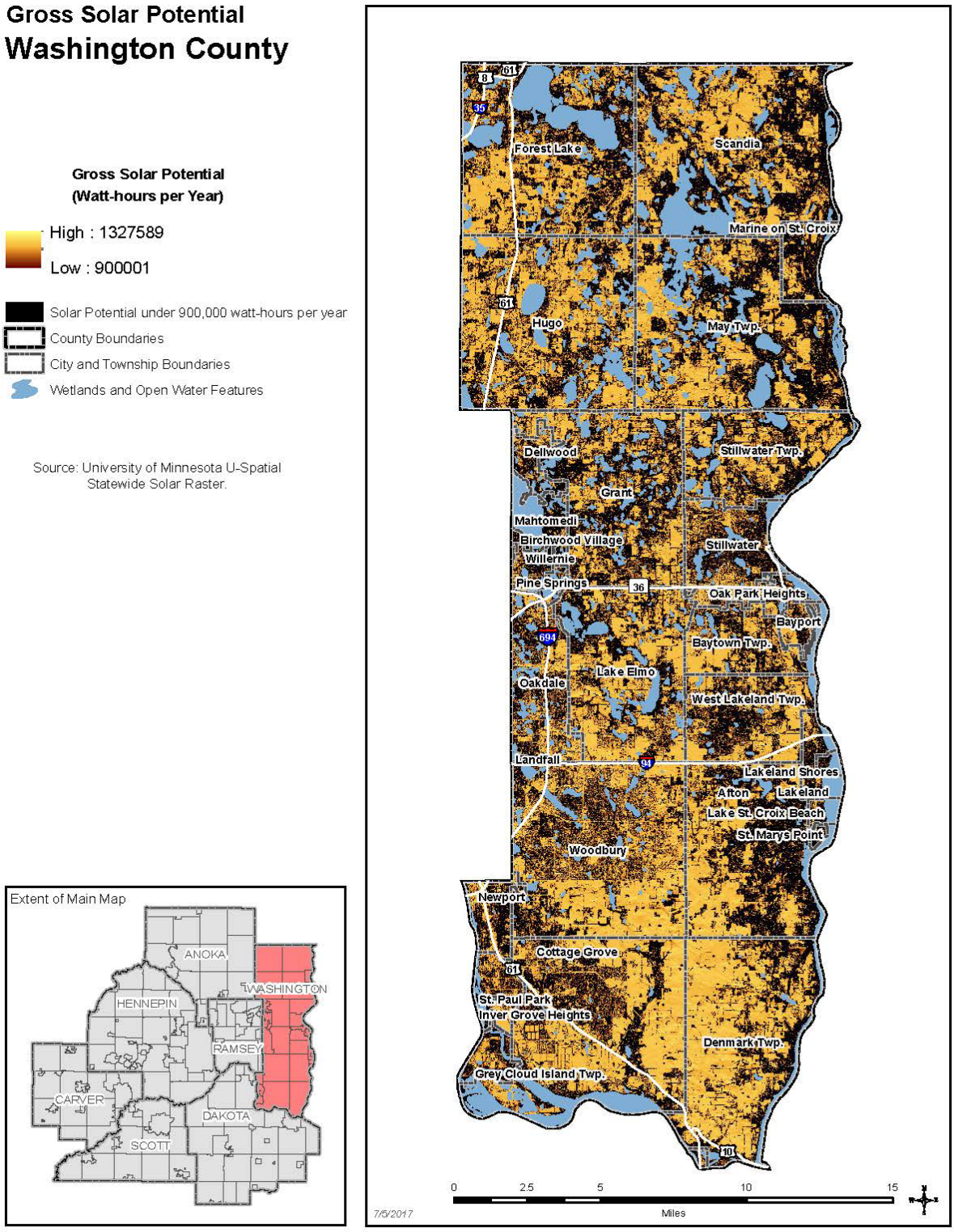
Solar installations are not limited to rooftop applications. This analysis does not include ground-mounted systems, but commercial parking lots may make good solar resources, or public right of ways; while areas planned for future development or park space may not. These criteria can be used to recalculate potential solar generation and redefine future solar goals for local development.

Solar Data Resources

Metropolitan Council: The Metropolitan Council requires cities to include: 1) A calculation of your community's solar resource along with solar suitability map; 2) Policies relating to the development of access to direct sunlight for solar energy, per the Metropolitan Land Planning Act; and 3) Strategies to implement those policies. The Council has developed maps for every community within its jurisdiction to help complete this requirement.

Minnesota Solar Suitability App: For communities outside the Metropolitan Council's jurisdiction, solar data can be accessed through the state of Minnesota's Solar Suitability App that provides a 1-meter resolution of a community's solar resource for nearly every section of the state. This data can be clipped to a community's building footprint to refine the solar potential (www.mn.gov/solarapp).

Figure 17: Solar Resource Map, Metropolitan Council Community Page



Wind Resource

Wind Resource

A good wind energy site needs to meet a number of characteristics, the most important of which is a good wind resource. Other characteristics include soils that can support the weight of the turbine; a site large enough to accommodate safety setbacks from neighboring properties, structures, or other uses; and surrounding land uses for which the visual impact and potential nuisances will not create a conflict. The Distributed Wind Energy Association offers this guidance on wind turbine placement:

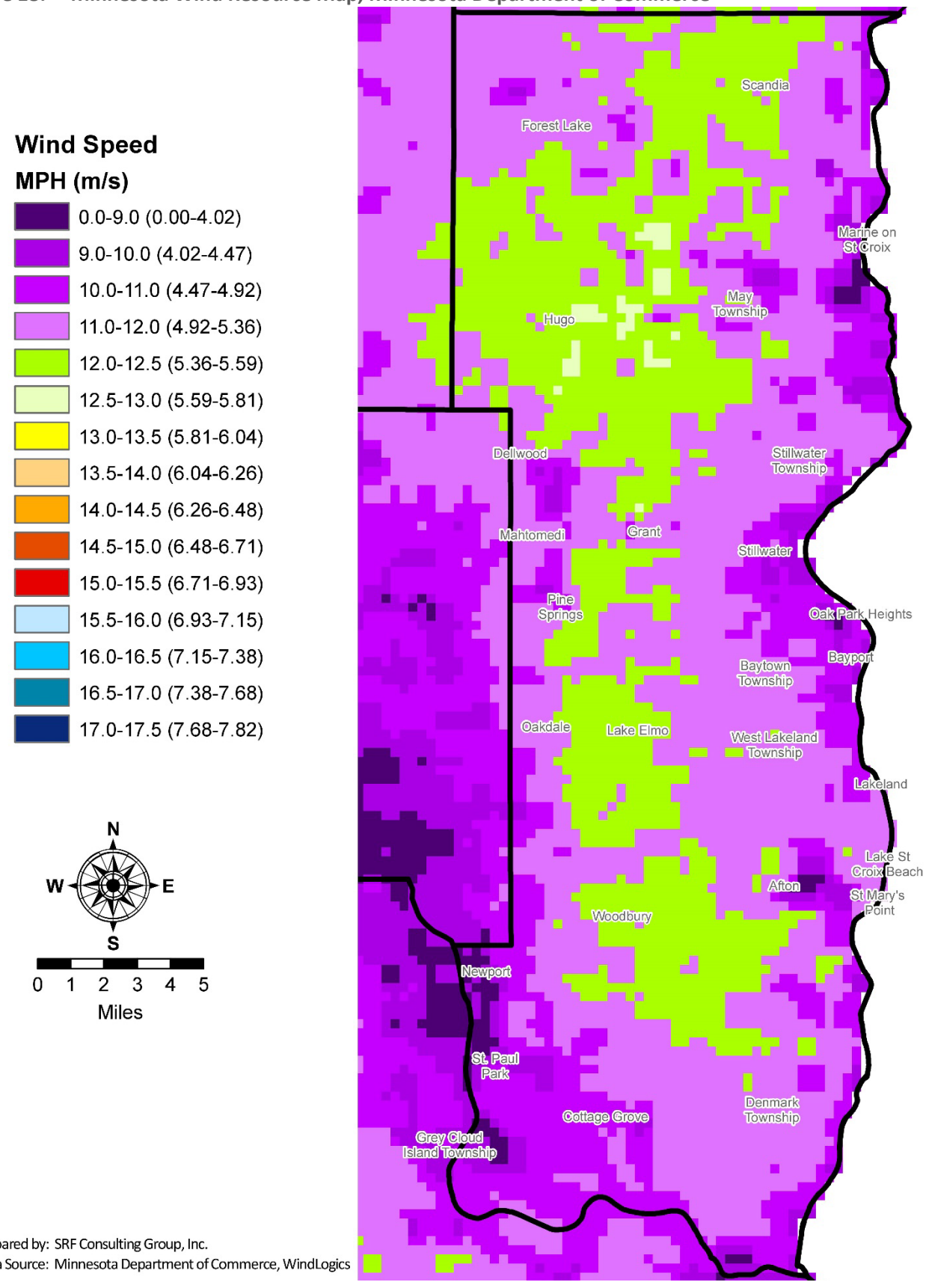
The industry guidance on minimum wind turbine height states the lowest extension of a wind turbine rotor must be 60 feet above the ground, assuming no surrounding obstacles. Where obstacles are present, the wind turbine rotor should be at least 30 feet above the tallest obstacle within a 500-foot radius. If trees are not fully grown, then the tower height must be adjusted for the growth over the next two or so decades, the life of the wind turbine.

Washington County with its urban, suburban, and rural characteristics has varying suitability for towers above a certain height. More appropriate tower heights for this community type would be at 30 meter heights. The Minnesota Department of Commerce developed wind speed maps at a 500-meter resolution to give a general sense of the wind resource at various tower heights, these are not adequate for a specific site assessment.

A good rule of thumb is that 12 mph is typically the minimum average annual wind speed for a good wind resource. At 30 meters, Washington County has an average wind speed of less than 10 miles per hour. The wind resource available at 30 meters is below the optimal speed needed for a productive wind energy system, suggesting that taller towers would be necessary from a production standpoint.

While the county does not have many opportunities for wind energy development, residents and businesses can participate in Xcel Energy's Windsource® or Renewable*Connect programs. These programs provide the clean energy benefit of having local wind (and solar) energy, although the economic benefits of clean energy development are realized elsewhere. According to Xcel Energy, eleven businesses are subscribed to a total of 52,887 kWh of wind energy, and 3,209 residences are subscribed to a total of 8,269,416 kWh of wind energy.

Figure 18: Minnesota Wind Resource Map, Minnesota Department of Commerce



Prepared by: SRF Consulting Group, Inc.
Data Source: Minnesota Department of Commerce, WindLogics

Biomass Resource

Fuel derived from biomass can be used to generate renewable electricity, waste heat, and gas. Minnesota has several biomass facilities generating electricity and heat. Biomass resources include municipal solid waste, landfill gas, wood waste, agricultural byproducts, food processing residue and other organic waste.

There are few assessments and little information available about potential biomass resources at a community level and the type of resource varies widely across communities. However, the county does currently use biomass resources for energy production, and additional opportunities may be available.

Through the Ramsey/Washington Recycling & Energy Board (R&E Board), Washington County owns and operates with Ramsey County the Recycling & Energy Center (R&E Center) in Newport, a refuse derived fuel (RDF) facility. The R&E Center uses shredding, magnetic separation and density separation to convert waste received into RDF. Ferrous metals and aluminum are also separated and recovered for recycling. After being processed, the RDF is transported to two facilities owned by Xcel Energy (in Red Wing and Mankato, MN) that use the RDF to generate electricity. These two plants provide enough electricity for 22,000 homes annually through waste-to-energy. In addition, the Washington County Waste Management Master Plan has policies and strategies pertaining to waste-to-energy, but also aims to increase the amount of organic waste (food waste, compostable paper, yard waste) to be managed through composting.

Through the R&E Board, the two counties are also exploring new technologies to increase energy produced, create fuels, make compost, or provide recyclable materials for manufacturing such as mixed waste processing, anaerobic digestion, and gasification.

Biomass as Renewable Energy

Anaerobic digestion is a process that uses captured biogas (methane and carbon dioxide) from the decomposition of organic material to generate heat and/or electricity. Biogas generated from this process can also be cleaned to remove carbon dioxide and other impurities to produce a renewable product equivalent to conventional natural gas, referred to as renewable natural gas. Renewable natural gas (or biogas) can serve as a replacement for any natural gas application and can also be compressed to provide a source of transportation fuel in place of conventional natural gas.

Biogas can be used to generate electricity in a process called combined heat and power. Combined heat and power (CHP) systems simultaneously generate electricity and thermal energy within a single system. By using the thermal energy, CHP systems efficiency is much greater than conventional power generating systems. While this system is well established in Minnesota, there is still great potential to harness this resource. Benefits of CHP application include:

- Produces power at a cost below retail electricity
- Enhances local power reliability
- Expands ability of biogas to produce useful energy beyond thermal loads
- Reduces greenhouse gas emissions and other air pollutants

Energy Storage Resource

Energy storage has the potential to transform the energy landscape. By storing energy, electricity can be redistributed from times of the day during which a surplus of energy can be generated to times of high energy demand. In the absence of storage, excess energy production is lost, while high demand necessitates the use of expensive gas-fired peaking plants that only are active for a few hours each year. Wide implementation of energy storage may smooth out the energy demand curve, reduce the need for peaking plants, bring about significant resiliency benefits, reduce carbon emissions, and result in an overall reduction in costs.

Energy storage has been experiencing a dramatic increase in deployment, and this trend is likely to continue for the foreseeable future. Various forms of energy storage are already in use. Batteries are the most widely known form of energy storage - and well known for their use in electrical vehicles - but energy storage is much more than the latest advancement in lithium battery technology. Chemical, thermal mechanical and electrical battery families populate today's market.

The University of Minnesota's Energy Transition Lab published a 2017 report suggesting that energy storage will become a cost-effective resource in the near future in Minnesota, especially when coupled with solar PV. Their work found that if environmental benefits are included, solar + storage will be a cost effective alternative to natural gas-fired peaking plants as early as 2018, and standalone storage will be a cost-effective alternative as soon as 2023. While still emerging as a use in Washington County and the country, energy storage could be a resource that is broadly employed over the next decade. Current testing of technology in demonstrates it is possible to run entire homes and charge electric vehicles through sole reliance on home batteries.

Back-up Power and Resilience

One of the potential advantages of using local energy resources for local energy needs is that local generation can provide backup or substitute power for when extreme weather or other emergencies shuts down the electric grid. The ability to generate power on-site is particularly important for critical facilities such as law enforcement, emergency shelters, health care facilities, and water pumping. Washington County currently has eleven generators at nine facilities that provide back-up electric power in the event of a power outage. All the generators are fueled with diesel and/or natural gas. Diesel generators are often sufficient to supply electricity for short-term outages; however, they have limitations that could be offset with a solar photovoltaic (PV) and storage system that increases the resilience of the facility and saves the county money.

Weather-related power outages have increased significantly in the U.S. since 2000. Sustained power outages can impact daily life, health, and safety of residents, as well as strain local economies. Diesel generators depend on an adequate supply of diesel to is with withstand long-term power outages, and may only work for a few days, particularly if there is limited or no access to additional fuel. Natural gas back-up power generators tend to have a more reliable supply, but can be expensive to run for an extended period.

Distributed PV can significantly increase the resilience of the local electricity system, but it must be designed with back-up power in mind. Most PV systems are technically incapable of providing back-up power during an outage. For safety reasons, these systems are installed with inverters that are designed to automatically disconnect from the grid during a power outage. Systems can, however, be designed for standalone operation along with battery storage to provide continuous power during an outage. The PV system should include an inverter that can automatically switch between charging batteries, supplying electricity to the on-site load, and/or feeding electricity to the grid. It must also be able to isolate the system from the grid during a power outage.

Existing Policy

State of Minnesota Energy and Climate Goals

- Many communities adopt the Minnesota energy or greenhouse gas (GHG) reduction goals. Minnesota has set a mandatory 80 percent GHG emission reduction target by 2050, from a 2005 emission baseline.
- The interim 2025 GHG target is a 30 percent reduction, including a 25 - 30 percent required renewable energy fuel mix for electric utilities.
- For renewable energy, Minnesota set an aspirational solar energy target equal to 10 percent of electric retails sales.

Waste Management

A sustainable community seeks a better quality of life for current and future residents by maintaining nature's ability to function over time. It depends on a co-existence of industry, transportation, economic development, residential development and the natural environment all of which can present challenges to one another. Washington County's waste management system is an integral component of the infrastructure of a sustainable community. Proper management of solid waste and recycling conserves resources and assures a high level of community sanitation. Therefore, solid waste must be managed by technologies and methods that support sustainable communities and environments, while also seeking to mitigate and effectively manage factors such as noise, congestion, odors, and environmental degradation which threaten the conditions that are desirable for citizens to live work and play. Municipal solid waste (MSW) generation in the Twin Cities Areas continues to grow with residential and business waste generated in the county increasing with population and business growth. MSW includes garbage, recyclables, yard waste, household hazardous waste, and bulky waste such as furniture.

In 1980, the Waste Management Act (MN Stat 115A) was passed to improve integrated solid waste management system to protect public health and the environment. The law established the waste management hierarchy for waste and order of preference for the management of waste.

Metropolitan counties are required (MN Stat 473.803) to prepare a master plan to implement the Minnesota Pollution Control Agency's (MPCA) Solid Waste Management Policy Plan every six years. The county's waste management master plan guides waste management activities while continuously striving to achieve quantifiable objectives to reduce land disposal of waste.

Development and implementation of the county's waste management master plan also includes continued partnership with Ramsey County through the Ramsey/Washington Recycling & Energy Board (R&E Board). This partnership brings together the two counties with common goals to collaborate, save financial and staff resources, and focus efforts to achieve the state's waste objectives. The counties have been working together since the early 1980's on solid waste management. This partnership was strengthened through its 2015 purchase of the Recycling & Energy Center (R&E Center), a refuse derived fuel (RDF) facility in Newport, MN.

Ramsey and Washington counties will continue to partner in exploring the potential of emerging technologies to extract additional recyclables from the trash until they can be separated at the source by the generator (helping the counties move closer to the state's 75 percent recycling goal).

Waste generated in the county is managed in a number of ways. The county reported nearly 213,000 tons of MSW managed in 2016. Almost 43 percent of that waste was recycled (this includes traditional curbside recycling and organics recycling), 40 percent was processed or waste-to energy and 12 percent was landfilled. However, recycling rates over the years have not increased significantly and the county must meet a new state 75 percent recycling goal. In addition, land disposal rates have increased since 2007.

The county has a number of programs and services to support recycling, composting, and waste-to- energy activities and also for proper management of solid and hazardous wastes. Some of these include:

- Technical support and funding is available to cities, townships, and schools for residential recycling programs and waste activities at schools.
- Solid and hazardous waste compliance programs and education and technical assistance on proper waste management.
- Operation of the Washington County Environmental Center for residents to dispose of household hazardous waste, electronics, and recyclables in an environmentally responsible way.
- Environmental complaint and response program for solid or hazardous waste issues and public health nuisances.

Washington County collects a county environmental charge that supports county efforts, such as the few listed above, to promote recycling, reduce waste, and protect soil and water against waste contamination.

Goals, Policies, and Strategies

To guide future decision making and county actions, goals, policies and strategies have been developed specific to the resilience and sustainability element. The following pages outline four goals with corresponding policies and strategies that set the course for the county's future. Chapter 3, Goals, Polices, and Strategies, also provides the information contained within this section, along with the goals for the other plan elements. Chapter 11, Implementation, provides tools that can be utilized while working to achieve these goals.

Resilience and Sustainability Goal 1: Maintain and improve community preparedness and emergency response capacity to ensure public health and safety.	
Community Vulnerability Policy	**Community Vulnerability Strategy**
Continue and enhance county and city level all-hazard mitigation and response planning.	Ensure the Washington County All Hazard Mitigation Plan is kept active and ensure local communities are considered eligible for the associated funding sources.
	Encourage all communities within Washington County to maintain an updated all hazards Emergency Operations Plan.
	Partner with local communities and private partners to encourage individual preparedness through educational opportunities.
	Continue to utilize stakeholder involvement in the update and implementation of the Washington County All Hazards Mitigation Plan.
	Promote and implement the goals, objectives, and strategies written within the Washington County All Hazard Mitigation Plan when feasible.
	Incorporate mitigation strategies into other local planning documents, processes, or mechanisms such as Continuity of Operations Plans (COOP), Growth Management Plans, Ordinances, Resolutions, Regulations, and Capital Improvement Plans (CIP).
Recognize and plan for the support of populations with high needs and vulnerabilities to all hazards including extreme weather and climate-related events.	Conduct a county wide climate vulnerability assessment that considers risk factors such as extreme heat events, poor air quality, changes in precipitation, changing ecologies, changing demographics, and psychological impacts.
	Incorporate, when possible, the needs of vulnerable populations such as elderly, low income, medically fragile, disabled, non-English speakers and children within applicable all hazards plans, training, and exercises at the city and county level of government.
	Encourage the inclusion of private partners in the identification and inclusion of vulnerable populations in preparedness planning.

Promote a disaster resistant community infrastructure of housing, utilities, transportation systems, and health care resources able to withstand natural, man-made and economic changes.	Promote mitigation efforts taken within Washington County for communities to reduce vulnerabilities.
	Encourage the collaboration between government agencies and private partners to incorporate mitigation activities for larger scale systems.
	Protect, maintain and improve constructed and natural systems that provide critical infrastructure.
	Consider current and future climate predictions in design of county infrastructure.
Resilience and Sustainability Goal 2: Promote personal and community health for all residents.	
Healthy Communities Policy	**Healthy Communities Strategy**
Pursue opportunities to address inequities and barriers to health.	Complete Community Health Assessment & Community Health Improvement Plan every five years to address health equity.
	Assess social determinants of health in county services and practices.
	Adopt health in all policies guides.
Support individual and community health behaviors that reduce the risks of chronic disease.	Promote policies and strategies of the county parks, trails and open space to encourage healthy and active lifestyle choices for all ages and abilities (see Parks, Trails and Open Space section).
	Support public and private partnerships that promote and encourage healthy lifestyle choices within the county.
	Adopt steps for access to multi-modal transportation for all residents to encourage physical activity (See Transportation section).
	Support, maintain and enhance county policies related to the reduction in tobacco use and exposure to second-hand smoke.
Encourage practices and activities to achieve healthy food access for all residents.	Support public and private partnerships that promote and encourage healthy food access.
	Adopt steps for access to multi-modal transportation for all residents to support access to healthy foods (See Transportation section).
	Promote small scale food production of healthy foods and county-wide availability.

Resilience and Sustainability Goal 3: Identify, promote, and expand the use of energy efficient practices and renewable energy resources.	
Energy Efficiency & Conservation Policy	**Energy Efficiency & Conservation Strategy**
Collaborate with public entities, community organizations, businesses within the county, and with other counties to achieve mutual energy goals.	Support cities, townships and schools working on conserving energy, using renewable energy, or taking steps to reduce greenhouse emissions.
	Partner with key stakeholders in the development and implementation of a countywide energy plan.
	Support the use of technologies that increase the use of local energy resources.
	Continue to promote Property Assessed Clean Energy (PACE) loans to finance energy efficiency upgrades and renewable energy installations in commercial buildings.
	Promote equitable access to energy resources for all.
	Continue to work with regional partners to connect and expand options for initiatives such as multi-modal transportation (see Transportation Chapter).
Lead by example in county operations to conserve energy, use renewable energy sources in an effective manner, and take steps to reduce greenhouse gas emissions.	Champion, adopt and implement a countywide energy plan.
	Incorporate energy conservation into existing and new building plans by using material and equipment to conserve energy and reduce greenhouse gas emissions.
	Leverage reduction of non-renewable consumption with renewable energy sources.
Resilience and Sustainability Goal 4: Protect public health and the environment by reducing the amount and toxic character of waste and ensuring proper management of wastes.	
Waste Management Policy	**Waste Management Strategy**
Minimize land filling through an integrated waste management system in accordance with the state hierarchy of waste reduction, reuse, recycling, composting and waste-to-energy.	Communicate and educate about sound environmental practices related to waste management activities and county programs, services, and resources to waste generators.
	Manage wastes generated by the county in accordance with the Minnesota Pollution Control Agency's (MPCA) Metropolitan Solid Waste Management Policy Plan, the Washington County Waste Management Master Plan (both are updated every six years), state law and county ordinances, and work with other public entities so that their waste is managed in the same manner.

Minimize land filling through an integrated waste management system in accordance with the state hierarchy of waste reduction, reuse, recycling, composting and waste-to-energy. ***(Continued)***	Continue partnership with Ramsey County through the Recycling and Energy (R&E) Board to collaborate in joint programming and projects, and explore new technologies at the R&E Center to produce energy and fuels, make compost or harvest materials for creation of consumer products.
	Explore ways to increase awareness and develop tools to address health equity and environmental justice in county waste and recycling programs and services.
	Communicate and educate about sound environmental practices related to waste management activities and county programs, services, and resources to waste generators.
Lead by example in county operations to develop and implement innovative waste management solutions.	Manage wastes generated by the county in accordance with the Minnesota Pollution Control Agency's (MPCA) Metropolitan Solid Waste Management Policy Plan, the Washington County Waste Management Master Plan (both are updated every six years), state law and county ordinances, and work with other public entities so that their waste is managed in the same manner.
	Ensure all municipal solid waste generated by county activities is processed and require all public entities to process municipal solid waste generated as a result of their activities.
Identify ways to collaborate with public entities, community organizations and businesses to develop and implement innovative waste management solutions.	Provide technical assistance, grant funding, and networking opportunities to share resources to cities, townships, and schools to make progress in implementing best practices to reinvigorate recycling, increase organics diversion, and refresh waste reduction and reuse opportunities.
	Continue partnership with Ramsey County, through the R&E Board, to assist businesses in organic waste diversion and recycling opportunities.
	Provide technical assistance and outreach to solid and hazardous waste generators to improve compliance to state regulation requirements.