

1. INTRODUCTION

Incorporated in 1951, the City of Arden Hills lies approximately eight miles north of downtown Saint Paul and downtown Minneapolis in the northwestern portion of Ramsey County. The City covers 9.4 square miles and, in 2016, was home to an estimated 9,966 people. The residents of Arden Hills enjoy a high quality of living with access to neighborhood and regional parks and trails; superb access to regional road transportation; nearby commercial services; and stable neighborhoods.

In addition to the City's high quality neighborhoods, Arden Hills is home to a number of large corporations, many small businesses, two private colleges, a high school, an elementary school, and more than 11,000 jobs¹. Arden Hills is a strong community that attracts residents and businesses because of its close-knit neighborhoods, parks, responsible government, and open spaces. Additionally, the Twin Cities Army Ammunition Plant (TCAAP) property provides the City with an opportunity for new development to help service the City's current and future residents.

While Arden Hills is a stable community with a bright future, the City does face some challenges. The median age has risen dramatically in recent years, a large percentage of the City's land area is tax-exempt, fewer families with children are able to afford a home in the City, and the regional transportation infrastructure is at or beyond capacity in many places. With 824,000 new residents expected in the Twin Cities area between 2010 and 2040, Arden Hills will undoubtedly feel the pressure for development and the impact of development in other communities.

1.1 COMPREHENSIVE PLANNING

The Comprehensive Plan is a policy document that asks: where are we now, where do we want to go, and how do we get there? This document reflects the City's value system and creates a framework for the future by providing an overall vision for the City. As a guiding tool, the Plan provides a system for measuring progress, direction for day-to-day and long-term decision-making, and a framework for setting priorities in several key areas that are vital to the successful and efficient functioning of the community. Each of the chapters in this Plan is examined in a comprehensive and community-wide manner in order to take advantage of opportunities, increase efficiency, and work toward building a stronger community.

The City recognizes the importance of planning and setting community-wide goals; however, this Plan is also being prepared as a requirement of the Metropolitan Land

¹ Minnesota Department of Employment and Economic Development – 2nd Quarter 2017 QCEW Data

Planning Act. Arden Hills completed its first Comprehensive Plan in 1966 with updates in 1976, 1980, 1998, and 2008. It is anticipated that the next Comprehensive Plan review will take place in 2028.

While this Plan is a guide for development through 2040, it is intended to be a flexible and responsive document that can be amended to acknowledge changing conditions and new opportunities. To best achieve the City's vision, this Plan must be continually referenced, updated, and used on a regular basis. This document provides a path for the City but does not dictate specific activities or absolute decisions; instead, this Plan is intended to help City leaders in developing policies, programs, ordinances, capital improvement plans, and budgets that reflect the overall values and priorities of the residents and businesses.

1.2 THRIVE MSP 2040

On May 28, 2014 the Metropolitan Council adopted the *Thrive MSP 2040* to guide growth in the seven county metropolitan area through 2040. Thrive MSP 2040 includes regional growth policies based on community designation for achieving these policies. Arden Hills is identified as Suburban. Some of the Suburban policies that are applicable to Arden Hills include:

- Integrate natural resource conservation and restoration strategies into the comprehensive plan.
- Implement best management practices to control and treat stormwater as redevelopment opportunities arise.
- Designate land in the comprehensive plan to support household growth forecasts and address the community's share of the region's affordable housing need through development and redevelopment at a range of densities.
- Use state, regional, and federal sources of funding and/or financing and development tools allowed by state law to facilitate the development of new lifecycle and affordable housing.
- Develop local policies, plans, and practices that improve pedestrian and bicycle circulation, including access to regional transit services, regional trails, and regional bicycle corridors.
- Seek opportunities to improve local street and pedestrian connections to improve access for local trips.
- Plan for land uses that support the growth of businesses that export goods and services outside the region, important regional economic clusters, and living wage jobs.

The City of Arden Hills supports these policies. The vision, goals, and policies identified in the City’s Comprehensive Plan seek to advance the Metropolitan Council’s Thrive MSP 2040 where applicable to Arden Hills.

Draft 03/07/2018

2. COMMUNITY PROFILE

In order to plan for the future of Arden Hills, it is important to understand where the City has been, where the City is now, and how the City is likely to change. Understanding the history of Arden Hills and the trends that affect the City can provide a basis from which to make better decisions. While the past is not a perfect indicator of future changes, it does give perspective on the status of the community and suggests where Arden Hills may be heading.

Since 2000, population has remained fairly stable, the median household income has remained higher than Ramsey County as a whole, a greater percentage of residents have a higher education, and the number of jobs in the City has remained stable. Arden Hills is a stable community and many residents are choosing to remain in Arden Hills as long as possible. However, high property values and the relative lack of turnover in the housing stock have made it difficult for some younger households to move into the City. Of the thirteen age groupings, seven of them increased and six decreased from 2000 to 2015. The most notable were a 107% increase in the 60-64 age group, and a 52% decrease in the 10-14 age group. Overall, the city saw an increase of 1.5% in total population during that time.

This chapter provides demographic and economic information about Arden Hills and some of the changes the community has seen in the last 10, 20, and 30 years. While there is a tendency to only look within the City borders, Arden Hills is part of a larger metropolitan area of seven counties with 184 municipalities and three townships. Therefore, a comparison of Arden Hills' demographic information to adjacent municipalities, Ramsey County, and the metropolitan area is provided where appropriate. The comparison helps provide context for this Plan, and helps explain the role that Arden Hills plays in the larger metropolitan community.

2.1 FORECASTS

The Metropolitan Council prepared population, household, and employment forecasts for all counties, cities, and townships in the metropolitan area. The forecasts were based on anticipated future land uses from previous plans, vacant land that is developable, and other factors. The forecasts provided by the Metropolitan Council are as follows:

Table 2.1 – Forecasts

	Census	Estimate	Thrive MSP 2040 Forecasts		
	2010	2015	2020	2030	2040
Population	9,552	9,797	10,000	12,000	13,500
Households	2,957	3,116	3,200	4,100	4,600
Employment	12,402	11,885	15,000	16,300	17,500

2.2 POPULATION FORECASTS

Figure 2.1 – 1990 - 2040 Population Change

Source: Metropolitan Council, US

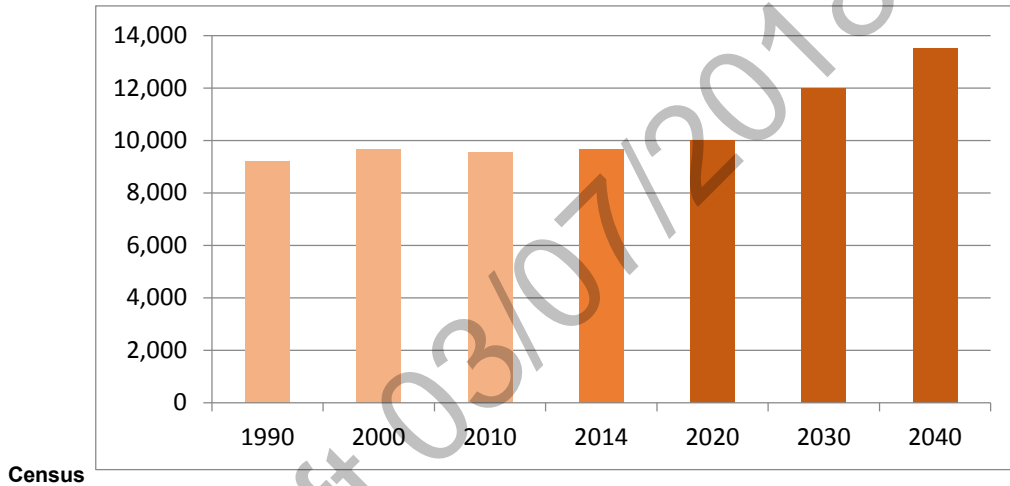


Table 2.2 – Population Change 1970-2040

Source: Metropolitan Council, US Census

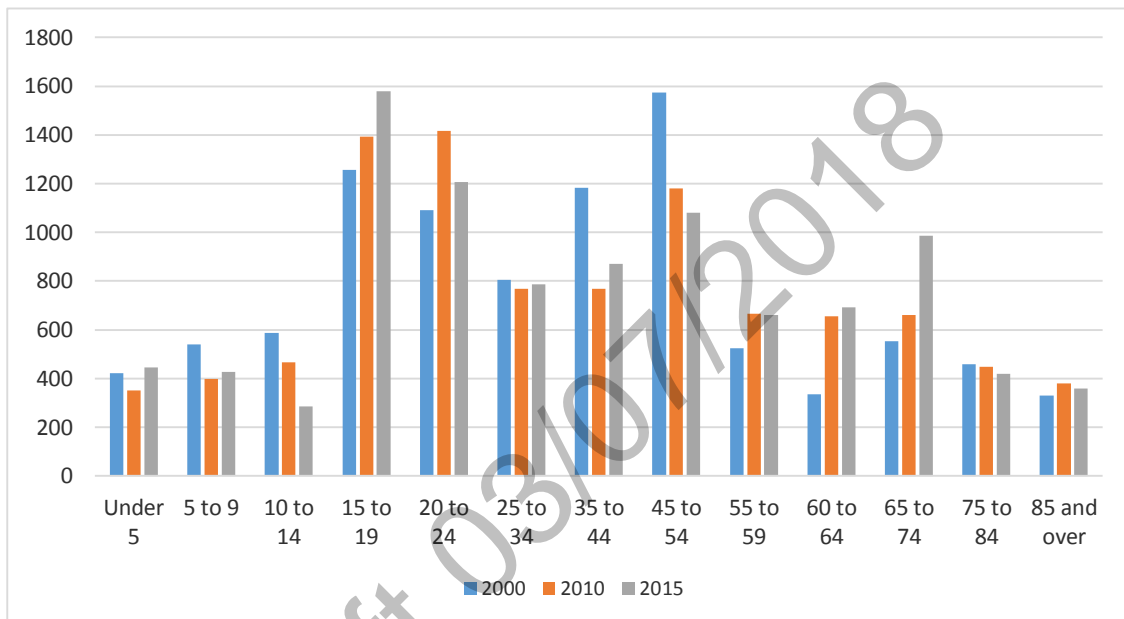
	1970	1980	1990	2000	2010	2000-2010 % Change	2014/2015 EST	2020	2030	2040	2010- 2040 % change
Arden Hills	5,149	8,012	9,199	9,652	9,552	-1.04%	9,652	10,000	12,000	13,500	41.33%
Mounds View	10,599	12,593	12,541	12,738	12,155	-4.58%	12,444	12,300	12,300	12,400	2.02%
New Brighton	19,507	23,269	22,207	22,206	21,456	-3.38%	22,084	22,300	23,100	24,100	12.32%
Roseville	34,438	35,820	33,485	33,690	33,660	-0.09%	34,719	33,800	34,000	34,500	2.50%
Shoreview	10,978	17,300	24,587	25,924	25,043	-3.40%	25,723	25,500	25,500	25,600	2.22%
Ramsey County	476,255	459,784	485,765	511,035	508,640	-0.47%	529,506	548,220	570,610	592,720	16.53%
7 County Metro Area	1,874,612	1,985,873	2,288,721	2,642,056	2,849,567	7.85%	2,952,114	3,131,170	3,389,060	3,636,390	27.61%

- From 2000 to 2010, Arden Hills experienced a slight decline in population. This is consistent with all other communities in the vicinity. However, the Seven County Metro Area grew 7.85% during this same time period.
- The City’s most rapid growth occurred during the 1970s when the City grew by 56 percent.

- The City’s population nearly doubled between 1970 and 2000 when it increased approximately 87 percent.
- Arden Hills is forecasted to experience a 41% jump in population between 2010 and 2040. Most of the projected growth is anticipated to occur on the proposed TCAAP property redevelopment.

Figure 2.2 – Arden Hills Age Distribution 2000, 2010, 2015

Source: US Census & American Community Survey



- The median age of Arden Hills residents has remained stable over the last fifteen years. In the year 2000, it was 36.2. By 2010, it had dropped down to 34.8. The latest population estimates show that it has increased back to 36.7 in the year 2015.
- The proportion of people over age 55 is anticipated to increase greatly from 2000 to 2015, increasing from 23 percent to 32 percent of the population.
- The relatively stable and higher percentage of population in the 18-24 age group from 2000 to 2015 is likely due to the student populations at Bethel University and Northwestern College.
- Except for the 15 – 24 age groups, Arden Hills’ population tended to shift into the older age groups in 2015. This growth in the older age groups, as noted in Figure 2.2, is anticipated to continue.

2.3 HOUSING

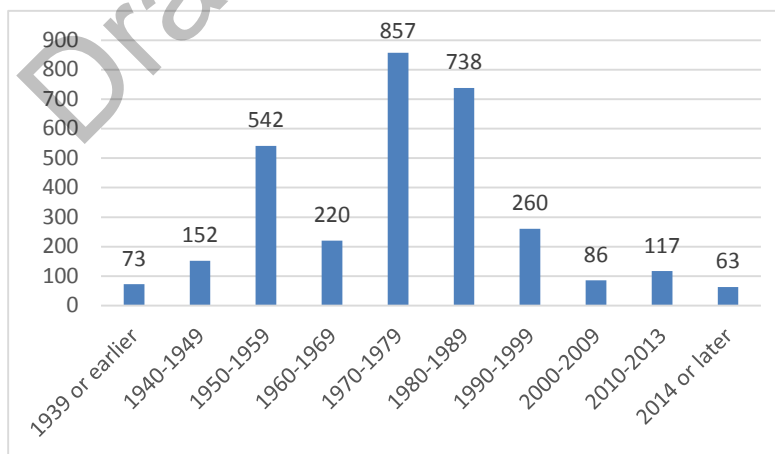
Table 2.2 – Household Forecasts

	2000	2010	% change 2000- 2010	2020	2030	2040	% change 2010- 2040
Arden Hills	2,959	2,957	-0.07%	3,200	4,100	4,600	55.56%
Mounds View	5,018	4,954	-1.28%	5,100	5,200	5,200	4.97%
New Brighton	9,013	8,915	-1.09%	9,500	10,000	10,400	16.66%
Roseville	14,598	14,623	0.17%	15,300	15,700	16,100	10.10%
Shoreview	10,125	10,402	2.74%	11,000	11,200	11,300	8.63%
Ramsey County	201,236	202,691	0.72%	223,460	236,090	246,050	21.39%
7 county Metro	1,021,456	1,117,749	9.42%	1,257,730	1,378,830	1,490,470	33.35%

- The forecasted increase in housing units from 2020 to 2040 is largely due to the proposed redevelopment of the TCAAP property.
- The adjacent communities and Ramsey County grew much slower between 1990 and 2000 and are anticipated to grow less than the seven county metropolitan area as a whole, which reflects the highly developed nature of Ramsey County.
- The developed portion of Arden Hills is likely to experience infill development and redevelopment in the coming years, particularly around the lakes.

Figure 2.3 – Age of Housing Stock

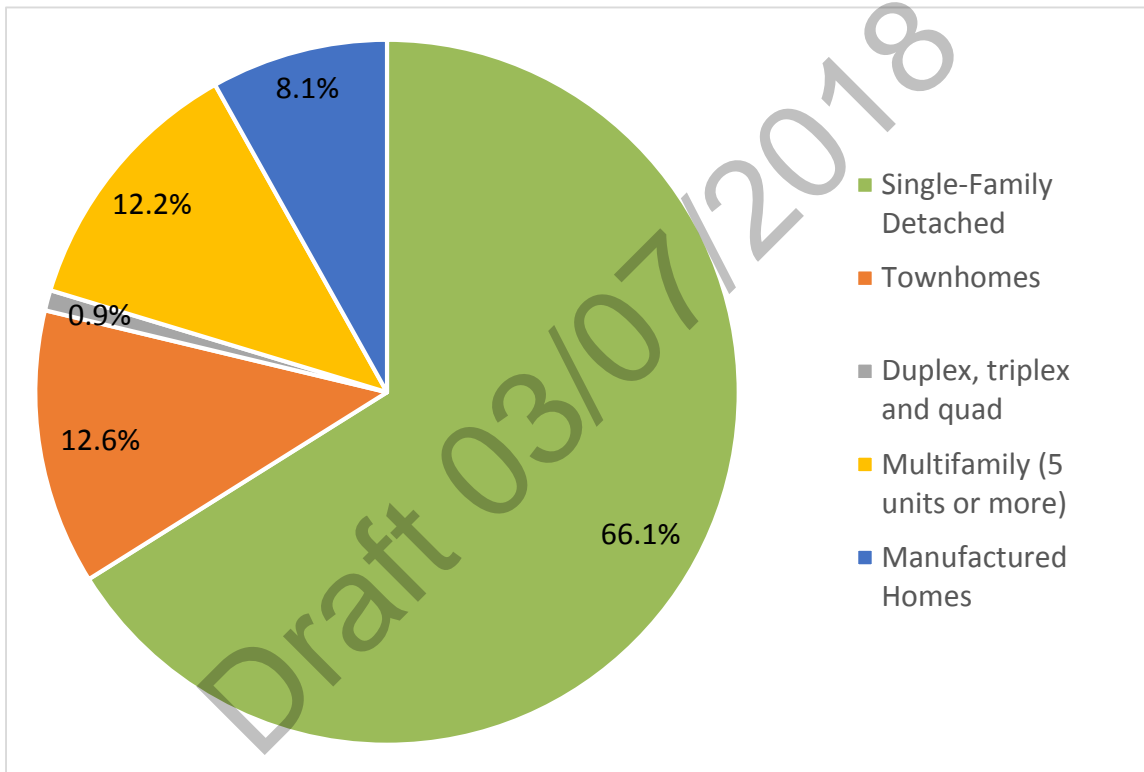
*Does not include the manufactured home community
Source: 2015 ACS



- Most of the housing units in Arden Hills were built between 1970 and 1989.
- Sixty percent of the homes in Arden Hills were built before 1980.
- At nearly 150 homes, more homes were built in 1979 than in any other year.
- There has been a significant drop in the number of housing units constructed as the availability of undeveloped land has significantly decreased.
- The large forecasted increase in housing in Arden Hills is largely focused in the TCAAP redevelopment area.

Figure 2.4 - Housing Type (2015)

Source: Met Council Estimates



- 78.7 percent of the housing in Arden Hills is single-family housing (attached and detached).
- 12.2 percent of the housing in Arden Hills is multi-family housing.
- 8.1 percent of the housing in Arden Hills is manufactured/mobile homes.

Chapter seven includes additional housing information.

2.4 EMPLOYMENT & INCOME

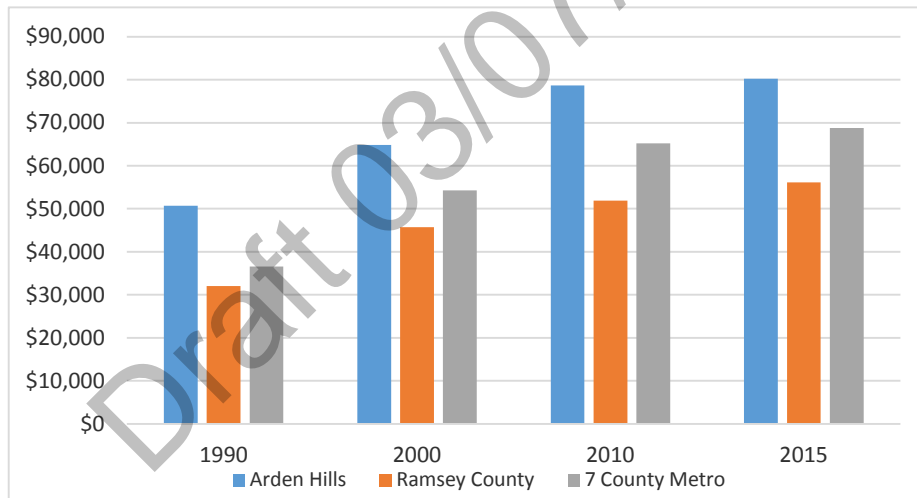
Table 2.3 – Employment Forecasts

	1990	2000	2010	2020	2030	2040
Arden Hills	10,929	12,429	12,402	15,000	16,300	17,500
Mounds View	3,142	4,382	6,386	6,800	7,100	7,200
Shoreview	5,771	9,829	11,665	13,200	14,100	14,700
Roseville	33,046	39,103	35,104	37,300	38,300	39,300

- In 2010, Arden Hills had 23 percent more jobs than residents.
- Arden Hills is anticipated to have more jobs than people through 2040.
- Much of the employment growth after 2010 is anticipated to be on the TCAAP property.

Figure 2.5 – Household Income

Source: US Census



- The median household income in Arden Hills in 2015 was \$80,200.
- The Arden Hills median household income was \$64,800 in 2000 (2000 dollars).
- The median household income in Arden Hills is higher than both Ramsey County and the seven county metro area.

2.5 PLACE TO WORK/WORK TO PLACE

Table 2.4 – Top 10 Work Destinations in 2015

Workplaces	Workers	Percent
Minneapolis	751	20.8%
St. Paul	509	14.1%
Arden Hills	232	6.4%
Roseville	217	6.0%
Shoreview	161	4.5%
New Brighton	108	3.0%
Blaine	106	2.9%
Bloomington	99	2.7%
Fridley	85	2.3%
Coon Rapids	74	2.0%
Remaining Destinations	1,260	35.0%
Total	3,603	100%

Source: US Census

Table 2.5 – Top 10 Sources of Employees in 2015

Residences	Workers	Percent
St. Paul	1,150	10.6%
Minneapolis	993	9.2%
Blaine	580	5.4%
Shoreview	517	4.8%
Brooklyn Park	377	3.5%
Coon Rapids	375	3.5%
Roseville	329	3.0%
Woodbury	285	2.6%
Lino Lakes	258	2.4%
New Brighton	242	2.2%
Remaining Sources	5,705	52.8%
Total	10,811	100%

Source: US Census

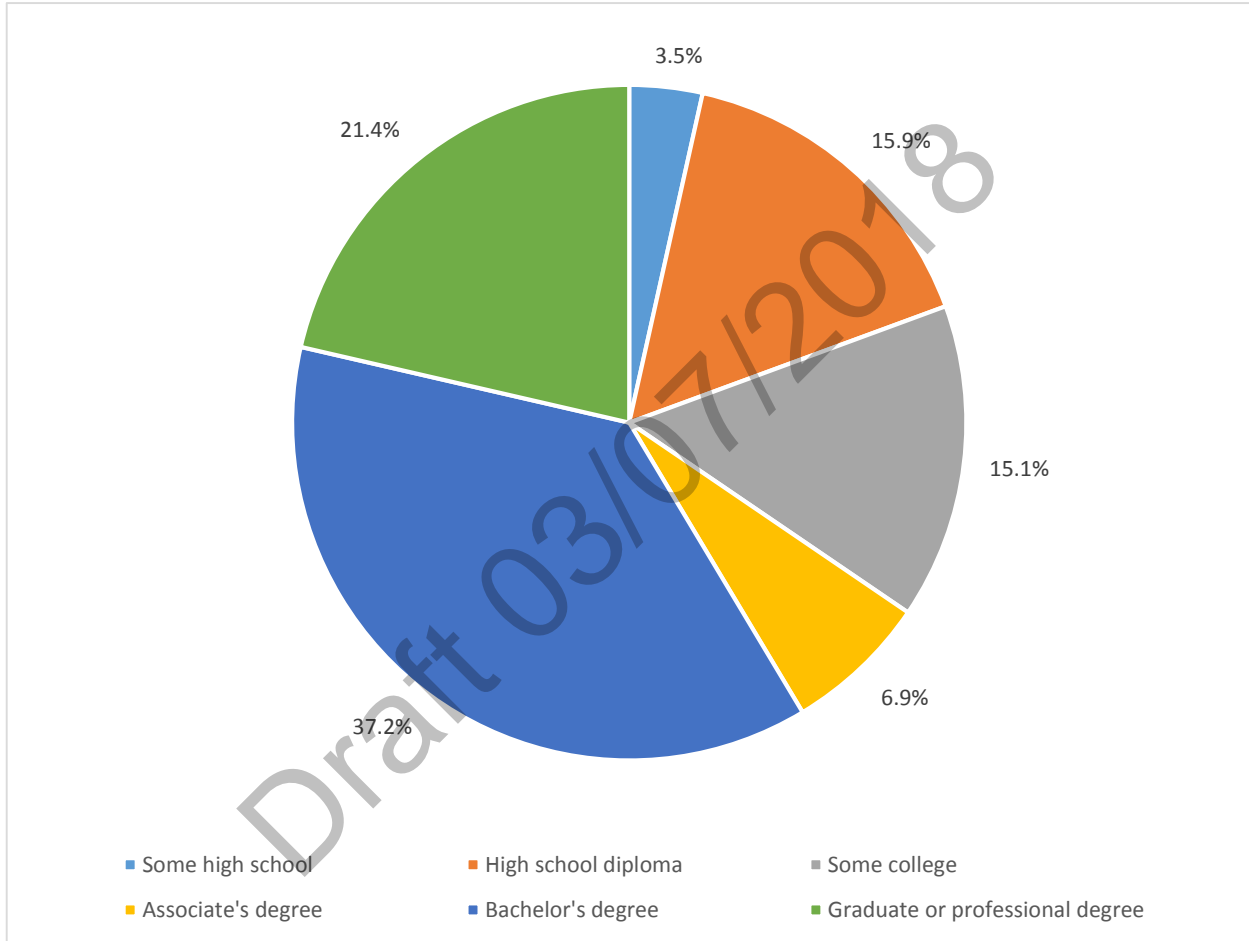
In 2015, the City had over 7,000 people of working age and approximately, 12,188 jobs. Although the City had almost two jobs for each resident, a majority of people commuted out of the City for employment in 2015 (Table 2.7 and 2.8).

- 232 Arden Hills residents also work in Arden Hills.

- Over 34 percent of residents (of working age) worked in either Saint Paul or Minneapolis (Figure 2.8).
- Saint Paul was the largest supply of workers for employers in Arden Hills (Figure 2.9).

2.6 EDUCATION

Table 2.6 – Educational Attainment (2015)



- Over 58 percent of Arden Hills residents have obtained a bachelor's degree or higher.
- 96.5 percent of Arden Hills residents have obtained at least a High School Diploma.

3. CITY VISION

On a day-to-day basis, the City provides many services that are needed to maintain a high-quality of living and contribute to the overall success of Arden Hills. This Plan is divided into fourteen chapters that address a range of topics, including land use, housing, and transportation among others. While each chapter has its own goals and policies, the chapters are not independent of each other. This Plan should be viewed as an integrated whole in order to take advantage of opportunities that may be able to advance the goals and policies from more than one chapter.

The chapters, goals, and policies in this Comprehensive Plan are not presented in order of importance or priority. Each goal and policy has been identified as a tool to advance the overall City vision. The primary purpose of this Plan is to support and advance the City's long-term vision:

City Vision – Arden Hills is a strong community that values its unique environmental setting, strong residential neighborhoods, vital business community, well-maintained infrastructure, fiscal soundness, and our long-standing tradition as a desirable City in which to live, work, and play.

The community seeks to achieve this overall City vision by working to advance the following goals in this Comprehensive Plan:

Active Living – Enhance the health, safety, and well-being of all who live, work, and play in the City.

TCAAP Redevelopment – Develop TCAAP in a way that accommodates a mix of land uses that is sensitive to the natural environment, economically sustainable, and of benefit to the community.

Land Use – Develop and maintain a land use pattern that strengthens the vitality, quality, and character of our residential neighborhoods, commercial districts, and industrial areas while protecting the community's natural resources and developing a sustainable pattern for future development.

Housing - Develop and maintain a strong, vital, diverse and stable housing supply for all members of the community.

Economic Development and Redevelopment – Promote the development, redevelopment, and maintenance of a viable, innovative, and diverse business environment serving Arden Hills and the metropolitan area.

Parks and Recreation – Create a comprehensive, maintained, and interconnected system of parks, pathways, and open spaces as well as a balanced program of recreational activities for residents of all ages, incomes, and abilities.

Protected Resources – Preserve, protect, and restore the community’s natural resources, including open spaces, lakes, wetlands, other significant natural features, and historic resources.

Transportation – Provide a transportation system that has convenient and effective multi-modal connections within Arden Hills and to adjacent municipalities, the remainder of the Twin Cities Metropolitan Area, and greater Minnesota.

Resilience and Sustainability – Promote resiliency and sustainable design practices in the preservation, development, redevelopment, and maintenance of the City’s natural and built environment.

Public Facilities, Infrastructure, and Services – Provide efficient and high-quality public facilities, services, and infrastructure.

Each chapter in this Plan includes the background information for each goal, policies to advance the goal, and suggested implementation options. The policies and other implementation techniques listed in this Plan are not intended to be all-inclusive and there is overlap between chapters. New opportunities or tools that arise over time should be considered even if not included in this Comprehensive Plan.

4. ACTIVE LIVING

Goal: Enhance the health, safety, and well-being of all who live, work, and play in the City.

In 2006, the City received a grant from Blue Cross Blue Shield of Minnesota to incorporate active living principles into the 2030 Comprehensive Plan. The purpose of the grant was to encourage cities to create a natural and built environment that encourages more physical activity and, subsequently, leads to an increase in overall public health. There is no single solution to increasing physical activity or public health, and the City does not seek to change personal choices. However, the City can work to remove obstacles to physical activity and increase opportunities for healthy living choices. The City continues to support the active living goals and policies identified during the last Comprehensive Plan update and has elected to retain this chapter in the 2040 Comprehensive Plan.

4.1 ACTIVE LIVING PRINCIPLES

A principal goal of active living is to create opportunities that integrate physical activity into daily routines. Removing obstacles in the built environment and encouraging a built environment that promotes physical activity can be achieved through the planning process.

In committing to promote and increase physical activity, the following principles, based on principles prepared by the Active Living by Design group (www.activelivingbydesign.org), serve as a guide to advancing the active living movement:

1. Physical activity is a behavior that can favorably improve health and quality of life.
2. Everyone should have safe, convenient and affordable choices for physical activity.
3. The City and new developments should be designed to provide a variety of opportunities for physical activity and should accommodate a wide range of individual preferences and abilities.
4. Development patterns should encourage opportunities for active living where appropriate as well as a variety of transportation choices.

5. Buildings should be designed and oriented to promote opportunities for active living, especially non-motorized transportation.
6. Transportation systems, including transit, should provide safe, convenient and affordable access to housing, worksites, schools and community services.
7. Parks and green space, including pathways, should be safe, accessible and part of a transportation network that connects destinations of interest, such as housing, worksites, schools, community services and other places with high population density.
8. The City, in cooperation with other public and private entities, are encouraged to plan for ongoing interdisciplinary collaboration, promotion of facilities, behavioral supports, policies that institutionalize the vision of active living, and routine maintenance that ensures continued safety, quality and attractiveness of the physical infrastructure.
9. City planning processes should address the multiple impacts of the built environment and transportation choices on residents' ability to be physically active.

These principles can help serve as an evaluation framework for new developments, ordinances, and policies.

4.2 APPLYING ACTIVE LIVING PRINCIPLES

This chapter does not encompass all of the goals or policies related to the active living movement. Where applicable, active living principles have been incorporated throughout this Plan to encourage coordination between goals, policies, and strategies. For example, reconstructing a road in the transportation chapter is related to creating a new pathway in the parks and recreation chapter, which increases opportunities for physical activity and healthy living.

In addition to the goals and policies throughout this Comprehensive Plan, the city seeks to advance the overall *active living goal* with the following additional policies:

- Encourage the incorporation of active living principles into new developments and redevelopments where feasible.
- Consider active living principles when evaluating new policies, ordinances, procedures, and proposals.
- Work with the adjacent communities, school districts, public & private institutions, and employers to encourage and advance the active living principles.

- Evaluate the City’s regulations to identify and remove obstacles to active living where feasible for residents of all ages and abilities.

The above strategies should not be considered all-inclusive. New opportunities and strategies should be identified to further advance the City’s active living goal and principles.

In addition to the local strategies listed above, the City will continue to partner with the coalition members of Active Living Ramsey Communities to encourage and support efforts to improve active living at the regional level through changes in public and private design, transportation, and policies.

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5. TWIN CITIES ARMY AMMUNITION PLANT (TCAAP) PROPERTY REDEVELOPMENT

Goal: Develop TCAAP in a way that accommodates a mix of land uses that is sensitive to the natural environment, economically sustainable, and a benefit to the community.

In 1941, the federal government started construction on the Twin Cities Army Ammunition Plant (TCAAP), which occupied about 3.7 square miles (2,370 acres) in what was then Mounds View Township (Figure 5.1). During a 16 month period, over 300 buildings were constructed to manufacture and test munitions for World War II. The plant also produced munitions for the Korean conflict, Vietnam conflict, and the first Gulf War. At its peak, the property had 40 miles of electric and telephone wire, 83 miles of sewer, 37 miles of road and railroad track, and employed more than 25,000 people.

The entire TCAAP property was included in the Arden Hills municipal border when the City incorporated in 1951, and now occupies approximately the northern third of Arden Hills. The TCAAP property is bounded by Highway 96 on the south, Highways 10 and 35W on the west, Lexington Avenue on the east, and County Road I on the north.

5.1 TCAAP DECOMMISSIONING AND LAND TRANSFERS

Between 1974 and 1985, the federal government started decommissioning TCAAP. While munitions production by private entities continued into the early 2000s, operations were a fraction of peak production. Plans to transfer portions of the property and redevelop it have been in the works since the 1980s. Redevelopment plans for the former TCAAP property have continued to evolve and become more detailed:

Table 5.1 – TCAAP Land Reuse Proposals

		1982	1998	2008	2016
Redevelopment Area	Residential	970	445	168	146
	Commercial/Industrial	500	222	182	198
	Parks and Other Open Space	805	252	168	24
	Institutional, Roads, & Other Public Use	95	215	65	53
Rice Creek Trail Corridor		na	na	113	221
Parks Preserve/Arden Hills Army Training Site (AHATS)/US Army Reserve		na	1,237	1,562	1,611
Other (MnDot, Ramsey County, Arden Hills)		na	na	113	113
Total		2,370	2,370	2,371	2,371
Acerage is approximate.					

Much of the former TCAAP property has already been transferred or leased to other public entities, including the Minnesota Department of Transportation, Ramsey County,

Arden Hills, and the Minnesota National Guard (Figure 5.2). In April of 2013, Ramsey County purchased 427 acres of the TCAAP site from the General Services Administration (GSA) for redevelopment.

5.1.1 Ramsey County Parks and Recreation

Rice Creek traverses the northwestern corner of the former TCAAP property and is an important animal habitat and recreation area. Approximately 113 acres adjacent to the creek were transferred to Ramsey County in 2006 for the development of the Rice Creek North Regional Trail (Figure 5.2). Ramsey County is currently working with the GSA to have an additional 108 acres of land transferred for the purpose of expanding the Rice Creek trail corridor.

Ramsey County Parks and Recreation also owns a parcel that is approximately 5 acres in size adjacent to Lexington Avenue near the Marsden Lake and wetland complex. This site is known as the Marsden Archery Range.

5.1.2 Arden Hills Army Training Site (AHATS) and Army Reserve

Approximately 1,611 acres will remain under federal ownership; however, the Minnesota National Guard has a long-term lease for most of the land. A small portion is used for the Army Reserve station in the far southeastern corner of the property. This land is expected to remain under federal ownership for the foreseeable future.

The Minnesota National Guard has designated their leased area as the Arden Hills Army Training Site (AHATS). Although live munitions firing are prohibited on the site, the Minnesota National Guard does use the property for training purposes. Much of AHATS is anticipated to remain as open space, but the National Guard is in the process of developing a long-term master plan for the property.

The Arden Hills Army Training Site is anticipated to include a field maintenance shop, training area management building, division headquarters, state joint force headquarters, billeting, and a number of ancillary buildings. The project is also expected to include an armory/training center that could have a community center component. The future buildings would be located on the north and west sides of the Ramsey County/Arden Hills Public Works Facility at the northwest corner of the Hamline Avenue and Highway 96 intersection.

The potential impacts of the AHATS master plan have not been fully evaluated, but it will increase use and workers on the National Guard property. The City

seeks to maintain a working relationship with the Minnesota National Guard on planning activities and to potentially collaborate on a community center as part of the training facility.

5.1.3 Ramsey County

In 2002, the General Services Administration (GSA) formally declared 585 acres of the TCAAP property as excess that was to be sold. In 2013, Ramsey County purchased 427 acres of the site from the U.S. Government with the intent to clean up the property and put it back into productive economic use. The property purchased by Ramsey County is adjacent to Interstate 35W and Highway 10 (Figure 5.2). The City of Arden Hills is partnering with Ramsey County on the redevelopment project, with the City being responsible for preparing the master plan and other land use control documents.

5.1.4 City of Arden Hills

The City of Arden Hills owns 6.9 acres of the former TCAAP property adjacent to Highway 96 (Figure 5.2). This property was transferred to the City for use as a new City Hall, which was completed in 2001.

5.1.5 State of Minnesota

The State of Minnesota controls nearly 62 acres of the former TCAAP property in the northwestern corner adjacent to County Road I and Interstate 35W. The Minnesota Department of Transportation has a facility on the site, including a driver licensing center.

5.2 TCAAP Master Plan

The City of Arden Hills in partnership with Ramsey County approved a Joint Powers Agreement (JPA) that created a Joint Development Authority (JDA) govern the redevelopment of 427 acres of the TCAAP property. The JDA initiated a master planning process for the 427 acre parcel purchased by the County in April 2013. Over the course of the subsequent year, the City held a series of public open houses to solicit community preferences and met with local developers and other relevant stakeholders to help inform the Master Plan. The long-term vision for the site that came out of this process emphasized the need for regional employment, a variety of housing options, well-designed and pedestrian-friendly commercial areas, and a network of parks and open spaces.

The City Council approved the Master Land Use Map for the site in June 2014, and the Alternative Urban Areawide Review (AUAR) and Mitigation Plan in July 2014. Following these approvals, the City began work on the regulations and policies component of the Master Plan in August 2014. This document, officially titled the TCAAP Redevelopment Code (TRC), was adopted by the City Council in July 2015, and establishes the development regulations for the parcel purchased by Ramsey County.

In 2016, the JDA initiated a request for proposals (RFP) process to solicit developers interested in redeveloping the 427 acres site in keeping with the approved TCAAP Master Plan. Following review of the RFPs, the JDA selected Alatus LLC as the Master Developer on May 2, 2016. Over the next six months, Alatus and the City discussed changes necessary to the TCAAP Master Plan to accommodate the plans of Alatus and their partners. To gather public input, an Open House was conducted on November 16, 2016 and the Planning Commission conducted a Public Hearing on December 7, 2016. The City Council approved amendments to the TCAAP Master Plan on December 12, 2016.

The goals of the TRC are to promote a more functional and attractive community through the use of recognized design principles and to allow property owners and developers flexibility in land use while prescribing a higher level of detail in building design and form. The City, along with the consultant team, drafted the TRC to codify the goals and vision for the site that were identified through the public engagement process.

Included in the TRC is the TCAAP Redevelopment Regulating Plan, which has been adopted as the official zoning map for the site. The Regulating Plan was amended by the City Council on December 12, 2016.

Since it is the City's goal to fully incorporate the TCAAP property into the fabric of the community, the land use, housing, parks and open space, transportation, and other components of the proposed TCAAP redevelopment have been integrated into their respective chapters in the Comprehensive Plan. The overall City vision, goals, and policies of each chapter also apply to the entire TCAAP redevelopment.

5.2.1 ENVIRONMENTAL CLEANUP

Portions of the TCAAP property were subject to environmental contamination during its four decades as a munitions manufacturing plant and testing area. The United States Army initiated environmental cleanup in the 1980s and cleanup of the groundwater is likely to continue for the next 40 years.

In 2013, Ramsey County entered into a contract with Carl Bolander & Sons Co. for hazardous material abatement, demolition, and site remediation services for the TCAAP property. The remediation project was completed in November 2015. Remediation has complied with the Minnesota Pollution Control Agency’s residential standard and the Agency issued a certificate of completion in August 2016.

5.2.2 REDEVELOPMENT TIMELINE

Demolition and remediation of the site was completed in November 2015. Grading of the site and construction of the main roadway and trunk utilities is expected to begin in 2019. At this time, it is expected that private development will begin in late 2019 or 2020. The project is anticipated to be completed in phases over the next 10 to 20 years; however, the development timeline will depend on a number of conditions, including the market, transportation improvements, and other related factors.

Draft 03/07/2018

6. LAND USE

Goal: Develop and maintain a land use pattern that strengthens the vitality, quality, and character of our residential neighborhoods, commercial districts, and industrial areas while protecting the community's natural resources and developing a sustainable pattern for future development.

To advance this *land use goal*, the following policies are proposed:

- Evaluate and amend the land use regulations to achieve the highest possible development standards, enhance the natural environment, protect public health, support a vital mix of land uses, and promote flexible approaches to implement the Comprehensive Plan.
- Ensure that land use regulations promote development that is compatible with nearby properties, neighborhood character, and natural features; minimize pedestrian and vehicular conflict; and visually enhance development.
- Preserve the stability and quality of the city's neighborhoods while allowing for redevelopment that is complimentary to existing development.
- Provide a balanced mix of residential, park, open space, and commercial land uses.
- Construct new development at an average density of at least five residential units per net residential acre.
- Explore the possibility of creating additional community gathering space in conjunction with public or private organizations, including AHATS.

6.1 INTRODUCTION

Land use is a defining characteristic of a community. While land use does not operate independently from the other characteristics that create a community, it is a binding factor between transportation, housing, parks, paths, and other characteristics. Through zoning, subdivision, and other land use regulations, a city has powerful tools to guide the long-term, look, feel, and vitality of their community.

Despite the vacant TCAAP property (see Chapter 5), Arden Hills is classified as a fully developed community by the Metropolitan Council's *Thrive MSP 2040*. The City is also entirely within the Metropolitan Urban Service Area (MUSA). The areas south of Highways 96 and 10 were mostly developed by the end of the 1970s, and less than three percent of the developable land in that part of Arden Hills is vacant. Significant land use changes are not anticipated in the developed part of Arden Hills; however, study areas have been identified in the Future Land Use section of this chapter. The City seeks to take a proactive stance to protect the high quality of life that residents have come to expect and to prepare for potential redevelopment opportunities on TCAAP and throughout the community.

6.2 FUTURE LAND USE – 2008 COMPREHENSIVE PLAN

The 2008 Comprehensive Plan included a future land use map (Figure 6.1) and proposed mix of land uses for future development, including potential land uses for the proposed TCAAP redevelopment:

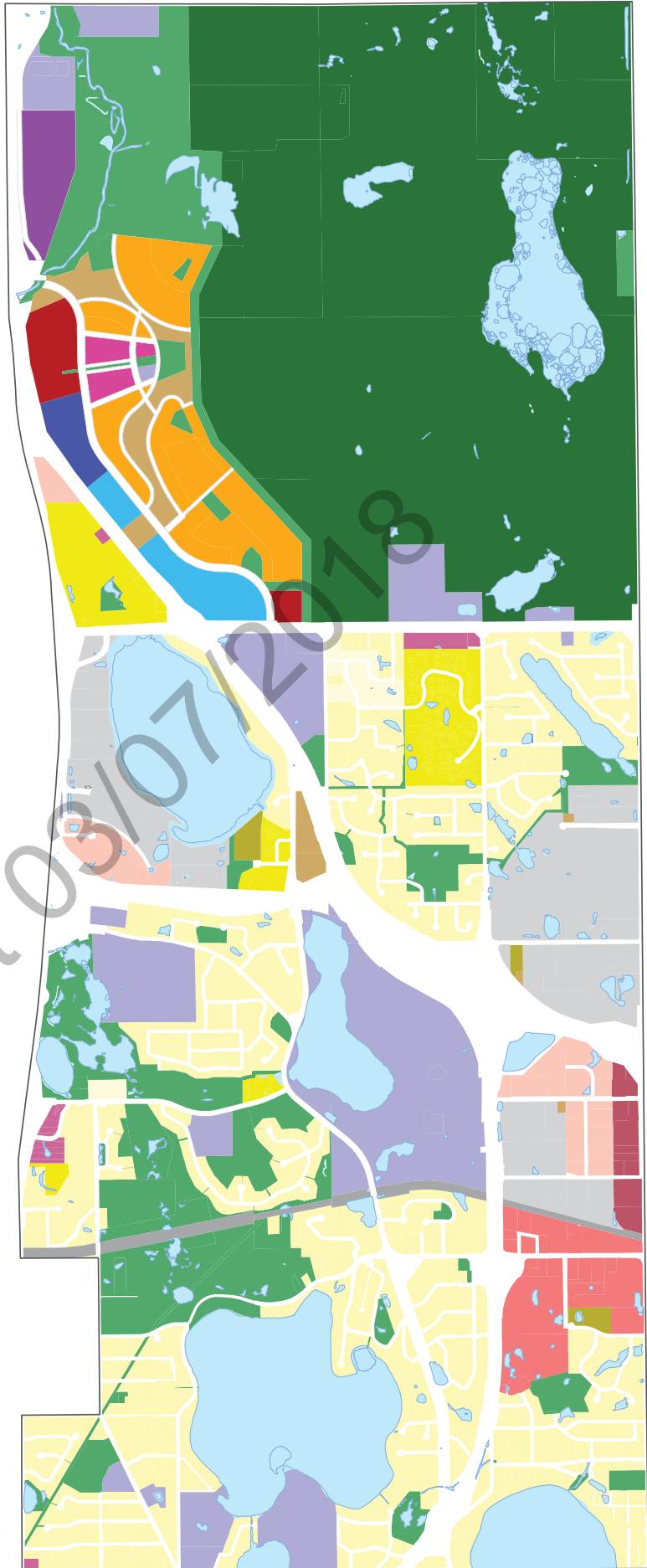
Table 6.1 – 2008 Future Land Use

2008 Comprehensive Plan - Future Land Use		
	Land Use	Acres
Arden Hills except TCAAP	Low Density Residential	978
	Medium Density Residential	136
	High Density Residential	12
	Neighborhood Business	19
	Mixed Business	79
	Commercial	26
	Community Mixed Use	100
	Light Industrial and Office	303
	Parks and Open Space	576
	Park Preserve	1,472
	Public & Institutional	461
	Utilities	15
	<i>Subtotal</i>	<i>4,178</i>
	TCAAP	Neighborhood Residential
Town Center		16
Campus Commercial		40
Office Mixed Use		20
Retail Mixed Use		34
Flex Business		42
Public & Institutional (Civic)		2
Parks and Open Space		24
Utilities		46
TCAAP Right-of-way		51
<i>Subtotal</i>		<i>427</i>
Other		Water
	Railroad Right-of-Way	35
	Right-of-way	685
	Total	6,121



*Figure 6.1
2030 Future
Land Use*

- VLDR - Very Low Density Residential
- LDR - Low Density Residential
- MDR - Medium Density Residential
- HDR - High Density Residential
- NR - Neighborhood Residential
- TC - Town Center
- NB - Neighborhood Business
- MB - Mixed Business
- COM - Commercial
- CMU - Community Mixed Use
- CC - Campus Commercial
- RMU - Retail Mixed Use
- OMU - Office Mixed Use
- FO - Flex Office
- I/O - Light Industrial and Office
- P/I - Public & Institutional
- UTL - Utility
- P/OS - Park and Open Space
- PP - Park Preserve
- WAT - Water
- RR - Railroad right-of-way
- ROW - Right-of-Way



The zoning district designations represented on this map correspond to the City of Arden Hills official Zoning Map. Questions concerning the Zoning Map should be directed to City Hall. Zoning designations are subject to change. Please refer to the Zoning Code for complete information.

Adopted: April 12, 1993
Printed: April 1, 2016



The following descriptions were used to define the future land use categories in the 2008 Comprehensive Plan:

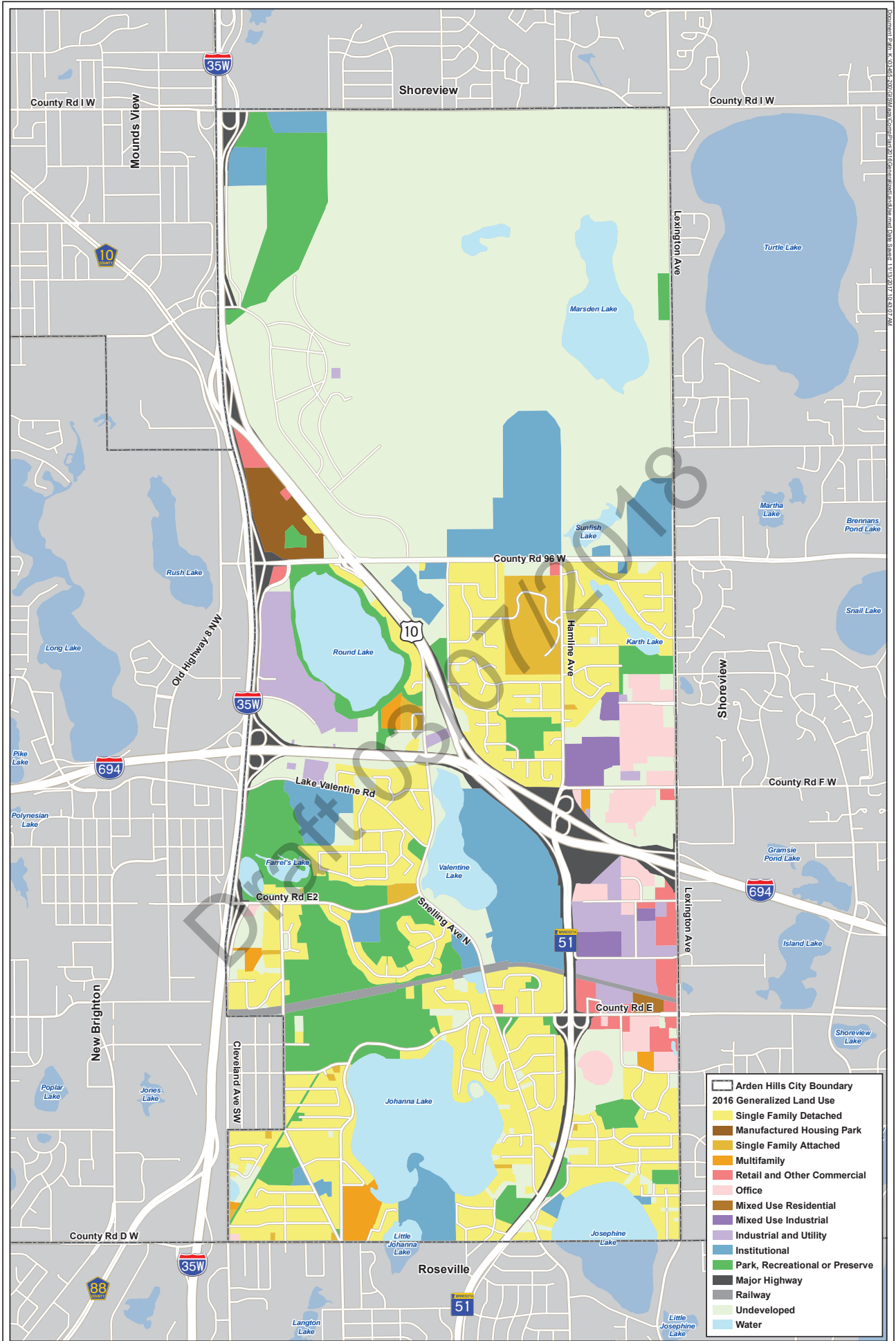
1. Very Low Density Residential (VLDR) – traditional single-family residential land use category. A density range of one and one-half (1.5) to three (3) units per acre.
2. Low Density Residential (LDR) – traditional single-family residential land use category. A density range of three (3) to five (5) units per acre may be allowed.
3. Medium Density Residential (MDR) – apartment and townhome land use category for providing densities of six (6) to nine (9) units per acre.
4. High Density Residential (HDR) – apartment and townhome land use category providing for densities of nine (9) to twelve (12) units per acre.
5. Neighborhood Residential (NR) – Provides for a range of attached and detached single-family and small multi-family uses at a density of one and one-half (1.5) to eight (8) units per acre.
6. Town Center (TC) – Provides for a range of commercial and residential uses that offer housing, assisted living, senior housing, office, retail, restaurant, and civic uses. Medium and large residential uses are permitted at a density of fifteen (15) to sixty-seven (67) units per acre.
7. Neighborhood Business (NB) – neighborhood business designates small, isolated areas for neighborhood commercial land uses when they are compatible with surrounding residential uses. Commercial uses that are high traffic generators, noise generators, or otherwise not compatible with residential neighborhoods, are inappropriate. Typically, Neighborhood Business areas will be located on intersections or nodes that are on the edge of residential areas, are less desirable sites for housing, or have traditionally been occupied with neighborhood services. Dwelling units of three (3) units per acre or more may be permitted.
8. Mixed Business (MB) – areas designated for a variety of businesses, including commercial, certain light industrial uses, warehousing, office, general business, retail.
9. Commercial (C) – areas designated for a broad range of retail, shopping, and services to meet the needs of the community and region. Compatible uses such as office buildings are also intended for this area.
10. Community Mixed Use (CMU) – areas designated for a broad range of retail, shopping, services, and office space to meet the needs of the community and surrounding areas. This area may also include medium to high density housing with a potential density of three (3) to twenty (20) units per acre.

11. Campus Commercial (CC) – Provides for multiple, single tenant buildings or campuses within a business park atmosphere.
12. Retail Mixed-Use (RMU) – Promotes retail as a primary use and allows for other commercial uses to be incorporated as vertical mixed-use buildings.
13. Office Mixed-Use – (OMU) – Focuses on office as a primary use, but also permits other commercial uses to be incorporated as vertical mixed-use buildings.
14. Flex Office (FO) – Permits large scale development for employment and light manufacturing uses that take advantage of highway frontage and automobile access.
15. Light Industrial and Office (I/O) – areas designated for a broad range of light industrial uses such as warehousing with manufacturing. This land use may also include offices.
16. Public & Institutional (P/I) – areas designated for uses such as government buildings, colleges, schools, and religious uses, but not medical uses.
17. Utility (UTL) – Public or private land occupied by a power substation, water tower, municipal well, pumping station, drainage infrastructure, or similar use.
18. Park and Open Space (P/OS) – areas designated as public parks.
19. Park Preserve (PP) – areas designated as natural or scenic areas that are to be preserved for public use or open space.
20. Water – includes permanently flooded open water, rivers and streams, and wetlands (wetlands not included in the national wetland inventory data may not be displayed).
21. Railroad right-of-way (RR) – public or private freight or passenger rail activities.
22. Right-of-way (ROW) – public vehicular, transit and/or pedestrian rights-of-way.

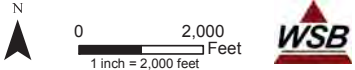
6.3 EXISTING LAND USE – 2016

The 2016 existing land use data is based on City and County property records and known land uses (Figure 6.2). The land uses are classified into the following categories:

1. Single Family Attached – includes all attached single family homes such as townhomes with separate entrances.
2. Single Family Detached – includes all detached single family homes.
3. Multifamily – includes apartment buildings and condominiums of more than one story.



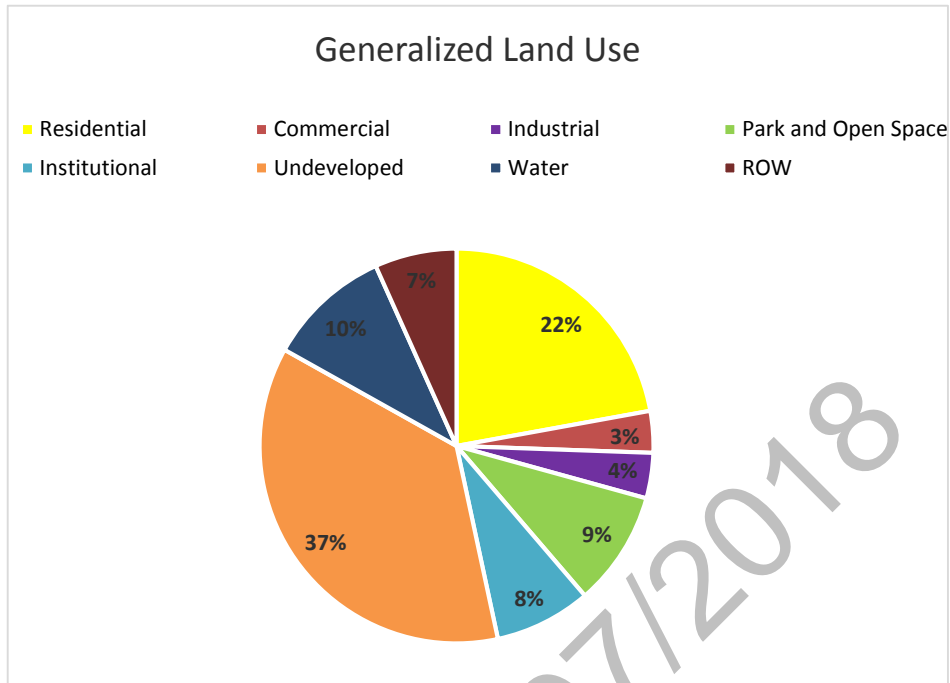
Arden Hills Comprehensive Plan
 Figure 6.2 2016 Generalized Land Use
 Arden Hills, MN



DOCUMENT ID: K:\GIS\2016\Map_Series\2016_Generalized_Land_Use_Map_Series_Sheet_11162016_11_031716.dwg

4. Manufactured Housing Parks – includes manufactured and mobile homes in specialized parks.
5. Mixed Use Residential - Land containing a building with multiple uses in combination with at least a residential unit(s).
6. Retail and Other Commercial – areas designated for a broad range of retail, shopping, and services to meet the needs of the community and region. Compatible uses such as office buildings are also intended for this area.
7. Office – Predominantly administrative, professional, or clerical services; includes medical clinics.
8. Mixed Use Industrial – Land containing a building with multiple uses in combination with industrial uses and NO residential units, such as light manufacturing and/or processing, warehousing, distribution, and offices.
9. Industrial and Utility - Land containing manufacturing, transportation, construction companies, communications, utilities (including water towers) or wholesale trade. This category includes publicly owned industrial lands (e.g. waste water treatment plant).
10. Park, Recreational or Preserve– areas designated as public parks.
11. Institutional– areas designated for uses such as government buildings, colleges, schools, and religious uses but not medical uses.
12. Undeveloped– Private land not occupied with a building or use.
13. Open Water– includes permanently flooded open water, rivers and streams, and wetlands (wetlands not included in the national wetland inventory data may not be displayed).
14. Railroad– Railroad right-of-way.
15. Major Highway– Major roadway strips of land or area, on which a vehicular rights-of-passage exists under the following conditions: all interstate highways; all 4-lane divided highways with rights-of-way of 200 feet or greater in width; or all 4-lane roads with a Metropolitan Council functional class designation of "Principal Arterial".

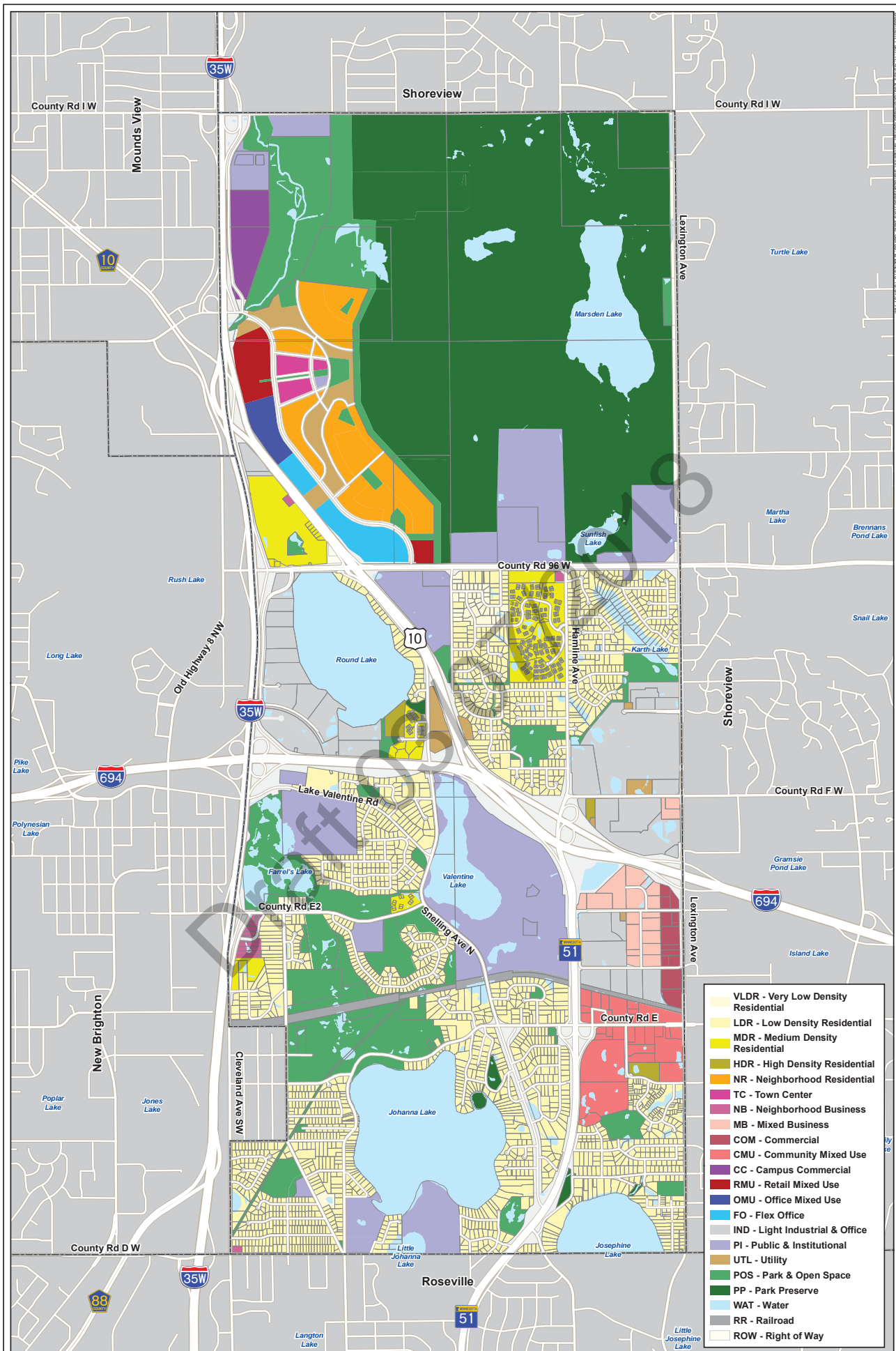
Figure 6.1 – 2016 Generalized Land Use



The table above shows land uses in Arden Hills in the generalized categories of: residential, industrial, institutional, water, commercial, park and open space, undeveloped, and right-of-way. Over one third of the land in Arden Hills is designated for undeveloped use, which is new from the 2008 land use categories. This is due to the former Twin Cities Army Ammunition Plant property and the vacant areas on college and corporate campuses. The next most prominent land use is all types of residential at 22 percent of the City’s total land area. The smallest land use categories are commercial and industrial at three percent and four percent, respectively.

6.4 FUTURE LAND USE - 2040

While redevelopment may occur on some parcels throughout the City, no significant land use changes in the developed areas of Arden Hills are anticipated (Figure 6.3). Most of the City’s projected population, household, and employment growth will occur on the TCAAP redevelopment site.



Arden Hills Comprehensive Plan

Figure 6-3 2040 Future Land Use
Arden Hills, MN

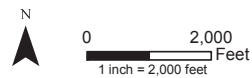


Table 6.3 – 2040 Future Land Use

2040 Future Land Use			
Land Use (Not Including TCAAP)	Acres	Land Use (TCAAP)	Acres
Very Low Density Residential	27	Neighborhood Residential (TCAAP)*	146
Low Density Residential	946	Town Center (TCAAP)*	16
Medium Density Residential	145	Campus Commercial (TCAAP)*	40
High Density Residential	14	Office Mixed Use (TCAAP)*	20
Neighborhood Business	10	Retail Mixed Use (TCAAP)*	34
Mixed Business	33	Flex Business (TCAAP)*	42
Commercial	26	Public & Institutional (Civic - TCAAP)	2
Community Mixed Use	100	Parks and Open Space (TCAAP)	24
Light Industrial and Office	346	Utilities (Water Infrastructure - TCAAP)	46
Public & Institutional	461	Right-of-way (TCAAP)	51
Utilities	20		
Park and Open Space	579		
Park Preserve	1,327		
Water	1,253		
Railroad Right-of-way	35		
Right-of-way	73		
Total** (Not Including TCAAP)	5,427	Total** (TCAAP)	427
*Includes future right-of-way.			
**May not equal 5,427 or 427 due to rounding.			

6.4.1 Future Land Use Classifications

There are twenty-two future land use classifications:

1. Very Low Density Residential (VLDR) – traditional single-family residential land use category. A density range of one and one-half (1.5) to three (3) units per acre may be allowed.
2. Low Density Residential (LDR) – traditional single-family residential land use category. A density range of three (3) to five (5) units per acre may be allowed.
3. Medium Density Residential (MDR) –townhome and multi-family residential land use category for providing densities of six (6) to nine (9) units per acre.
4. High Density Residential (HDR) –townhome and multi-family residential land use category providing for densities of nine (9) to twelve (12) units per acre.

5. Neighborhood Residential (NR) – Provides for a range of attached and detached single-family and small multi-family uses at a density of one and one-half (1.5) to eight (8) units per acre.
6. Town Center (TC) – Provides for a range of commercial and residential uses that offer housing, assisted living, senior housing, office, retail, restaurant, and civic uses. Medium and large residential uses are permitted at a density of fifteen (15) to sixty-seven (67) units per acre.
7. Neighborhood Business (NB) – neighborhood business designates small, isolated areas for neighborhood commercial land uses when they are compatible with surrounding residential uses. Commercial uses that are high traffic generators, noise generators, or otherwise not compatible with residential neighborhoods, are inappropriate. Typically, Neighborhood Business areas will be located on intersections or nodes that are on the edge of residential areas, are less desirable sites for housing, or have traditionally been occupied with neighborhood services. Dwelling units of three (3) units per acre or more may be permitted.
8. Mixed Business (MB) – areas designated for a variety of businesses, including commercial, certain light industrial uses, office, general business, and retail.
9. Commercial (C) – areas designated for a broad range of retail, shopping, and services to meet the needs of the community and region. Compatible uses such as office buildings are also intended for this area.
10. Community Mixed Use (CMU) – areas designated for a broad range of retail, shopping, services, and office space to meet the needs of the community and surrounding areas. This area may also include medium to high density housing with a potential density of nine (9) to twenty (20) units per acre.
11. Campus Commercial (CC) – Provides for multiple, single tenant buildings or campuses within a business park atmosphere.
12. Retail Mixed-Use (RMU) – Promotes retail as a primary use and allows for other commercial uses to be incorporated as vertical mixed-use buildings.
13. Office Mixed-Use – (OMU) – Focuses on office as a primary use, but also permits other commercial uses to be incorporated as vertical mixed-use buildings.
14. Flex Office (FO) – Permits large scale development for employment and light manufacturing uses that take advantage of highway frontage and automobile access.

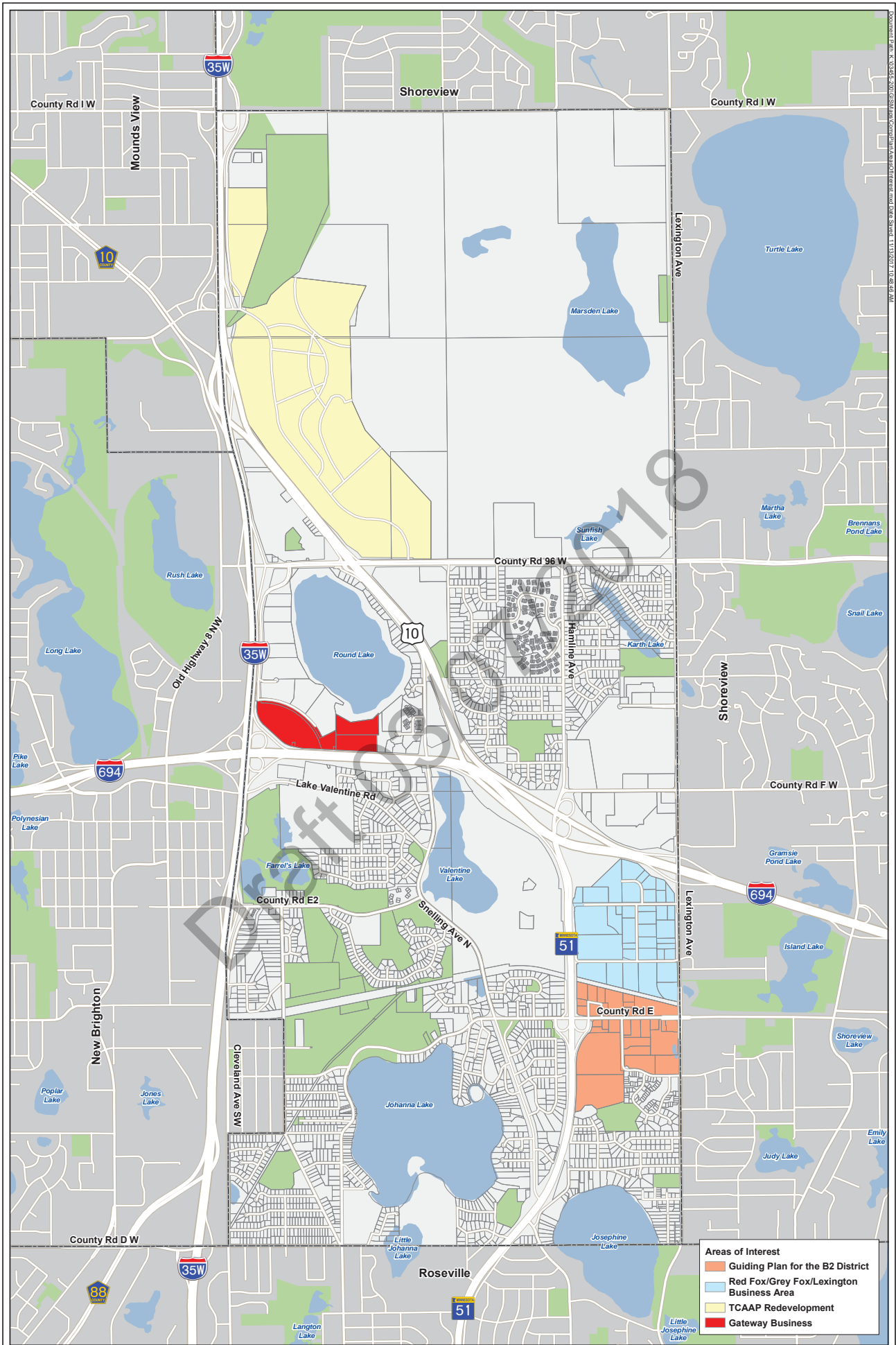
15. Light Industrial and Office (I/O) – areas designated for a broad range of light industrial uses such as manufacturing, processing, and warehousing. This land use may also include offices.
16. Public & Institutional (P/I) – areas designated for uses such as government buildings, colleges, schools, and religious uses, but not medical uses.
17. Utility (UTL) – Public or private land occupied by a power substation, water tower, municipal well, pumping station, drainage infrastructure, or similar use.
18. Park and Open Space (P/OS) – areas designated as public parks.
19. Park Preserve (PP) – areas designated as natural or scenic areas that are to be preserved for public use or open space.
20. Water – includes permanently flooded open water, rivers and streams, and wetlands (wetlands not included in the national wetland inventory data may not be displayed).
21. Railroad right-of-way (RR) – public or private freight or passenger rail activities.
22. Right-of-way (ROW) – public vehicular, transit and/or pedestrian rights-of-way.

6.4.2 Guiding Plan for the B-2 District

In March 2008, the City completed a visioning and planning process for the B-2 District, which generally includes the properties near County Road E between Lexington Avenue and Hamline Avenue/Highway 51 (Figure 6.4). Long considered the “downtown” of Arden Hills, the district is a mix of newer and older buildings and primarily retail, service, and office uses. As this corridor ages, market initiated redevelopment is anticipated.

The “Guiding Plan for the B-2 District” includes a long-term vision for the future redevelopment of this corridor and addresses transportation issues, land uses, infrastructure improvements, landscaping, pedestrian facilities, building design, and site layout among other issues. While the primary uses along this corridor are likely to remain retail, commercial, and office, the Guiding Plan and subsequent land use changes add the possibility for multi-family residential housing in this area.

Since the completion of the plan in 2008, the area has seen substantial redevelopment with the opening of new retail, restaurant, and multi-family residential housing uses. The City and Ramsey County completed infrastructure improvements on County Road E in 2015, including streetscape enhancements and improved pedestrian and bicycle facilities.



Arden Hills Comprehensive Plan
 Figure 6.4 Areas of Interest
 Arden Hills, MN

N

0 2,000 Feet

1 inch = 2,000 feet



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6.4.3 Red Fox/Grey Fox/Lexington Avenue Business Area Guiding Plan

Immediately north of the B-2 District is a significant industrial, office, and retail area for the City. This area includes Red Fox and Grey Fox roads and is bounded by Lexington Avenue, Highway 51, Interstate 694, and the Canadian Pacific railway (Figure 6.4). This area is used by a number of small and large businesses for a variety of retail, manufacturing, distribution, warehousing, and office uses. This area was largely developed between the 1950s and 1970s, though the retail area along Lexington Avenue has had some new development and redevelopment in the last 15 years.

While good access to regional transportation has helped to continue to make this area viable, some of the buildings are becoming functionally obsolete for modern manufacturing, warehousing, and business uses. As redevelopment pressure increases, a more detailed guiding plan is required to comprehensively address the overall redevelopment and transportation needs in this area of the City.

6.4.4 B-4: Retail Center Zoning District

The B-4 Zoning District is comprised of the properties with frontage on Dunlap Street between Grey Fox Road and Red Fox Road. There are no undeveloped parcels in the B-4 District and all the buildings are currently occupied. The properties are not generally retail in nature and therefore do not achieve the purpose statements of the B-4 District. The businesses are mostly wholesale sales, office/warehouse, light manufacturing, or repair orientated that are more typically industrial uses. The City should consider whether zoning changes in this area of the City would be appropriate in order to achieve the City's vision for the district and to support existing businesses in the area.

6.4.5 Neighborhood Business

The purpose of the Neighborhood Business land use concept is to promote the development of commercial nodes that were compatible with the surrounding residential uses and provided services to residential areas. Commercial uses that generate high traffic, noise, or other negative impacts were considered undesirable. Neighborhood business areas are located at intersections or nodes at the edge of residential areas, on properties not considered desirable for housing, or properties that have traditionally been occupied with neighborhood services. Housing can be a component of the development but would not necessarily be the focal point.

To date, the success of the Neighborhood Business district has been mixed. Two projects have been developed under this zoning designation, and both resulted in the construction of small office buildings with a variety of services. However, neither of the projects focused on providing neighborhood level services.

There are a number undeveloped Neighborhood Business properties on Cleveland Avenue south of County Road E-2 and the former City Hall/Public Works site south of Highway 96 at Hamline Avenue. The size, shape and proximity to residential uses limits the commercial redevelopment opportunities, and the City may choose to consider appropriate residential uses for these sites.

6.4.6 Developable Gateway Business Properties

There is about 35 acres of undeveloped land in the Gateway Business Zoning District northeast quadrant of Interstates 35W and 694. There are some wetlands and woodland that may influence future development, but considerate design may mitigate most impacts of development. The designation of this area is currently I/O – Light Industrial & Office. The City's vision is for these undeveloped properties to be developed for a corporate office or similar type use.

6.4.7 Employment Zones and Consumer Zones

The uses allowed in all the existing industrial zones and most of the commercial zones would allow for high economic activity uses adjacent to low economic activity uses. The uses allowed in some industrial zoning districts should be limited to create high economic activity districts with an emphasis on employment activities. Certain commercial zoning districts should be limited to encourage consumer-orientated uses. This employment versus consumer activity should be considered when revising the uses allowed in the various commercial and industrial zones.

6.4.8 Manufactured Home Community

The Arden Manor neighborhood has been identified as an important community and the primary supply of affordable housing options in the City. Bounded by Interstate 35W, Highway 96, and Highway 10, the neighborhood is facing

pressure from adjacent highways and land uses. The City anticipates this property will remain as a medium density residential use for the foreseeable future.

6.4.9 TCAAP Redevelopment

As noted in Chapter 5, the City of Arden Hills hired a consultant team in 2013, to create a Master Plan for the redevelopment of the TCAAP site. A central component of this work was the development of a Master Land Use Plan that allocated an appropriate mix of residential, commercial, industrial, civic, and open space uses on the site. The TCAAP Master Plan was approved by the City Council in July 2015 and amended by the City Council in December 2016, and has been incorporated in the 2040 Future Land Use data (Figure 6.3 and Table 6.4).

The City began work on the zoning and design standards to implement the Master Land Use Plan in August 2014. These regulations and policies are found in the TCAAP Redevelopment Code (TRC), which was approved in July 2015 and amended in December 2016. The TRC puts in place land use regulations that will achieve the community's goals for the TCAAP redevelopment including: high development and design standards; defined residential neighborhoods and commercial districts interconnected by streets, trails, and sidewalks; energy resiliency and sustainability; and abundant parks and open space.

Though the TCAAP Master Plan establishes a proposed allocation of the various uses throughout the TCAAP area and illustrates the current preferred development pattern for the area, the City has considered the proposal from Alatus LLC and its partners for modifications to the TCAAP Master Plan that proposed different locations for the allocated uses and amended the TCAAP Master Plan accordingly in December 2016. The City may consider on its own initiative to consider amendments to the adopted plan as development occurs or circumstances change in order to promote high quality development of the area consistent with City goals and this Plan.

6.4.10 Development Capacity and Net Residential Density

The Metropolitan Council's Thrive MSP 2040 assign a community designation of "suburban" which requires an average net residential density of at least five units per net residential acre. Densities lower than this are not an efficient use of the region's sanitary sewer infrastructure. Net residential acreage is calculated by subtracting wetlands, water bodies, public parks, arterial streets, and identified

natural resources that are protected by ordinance from gross acres. The number of net residential acres is then divided by the number of lots to determine net residential density.

According to the 2016 land use data provided by the Metropolitan Council, there were 1,362 acres of net residential land in Arden Hills, which includes the rights-of-way of adjacent City streets. The Metropolitan Council lists 3,198 housing units in Arden Hills in 2015. Based on that information, the residential density in the developed portion of Arden Hills is approximately 2.35 residential units per net residential acre. While this is below the five units per net residential acre required by the Metropolitan Council, the City is not required to raise densities in the built portion of Arden Hills. However, all future land uses should be able to accommodate development in average of five units per net residential acre.

There are no expected land use changes that would result in a reduction in net residential density in the developed part of Arden Hills. Furthermore, the remaining vacant residential land that is south of Highway 96 and 10 is guided for development that could be built at a density of an average of five residential units per acre.

The approved Master Plan for the TCAAP property includes 162.2 acres of residential land and a maximum of 1,460 residential units for an overall maximum gross density of 9.00 units per acre. The gross density includes the neighborhood collector roads; however, it excludes parks, arterial roads, and the water infrastructure.

6.4.11 Staged Development

Since the areas south of Highways 96 and 10 are considered fully developed and there is relatively little vacant property, a five year staged development has not been developed. While a small amount of vacant land exists in the developed portion of the City, development on the vacant land is unlikely to have a significant impact on the City's or region's infrastructure.

As previously noted in Chapter 5 the demolition and remediation of the TCAAP site was completed in November 2015. Grading of the site and the construction of the main roadway are expected to begin in 2019. At this time, it is expected that private development will begin in late 2019 or 2020. The project is anticipated to be completed in phases over the next 10 to 20 years; however, the development timeline will depend on a number of conditions, including the market, transportation improvements, and other related factors.

6.5 IMPLEMENTATION STRATEGIES

In order to advance implementation of this land use chapter, the below activities are proposed. This list is not intended to be all-inclusive and additional activities that advance the land use goal are encouraged to be developed.

- Update the City's Zoning Code to bring it into conformance with the land uses in the Comprehensive Plan.
- Evaluate zoning regulations to ensure that sufficient buffers are provided between commercial, industrial, and residential uses to protect the character of the City's residential neighborhoods.
- Develop a small area plan for the Red Fox/Grey Fox/Lexington Avenue business area to provide a more detailed redevelopment vision for incorporation into this Comprehensive Plan.
- Develop design standards for commercial, industrial, and residential developments to ensure the construction of high-quality, sustainable, and aesthetically enhancing development.
- Develop zoning regulations that restrict housing construction that is not sensitive to the character of the existing neighborhood.
- Continue to enforce property maintenance codes to protect quality and property values in the City.
- Implement design standards for the TCAAP development to create a cohesive character that compliments the established neighborhoods in the City.
- Work to protect significant environmental features on the AHATS property as park preserve.
- Work with the National Guard on the AHATS property to develop synergistic uses such as a community center.
- Consider zoning changes to the B-4 District based on the City's vision for this area.
- Determine the highest and best use for the vacant properties on the south end of Gateway Blvd along I-694 and rezone the properties accordingly.
- Evaluate the uses within the industrial zoning districts to emphasize employment uses.
- Evaluate the uses within the commercial zoning districts to ensure that there are an appropriate amount of retail and hospitality opportunities within Arden Hills.

The above strategies should not be considered all-inclusive. New opportunities and strategies should be identified to further advance the City's land use goal and policies.

7. Housing

Goal: Develop and maintain a strong, vital, diverse and stable housing supply for all members of the community.

To achieve this housing goal, the following policies are proposed:

- Promote the development of a variety of housing options by preserving and increasing high-quality housing opportunities that are suitable for a mix of ages, incomes and household types.
- Encourage the incorporation of affordable and life-cycle housing into new development and redevelopment where feasible.
- Maintain the quality, safety, and unique character of the City's housing stock.
- Preserve and strengthen the community's neighborhoods to maintain a high-quality of life for residents.
- Encourage housing development and redevelopment that is complimentary to and enhances the character of the City's established neighborhoods.

7.1 INTRODUCTION

One of the principal roles of a community is to serve as a place to live. In Arden Hills, 21.2 percent of all of the land area in the community is currently used for housing (not including TCAAP). The approved TCAAP Master Plan envisions that 38.0 percent of the total 427 acre site will be developed for residential uses. Because housing is such an important part of Arden Hills, maintaining the quality of the current housing stock while providing long-term opportunities for new housing is important to the ongoing vitality of the community and to retaining Arden Hills' reputation as a highly desirable place to live.

7.2 CONTEXT

According to the Metropolitan Council, Arden Hills had 3,198 housing units in 2015. A housing unit is the actual structure while a household refers to the people living in a housing unit. Approximately 66 percent of the housing units in Arden Hills are detached single-family homes, 13 percent are attached single family homes (commonly referred

to as townhomes), 12 percent are multifamily, with five units or more, and finally eight percent of units are manufactured homes.

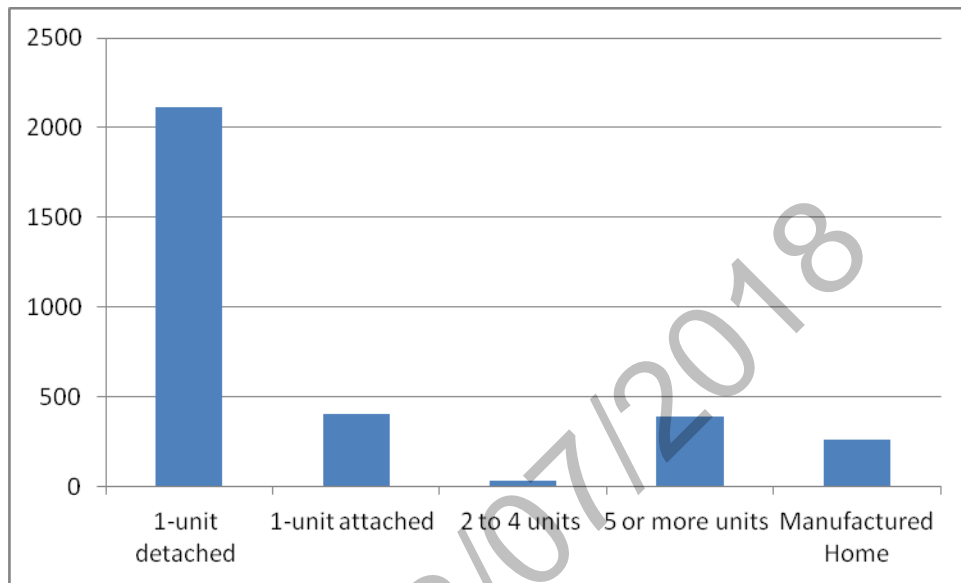


Figure 7.1 – Arden Hills Housing Type

Source: Metropolitan Council

Household composition will play a role in defining future housing needs in Arden Hills. Between 2000 and 2015, increases were seen in both the number of non-family households and in householders living alone.

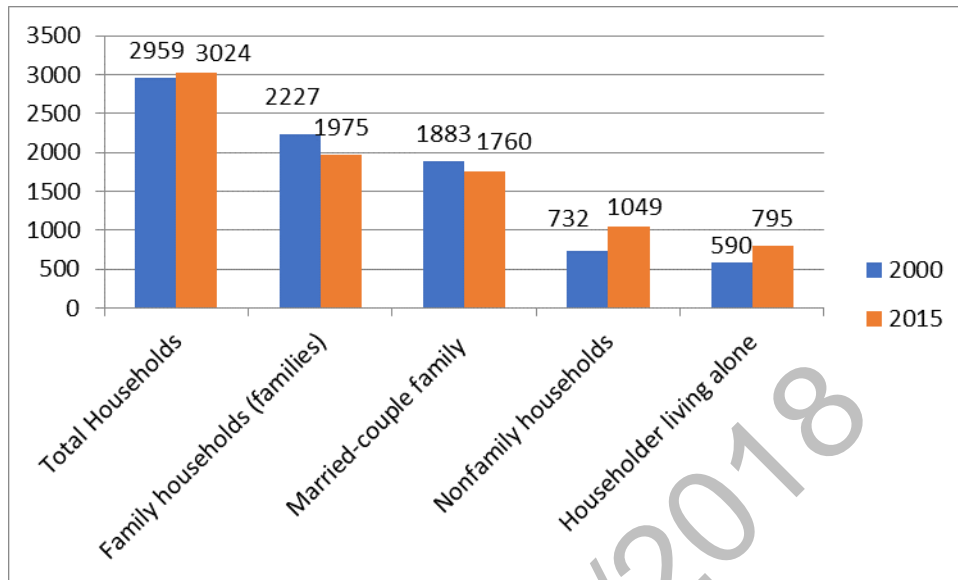


Figure 7.2 – Arden Hills Household Type

Source: US Census

Additionally, the age of Arden Hills’ residents will also impact housing choices. From 2000 to 2015, there was a significant decrease in residents between 45 and 54 years of age. Additionally, there have also been notable increases in the population between 65 and 74 as well as the 75+ age group.

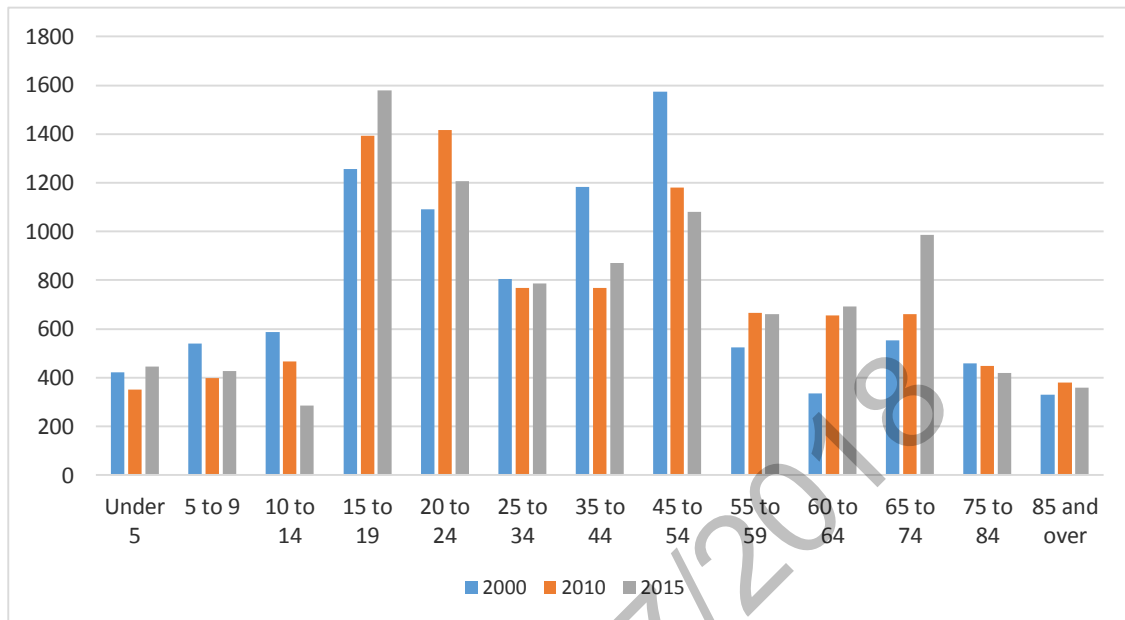


Figure 7.3 – Arden Hills Age Distribution 2000, 2010 and 2015

Source: US Census and American Community Survey

The age of the existing housing stock is also an indicator of potential future needs. From 1970 to 1979, 920 housing units were built in Arden Hills, the most of any decade to date. Of note is the fact that 50 percent of the housing in the community was constructed prior to 1974 (not including the manufactured homes). Homes that are older than 30 years may typically need more repairs and renovations.

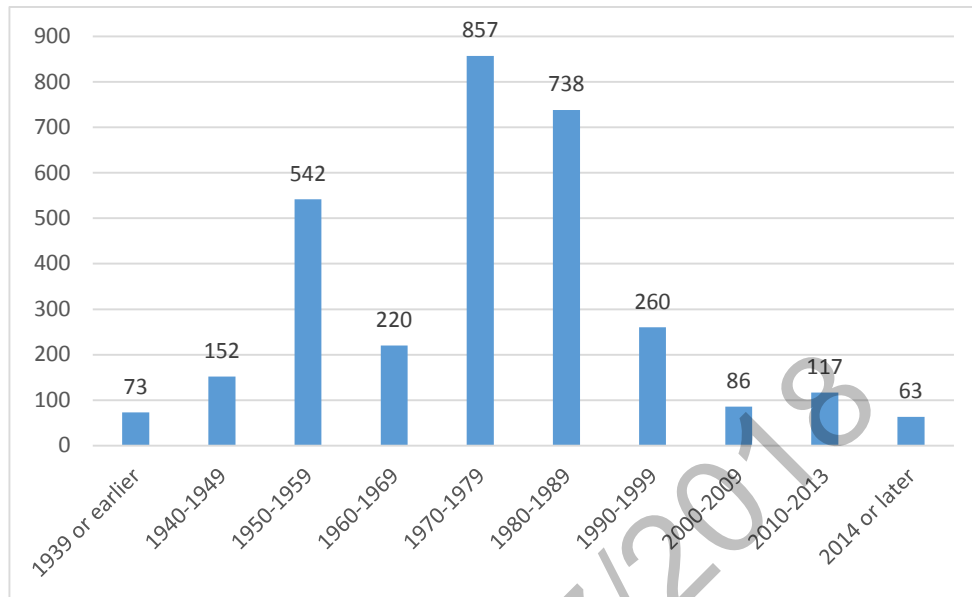


Figure 7.5 – Age of Housing Stock

Source: 2015 American Community Survey

Group quarters, which include college dormitories, nursing homes, and group homes, are calculated separately from traditional types of housing such as single family homes, townhomes, and apartments. Since 1990, group quarters and the number of people living in group quarters have increased:

TABLE 7.1 – ARDEN HILLS GROUP QUARTERS POPULATION

	1990	2000	2016
College Dormitories	631	1,557	1,655
Nursing Homes	384	411	623
Other Group Quarters	10	20	20
Total	1,025	1,988	2,298

Source: US Census, Bethel University, Presbyterian Homes

Almost the entire group quarters population is at Bethel University or Johanna Shores, a senior housing community owned and operated by Presbyterian Homes & Services. For the 2016/2017 school year, Bethel University had an occupancy of 1,655 students. The Johanna Shores housing facility has 126 units and is typically at capacity. The remaining group quarters population lives in group homes in residential areas of the City. The University of Northwestern is partially located in Arden Hills; however, the residence halls for the university are located in the adjacent community of Roseville.

While group quarters housing is calculated separately from traditional housing, it is important to recognize this type of housing can impact the City’s sewer, water, transportation, parks, and recreation systems differently than traditional types of housing. It is likely that the number of people living in group quarters at Bethel University, Johanna Shores, and other group homes will increase as those facilities do have additional land to expand. Therefore, it is important for the City to work with these institutions to manage the potential impacts as well as promote a diversity of housing.

7.3 Household Forecasts

The total number of households in Arden Hills is forecasted to increase by 1,300 households between 2020 and 2040.

TABLE 7.2 - HOUSEHOLD FORECASTS BY CITY

	2000	2010	2020	2030	2040	% Change 2010-2040
Arden Hills	2,959	2,957	3,200	4,100	4,600	55.6%
Mounds View	5,018	4,954	5,100	5,200	5,200	4.7%
New Brighton	9,013	8,915	9,500	10,000	10,400	14.3%
Roseville	14,598	14,623	15,300	15,700	16,100	9.2%
Shoreview	10,125	10,402	11,000	11,200	11,300	7.9%
Ramsey County	201,236	202,691	223,460	236,090	246,050	21.4%
7 county Metro	1,021,456	1,117,749	1,257,730	1,378,830	1,490,470	33.3%

The rate of forecasted household growth in Arden Hills surpasses all adjacent communities as well as Ramsey County. In establishing its forecasts, the Metropolitan Council is assuming full development of the buildable portion of the TCAAP property by 2030 which will also represent essentially a full build-out of Arden Hills.

TABLE 7.3 - PEOPLE PER HOUSEHOLD

2010	2020	2030	2040
2.45	3.13	2.93	2.93

Arden Hills' households are projected to grow by more than 50% between 2010 and 2040. It is expected that most of the those new households would be occupied by young families which would increase the persons per household. 7.4 Housing Issues

Three primary housing issues will need to be addressed by Arden Hills in the next 20 years. They include housing diversity, housing affordability, and housing quality. Each is discussed below.

7.4.1 Housing Diversity

Life-cycle housing, which was referenced in the housing goals, is a common term used to describe the provision of housing types for all stages of life. Life-cycle housing is based on the premise that as people go through life, their housing needs change. A young person getting out of school and just starting out usually cannot afford to own a home so they often begin by renting. As a person grows older, they often establish a family and buy their first home, sometimes either a starter home or townhome. As a family's income grows, they may move up to a

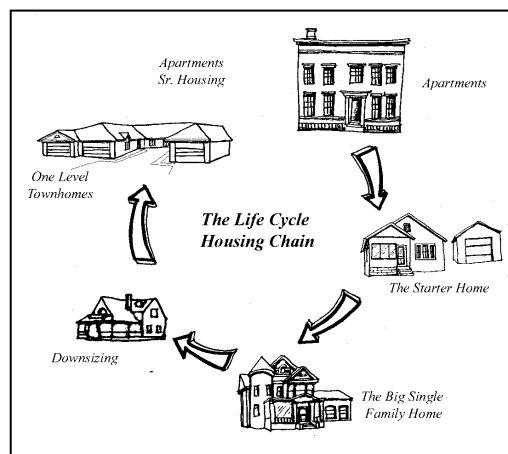


FIGURE 7.6 - LIFE CYCLE HOUSING

larger home. Once the children leave and the family size decreases, parents often move back to a smaller home with fewer maintenance needs or to one of the growing number of either single-family or multi-family housing options that has an association that take care of home and property maintenance. Eventually, as a person ages, there is often a need for assisted living or an extended care facility.

Housing in Arden Hills today is primarily focused on one stage of the housing life-cycle, move-up housing. Ironically, a significant number of units constructed in Arden Hills during the 1970s were oriented to the first-time homebuyer market. As housing prices have risen over the past three to four decades, what was once priced for a first-time buyer is now classified as move-up housing due to escalated prices. Arden Hills does still have a limited supply of more entry level housing. In 2014, there were 283 units in the Arden Manor manufactured home community, serving approximately 840 residents.

Rental housing is another component of life-cycle housing that needs to be addressed. Rental housing is an important component of the overall housing supply since it provides options for both the beginning and later stages of the life-cycle chain. It may also serve the needs of several segments of the population including retail service employees, seniors, young adults just entering the workplace and economically disadvantaged households. Based on the homestead data from Ramsey County, 10 percent of the housing in Arden Hills is classified as non-homesteaded, which is a rough indicator for rental housing. According to the 2010 Census, slightly more than 86 percent of the occupied single family homes and townhomes (not including manufactured homes or condominiums) were owner occupied in 2010.

Arden Hills promotes housing diversity through its long-term goals, policies, and strategies. The market is also expected to exert pressure on the City for more housing diversity. As was noted earlier, factors such as an aging population, a population that has more non-family households, and increased numbers of householders living alone is expected to drive demand for more attached, multi-family housing. Multi-family units expected to be in demand are likely to be oriented toward both owners and renters.

7.4.2 Housing Affordability

Affordable housing is an issue in every Twin Cities area community. With housing costs outpacing many wages, it is becoming increasingly important to focus on affordable housing. Because of the disparity of housing costs and wages throughout the Twin Cities, affordable housing continues to be a major initiative of the Metropolitan Council.

According to the Metropolitan Council, housing is considered affordable if it is priced at or below 30 percent of the gross income of a household earning 50 percent of the Twin Cities median family income. In 2017, the area median income for the seven-county Minneapolis-St. Paul area adjusted by the Department of Housing and Urban Development for a family of four was \$90,400. Therefore, in 2017, housing was considered affordable if annual housing costs for a family of four do not exceed 30 percent of \$45,200, which translates to \$13,560 per year or \$1,130 per month for housing. While the purchasing power of \$1,130 per month depends on interest rates and other household factors, it could be sufficient to purchase a home that is priced in the range of \$150,500.

To implement the Livable Communities Act in 2007, the Metropolitan Council uses as the upper limit of affordability for ownership purchase price and monthly rents, the following dollar amounts:

TABLE 7.4 - 2015 OWNED OCCUPIED AFFORDABLE HOUSING PRICES

Household Income Level:	Affordable Home Price
80% of area median income	\$238,500
50% of area median income	\$151,500
30% of area median income	\$84,500
Source: Metropolitan Council	

Table 7.5 - Rental Housing Affordable Prices

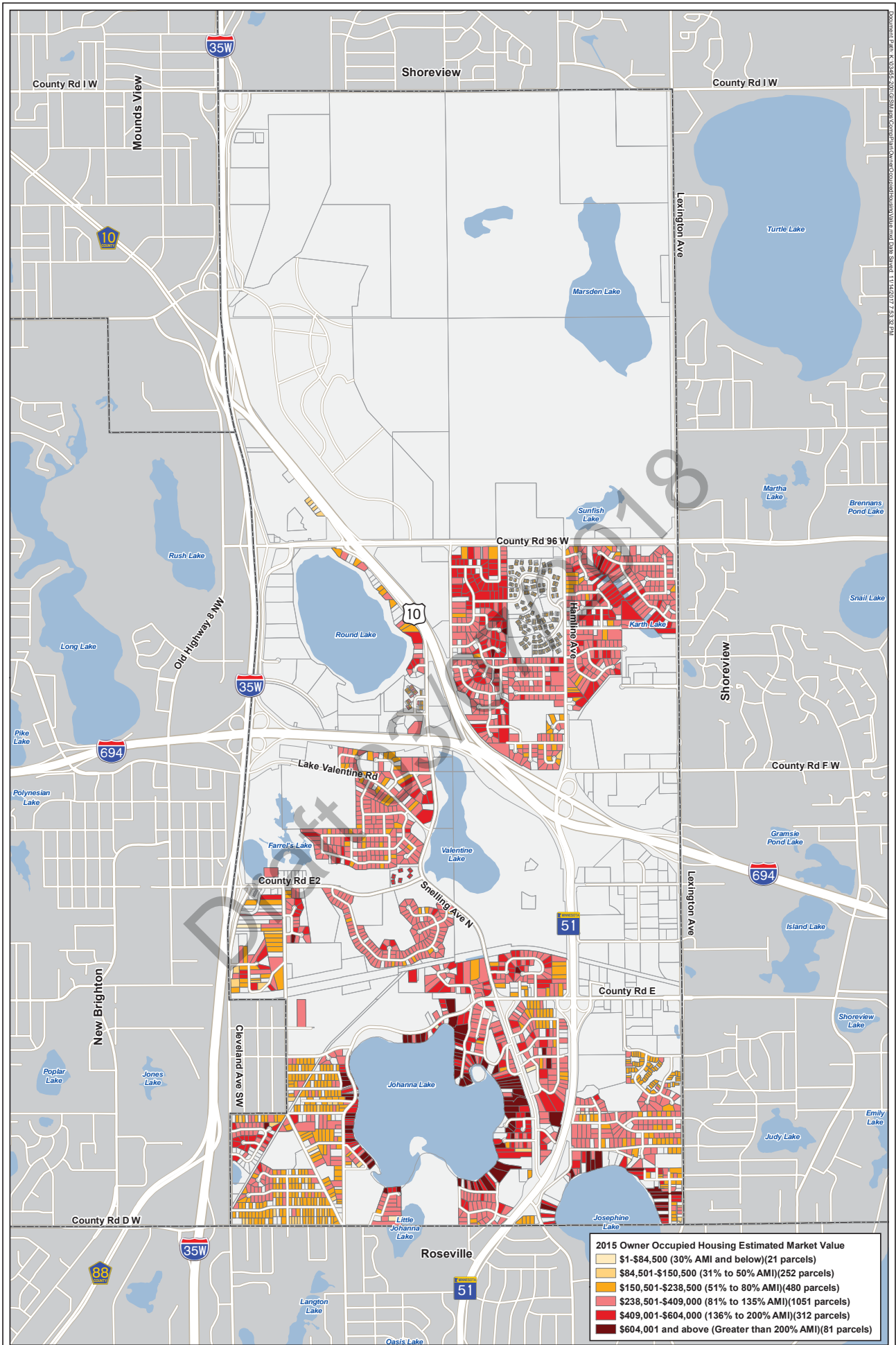
Number of Bedrooms	Affordable Rent at 30% of AMI	Affordable Rent at 50% of AMI	Affordable Rent at 80% of AMI
Studio	\$450	\$751	\$1,201
1-BR	\$483	\$805	\$1,288
2-BR	\$579	\$966	\$1,545
3-BR	\$669	\$1,115	\$1,784
4-BR	\$747	\$1,245	\$1,992

The average housing value in 2015 was \$281,300. Based on 2015 assessed property values from Ramsey County (Figure 7.7) 34.3 percent of the housing was at or below the affordable home price of \$238,500 and approximately 12.5 percent was at or below \$150,500.

The following table illustrates the assessed values of owner-occupied housing units in Arden Hills. Values are differentiated above and below the 80% Area Median Income of \$240,000.

Table 7.6 – Owner Occupied Housing in Arden Hills by Affordability Bands

Housing Values	Affordability Band	Parcels	Percent
\$1 - \$84,500	30% and Below AMI	21	1.0%
\$84,501 - \$150,500	30% - 50% AMI	252	11.5%
\$150,501 - \$238,500	50% - 80% AMI	480	21.8%
\$238,501 - \$409,000	81% - 135% AMI	1051	47.8%
\$409,001 - \$694,000	136% - 200%	312	14.2%
\$604,001 and Above	Greater than 200% AMI	81	3.7%
Total Owner Occupied Housing Units		2,197	100%



Arden Hills Comprehensive Plan
 Figure 7.7 Owner Occupied Housing Value
 Arden Hills, MN



0 2,000 Feet
 1 inch = 2,000 feet



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In December of 2014, the Metropolitan Council released a report entitled “Thrive 2040 Housing Policy Plan” The report not only forecasts the regional need by 2030 for newly constructed, affordable housing but it allocates each community’s share of the regional need. The total need for newly constructed affordable housing in the Twin Cities is estimated to be 37,900 units between 2021 and 2030. Each community’s share of the regional need is allocated based on a number of factors. According to the Metropolitan Council, 33.2 percent of new housing units in all cities should be affordable. Allocations are then adjusted by the balance of low-wage jobs and workers and the and existing affordable housing stock. Based on the formula, the Metropolitan Council has allocated a need for 373 affordable housing units to Arden Hills between now and the year 2030.

Housing—along with food, clothing, transportation and medical care—is a necessity. For many households, it is their largest monthly expense. When households spend more than 30% of their monthly income on housing costs, they are considered “cost-burdened.”

7.4.2.1 Existing Affordable Housing Need

While the Census Bureau does not report household incomes in the ranges identical to the affordable income limits of the Metropolitan Council, Tables 7.7 and 7.8, represents an approximation of the number of Arden Hills households that fall within the three AMI ranges. On a pro-rated basis, there is 302 households with incomes at 30% of AMI and below, 334 households with incomes between 30% and 50% of AMI, and 500 households with incomes between 50% and 80% of AMI.

Initially the 242 cost burdened households with incomes of 30% of AMI or below, the 150 cost burdened households with incomes between 50% and 80% AMI, and the 201 cost burdened households with incomes between 50% and 80% AMI listed in Table 7.10 would indicate that Arden Hills would need more affordable housing units. The 318 existing housing units affordable at 30% AMI and below exceeds the approximately 302 households in Arden Hills with incomes at 30% and below. The 384 existing housing units affordable between 30% and 50% AMI exceeds the approximately 334 households in Arden Hills with incomes between 30% and 50% AMI. The 790 existing housing units affordable between 50% and 80% AMI exceeds the approximately 500 households in Arden Hills with incomes between 50% and 80% AMI. What appears to be happening is that

households with incomes greater than affordability bands are occupying the affordable housing units. In summary, Arden Hills’ existing housing stock is adequate to address the needs of households within the affordable income bands.

TABLE 7.7 - 2015 AFFORDABLE HOUSING UNITS AND COST BURDENED HOUSEHOLDS

Affordability	Housing Units			Cost Burdened Households ³
	Owner Occupied ¹	Rental	Total ²	
30% AMI and Below	21	297	318	242
30% to 50% AMI	252	132	384	150
50% to 80% AMI	480	310	790	201

AMI = Area Median Income
 Source 1: Ramsey County 2015
 Source 2: Metropolitan Council 2015 Housing Stock Estimates
 Source 3: U.S. Department of Housing and Urban Development 2009-2013 Comprehensive Housing Affordability Strategy

TABLE 7.8 – 2015 AFFORDABLE INCOME LIMITS

Affordability	Income Limits
30% AMI and Below	\$26,000
30% to 50% AMI	\$43,300
50% to 80% AMI	\$65,800

Source: Metropolitan Council

TABLE 7.9 – 2015 HOUSEHOLD INCOME

Income Range	Households
\$24,999 and Below	289
\$25,000 - \$44,999	381
\$45,000 - \$74,999	714
\$75,00 and Above	1,640

Source: U.S. Census Bureau

TABLE 7.10 - 2015 AFFORDABLE HOUSING UNITS AND 2015 HOUSEHOLD INCOME

Affordability	Total Housing Units¹	Households (Pro-Rated)²	Excess Housing Units
30% AMI and Below	318	302	+16
30% to 50% AMI	384	334	+50
50% to 80% AMI	790	500	+290
<i>AMI = Area Median Income Source 1: Metropolitan Council 2015 Housing Stock Source 2: WSB Pro-Rated from U.S. Census Bureau</i>			

7.4.2.2 2021-2030 Affordable Housing Allocation

Thrive MSP 2040 states that communities must guide a sufficient amount of land at minimum densities to provide opportunities for affordable housing to be developed. Communities have two options to provide this density: Option 1 is to guide sufficient land at a minimum of 8 dwelling units per net acre (du/ac), and Option 2 is to guide sufficient land at a minimum of 12 du/ac for the affordable housing allocation of 50% AMI and below and sufficient land at a minimum of 6 du/ac for the affordable housing allocation between 51% and 80% AMI. Arden Hills has proposed to use Option 2 to achieve the affordable housing allocation.

Table 7.11 – 2021-2030 Affordable Housing Allocation

Affordability	Units
At or Below 30% AMI	129
31 to 50% AMI	100
51 to 80% AMI	144
Total Units	373

In order to ensure that the 50% AMI or below housing need can be met, Arden Hills has 15.9 acres guided for Town Center zoning within the TCAAP development. At the minimum density required, this could provide 239 units.

Table 7.12 – Option 2 – 50% AMI and Below Likely Development

50% AMI and Below Requirement	Arden Hills Designation	Acres	Minimum Density	Minimum Units	Difference
229 Units	Town Center	15.9 Acres	15 Units/Acre	239 Units	+10 Units

In order to ensure that the 51% to 80% AMI housing need can be met, Arden Hills has guided several areas of the City with land uses that require a minimum of 6 dwelling units per acre or greater. These areas include the surplus Town Center units from TCAAP, the Parkshore Drive area and the old City Hall/Public Works site, both of which are guiding Medium Density Residential (MDR), and the B-2 District around County Road E, which is guided Community Mixed Use (CMU). The City expects that 6% of the CMU area will redevelop between 2021 and 2030 for residential uses. At the minimum required densities, these areas could provide 147 units.

The City would not seek to concentrate affordable housing in any particular area.

Table 7.13 – Option 2 – 51% to 80% AMI Likely Development or Redevelopment

51% to 80% AMI Requirement	Arden Hills Designation	Acres	Minimum Density	Minimum Units	Difference
144 Units	Surplus Town Center Units	N/A	15 Units/Acre	10 Units	+3 Units
	MDR	13.8 Acres	6 Units/Acre	83 Units	
	CMU (6% Residential)	100.2 Acres	9 Units/Acre	54 Units	
	Total	114.0 Acres	≥6 Units/Acre	147 Units	

In addition to ensuring that there is sufficient land designated that has the potential to provide affordable housing, the City of Arden Hills is continuing its participation in the Metropolitan Livable Community Program. As a participant, the City of Arden Hills continues to be eligible to compete for grant funding provided by the Livable Communities Act (LCA) to assist with clean-up operations for polluted land for redevelopment, creating development or redevelopment opportunities that demonstrate efficient use of land and infrastructure through connected development patterns, and opportunities to create more affordable housing.

7.4.2.3 Programs

Numerous programs are available to help cities meet their housing goals and policies. Cities can consider utilizing certain programs such as fee waivers and/or adjustments to facilitate affordability. In addition, cities may also consider encouraging and working with potential developers who plan to use federal low income housing tax credits to construct affordable rental housing. Other options include: affordable housing assistance or development and preservation programs available through the local, county, state, and federal government. Cities may consider the following programs in order to meet its housing goals:

Minnesota Housing Consolidated Request for Proposals: The Minnesota Housing Finance Agency provides a once annually request for proposal (RFP) where affordable housing developers can apply for funding to construct affordable housing. Developers can apply to the Consolidated RFP to provide affordable housing for those Arden Hills residents in need. The RFP is a useful tool to support the development of rental housing units affordable at 50% AMI or below.

Community Development Block Grants (CDBG): The U.S. Department of Housing and Urban Development (HUD) provides CDBG funds to communities with over 45,000 residents for the use of providing and maintaining affordable housing. Ramsey County Community and Economic Development (CED) administers these CDBG funds for the City of Arden Hills. Ramsey County CED can use CDBG funds to provide affordable housing for those Arden Hills residents in need. CDBG is a useful tool to preserve both rental and ownership units affordable at 80% AMI and below.

HOME Funds: The HOME Investment Partnerships Program (HOME) is a flexible federal grant program that allows Ramsey County to fund affordable housing activities for very low and low-income families or individuals, homeless families, and persons with special needs. Ramsey County CED can use HOME funds to provide affordable housing for those Arden Hills residents in need. HOME funds are a useful tool for both the preservation and development of both rental and ownership units affordable at 50% AMI and below.

Neighborhood Stabilization Program (NSP) Grants: The NSP was established by HUD for the purpose of stabilizing communities that have suffered from foreclosures and abandonment. The focus of this program is the purchase, rehabilitation and resale of foreclosed and abandoned properties. NSP is currently not funded. NSP funds were a useful tool to preserve ownership units affordable at 80% AMI and below.

Homebuyer Assistance Programs: Homebuyer assistance programs funded directly by Ramsey County CED are available to first time homebuyers. Arden Hills residents can contact the Minnesota Homeownership Center regarding homebuyer assistance programs that are currently available. Homebuyer assistance funds are a useful tool to preserve ownership units affordable at 80% AMI and below.

Repair and Rehabilitation Support: Ramsey County offers a residential rehabilitation deferred loan program to assist homeowners with home repair projects. Repair and rehabilitation support is a useful tool to preserve ownership units affordable at 80% AMI and below.

Foreclosure Prevention: The Housing Crisis Response in Ramsey County provides foreclosure counseling to Arden Hills residents. The Minnesota Home Ownership Center and Lutheran Social Services may also be resources to the residents of Arden Hills. Foreclosure prevention funds are a useful tool to preserve ownership units affordable at 80% AMI and below.

Energy Assistance: Ramsey County offers an energy conservation deferred loan program to Arden Hills residents. EnergySmartsPays.com is also an energy conservation program that is available. Energy assistance is a useful tool to preserve both rental and ownership units affordable at 80% AMI and below.

Rental Assistance: Renters interested in suburban rental housing assistance can contact the Metro Housing and Redevelopment Authority, which is the

program that administers the Section 8/Housing Voucher program to Arden Hills residents. Rental assistance is a useful tool to preserve rental units affordable at 80% AMI and below.

Livable Communities Grants: Arden Hills is a participating community in the Metropolitan Council’s Livable Community Act (LCA) programs. Arden Hills can consider applying for livable communities grant on behalf of developers who are provide level of affordable housing and the guaranteed length of affordability that generates a public benefit greater than the resources required to apply for and administer the livable community grants. LCA grants are a useful tool for the development of both rental and ownership units affordable at 80% AMI and below.

Local Fair Housing Policy: Ramsey County works with the Twin Cities Metro Area Fair Housing Implementation Council to stop discrimination and promote integration. Any Arden Hills residents that feel they have been subjected to unfair housing practices should contact this organization. Ramsey County CED can continue the implementation of its fair housing policy. Local fair housing policy is a useful tool for the preservation of both rental units affordable at 80% AMI and below.

Land Trusts: There is no established Land Trust serving the City of Arden Hills currently. Should a Land Trust be established, the Rondo Community Land Trust in St. Paul would be a good model to use. A land trust can be a useful tool for both the development and preservation of ownership units affordable at 80% AMI and below.

7.4.2.4 Fiscal Devices

Fiscal devices, such as revenue bonds, tax increment, financing, or tax abatement can be used to help ease the construction and availability of affordable housing in the City of Arden Hills.

Development Authorities: Arden Hills does not have its own Housing and Redevelopment Authority (HRA) and depends on Ramsey County Coordinate HRA for affordable housing and redevelopment services. Ramsey County can construct, finance and/or partner with private developers to provide affordable housing for those Arden Hills residents in need. Development authorities are a

useful tool to support the development of both rental and ownership housing units affordable at 50% AMI or below.

Housing Bonds: Minnesota State Statute allows HRAs the ability to issue housing bonds to provide affordable housing. Ramsey County HRA can issue housing bonds to provide affordable housing for those Arden Hills residents in need. Housing bonds are a useful tool to support the development of both rental and ownership housing units affordable at 50% AMI or below.

Tax Abatement: Cities may issue bonds to be used to support the construction of affordable housing and use a portion of the property tax received (tax abatement) from the development to finance these bonds. This removes this property taxes revenue from paying for the services needed for this property, its residents and the community in general. Tax abatement is a useful tool to support the development of both rental and ownership housing units affordable at 80% AMI or below.

Tax Increment Financing: Cities may create a housing district to create a tax increment financing (TIF) district. The TIF bonds issued on this district are to be used to support the construction of affordable housing and entire property taxes received above the original tax value (increment) from the development to finance these bonds. This removes this property taxes revenue from paying for the services needed for this property, its residents and the community in general. TIF is a useful tool to support the development of both rental and ownership housing units affordable at 50% AMI or below.

7.4.2.5 Official Controls

Official controls and land use regulation can be used to assist in the construction of affordable housing units. Controls and regulations can also be used to simplify the process of expanding local housing options also.

Fee Waivers or Adjustments: Cities may waive or reduce fee to reduce the cost of construction of affordable housing. Conversely, State rules require that the fee that a city charges be related to the cost of providing the services for which the fee are collected. This waiver or reduction could create a deficiency in the funding for services which would be required the use of general funds to resolve. Cities can develop a fee waiver or reduction policy to determine when the level of

affordable housing and the guaranteed length of affordability provide a public benefit great enough to justify the reduction or waiver of development fees. Fee waivers or adjustments are a useful tool to support the development of both rental and ownership housing units affordable at 80% AMI or below.

Zoning and Subdivision Policies: Cities have the ability to adjust their zoning and subdivision regulations through a planned unit development (PUD). Zoning and subdivision regulation are created in part to mitigate the impacts that a development may have on adjoining properties. When considering a PUD for affordable housing, cities should determine when the level of affordable housing and the guaranteed length of affordability provide a public benefit great enough to justify the potential impacts that would result from a deviation in the zoning or subdivision regulations. PUD is a useful tool to support the development of both rental and ownership housing units affordable at 80% AMI or below.

4(d) Tax Program: The 4(d) tax program provides a 4% tax credit to affordable housing developers. This program is administered through the Minnesota Housing Finance Agency. Minnesota Housing Finance Agency can continue administer the 4(d) tax program to provide affordable housing for those Arden Hills residents in need. 4(d) tax bond funds are a useful tool to support the development of rental housing units affordable at 50% AMI or below.

TABLE 7.14 – AFFORDABLE HOUSING TOOLS

Arden Hills Housing Goals/Policies	Arden Hills EDA	Tax Abatement	Tax Increment Finance	Fee waivers or adjustments	Zoning and subdivision policies	Ramsey County HRA	Housing Bonds	MN Housing Consolidated RFP	4(d) tax program	CDBG grants	HOME funds	NSP Funds	Livable Communities grant	Land trusts	Homebuyer assistance programs	Repair & Rehab Support programs	Foreclosure prevention programs	Energy Assistance programs	Rental Assistance	Local Fair Housing Policy
Promote the development of a variety of housing options by preserving high-quality housing opportunities that are suitable for a mix of ages, incomes and household types.				X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
Encourage the incorporation of affordable, life-cycle, and workforce housing into new development and redevelopment where feasible.	X	X	X	X	X	X	X	X	X		X		X							X
Preserve and strengthen the community's neighborhoods to maintain a high-quality of life for residents.					X	X				X	X	X			X	X	X	X	X	X
Encourage housing development and redevelopment that is complimentary to and enhances the character of the City's established neighborhoods.	X	X	X	X	X	X	X	X	X				X							X

Approved: , 2018

7.4.3 Housing Quality

Except for the TCAAP property, much of Arden Hills is considered developed. As was pointed out earlier, the age of the majority of the current housing stock makes ongoing maintenance a community concern. If Arden Hills' existing neighborhoods are going to remain attractive places to live, owners will need to continue maintenance and reinvestment efforts. Encouraging housing maintenance can be done in two ways, either through voluntary efforts or through regulatory requirements. Many communities rely on both. Ideally, all residents will maintain their property in a sound and attractive manner. Realistically, however, a small percentage of properties will not be adequately maintained and in such cases, they can have a significant negative impact on surrounding properties and even the neighborhood as a whole.

Arden Hills relies primarily on individual owners to maintain property. The City has nuisance provisions in its local code, it enforces the Minnesota State Building Code, and the International Property Maintenance Code was adopted in 2015. In 2009, the City approved the Rental Registration Ordinance that requires owners of rental units to register with the City annually. Additionally, Arden Hills will continue to work with programs offered by county, regional, state and federal agencies as appropriate. Such programs are more limited than they were in the past due to changes in priorities and reductions in funding.

7.5 Future Opportunities

While Arden Hills does have a limited number of smaller, infill vacant parcels south of Highway 96, future housing opportunities will largely come from the development of the TCAAP site. TCAAP offers an unparalleled opportunity to create a mix of housing integrated with employment, entertainment, recreation and transit service. The flexibility included in the design and development regulations for the site will help the community address its goals of housing diversity and housing affordability.

The TCAAP site will include approximately 427 acres of gross development area. Of this total, approximately 162.2 acres of land has been designated specifically for residential development. Residential areas are divided between several zoning districts with varying gross density requirements. A range of different housing types will be accommodated, including single-family detached homes, twin homes, townhomes, manor homes, apartments, condominiums, and senior housing. The City expects that up to 1,460 housing units will be constructed on the site at the time of full development.

The residential component of the TCAAP site will offer a future mix of housing that will compliment Arden Hills' current supply of predominately single-family detached housing. It will provide opportunities to address the changing needs of the local population and it will attract new people to the community. Combined with the City's efforts to maintain the current supply of housing, the development of the TCAAP site will continue Arden Hills' position in the marketplace as a highly desirable place to live.

7.6 Implementation Strategies

In order to advance the policies and ideas identified in this chapter, the following implementation strategies could be used:

- Review City codes to consider and encourage a range of housing opportunities and innovative site design.
- Pursue grants or other opportunities that promote the construction of affordable housing.
- Implement the adopted rental regulations to ensure the functionality and maintenance of rental properties.
- Explore the adoption of an administrative fine program to deter ongoing nuisance and property maintenance issues.
- Promote the use of high quality materials in new housing construction to minimize long-term deterioration of the housing stock.
- Ensure safety, livability and durability of the housing stock through enforcement of the Minnesota State Building Code, which includes educating property owners and residents on housing and property maintenance codes.
- Develop regulations that prohibit the construction of housing that is not compatible with the scale of the existing neighborhood.
- Implement adopted standards to protect lakes, wetlands, trees, and other open spaces during redevelopments and infill projects.
- Establish architectural/design guidelines for new developments and redevelopments.

- Identify programs, policies, and strategies that encourage aging in place for senior citizens.

The above strategies should not be considered all-inclusive. New opportunities and strategies should be identified to further advance the City's housing goal and policies.

Draft 03/07/2018

8. ECONOMIC DEVELOPMENT AND REDEVELOPMENT

Goal: Promote the development, redevelopment, and maintenance of a viable, innovative, and diverse business environment serving Arden Hills and the metropolitan area.

To achieve this *economic development and redevelopment goal*, the following policies are proposed:

- Work to create and strengthen existing partnerships between public and private agencies and institutions.
- Engage the private sector to encourage development and redevelopment projects that are beneficial to the City and identify incentives or programs where applicable that promote private sector investment.
- Encourage communication and cooperation between businesses, educational institutions, and the public sector.
- Promote business retention and expansion to enhance the existing economic base and provide applicable and appropriate resources.
- Capitalize on existing community strengths, such as location, freeway access, and a well-educated population.
- Identify marketing and promotion tools and techniques to attract commercial, office, residential, and industrial uses.
- Identify incentives or programs that provide housing choice.

Arden Hills has a strong local economy supported by a mix of size and types of businesses with an educated population, desirable residential neighborhoods, a central location in the north part of the metropolitan area, and relatively easy access to the freeway system. With more than 11,000 jobs in 2017, Arden Hills has more jobs than residents. While the City places a high value on its residential neighborhoods, the business community is an important component to the City's long-term success.

The long-term economic health of Arden Hills is not without its challenges. While the City's economic base is relatively strong, the City recognizes the need to maintain and enhance the economic base over the long-term. Except for the TCAAP redevelopment, the City has few vacant commercial or industrial properties remaining. Furthermore, some of the commercial and industrial buildings may not be cost-effective to convert to other uses and consequently may be nearing obsolescence. Redevelopment in certain parts of the City is almost certain to occur.

Economic development and redevelopment is linked to the other chapters of this Comprehensive Plan. Land use, housing, transportation, and public amenities impact the City's ability to retain its economic base and attract desired development.

8.1 ECONOMIC DEVELOPMENT AUTHORITY (EDA)

In 1996, the City established the Economic Development Authority (EDA) with the following mission:

- Preserve and create jobs;
- Enhance the City’s tax base; and,
- Promote the general welfare of the people of Arden Hills.

Minnesota State Statutes guide the powers of the EDA; however, the EDA is generally able to purchase property, redevelop property, create economic development districts, study economic development needs, and perform other duties related to economic development. The members of the City Council make up the full EDA.

The EDA is an important tool in projects where the City seeks to take an active role in purchasing property, redevelopment, and/or public financing of projects.

8.2 ECONOMIC DEVELOPMENT COMMISSION (EDC)

The Economic Development Commission is a nine member body that advises the City Council on economic development activities. The Commission was established to facilitate positive interaction with the business community and to advise the City Council and Economic Development Authority on economic development, redevelopment, and related community development issues. The Commissioners may be residents or non-resident business representatives; however, at least four of the Commissioners must be Arden Hills’ residents.

8.3 GUIDING PLANS AND REDEVELOPMENT

Guiding Plan for the B2 District

In 2008, the City accepted the “Guiding Plan for the B2 District.” This Guiding Plan provides a vision for the entire B2 Zoning District, which generally includes those properties along County Road E between Highway 51 and Lexington Avenue, Connelly Avenue, and Pine Tree Drive. The City seeks to promote high-quality redevelopment in this district as the market allows to enhance its value for the overall community. The City and Ramsey County completed infrastructure improvements along County Road E in 2015, including streetscape enhancements and pedestrian and bicycle facilities.

TCAAP Master Plan

The TCAAP Master Plan was approved by the City in July 2015 and amended in December 2016. The Master Plan will guide the redevelopment of the TCAAP site to achieve the City’s goals of high development and design standards, defined residential

neighborhoods and commercial districts linked by streets, trails, and sidewalks, energy resiliency and sustainability, and ample parks and open space.

Commercial, Industrial, and Higher Education Study

In September 2017, the City accepted the “Commercial, Industrial, and Higher Education Study” report. The study examined the existing commercial and industrial climate in the community, the plans of Bethel University and the University of Northwestern, the existing zoning regulations for higher education uses, and how other communities regulate higher education uses. The findings included:

- That the existing commercial and industrial markets are strong in Arden Hills;
- There are few sites available for redevelopment;
- A mix of employment and consumer uses are important; and,
- That Arden Hills has more higher education students per capita than any other community in Minnesota.

The result of the study was the creation of an INST – Institutional zoning district for the higher education institutions and the removal of the higher education use from all other zones in Arden Hills.

Chapter 6 (Land Use) identifies several other areas where the City may benefit from completing small area plans or reviews of existing zoning regulations. These efforts would also help in improving the economic competitiveness of the City. The following list is not intended to be all inclusive and other opportunities may arise over time:

- A Guiding Plan for the Red Fox/Grey Fox/Lexington Avenue Area;
- Review of B-4 Retail Center Zoning District regulations;
- Establishing vision for the developable Gateway Business properties;

Review of existing industrial and commercial zones to ensure correct balance of employment versus consumer uses.

8.4 IMPLEMENTATION STRATEGIES

In order to advance the policies and ideas identified in this chapter, the following implementation strategies could be used:

- Identify the desired long-term mix of businesses.
- Identify and promote the market strengths of Arden Hills.
- Use the small area planning process or a similar planning process to develop more detailed long-term plans for the business areas to better manage redevelopment as it occurs.
- Develop design standards to encourage the construction of high-quality buildings and designs.

- Work to strengthen and encourage communication and collaboration between businesses and institutions, such as Bethel University, Northwestern College, and other significant hiring establishments.
- Promote community education for residents of all ages and utilize the skills of residents where feasible.
- Identify infrastructure deficiencies and work to resolve deficiencies.
- Identify potential partnerships and/or developments that could enhance the City's infrastructure and/or quality of life.
- Identify constraints to development, redevelopment, and retention.
- Evaluate the City's existing Business Retention and Expansion efforts and establish long-term goals for the program.
- Encourage the creation of a pedestrian friendly environment--link major roadways, destinations, and businesses to transit, pathways, and neighborhoods.
- Evaluate the land use regulations in the commercial zones to provide flexibility for economic development while requiring high-quality and mixed-use buildings and uses with minimal impact on residential areas.
- Develop a database to assist businesses in identifying appropriate and available locations within the City.
- Provide information for businesses and developers on the City web site.
- Assess the Business Subsidy Criteria and City Public Financing Guidelines as needed to ensure the adopted policies are aligned with community goals.

The above strategies should not be considered all-inclusive. New opportunities and strategies should be identified to further advance the City's economic development and redevelopment goal and policies.

9. PARKS AND RECREATION

Goal: Create a comprehensive, maintained, and interconnected system of parks, pathways, and open spaces as well as a balanced program of recreational activities for residents of all ages, incomes, and abilities.

To achieve this *parks and recreation goal*, the following policies are proposed:

- Develop, maintain, and encourage the use of a system of neighborhood parks and pathways that are safe and engaging, which includes:
 - Developing, maintaining, and encouraging the use of north-south and east-west arterial pathways that connect neighborhood paths within the City and to regional paths.
 - Connecting neighborhoods, parks, and other destination points through a City-wide pathway system.
 - Strengthening the park and path system by making improvements as feasible through the annual budgeting and CIP process.
- Provide recreation programs and activities that address the interests of all segments of the community, including children, adolescents, adults, families, and seniors.
- Encourage non-motorized transportation and commuting in and outside of Arden Hills to reduce reliance on motor vehicles and increase physical activity.
- Work to connect the pathway system to transit facilities.
- Protect and maintain access to lakes, marshes, and wooded areas for active and passive recreation.
- Plan for parks, paths, and recreation on the TCAAP property that addresses the interests of Arden Hills' residents.
- Explore financing and funding options to improve and expand the City's parks and recreation system.
- Promote the removal of invasive species throughout the park and recreational system.
- Construct way-finding signage for parks and paths.
- Explore options for collaboration with other governmental, educational, and private entities to provide an array of high-quality recreational programs.
- Work and coordinate with Ramsey County, the Metropolitan Council, the school districts and other applicable organizations to enhance the park, pathway, and recreation system.

9.1 PARKS, TRAILS AND OPEN SPACE PLANNING PROCESS

The City recognizes that demographic, recreation, and environmental trends will impact park, recreation, trail, and open space user needs. To prepare for future needs, the City of Arden Hills' Parks, Trails, and Recreation Committee (PTRC) provides

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recommendations for continuing development, expansion, and improvement of parks, trails, recreation and natural resources. Through collaboration with other City committees, the PTRC has aided in the development of a long-term vision for the City's parks and recreation system. The following information in this chapter was developed in consultation with the PTRC.

As part of previous planning efforts, the City identified long-term trends to help determine future park, trail, and recreation needs. Recreation interests and participation are influenced by a number of factors, including, age, access to facilities, income, available leisure time, interest in the environment, new recreation technology, and social trends. In general, people are looking for quality recreation that is close to home, but they are willing to travel to obtain higher quality or more specialized activities or environments.

9.2 REGIONAL PARK AND RECREATION SYSTEM

Although the Arden Hills Comprehensive Plan focuses on local needs, the community recognizes that Arden Hills is connected to and participates in a larger, regional network of parks, pathways, and open spaces. As of 2014, the Metropolitan Council's regional park system includes 62 regional parks and park preserves that cover more than 52,000 acres. The regional system also boasts 40 regional trails that span 340 miles.

Arden Hills is linked to three regional trails and is home to one regional park (Figure 9.1). The Highway 96 Regional Trail crosses the City from east to west adjacent to Highway 96. Recent improvements to this trail now provide a continuous connection along the southern side of the roadway to the City of New Brighton. Regional trail planned improvements include a north south segment of trail located near the intersection of Snelling Avenue North and Highway 96. This planned trail will be critical, providing users with direct access to the Rice Creek North Regional Trail. In addition, Ramsey County is in the planning process and anticipates amending the Rice Creek Regional Corridor of Fall 2017.

The Lexington Parkway Regional Trail spans the entire length of the Shoreview and Arden Hills border on the eastern side of the City. While the trail is complete on the Shoreview side of Lexington Avenue, the city pathway along the western side of Lexington Avenue contains several incomplete sections within the city limits. In the past, the City of Arden Hills had requested the construction of several sections of the pathway on the western side of Lexington Avenue that were not approved by the Minnesota Department of Transportation. As redevelopment occurs and other opportunities arise, the City does seek to complete the trail to both the north and south on the Arden Hills side of Lexington Avenue. In addition, the Metropolitan Council has

identified Lexington Avenue as a regional trail search corridor. The future alignment will be determined by Ramsey County through completion of a regional master plan for the Lexington Avenue corridor anticipated to be completed in 2018. This extent of this corridor is expected to extend from County Road J to Larpenteur Avenue.

In 2006, Ramsey County acquired 113 acres of land within the Twin Cities Army Ammunition Plant (TCAAP) property for the Rice Creek North Regional Trail Corridor. The new trail corridor is located in the northwestern corner of the TCAAP site adjacent to Rice Creek and Interstate 35W. This land was transferred to the County by the National Park Service as part of the Federal Lands to Parks Program. An amendment to the Rice Creek North Regional Trail Corridor Master Plan in 2003, identified an additional 49 acres to the east of the existing area to be acquired as a wildlife corridor. Following the County's purchase of 427 acres of the TCAAP site for redevelopment, a subsequent amendment was made to the Master Plan identifying 60 additional acres for the Rice Creek North Regional Trail Corridor. This area generally extends from Highway 96 to County Road I and would facilitate a trailhead entry, additional trails, and a 150 foot wide trail corridor along the eastern side of the TCAAP development through the 500' access from County I to the wildlife corridor.

Designated a regional park in 2006, the 217 acre Tony Schmidt Regional Park extends from the northern shore of Lake Johanna to the west side of Mounds View High School on Lake Valentine Road. Recent improvements include the completion of a trail underpass connecting the north and south sides of the park, which were previously bisected by the railroad. While much of the park is open space, the park offers a variety of amenities and is connected to local paths.

There are a number of regional parks within a short distance of Arden Hills. Long Lake Regional Park is located in New Brighton, and the Snail Lake Regional Park is in Shoreview. The Rice Creek Chain of Lakes Park Preserve is in Shoreview, Circle Pines, and Lino Lakes.

9.3 ARDEN HILLS PARK AND RECREATION SYSTEM

Arden Hills has 14 City parks ranging in size from one acre to 28 acres and other open areas that cover more than 145 acres (Figure 9.2 and Table 9.1). There is also approximately 17 miles of paths, which are primarily located on or adjacent to County roads. The surface of these paths varies between asphalt, concrete, gravel, wood chip mulch, and grass. The parks in Arden Hills provide a variety of amenities ranging from tennis courts and playgrounds to baseball diamonds and picnic shelters (Table 9.1). The City parks are well-distributed throughout Arden Hills south of Highways 96 and 10 and most residents are within one mile of a City park; however, controlled access roads interfere with convenient access to some parks that would otherwise be close by.

South of Highways 96 and 10, there are four lakes entirely within Arden Hills and one lake shared by Arden Hills and Roseville. Lake Johanna and Lake Josephine have public access and beaches, though the public access and beach for Lake Josephine is in Roseville. Lake Valentine is a relatively shallow lake adjacent to Bethel University with some limited public use and access. Karth Lake, which is located southwest of the Highway 96 and Lexington Avenue intersection, is adjacent to a public park but is primarily used for non-motorized recreation by the surrounding property owners. Round Lake is unusable for recreation purposes due to contamination from the former Twin Cities Army Ammunition Plant. The entire shoreline of Round Lake is owned by the federal government, and there is no public access.

The City has approved the TCAAP Redevelopment Code (TRC) to guide development on 427 acres purchased by Ramsey County of the former Twin Cities Army Ammunition Plant site. Three City parks are planned to serve the new population on TCAAP and to complement the City's existing park and recreation amenities. Additional private parks and open space including size and amenities have been identified through the TCAAP planning process. As planning and development progresses, these private parks and open space may be relocated, but will still meet acreage and amenities identified in the TCAAP master plan. Trails will also be constructed throughout the development to serve the site and to provide access to adjacent park and open space areas.

PARK AND TRAILS MAP - FIGURE 9.1

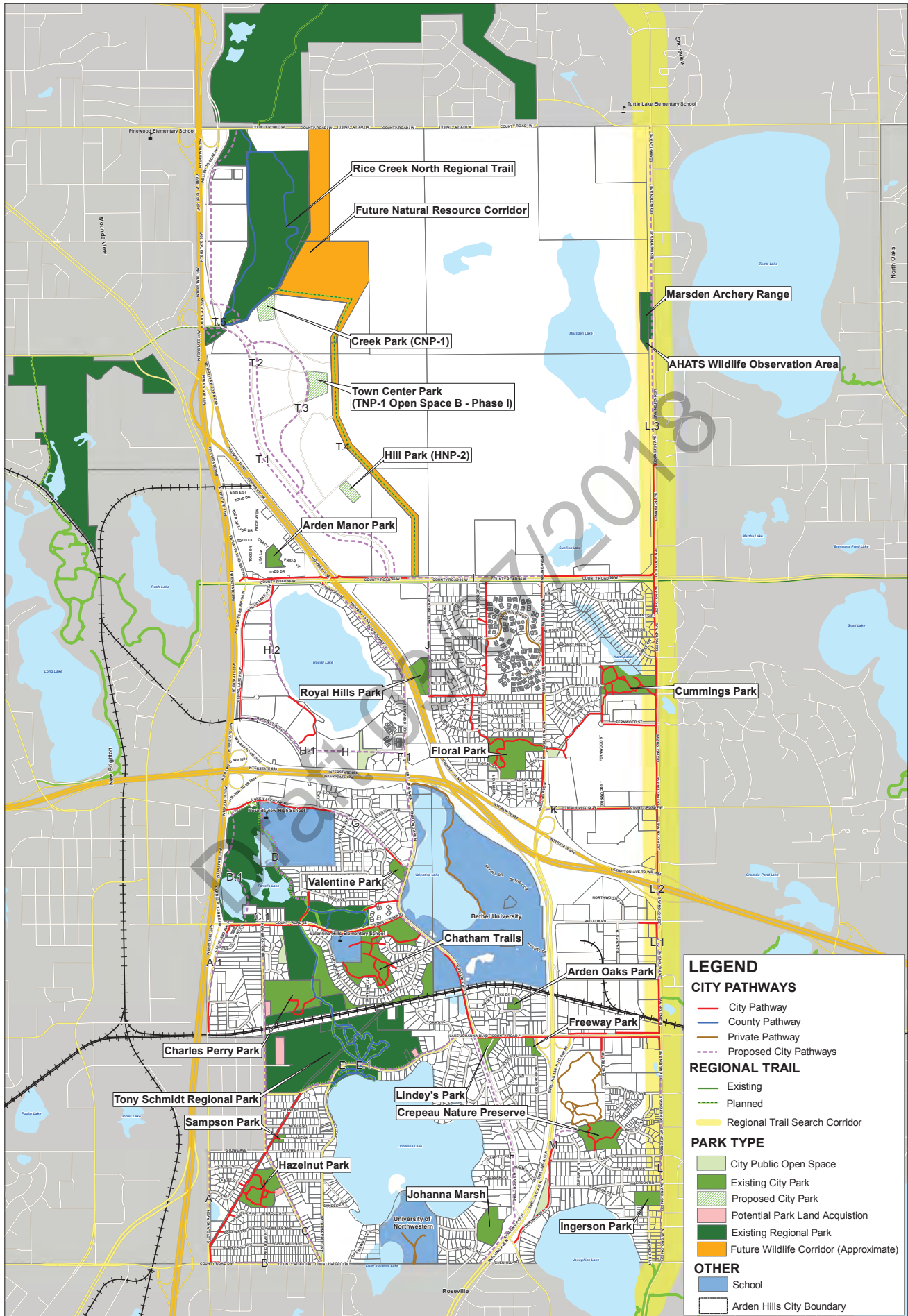


Table 9.1 - Current and Proposed Park Amenities (2040)

	Existing Parks	Acres	Softball / Baseball Field	Soccer	Tennis	Sand Volleyball Court	Basketball Court Area	Gaga Pit	Water Fountain	Play Equipment	Amphitheater	Pavillio n	Picnic Building / Shelter	Warming House	Permanen t Restrooms	Hockey Rink	Skating Rink	Dog Park	Trail(s)
1	Arden Manor Park 4601 Prior Avenue	2.5					X			X			X						
2	Arden Oaks Park 1413 Arden Oaks Drive	1.5					X			X									
3	Charles Perry Park 3700 New Brighton Road	20	X	X					X	X		X	X	X	X	X		X	X
4	Crepeau Nature Preserve* 1224 Harriet Avenue	12.5																	X
5	Cummings Park 1220 Wyncrest Court	17.5	X	X	X		X		X	X		X	X	X	X		X		X
6	Floral Park 1423 West Floral Drive	20	X	X	X		X			X		X							X
7	Freeway Park 1370 West County Road E	1					X			X				X		X	X		
8	Hazelnut Park 3301 New Brighton Road	12	X	X	X		X	X		X		X	X			X	X	X	X
9	Ingerson Park 3255 North Lexington Avenue	5					X			X		X							
10	Johanna Marsh Park 3168 Ridgewood Drive	8.5								X		X							
11	Lindey's North Snelling & County Road E	1.5																	
12	Royal Hills Park 4375 Snelling Avenue	4.5	X		X		X			X		X							
13	Sampson Park 1900 Lake Lane	1					X			X									X
14	Valentine Park 1650 West County Road F	3					X			X		X							X

Key: *Nature Conservancy Park

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	Proposed Parks	Acres	Softball / Baseball Field	Soccer	Tennis	Sand Volleyball Court	Basketball Court Area	Gaga Pit	Water Fountain	Play Equipment	Amphitheater	Pavillio n	Picnic Building / Shelter	Warming House	Permanen t Restrooms	Hockey Rink	Skating Rink	Dog Park	Trail(s)
1	Creek Park (CNP-1)	4.73	X	X			X		X	X		X	X	X	X	X			X
2	Town Center Park TNP-1 Space B (Phase I)	3.1				X			X	X	X	X	X	X	X				X
3	Hill Park (HNP-2)	2.72		X	X		X		X	X		X	X		X				X

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9.4 PARKS AND RECREATION MAINTENANCE, UPGRADES, AND EXPANSIONS

The proposed park and pathway upgrades are based on input gathered through consultation of the PTRC (Figure 9.1).

9.4.1 Park Renovation and Upgrades

In an effort to meet changing demographics, public safety, and the desires of the community, the City of Arden Hills will continue to use a multi-year capital improvement plan (CIP) to plan for park upgrades and renovations. The improvement recommendations are intended to improve public safety, aesthetics, function, and efficiency of individual parks as well as to promote overall public health and activity. The City also seeks to meet American with Disabilities Act (ADA) requirements.

In order to minimize park disruption, reduce costs through efficiency of construction, and improve park function, park renovation is recommended to be done all at once in each park, whenever possible. Individual park renovation recommendations are summarized below by park:

- **Arden Manor Park** – Provide connections within the park and from the park to the potential future paths along Highway 96 when reconstruction of this highway occurs. Add benches near park features.
- **Arden Oaks Park** – Recent improvements include the addition of benches, trash containers and trees. Consider providing pedestrian pathway connections to amenities.
- **Charles Perry Park** – Consider moving the entrance drive to line up with Thom Drive. This will eliminate the conflict that exists with the ice rink where skaters have to cross the entrance drive, and will create space for a pleasure rink. Explore the possibility of paving the existing skating rink for inline skating and half-court basketball. Recent improvements include a new playground as well as a dog park through repurposing of a previously underutilized existing ballfield.
- **Crepeau Nature Preserve** – Add additional unpaved paths within the park.

- **Cummings Park** –Add benches along the paths and park amenities. Recent improvements included relocating bleachers and repurposing entrance sign.
- **Floral Park** –Additional unpaved looped paths could be constructed in the park to provide more walking and nature watching opportunities. Add benches along the paths and park amenities. Provide pedestrian pathway connections/accessibility to amenities.
- **Freeway Park** - Consider paving the hockey rink for year-round use. Explore additional pedestrian routes to provide enhanced circulation to amenities in the park.
- **Hazelnut Park** –Install benches near recreational features. Add lights from parking lot to skating rink. Improve the picnic shelter or add a pavilion to meet the usage demands of the park. Recent improvements include the addition of a gaga pit and dog park through reuse of the existing ice rink. The City is also considering acquiring a portion of the parking lot from the adjacent trinity Lutheran Church for potential redevelopment in this location.
- **Ingerson Park** – Add a connecting path to Lexington Avenue, Fernwood Court, and Lake Lane. Consideration should be given to providing additional pedestrian walkways to existing amenities.
- **Johanna Marsh** – The existing tennis courts will be removed and replaced with a new multiple age playground and Johanna Marsh overlook.
- **Lindey’s Park** – The addition of a trail planned for 2018 construction on the south side of County Road E will provide increased connectivity to the park for potential users. Consider providing access into the park from this planned trail, additional pedestrian connections into the park, and seating opportunities.
- **Round Lake Open Space** – Explore the possibility of adding a path connecting Old Highway 10 to the path west of Round Lake by easement or land acquisition. Determine what type of amenities/fields meet the needs of the community and develop the park.
- **Royal Hills** – Add a fence along the outfield and sideline of the ball field to minimize balls going into the woods. The addition of pathways should also

be considered to meet ADA accessibility to amenities and connect to the proposed trail connection along Snelling Avenue North.

- **Sampson Park** – Add landscaping within the park to provide interest and improve aesthetics. Consideration should also be given to providing pedestrian accessibility to amenities and the addition of a shelter for additional seating opportunities.
- **Valentine Park** – Park was recently redeveloped in 2013 which includes a new shelter, parking lot, play equipment, half basketball court and pedestrian pathways.
- **TCAAP Proposed Parks** – Three city parks have been identified for incorporation within the TCAAP site. The parks range in scale from approximately three to five acres in size and include amenities as shown in Table 9.1 based on the master plan process.

9.4.2 Recreation

The City currently has an extensive youth recreation program. While the programs have been primarily focused on youth and adolescent activities, an increased need for teen, adult, and senior activities was identified through feedback gathered from the PTRC as well as the community meetings held for the 2030 Comprehensive Plan update. To help inform the recreation program development process, the City may consider creating advisory groups for seniors, teens, children, and other interested groups.

9.4.3 Pathway Expansion and Upgrades

A number of neighborhoods in Arden Hills have pathways; however, in order to provide a connected and complete pathway system in Arden Hills, additional arterial and neighborhood paths are needed (Figure 9.1). While paths are popular for recreational purposes, there is also a growing demand for utilitarian pathways that connect residential areas to destinations such as commercial areas, offices, parks, and other popular places. Providing multiple destinations on a pathway system can increase use, promote physical activity, and reduce motorized travel.

The tables on the following page provides a list of proposed trail segments for expansions and upgrades (segments presented on this list are not listed based on priority):

Table 9.2 - Trail Improvement List (outside of TCAAP Site) (2040)

Segment	Proposed Trail Location Outside of TCAAP Site	Length	
		Feet	Miles
A	Cleveland Ave. (County Road "D" to Stowe Ave.)	2,623	0.50
A.1	Cleveland Ave. (Thom Ct. to existing path off Cty E2)	1,672	0.32
B	County Road D (Cleveland to New Brighton Road)	2,380	0.45
C	New Brighton Road (County Rd. D to Stowe Ave.)	2,957	1.54
C.1	New Brighton Road (Stowe Ave. to County Road E2)	5,333	1.01
D	R.C. Open Space (from City path to MVHS)	2,940	0.56
D.1	R.C. Open Space (from County Rd. E2 to MVHS)	3,095	0.58
E	County Road E (Indian Pl. to Lk. Joh. Blvd. to Tony Schmidt U. Trail to end of park - north side)	1,675	0.32
E.1	Lake Johanna Blvd. (From Segment G to Old 10 - Snelling)	2,845	0.54
F	Snelling Ave. (Highway 51 to County Road E)	5,672	1.07
F.1	Old Highway 10-Snelling (from Cty. Road E2 to Hwy. 96)	7,880	1.50
G	Lake Valentine Road (Mounds View H.S. to Old 10-Snelling)	1,600	0.30
H	Parkshore Dr. (from Old Hwy 10-Snelling to beginning of Rd. Lake Trail)	2,051	0.39
H.1	Gateway Blvd. (from proposed segment K to Round Lk. Road)	1,985	0.38
H.2	Round Lake Trail (Complete the loop that has a gap behind Nott Co.)	2,433	0.46
I	County Road 96 (Complete trail west from Hamiline Avenue near Snelling Avenue North)	3,100	0.59
J	North Snelling Ave. (From County Road 96 to Briarknoll)	2,652	0.50
K	County Road F (From Existing Sidewalk from Lexington to Hamiline)	403	0.08
L	Lexington Ave. (From County Road D to County Road E)	4,398	0.83
L.1	Lexington Ave. (From County Road E to Grey Fox Road)	973	0.19
L.2	Lexington Ave. (From Red Fox Road to Gramsie Road)	1,088	0.21
L.3	Lexington Ave. (From Tanglewood to County Road I - West Side)	7,839	1.49
M	Crepeau Preserve (From Cannon to Crepeau Nature Preserve)	680	0.13
Total Proposed Future Trails		68,274	13.94

Table 9.3 - Trail Improvement List (within TCAAP Site) (2040)

Segment	Proposed Trail Location within TCAAP Site	Length	
		Feet	Miles
T.1	Spine Road Trail (From HWY 96 to County Road H)	8,656	1.64
T.2	Spine Road Trail (From HWY 96 to County Road I)	12,843	2.43
T.3	Town Center Trail (Along Water Infrastructure)	5,142	0.97
T.4	Rice Creek North Trail Corridor Addition (From HWY 96 to Rice Creek North Regional Trail)	9,263	1.76
T.5	Rice Creek North Trail Corridor Addition (Crossing at Interstate 35W)	637	0.40
Total Proposed Future Trails		36,541	7.20

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Recent and planned improvements, based upon proposed segments identified in the 2030 Comprehensive Plan, have been planned for extending trail segments that are crucial for developing needed north-south and east-west path connections. Through these efforts trail improvements are anticipated for 2018 construction to include providing a continuous connection from County Road E to County Road E2 through the addition of a trail along Snelling Avenue North (Old S.T.H. 10). In coordination with the capital improvements plan (CIP), the City may benefit from setting specific trail priorities to take advantage of grants, road reconstruction projects, and other opportunities as they arise.

In conjunction with Ramsey County and MnDOT, grade separated crossings of major roads and railroads is one of the more important actions the City can take to improve the path network, increase safety, enhance access to parks, encourage increased physical activity, and help tie the community together (Figure 9.2). The following connections and improvements for pedestrian and bicyclists (non-motorized users), some of which are noted in the above list, are recommended through discussion with the PTRC and community meetings:

- **Snelling Avenue North (Old S.T.H. 10)**– A proposed trail (Figure 9.1) from the Hwy. 96 regional trail is recommended to provide a north-south connection the intersection of Snelling Avenue North and County Road E2 (segment F.1). Due to major highways, this route provides a critical connection to several city parks, schools, and the Tony Schmidt Regional Park. This would also provide a connection of the Round Lake proposed trail connection if an easement was acquired south of Round Lake.
- **Lake Valentine Road** – The connection of a city path (segment G) on the southern side of Lake Valentine Road is recommended to provide a safe route for adjacent neighborhoods to the Mounds View High School and a connection to newly redeveloped Valentine Park.
- **County Road E (Lake Johanna Blvd)** – The addition of providing a trail connection (segment E & E.1) along the north side of County Road E between Indian Place and Snelling Avenue North (Old S.T.H. 10) is recommended to create accessibility to the Tony Schmidt Regional Park and improve east-west trail connections.
- **Highway 96** – A grade separated trail connection (segment I) may be needed at a location between Highway 10 and Hamline Avenue North. The grade-separated connection would provide access to Ramsey County and Arden Hills facilities and the TCAAP area. In addition, a trail crossing

at the intersection of Snelling Avenue North would provide an essential trail crossing to the planned regional trail and the neighborhoods adjacent to south of Highway 96.

- **Snelling Avenue North (Old S.T.H. 10)** – A proposed trail segment (segment F) from the intersection of County Road E and Snelling Avenue North to Glenhill Road is recommended to provide accessibility and potential future connections with city parks and amenities beyond the city limits including the adjacent University of Northwestern Campus. Construction is anticipated for 2019.
- **Trail Signage** – added small trail identification maps that include distance, name, and standard city identification where needed.

Implementing the pathway expansion and improvement plan will require cooperation with Ramsey County, MnDOT, the school districts, and other private and public entities. The City recognizes that the entire network cannot be completed at once; however, the above list represents the long-term goal of a comprehensive pathway network to facilitate recreational and utilitarian uses.

9.4.4 Park and Open Space Acquisitions

While there is very little vacant land available in the City outside of the TCAAP property, four locations were identified for potential incorporation into the City's park and recreational system (Figure 9.1). Two land parcels remain to be acquired within the boundary of Tony Schmidt Regional Park. Additional public lands adjacent to the park are proposed to be used for trails and trail connections under cooperative agreements.

- **Charles Perry Park** – The City may consider acquiring the residential property adjacent to Charles Perry in order to minimize the potential conflict caused by reflected light, noise and trespassing while providing an opportunity to expand the recreational offerings in the park and to provide better park access.
- **Round Lake Open Space** - The land to the west of the existing Round Lake Open Space area could provide adequate space for soccer fields, community gardens, ball fields, or other recreational uses. The amount of property to acquire would be determined by what programming needs exist at that time.

- **Round Lake Trail Easements** - The remaining easements are needed to complete the trail around the west and south sides of Round Lake.
- **Tony Schmidt Regional Park** – While Tony Schmidt Regional Park is a Ramsey County park, the City encourages the County to expand its facility in accordance with their facility and land needs. The Tony Schmidt Regional Park Master Plan lists potential land acquisitions, which are shown on Figure 9.1.

9.4.5 TCAAP Redevelopment Area

Ramsey County purchased 427 acres of the TCAAP property in April 2013. The City has approved the TCAAP Redevelopment Code to regulate zoning and land uses. Approximately 24.3 acres are planned to be used for City parks and public open space. Ramsey County is acquiring an additional 30 acres from the federal government for a north-south trail and 78 acres for a future wildlife corridor and trailhead.

Three City parks will be located within or adjacent to residential neighborhoods. Amenities will be planned for each park based on the population served and to complement existing amenities in the developed portion of the City. The timing of park development will be aligned to the development of adjacent neighborhoods. In order to provide flexibility the exact boundary and location of each park include on the TCAAP property may move within its given district. However, each park will be required to include the identified amenities within the City's TCAAP Master Parks and Open Space Plan.

Green space will be provided along a pedestrian corridor linking the primary retail area west of the Spine Road to a City park on the eastern edge of the site. Trails will be provided along the Spine Road and along a collector road adjacent to the natural resources corridor. In cases where private development is immediately adjacent to park and open space areas, the TCAAP Redevelopment Code requires frequent pedestrian connections to open space. Connections to the north-south trail corridor and trails in the wildlife corridor will be provided from adjacent neighborhoods.

Ramsey County has prepared and the City has approved the Rice Creek North Regional Trail Wildlife Corridor Habitat Restoration plan. Improvements, remediation, restoration and other development of the wildlife corridor property, prior to and following transfer to Ramsey County, will be guided by this plan. Trail connections for public use may be incorporated into the wildlife corridor.

However, they must be designed and aligned so as not to impede the movement of wildlife.

9.5 IMPLEMENTATION STRATEGIES

9.5.1 Priority Setting

One tool to advance this chapter is to create a flexible priority list for improvements and expansions. With the priorities laid out, the City would be able better able to assess fund balances and make informed spending decisions and coordinate improvements with other projects such as road improvements. The priority list will need to be regularly evaluated to measure progress and to adjust the list to accommodate funding availability, changing circumstances, and changing priorities. A fully functioning and complete park and pathway system adds to the attractiveness of the City and to the values of property owners.

While a long-term priority list will help the City in the decision-making process and help plan for future expenses, the list must be flexible. As new local and regional projects, needs, and opportunities arise, it may be necessary to adjust the list to take advantage of opportunities that may not yet be known.

9.5.2 Partnerships

Developing partnerships with other public and private organizations is an important tool for implementing this and other chapters of the Comprehensive Plan. With scarce resources and increasing demands, searching for partnerships to reduce costs, increase efficiency, and expand services is necessary. Working with adjacent cities, the Metropolitan Council, Ramsey County, businesses, school districts, higher education institutions, and other stakeholders may lead to better and more efficient implementation of this Chapter.

MNDOT & Ramsey County Transportation – Coordinating with MnDOT and Ramsey County Public Works will help ensure that pathway additions and crossings are in their transportation master plans, included in reconstruction projects, and are a priority for funding and implementation in their capital improvement plans (CIP).

Ramsey County Parks and Recreation – With regional facilities in Arden Hills and connecting to City pathways, it is important to coordinate with the County. The County is working to implement the Tony Schmidt Master Plan, the Rice Creek

trail system, and other regional park and trail projects that connect to or impact Arden Hills.

Mounds View and Roseville School Districts – The City has an opportunity to work with the school districts and the two facilities in Arden Hills to increase pedestrian and bike access to the schools, promote safe routes to school, and increase physical activity.

Bethel University and Northwestern College – Both of these campuses have trails that can be accessed by the public. The City should consider working with these institutions to ensure continued access to these trails and to make connections with City trails.

Twin Cities Army Ammunition Plant (TCAAP) Redevelopment Partner and the Arden Hills Army Training Site (AHATS) – The proposed redevelopment on the TCAAP property offers an opportunity to greatly expand the City’s park and pathway network. The City seeks to continue working with the developers, AHATS, and private entities to ensure a park and pathway system is constructed that meets the needs of current and future residents. Although the AHATS property is not freely open to the public, it could play a role in future park and recreation opportunities.

9.5.3 Financing

While the City supports the park and recreation system, it is recognized that other needs in the City compete for funds and funding will continue to be a challenge. In order to implement the parks and recreation plan, yearly priorities are being identified in the City’s capital improvement plan (CIP), which can be adjusted annually as funding, opportunities, and needs change. Flexibility in implementation will be necessary.

Since much of the City is developed, park and recreation expansion improvements cannot rely on park dedication fees alone. Therefore, the City may need to explore other financing options. Pursuing funding opportunities may help advance implementation of this plan at a faster rate than would otherwise be able to occur.

9.5.4 Additional Strategies

The strategies in the previous sections should not be considered all-inclusive. New opportunities and strategies should be identified to further advance the City’s parks and recreation goal and policies.

10. PROTECTED RESOURCES

Goal: Preserve, protect, and restore the community's natural resources, including open spaces, lakes, wetlands, other significant natural features, and historic resources.

To achieve this *protected resources goal*, the following policies are proposed:

- Identify and work to protect the sensitive natural resources within the City.
- Develop or enhance regulations to protect the City's natural resources, including trees, lakes, wetlands, and other unique or significant natural resources.
- Work with the appropriate agencies to assure that surface and ground water quality is protected.
- Support public educational opportunities to foster a better understanding of the natural environment as well as ways to restore and protect the natural environment.
- Work with the Arden Hills Army Training Site (AHATS) to protect the unique natural resources and open spaces as park and/or open space.
- Encourage the identification and protection of historically significant sites and structures.

10.1 INTRODUCTION

The beautiful lakes, diverse topography, and wooded character of Arden Hills provide exceptional residential, recreational, and business environments. The community has carefully guarded these resources in the past; however, they are constantly threatened by human activities. Protecting these areas requires diligence, including adherence to strong protection policies and requirements, studying the most up-to-date preservation methods, and educating the public on environmentally sound development and maintenance practices.

Lakes are a significant resource in the City and will continue to be if water quality can be enhanced and maintained. Lakes and their surrounding watersheds need to be managed as sensitive and limited resources, requiring purposeful planning and action. The lack of management of these limited resources can lead to diminished water quality and can negatively affect public health, recreational activities, wildlife, and fishing, community quality of life, and ultimately tax revenues through diminished property values.

Arden Hills is located entirely within the Rice Creek Watershed District (RCWD). The RCWD addresses water issues, administers regulatory programs, and undertakes projects to improve water quality. The City has a number of protective ordinances and policies in place that enhance RCWD activities; however, those policies require

monitoring to ensure that they are meeting community needs and effectively protecting the City's natural resources.

In addition to lake protection, several high-priority natural areas, endangered and protected species, and historic sites have been identified as significant in the City. These significant resources are highly valuable and have features that may require special levels of protection. Preserving the City's natural setting is of the utmost importance to residents of Arden Hills.

10.2 WATER RESOURCES

Covering nearly 550 acres in Arden Hills, the seven lakes and many wetlands have always been a focal point in the community (Figure 10.1). Early settlers and development took advantage of the recreational and scenic qualities of the lakes, and they continue to be an attractive characteristic for residents and visitors. Most of the shoreland development took place prior to the adoption of modern development regulations; and the City is experiencing redevelopment pressure along the City's shorelines.

The Minnesota Department of Natural Resources (DNR) requires communities to adopt shoreland ordinances, which typically regulate lot size, minimum shoreline width, lot coverage, and structure setbacks for development along water bodies. Development regulations vary depending on the lake classification set by the DNR:

- Natural Environment Lakes and Streams (NE) – usually have less than 150 total acres, less than 60 acres per mile of shoreline, and less than three dwellings per mile of shoreline. They may have some winter kill of fish; may have shallow, swampy shoreline; and are less than 15 feet deep.
- Recreational Development Lakes (RD) – usually have between 60 and 225 acres of water per mile of shoreline, between three and 25 dwellings per mile of shoreline, and are more than 15 feet deep.
- General Development Lakes (GD) – usually have more than 225 acres of water per mile of shoreline and 25 dwellings per mile of shoreline, and are more than 15 feet deep.

10.2.1 Lakes and Water Bodies

As noted above, the City has seven lakes in or partially in Arden Hills. All water bodies in the City are highly valued and warrant continued protection.

Lake Johanna

Lake Johanna is the biggest lake in Arden Hills at 230 acres with a 4.25 square mile watershed. It is up to 41 feet deep and has an average depth of 17 feet. The lake is classified as a GD lake.

The land on the north, west, and east sides of Lake Johanna is largely developed with single family homes. Tony Schmidt Regional Park, located on the northwest side of the lake, includes a swimming beach and boat ramp. Presbyterian Homes, a senior housing facility, is located on the southwest corner. Northwestern College occupies the peninsula on the southern side of the lake.

A wide variety of recreational opportunities exist on Lake Johanna, including swimming, skiing, and fishing. Boats are restricted to five miles per hour within 250 feet of the shoreline, and there are restricted hours for speeds in the rest of the lake. A wide variety of fish exist in the lake, including Bass, Bluegills, Bullheads, Carp, Crappies, Muskies, Northern Pike, Perch, Sunfish, and Walleye.

Storm water flows into Lake Johanna from Little Lake Johanna via Ramsey County Ditch 4, which originates north of County Road C in Roseville. City storm water is also routed into Lake Johanna on its west and east sides. As part of the City's pavement management program, the City is working to provide stormwater treatment systems to improve the water quality of the stormwater that reaches Lake Johanna.

The Lake Johanna Improvement Society is an organization made up of lake area property owners. The group coordinates lake issues with the City, including the boat speed limits.

The Rice Creek Watershed District has noted that Lake Johanna has the potential to become impaired without additional protection and attention to water quality. The lake is listed on the impaired list for mercury contamination. Although the source and long-term impacts are unknown, fish in Lake Johanna were found to have elevated levels of the chemical perfluorooctane sulfonate (PFOS) in 2007. No additional fish consumption or swimming warnings have been issued.

Lake Josephine

Lake Josephine is approximately 114 acres in size with a subwatershed of 1.31 square miles. The northern 60 acres are located in Arden Hills while the southern 54 acres are located in the City of Roseville. The lake has a maximum

depth of 44 feet and an average depth of 20 feet. Lake Josephine is classified as a GD lake.

The land around the lake is fully developed with single family homes. There is a concrete boat access and public beach immediately south of the municipal border in the City of Roseville on the east side of the lake. The lake is used for boating swimming, and fishing. Bullheads, Crappies, Bluegills, Carp, Sunfish, Bass, Northern Pike, and Walleye can be found in the lake.

The outlet of Lake Josephine is located at the northwestern part of the lake and flow to Lake Johanna through a storm sewer and ditch system.

The Lake Josephine Improvement Association consists of lake area property owners. The City of Roseville and the City of Arden Hills have adopted joint regulations for Lake Josephine, which includes a maximum speed limit and a no wake zone of 150 feet from the shoreline.

The Rice Creek Watershed District has noted that Lake Josephine has the potential to become impaired without additional protection and attention to water quality. The lake is listed on the impaired list for mercury contamination.

The fish in Lake Josephine were tested for perfluorooctane sulfonate (PFOS) in 2007; however, the results of those tests were not available in time for the release of this Plan.

Little Johanna Lake

Little Johanna Lake is approximately 18 acres in size and has a maximum depth of 22 feet. The lake is classified as an NE and RD lake by the DNR and Ramsey County, but as a GD lake by the City. It is a non-swimming lake, there are no formal public access points, and recreational uses are limited.

The northern eight acres are within the City of Arden Hills, and the southern ten acres are within the City of Roseville. Northwestern College occupies much of the lake's eastern, northern, and southern shoreline and single family homes are on the west side of the lake.

Drainage into Little Johanna Lake comes from Ramsey County Ditch 4, which originates north of County Road C in the City of Roseville and flows out to Lake Johanna. Little Johanna Lake and the ditch function as a settling area for stormwater prior to flowing into Lake Johanna. During larger storm events, however, water flows through the water bodies rapidly, which allows little time for

unwanted nutrients to settle out of the water. As a result, the quality of Little Johanna Lake and Lake Johanna are compromised.

Valentine Lake

Covering approximately 74 acres with a 2.4 square mile watershed, Valentine Lake is an NE lake located just south of Interstate 694. Bethel University owns almost all of the lakeshore; however, the lake can be viewed from Old Highway 10 along the western shoreline. While there is not any formal boat or public access points, the lake is used for fishing by the public. In the future, it may be necessary to develop a formal agreement with Bethel University for public use and a parking lot for users.

The lake has a dominance of blue-green algae and has heavy algal blooms throughout the summer. Water flows southwest out of Lake Valentine into the County Ditch 12 and eventually into Long Lake in the City of New Brighton.

Round Lake

Round Lake is approximately 125 acres in size and has a subwatershed of 0.83 square miles. The United States Fish and Wildlife Service owns all of the land around the lake. Public use of the lake is prohibited and there are not any public access points due to contamination in the lake bed from operations on the former Twin Cities Army Ammunition Plant (TCAAP) property. There are single family homes on the east side of the lake, apartments and townhomes on the southeast side, and industrial development on the south and west sides. The north side of the lake is bordered by Highway 96. None of the adjacent property owners have access to the lake.

Karth Lake

Karth Lake is approximately 15 acres in size and is surrounded by single family homes. There is a City park on the south side of the lake; however, there are not any public boat launches to the lake.

Rice Creek Watershed District is conducting water quality monitoring for the lake. The immediate area drains into the lake, and there are also five (5) stormwater inlets draining approximately 170 acres to the lake. Prior to 2004, there was not an outlet for Karth Lake, and the water level steadily increased. The Karth Lake Improvement District was created in 2003 to manage the water level, and a pump was constructed in 2004 to control the lake level. Water that is pumped out of the lake flows through storm sewer and ditch systems to Valentine Lake.

Sunfish Lake

Located on the AHATS property, Sunfish Lake is approximately 11 acres in size. No water quality monitoring has been conducted for the lake. City Hall is southeast of the lake, and the joint Ramsey County/Arden Hills Public Works facility is west of the lake. There is not any residential development around the lake. The lake is not accessible to the public, and public access is not anticipated because the land is owned by the federal government and used for Minnesota National Guard training.

Marsden Lake

Covering more than 275 acres, Marsden Lake is a large wetland complex (wet meadow) that has been identified by the Minnesota DNR as an important natural community. The entire lake is within the federally owned property that is leased by the Minnesota National Guard. There are not any public access points to the lake. The lake is part of the critical habitat for the Blanding's Turtle, which is classified as "threatened" by the State of Minnesota.

Rice Creek

Rice Creek flows through the far northwest corner of the City and is the only natural watercourse in the City. There are a number of County drainage ditches connecting the major lakes and providing connections to Rice Creek.

Approximately 112 acres of land was transferred to Ramsey County along the creek, and the Rice Creek North Regional Trail has been constructed. The trail connects to adjacent cities, the regional park system, and likely to the TCAAP redevelopment property.

Wetlands

Arden Hills has many wetlands of various sizes and types spread throughout the City. The wetlands are an integral part of the natural environment and are important component of healthy lakes, streams, and animal habitat. Development impacts to wetlands are regulated by Federal and State laws. The U.S. Army Corps of Engineers – Saint Paul Office implements the federal wetland laws, and the Minnesota DNR and the Rice Creek Watershed District implement State wetland laws. Alterations to wetlands almost always require a permit, and the City seeks to protect wetlands wherever possible.

10.2.2 Rice Creek Watershed District & Water Quality Management

Arden Hills is located entirely within the Rice Creek Watershed District (RCWD). The RCWD requires permits for land development, site grading, wetland and shoreland alterations, and drainage plans and systems.

Water quality for Lake Josephine, Lake Johanna, Round Lake, and Valentine Lake is monitored by Ramsey County. The RCWD utilizes this data.

The City's Floodplain and Shoreland Ordinances govern development activities in areas that contribute storm water runoff to the City's lakes. In addition, the lake use ordinances on Lake Johanna and Lake Josephine help to control erosion and water quality. Unfortunately, water quality has decreased in recent years and additional efforts are needed to maintain and improve water quality.

10.3 PROTECTED SPECIES/HABITAT

The City is home to at least two species that have a legally protected status, and two habitats that have been identified by the DNR as in need of being protected (Figure 10.2). Blanding's Turtles have "threatened" species status in Minnesota, which means that the State has determined that the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range within Minnesota. While it is outside of the City's regulatory authority, Illinois Tick Trefoil is a rare plant that was identified in the AHATS area.

Both high value habitats are located on the AHATS property outside of the City's regulatory authority. Marsden Lake is a large wetlands complex (wet meadow) and has been identified by the Minnesota DNR as an important natural community. The kame, also located on the AHATS property, is a relict of the glacial landscape and has also been identified by the DNR as an important geological feature. The kame is the highest geographical point in Ramsey County.

10.4 CULTURAL RESOURCES

Although little information has been compiled regarding historic sites or buildings in Arden Hills the Minnesota Historical Society and Ramsey County Historical Society identified one structure that may be worthy of being placed on the National Register of Historic Places (Figure 10.2). The 1998 Comprehensive Plan identified two additional buildings and one site as historic and/or architecturally significant to the community.

Charles Perry House

The Charles Perry House, located at 3491 Lake Johanna Boulevard, has been identified by the Minnesota Historical Society and Ramsey County Historical Society as historically important. While there has been consideration of placing this house on the National Register of Historic Places, additional research and community interest is needed.

Farrell Homestead

The Farrell Homestead at 1963 County Road E2 is a large, Victorian farm home just north of the intersection of County Road E2 and New Brighton Road. The Homestead was constructed in 1874. John Farrell, of Irish descent, settled and farmed more than 500 acres. A friend once asked him why he brought such a hilly farm, to which John replied, “Because it reminds me of Ireland.”

An interesting side note is from Mary (May) Marston, granddaughter of John Farrell, who grew up on the farm in the 1890s. Ms. Marston stated that, “Across from the farm was a hill with Indian grave platforms and artifacts.”

Nazareth Hall on the Northwestern College Campus

Nazareth Hall was constructed in 1921-22 on the Northwestern College campus. It was constructed in the “Lombardic Romanesque” style from northern Italy. It faces east to overlook Lake Johanna. It includes six buildings constructed as one, with several courtyards styled after the Vatican. The building covers approximately 37,400 square feet of ground and was designed to fit into its natural lakeshore setting.

Round Lake Prehistoric Site

The Round Lake prehistoric site is located on a small knoll on a peninsula on the southwestern shore of Round Lake. Archaeological exploration has determined that the knoll on the peninsula is most likely of natural origin. Artifacts relating to the manufacture or maintenance of stone tools were observed on the site, and it appears that it may be eligible for the National Register of Historic Places. This site was threatened by development in 1997; however, the City was able to obtain a conservation easement over the peninsula to preserve it in its current condition. Further research, as well as community interest, is required before actual placement on the National Register of Historic Places.

10.5 NATURAL RESOURCE INVENTORY MAP

Although the portion of Arden Hills south of Highways 96 and 10 is considered fully developed, there is an abundance of mature trees, lakes, wetlands, open spaces, parks, and other natural amenities that give the City its highly valued natural and well-landscaped character. The southern two thirds of Arden Hills contain more than 363 acres of public parks and undevelopable open spaces. Northwestern College, Bethel University, and Mounds View High School also contain highly valued natural areas of varying character and quality.

The Arden Hills Army Training Site (AHATS) property is also home to some of the most significant natural resources in Arden Hills, including lakes, wetlands, woodlands, meadows, rolling terrain, and vistas. The kame, which is a geological formation made by retreating glaciers, is located in the central part of the property and is the highest point in Ramsey County. While some institutional development from the Minnesota National Guard may occur on the southern part of the AHATS property, much of that area is anticipated to remain as open space. The AHATS property is not open freely to the public, but the National Guard does allow some scheduled visits on the property.

Of the 585 acres on the TCAAP property that are anticipated to be sold to the City for redevelopment, preliminary plans include approximately 168 acres for use as open space in the form of parks, wetlands, stormwater areas, recreational areas, and a wildlife corridor.

The Rice Creek Watershed District has compiled data and generated a resource protection map to show areas of significant natural resources (Figure 10.3). The map is only intended to be a guide and is not detailed enough for site specific planning as there may be inaccuracies due to the scale of the assessment. Additional information regarding feasibility and site condition should be collected before utilizing this information at a smaller scale.

This resource protection map has two primary purposes. First, it is meant to help develop regulations to protect significant natural resources where it is feasible to do so. Second, it is meant to help make more informed development decision in places where there may be significant resources. The map displays the following information:

- Remaining natural areas within your community
- Results of a natural resource assessment
- Results of a wetland restoration assessment
- Lakes and streams currently listed on the 303(d) list of impaired waters
- Results of lake water quality assessment

10.5.1 Natural Resources Assessment

The Rice Creek Watershed District (RCWD) evaluated the natural areas within its jurisdiction, which includes all of Arden Hills, to determine the relative quality of remaining natural areas. The RCWD evaluated the natural resource data based on the following characteristics:

- Health of natural area: High quality areas with native vegetation were considered more important than areas with partial or total dominance by invasive species.
- Size: Large natural areas (five acres or greater) were considered more important than small natural areas (less than five acres).
- Rarity of community type within the watershed: Natural community types that are rare due to specific site requirements (fens, bogs, etc.), or have become rare due to historic land use changes or degradation (prairie, oak savanna, etc.) were considered more important than more common natural community types.
- Adjacency to other natural areas: Natural areas that are immediately adjacent to several other natural areas were considered to be more important than natural areas that are adjacent to one or no other natural areas.
- Proximity of healthy natural areas to other healthy natural areas: Healthy natural areas that are in close proximity to each other (within 1/8 of a mile) were considered more important than isolated healthy natural areas, healthy natural areas in close proximity to degraded natural areas, or degraded natural areas in close proximity to each other.

These natural resource characteristics were combined to form the overall natural resource assessment ranking for each area shown on Figure 10.3.

10.5.2 Wetland Restoration Assessment

All wetland areas within the RCWD were evaluated to determine their potential for vegetation and/or hydrologic restoration. A wetland's potential for either type of restoration was determined in the following manner:

- Vegetation Restoration: The Minnesota Land Cover Classification System (MLCCS) data includes information on whether or not a natural area is dominated by invasive species. Wetlands dominated by invasive species represent an opportunity to restore native vegetation. Taking this into account, wetland communities that were recorded in the MLCCS as dominated by invasive species and greater than two acres in size were included in this category and displayed on the map.

- Hydrologic Restoration: National wetland inventory (NWI) data and ditch inventory data were used to identify wetlands with the potential for hydrologic restoration. The location of partially drained wetlands in the NWI data and the location of known ditches were used to identify wetlands that have been partially drained and could be restored to more natural, flow through hydrology without necessarily changing the hydrologic regime. Only polygons one acre or larger were included and displayed on the map. Wetland areas with these characteristics that were in close proximity to existing infrastructure (homes, businesses and roads) were removed from consideration.

10.5.3 Lake water quality assessment

Each lake located within the Rice Creek Watershed District was evaluated to determine its potential for water quality impairment due to excessive nutrients (Table 10.1). The lakes fell into one of three categories:

- No data: Not enough water quality data available for evaluation.
- Listed on 303(d) list of impaired waters: Lake is currently on the impaired waters list (TMDL list) for excessive nutrients. (Lakes that are on the impaired waters list only due to high levels of mercury, and not due to excessive nutrients, are not included in this category.)
- Potential to become impaired: Available water quality data suggest that the lake is currently not impaired. Due to development pressure or to borderline water quality conditions, this lake has the potential to become impaired in the near future.

Table 10.1 - Lake Water Quality (Rice Creek Watershed District)

Lake	No Data	Listed on the 303(d) list of impaired waters	Potential to become impaired
Johanna*			X
Josephine*			X
Karth	X		
Little Johanna		X	
Marsden	X		
Round			X
Sunfish	X		
Valentine		X	

*Listed on the 303(d) list of impaired waters for mercury

The 303(d) list is part of the federal Clean Water Act, which requires states to adopt water quality standards to protect waters from pollution.

10.5.4 Priority Areas

Area 1 – This area contains a relatively diverse assemblage of upland and wetland communities connecting Lake Johanna and Farrel’s Lake. Upland community types in this area include aspen forest, lowland hardwood forest, oak woodland, and mesic prairie. Wetland community types in this area include willow swamp, mixed emergent marsh, and cattail marsh. The majority of these communities were given a “medium” ranking in the natural resource assessment. There are also several potential opportunities for wetland restoration within this area, both hydrologic and vegetation. Lake Johanna has the potential to become impaired due to excess nutrients.

Area 2 – This area contains areas a mosaic of upland and wetland community types surrounding Rice Creek. Community types include forest, woodland, and emergent marsh. The majority of these communities were given a “medium” ranking in the natural resource assessment. The portion of Rice Creek within the City of Arden Hills is currently on the 303(d) list of impaired waters. A portion of this area near Interstate 35W on the west side of Rice Creek is included in the TCAAP redevelopment plans.

Area 3 – This area contains areas of forest, woodland, and emergent marsh surrounding Marsden Lake. All of the lake’s shoreline is in natural vegetation. This complex of natural areas is unique because of its large size and lack of fragmentation. The majority of these areas were given a “medium” ranking in the natural resource assessment. Marsden Lake does not have sufficient water quality information to determine its potential for water quality impairment due to excess nutrients.

Area 4 – As part of the TCAAP redevelopment, a 49 acre wildlife corridor will be designated to connect the Rice Creek corridor to the AHATS property. While the RCWD did not include the wildlife corridor in their analysis, the City and Ramsey County have identified it as a significant natural resource and as a priority area. Ramsey County will own and maintain the wildlife corridor.

10.5.5 Aggregate Resources

There are no accessible aggregate resources in Arden Hills.

10.5.6 Solar Resource Development and Protection

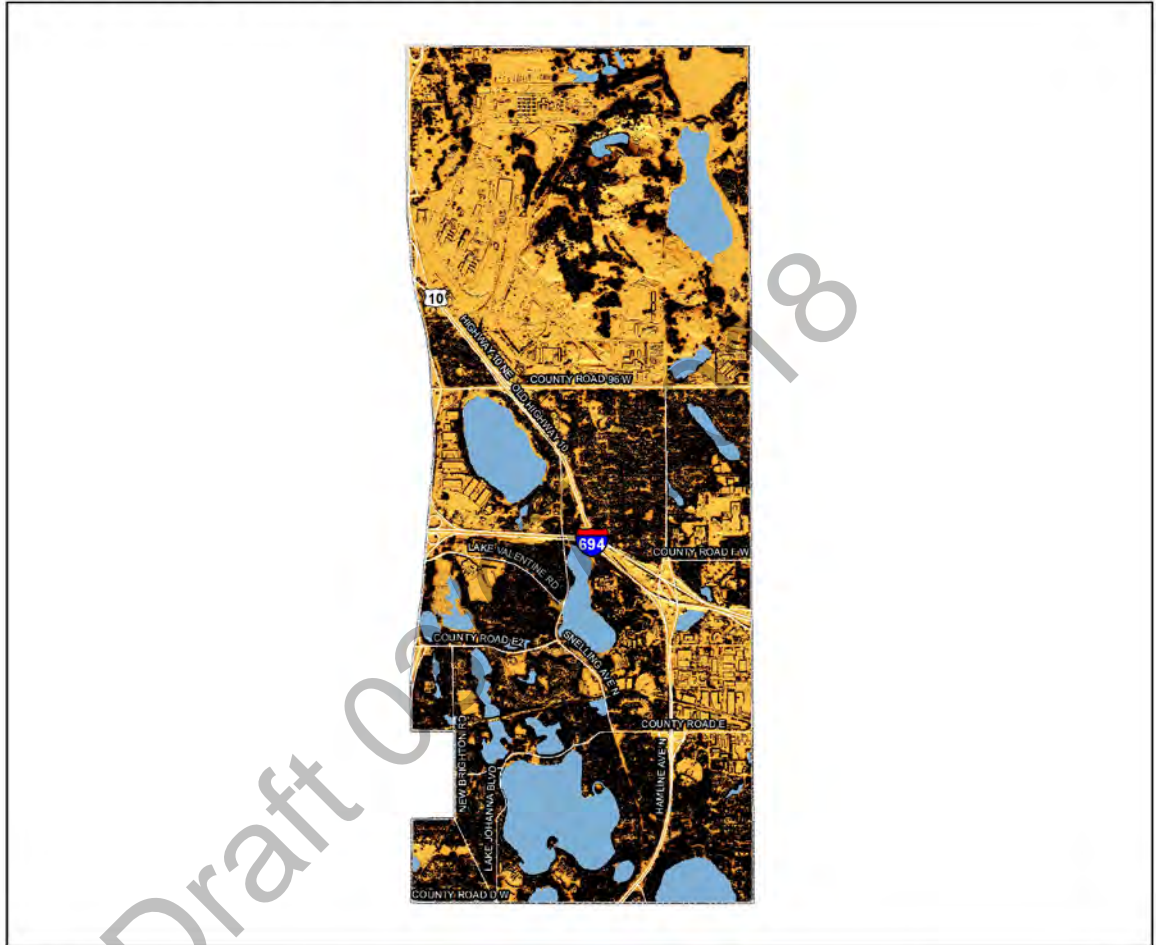
Solar Goals

- a) Encourage residential solar development that maintains community character.
- b) Increase energy resilience of critical facilities such as police, fire, and emergency and hazard response centers.
- c) Fairly balance the development rights of land owners with solar resource with the community character rights of adjacent landowners.
- d) Protect access to solar resources in new developments and subdivisions, enabling individual land owners to choose to self-generate energy.

Strategy

The City shall evaluate the zoning ordinance and other regulations for where amendments can be made to implement the above solar goals.

Gross Solar Potential City of Arden Hills, Ramsey County



11/30/2016



- Gross Solar Potential
(Watt-hours per Year)**
- High : 1271295
 - Low : 900001
 - Solar Potential under 900,000 watt-hours per year
 - County Boundaries
 - City and Township Boundaries
 - Open Water Features

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

Calculation

The gross solar potential and gross solar rooftop potential are expressed in megawatt hours per year (mwh/yr), and these estimates are based on the solar map above. These values represent gross totals; in other words, they are not intended to demonstrate the amount of solar likely to develop within the community. Instead, the calculations estimate the total potential resource before removing areas unsuitable for solar development or factors related to solar energy efficiency. The gross solar generation potential and the gross solar rooftop generation potential are estimates of how much electricity could be generated using existing technology and assumptions on the efficiency of conversion. The conversion efficiency of 10% is based on benchmarking analyses for converting the Solar Suitability Map data to actual production, and solar industry standards used for site level solar assessment.

Gross Potential (mwh/yr)	Rooftop Potential (mwh/yr)	Gross Generation Potential (mwh/yr) ²	Rooftop Generation Potential (mwh/yr) ²
13,320,595	925,656	1,332,059	92,565

10.6 INVASIVE SPECIES

While many of the open spaces in Arden Hills are of high quality, invasive species such as buckthorn are a problem in many parks and open spaces throughout Minnesota. Unfortunately, a number of parks and open spaces in Arden Hills contain buckthorn. In cooperation with residents and service groups, the City has instituted a buckthorn removal program. The City plans to continue to control buckthorn on an ongoing basis as needed and as resources are available. The City will also continue to encourage the removal of buckthorn and other invasive species from private land.

10.7 IMPLEMENTATION STRATEGIES

In order to advance the protected resources goal, the below activities are proposed:

- Maintain tree preservation standards and landscaping requirements.
- Review existing and develop new policies or regulations to protect identified natural resource protection areas, including historical areas.
- Encourage new development to respect the natural features and to minimize damage to the natural environment.

- Update the shoreland and floodplain development regulations to be in compliance with Minnesota Department of Natural Resources regulations, Rice Creek Watershed District regulations, and to encourage the protection of the City's water resources.
- Work cooperatively with private landowners and other governmental agencies to preserve and enhance open spaces.
- Explore the inclusion of an environmental library and/or education center on the TCAAP property.
- Support public educational opportunities to foster a better understanding of the natural environment.
- Work with the Rice Creek Watershed District to increase water quality and to complete Total Maximum Daily Load (TMDL) studies.
- Identify and adopt best management practices to protect the water quality of lakes, streams, wetlands, and groundwater.
- Work to reduce nonpoint pollution sources, including educating residents and using best management practices.
- City encourages development of distributed solar energy systems that are in keeping with the community's character and use community solar resources.
- City supports the development of zero net energy buildings and use of local renewable and energy efficiency resources.
- City sets a local renewable energy goal to meet 10% of community-wide electric energy use with on-site renewable energy.

The above strategies should not be considered all-inclusive. New opportunities and strategies should be identified to further advance the City's protected resources goal and policies.

11. TRANSPORTATION

Goal: Provide a transportation system that has convenient and effective multi-modal connections within Arden Hills and to adjacent municipalities, the remainder of the Twin Cities Metropolitan Area and greater Minnesota.

To achieve this *transportation goal*, the following policies are proposed:

- Approach transportation in a comprehensive manner by giving attention to all travel modes and related facilities, linking transit and land use and by combining or concentrating various land use activities to reduce the need for transportation facilities.
- Coordinate transportation plans with adjacent communities and the County, State, and Federal governments to assure system continuity, determine priorities, increase safety, and to efficiently use resources and reduce congestion.
- Create/provide a safe, cost effective, and efficient transportation system that is adequate for car, transit, pedestrian, bicycle, and truck transportation for the movement of people and goods and services in the community.
- Encourage transportation methods that are less dependent on motor vehicles such as walking, biking, and transit.
- Maintain the existing transportation infrastructure to protect the existing investments, increase efficiency, and delay the need for improvement or expansion. Where necessary, expand the City's transportation system to meet current and future transportation needs.
- Continue to work with the County and State elected and appointed officials to include County road reconstruction projects to address needed reconstruction and potential trails along the roadways when improved.
- Work with developers to construct needed improvements prior to development.
- Work to manage traffic in residential neighborhoods to not overburden any particular City street.

11.1 INTRODUCTION

The transportation system in the City of Arden Hills is largely established, made up of metropolitan freeways and highways, County roads, and City streets. Except for the proposed TCAAP redevelopment, the City's transportation system is not likely to see major changes in the next 10 to 20 years. The fact that the network is established, however, does not diminish the importance of continually monitoring the system to ensure that it performs adequately. As such, whether an existing roadway is proposed for upgrading or a land use change is proposed on a property, this Plan provides the framework for decisions regarding the nature of roadway infrastructure improvements necessary to achieve safety, adequate access, mobility, and performance of the existing and future roadway system.

Arden Hills is classified by the Metropolitan Council under the Suburban community designation. Suburban communities typically have automobile-oriented development patterns. Suburban communities are expected to plan for forecasted population and household growth at average densities of at least five units per acre for new development and redevelopment. In addition, Suburban communities are expected to target opportunities for more intensive development near regional transit investments identified in the Metropolitan Council 2040 Transportation Policy Plan.

This chapter includes established local goals, policies, standards, and guidelines to implement a future roadway network and transit vision that is coordinated with respect to county, regional, and state plans in such a way that the transportation system enhances quality economic and residential development within the City of Arden Hills.

This chapter also includes two appendices. Appendix B describes the general transportation system principles and standards, including functional classification, roadway capacity by type, access management guidelines, geometric design standards, and roadway jurisdiction. Appendix C includes the full transportation forecast and traffic modeling methodology.

11.2 EXISTING TRANSPORTATION SYSTEM EVALUATION

The transportation system in Arden Hills includes a roadway system that accommodates a variety of vehicles including cars, trucks, and public transit. Transportation also includes pedestrian movement and bicycles, which is also discussed in Chapter 9 (Parks & Recreation) of this Plan. While upgrades will need to be made over time, existing City controlled roads provide sufficient transportation service to the City.

11.2.1 Existing Traffic Volumes and Capacity Issues

Roadway capacity and roadway safety are two key indicators of how well the roadway system is meeting the city's transportation needs. The sections below provide information to better understand capacity and safety issues within Arden Hills.

A roadway's capacity indicates how many vehicles may use a roadway before it experiences congestion. Capacity is largely dependent upon the number of lanes. Table 11.1 below lists planning-level thresholds that indicate a roadway's capacity. Additional variation (more or less capacity) on an individual segment is influenced by a number of factors including: amount of access, type of access, peak hour percent of traffic, directional split of traffic, truck percent, opportunities to pass, amount of turning traffic, the availability of dedicated turn lanes, parking availability, intersection spacing, signal timing and a variety of other factors.

Table 11.1 – Planning-Level Roadway Capacity

Facility Type		Daily Two-Way Volume	
		Lower Threshold	Higher Threshold
Arterials	Two-lane undivided	10,000	12,000
	Two-lane divided or three-lane undivided	15,000	17,000
	Four-lane undivided	18,000	22,000
	Four-lane divided or five-lane undivided	28,000	32,000
Freeways	Four-lane freeway	60,000	80,000
	Six-lane freeway	90,000	120,000
	Eight-lane freeway or higher	Calculated on a segment by segment basis	

At the planning level, capacity problems are identified by comparing the existing number of lanes with current traffic volumes. Table 11.2 and Figure 11.1 illustrate the existing number of lanes on arterial roadways within the city. Figure 11.2 illustrates existing traffic volumes on Principal Arterial, A-Minor Arterial and other significant roadways within the city.

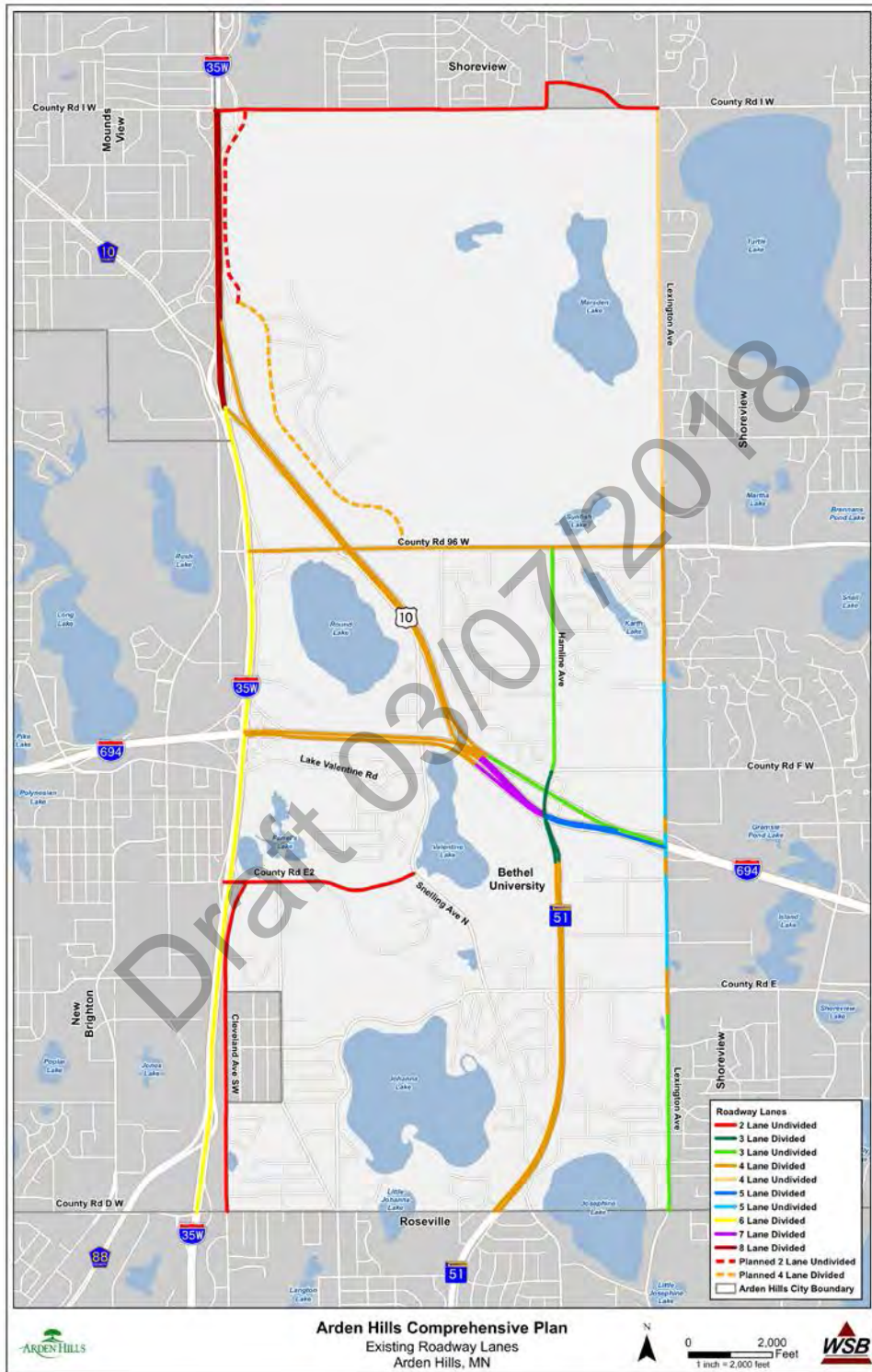
Congestion analysis shows I-35W and I-694 as the roadways with significant congestion. The rest of the existing transportation system throughout Arden Hills is primarily periodically congested, with areas that are near congested. Of primary concern to the City of Arden Hills is the congestion on TH 51/Hamline Avenue, south of I-694 and the county roadways at the interchanges with I-35W. This indicates that the congestion on I-35W is impacting the county roadways that have access to it. As I-35W becomes more congested, more traffic will likely use TH 51 or other adjacent minor arterials as an alternate route, which may also become congested.

Table 11.2 – Existing Number of Lanes on Arterial Roads

Functional Classification	Roadway Name	Location	Number of Lanes
Principal Arterial	I-35W	Western border	6-8
	I-694	I-35W to Lexington Avenue	4
"A" Minor Augmentor	TH 51 (Snelling Avenue)	Southern border to I-694	4
	Lexington Avenue (CSAH 51)	Southern border to I-694	3-5
"A" Minor Expander	Lexington Avenue (CSAH 51)	I-694 to County Road I	4-5
	County Highway 96	I-35W to Lexington Avenue	4
	Hamline Avenue (CSAH 50)	I-694 to County Highway 96	3
"A" Minor Reliever	US Highway 10	I-35W to I-694	4
	Cleveland Avenue (CSAH 46)	County Road D to County Road E2	2

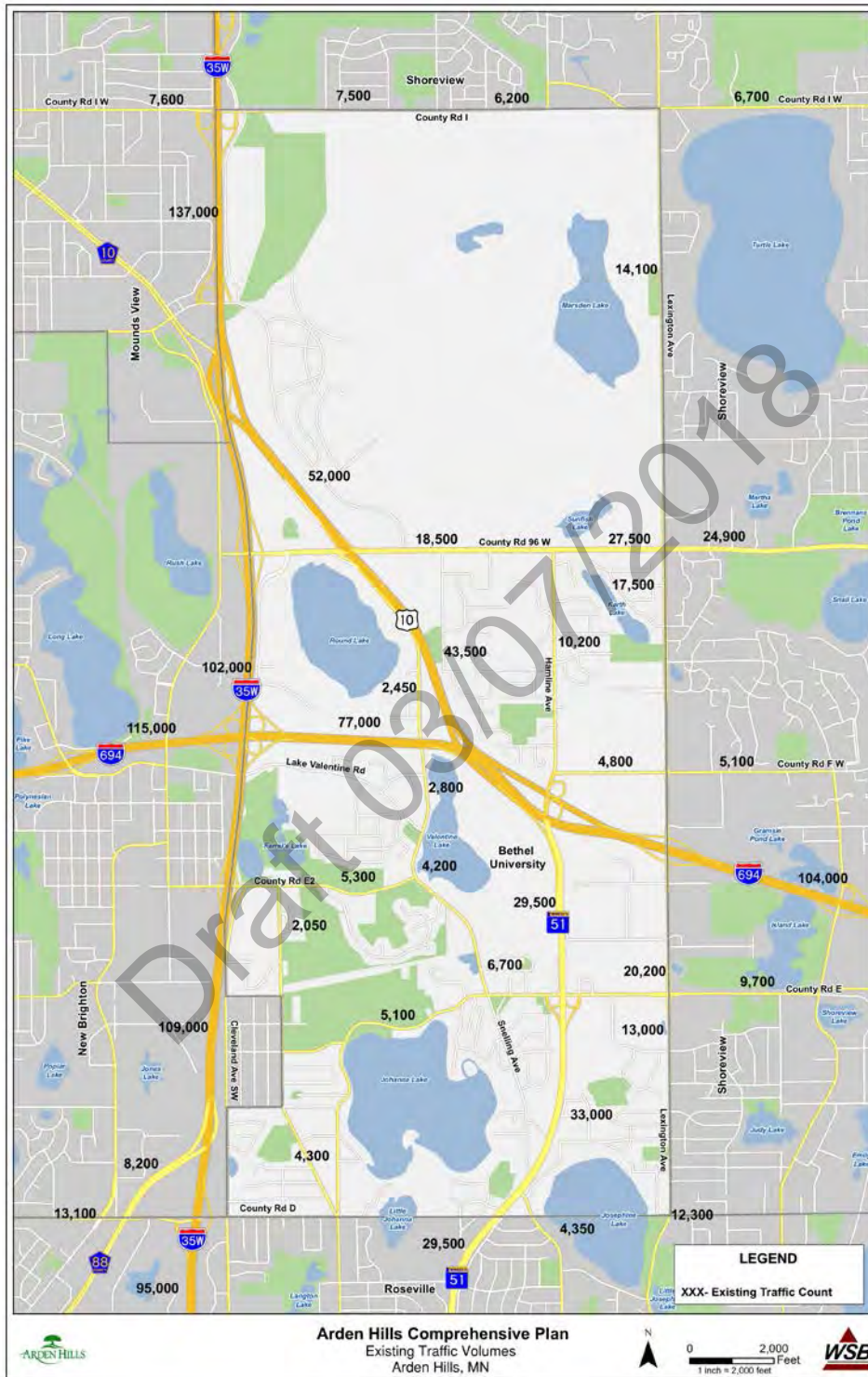
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Figure 11.1 – Existing Number of Lanes



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Figure 11.2 – Existing Traffic Volumes



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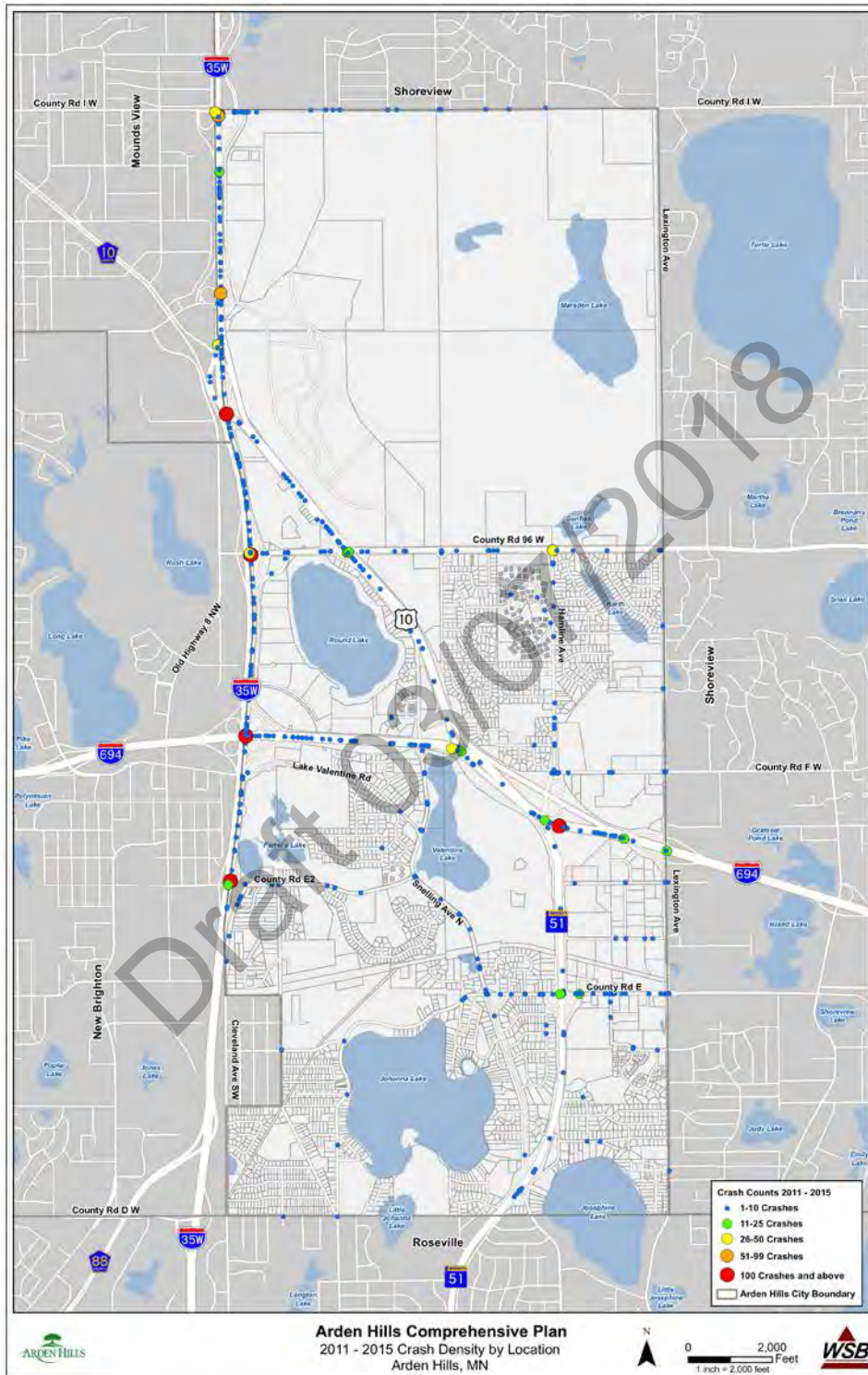
11.2.2 Safety

A planning-level analysis of the existing transportation system in Arden Hills was completed and included evaluating crash records for crash trends, the types of crashes most commonly occurring, and where crash trends may exist. In the five-year time period from January 1, 2011, through December 31, 2015, there were 2,340 crashes on the roadways within or adjacent to the City of Arden Hills. The locations with high crash rates are primarily on the county and state highway intersections (Figure 11.3). Locations with the highest crash frequency are on I-694 with TH 51, and I-694 with I-35W. Additionally, there are high crash rates along I-35W and I-694 at every interchange location.

Other locations off the freeway with high crash frequency are the intersections of TH 10/Old Highway 10 with CSAH 96, TH 51 with County Road E, CSAH 96 with Hamline Avenue, and Hamline Avenue with CR F.

Of the 2,340 crashes, there were 4 fatalities, 113 included injuries, 353 had possible injuries, and 1,870 involved property damage only. Rear end crashes represented 52 percent of the crashes, and 5 percent were right angle crashes. Half of the total crashes occurred at intersections.

Figure 11.3 – 2011-2015 Crash Density by Location



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11.2.3 Jurisdictional Issues

There are no planned jurisdictional transfers planned between Arden Hills and Ramsey County. The City desires active participation in any jurisdictional discussion.

11.2.4 Relevant Transportation Studies

A number of studies have been completed or are in the process of being completed to provide direction relative to the development of the City of Arden Hills' transportation system.

Twin Cities Army Ammunition Plant (TCAAP) Alternative Urban Areawide Review:

An Alternative Urban Areawide Review (AUAR) and Mitigation Plan was approved for the TCAAP site in 2014, including "Minimum" and "Maximum" development scenarios. A separate traffic study was conducted as part of the preparation of the AUAR. This included a more comprehensive summary of the analysis results than what was provided in the AUAR. To determine the impacts on the local roadway network, a traffic operations analysis was conducted for intersections within the vicinity of the TCAAP site for various development scenarios, and mitigation measures were identified based on the results.

In addition to Existing and 2030 No Build Scenarios, the future development scenarios for TCAAP included a Year 2030 Minimum Development Scenario and a Year 2030 Maximum Development Scenario. The minimum development scenario was based on the City's existing zoning requirements for the site, which provided a constrained analysis. A Maximum Development Scenario for 2030 was also analyzed to evaluate a land use mix that maximized the acceptable use of available and potential infrastructure, seeking a balance of financial feasibility, while maintaining community livability and sustainability.

Due to increases in background traffic and the proposed TCAAP redevelopment, transportation network changes are anticipated to occur in the future. Several long-term improvements are being implemented in and around the project study area. Improvements at the Interstate 35W interchanges with Highway 96, County Road H, and County Road I have been constructed. In addition, Old Hwy 8 and the "Spine Road" will provide regional connections through the TCAAP site and to the regional roadways. These improvements will influence trip distribution for the TCAAP redevelopment project.

I-35W North Reconstruction Project:

Several transportation studies have been completed over the past decade evaluating improvements to the I-35W North corridor to address safety, mobility, and pavement condition. Studies include the I-35 Corridor Management Plan, the MnPASS System Studies Phase 1 and Phase 2, and the Metropolitan Highway System Investment Study. Most recently, the 2013 I-35W North Managed Lanes Study recommended construction of an additional lane on I-35W from Roseville to Blaine.

Based on these study recommendations, the Minnesota Department of Transportation (MnDOT) has identified a major reconstruction project for I-35W between County Road C in Roseville north to Sunset Avenue in Blaine/Lino Lakes. The project is anticipated to begin in late 2018, and is expected to last three to four years. The project includes roadway rehabilitation, the addition of a managed lane (MnPASS), auxiliary lane extensions at various locations, and noise walls.

US Highway 10 Auxiliary Lane Project:

To address safety issues and improve mobility and access along eastbound US Highway 10, MnDOT is planning to construct an auxiliary third lane on eastbound US Highway 10 between I-35W and CSAH 96 and a second lane to the ramp from southbound I-35W to eastbound US Highway 10. In addition, the project will straighten and realign Prior Avenue to connect the intersection at a right angle to US Highway 10 at Arden Manor and build a new right turn only exit to eastbound US Highway 10 from Arden Manor/Big Ten Tavern. Construction is expected to begin in late 2018 be completed in 2019.

County Road F Improvements:

Ramsey County is planning a construction project in 2018 on County Road F between Lexington Avenue and Hamline Avenue to install a center turn lane, add intersection improvements at County Road F and Innovation Way including a traffic signal and turn lanes, and complete the ten-foot wide trail along the south side of the road. This project is expected to improve safety and mobility.

Lexington Avenue Improvements:

Ramsey County is planning a construction project in 2020 on Lexington Avenue between County Road E and Interstate 694. This project is expected to include the reconstruction of the roadway and the inclusion of traffic control improvements.

11.2.5 Multimodal Transportation Opportunities

It is recognized that various methods of travel impact the economic vitality of a city, county, or broader region. In addition to the traditional road system, multimodal transportation includes transit, aviation, railway, and paths.

Transit Service

The City of Arden Hills is located within Transit Market Areas III and IV in the Transit Capital Levy District as shown in the Metropolitan Council's 2040 Transportation Policy Plan. Market Area III supports transit services primarily comprised of commuter express bus service. Market Area IV can support peak period express bus services if there is a sufficient concentration of commuters likely to use transit service located along a corridor. General public dial-a-ride services are available where fixed-route service is not viable. Service characteristics include peak-period express buses, one-to-two hour midday frequencies, dial-a-ride advance registration, service spans of 10-14 hours per day on weekdays and limited weekends, and access primarily tied to park-and-ride lots and hubs.

The closest Park and Ride facilities are located at I-35W and County Road H, Highway 10 and County Road H in Mounds View, I-35W and County Road C in Roseville, and at the Shoreview Community Center on County Road 96. The near Transit Center to Arden Hills is located at the Rosedale Center in Roseville, and is served by the A Line bus rapid transit (BRT) high-frequency bus route. Bus-only shoulders exist along I-35W and along US Highway 10 between I-35W and I-694.

Figure 11.4 – Existing and Planned Transit Routes and Passenger Facilities displays the current services available, including route and park and ride locations in and around the City of Arden Hills. Regular route service in the City as currently provided is described below:

- Routes 225 and 227 are local bus routes operated by Metro Transit. These route provides connectivity to the Rosedale Transit Center in the City of Roseville, and serves Shoreview, Arden Hills, and Roseville. Major destinations for Route 225 include Land O'Lakes, Deluxe, Super Target, Cub Foods, Roseville Medical and Dental Center, and Rosedale Center. Route 227 also serves the Roseville Skating Center. Schedules vary from 30 to 60 minutes between trips during rush hour, and hourly midday and weekend service.

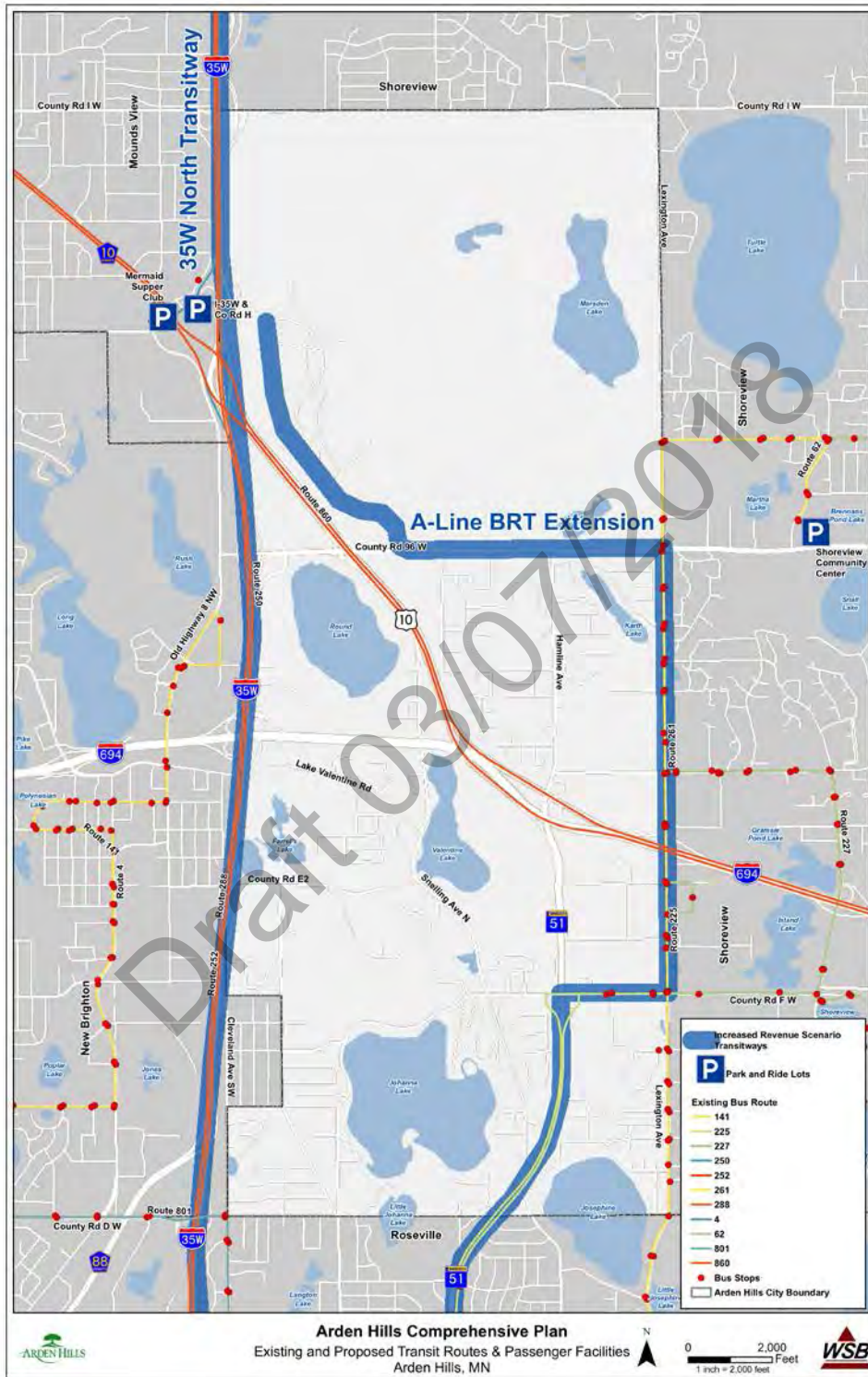
- Route 250 is an express bus route operated by Metro Transit. The route provides connectivity to downtown Minneapolis from Lino Lakes, Circle Pines, Lexington, Blaine, Shoreview, and Mounds View, primarily along I-35W, I-694, and I-94. Arden Hills' residents can access the route from the park and ride lot in Mounds View along County Road H, just west of I-35W. Schedules with stops at the park and ride lot vary from five to fifteen minutes between trips during the peak hours. Two midday trips are also provided.
- Route 261 is an express route to downtown Minneapolis operated by Metro Transit. The route provides connectivity between Shoreview, Roseville, and Minneapolis, along with Arden Hills along Lexington Avenue. There are five-six total peak hour trips during weekdays only.
- Route 801 is a local bus route operated by Metro Transit. This route provides service between the Brooklyn Center Transit Center and the Rosedale Center. There is a bus stop that serves the southwestern corner of Arden Hills at County Road D and Cleveland Avenue. Hourly weekday service is provided.
- Route 860 is an express bus route operated by Metro Transit. This route provides connectivity to downtown St. Paul from Coon Rapids, Blaine, and Mounds View. Arden Hills' residents can access the route from the park and ride lot in Mounds View along County Road H and Highway 10, just west of I-35W. Schedules vary from 15 to 20 minutes between trips during the peak hours. It has seven trips each peak hour during the weekdays only.

Local ADA service is provided by Metro Mobility. Metro Mobility is a shared public transportation service for certified riders who are unable to use regular fixed-route buses due to a disability or health condition. Rides are provided with ADA-equipped vans, and need to be scheduled ahead of time.

General public dial-a-ride service is provided by Transit Link, a small bus service for the general public where regular route transit service is not available. Transit Link is for trips that can't be accomplished on fixed route bus service alone, and may combine regular route and Transit Link service. Both Metro Mobility and Transit Link are services provided by the Metropolitan Council serving the seven-county region.

Arden Hills residents also have opportunities to participate in the Metro Vanpool program. This program provides financial assistance for vanpools to serve areas with limited regular-route transit service.

Figure 11.4 – Existing and Proposed Transit Routes and Passenger Facilities



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Aviation Plans/Facilities

There are no existing or planned aviation facilities within Arden Hills, but the Anoka County/Blaine Airport is located approximately 1.5 miles northwest of the City of Arden Hills, west of I-35W and north of TH 10.

Railway

There is one railway line within the City of Arden Hills. The rail line is active and operated by the Canadian Pacific Rail System (CPR) with an average of four trains per day using the line. It runs east-west through the southern portion of Arden Hills, north of County Road E with a speed threshold of 40 mph. The line includes a spur into the Red Fox/Grey Fox business area.

Minnesota Commercial Railway (MNNR) operates a north-south railway line in New Brighton west of I-35W. One MNNR rail spur provides service to the Scherer Brothers Lumber Yard and ends west of Highway 10 in Arden Hills. The rail spur previously accessed the Twin Cities Army Ammunition Plant (TCAAP) site, but has since been abandoned at Highway 10 to the east. A second rail spur that accessed the Gateway Business District has also been removed and abandoned.

Ramsey County has Regional Rail Authority, which reviews, recommends, proposes, and buys abandoned rail lines for future transportation purposes. It has identified a transitway corridor through the northeast metropolitan area. The Northeast Diagonal transitway corridor follows the partially abandoned and existing Burlington Northern Santa Fe railroad tracks from northeast Minneapolis through St. Anthony, Roseville, Shoreview, Little Canada, Vadnais Heights, Gem Lake, White Bear Township, and ending in White Bear Lake. The potential route does not directly impact Arden Hills.

Truck Freight

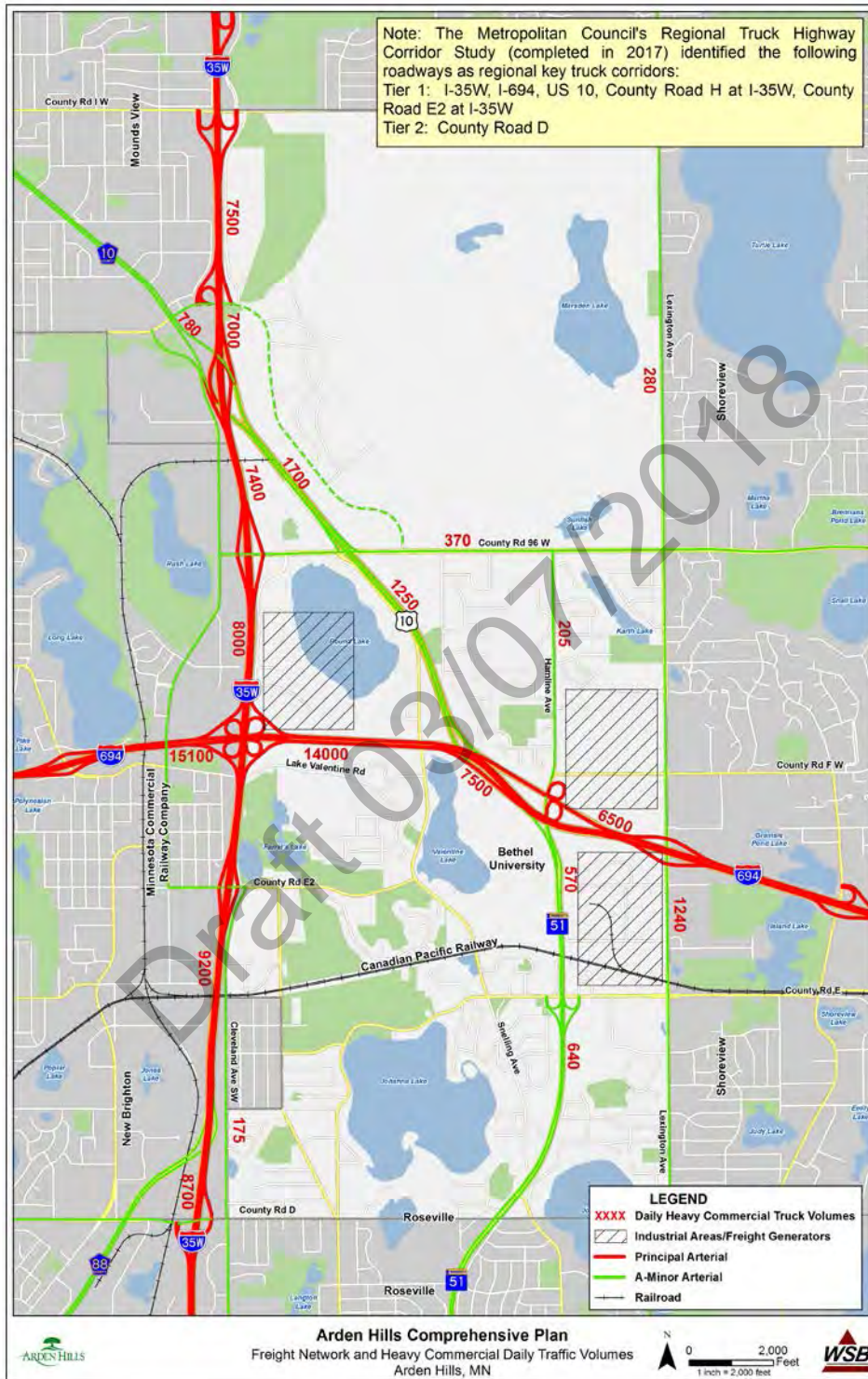
Truck freight transportation in Arden Hills is served by the arterial highways, I-35W, I-694 and US 10. Figure 11.5 shows the City's freight system. There are no large freight traffic generators within the City as identified by the Metropolitan Council. Freight generators within the City include a concentration of light industrial, office, and commercial land uses east of TH 51/Snelling Avenue and along the I-35W corridor.

The Metropolitan Council’s Regional Truck Highway Corridor Study (completed in 2017) identified I-35W, I-694, and US 10 as Tier 1 regional key truck corridors. County Road D (between I-35W and Fairview Avenue) was identified as a Tier 2 regional key truck corridor, and TH 51/Snelling Avenue (south of I-694) was identified as a Tier 3 regional key truck corridor. In addition, nearby Old Highway 8, County Road E2 west of I-35W, and County Road H west of I-35W were defined as regional key truck corridors. As defined in the Regional Truck Highway Corridor Study, the interstate system serves as the freight backbone, and other tiered roadways provide redundancy to the interstate system, as well as provide door-to-door access to manufacturing facilities, distribution centers, intermodal freight hubs, and ultimately, retailers and customers.

Figure 11.5 shows Heavy Commercial Average Annual Daily Traffic (HCAADT) within Arden Hills on the Principal Arterial and “A” Minor Arterial system. Within the City, the largest amount of heavy commercial vehicles travel on I-694 and I-35W (14,000 and 7,000-9,000 trucks per day, respectively).

Draft 03/07/2018

Figure 11.5 – Freight and HCAADT



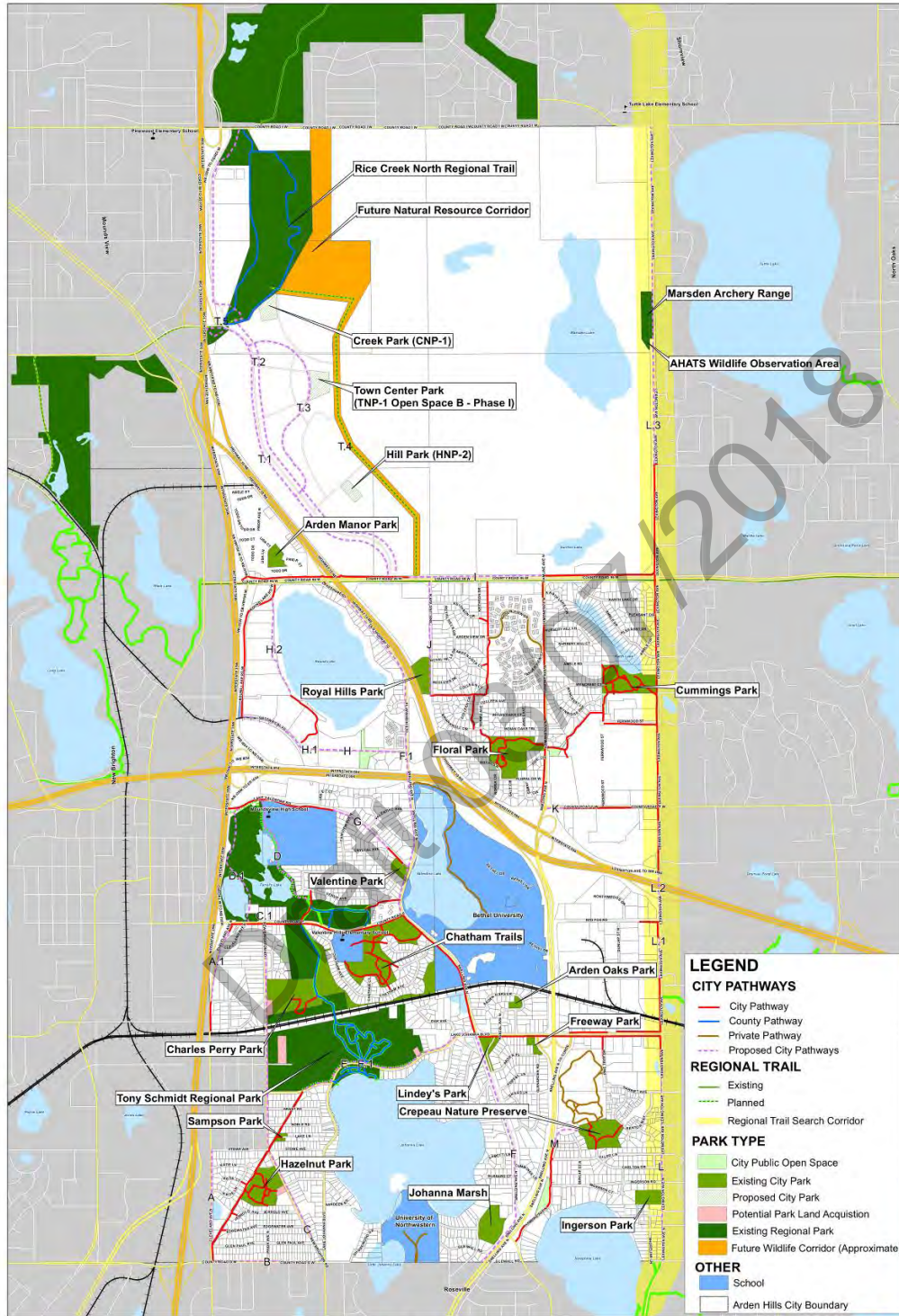
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Pathways

The City includes a number of pedestrian and bike pathways that are an integral part to the City’s transportation system as shown in Figure 11.6. While paths are popular for recreational purposes, there is also a growing demand for utilitarian pathways that connect residential areas to destinations such as commercial areas, offices, parks, and other popular places. Providing multiple destinations on a pathway system can increase use, promote physical activity, and reduce motorized travel in suburban communities. The existing system is more fully described in Chapter 9.

Active Living Ramsey Communities (ALRC) is an initiative designed to encourage and support active living by bringing about and sustaining changes in public and private design, transportation and policies. ALRC encourages healthy lifestyles by bringing people and resources together to build active, bikeable and walkable communities. In 2015, ALRC completed the Ramsey County-Wide Pedestrian and Bicycle Plan. The plan provides a framework for development of a connected Ramsey County where walking and biking are regular everyday parts of people’s lives. This plan provides a set of tools, analysis and actions to engage Arden Hills and community members at all levels in supporting a place where people of all ages and abilities can safely and comfortably walk and bicycle. The City will utilize this resource in the further development of its pathway network.

Figure 11.6 – Bicycle and Pedestrian Facilities



Arden Hills Comprehensive Plan
Bicycle and Pedestrian Facilities
Arden Hills, MN



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11.3 FUTURE TRANSPORTATION SYSTEM PLAN

Except for the future roads on the TCAAP property, the transportation system within Arden Hills is generally considered developed, and improvements are anticipated as reconstruction of aging infrastructure is pursued. As reconstruction occurs, it will be important for the City to improve the roadway system and non-motorized travel opportunities consistent with the recommended Transportation System Principles and Standards in this Chapter and the pathways recommendations in Chapter 9 to the extent possible.

11.3.1 Forecasted Traffic Volumes & Capacity Needs

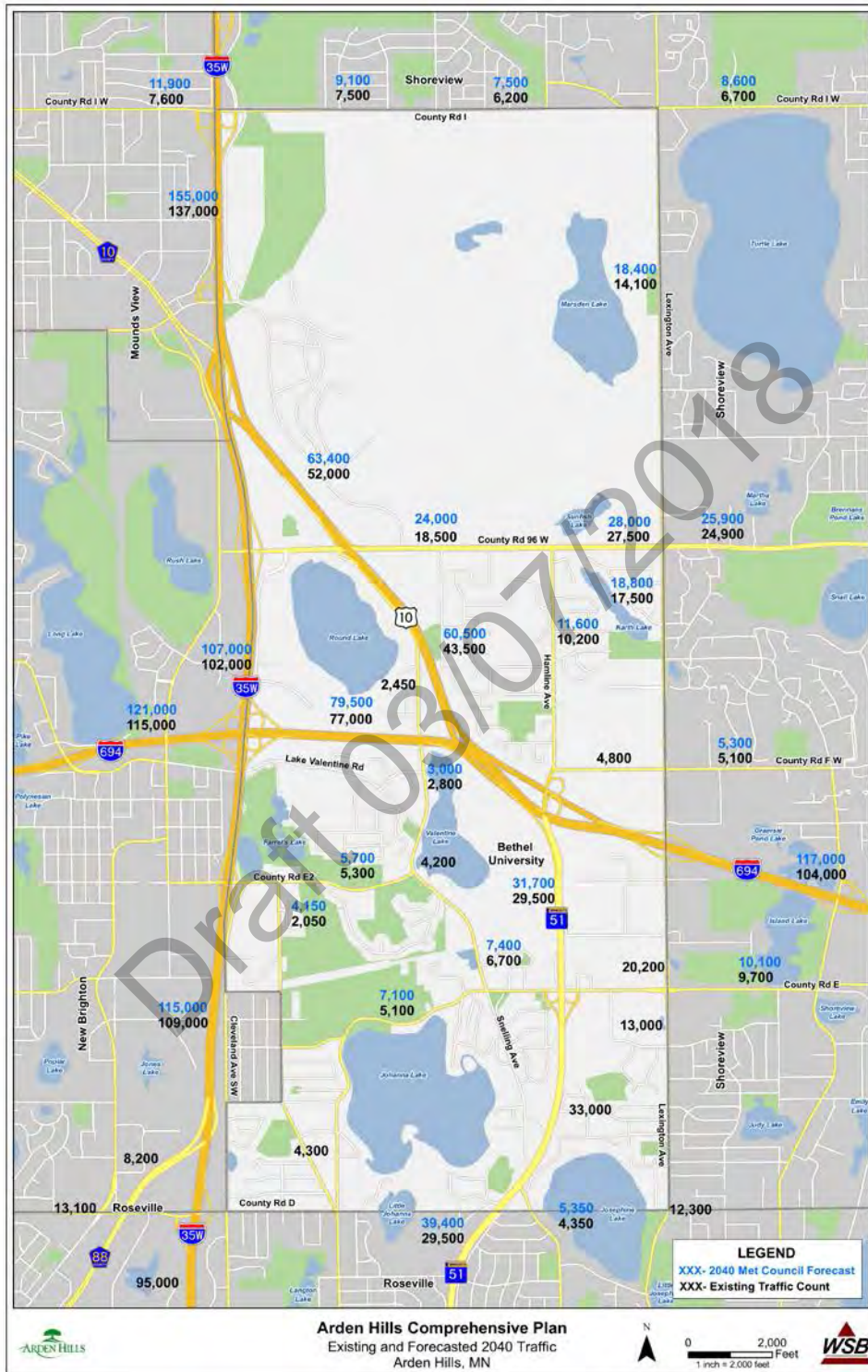
In the City of Arden Hills, the major roadways carrying traffic are county and state roadways, ranging from arterials to collectors. The City roadways are primarily local city streets that only carry local traffic. Generally, the roadways in Arden Hills serve areas that are fully developed, and the land use patterns in Arden Hills are not expected to significantly change, except on the TCAAP property. However, an increase in traffic on these corridors is expected due to the future growth in the northern part of the City and the future growth in adjacent communities. The existing pattern of rights-of-way and development setbacks present challenges for significantly improving the existing level of service on some roadways through roadway capacity improvements.

The forecasted 2040 average annual daily traffic volumes are illustrated in Figure 11.7 – Existing and Forecasted 2040 Traffic Volumes and also in Appendix C.

I-35W and I-694 are expected to continue experiencing congestion based on the forecasted Metropolitan Council 2040 travel demands. Recent and programmed improvements on these roadways will ease but not alleviate congestion levels over the 20-year planning horizon due to regional population growth.

The recently completed reconstruction of the Interstate 35W interchanges at County Road 96, County Road I, and County Road H are critical to support development intensities on TCAAP. In addition, the planned I-35W North reconstruction project (which includes adding managed lanes) and I-694 expansion (underway) from Lexington Avenue to I-35E will provide additional capacity to support TCAAP development.

Figure 11.7 – Existing and Forecasted 2040 Traffic Volumes



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11.3.2 Roadway Safety & Mobility Needs

Many of the roadways within and adjacent to the City of Arden Hills are in need of capacity improvements by 2040 due to the anticipated growth throughout the area. This is due not only to growth within the City of Arden Hills but also growth within adjacent cities and other cities along the freeway and highway corridors. With this increase in development and increase in traffic, an increase in congestion is expected for most roadways throughout Arden Hills. Improvements are recommended for Hamline Avenue, Lexington Avenue, Old Highway 10, and the interstate freeways. The expansion and reconstruction of I-694 will improve operations, especially from I-35W to TH 10, even with the increased traffic expected by 2040. The other areas of I-694 will likely be congested as much as they are today by 2040. Since the primary roadways providing significant mobility within the City of Arden Hills are county and state roadways, the City will need to coordinate with the State and County on roadway improvements.

Collector roadways carrying greater than 1,500 vehicles per day have volumes that tend to create potential conflicts between vehicles, bicycles, and pedestrians. The City, in cooperation with Ramsey County, will need to monitor pedestrian and bicycle issues, crashes, near misses, and complaints, and prioritize roadway improvements with pavement rehabilitation needs. Strategies to improve safety and mobility will be considered, including the consideration of adding pedestrian facilities at intersections, non-motorized facilities both along and separate from roadways, additional roadway width for wider lanes or shoulders, or when possible, turn lanes to City collector roadways intersecting with County roadways. To accommodate necessary turn lanes or roadway widening, additional right-of-way may be required at the intersection. As reconstruction of aging infrastructure is pursued on City collector streets the recommended geometric design standards will assist in improving safety and mobility (Appendix B).

Additionally, as traffic volumes approaching an intersection increase, an intersection control evaluation may be necessary. Triggers for an evaluation may include an increase in correctable crashes or an unacceptable traffic back up. Higher volume roadways that could show traffic signal benefits are under the jurisdiction of the County. As the jurisdictional authority, the County would make decisions on appropriate traffic control. The intersection control evaluation would identify the traffic control option (e.g. all way stop, roundabout, possible signalization) and capacity improvements (e.g. turn lanes) necessary to accommodate the traffic volumes in a safe and efficient manner. Future reconstruction may require modifications of existing access to include strategies such as access consolidation, right-in, right-out access only, or the development

of a frontage road to improve the safety and mobility of the corridor. Additional right-of-way should be acquired for future improvements as properties in the area develop or redevelop.

The high crash locations along I-694 at I-35W, TH 10, and TH 51 should be partially rectified by recent and proposed improvements on I-35W and I-694 through the area. Further improvements should be studied with the Minnesota Department of Transportation and Ramsey County at the problem intersections.

11.3.3 Functional Classification Needs

Due to the developed nature of the City of Arden Hills, together with the community's pattern of water features and freeway facilities, there are minimal opportunities to expand the local roadway system in the developed areas of the City and develop additional continuous routes through the City.

Two roadways, the Spine Road and Old Hwy 8, are proposed to provide access to the TCAAP redevelopment area as detailed below.

As redevelopment occurs on the TCAAP property, the internal roadway system will be expanded to serve this area of the City. The internal roadway system for TCAAP will consist of a north/south A-Minor Expander arterial (referred to as the Spine Road) in addition to a network of local streets. The Spine Road will be consistent with County State Aid Standards (CSAH) for intersection spacing which is 1/4 mile minimum spacing for full access intersections and 1/8 minimum spacing for right-in/right-out accesses. The minor streets will primarily provide access to residences and private businesses. These local roads will be constructed on the property as future development occurs.

Old Hwy 8 is identified as Major Collector roadway that provides access through the TCAAP property between County Road H and County Road I (CSAH 3). Old Hwy 8 outside of the TCAAP site is approximately 2,000 feet long extending from County Road I to the north TCAAP property line. Old Hwy 8 will be under the jurisdiction of Ramsey County and is also expected to be part of the County State Aid Highway system (CSAH 13). The proposed typical section consists of a single travel lane in each direction with a center median or left turn lane. The intersection control at County Road I is a single lane roundabout.

Other roadway continuity improvements in Arden Hills are not anticipated. The City will review redevelopment plans with the option to consider opportunities to improve continuity or improve/consolidate accesses.

The City of Arden Hills does not support an additional road connection over Interstate 35W between Interstate 694 and CSAH 96 due to the likely traffic impact on Round Lake Road.

11.3.4 Multimodal Transportation Opportunities

It is important for the community to plan for the ability to accommodate multimodal activities (i.e. transit, pedestrian, and bicycle) on non-local roadways to provide other opportunities to move about the City and beyond.

Transit Service

While significant changes to existing transit opportunities in Arden Hills are not planned by the Metropolitan Council, the City recognizes the growing need for transit services in Arden Hills, and the City supports exploring additional transit options. With increasing fuel costs, worsening congestion, and an aging population, the demand for transit will increase.

The City will continue to be supportive of the park-and-ride lots used by Arden Hills' residents, such as the lots on County Road H in Mounds View and at Rosedale in Roseville. The City will evaluate the need for future park-n-ride opportunities along with redevelopment proposals where feasible.

The City supports efforts to add or expand transit options to Northwestern College, Bethel University, Mounds View High School, and employers, such as Boston Scientific, Land O' Lakes, and the businesses along Round Lake Road and Gateway Boulevard. As the City's population ages, the City will continue to work with Metro Transit and senior community services to ensure needs are being met. Para-transit, which is provided by Metro Mobility, is also an important resource for members of the community, particularly the disabled and seniors.

The Metropolitan Council 2040 Transportation Policy Plan does not show any transitway investments planned within Arden Hills under the current revenue scenario. Under the increased revenue scenario, two corridors within Arden Hills are identified: A Line BRT Extension and I-35W North Transitway. These two corridors are discussed below and are shown in Figure 11.4.

A Line BRT Extension

Ramsey County plans to redevelop the TCAAP site into a net-zero energy, mixed-use, high-density transit oriented development with the A Line connecting the site to the region’s high frequency transit network. In 2016, Metro Transit evaluated the feasibility of extending the A Line BRT route from Rosedale Center to TCAAP. As part of the study, a recommended alignment for the A Line extension was defined using Snelling Avenue, County Road E, Lexington Avenue, County Road 96, and the Spine Road at TCAAP (see Figure 11.8). The study identified that resources are currently not available and ridership is unlikely support an immediate A Line extension. However, the City, Ramsey County, private developers, and Metro Transit can plan for and implement transit oriented development and other transit ready infrastructure to support the A Line BRT extension to TCAAP. Study recommendations include:

- Include transit ready infrastructure and amenities in road reconstruction plans
- Continued development of pedestrian friendly street designs
- Evaluate using existing resources to provide more transit service
- Construct needed bus system infrastructure for service growth
- Plan for changes in density and land use patterns through comprehensive plan updates

Figure 11.8 – A Line Extension Map - Draft Preferred Alignment



Source: Metro Transit. A Line Corridor Extension Evaluation, Rosedale Center to Rice Creek Commons, September 2016.

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35W North Transitway

The 35W North corridor links downtown Minneapolis with communities along I-35W north of downtown to Forest Lake. The corridor was studied through a feasibility study led by MnDOT in 2013. The study focused primarily on the highway managed-lane vision but included an analysis of BRT potential coordinated with that vision. The managed lane will be constructed as part of the major I-35W reconstruction project between Highway 36 and Sunset Avenue in Blaine starting in 2018. Additional study is needed to explore BRT implementation and transitway extension north of Blaine.

Aviation Plans/Facilities

Although there are not any aviation facilities within Arden Hills, standards for airspace protection are required to maintain a clear path for helicopters and for aviation related facilities.

Federal Regulation Title 14, Part 77 establishes standards and notification requirements for objects affecting navigable airspace. This notification serves as the basis for evaluating the effect of the construction or alteration on operating procedures, determining the potential hazardous effect of the proposed construction on air navigation, identifying mitigation measures to enhance safe air navigation, and charting of new objects. Notification allows the Federal Aviation Administration (FAA) to identify potential aeronautical hazards in advance, thus preventing or minimizing the adverse impacts to the safe and efficient use of navigable airspace.

Title 14, Part 77.13 requires any person/organization who intends to sponsor any of the following construction or alterations to notify the Administrator of the FAA when:

- Any construction or alteration exceeding 200 feet above ground level;
- Any construction or alteration:
 - Within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with at least one runway more than 3,200 feet
 - Within 10,000 feet of a public use or military airport which exceeds 50:1 surface from any point on the runway of each airport with its longest runway no more than 3,200 feet
 - Within 5,000 feet of a public use heliport which exceeds a 25:1 surface;
- Any highway, railroad or other traverse way whose prescribed adjusted height would exceed that above noted standards;

- When requested by FAA; and;
- Any construction or alteration located on a public use airport or heliport regardless of height or location.

Persons or organizations intending to sponsor construction or alterations require notification to the FAA under Title 14, Part 77.13 using FAA form 7460–1 and associated amendments. Any structure meeting the requirements in Title 14, Part 77.13 must receive permission from the Minnesota Department of Transportation (MnDOT) and the Federal Aviation Administration (FAA). Structures will be compatible with the Anoka County/Blaine Airport Long Term Comprehensive Plan.

Freight

The Metropolitan Council 2040 Transportation Policy Plan acknowledges several freight challenges that impact the City and the region. Freight traffic and congestion are expected to increase and place pressure on the region's highway and rail systems. Additionally, there are concerns about compatibility between freight traffic and adjacent land use. While the City's light industrial areas are located adjacent to primary freight corridors (I-35W, I-694, and US 10), it will be important to ensure that future development is also compatible with freight operations.

Pathways

A more detailed plan for expanding the City's non-motorized pathway system is discussed in Chapter 9. Non-motorized pathways are an integral part of the City's transportation system. The improvements and expansions in Chapter 9 work to ensure a sound transportation system within Arden Hills.

Pursuing pathway projects in combination with road reconstruction projects is a primary method for implementing pathway expansion and improvement recommendations in Chapter 9. For each of the County highways within Arden Hills, roadway shoulders, in addition to pathways, are recommended on both sides of the roadway to accommodate pedestrian, bicycle, and other non-motorized travel where feasible.

The City will also review pedestrian facilities and school routings to determine their adequacy as traffic conditions change. Shoulders and paths should be integrated with the roadway system to provide routes for non-motorized traffic to access existing and future controlled intersections where feasible. Non-motorized facilities are to be incorporated into road projects and land

redevelopments to safely accommodate pedestrians and bicycles with vehicle traffic in the City, as the City grows.

In conjunction with Ramsey County and MnDOT, grade separated crossings of major roads and railroads is one of the more important actions the City can take to improve the path network, increase safety, enhance access to parks, encourage increased physical activity, and help tie the community together. Recent interchange and road reconstruction projects have included pathway facilities to allow or enhance the crossing of major highway barriers like I-35W and US 10. Additional opportunities to improve connections for pedestrians and bicyclists across major physical barriers is provided in Chapter 9.

Regional Bicycle Transportation Network (RBTN)

The Metropolitan Council established a Regional Bicycle Transportation Network (RBTN) in 2015. The RBTN establishes regional priorities for bicycle transportation so that regional destinations are accessible by bicycle.

The Metropolitan Council established RBTN alignments in areas where existing facilities created a clear connection between regional destinations. RBTN corridors were identified in areas where there are several options for connections between regional destinations. The RBTN is further divided into two tiers. Tier 1 alignments/corridors are expected to attract the most bicycle use and are the highest priority for regional investments. Tier 2 alignments/corridors are the second priority for regional investments.

Within Arden Hills, the RBTN identifies three Tier 1 RBTN alignments. These alignments follow Lexington Avenue, Highway 96, and the western segment of the Rice Creek North Regional Trail between County Road H to County Road I.

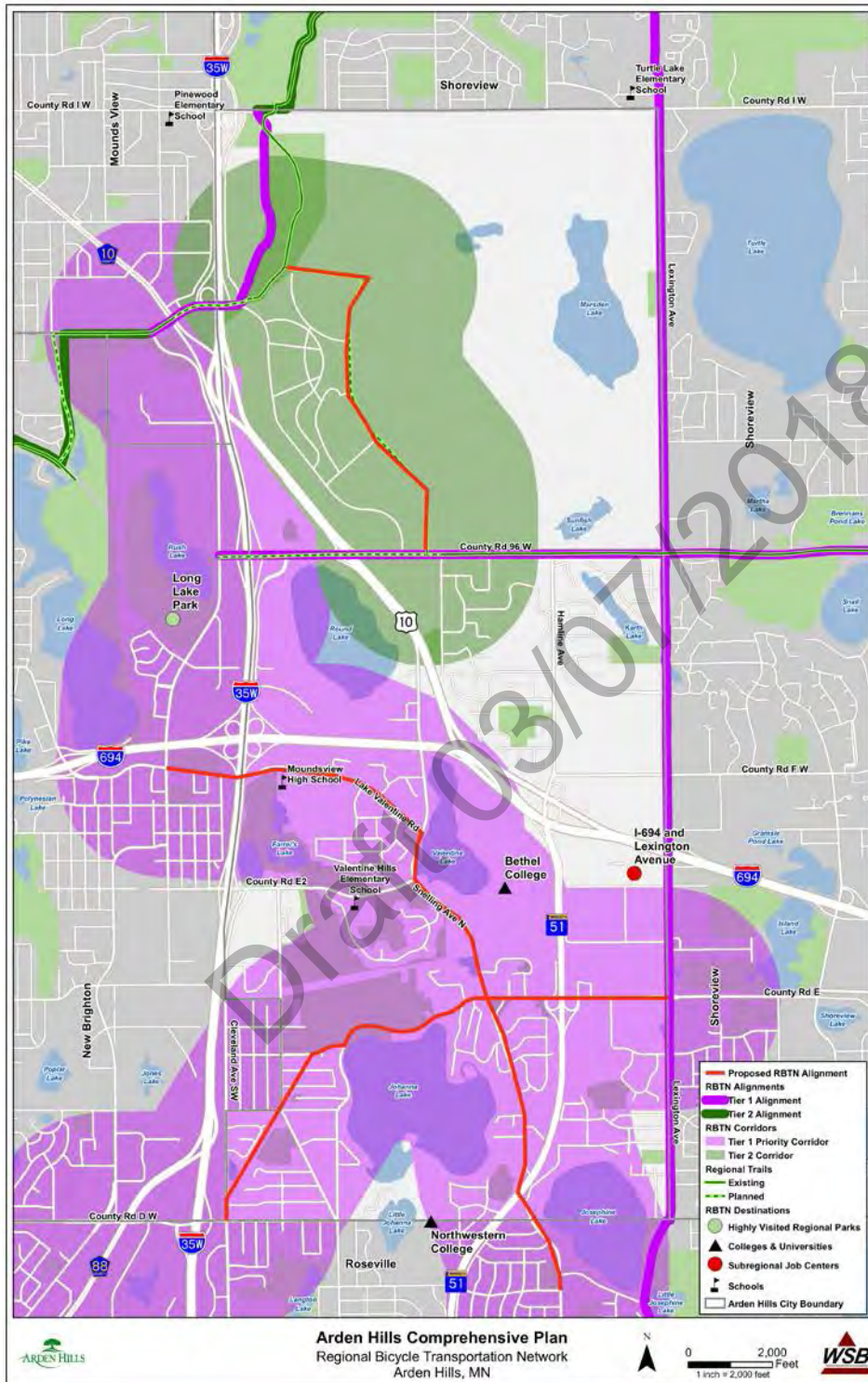
In addition, two Tier 1 RBTN corridors and one Tier 2 RBTN corridor were identified. The first Tier 1 corridor runs east-west along the southern part of the city, generally following the Elmer L. Andersen Memorial Trail, Lake Johana Boulevard, and County Road D. The second Tier 1 corridor runs north-south, generally following Old Snelling Avenue and Lake Valentine Road to connect to the Rice Creek North Regional Trail in Mounds View. The Tier 2 corridor generally follows the planned Rice Creek North Regional Trail between Highway 96 and the existing regional trail segment. With these corridors, existing land use patterns and major roadway barriers limit other opportunities for an efficient and successful bikeway route.

Through the comprehensive planning update process, Metropolitan Council has requested communities to recommend specific alignments for planned bikeway connections that meet the intent of the RBTN corridors. The City proposes the following alignment for the RBTN corridor identified within the City. These alignments are also shown in Figure 11.9.

- The existing and planned pathways along the Elmer L. Andersen Memorial Trail, Lake Johana Boulevard, and County Road E.
- The existing and planned pathways along Hamline Avenue, Old Snelling Avenue, and Lake Valentine Road connecting to Long Lake Regional Park and Rice Creek Regional Trail in New Brighton.
- The planned Rice Creek North Regional Trail using the dedicated trail corridor between Highway 96 and the existing Rice Creek Regional Trail segment.

Draft 03/07/2018

Figure 11.9 – Regional Bicycle Transportation Network



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11.3.5 Long-term Transportation Planning

It is fundamental to rethink transportation plans and systems through at least 2040 as infrastructure needs and demands will inevitably change. Due to changing demographics and increasing energy costs, the demand for mass transit is likely to increase. While efficient transit requires different growth and development patterns, transit corridors can be developed to compliment and be integrated with a community. Transit corridors may offer growth potential for residential, retail, and business.

While the City does not have a significant influence on the nation's energy infrastructure and it is difficult to predict future energy infrastructure needs, the City will be impacted by outside forces beyond its control. It will be necessary to be flexible when implementing this Comprehensive Plan and other developments in order to be responsive to changing conditions.

11.4 IMPLEMENTATION STRATEGIES

The following below strategies are proposed to help advance the goal of the transportation chapter:

- Utilize the Capital Improvement Plan (CIP) and Pavement Management Program (PMP) to plan for long-term improvements.
- Require right-of-way dedication along County and local roads to meet future capacity needs as redevelopment is proposed.
- Consider the use of flexible street design standards when reconstructing roadways in parts of the City with unique topographical or environmental features.
- Develop standards to increase the safety of pedestrian crossings throughout the City.
- Update the Zoning and Subdivision Ordinances consistent with the Transportation Plan.
- Establish a policy outlining when a traffic impact study should be conducted, including acceptable information to be contained within the study.
- Maintain a Capital Improvement Plan (CIP) that contains elements for reconstruction of the roadway system, with scheduled maintenance included in annual budgets. Street maintenance includes routine patching, crack filling, and storm sewer cleaning. Implement a schedule for roadway maintenance and reconstruction, street widening/realignment, etc.
- Seek to partner and collaborate with Ramsey County, MnDOT, adjacent cities, and other agencies on transportation planning, upgrades, and other issues.

The above strategies should not be considered all-inclusive. New opportunities and strategies should be identified to further advance the City’s transportation goal and policies.

11.5 PROGRAMMED TRANSPORTATION IMPROVEMENTS

The regional transportation system will require continued improvements to satisfy current and future demands, particularly due to planned growth related to the TCAAP development. Table 11.3 lists programmed transportation improvement projects, along with the estimated timing and costs anticipated by the City of Arden Hills as a local partner agency.

Table 11.3 – Programmed Transportation Improvements

Project	Lead Agency	Estimated City Local Match Contribution	Year
County Road F Improvements	Ramsey County	\$600,000	2018
Spine Road Project	Ramsey County	To be Assessed	2019
I-35W North Reconstruction Project	MnDOT	\$0	2019
US Highway 10 Auxiliary Lane Project	MnDOT	\$0	2019
Lexington Avenue Improvements	Ramsey County	\$306,500	2020
Pavement Management Plan	City of Arden Hills	\$2,500,000	Biennial

12. RESILIENCE AND SUSTAINABILITY

Goal: Promote resiliency and sustainable design practices in the preservation, development, redevelopment, and maintenance of the City's natural and built environment.

To achieve this *resilience and sustainability goal*, the following policies are proposed:

- Promote best practices for sustainable design in the construction and operations of new development, additions, and building renovations.
- Evaluate energy use that contributes to energy and climate uncertainty.
- Encourage the use of site sensitive planning and design to protect significant natural features throughout the City.
- Support the use of renewable energy.
- Support the efficient use of land and development that reduces reliance on fossil fuels.
- Work to reduce carbon emissions at City facilities, from City vehicles, and overall City design.
- Work to protect air, water quality, and healthier indoor environment.
- Encourage programs that reduce waste and increase recycling.
- Ensure the stability of public infrastructure systems in consideration of changing climate trends.

The need for communities to address environmental sustainability, green building practices, energy efficiency, and conservation is becoming more apparent in the face of energy uncertainty and climate change. While Arden Hills has a relatively small impact, the City does play a role in protecting the environment and encouraging sustainable development and redevelopment. If more cities adopt environmentally sustainable practices, the combined impact is substantial regardless of city size.

Resiliency and sustainability incorporates a range of techniques, such as environmentally sensitive site planning, using resource efficient building materials, enhancing indoor and outdoor air quality, enhancing the use of daylight, reducing the need for automotive travel. In addition to the environmental benefits associated with implanting these practices, they also bring benefits to the community in terms of improved public health and economic competitiveness.

The City joined the Minnesota GreenStep Cities program in 2016. This voluntary program is managed by the Minnesota Pollution Control Agency and is designed to assist cities achieve sustainability and quality-of-life goals. Many of the goals outlined in this chapter are also identified as best practices by the GreenStep Cities program. The City is committed to continuing its participation in this program.

This particular chapter discusses the overarching policies, practices, information, and implementation techniques that apply throughout the Plan. There are policies, tools, and implementation techniques in other chapters that directly relate to resilience and sustainability, though may not be repeated in this chapter. The goal of this chapter is to recognize the importance of resilience and sustainability as well as to coordinate these efforts throughout the Comprehensive Plan.

12.1 WHAT IS SUSTAINABILITY AND SUSTAINABLE DESIGN?

Sustainability: The concept of meeting present needs without compromising the ability of future generations to meet their needs.

Sustainable Design: Design that seeks to avoid depletion of energy, water and raw material resources; prevent environmental degradation caused by facility and infrastructure development over their life cycle; and create environments that are livable, comfortable, and safe and that promote productivity.

12.2 GREEN BUILDING PRACTICES

The industry focus is toward overall improved design of buildings to conserve energy and produce a healthier living environment. Leading programs are Leadership in Energy and Environmental Design (LEED), and the US Green Building Council. Additional organizations working on these efforts include the U.S. Environmental Protection Agency, MN Pollution Control Agency, and American Institute of Architects.

The most notable rating system currently in use is the LEED rating system, which is organized to promote action in the following areas:

- Location and Transport
- Sustainable Sites
- Water Efficiency
- Energy and Atmosphere
- Materials and Resources
- Indoor Environmental Quality

While gaining LEED certification has become important for the environmental aspects, it has also become a marketing tool. Encouraging the use of LEED standards may help the City be more competitive over the long term. With redevelopment in commercial and industrial districts and redevelopment of the TCAAP property, the City and developers have the opportunity to employ LEED standards and other sustainable techniques.

Existing structures and practices can also be modified or upgraded to reduce their environmental impact. For example, using energy efficient lighting, increasing insulation, reducing automobile usage, and other similar measures can reduce a person's impact at home and at work.

12.3 LOW IMPACT DESIGN

Municipal land use and transportation planning decisions directly influence whether people and businesses will have mobility choices that allow them to save energy and money. Through zoning codes, building codes, public incentives, and the permitting process, municipalities can encourage building and site design that reduces energy needs, resources, and greenhouse gas emissions.

Environmental sustainability and low impact design also includes ecology and open space planning. Some of the practices and tools that coordinate development with protecting the environment and open spaces include:

- LEED and other similar design standards;
- Water gardens, porous or structured parking, and minimizing paved areas;
- Storm water control, collection, and filtration before entering storm sewers;
- Wetlands preservation and control;
- Access to local foods, materials, building supplies;
- Walkable and bikeable community;
- Increased landscaping with more trees and vegetation;
- Smart design and location for structures – east, west, south exposure for solar gain, natural ventilation to reduce air-conditioning, recycled and natural building products.
- Transportation hubs and depots – walkable, bikeable, electric vehicle distance to local community centers or business districts.

This section does not include all low impact design practices and tools. As technology and ideas are available, they should be evaluated to determine if they could advance the City's goals. The above practices and tools could be encouraged or required through the City's regulations.

12.4 CARBON REDUCTION

Planning for energy uncertainty and climate change will require proactive planning at every level of government. In Arden Hills, a significant contributor of carbon and greenhouse gas emissions is traffic passing through on Interstates I-694, I-35W, Highway 10, Highway 96, Snelling Avenue, and Lexington Avenue. Although the City has limited ability to regulate these roads, the City can encourage other governmental units to use these tools to help lower emissions:

Approved:

- Lowering speed limits
- Higher mpg vehicles
- Using fuel efficient, hybrid and/or alternative fuel buses
- Using electric cars or personal vehicles
- Traffic roundabouts that slow speeds but do not stop traffic
- Improving public transit options for residents and employees in Arden Hills

Cities, counties, and the state need to work cooperatively on other regulatory measures that encourage carbon emission reduction. Reducing carbon emissions will take cooperation at all levels to be successful, and Arden Hills is in support of finding ways to reduce carbon emissions.

12.5 IMPLEMENTATION STRATEGIES

Future sustainability projects that will benefit the City and region include, but are not limited to:

- Develop an energy conservation policy for City buildings and equipment.
- Encourage geothermal heating and cooling for individual buildings and for district heating/cooling size installations.
- Increase recycling at all uses.
- Develop regulations that encourage the use of pervious surfaces, green roofs, and other environmentally sensitive site and building design practices.
- Promote LEED/green building practices through, zoning, codes, and possible incentives.
- Encourage the use of renewable energy and work to protect access to direct sunlight for solar energy systems.
- Work with Metro Transit on opportunities to improve public transit facilities.
- Develop zoning regulations and public infrastructure systems that support healthy community transportation and access to recreation and open space. Advocate for the use of renewable energy on AHATS.

The above strategies should not be considered all-inclusive. New opportunities and strategies should be identified to further advance the City's resilience and sustainability goal and policies.

13. PUBLIC FACILITIES, SERVICES, AND INFRASTRUCTURE

Goal: Provide efficient and high-quality public facilities, services, and infrastructure.

To achieve this *public facilities, services, and infrastructure goal*, the following policies are proposed:

- Provide reliable and high-quality water facilities, sanitary sewer, and stormwater systems.
- Prepare long-term plans to identify, prioritize, and determine the costs to maintain and/or replace City water and sewer facilities.
- Maintain and keep the emergency preparedness plan updated.
- Work to provide efficient, low-cost services through ongoing evaluation and intergovernmental coordination.
- Utilize the Capital Improvement Plan (CIP) and annual budgeting process for prioritizing major public expenditures.
- Work to reduce inflow and infiltration into the City's sanitary sewer system.
- Coordinate with the public and private school system on programs and activities where feasible.
- Continuously evaluate all contracted services to assure that efficient and high-quality services are being provided.

The Arden Hills City government provides a variety of public facilities and services. While some services are used or seen on a daily basis, such as streets, sanitary sewer, and water, other services are less noticed, but are absolutely necessary for the efficient functioning of the City. Utility services are vital to the health, safety and welfare of the citizens of Arden Hills. The physical infrastructure of the Arden Hills is aging; the City recognizes the need to track and evaluate the condition of the existing infrastructure. The Capital Improvement Plan and annual budgeting process are two tools used to plan for improvements to the infrastructure.

13.1 WATER RESOURCE MANAGEMENT

In the developed portion of Arden Hills, the City is not anticipating any significant land use changes that would result in increased demand on the City's water supply, stormwater management, or sanitary sewer system. Redevelopment of the TCAAP property is expected to be completed in ten to twenty years. Infrastructure for water, sanitary sewer, stormwater, and other utilities are anticipated to be implemented during the construction of the main boulevard through TCAAP construction in calendar year 2019.

13.1.1 Water Supply (Appendix D)

The Water Supply Plan provides the City of Arden Hills and its residents with assurance that an adequate supply of safe water is available for use, guidance and procedures for water system emergencies are in place, and measures are being implemented to conserve the City’s water supply. The Water Supply Plan is divided into four parts (Appendix D):

- Part I: Water Supply System Description and Evaluation
- Part II: Emergency Preparedness Procedures
- Part III: Water Conservation Plan
- Part IV: Items for Metropolitan Area Communities

The City of Arden Hills purchases potable water from the City of Roseville, who purchases water from the Saint Paul Regional Water Services. Saint Paul Regional Water Services provides the required treatment processes before the water is introduced into the water distribution system in Arden Hills; no further treatment is required by the City of Arden Hills. Once in the City, the system is under the jurisdiction of the City’s water utility.

The City has three connection points with the City of Roseville:

1. Cleveland Avenue and County Road D,
2. Fairview Avenue and County Road D, and
3. Glenhill Road and Hamline Avenue.

Historically, the water utility has managed to be self-supporting, with future replacement needs financed from revenues generated from the fees paid by users. The City periodically reviews the arrangement with the City of Roseville and the Saint Paul Regional Water Services to ensure that the City is obtaining the most cost-effective services.

The City operates and maintains approximately 55 miles of mainline, two water towers, one booster station (water pumping facility) and three emergency cross connections with adjacent communities (Table 13.1). These interconnections are normally closed, but can be opened to meet emergency needs.

Table 13.1 - Intercommunity Water Connections

City	Size	Location
Shoreview	8"	North of Grey Fox Road on Lexington Avenue
Shoreview	8"	North of Cummings Park Drive on Lexington Avenue
New Brighton	8"	East of Cleveland Avenue on Stowe Avenue

13.1.2 Sanitary Sewer (Appendix E)

The entire City of Arden Hills is within the Metropolitan Urban Service Area (MUSA), therefore sanitary sewer interceptor and treatment is provided to the City via the Metropolitan Council Environmental Services (MCES) system. Within the City, the system is under the jurisdiction of the City's sanitary sewer utility. Historically, the sanitary sewer utility has managed to be self-supporting; with future infrastructure replacement needs financed from revenues generated from the fees paid by users.

The Arden Hills sanitary sewer system consists of approximately 49 miles of sanitary sewer, over 1,150 manholes, and fourteen (14) lift stations.

The Metropolitan Council Environmental Services (MCES) Water Resources Policy Plan includes policies for reducing inflow and infiltration into the region's sewage treatment system. The MCES has projected significant growth in the metropolitan area by 2040. This increase, along with current levels of inflow & infiltration (I/I) in the system, would require significant, costly increases to expand the existing MCES treatment facilities to meet the future wastewater flows. As a result, MCES has implemented an I/I Surcharge Program.

Communities with excessive I/I are required to develop plans and reduce their I/I. If I/I is not reduced in the community with excessive I/I, the MCES will impose a surcharge. The City of Arden Hills was identified as a community with excessive I/I and assessed a surcharge in 2007. That year, the City initiated an I/I identification program and has since completed flow monitoring, smoke testing, televising, manhole rehabilitation, sump pump inspections, sewer lining, and sewer replacement. Since 2007, the City has conducted numerous significant investments to reduce the amount of I/I introduced into the City's sanitary sewer system. The City will continue these efforts to monitor and reduce I/I.

Appendix E contains general sanitary sewer information and also outlines the City's objectives, policies, strategies and implementation plan to reduce I&I.

13.1.3 Stormwater/Surface Water Management

With nearly 550 acres of water across seven lakes, numerous wetlands, and Rice Creek, protecting water quality and managing stormwater is of the utmost importance in Arden Hills. As part of the City's water quality goals, the City recognizes the need to establish a plan that is in conformance with the plans and regulations adopted by the Rice Creek Watershed District and the Metropolitan Council's *2040 Water Resources Policy Plan*.

As part of the TCAAP redevelopment process, an AUAR was completed that included an analysis of stormwater mitigation needs. According to the AUAR, stormwater will be managed on-site, maintaining the current drainage patterns and utilizing the current outfalls to Rice Creek and Round Lake. Stormwater will be conveyed to Round Lake and Rice Creek by means of underground storm sewer, ponds, vegetated swales, and wetlands. Conveyance systems will be designed in accordance with acceptable industry standards and in conformance with jurisdictional requirements. The primary method of stormwater treatment will be the use of multiple ponds for the removal of total phosphorous and total suspended solids. Water reuse, bio-filtration, filtration, and stormwater wetlands are also suitable for treatment within the Study Area. No discharge water will be directed to surface waters without prior treatment for water quality and a determination that no contamination exists.

13.1.3.1 Stormwater Management Plan (Appendix F)

Arden Hills falls entirely within the Rice Creek Watershed District (RCWD), which is the regulating authority for stormwater in Arden Hills. The RCWD is responsible for administering the Wetland Conservation Act and related permitting activities.

Regulatory agencies, including the RCWD and Metropolitan Council, share Arden Hills' view on the importance of protecting water quality and storm water management. The City's 2018 LSWMP discusses local methods to further joint goals and policies regarding surface water management while assessing problems and proposing corrective actions. The primary purpose of the 2018 LSWMP is to:

- Assess existing water quantity and quality issues;
- Assess potential problems and opportunities for natural resource enhancement in light of anticipated development within each watershed; and,
- Formulate practical strategies to correct existing problems to prevent potential problems and to take advantage of opportunities to enhance water related natural resources.

In order to advance the above purpose statement, the 2018 LSWMP reviewed the physical environment, performed water quality and hydraulic analyses, established the objectives and policies, and set implementation steps. In summary, the LSWMP objectives are to (Section 3 of the LSWMP):

- Improve water quality

- Prevent flooding and erosion from surface water flow
- Promote groundwater recharge
- Protect and enhance fish and wildlife habitat and water recreation
- Pollution control and good housekeeping for municipal operations
- Public participation, information, and education
- Establish funding sources for management programs

The Rice Creek Watershed District will be issuing an update to their Water Resource Management Plan (WRMP) in 2020. The City will incorporate any necessary changes during the next 10-year planning cycle.

13.1.3.2 Local Ordinances (Appendix F)

In addition to the LSWMP, the City has adopted regulations to further the City's goals in protecting water quality, reducing nonpoint source pollution, protecting sensitive natural areas, and managing stormwater (Appendix F):

- Erosion and Sediment Control Ordinance
- Shoreland Ordinance
- Floodplain Ordinance

The City's Stormwater Management Ordinance references Rule C: Stormwater Management Plans of RCWD's District Rules.

The Erosion and Sediment Control Ordinance was adopted in 2008 and the Shoreland and Floodplain ordinances were adopted in 2002 and 2001, respectively. The City intends on reviewing the Shoreland, Floodplain and Erosion Control ordinances regularly to ensure that they are effectively advancing City goals and policies.

13.1.3.3 National Pollutant Discharge Elimination System (Appendix F)

On March 17, 2014, the Minnesota Pollution Control Agency (MPCA) approved the City's Municipal Separate Storm Sewer System (MS4) permit. This permit is set to expire in 2018 and will need to be renewed at this time. The MS4 general permit is mandated by federal regulations under the Clean Water Act and administered by the MPCA. In general terms, MS4s are publicly owned or operated stormwater infrastructure, used solely for stormwater, and which are not part of a publicly owned wastewater treatment system. Examples of stormwater infrastructure include curbs, ditches,

culverts, stormwater ponds and storm sewer pipes. The City of Arden Hills is an MS4.

The MS4 general permit focuses on reducing the pollution that enters these public systems and discharges to wetlands, streams and lakes (“waters of the state”). The MS4 permitting program gives owners or operators of municipal separate storm sewer systems approval to discharge stormwater to lakes, rivers and wetlands in Minnesota. All owners or operators of MS4s are required to satisfy the requirements of the MS4 general permit.

The MS4 general permit requires the MS4 operator or owner to create a Stormwater Pollution Prevention Program (SWPPP) with six important components (included in the attached MS4 permit):

- Public education and outreach, which includes teaching citizens about better stormwater management.
- Public participation: Include citizens in solving stormwater pollution problems. This includes a required public annual meeting and an annual report.
- A plan to detect and eliminate illicit discharges to the stormwater system (such as chemical dumping and wastewater connections)
- Construction-site runoff controls. This includes the implementation of an Erosion and Sedimentation Control ordinance.
- Post-construction runoff controls
- Pollution prevention and municipal “good housekeeping” measures, such as covering salt piles and street-sweeping.

13.1.3.4 Total Maximum Daily Load (TMDL)

Table 2.6 in Section 2 of the LSWMP (Appendix F) includes the TMDL listing status for the major water bodies in Arden Hills or that receive drainage from Arden Hills. Lakes Johanna, Josephine, and South Long Lake are listed for mercury in fish tissue. Little Lake Johanna has a TMDL approved for chloride and nutrients. The Upper Mississippi River has an approved TMDL for fecal coliform. The Minnesota Pollution Control Agency (MPCA) is underway with the remainder of the TMDLs for the waterbodies in Arden Hills. The City will cooperate with the MPCA and other related agencies as TMDL studies that impact Arden Hills are approved and implemented.

Table 13.2 - TMDL Status

Waterbody/Watercourse	Year Added to List	Affected Use	Pollutant/Stressor	TMDL Status
Rice Creek	2006	Aquatic Life	Aquatic macroinvertebrate bioassessments	Approved
Rice Creek	2004	Aquatic Life	Fishes bioassessments	Approved
Valentine Lake	2014	Aquatic Life	Chloride	Approved
Valentine Lake	2002	Aquatic Recreation	Nutrient/eutrophication biological indicators	Approved
Lake Johanna	2002	Aquatic Consumption	Mercury in fish tissue	Approved
Lake Johanna	2010	Aquatic Consumption	PFOS in fish tissue	Underway
Little Johanna Lake	2014	Aquatic Life	Chloride	Approved
Little Johanna Lake	2004	Aquatic Recreation	Nutrient/eutrophication biological indicators	Approved
Little Johanna Lake	2012	Aquatic Consumption	PFOS in fish tissue	Underway
Lake Josephine	1998	Aquatic Consumption	Mercury in fish tissue	Approved
Upper Mississippi River	1996	Aquatic Recreation	Fecal Coliform	Approved
Upper Mississippi River	1998	Aquatic Consumption	Mercury in fish tissue	Underway
Upper Mississippi River	1998	Aquatic Consumption	Mercury in water column	Underway
Upper Mississippi River	1998	Aquatic Consumption	PCB in fish tissue	Underway
Upper Mississippi River	2014	Aquatic Life	Total suspended solids	Underway
South Long Lake	2014	Aquatic Life	Chloride	Underway
South Long Lake	1998	Aquatic Consumption	Mercury in fish tissue	Underway
South Long Lake	2002	Aquatic Recreation	Nutrient/eutrophication biological indicators	Underway

13.1.3.5 Additional Water Quality Plans and Tools

The City is committed to adopting plans, policies, and tools that effectively advance the City’s, RCWD’s, and regional water quality goals. As part of LSWMP updates, development reviews, regulatory updates, and other related policies, the City will work to address the following issues:

- Formally adopt criteria to protect and improve stormwater runoff and quality, such as the Nationwide Urban Runoff Program (NURP);

- Require stormwater plans for new development and redevelopment that requires increased stormwater infiltration and a decreased use of impervious materials;
- Identify and adopt best management practices that reduce stormwater runoff using tools such as the Minnesota Stormwater Manual;
- Where feasible, require pre-settlement stormwater discharge on new developments and redevelopments;
- Identify and adopt methods for minimizing the effects of temperature, especially for streams and wetlands;
- In cooperation with the RCWD, collect water quality data on lakes within the City and establish goals for each water body;
- Educate residents on the link between surface water and ground water quality; and,
- In cooperation with the RCWD, complete a wetland management plan;

13.2 OTHER UTILITIES

Electricity, natural gas, and cable television are provided and maintained by private companies; however, they do use the right-of-way for distribution of these services. Electricity and natural gas is provided by Xcel Energy. Comcast provides cable television services to Arden Hills.

13.3 CITY STREET AND RIGHT-OF-WAY MAINTENANCE

The City has an on-going Pavement Management Program (PMP) that documents the physical condition of the approximately 31 miles of streets. The condition of each of the streets is evaluated and given a Pavement Condition Index (PCI), which is used to prioritize street reconstruction and maintenance. The PMP reviews roadway pavement condition as well as presence of concrete curb and gutters, storm drainage system, and public utility conditions. These factors are weighted together to generate a prioritized list of roadway improvements. A financial analysis is conducted and the proposed improvements are grouped into annual programs in the Capital Improvement Plan (CIP) and annual budgeting process.

Technological advances and development activities are placing increasing strains on the City's right-of-way. Right-of-way (ROW) is used to provide area for electric, gas, telephone, cable, and other public and private utility lines. Unplanned use of the ROW can lead to a confusing jumble of underground utilities that increase the maintenance and reconstruction costs to all users. It is in the City's best interest to revise its right-of-way ordinance to provide for a comprehensive approach for the maintenance and construction for all public and private utilities within the City ROW.

13.4 EMERGENCY PREPAREDNESS

The City adopted the Ramsey County-wide Emergency Operations Plan in 2005, and updated its City supplemental plan in July 2009. The purpose of this Plan is to maximize the protection of life and property, ensure the continuity of government, sustain survivors, and repair essential facilities and utilities. The Plan is intended to assist key City officials and emergency organizations to carry out their responsibilities for protection of life and property under a wide range of emergency conditions. It is also important to be able to efficiently coordinate emergency services and communicate with other governmental organizations.

13.5 CITY BUILDINGS

13.5.1 City Hall

The City Hall building was opened in October 2001 and is located at 1245 West Highway 96, which is approximately half way between Lexington and Hamline Avenues on the north side of Highway 96. The building includes a community room, Council chambers, and additional space for future needs.

13.5.2 Public Works/Joint Maintenance Facility

In October 2004, the City of Arden Hills, Ramsey County, and the Mounds View School district opened a joint maintenance and operations facility on Paul Kirkwold Drive, which is in the northwest corner of the Highway 96 and Hamline Avenue intersection. The City's Public Works Department, including staff and equipment is located at this facility.

13.6 CITY SERVICES

In addition to basic infrastructure needs, the City provides a variety of public services, including police and fire protection as well as day to day administrative functions. In 2017, the City had 27 full-time employees and 44 seasonal employees. The number of temporary employees changes throughout the year depending on the time of year. Many of the temporary employees are hired by the Public Works Department for park and recreation services. The City continually strives to provide services in an efficient manner. In order to provide services at a low-cost, Arden Hills has sought partnerships with other cities and Ramsey County.

13.6.1 Police

The City contracts with the Ramsey County Sheriff's Office for all police services. As with all its vendors, the City periodically reviews this arrangement to ensure that the City is obtaining the most cost-effective services for its residence. The Ramsey County Patrol Division is located in Arden Hills at the Joint Maintenance Facility. As development occurs on TCAAP, the City and Ramsey County will evaluate the services provided to the City to determine if additional facilities or services are needed.

13.6.2 Fire

The Lake Johanna Volunteer Fire Department provides fire fighting services to Arden Hills, Shoreview, and North Oaks. The fire department owns three fire stations:

- Station 120 in North Oaks at 4676 Hodgson Road;
- Station 130 in Shoreview at 5545 Lexington Ave N; and,
- Station 140 in Shoreview at 3615 Victoria Street.

As with all its vendors, the City periodically reviews this arrangement to ensure that the City is obtaining the most cost-effective services for its residence. As development occurs on TCAAP, the City and Lake Johanna Fire Department will evaluate the services provided to the City to determine if additional facilities are needed.

13.6.3 Administration

The City operates under a City Administrator style government, and the administrator manages the function of all other departments as well as implementation of the City Council's policies and decisions.

The City also has had a Joint Powers Agreement with the City of Roseville for information technology services since 2001.

13.7 POSTAL SERVICES

The City receives regular mail service via the New Brighton Post Office. If the need or opportunity arises for new or additional facilities, it has been a longstanding desire to have a full service post office within Arden Hills.

13.8 PUBLIC SCHOOLS

Almost all of Arden Hills is in the Mounds View School District (ISD 621); however, a small area in the southern part of Arden Hills is within the Roseville School District (ISD 623). Two of the eleven Mounds View School District buildings are located in Arden Hills: the Mounds View High School at 1900 Lake Valentine Road and Valentine Elementary at 1770 West County Road E2. The Mounds View School is also a partner in the joint maintenance facility used by the City and Ramsey County.

The Mounds View School District is one of the highest rated school districts in the state and is a valued organization in the community. In addition to serving Arden Hills, the Mounds View School District also serves all or part of the cities of Blaine, Mounds View, New Brighton, Roseville, Shoreview, North Oaks, Spring Lake Park, and Vadnais Heights as well as White Bear Township. During the 2015-2016 school year, Mounds View High School had approximately 1,650 students and was the twenty-seventh largest high school in the State. Valentine Elementary currently serves approximately 600 students. The district is anticipating 1,600 additional students over the next seven years and expects to accommodate these additional students by renovating and expanding its existing facilities.

The Roseville School District has 10 buildings; however, none of them are located in Arden Hills. In addition to serving Arden Hills, the district also includes all or parts of the cities of Falcon Heights, Lauderdale, Little Canada, Maplewood, Roseville, and Shoreview.

13.9 HIGHER EDUCATION

While not technically a public service, Arden Hills is home to two private higher education institutions: Bethel University and University of Northwestern. Bethel University is located south of Interstate 694 and is on the shoreline of Lake Valentine. The University has a long range Master Plan and future expansion on the campus is expected. Bethel University acquired the former Country Financial campus at 2 Pine Tree Drive in 2013 and plans to slowly grow into the facility over the next 5 to 10 years. The site will be used for classrooms and general office uses.

Split by the Roseville-Arden Hills border, University of Northwestern is located in the south part of the City on the southern shore of Lake Johanna. The College does not have road access into Arden Hills; however, many of the College's educational buildings are located in Arden Hills. Both Roseville and Arden Hills approved a long range Master Plan for University of Northwestern in 2007.

Bethel University and Northwestern College have abundant natural resources and trails that are open for use to the residents of Arden Hills. The City strives to maintain a strong working relationship with both institutions to help ensure long term recreational access to these campuses and to coordinate any changes or expansions with the adjacent residential areas.

Draft 03/07/2018

14. IMPLEMENTATION

The Comprehensive Plan is a guide for decision making, setting priorities, developing new policies, and guiding City business. However, this Plan requires active implementation to be successful. The vision, goals, policies, and information in this document are meant to support the City and provide a strategic framework for accomplishing City goals and maintaining a healthy, vibrant, and stable community. While this Plan provides a policy framework, implementation will require additional review, research, process, and action.

14.1 IMPLEMENTATION STRATEGIES

Most of the chapters include recommended implementation strategies and ideas to advance the City's vision and goals. The strategies are not ranked and are not considered all-inclusive. The potential implementation strategies in the chapters of this Plan are meant to be coordinated where feasible. The information, goals, and policies throughout this Plan are often interrelated and directly impact each other: land uses impact housing, transportation, and protecting natural resources. Coordinating the goals, policies, and strategies from each chapter is a primary strategy of implementing the City's vision in this Comprehensive Plan.

The vision, goals, and policies in this Comprehensive Plan chapter are a starting point for implementation continuing the implementation discussion. As new opportunities and tools arise, new strategies and ideas can be added to help ensure the advancement of the City's vision. The City will review the Plan on a regular basis to ensure implementation continues on a timely manner.

14.2 CAPITAL IMPROVEMENT PLAN (CIP)

The Capital Improvement Plan (CIP) is the financial planning mechanism used by the City to plan for long range and significant expenditures. Arden Hills has adopted a five-year CIP that is updated on a regular basis. The official Copy is kept on file at the City of Arden Hills, and a copy is included in Appendix A for informational purposes only. The CIP is subject to change. Each year the CIP is reviewed and revised as priorities change, more details are known, and funds become available for capital projects and purchases. The CIP is an important implementation tool for the annual budgeting process because it helps guide the allocation of funds for the upcoming year.

The Comprehensive Plan sets forth overall direction for the City; the CIP and the annual budgeting process implement the goals and policies contained within this Plan. Each year, the CIP is evaluated in relation to the goals, policies, and direction in the

Comprehensive Plan. This yearly process allows spending decisions to be made within the overall context and future planned environment for the community. While it is important that the City's financial tools implement the intent of the Comprehensive Plan, the Comprehensive Plan cannot predict every future need, project, or constraint. The Comprehensive Plan is a dynamic document that can be amended, with careful review, to respond to unanticipated changes in the City.

14.3 ORDINANCES

Ordinances are a powerful tool for implementing the Comprehensive Plan since they provide the legal framework for evaluating projects and implementing many policies. The City currently uses a number of ordinances to regulate development and other activities, including, but not limited to:

- Erosion – provides regulations for controlling erosion on development throughout the City.
- Floodplain – regulates development within the floodplains throughout the City.
- Shoreland – regulates development along shorelines of streams and lakes.
- Subdivision – regulates the subdivision and consolidation of land.
- Zoning (Appendix H) – regulates the use, type, and style of development throughout the City.

Ordinances require periodic evaluation to ensure they are meeting the City's vision, Metropolitan Council requirements, Rice Creek Watershed District regulations, and State Statutes. State law requires the official controls to be amended to conform to the Comprehensive Plan. Implementing this Comprehensive Plan will require the review and possibly the updating of a number of ordinances. Although no significant changes to the existing zoning classifications are anticipated, it is the City's intent to revise ordinances where needed. The Zoning Code will be updated in preparation for the TCAAP redevelopment upon selection of a land use plan.

14.4 ADDITIONAL PLANNING EFFORTS

While this Comprehensive Plan provides overall policy direction for the City, additional planning detail is needed in select areas. In October 2008, the City approved on a small area plan for the County Road E corridor. This small area plan addressed land use, future redevelopment, and transportation issues in greater detail in this area.

In September 2017, the City accepted the Commercial, Industrial, and Higher Education study. The study recommended the creation of an INST – Institutional District for the Bethel University and University of Northwestern campuses, which was adopted in September 2017. The City may consider if additional campuses, such as the Mound

View High School or the Ramsey County multiple jurisdictional public works facility, could be included into the INST – Institutional District.

The City may also move forward with a more detailed plan for the Lexington Avenue/Red Fox/Grey Fox business area. Although there has been some new development in this area, many of the buildings are aging and are likely to be redeveloped in the future. An additional plan to address issues in this area may be warranted.

14.5 COMMUNITY INVOLVEMENT

Community involvement is an important part of implementing this Comprehensive Plan. While the City can adopt policies and programs, successful implementation requires solid communication as well as input and participation from residents and businesses. The City currently utilizes a number of methods to facilitate communication between the residents, elected officials, and City staff, including surveys, direct mailings, regular City newsletters, public comment times at Council meetings, Town Hall meetings, cable television, and the City's website.

The City also uses volunteer commissions, committees, and special task forces to include residents and businesses in the project development and decision-making process:

- Communications Committee;
- Economic Development Commission;
- Financial Planning and Analysis Committee;
- Parks, Trails, and Recreation Committee;
- Planning Commission;

These groups allow more direct involvement and participation from the community to help advance and create programs that work toward implementing the Comprehensive Plan. In addition to these groups, the City can create other types of committees as needed to work on specific projects or policies. These committees are created by the City Council and exist throughout the duration of the project.

14.6 INTERGOVERNMENTAL COORDINATION

Coordinating with the adjacent communities, Ramsey County, the Metropolitan Council, and the State are needed to help advance local as well as regional goals. The City's water, sewer, transportation, park, and recreation systems are linked to other public entities. Where feasible, the City seeks to cooperate with other governments to help ensure efficient use of public resources and reduce overlapping government services.

14.7 FUTURE COMPREHENSIVE PLAN AMENDMENTS

As a policy and planning document, text and/or map amendments to this Comprehensive Plan will be needed. This Plan is meant to be a dynamic document that can respond to unforeseen changes, priorities, and opportunities.

Amendments may be needed for a future Lexington Avenue/Red Fox/Grey Fox Guiding Plan. Additional amendments may be considered where appropriate to advance the overall City vision and goals.

Draft 03/07/2018



2018-2022
Proposed
CAPITAL IMPROVEMENT PLAN
EQUIPMENT REPLACEMENT PLAN

CITY OF ARDEN HILLS
Council Work Session September 18, 2017

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Draft 03/07/2018

City of Arden Hills, Minnesota

Capital Improvement Plan

2018 thru 2022

PROJECTS BY DEPARTMENT

Department	Project#	Priority	2018	2019	2020	2021	2022	Total
Economic Development								
Gateway Signs	16-EDA-001	n/a	80,000					80,000
Economic Development Total			80,000					80,000
Government Buildings								
City Hall Maintenance	17-Bldg-005	2	50,000	200,000				250,000
Government Buildings Total			50,000	200,000				250,000
Parks Department								
Playground Structure Replacement	11-Park-003	n/a	125,000	120,000	45,000			290,000
Development of TCAAP Park Facilities	17-Park-001	3			5,000,000	5,000,000	5,000,000	15,000,000
Hard Court Reconstruction	18-Park-001	3	50,000	55,000	60,000	60,000	60,000	285,000
Hazelnut Park	18-Park-002	3		25,000				25,000
Park Improvements - TBD	18-Park-004	2	150,000					150,000
Parks Department Total			325,000	200,000	5,105,000	5,060,000	5,060,000	15,750,000
Public Safety								
LJFD General Equipment	09-Pub-001	n/a	7,418	3,050				10,468
LJFD Engine/Ladder Replacement	17-Pub-001	n/a					183,000	183,000
LJFD Rescue/Chief/Utility Vehicle Replacement	17-Pub-002	n/a	47,580	15,582	50,752	24,400		138,314
LJFD Station Capital	17-Pub-004	n/a	15,860	9,760				25,620
Public Safety Total			70,858	28,392	50,752	24,400	183,000	357,402
Sanitary Sewer Department								
Sewer Lining/Rehabilitation	09-Sew-002	3	200,000	400,000		400,000		1,000,000
TCAAP Trunk Sanitary Sewer & Lift Station	16-Sew-001	3		1,200,000				1,200,000
Sanitary Sewer Department Total			200,000	1,600,000		400,000		2,200,000
Street Department								
Old Snelling Ave PMP w/ Bridge Reconstruction	17-Str-004	3		1,750,000				1,750,000
County Road E Trail and Old Snelling (Bethel)	18-Str-003	3	932,000					932,000
Future PMP	18-Str-005	2			2,500,000		2,500,000	5,000,000
Lexington Improvements	18-Str-006	2			100,000			100,000
County Road E2 Trail	18-Str-007	3	100,000					100,000
Old Snelling Trail - Bethel to E2	18-Str-008	3	1,090,000					1,090,000
Indian Oaks/Floral Drive PMP - 2018 PMP	18-Str-065	3	2,200,000					2,200,000
Street Department Total			4,322,000	1,750,000	2,600,000		2,500,000	11,172,000
Surface Water Management Dept								
Surface Water Project	18-Storm-001	3	200,000					200,000

Department	Project#	Priority	2018	2019	2020	2021	2022	Total
Surface Water Management Dept Total			200,000					200,000
Technology								
Springbrook Software Upgrades	12-Tec-001	n/a	5,000	5,000	5,000	5,000	5,000	25,000
Technology and Office Equipment	12-Tec-002	n/a	5,000	5,000	5,000	5,000	5,000	25,000
Communications Equipment	12-Tec-003	n/a	2,000	2,000	2,000	2,000	2,000	10,000
Technology Total			12,000	12,000	12,000	12,000	12,000	60,000
Water Department								
Water Towers Repair and Repainting	12-W-001	3	520,000					520,000
TCAAP New Booster Station	16-W-001	3		1,000,000				1,000,000
TCAAP Water Tower	16-W-003	3		4,800,000				4,800,000
TCAAP Trunk Water Improvements (Spine Road)	16-W-005	3		1,000,000				1,000,000
CR E2 Water Replacement/Old Hwy 10 Water Loop	17-W-001	3	855,000					855,000
Booster Station Repair/Upgrade - Roseville	18-W-001	2	400,000	154,000				554,000
County Road F Watermain Replacement	18-W-002	3	300,000					300,000
Water Department Total			2,075,000	6,954,000				9,029,000
GRAND TOTAL			7,334,858	10,744,392	7,767,752	5,496,400	7,755,000	39,098,402

Draft 03/07/2018

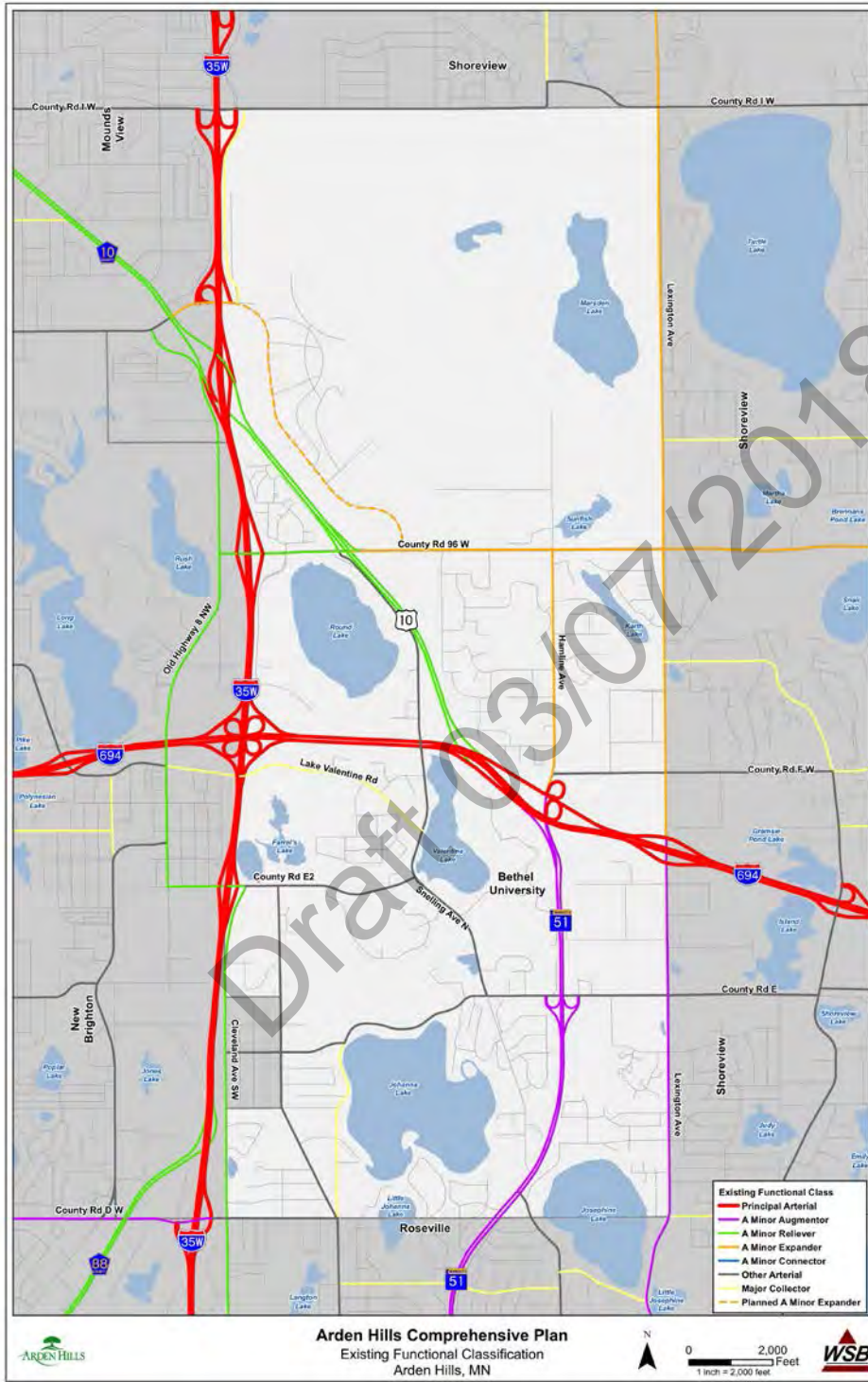
APPENDIX B: TRANSPORTATION SYSTEM PRINCIPLES AND STANDARDS

The transportation system principles and standards included in this Plan create the foundation for improving the transportation system, evaluating its effectiveness, determining future system needs, and implementing strategies to fulfill the goals and policies identified.

1. FUNCTIONAL CLASSIFICATION

It is recognized that individual roads and streets do not operate independently in any major way. Most travel involves movement through a network of roadways. It becomes necessary to determine how this travel can be channelized within the network in a logical and efficient manner. Functional classification defines the nature of this channelization process by defining the part that any particular road or street should play in serving the flow of trips through a roadway network. It is the process by which streets and highways are grouped into classes according to the character of service they are intended to provide. Functional classification involves determining what function each roadway should perform prior to determining its design features, such as street widths, speed, and intersection control. The functional classification system typically consists of five major classes of roadways: Principal Arterials, Minor Arterials, Major Collectors, Minor Collectors, and Local roadways. The existing roadways are described in this section and illustrated in Figure B.1 – Existing Roadway Functional Classification.

Figure B.1 – Existing Roadway Functional Classification



Approved: XXXXX

1.1 PRINCIPAL ARTERIALS

Roadways of this classification typically connect large urban areas to other large urban areas or they connect metro centers to regional business concentrations via a continuous roadway without stub connections. They are designed to accommodate the longest trips. Their emphasis is focused on mobility rather than access and as such, private access should not be allowed. They connect only with other Principal Arterials, interstate freeways, some Minor Arterials, and Collector Streets. There are two Principal Arterials within Arden Hills, Interstates I-35W and I-694.

1.2 MINOR ARTERIALS

Roadways of this classification typically link urban areas and rural Principal Arterials to larger towns and other major traffic generators capable of attracting trips over similarly long distances. Minor Arterials service medium length trips, and their emphasis is on mobility as opposed to access in urban areas. They connect with Principal Arterials, other Minor Arterials, and Collector Streets. Connections to Local Streets should be avoided if possible, and private access should not be allowed. Minor Arterials are responsible for accommodating through-trips, as well as trips beginning or ending outside the Arden Hills area. Minor Arterial roadways are typically spaced approximately one to two miles apart in urbanized communities similar to Arden Hills. Within Arden Hills there are 15 roadways classified as Minor Arterials. These roadways are US Highway 10, TH 51, Old US-10, County State Aid Highway (CSAH) 46/Cleveland Avenue, CSAH 47/New Brighton Road, CSAH 50/Hamline Avenue, CSAH 51/Lexington Avenue, CSAH 76/Snelling Avenue, CSAH 96 (CR G), CSAH 149/Lake Johanna Boulevard, County Road (CR) D (CSAH 19), CR E (CSAH 15, CSAH 149, CR 99), CR E2 (CSAH 73), CR F (CSAH 12), CR H (CSAH 9), and CR I (CSAH 3). The Spine Road is a Planned A Minor Arterial.

In the Twin Cities Metropolitan Area, there is a further breakdown of Minor Arterial roadways to establish federal funding priorities, “A Minor” and “Other” (previously referred to as “B Minor”). The A Minor Arterial classifications include Relievers, Expanders, Connectors, and Augmenters. As defined by the Twin Cities Metropolitan Council, Relievers provide ‘open up’ capacity for traffic on Metropolitan Highway Principal Arterials. Augmenters supplement the Principal Arterials within the beltway. Expanders provide connection between developing areas outside the beltway, and connect Principal Arterials. Connectors provide links between rural town centers in the urban reserve and rural area. Other Minor Arterials have a lower priority than A Minor Arterials and are not eligible for federal funding.

Within Arden Hills, the A Minor Arterial Relievers are US Highway 10, CSAH 46/Cleveland Avenue, CSAH 73/CR E2 (west of CSAH 46), and CSAH 96 (west of US

Highway 10). The A Minor Arterial Expanders are CSAH 51/Lexington Avenue (north of I-694) and CSAH 96 (east of US Highway 10). The Spine Road is a Planned A Minor Expander. The A-Minor Arterial Augmenters are TH 51, CR D (west of I - 35W), and CSAH 51/Lexington Avenue (south of I-694). The Other Minor Arterials are Old US-10, CR E, CR E2 (east of Cleveland Avenue), Hamline Avenue, Snelling Avenue (north of CR E), and New Brighton Road.

1.3 MAJOR COLLECTORS

Roadways of this classification typically link neighborhoods together within a city or they link neighborhoods to business concentrations. In highly urban areas, they also provide connectivity between major traffic generators. A trip length of less than five miles is most common for Major Collector roadways. A balance between mobility and access is desired. Major Collector street connections are predominately to Minor Arterials, but they can be connected to any of the other four roadway functional classes. Local access to Major Collectors should be provided via public streets and individual property access should be avoided. Major Collector streets are predominantly responsible for providing circulation within a city. Major Collectors that are a part of the road network in Arden Hills includes Valentine Lake Road, west of CSAH 76/Snelling Avenue; and CSAH 149/Lake Johanna Boulevard from CR D to CR E. Old Hwy 8 is designated as a Major Collector.

1.4 MINOR COLLECTORS

Roadways of this classification facilitate the collection of local traffic and convey it to Major Collectors and Minor Arterials. Minor Collector streets serve short trips at relatively low speeds. Their emphasis is focused on access rather than mobility. Minor Collectors are responsible for providing connections between neighborhoods and the Major Collector/Minor Arterial roadways. There are no roadways designated as Minor Collector roadways in the City of Arden Hills.

1.5 LOCAL STREETS

Roadways of this classification typically include city streets that facilitate the collection of local traffic and convey it to collectors and Minor Arterials. Their emphasis is to provide direct property access. The City's Pavement Management Program adopts a four-classification system of local streets generally based on the average length of trip on the street: Community Street, Neighborhood Street, Residential Street, and Special Cases. The street width varies per street classification and the Pavement Management Program includes a list of additional considerations for additional street width deviations.

2. ROADWAY CAPACITY

Capacities of roadway systems vary based on roadway functional classifications, roadway design (number of lanes, divided or undivided), and system connectivity. A two-lane divided arterial roadway has a daily capacity of 15,000 to 17,000 vehicles per day, a four-lane divided arterial street has a daily capacity of 28,000 to 32,000 vehicles per day, and a four-lane freeway has a daily capacity of approximately 60,000 to 80,000 vehicles per day. The variability in capacities are directly related to many roadway characteristics including access spacing, traffic control, adjacent land uses, as well as traffic flow characteristics, such as percentage of trucks and number of turning vehicles. Therefore, it is important that the peak hour conditions are reviewed to determine the actual volume-to-capacity on roadway segments with average daily traffic volumes approaching these capacity values.

Major Collector and Minor Collector streets have physical capacities similar to those of a two-lane arterial street; however the acceptable level of traffic on a residential street is typically significantly less than the street's physical capacity. The acceptable level of traffic volumes on Major Collectors and Minor Collector streets vary based on available right-of-way width, housing densities and setbacks, locations of parks and schools, and overall resident perceptions. Typically, traffic levels on Major Collector streets in residential/educational areas are acceptable when they are at or below 50 percent of the roadway's physical capacity, resulting in an acceptable capacity of 6,000 to 9,000 vehicles per day. In most communities, acceptable traffic levels on Minor Collector streets are considerably less. Typically, a daily traffic volume of 1,000 to 1,500 vehicles per day is acceptable on Minor Collector streets in residential areas.

In the City of Arden Hills, the roadways that function as Major Collectors currently carry 50 percent or less than the roadway capacity, except Valentine Lake Road, west of Mounds View High School, which has a volume to capacity ratio of 51 Percent. Even though the capacity ratio is over 50 percent, the volumes on the major collectors in Arden Hills are considered to generally be accepted and the roadways are interpreted as operating at or below their capacity.

2.1 ESTIMATED DAILY CAPACITIES

Table B.1 – Planning-Level Roadway Capacity in Arden Hills, identifies various roadway types and the estimated daily capacities that the given roadway in the City of Arden Hills can accommodate. A capacity deficiency exists when traffic volumes approach or exceed the capacity of the roadway.

Table B.1 – Planning-Level Roadway Capacity

Facility Type		Daily Two-Way Volume	
		Lower Threshold	Higher Threshold
Arterials	Two-lane undivided	10,000	12,000
	Two-lane divided or three-lane undivided	15,000	17,000
	Four-lane undivided	18,000	22,000
	Four-lane divided or five-lane undivided	28,000	32,000
Freeways	Four-lane freeway	60,000	80,000
	Six-lane freeway	90,000	120,000
	Eight-lane freeway or higher	Calculated on a segment by segment basis	

2.2 LEVEL OF SERVICE

Roadway Level of Service (LOS) is used to assign a value to the level of congestion and efficiency of the roadway. The LOS is determined by the ratio of the actual roadway volume to the established capacity. In general, the higher the volume, the lower the LOS. There are six LOS, depending on the extent of congestion and service on the roadway. The LOS are defined in Table B.2 – Roadway Level of Service as follows:

Table B.2 – Roadway Level of Service

Level of Service	Volume to Capacity Ratio (v/c)
A	0.00 to 0.35
B	0.35 to 0.49
C	0.50 to 0.74
D	0.75 to 0.89
E	0.90 to 0.99
F	> 1.00
Source: Based on Highway Capacity Manual	

Generally, the City of Arden Hills should consider capacity improvements on roadways with a LOS D or worse and volume-to-capacity ratios over 0.75 during the peak hours.

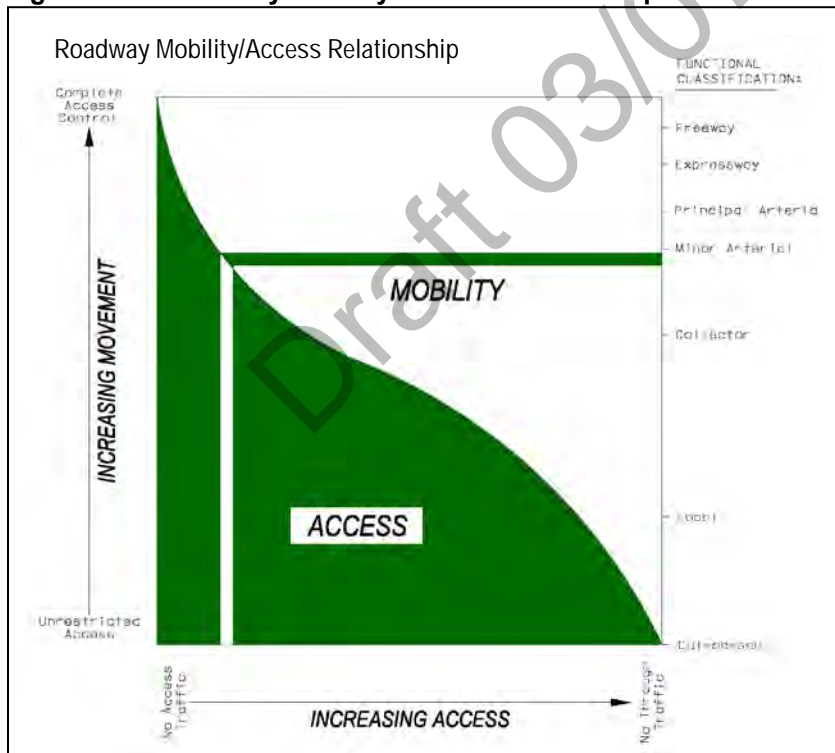
2.3 ACCESS MANAGEMENT GUIDELINES

Access management guidelines are developed to maintain traffic flow on the network so each roadway can provide its functional duties, while providing adequate access for private properties to the transportation network. This harmonization of access and mobility is the keystone to effective access management.

Mobility, as defined for this Transportation Plan, is the ability to move people, goods, and services via a transportation system component from one place to another. The degree of mobility depends on a number of factors, including the ability of the roadway system to perform its functional duty, the capacity of the roadway, and the operational level of service on the roadway system.

Access, as applied to the roadway system in Arden Hills, is the relationship between local land use and the transportation system. There is an inverse relationship between the amount of access provided and the ability to move through-traffic on a roadway. As higher levels of access are provided, the ability to move traffic is reduced. The graphic below illustrates the relationship between access and mobility.

Figure B.2 – Roadway Mobility/Access Relationship



Each access location (i.e. driveway and/or intersection) creates a potential point of conflict between vehicles moving through an area and vehicles entering and exiting the roadway. These conflicts can result from the slowing effects of merging and weaving that takes place as vehicles accelerate from a stop turning onto the roadway, or deceleration to make a turn to leave the roadway. At signalized intersections, the potential for conflicts between vehicles is increased, because through-vehicles are required to stop at the signals. If the amount of traffic moving through an area on the roadway is high and/or the speed of traffic on the roadway is high, the number and nature of vehicle conflicts are also increased.

Accordingly, the safe speed of a road, the ability to move traffic on that road, and safe access to cross streets and properties adjacent to the roadway all diminish as the number of access points increases along a specific segment of roadway. Because of these effects, there must be a balance between the level of access provided and the desired function of the roadway.

In Arden Hills, access standards and spacing guidelines are recommended as a strategy to effectively manage existing ingress/egress onto streets and to provide access controls for new development and redevelopment. While the City of Arden Hills has access authority for those roadways under its jurisdiction, Ramsey County and the Minnesota Department of Transportation (MnDOT) have access authority for roadways under their jurisdiction. The permitted width of accesses to County or State streets or roads is subject to County or State regulations. The State regulations for access standards and spacing are included in the MnDOT State-Aid design standards and the MnDOT Access Category System and Spacing Guidelines (referenced in Table B.3 and B.4).

Table B.3 – MnDOT Access Management Manual – Summary of Recommended Street Spacing for Interregional Corridors

Category	Area or Facility Type	Typical Functional Class	Public Street Spacing		Signal Spacing
			Primary Full-Movement Intersection	Secondary Intersection	
1 High Priority Interregional Corridors & Interstate System (IRCs)					
1F	Interstate Freeway	Principal Arterials	Interchange Access Only		⊘
1AF	Non-Interstate Freeway		Interchange Access Only (see Section 3.2.7 for interim spacing)		See Section 3.2.5 for Signalization on Interregional Corridors
1A	Rural		1 mile	1/2 mile	
1B	Urban/Urbanizing		1/2 mile	1/4 mile	
1C	Urban Core		300-660 feet dependent upon block length		
2 Medium Priority Interregional Corridors					
2AF	Non-Interstate Freeway	Principal Arterials	Interchange Access Only (See Section 3.2.7 for interim spacing)		See Section 3.2.5 for Signalization on Interregional Corridors
2A	Rural		1 mile	1/2 mile	
2B	Urban/Urbanizing		1/2 mile	1/4 mile	
2C	Urban Core		300-660 feet, dependent upon block length		1/4 mile
3 Regional Corridors					
3AF	Non-Interstate Freeway	Principal and Minor Arterials	Interchange Access Only (see Section 3.2.7 for interim spacing)		Interim
3A	Rural		1 mile	1/2 mile	See Section 3.2.5
3B	Urban/Urbanizing		1/2 mile	1/4 mile	1/2 mile
3C	Urban Core		300-660 feet, dependent upon block length		1/4 mile

Source: MnDOT

Table B.4 – MnDOT Access Management Manual – Summary of Recommended Street Spacing for Non-Interregional Corridors

Category	Area or Facility Type	Typical Functional Class	Public Street Spacing		Signal Spacing
			Primary Full-Movement Intersection	Secondary Intersection	
4 Principal Arterials in the Twin Cities Metropolitan Area and Primary Regional Trade Centers (Non-IRCs)					
4AF	Non-Interstate Freeway	Principal Arterials	Interchange Access Only (see Section 3.2.7 for interim spacing)		Interim
4A	Rural		1 mile	1/2 mile	See Section 3.2.5
4B	Urban/Urbanizing		1/2 mile	1/4 mile	1/2 mile
4C	Urban Core		300-660 feet dependent upon block length		1/4 mile
5 Minor Arterials					
5A	Rural	Minor Arterials	1/2 mile	1/4 mile	See Section 3.2.5
5B	Urban/Urbanizing		1/4 mile	1/8 mile	1/4 mile
5C	Urban Core		300-660 feet, dependent upon block length		1/4 mile
6 Collectors					
6A	Rural	Collectors	1/2 mile	1/4 mile	See Section 3.2.5
6B	Urban/Urbanizing		1/8 mile	Not Applicable	1/4 mile
6C	Urban Core		300-660 feet, dependent upon block length		1/8 mile
7 Specific Area Access Management Plans					
7	All	All	By adopted plan		

Source: MnDOT

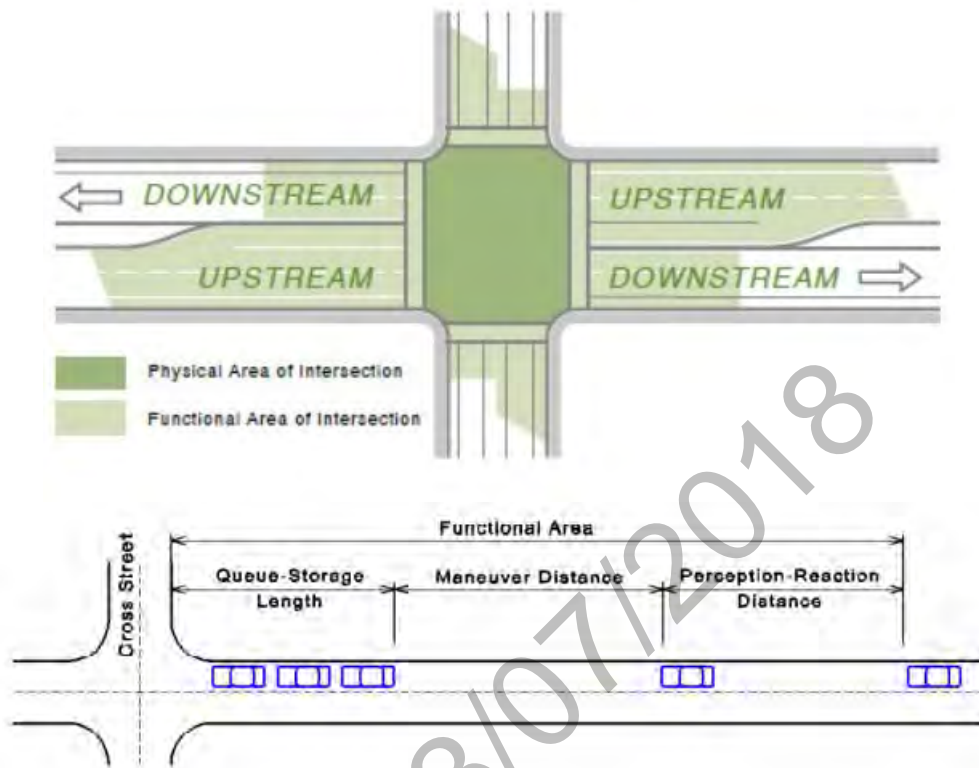
Ramsey County has developed a draft set of access management policies. Rather than a set of specific standards, Ramsey County’s draft policies “are intended to apply accepted access management principles in a context-sensitive manner to maximize the possible benefits as development occurs or as existing properties are modified.” The draft policies are as follows.

- A parcel has the legal right to one access from a public street. If access can be obtained from an adjacent street, rather than from a County Road or County State Aid Highway, access should be directed to the minor street.
- Opportunities to combine or eliminate accesses shall be considered when new accesses are proposed.
- Where feasible, the access spacing standards of the MnDOT Access Management Manual shall be met.

Approved: XXXXX

- Where possible, new driveways shall be aligned with existing driveways or streets.
- Any proposed new access or modification of an existing access to a Ramsey County Road or County State Aid Highway requires a County access permit, with approval subject to review by the County Engineer.
- Any change in land use of a property with access to any County Road or County State Aid Highway, requires review of the access, in accordance with Minnesota Rules 8810.5200, which states in full, “In the event of a change in the land use or major change in the traffic pattern of the existing facility, existing driveways are not automatically perpetuated and new driveway access applications shall be submitted.”
- Unless no other option for access to a property exists, access will not be allowed within the functional area of a street intersection, or within the functional area of another existing access. As defined by MnDOT, the functional areas of intersections are defined as follows:
 - On roadways with posted speed limits less than 45 MPH, 435 feet.
 - On roadways with posted speed limits of 45 MPH or greater, 650 feet.
- The interpretation of the functional area of an intersection shall be made by the County Engineer and adjustments to these distances shall be made, as appropriate to the particular situation. Diagrams of intersection functional areas are shown below:

Figure B.3 – Intersection Functional Areas



- If no access to a parcel can be obtained, except from a County Road or County State Aid Highway, Ramsey County acknowledges that a parcel has the right to one access, subject to approval by the County Engineer. More than one access may be approved, but should not be assumed.
- The need for turn lanes, bypass lanes, medians or median improvements, signage, or any other accommodations necessary for safe operation of an access shall be determined by the County Engineer and incorporated into access permit provisions. All construction costs shall be paid for by the permit applicant. Ramsey County will not contribute to the costs of necessary improvements.
- The need for a Traffic Impact Study for any proposed access shall be determined by the County Engineer. The County Engineer may require installation of any mitigation measures recommended by a Traffic Impact Study.
- The County Engineer may require dedication of access control over the remainder of a parcel as a condition of granting access in a particular location.

It should be noted that there are existing access points within the City that are inconsistent with Ramsey County’s draft access management policies. In many cases these access points were established prior to agency access spacing guidelines/policies. In other cases the agency has granted an exception to the existing

guidelines. As roadways are reconstructed and as development or redevelopment occurs, Ramsey County and MnDOT generally work to modify and/or relocate access points that do not meet current access spacing guidelines, recognizing that this may not be feasible in all instances.

To further the relationship of access and mobility throughout Arden Hills, the City supports managing access consistent with the roadway mobility and access relationship (Figure B.2) and supports the access spacing guidelines of the State and County. The City of Arden Hills agrees to work with Ramsey County and MnDOT to achieve desirable access and spacing standards. Table B.5 presents the access spacing guidelines for the roadway network in Arden Hills.

Table B.5 – Access Spacing Guidelines for Collector Roadways in Arden Hills ⁽¹⁾

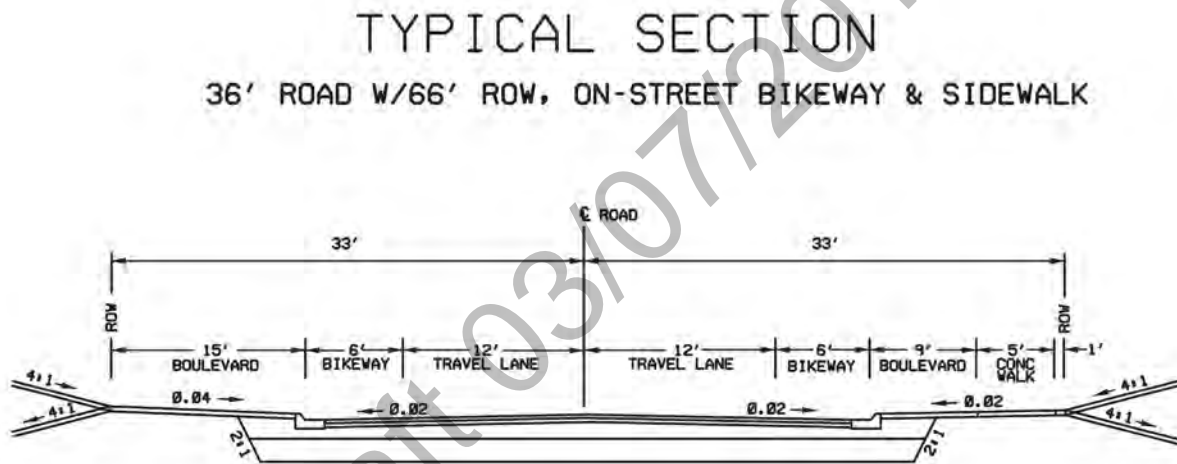
Type of Access	Major Collector ⁽²⁾	Minor Collector ⁽³⁾
Private Residential	Not Permitted	As Needed
Private Commercial/Industrial	Not Permitted	As Needed
Minimum Corner Clearance from a Collector Street	660'	300'
⁽¹⁾ These guidelines apply to City streets only. Ramsey County has access authority for roadways under their jurisdiction.		
⁽²⁾ Access to Major Collectors is limited to public street access. Steps should be taken to redirect private accesses on Major Collectors to other local streets. New private access to Major Collectors is not permitted unless deemed necessary.		
⁽³⁾ Private access to Minor Collectors is to be evaluated by other factors. Whenever possible, residential access should be directed to non-continuous streets rather than Minor Collector roadways. Commercial/Industrial properties are encouraged to provide common accesses with adjacent properties when access is located on the Minor Collector system. Cross-traffic between adjacent compatible properties is to be accommodated when feasible.		

Providing direct access from private property onto collectors and arterials should be minimized in order to minimize conflict points and increase safety and mobility.

3. GEOMETRIC DESIGN STANDARDS

Geometric design standards are directly related to a roadway’s functional classification and the amount of traffic that the roadway is designed to carry. For the City of Arden Hills, geometric design standards are based on MnDOT State-Aid standards. The following geometric design standards for Major and Minor Collector roadways are illustrated in Figures B.4 and B.5 A and B respectively. These design standards achieve adequate capacity within the roadway network, as well as a level of acceptance by adjacent land uses, given the constraints associated with the existing development pattern. Each component identified in the typical sections helps establish a roadway’s ability to perform its function in the roadway network.

Figure B.4 – Major Collector Design Standards



1. DESIGN STANDARDS APPLY TO ROADWAYS UNDER THE CITY OF ARDEN HILLS JURISDICTION ONLY.
2. ADDITIONAL ROW WILL BE NEEDED AT INTERSECTIONS TO ACCOMMODATE TURN LANES, AT THE DISCRETION OF THE CITY ENGINEER.

Figure B.5a – Minor Collector Design Standards

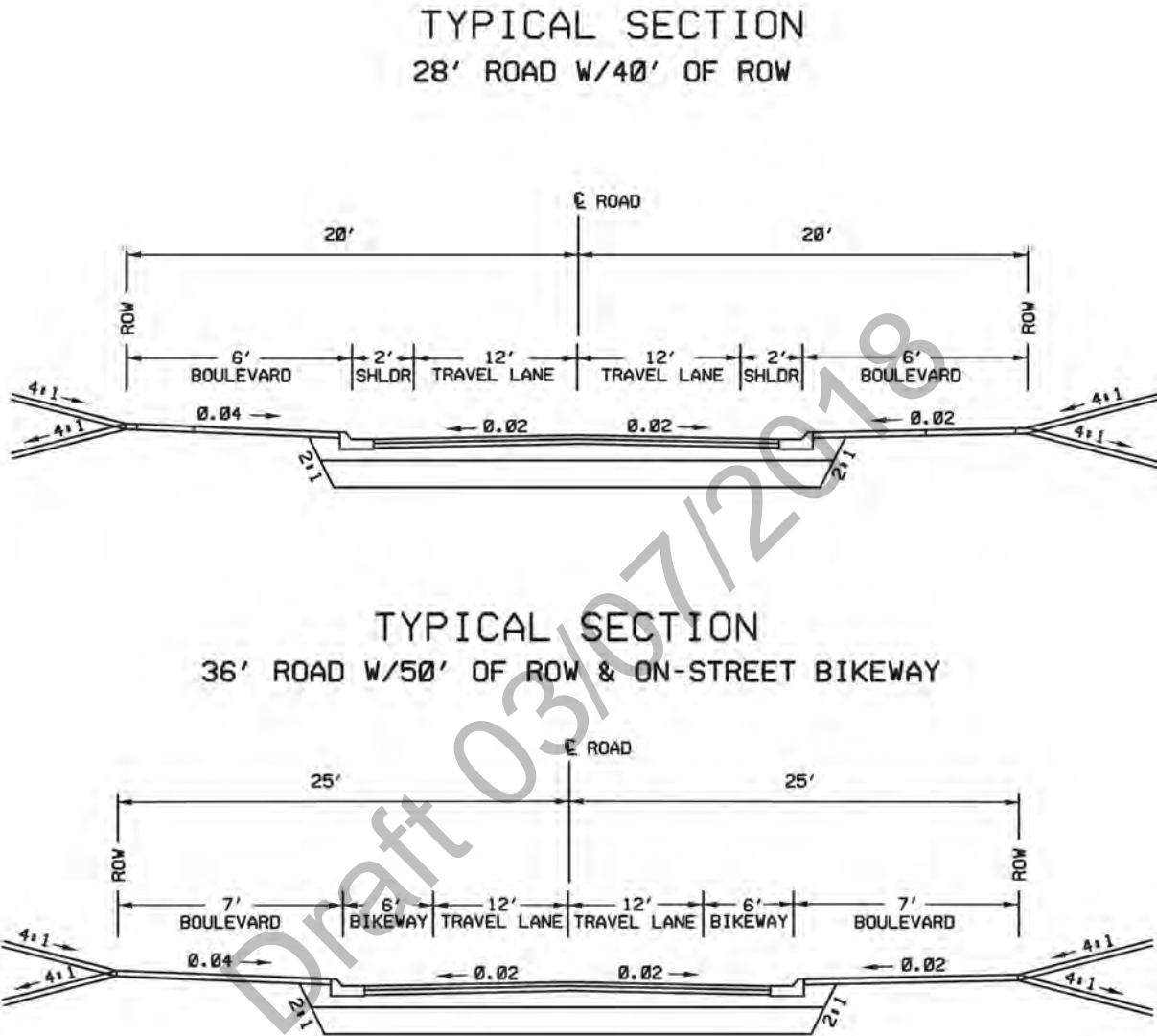
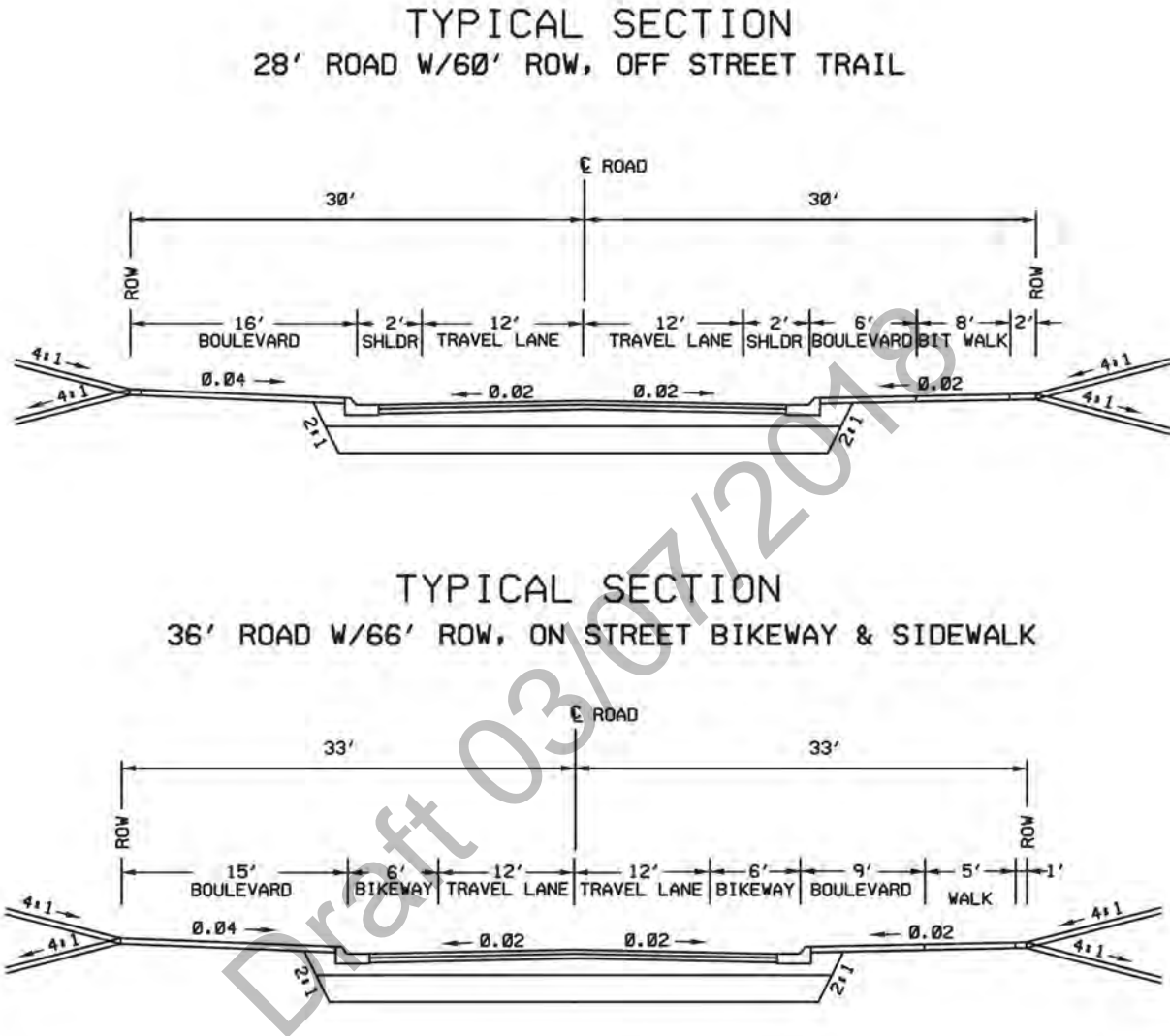


Figure B.5b – Minor Collector Design Standards



3.1 ROADWAY WIDTH

Roadway and travel lane widths are directly associated with a roadway's ability to carry vehicular traffic. On Major Collector roadways and Minor Collector streets, a 12' lane is recommended for each direction of travel. The 24' total travel width is recommended to accommodate anticipated two-way traffic volumes. In addition to the travel width, a minimum 6' shoulder lane width accommodates pedestrian and bicycle traffic, parked or stalled vehicles, and maintenance activity. Roadway widths not meeting the Geometric Design Standards results in decreased performance of the particular roadway and additional travel demand on the adjacent roadway network components. For example, a sub-standard Major Collector roadway may result in additional travel demand on an adjacent Minor Collector or local street, resulting in an overburden for adjacent landowners. Similarly, additional local circulation on an adjacent Minor Arterial results in reduced mobility for regional trips. Due to the varying right-of-way widths present in Arden Hills, Figure B.5A and B.5B identify four different typical sections for Minor Collector roadways to be considered as reconstruction is pursued.

3.2 PATHWAYS

Pathways, including bikeways, sidewalks, trails, and some roadway shoulders, are recommended to be on or adjacent to Major Collector and Minor Arterial roadways, and most Minor Collector roadways to accommodate pedestrian, bicycle, and other non-motorized travel in a safe and comfortable manner. These roadways carry a considerable amount of vehicular traffic and non-motorized facilities are recommended. Design and accommodations for non-motorized traffic facilities in Arden Hills follow the MnDOT Bikeway Facility Design Manual; Americans' with Disabilities Act (ADA); AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities; FHWA Designing Sidewalks and Trails, Part II, Best Practices Design Guide; and FHWA Design Guidance, Accommodating Bicycle and Pedestrian Travel: A Recommended Approach. The City will continue to work with Ramsey County and MnDOT to plan, evaluate, and design non-motorized facilities and integrate the facilities into reconstruction efforts. At the discretion of the City, the requirements for trails, sidewalks, bikeways, and shoulders may vary. The non-motorized traffic facilities will provide connectivity as shown in the Arden Hills Parks, Trails, and Open Space Plan.

3.3 DESIGN SPEED

The design speed of a roadway is directly related to the roadway's function in the roadway system. The focus of Minor Arterial roadways is mobility; therefore these roadways should be designed to accommodate higher travel speeds. Likewise, Minor Collector roadways are more focused on accessibility and should be designed to

accommodate lower travel speeds. The function of Major Collectors is balanced between mobility and accessibility; therefore these roadways should be designed accordingly. Table B.6 below presents the recommended design speed for the Arden Hills roadway network:

Table B.6 – Roadway Design Speed Guidelines

Functional Classification	Design Speed ⁽¹⁾
Minor Collector Street	30 mph
Major Collector Roadway	35 – 40 mph
Minor Arterial Roadway	45 – 55 mph
⁽¹⁾ At the discretion of the City Engineer for City roadways, with approval by the City Council.	

3.4 RIGHT-OF-WAY WIDTH

Right-of-way width is directly related to the roadway’s width and its ability to carry vehicular and pedestrian traffic in a safe and efficient manner. The roadway right-of-way widths identified in Figures B.4 and B.5 A and B are the minimum required for Major and Minor Collector streets, respectively. For Minor Collector streets in residential areas, a minimum right-of-way width of 66’ is necessary for the added roadway width, as well as to provide added setback distance between the roadway and homes along the roadway. Right-of-way widths greater than 66’ may be required on Major Collector roadways within commercial areas to accommodate the potential for higher traffic volumes and the need for additional through or turning lanes. All right-of-way requirements may be increased at the discretion of the City Engineer, with approval by the City Council. Please refer to Ramsey County’s right-of-way requirements for county roads in their current Transportation Plan. The City should obtain identified local and county right-of-way through any proposed redevelopment process to accommodate long-term roadway and sidewalk/trail needs.

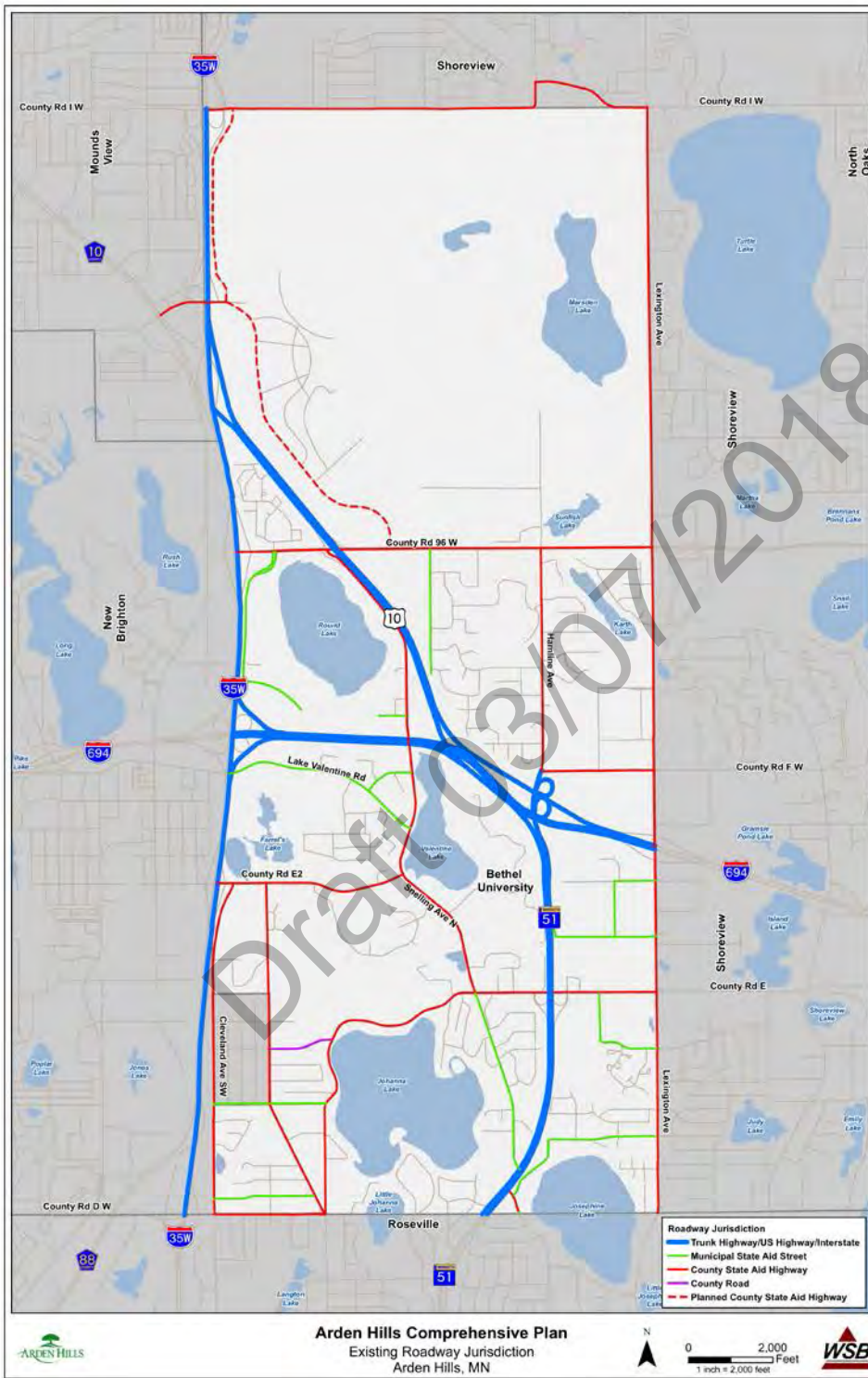
3.5 ROADWAY JURISDICTION

Roadway jurisdiction directly relates to functional classification of roadways. Generally, roadways with higher mobility functions (such as arterials) should fall under the jurisdiction of a regional level of government. In recognizing these roadways serve greater areas resulting in longer trips and higher volumes, jurisdiction of Principal Arterial and Minor Arterial roadways should fall under the jurisdiction of the State and County, respectively. Similarly, roadways with more emphasis on local circulation and

access (such as collectors) should fall under the jurisdiction of the local government unit. These roadways serve more localized areas and result in shorter trip lengths and lower volumes. Major Collector and Minor Collector roadways should fall under the jurisdiction of the City of Arden Hills. As roadway segments are considered for turn-back to the City, efforts will be taken to evaluate the roadway features for conformance to current standards, structural integrity, and safety. This effort will help the City develop short and long-range programs to assume the responsibilities of jurisdictional authority. In the City of Arden Hills, three jurisdictions have responsibility for the overall road network. The Minnesota Department of Transportation is responsible for I-35W, I-694, TH 10, and TH 51, while Ramsey County is responsible for routes D, E, E2, F, H, I, 46, 47, 50, 51, 76, 96, and 149. Both the Spine Road and Old Hwy 8 are anticipated to be under Ramsey County's jurisdiction (CSAH 13) once constructed. The City of Arden Hills is responsible for all remaining roadways. Figure B.6 shows existing roadway jurisdiction.

Draft 03/07/2018

Figure B.6 – Existing Roadway Jurisdiction



DRAFT



COMPREHENSIVE PLAN

COMPREHENSIVE SANITARY SEWER PLAN

CITY OF ARDEN HILLS | MINNESOTA

February 23, 2018

Prepared for:
City of Arden Hills
1245 West Highway 96
Arden Hills, MN 55112

WSB PROJECT NO. 3455-20



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INTRODUCTION

The City of Arden Hills is required to prepare a Comprehensive Plan that aligns with the Metropolitan Council's Metropolitan System Plan every ten years per Minnesota Rule 473.858. One component of the Comprehensive Plan is the Sanitary Sewer Plan, which describes the existing sanitary sewer system and outlines the timing and sequence of future improvements. The Sanitary Sewer Plan allows the City and the Metropolitan Council to build and improve their sanitary sewer collection and treatment systems in the most efficient and cost-effective manner.

The City of Arden Hills is entirely within the 2040 Metropolitan Urban Service Area (MUSA), so sanitary sewer interceptors and treatment are provided by the Metropolitan Council Environmental Services (MCES) system. The City is responsible for local wastewater collection and conveyance, which has historically been self-supporting through fees paid by users.

The City of Arden Hills' Sanitary Sewer Plan was developed to conform to the Metropolitan Council's Thrive MSP 2040 Water Resources Policy Plan. The Thrive MSP 2040 Plan was approved in May 2015 and outlines regional goals for the wastewater system, including environmental sustainability, water reuse, and water conservation. Additionally, the Thrive MSP 2040 Plan includes population, household, and employment projections, and projected wastewater flows.

As a result of projected population and land use changes in Arden Hills, the Metropolitan Council estimates that sanitary sewer flows will increase approximately 19 percent between now and 2040. The greatest increase in flow is expected from the development of the Twin Cities Army Ammunition Plant (TCAAP) site in the north part of the City. This Sanitary Sewer Plan outlines the locations in which the Metropolitan Council can expect to see increased wastewater flows, allowing the Council to determine if capacity upgrades will be required at regional wastewater treatment plants and interceptors. This plan also serves as a guiding document for City infrastructure improvements and expansion.

BACKGROUND

The City of Arden Hills is located in Ramsey County north of the Twin Cities. Arden Hills is bordered by the Cities of Shoreview, Roseville, New Brighton, and Mounds View. Much of Arden Hills is residential, with commercial, industrial, and office development located along its eastern border and Interstate Highway 694. Approximately 11 percent of the area of the City is occupied by lakes and wetlands.

Arden Hills has been designated entirely as a suburban community. This designation indicates that the City experienced continued growth through the 1980s and 1990s. The Metropolitan Council expects Arden Hills to, “plan for forecasted population and household growth at average densities of at least 5 units per acre for new development and redevelopment ... and to target opportunities for more intensive development near regional transit investments.”

EXISTING SANITARY SEWER SYSTEM

The City of Arden Hills’ sanitary sewer system is a collection system only, as described previously. The existing sanitary sewer system is shown in **Figure 1**. The system collects and conveys the City’s wastewater to five MCES Meters (M051, M052, M054, M059, and M203) and their associated MCES Interceptors (1-RV-432, 1-RV-432, 1-RV-431, 2-NB-100, and 4-NS-524), as shown in **Figure 2**. MCES Meter M203 does not currently receive flow from Arden Hills, but is planned to receive future flows from the TCAAP development.

All of the wastewater collected in the City of Arden Hills is conveyed through the MCES system to the MCES Metropolitan Wastewater Treatment Plant (WWTP) located southeast of St. Paul on the Mississippi River. The Metropolitan WWTP has a capacity of 251 MGD, provides advanced secondary treatment with chlorination/dechlorination, and discharges treated effluent to the Mississippi River. It also generates energy from the residual biosolids for in-plant use.

Service Districts

The sanitary sewer system has been divided into eighteen (18) sewer districts. These districts, shown in **Figure 2**, correspond to the fourteen (14) lift stations, two existing gravity networks (MCES 54, MCES 59), and two future networks for the TCAAP development (North, South). The Arden Hills Army Training Site (AHATS) discharges via a private forcemain into district MCES 59.

Gravity Sewer

The City of Arden Hills’ gravity sewer system consists of 8-inch to 21-inch diameter polyvinyl chloride (PVC) pipe, reinforced concrete pipe (RCP), vitrified clay pipe (VCP), and cured-in-place pipe (CIPP). Nearly the entire system has been televised over the last twenty years, and approximately one quarter of the pipes in the system have been lined over the last fifteen years.

Lift Stations

The City's current system includes fourteen lift stations, as summarized in **Table 1**. All but one of the City's lift stations are either new or have been rehabilitated since 1990; the rehabilitation of Lift Station 11 was completed in 2017.

Table 1. Existing Lift Station Summary

Lift Station	Location	Year Built	Pump Rehab.	Wet Well Rehab.	Controls Rehab.
LS 1	Cleveland Ave N near Elmer L. Anderson Memorial Tr	1961	2012	2012	2012
LS 2	New Brighton Rd in Charles Perry Park	1983	2011	2003	2011
LS 3	Lake Johanna Blvd near Siems Court	1999	-	-	-
LS 4	Ridgewood Rd and Arden Pl	1998	2013	2005	2013
LS 5	Tony Schmidt Regional Park and Lake Johanna Blvd	1977	2011	2003	2011
LS 6	Lake Johanna Blvd south of Stowe Ave	Unknown	1996	-	1996
LS 7	Shorewood Dr	Unknown	2004	2004	2013
LS 8	Ingerson Rd	1976	2011	2001	2011
LS 9	Ridgewood Rd and Edgewater Ave	Unknown	2013	2005	2013
LS 10	Cleveland Ave N and County Rd E2	1989	-	-	-
LS 11	Hwy 96 and Prior Ave N near Arden Manor Park	1971	2017	2017	2017
LS 12	Thom Dr and New Brighton Rd	1970	2012	2012	2012
LS 13	Karth Lake Dr and Pleasant Dr	Unknown	2012	2012	2012
LS 14	Hamline Ave N and Paul Kirkwood Dr	1995	-	-	-

Community Treatment Systems

There are no public or private community treatment system within the City of Arden Hills. All properties within the City are served by the public collection system or by individual sewage treatment systems.

Intercommunity Flows

The City of Arden Hills has intercommunity sanitary sewer connections with three other communities, as listed in **Table 2** and indicated in **Figure 2**.

Table 2. Intercommunity Flows

City	Flow TO Arden Hills	Flow FROM Arden Hills
Mounds View	-	TCAAP Area
Roseville	58 services	53 services
Shoreview	-	2 services
Total	58 services	55 services + TCAAP

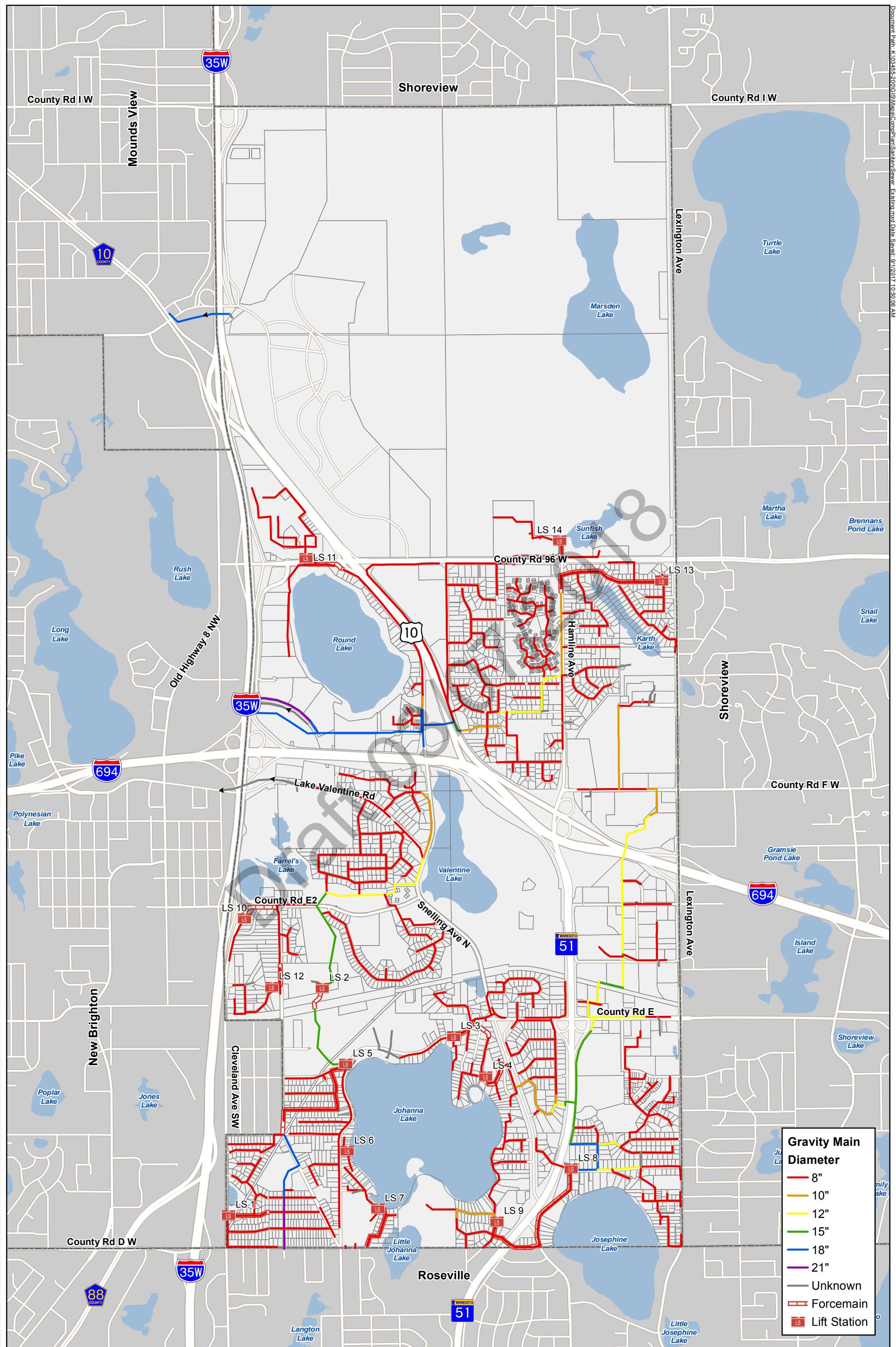


Figure 1 - Existing Sanitary Sewer System
2040 Comprehensive Plan
Arden Hills, MN

N

0 2,000 Feet
1 inch = 2,000 feet



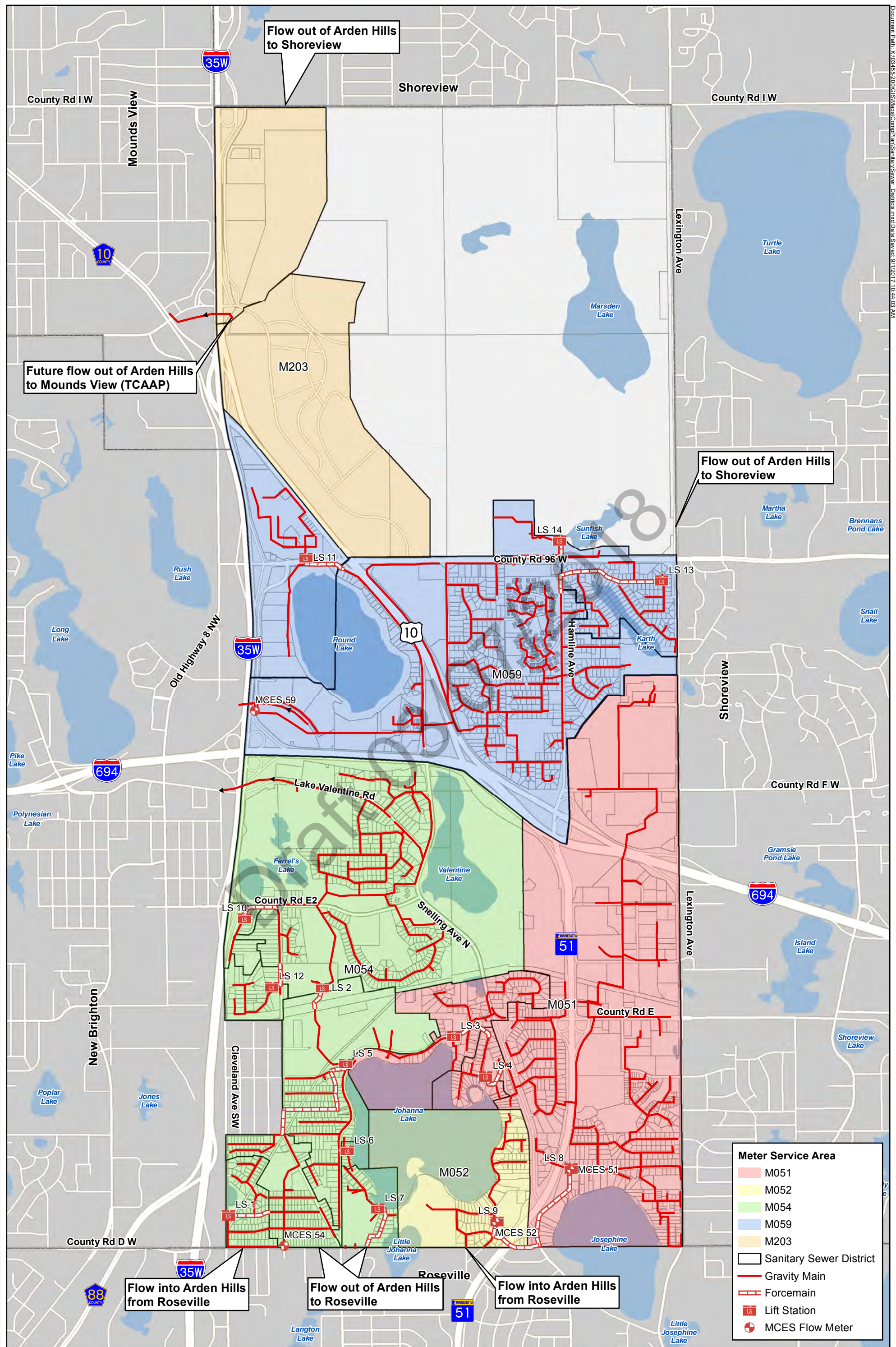


Figure 2 - Sanitary Sewer Districts
 2040 Comprehensive Plan
 Arden Hills, MN



Individual Sewage Treatment Systems

Nearly all properties within the City of Arden Hills are served by the public collection system. Currently, there are only two (2) individual sewage treatment systems (ISTS) in operation in the northwest corner of the City. The locations of these ISTS are shown in **Figure 3**. The two properties are:

- 5400 Highway 8 (State of Minnesota)
- 5420 Highway 8 (State of Minnesota)

These two State of Minnesota properties are exempt from City requirements. The TCAAP development includes a proposed sanitary sewer extension which will be able to serve these two facilities, enabling the abandonment of their ISTS.

The City Code requiring connection to the public collection system is excerpted below.

1010.02 Connections Required.

Subd. 1 Existing Buildings. Any building used for human habitation and located on property adjacent to a sewer main, or in a platted block through which the system extends, shall be connected to the municipal sanitary sewer system within two (2) years from the date on which a connection is available to the building.

Subd. 2 New Buildings. All buildings constructed after the adoption of this code within the City on property adjacent to a sewer main or in a platted block through which the municipal sanitary sewer system extends, shall be provided with a connection to the sewer system for the disposal of all human wastes.

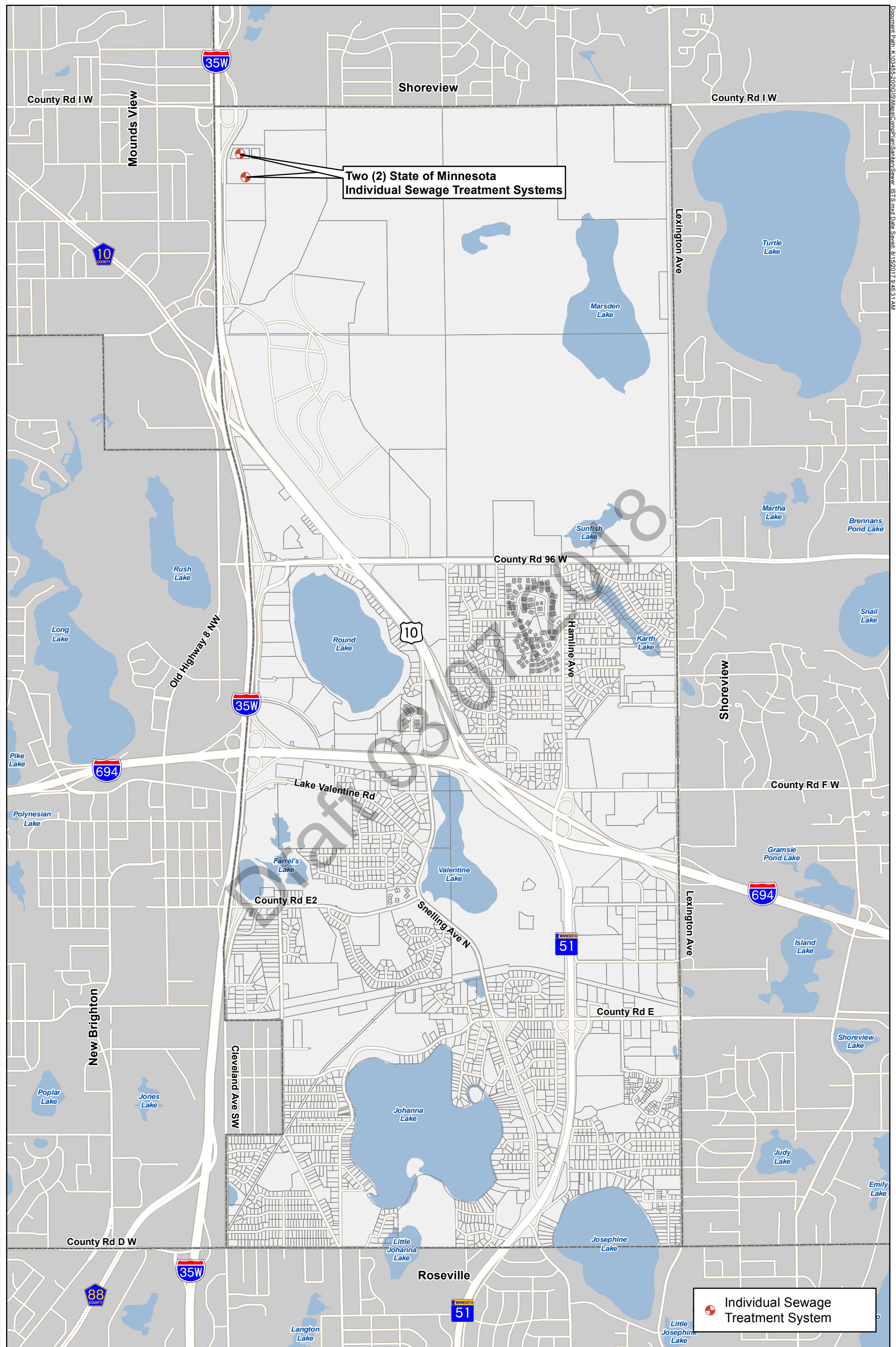


Figure 3 - Individual Sewage Treatment Systems
 2040 Comprehensive Plan
 Arden Hills, MN



0 2,000
 Feet
 1 inch = 2,000 feet



FORECASTS

Population

The Metropolitan Council publishes population and sewer usage forecasts for each city in the Metropolitan Area. These forecasts serve to help cities prepare infrastructure for growth and to promote continued maintenance of municipal infrastructure. The forecast data in **Table 3** is from the Metropolitan Council's Local Planning Handbook Community Page for Arden Hills and includes the total and sewer population, number of households, and employment. In the case of Arden Hills, where effectively the entire City is sewer, these values are the same.

Table 3. Population Projections

Year	Total & Sewered		
	Population	Households	Employment
2010	9,552	2,957	12,402
2020	10,000	3,200	15,000
2030	12,000	4,100	16,300
2040	13,500	4,600	17,500

**Interpolated values*

These projections are separated by MCES Meter Service Area in **Tables 4-A** and **4-B**.

Table 4-A. Projections by Meter Service Area & Interceptor

Year	M051 1-RV-432			M052 1-RV-432			M054 1-RV-431		
	Pop.	Hhds.	Empl.	Pop.	Hhds.	Empl.	Pop.	Hhds.	Empl.
2010	1,999	619	7,158	264	82	1,579	3,334	1,032	1,361
2020	1,999	619	7,258	264	82	1,579	3,334	1,032	1,361
2030	2,184	682	7,278	264	82	1,579	3,334	1,032	1,361
2040	2,184	682	7,298	264	82	1,579	3,334	1,032	1,361

**Interpolated value*

Table 4-B. Projections by Meter Service Area & Interceptor

Year	M059 2-NB-100			M203 4-NS-524		
	Pop.	Hhds.	Empl.	Pop.	Hhds.	Empl.
2010	3,955	1,224	2,304	0	0	0
2020	3,956	1,264	2,324	447	203	2,478
2030	4,008	1,368	2,414	2,210	936	3,668
2040	4,008	1,368	2,504	3,710	1,460	4,758

**Interpolated value*

Wastewater Flows

All of the wastewater flow from the City of Arden Hills is treated at the Metropolitan WWTP, and any increase in wastewater flow will be treated at the Metropolitan WWTP as well. **Table 5** lists the projected total average wastewater flow for Arden Hills from MCES and from this Sanitary Sewer Plan. Note that the projections used in this report are greater than the MCES projections since they rely on flow estimates for each parcel of developable land.

Table 5. Total Wastewater Projections

	2020 Average Flow (MGD)	2030 Average Flow (MGD)	2040 Average Flow (MGD)
MCES	0.93	1.04	1.09
Sanitary Sewer Plan	0.90	1.13	1.37

MGD = millions of gallons per day

Draft 03/07/2018

SANITARY SEWER DESIGN CRITERIA

Land Use

The City's existing and 2040 land use maps were used in the development of this plan. Detailed information and figures regarding Arden Hills' land use is included in the City's 2040 Comprehensive Land Use Plan. Using existing land use, metering data, and future land use information, current and future flows were calculated and divided by service area as described below.

Estimated Average Flows – Existing

To estimate the flows in trunk mains throughout the City, metering data was obtained from the Metropolitan Council. Flows were assigned proportionally to each service district based on the acreage of residential, mixed use, commercial/industrial/office, and institutional land within each area and typical flows per acre for each particular land use.

Estimated Average Flows – 2040 Build Out

Once average flows were estimated, future flows were projected based on the planned 2040 land use from the Land Use Plan. Parcels that are planned to be developed were assigned wastewater flow rates in accordance to their land use type. **Table 6** lists the assigned flows, which include design considerations for inflow and infiltration (I/I). Refer to the Inflow and Infiltration section of this report for more information about I/I as it relates to Arden Hills' sanitary sewer system.

Table 6. Assumed Wastewater Generation by Land Use Type

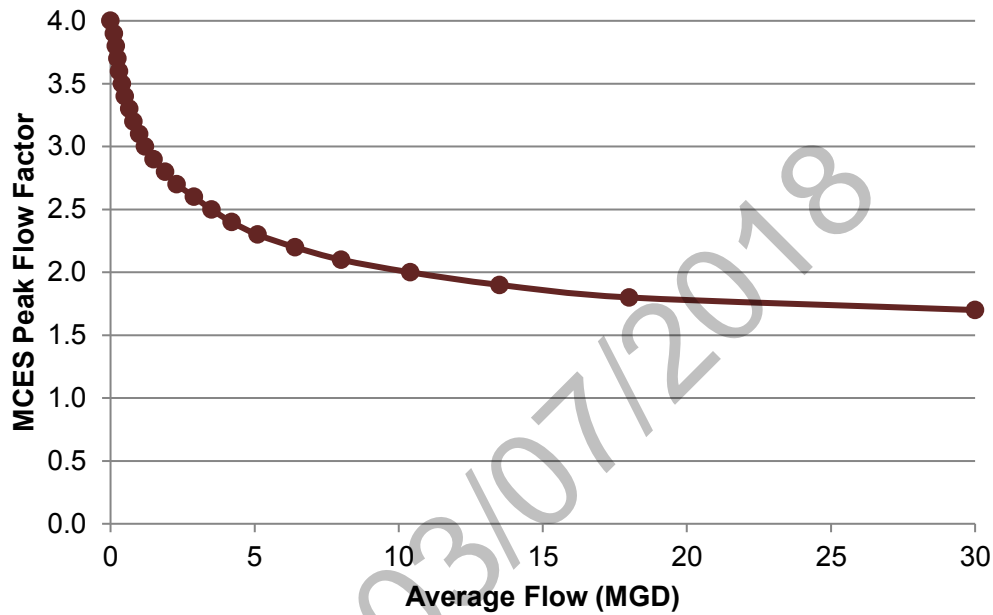
Land Use	Average Flow (gpd/acre)
Low Density Residential	720
Neighborhood Residential	900
Medium Density Residential	1,350
High Density Residential	1,890
Town Center	7,380
Public/Institutional	250
Commercial/Industrial/Office	800

Future flows from areas of redevelopment were added to existing flows to determine if existing pipe capacities will be sufficient. In locations in which development will lead to pipes that are under capacity, recommendations are made to address the issue. Areas that will need to be served in the future were evaluated to determine the required sewer diameters and improvements to serve these areas.

Peak Flow Factors

To ensure that the sanitary sewer system is capable of handling flow fluctuations throughout the day, peak flow factors are assigned based on average flows. The peak factors are provided by the Metropolitan Council and are based on average flow volumes. Pipes that serve small generator customers are more likely to experience large fluctuations in flows. Therefore, the peak factor decreases as average flow increases. The Metropolitan Council peak flow factors used in this report are shown in **Figure 4** below. These factors include consideration of inflow and infiltration.

Figure 4. MCES Peak Factors for Sanitary Sewer Design



SANITARY SEWER TRUNK RECOMMENDATIONS

The proposed future sewer system for the City of Arden Hills, including gravity mains, forcemains, and lift stations, is shown in **Figure 5**, as follows. The required infrastructure additions were determined based on the areas that the City is planning to redevelop by 2040. This report includes only oversized sewer lines (greater than 8-inch) and does not depict lateral lines. The design and siting for lateral lines should be completed in conjunction with development plans and platting. The location of such lines will be dependent on parcel layout and the design of new roads. It is possible that small scale lift stations will be required within developments.

The exact alignment of the proposed mains and lift stations may change during the design phase of each project. The purpose of this report is to provide the City with a document that can be used to plan for large infrastructure additions and replacements.

Lift Station Analysis

The estimated 2040 peak flows and subsequent remaining capacity for each of the City's fourteen (14) lift stations are shown in **Table 7**. The peak flows listed include the pumping rates of any lift stations directly upstream in order to be conservative. All lift stations are projected to have adequate pumping capacity to convey peak wastewater flows through the year 2040.

Table 7. Projected 2040 Peak Flows by Lift Station

Lift Station	Pumping Capacity (gpm)	2040 Peak Flow (gpm)	Remaining Capacity (gpm)
LS 1	240	28	212
LS 2	970	647	323
LS 3	240	52	188
LS 4	240	218	22
LS 5	660	473	187
LS 6	80	3	77
LS 7	220	86	134
LS 8	1,170	1,050	120
LS 9	280	81	199
LS 10	80	21	59
LS 11	350	204	146
LS 12	120	33	87
LS 13	460	87	373
LS 14	180	16	164
LS 15	*	1,010	*

gpm = gallons per minute

**Future lift station to serve the TCAAP development south of County Road H. The 2040 peak flow projected in this report is less than that listed in the TCAAP Site Redevelopment Infrastructure Preliminary Design Report from June 2015 because a lower flow per SAC unit of 180 gallons per day was used.*

Trunk Sewer Analysis

The estimated 2040 peak flows and subsequent remaining capacity in the City's trunk sewer lines are shown in **Table 8**. Trunk sewers of sub-districts served by a small network of 8-inch gravity main are not included in this analysis. None of the trunk gravity sewers are expected to exceed their capacity by the year 2040.

Table 8. Trunk Sewer Capacity Analysis

District	Location	Diameter	Capacity (gpm)	2040 Peak Flow (gpm)	Remaining Capacity (gpm)
LS 2	Perry Park	15"	1,120	647	473
LS 5	Yard Waste Collection Site	15"	1,120	473	647
LS 8	Ingerson Rd	18"	1,630	1,050	580
LS 9	Ridgewood Rd	10"	520	81	439
MCES 54	N Prior Ave	21"	2,250	605	1,645
MCES 59	Gateway Blvd	18"	1,630	1,223	407

gpm = gallons per minute

Draft 03/07/2018

MCES Interceptor Facility Forecasts

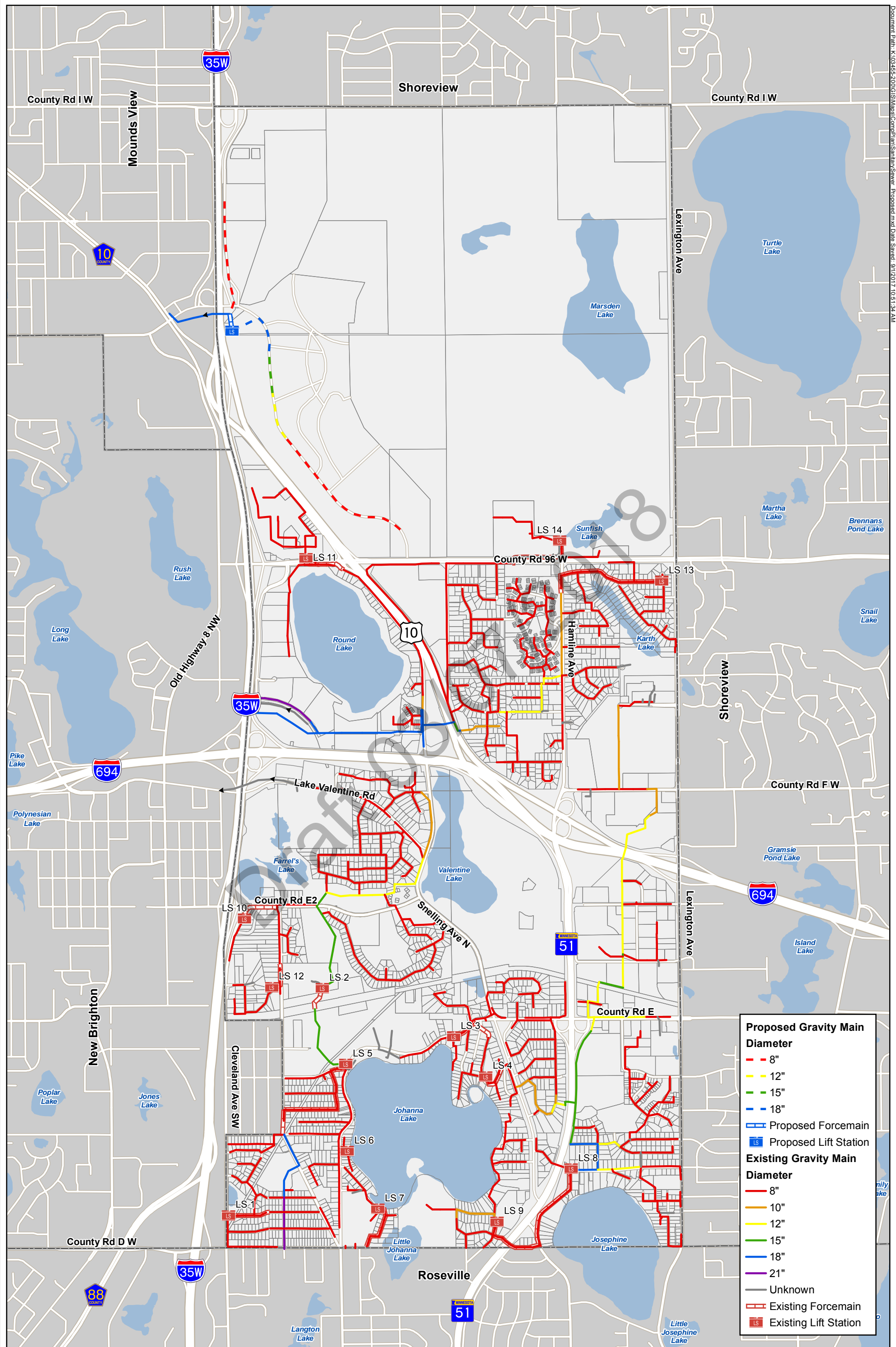
The MCES Interceptors used by the City of Arden Hills and the 2040 forecasted flows to those interceptors are listed in **Table 9**. The wastewater flow projections listed include only the flow generated within the City of Arden Hills.

Table 9. Projected 2040 MCES Interceptor Use

MCES Meter	MCES Interceptor	2040 Average Flow (MGD)	2040 Max Flow (MGD)
M051	1-RV-432	0.37	1.34
M052	1-RV-432	0.03	0.12
M054	1-RV-431	0.19	0.73
M059	2-NB-100	0.31	1.13
M203	4-NS-524	0.46	1.61

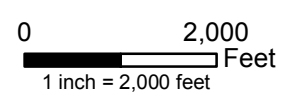
Individual Sewage Treatment Systems

As future development occurs and the sanitary sewer system is expanded to cover the northern portion of the City, the two (2) remaining State of Minnesota ISTS in the northwest corner of the City can be disconnected and properly abandoned.



Proposed Gravity Main Diameter	
8"	Red dashed line
12"	Yellow dashed line
15"	Green dashed line
18"	Blue dashed line
Proposed Forcemain	
Proposed Forcemain	Blue solid line
Proposed Lift Station	
Proposed Lift Station	Blue square with 'LS'
Existing Gravity Main Diameter	
8"	Red solid line
10"	Orange solid line
12"	Yellow solid line
15"	Green solid line
18"	Blue solid line
21"	Purple solid line
Unknown	Grey solid line
Existing Forcemain	
Existing Forcemain	Red dashed line
Existing Lift Station	
Existing Lift Station	Red square with 'LS'

Figure 5 - Proposed Sanitary Sewer System
 2040 Comprehensive Plan
 Arden Hills, MN



INFLOW AND INFILTRATION

General

Inflow is water, typically stormwater, which enters the sewer system through broken manhole covers, sewer cleanouts, sump pumps, foundation drains, and rain leaders. **Infiltration** is water, typically groundwater, which leaks into the sewer system through cracks in the sewer mains, laterals, joints, and manholes.

Water from inflow and infiltration (I/I) can consume available capacity in the wastewater collection system and increase the flow into treatment facilities. In extreme cases, the added flow can cause bypasses or overflows of raw wastewater. This extra flow also requires a larger capacity in the city's collection and treatment components, which results in increased capital, operation and maintenance, and replacement costs. As a sewer system ages and deteriorates, I/I can become an increasing burden on a City's system. Therefore, it is imperative that I/I be reduced whenever it is cost effective to do so.

In 2006, the MCES began an Ongoing I/I Program which requires communities within their service area to eliminate excessive I/I. The MCES establishes annual I/I goals for each community discharging wastewater into the Metropolitan Disposal System (MDS) based on average daily flows, adjustments for community growth, and I/I mitigation peaking factors.

The City of Arden Hills was assessed a surcharge in 2007 and initiated an I/I identification program that year to diagnose the extent and location of the I/I and to prepare a reduction plan. The City also had exceedances in MCES Metershed M051 from a June 21, 2013 storm and in MCES Metersheds M051 and M054 from a June 19, 2014 storm. Over the past ten years, the City has performed flow monitoring, smoke testing, televising, manhole rehabilitation, sump pump inspections, sewer lining, and sewer replacement. More details on these activities is provided in the I/I Reduction section.

Flow metering data is available for the MCES Meters that measure the City's wastewater flow, and an analysis of this data as it relates to I/I is presented on the following page. The City's strategies, programs, investments, and goals for reducing I/I are listed in this section as well.

I/I Analysis

Arden Hills' sanitary sewer system currently consists of approximately 49 miles of gravity main, 14 lift stations, and 3.6 miles of forcemain. Approximately 26 percent of the gravity mains have been lined in the last fifteen years, primarily in the southern half of the system. Approximately 38 percent of the residential housing in the City was constructed before 1970. The only I/I evaluation that has been done for pre-1970 era private services is the televising of their wye connection during the trunk main televising listed in **Table 11** in the next section. I/I reduction activities are discussed in greater detail in the next section.

The amount of clearwater flow generated within the City was estimated by calculating the average annual and peak month I/I rates, equal to the average wastewater flow minus the base wastewater flow, using data from 2012-2016. The average flow, both annual and monthly, was calculated from MCES meter data. The peak month flow was determined for each year from 2012-2016, and then those peak month flows were averaged to give the value listed in **Table 10**. The base flow was calculated as the difference between average dry weather flow and groundwater infiltration, based on hourly meter data from a period of nine days of dry weather (three days since a rain event) and high groundwater level (spring) in March 2017. The groundwater infiltration rate was calculated as the average flow from 1:00-6:00 AM over the same nine-day period.

Table 10. Estimated I/I Rate

Metershed	M051	M052	M054	M059	Total
Average Flow (MGD)	0.345	0.029	0.192	0.261	0.826
Peak Month Flow (MGD)	0.498	0.039	0.278	0.318	1.134
Base Flow (MGD)	0.142	0.015	0.078	0.108	0.344
Average Annual I/I Rate (MGD (%))	0.202 (59%)	0.014 (48%)	0.114 (59%)	0.153 (58%)	0.482 (58%)
Peak Month I/I Rate (MGD (%))	0.356 (71%)	0.024 (62%)	0.201 (72%)	0.210 (66%)	0.790 (70%)

I/I Reduction

The City's strategy for preventing excess I/I includes requiring all development to conform to City standards. Arden Hills City Code prohibiting the discharge of stormwater to the sanitary sewer system and requiring the disconnection of existing I/I sources is excerpted below.

Subd. 8 Prohibited Connections of Surface Water and Ground Water Discharge Facilities to the City's Sanitary Sewer System.

A. No person, owner, lessee or occupant of any parcel of land, building, or premises shall discharge, or permit to be discharged, directly or indirectly, into the sanitary sewer system any surface water or groundwater including water from roofs, yards, lawns, streets, alleys, groundwater sump pumps, footing tile, or other natural precipitation.

...

Subd. 10 Removal of Prohibited Connections; Surcharge; City Reimbursement. Any person, owner, lessee or occupant, and any plumber or building contractor who has presently made or permitted to be made, or shall make or permit to be made, any connection or installation in violation of subdivision 8, shall immediately remove such connection or correct such an installation. ...

Draft 03/07/2018

The City has several programs in place to both identify and reduce I/I and has completed projects nearly every year since 2007 to that end. A summary of these I/I reduction projects and their costs, as known, is given in **Table 11**.

Table 11. I/I Reduction Activities

Year	Project	Cost (if known)
2007	I/I Investigation, I/I Study by Bonestroo	
2008	Flow monitoring, smoke testing, televising, lift station pump calibration	
	Manhole Rehabilitation Project	
	Sewer Lining Project	
2009	Sump pump inspections, manhole inspections, televising	
	Manhole Rehabilitation Project	
	Sewer Lining Project	\$82,989.50
2010	Sump pump inspections, manhole inspections	
	Sewer Lining & Replacement Project (chimney seals)	\$111,765.00
2011	Sump pump inspections	
	Sewer Lining Project	\$399,444.50
2012	Grant applications for 2013	
2013	Sewer Lining Project	\$625,526.05
2014	Grant applications for 2015	
2015	Sewer Lining Project	\$507,465.50
2017	Sewer Lining Project	\$200,000.00
2018	Street & Utility Project (sewer lining and spot repairs)	<i>Est.</i> \$285,600

The City has ongoing reviews of flows and discussions with consulting engineers to develop the next stage of improvement plans. As noted above, project areas have been identified for 2018. Significant improvements have been made over the last ten years, and the City of Arden Hills remains committed to identifying and eliminating sources of I/I in its sanitary sewer system.

COST ESTIMATES AND FINANCING

The bulk of the improvements to the City's sanitary sewer system will be made in conjunction with TCAAP development, including new trunk gravity mains and one lift station. The City has also budgeted for routine I/I reduction work and other system maintenance and rehabilitation. The proposed capital improvements to the sanitary sewer system and their estimated costs are listed in **Table 12**.

Table 12. Capital Improvements

Year	Item	Estimated Cost
Biennial	Sewer Lining and Rehabilitation	\$400,000
2019	TCAAP Spine Rd Trunk Sewer & Lift Station	\$1,200,000

SUMMARY AND OUTCOMES

The analysis provided in this Sanitary Sewer Plan is aimed to provide the City of Arden Hills and the Metropolitan Council assistance in planning for wastewater collection and treatment, including the planned development of the TCAAP area. It is anticipated that the design flows and criteria outlined will be used for utility planning as development continues within the City. Tables and figures can be utilized to create budget-level estimates and schematic representations of infrastructure improvements, with specific sizing and routing to be determined during the design phase.