City of New Trier
Comprehensive Plan

December 2018

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I. INTRODUCTION

The Metropolitan Council updated its regional plan, *Thrive MSP 2040*, and issued "Systems Statements" to all jurisdictions in the seven-county metropolitan area in 2015. The systems statements identify changes in metropolitan system plans and basic planning issues that must be addressed in local plans.

Cities and Townships have had land use and zoning authority in Dakota County since the 1970s. The majority of rural City and Township comprehensive plans in southern Dakota County were initially completed and adopted in the late 1970's or the early 1980's, having been prepared and approved as a requirement of the Metropolitan Land Planning Act of 1976. All cities and townships implement their own zoning and subdivision ordinances.

The Metropolitan Land Planning Act of 1995 required that a review of local plans be completed every ten years to ensure that local plans are consistent with the regional plans prepared by the Metropolitan Council. A collaborative of 13 townships and five rural cities completed "A Composite Comprehensive Plan Update for Eighteen Cities and Township" in 2000 and was found to be consistent with the Metropolitan Council's Regional Blueprint. A collaborative of 12 townships and four rural cities completed the "Dakota County Rural Collaborative Comprehensive Plan" in 2009 and was found consistent with the *Development Framework* of the Metropolitan Council.

The City of New Trier participates in the Dakota County Rural Collaborative comprehensive planning effort. The Collaborative comprehensive plan is being updated based on *Thrive MSP 2040 Plan*. Eleven townships and five rural cities adopted joint resolutions in fall 2016 to participate in the joint planning process for the land use plan update and assistance in meeting local water management planning requirements. Participating jurisdictions include:

Castle Rock Township	City of New Trier
City of Coates	Nininger Township
Douglas Township	City of Randolph
Empire Township	Randolph Township
Greenvale Township	Ravenna Township
Hampton Township	Vermillion Township
Marshan Township	City of Vermillion
City of Miesville	Waterford Township

Components of the collaborative plan update include:

- Population, household, and employment trends
- Land use characteristics and agricultural land identification
- Future land use plan
- Solar protection and historic preservation
- Housing
- Parks and Trails
- Transportation
- Water Resources, including
    - Surface water management
    - Subsurface sewage treatment systems (SSTS) management
- Implementation

The City of New Trier's individual comprehensive plan is prepared in addition to the Rural Collaborative Comprehensive Plan. This individual comprehensive plan contains more details specific to the city and other community planning issues.

A. Goals and Policies

Goals and policies are official community positions that provide the basis for strategies to manage growth and change. Goals are general statements that reflect community values regarding the built and natural environments. Policies are more specific, official positions of communities that guide future planning decisions and implementation strategies. The goals for future growth management within the City of New Trier are outlined below.

1. Land Use Goals
    - Maintain a small town character and atmosphere
    - Prevent adjacent land areas to the city from developing in patterns inconsistent with the future growth and expansion of the city
    - Develop public infrastructure required to service growth in a fiscally responsible manner
    - Increase housing opportunities
    - Provide for economic development for job retention and growth, increased tax base and the provision of additional goods and services within the community
    - Protect and enhance the city's natural resources, such as waterways, woodlands and wetlands
    - Protect and enhance the natural resources within the city
    - Protect, preserve and enhance the historic structures within the community

2. Agricultural Goals
    - Minimize conflicts between land uses.
    - Protect the rural atmosphere of the area.
    - Minimize the impact on long-term agricultural areas by maintaining very low density residential development.
    - Preserve agriculture as a primary land use and economic opportunity in the area.
    - Minimize the conversion or disruption of agricultural land uses by limiting non-farm uses in long-term agricultural areas.

    Agricultural Policies:
    - Limit non-farm residential development densities in long-term agricultural areas to one home per quarter-quarter section.
    - Encourage farm practices that are consistent with conservation methods.
    - Support and encourage incentives that will maintain and enhance farming operations and agricultural land use.
    - Limit home occupations from expanding into non-agricultural businesses that should be located in cities or areas with appropriate services and facilities.
    - Promote right-to-farm provisions and protection in long-term agricultural areas.
    - Support voluntary enrollment of land in the Agricultural Preserves Program in areas designated for long-term agriculture.
    - Prohibit development in the long-term agricultural area that requires public utilities or extensive public services.
    - Limit business development in long-term agricultural areas to businesses that directly serve or support agriculture or are located in areas clearly planned and designated for business development.
    - Promote MPCA's and other related or appropriate agency's "best management practices" for farmland to ensure that soils are protected and water quality standards are maintained.
    - Enforce uniform feedlot standards.

3. Residential Goals
    - Protect residential uses from potential impacts of incompatible uses.
    - Maintain the quality and character of existing residences.
    - Promote higher density housing, life-cycle housing, and affordable housing opportunities in the communities with public utilities.
    - Support affordable housing opportunities for all age groups.
    - Limit non-farm residences in areas designated long-term agriculture.
    - Educate non-farm residents on the potential impacts from normal farm practices and the support for long-term agriculture as a primary land use in the area.
    - Maintain the rural atmosphere.

    Residential Policies:
    - Minimize conflicts between residential and non-residential uses through appropriate land use designation and official controls.
    - Require that the staging of new residential development in communities with public utilities is consistent with utility staging plans.
    - Limit residential development and densities consistent with planned land use designations and local ordinances.
    - Protect and maintain the quality of existing housing stock.
    - Participate in or promote county and state programs for housing maintenance and rehabilitation assistance to sustain and improve existing housing quality and retain affordable housing options.
    - Require development agreements for all platted subdivisions to ensure that the regulations of the community are met.
    - Promote minimum residential densities of three units per acre in new developments with access to public utilities.
    - Promote life cycle housing choices and affordable housing opportunities in communities with access to public utilities.

4. Commerce/Industry Goals
    - Promote the expansion of non-farm business development in area cities and designated rural centers.
    - Support agri-business expansion in the community and retain existing service industries.
    - Promote the economic viability and vitality of long-term agricultural operations.
    - Limit non-farm business development to areas not designated for long-term agriculture and areas where the provisions for higher levels of service may be available.

    Commerce/Industry Policies:
    - Ensure that business developments are designed in a manner that is compatible with adjacent land uses, functional, safe and aesthetically pleasing.
    - Evaluate business development opportunities that are consistent with local land use designations and zoning regulations.
    - Require adequate lot size, site coverage, setback, parking, access, environmental controls, screening and landscaping standards for business development in order to provide safe and convenient access, and compatibility with adjoining land uses.

5. Public Facilities and Services Goals
    - Cooperate and coordinate with neighboring communities and governments on issues that have the potential for affecting the long-term goals of the community.
    - Support the preservation of cultural heritage sites.

- Maintain responsible fiscal management based upon limited tax values and government aids.
- Protect the health, safety, and welfare of area residents and businesses.
- Maintain a level of public services appropriate for the rural/agricultural nature of the area, the needs and desires of the community, and the priorities of the community.
- Ensure that residents have the opportunity to offer input and have access to local government activities.
- Promote solar access and sustainable energy alternatives for residents and businesses.

Public Facilities and Services Policies:

- Implement existing and proposed plans, ordinances, and regulations to promote and protect the public health, safety, and welfare.
- Evaluate cooperative service delivery options with adjacent communities and appropriate agencies.
- Identify ongoing administrative requirements as communities grow.
- Provide cost effective delivery of services through periodic analysis and updates of services, operating budgets, and capital improvement needs.
- Identify and plan for cost-effective improvements to public facilities as needs arise.
- Evaluate public safety needs and service options as communities grows.
- Ensure the proper functioning of individual sewage treatment systems through proper installation and periodic inspections through programs established in cooperation with Dakota County.
- Cooperate with the watershed management authority on area-wide capital improvement needs.
- Maintain and improve existing public utility systems consistent with permitting standards.
- Accommodate provisions for the delivery of essential services that are consistent with need and the protection of public health, safety, and welfare.

6. Environmental Resources Goals
   - Ensure that all land use activities take place in harmony with natural systems.
   - Protect the open space quality
   - Reduce instances of harmful erosion, sedimentation, and pollutants from affecting water resources.
   - Protect surface waters and wetland areas to promote water quality, natural habitat areas, groundwater recharge, and recreational opportunities.
   - Protect the natural habitat qualities and biodiversity of the area.
   - Protect and preserve natural systems for the collection and dispersion of stormwater and runoff.
   - Protect existing woodlands throughout the area.
   - Protect the quality and quantity of the groundwater supply.
   - Protect high quality aggregate resources for future use.

   Environmental Resources Policies

   - Work cooperatively with Dakota County and other organizations that support the goals of protecting natural areas and corridors in southern Dakota.
   - Develop and implement a protection and management plan for natural areas that includes:
     - A cohesive system of natural areas connected by natural corridors
     - Areas identified and prioritized for preservation, protection, or restoration

    - A functional classification of natural areas based upon appropriate use, including recreation, preservation, hunting, agricultural, private.
    - Land protection strategies for targeted areas, including voluntary conservation plans, donation or purchase of conservation easements, transfer of development rights, purchase of development rights, acquisition.
    - Strategies and standards for the long-term management of natural areas.
    - A description of partnerships with other units of government to protect shared natural areas.
    - Innovative and appropriate natural area agricultural practices.
    - Funding and funding sources.
- Work with Dakota County and Dakota SWCD to identify, evaluate, and map locally important natural areas.
- Enforce provisions in local ordinances that provide for and promote the protection of regionally and locally-important natural areas, including:
    - Protection of undisturbed natural areas in southern Dakota County;
    - Protection of natural areas with scientific, cultural, or local significance;
    - Protection and enhancement of the ecological diversity of southern Dakota County.
- Involve citizens and stakeholders in the planning process and in programs for managing and restoring natural areas.
- Use park dedications or cash-in-lieu donations in new cluster developments to acquire high quality natural areas.
- Encourage permanent set-aside programs to create and protect open space, create wildlife habitat, protect surface and ground water quality, and reduce erosion and sedimentation in streams.
- Encourage the use of native species in plantings where soil disturbance requires long-term erosion control, through local ordinance regulation and WMO standards, on public lands, reclamation projects on private land, natural areas, and similar projects.
- Actively seek funding to acquire priority areas
- Support education of residents to increase the knowledge, skills, motivation, and commitment to work individually and collectively toward protecting natural resources.

7. <u>Recreation and Open Space Goals</u>
    - Preserve open spaces that enhance rural aesthetic values, protect natural habitat, allow recreational uses, and promote area-wide greenway corridor potential.
    - Support active youth and senior recreational opportunities and facilities in area cities and schools.
    - Support recreational opportunities that are not disruptive to long-term agriculture and are compatible with the rural character of the area.
    - Promote regional trails that provide connectivity between communities, regional parks, water resources, and significant natural features.

    <u>Parks, Recreation, Trails, and Natural Areas Policies:</u>
    - Design and maintain local parks to ensure public and property safety.
    - Periodically evaluate community parks, trails, and recreation needs and opportunities.
    - Coordinate regional parks planning and regional trail opportunities with Dakota County and adjacent communities.
    - Evaluate potential land gifts, conservation easements, and property forfeitures in areas with recreational development opportunities or natural resource protection that benefit the community and region.

- Review and evaluate opportunities to implement the Dakota County Farmland and Natural Areas Program (FNAP).
- Review and evaluate opportunities to implement the Dakota County Land Conservation Program.
- Identify the potential for trail corridors in the community that link local and regional trails, parks, natural features, and community destinations.
- Evaluate regional greenway concepts in cooperation with Dakota County and local participation opportunities.
- Monitor local land use development activities for compatibility with existing and proposed parks and recreation areas, natural features, and trails.

8. Water Resources Goals
   - Maintain and enhance natural systems and water resources for future generations to enjoy.
   - Protect the habitat and biodiversity of the area.
   - Protect water resources from improper land use resulting in unnecessary impacts.
   - Protect surface waters and wetland areas to promote water quality, recreation opportunities, aesthetic qualities, natural habitat areas, and ground water recharge.
   - Work with local watershed organizations to improve water resources.

   Water Resources Policies
   - Cooperate and coordinate actions with Dakota County regarding the enforcement of the County Shoreland and Floodplain Management Ordinance and local ordinances.
   - Cooperate and coordinate actions with North Cannon River Watershed Management Organization on water resource management.
   - Develop goals and policies related to the prevention of agricultural runoff and water quality, including educational programs in cooperation with the Dakota Soil and Water Conservation District.
   - Incorporate stormwater management practices and regulations through amendments to local zoning ordinances or separate ordinances, consistent with watershed plans and standards.
   - Require, as part of any proposed subdivision, that the natural drainage system remain intact to the extent practicable.
   - Adopt and enforce wetland alteration and mitigation requirements consistent with the Wetlands Conservation Act.
   - Prohibit development on slopes greater than 18%.
   - The natural drainage will be protected and used to the extent possible for storage and flow of runoff. Wetlands should be used as natural recharge areas. Pre-settling of runoff will be required prior to discharge to wetlands.
   - Temporary storage areas and pre-sedimentation ponds will be required to accommodate peak flows of water runoff. Newly constructed stormwater sedimentation ponds will be required to meet pond design standards of the Nationwide Urban Runoff Program (NURP).
   - Use MPCA's urban "Best Management Practices" (currently titled "Protecting Water Quality in Urban Areas") for all new or redeveloped land developments.
   - Require and review Stormwater Pollution Prevention Plans (SWPPP) that provide preventive measures for erosion and sedimentation related to proposed development.
   - Require and review NPDES Construction Permit documentation for all land disturbances exceeding one acre in area.
   - Require development proposals to include measures for preventing erosion, minimizing site alteration, minimizing and improving the quality of runoff, and addressing view impacts during and after construction.

- Establish and enforce standards and regulations restricting the clear cutting of woodland areas.
- Encourage development to conform to the natural limitation of the topography and soil so as to create the least potential for soil erosion.
- Proposed extraction operations shall be required to submit permit documentation and land reclamation plans consistent with standards outlined in local ordinances.
- If erosion is resulting from an agricultural operation, the Soil and Water Conservation District should be consulted regarding possible corrective or preventive measures.
- Wet soils and high water table areas will be regulated through the Zoning Ordinance.
- Adopt the North Cannon River Watershed District local water management plans by reference and update community ordinances as needed.
- Work with the Dakota Soil and Water Conservation District to enhance education and programs related to the prevention of agricultural runoff and water quality.
- Utilize services through the Soil and Water Conservation District to review predevelopment in steep sloped areas, wet soils, and high water table areas.

<u>Subsurface Sewage Treatment System Policies</u>

- Update local ordinances to incorporate amended MPCA Rules Chapters 7080-7083 standards
- Require existing individual sewage treatment systems that need to be expanded or replaced to meet the standards of MPCA Rules Chapters 7080-7083, as amended, and Dakota County Ordinance #113 standards and regulations. Only alternative systems identified in MPCA Chapter 7080 will be allowed in the communities.
- Maintain the joint management program for individual sewage treatment systems that includes:
    - Design, construction, and inspection of new systems;
    - Record keeping of existing systems;
    - Pumping and inspection of systems every three years;
    - Repair or replacement of systems found to be an imminent public health threat or failure.
- Require SSTS inspectors to maintain adequate training and certification regarding updated installation techniques and regulations relating to individual sewage treatment systems.

B. Purpose of the Plan

This Comprehensive Plan responds to the requirements of the Metropolitan Land Planning Act: Minnesota Statutes, Section 473.859. The plan is intended to guide future land use development, redevelopment, and other planning and policy concerns for the City of New Trier.

C. Process

Descriptive data were gathered through a variety of sources. This data includes existing land use, basic demographics of the area.

- The City of New Trier held an orientation meeting on February 13, 2017 to review the various issues addressed within the Collaborative Plan.
- The City of New Trier held an open house on October 10, 2017 to discuss future land use and other components of the comprehensive plan.
- The City of New Trier conducted a public hearing on March 12, 2018 to address both the Collaborative and the individual community plan.

D. History

New Trier owes its beginnings to German-Catholic immigrants who settled in the area in 1854. A group of about 17 families journeyed from the St. Paul area and made their claims in the northeast section of Hampton Township. Among the earliest settlers were Peter and Nicholas Doffing, John Gores, Barney Tix, Eugene Thien, John and Charles Kranz, John Moes and John Schaffer. Religion held a strong precedence in the settlers' lives. The first building erected was a log church to hold their services. Shortly thereafter, more buildings and homes were constructed to meet the needs of this young and growing area.

In 1874, the village of New Trier was named in memory of the early settlers' native town of Trier, Germany. The village officers included: Francis Gores, President; Joseph Oeiring, Clerk; Andrew Weisen, Peter Redlinger and Charles Hostert, Trustees. The village encompassed 75 acres of land and quickly became fairly developed. The first hotel, built in 1865 and called The New Trier House, was joined by a second hotel. There were two general stores, a hardware store, a meat market, a harness shop, two blacksmith shops, two shoemakers, a tailor and a wagon maker, one physician, a cheese factory and five saloons. As was generally true throughout Dakota County at this time, New Trier grew steadily - to a population of approximately 120 people. A post office was built in 1876 for the needed mail service. It received weekly mail from Hastings, 12 miles to the northeast and semi-weekly mail from Northfield, the same distance to the southwest.

Over the years, New Trier has remained a small rural service area. Many of the businesses, which existed in the City, have either relocated or died, yet the City survives because of the residents good feelings toward a small town setting. It is important for New Trier to strive to remain a small city, as well as to promote any worthwhile projects that will enhance the City's character. Many buildings which were constructed during New Trier's earliest years are still existent today. The historical significance of these buildings is not being ignored. St. Mary's Church, built in 1866 as an addition to the first church built in New Trier, still services the area. It has been placed on the National Register of Historic Places. St. Mary's School is also a building of historical significance. Located next to the church, it has been a school for the Catholic children of New Trier for many years. It is an architecturally beautiful building which assuredly stood out in importance in its earlier years. The Blacksmith Shop, located at 240th Street and Hogan Avenue, is another important historic building in the City. The importance of these buildings lies with the fact that they help to create a sense of historical pride within the City. The buildings recognized as historically significant play a major part in the development of New Trier's legacy. Because of this, the following policy is adopted by the City:

The City recognizes the historical significance of St. Mary's Church and School and the Blacksmith Shop and will support any public actions to maintain and preserve the historical heritage of the building and site.

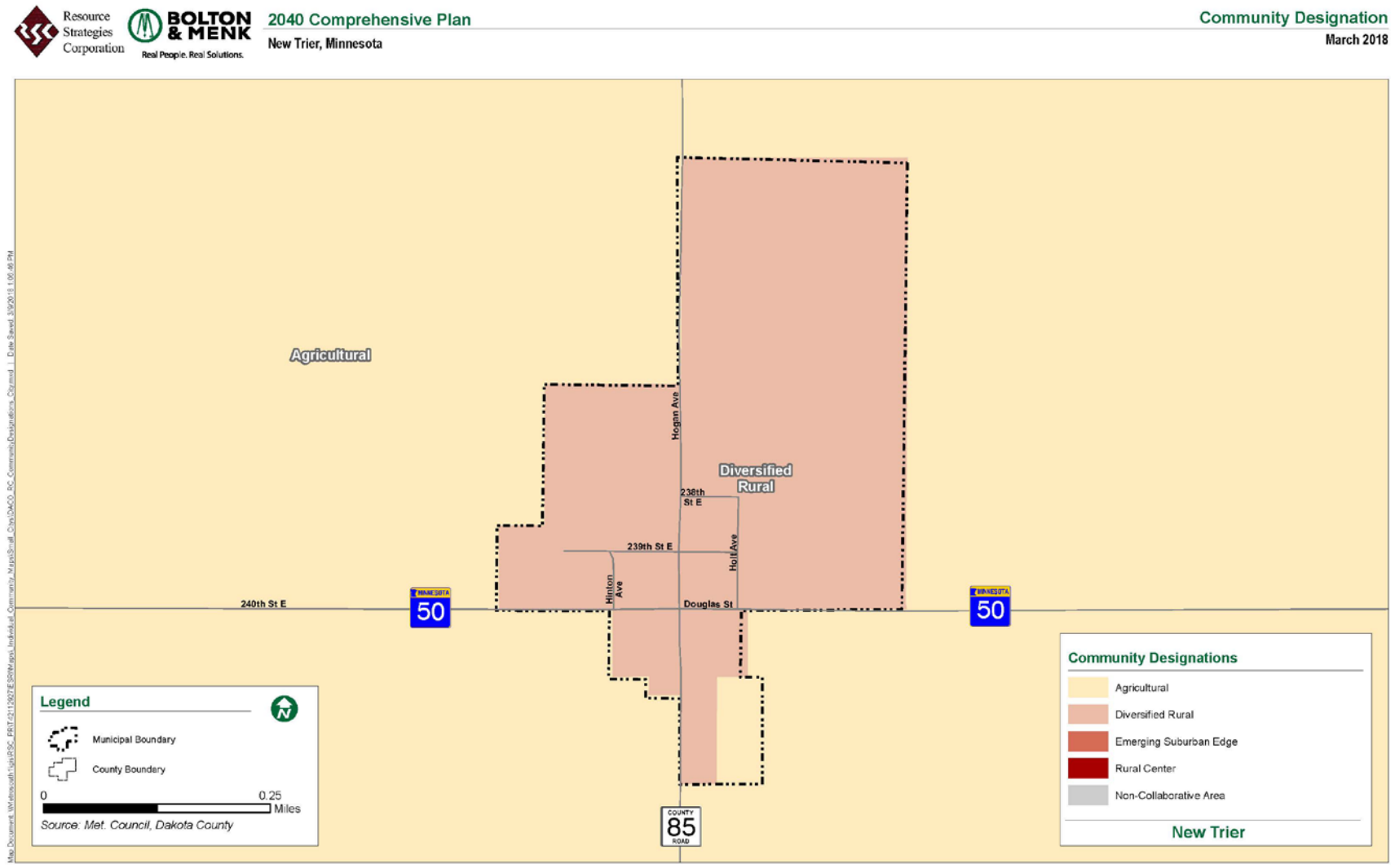
E. Regional Setting

The City of New Trier is located on 117 acres in southern Dakota County. The City is fully surrounded by Hampton Township and is located east of US Highway 52 on MN Highway 50.

The City of New Trier is designated as Diversified Rural by the Metropolitan Council. Diversified Rural Communities have areas that contain a variety of agricultural, residential, and other non-agricultural land uses. These areas both protect rural, agricultural lands while offering potential for future development. Development in Diversified Rural communities averages four units per 40 acres. The City recently annexed property that was previously guided by the Metropolitan Council as Agricultural property. This land has been identified as having residential development potential and is guided as such in the future land use map.

The City of New Trier has annexed property in the southern portion of the city. To ensure the entirety of New Trier is recognized as a Diversified Rural community, the designation needs to be extended to encompass the annexed area. The figure on the next page shows the current Diversified Rural designation from the Metropolitan Council and the current municipal boundary for the City. The recently annexed land in New Trier is still designated as Agricultural.

Figure 1: Community Designation from Metropolitan Council



Source: Metropolitan Council

II. LAND USE

A. Historical Figures

Table 1 identifies the historical population, household, and employment trends in the City of New Trier from 1970 to 2016. Between 1970 and 1990, there was a 37% decrease in population. The City's population rebounded slightly between 1990 and 2000 but has seen gradual decrease again in more recent years. The average annual rate of population decline in the City from 2000 to 2016 was 1%.

Table 1 – Historical Population, Housing & Employment						
Category	**1970**	**1980**	**1990**	**2000**	**2010**	**2016**
Population	153	115	96	116	112	109
Households	32	31	29	31	41	41
Employment	10	50	50	30	35	82

Source: Metropolitan Council

The household growth rate in the City remained relatively stable until 2010. There was a small increase in households in the City in 2010, which has remained constant since. Employment in the City grew rapidly from 1970 to 1980 but decreased between 1990 and 2000. The number of jobs in the City slightly increased between 2000 and 2010. Employment data for 2016 estimate 82 jobs in the City, which is a 134% increase from 2010 employment levels.

B. Forecasts

As of 2016, approximately 109 people lived in New Trier in roughly 41 households. Projected population, household, and employment trends are detailed in Table 2. Population in the City of New Trier is expected to grow, topping out at 130 in 2020 before decreasing again in 2030. Likewise, the number of households is anticipated to increase 50 by 2020 and remain constant between 2030 and 2040. Employment estimates for 2016 show employment in the City has already outpaced 2040 forecasts. However, this could be due to the small sample size within the City. These projections are subject to the ability of the City to support growth.

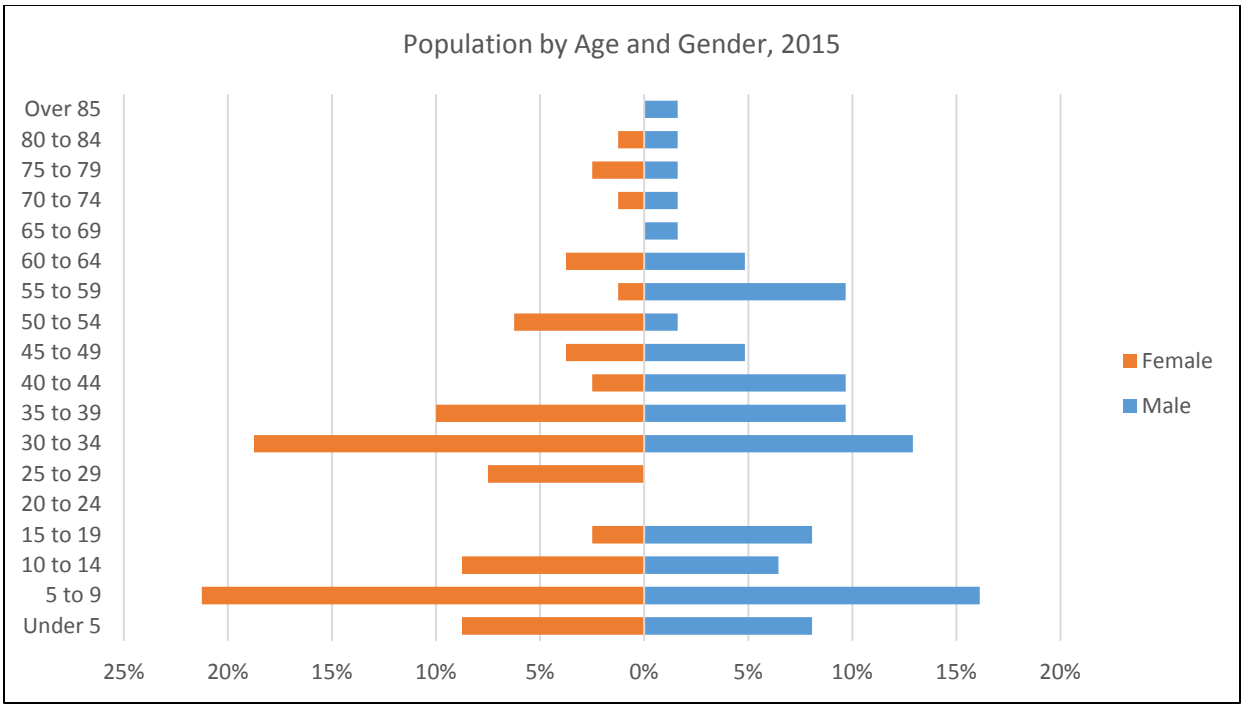
Table 2 – Projected Population, Housing & Employment Trends					
Category	**2010**	**2016**	**2020**	**2030**	**2040**
Population	112	109	130	120	120
Households	41	41	50	50	50
Employment	35	82	50	60	60

Source: Metropolitan Council

1. Demographics[1]

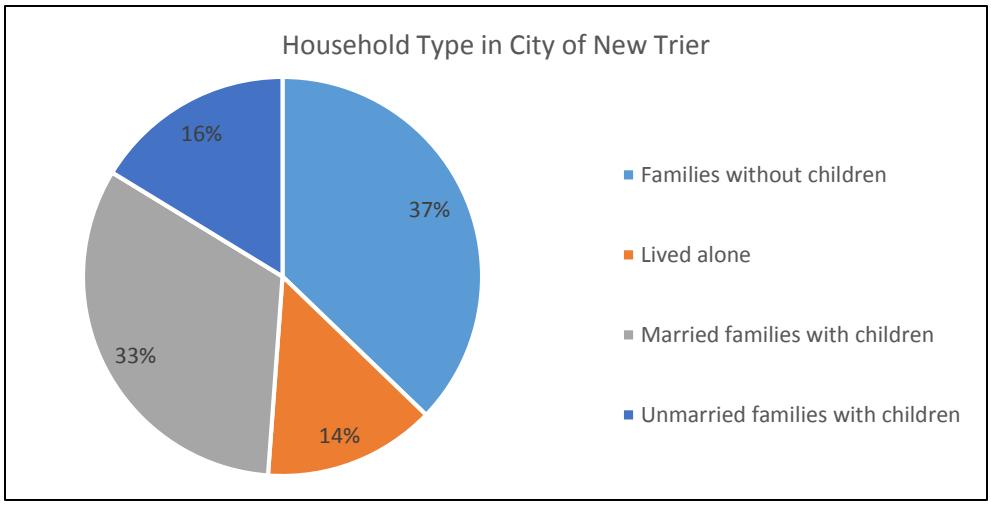
The figure below shows the estimated age and gender composition of the City of New Trier in 2015. The largest age group is 5 to 9 years old, representing almost 20% of the total population. Roughly 40% of the population is under the age of 20. The City's age distribution is younger than Dakota County as a whole; Dakota County has a larger percentage of persons over the age of 50 than New Trier.

[1] Demographic data for the City of New Trier should be considered with caution, since there is a higher margin of error due to small sample size.



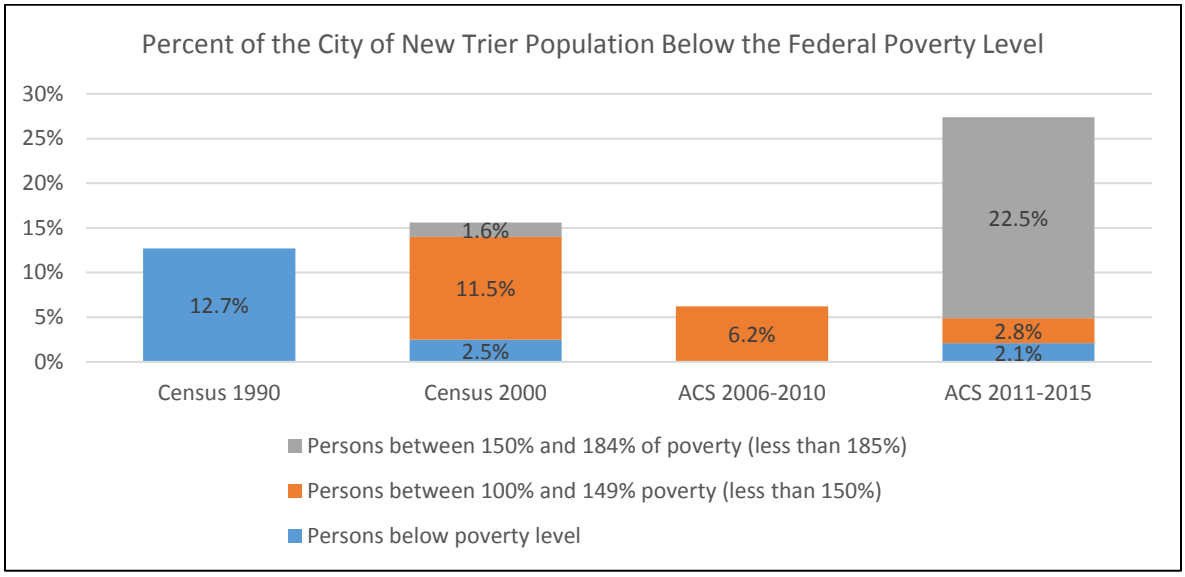
Source: Metropolitan Council Tabulation of American Community Survey Data

The figure below shows the household composition of New Trier. Over one-third of households (37%) are married families without children. This is a similar percentage when compared to Dakota County as a whole (35%). New Trier has fewer 'live alone' households (14%) then Dakota County (24%). About half of New Trier households have children, most of which are with married couples.



Source: Metropolitan Council Tabulation of American Community Survey Data

As shown in the figure below, about one-fourth of New Trier residents are between 100% and 185% of the federal poverty level while roughly 2% of residents are below the federal poverty level. The proportion of residents between 100% and 185% of the federal poverty level is higher in the City of New Trier than in the whole of Dakota County (10%), but there are fewer residents below the poverty level in New Trier than in the County (7%).



Source: Metropolitan Council Tabulation of US Census and American Community Survey Data

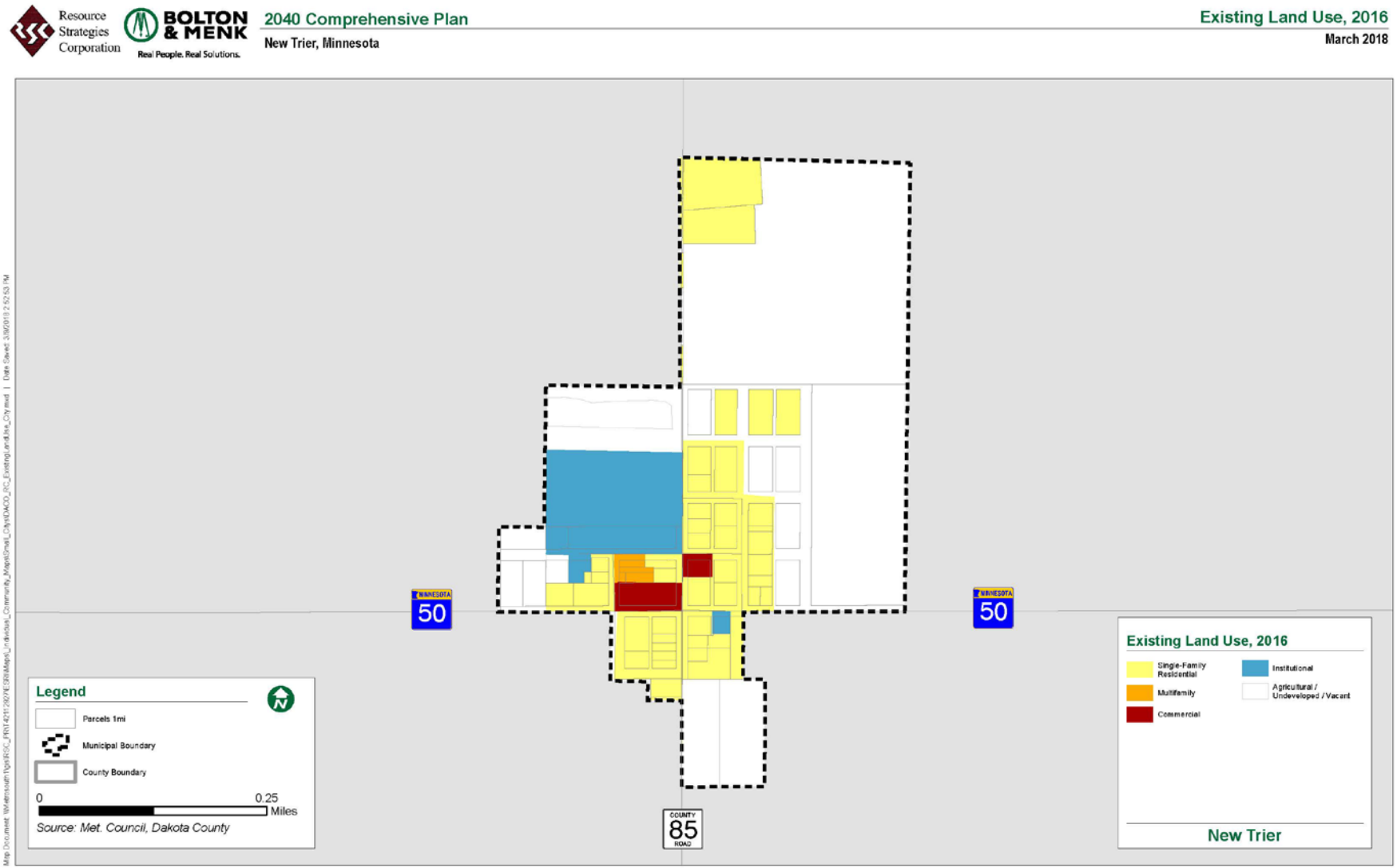
C. Existing Land Use

The existing land use in the City of New Trier is detailed in Table 3. The predominant agricultural or undeveloped land use reflects local policies to preserve agricultural land. This is accomplished primarily through implementation of density standards that limit consumption of agricultural land for non-agricultural uses while still allowing for the ability to provide opportunities for some residential growth. Single family residential is the second most common land use in the city, accounting for roughly 23% of the city's total acres. Existing land use is illustrated in the exhibit on the following page.

Table 3 – Existing Land Use Characteristics

Land Use	Acres	Percent of Total
Agricultural / Undeveloped	78.4	65%
Commercial	2	2%
Institutional	11.6	9.6%
Multifamily	0.8	0.6%
Single-Family Residential	28	23%
Total	**121**	**100%**

Figure 2: Existing Land Use



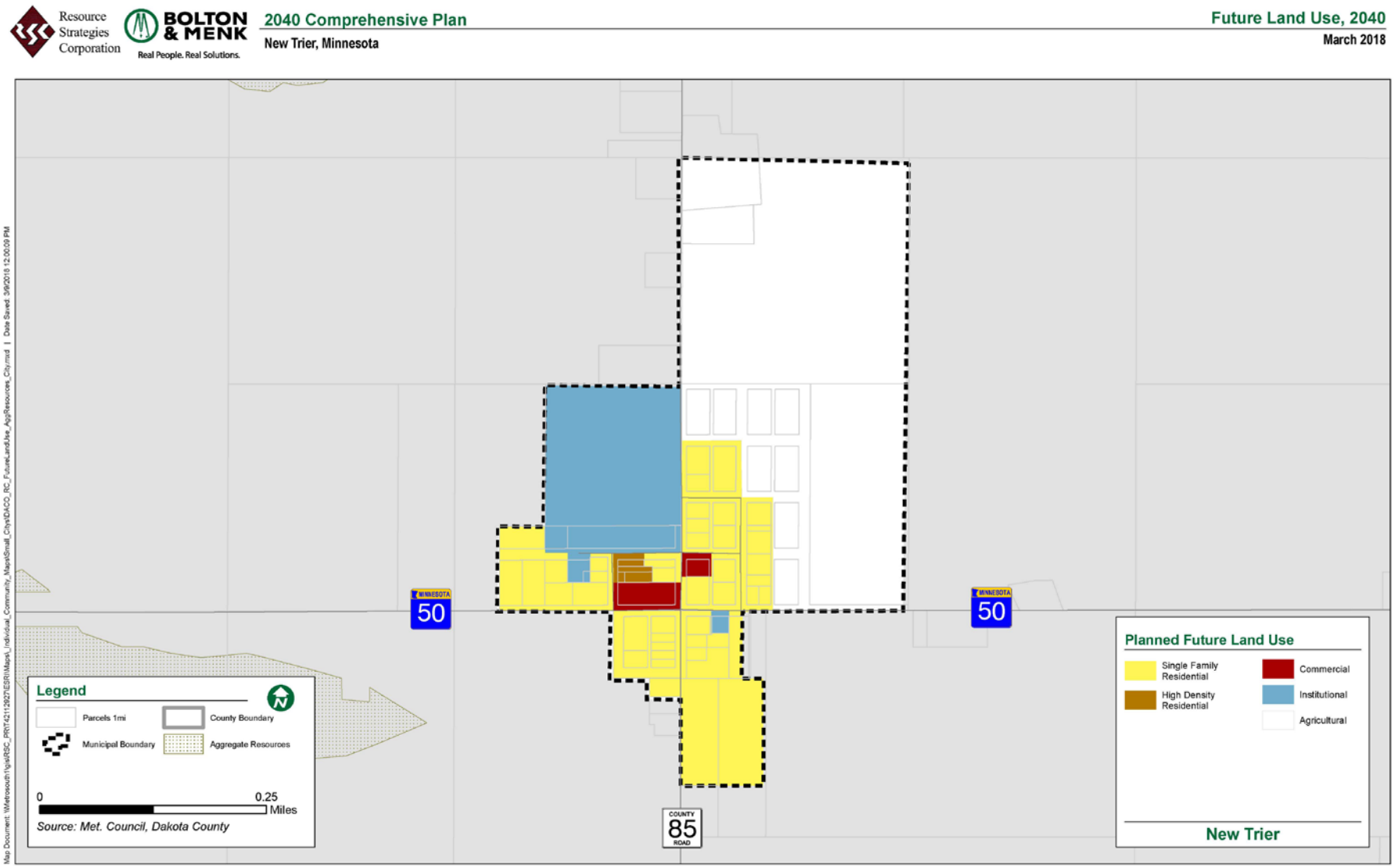
D. Future Land Use

The future land use categories in this section identify the specific rationale for growth management in the City of New Trier. The land use categories are the framework upon which the official controls, such as the zoning ordinances and subdivision regulations, are based and provide implementation for future growth. The land use categories identify the regulatory concepts for agricultural protection and residential growth. The 2040 Land Use Plan below identifies the specific land use categories within the City of New Trier. The planned future land uses shown on this map reflect previous community planning efforts as well as desired updates identified as part of the 2018 Comprehensive Plan Update process.

Table 4 – Planned Land Use Characteristics

Land Use	Acres	Percent of Total
Agricultural	69	57%
Commercial	2	2%
High Density Residential	0.8	0.7%
Institutional	18.5	15%
Single-Family Residential	30	25%
Total	**121**	**100%**

Figure 3: Future Land Use



Future Land Use Categories

The following land use descriptions will be used for providing the basis for these land use categories. They prescribe the types of uses, density and other performance standards for the purposes of maintaining compatible land uses within the City.

- **Agriculture or Undeveloped**

The Agriculture/Open Space District is anticipated to encompass about 69 acres of land. New Trier is interested in preserving agriculture in the northern and eastern parts of the city. Areas designated for Agriculture/Open Space District will permit a maximum density of one home per forty acres. The primary intent of this designation is to support the continuation of agricultural uses. The City will strictly limit the development of land in the district. It guarantees the City a certain amount of “open space” for the near future.

- **Single Family Residential**

The City of New Trier does not have municipal sewer services available that would facilitate higher density residential development. The land use guidance for this area is a density of two to three units per acre.

- **High Density Residential - Multifamily**

The multifamily area is located in the center of the city. The land use guidance for this area is a density of four to eight units per acre.

- **Commercial**

Commercial areas in New Trier are limited to existing developed areas. Other commercial and industrial development opportunities are limited to agri-business and service industries, which are allowed in the Agriculture area rather than separate commercial or industrial land use categories. Employment numbers for the commercial land use district is anticipated to be 8 to 12 employees per acre.

- **Institutional**

Institutional land uses are generally defined as land uses developed which serve a community's social, educational, health, cultural and recreational needs. They include government owned and operated facilities. Institutional uses include government facilities, churches, and schools. Employment levels for this land use is anticipated to be six to ten employees per acre.

Density Calculations

Housing density is a measure of the number of housing units in an area. It is measured on a per acre basis. Density calculations are based on the existing number and location of units. The land use calculations are based on planned land use categories. Table 5 provides the existing net residential density in the City while Table 6 shows the density ranges of residential land use categories and the range of acres needed to accommodate projected household growth.

Table 5 – Existing Net Residential Density (Based on Future Land Use Categories)

Land Use	Single Family Number of Units	Multi-Family Number of Units	Gross Acres	Undevelopable Acres*	Net Residential Acres	Existing Net Density Units/Acre
Agricultural	2	0	69	0.5	68.5	0.03
High Density	0	4	0.82	0	0.82	5
Single Family Residential	34	2	30	0	30	1.2
Total	36	6	100	0.5	99.5	0.4

**Undevelopable due to steep slopes, wetlands, right-of-way, etc.*

Table 6 – Residential Density Ranges

Future Land Use Categories	Density Range (Units/Acre)		Units Needed	Minimum Acres	Maximum Acres
	Minimum	Maximum			
Agricultural	NA	0.025	0	0	NA
High Density Residential	4	8	0	0	0
Single Family Residential	2	3	8	2.7	4
Total			8	2.7	4

Future land use guides properties that have development potential. It is anticipated that housing development will largely occur in existing vacant parcels in the Single-Family Residential land use district. Remaining units can be accommodated on available lots in the Agricultural zoning district. The Metropolitan Council projects an increase of nine households between 2010 and 2040. There is typically low housing vacancy in the city. As such, this staging development plan does not account for a housing vacancy rate; the projected number of households is considered synonymous with projected housing units. There are currently 42 housing units in the City of New Trier. Assuming growth to 50 households in 2040, the City will only need to add eight more housing units by 2040 to accommodate eight more households.

E. Staged Development or Redevelopment

The goal of the Staging Plan is to manage growth and guide the orderly and cost effective provision of infrastructure at a rate that is consistent with forecasted growth, at the same time responding appropriately to market conditions. The staging plan cannot force development to occur, but can be used as a tool to guide development appropriately. It should be clear that while there are legitimate reasons why communities should stage and time growth in an orderly and contiguous manner, there is nothing about adopting a staged growth plan that forces a private property owner to sell their land before they wish to do so.

The City of New Trier is capable of accommodating projected population, household, and employment growth. There is approximately seven developable acres that is or will be zoned Single Family Residential by 2040. Based on the minimum density of this zoning district (2 units per acre), about 14 housing units

can be accommodated on existing, developable land. This is sufficient to accommodate projected need for housing units (eight additional units).

Residential development is expected to take place on existing, vacant lots located in the western and southern portions of the City. (See Existing Land Use figure). These lots are currently agricultural but will transition to residential uses, given their proximity to existing neighborhoods and institutions. This preserves larger, contiguous agricultural parcels in the eastern half of the City for long-term agricultural use. The identified undeveloped lots are located along MN Highway 50 or County Road/CSAH 85. There may be a need to provide or allow access to internal lots from these roads.

Employment estimates for the City in 2016 are higher than the 2040 projected employment growth. The City is capable of accommodating this level of employment.

F. Natural Resources

Natural resources are beneficial to the social, environmental, and economic vitality of a community. "Natural resources" include undeveloped habitats, surface water and ground water resources, undeveloped open space, significant scenic and scientific areas, and, in some cases, agricultural land. "Natural areas" are areas of natural resources that are largely unaltered by modern human activity, where native vegetation is distributed in naturally occurring patterns. The City of New Trier has a strong history of commitment to protecting agricultural land and other natural resources in order to preserve the rural character of the area. This longstanding policy has provided an opportunity to further protect natural resources and the rural character of the area.

Providing for the protection of natural areas and corridors is directly related to the preservation of the rural character and economy of rural Dakota County. For example, the tools available to protect agricultural land are similar in many respects to those available to protect other natural resource areas. Currently, the City uses official controls to limit density of development in order to protect agricultural land. The Farmland and Natural Areas Program (FNAP) is a voluntary program in which the county and other partners work with willing landowners to achieve mutual land protection and natural resources stewardship goals through the acquisition of conservation easements or fee title. The major goal of the program is to protect large, contiguous agricultural areas, while protecting water quality and wildlife habitat benefits, and to protect, connect and manage priority natural areas. Land in this program are not shown on any maps in this comprehensive plan but is included in the County plan.

G. Special Resource Protection

There are no aggregate resources located in the City of New Trier.

St. Mary's Church, a colorful and striking building, stands near the top of Mary Hill overlooking the small town of New Trier. The Beaux Arts style church, designed by architect George J. Ries, was built in 1909. Ries served as apprentice architect in Bavaria before emigrating to St. Paul in 1881. He worked as a bricklayer until 1892, when he started his own construction company. He officially went into architecture in 1906. Perhaps his best known work is St. Agnes Church on Lafond Avenue in St. Paul. The Church of St. Mary is identified in the National Historic Register.

The City will promote preservation and reuse of historically significant buildings or sites. If development and redevelopment affects potentially existing, historic buildings or sites within the City, the City, as part of its review of the development, will check with the State Historic Preservation Office to determine if the affected structure(s) or site(s) is (are) on the National Register of Historic Places or has been determined to be historically significant either by the State or Federal government. The City will also adopt historic preservation measures into its local ordinance in order to further protect these historic structures.

H. Solar

The Metropolitan Land Planning Act (Minnesota Statues 473.859, Subd. 2) requires local comprehensive plans to include for the protection and development of access to direct sunlight for solar energy systems. The City of New Trier acknowledges the importance of protecting solar access from potential interference by adjacent structures. Due to the rural, low-density characteristic of the City, it is unlikely that solar energy systems would be precluded by structure interference. Zoning provisions within the City's ordinance also regulate density, height, and structure setback in residential areas and in commercial and industrial areas to provide adequate protection for solar energy access. It is the policy of the City of New Trier is to protect solar access through adequate zoning standards.

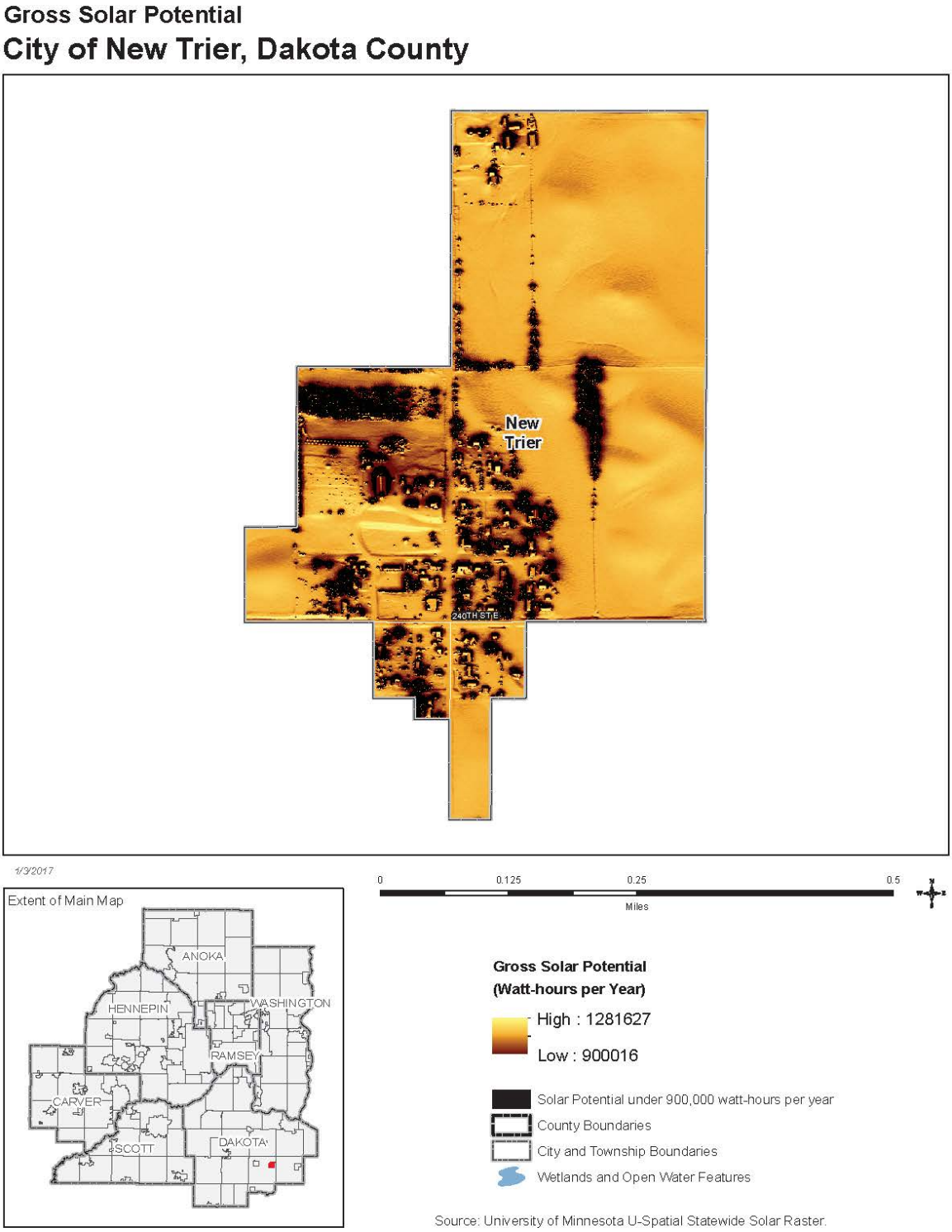
Solar potentials and the solar suitability exhibit is provided below. The solar potential calculations assume a 10% conversion efficiency and current (2016/17) solar technologies. The solar potential table is for illustrative purposes only and do not represent any planned solar development.

Table 7 - Solar Energy Potential

Gross Potential (Mwh/yr)	Rooftop Potential (Mwh/yr)	Gross Generation Potential (Mwh/yr^2)	Rooftop Generation Potential (Mwh/yr^2)
470,233	6,716	47,023	671

Source: Metropolitan Council

Figure 4: Solar Potential Map



III. HOUSING

A. Existing Housing

In 2015, the City of New Trier contained approximately 42 housing units according to the ACS Community Survey[2]. About 86% of units were single family and 14% were multifamily. Most homes are owner occupied (81%). About 95% of homes in the City are affordable to households at or below 80% area median income (AMI). However, about 45% of all households experience cost burden, suggesting a mismatch between the affordability of units and the income levels of unit residents. There are no publically subsidized housing units the City of New Trier.

Table 8 – Housing Conditions, 2015		
	Number of Units	**Percent of Total**
Total of Housing Units	42	100%
Housing Units		
– Owner Occupied	34	81%
– Rental	8	19%
- Vacant	0	0%
Single Family Homes	36	86%
Multifamily Homes	6	14%
Housing Units affordable to households with incomes at or below 30% Area Median Income (AMI)	2	5%
Housing Units affordable to households with incomes between 31 and 50% Area Median Income (AMI)	22	52%
Housing Units affordable to households with incomes between 51 and 80% Area Median Income (AMI)	15	38%
Households experiencing housing cost burden with incomes below 30% AMI	2	5%
Households experiencing housing cost burden with incomes between 31% and 50% AMI	0	0%
Households experiencing housing cost burden with incomes between 51% and 80% AMI	11	26%

Source: Metropolitan Council Estimates

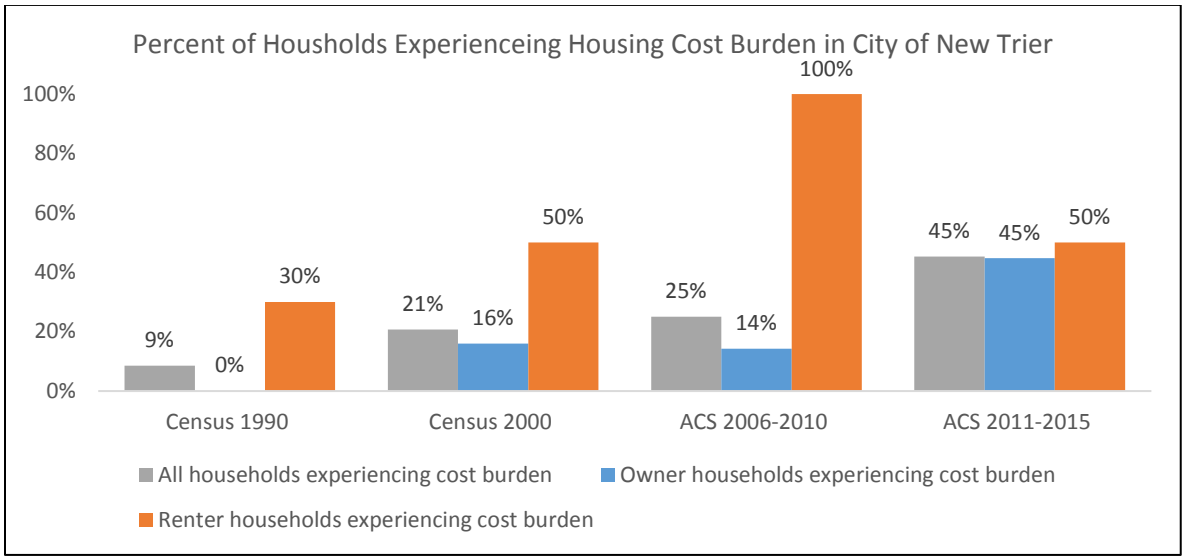
Table 9 – Total Households Experience Cost Burden		
	Households	**Percent of Total Household Type**
Existing households experiencing housing cost burden	19	45%
Owner households experiencing housing cost burden	17	45%
Renter households experiencing housing cost burden	2	50%

Source: Metropolitan Council

The graphic on the following page details housing cost burden in the City of New Trier since 1990. Housing cost-burden occurs when households spend 30% or more of their income on housing costs. The percentage of cost-burdened households in the City has increased steadily over the years. Cost burden for owner-occupied units slightly decreased between 2000 and 2010, but increased greatly between 2010 and

[2] Housing data for the City of New Trier should be considered with caution, since there is a higher margin of error due to small sample size.

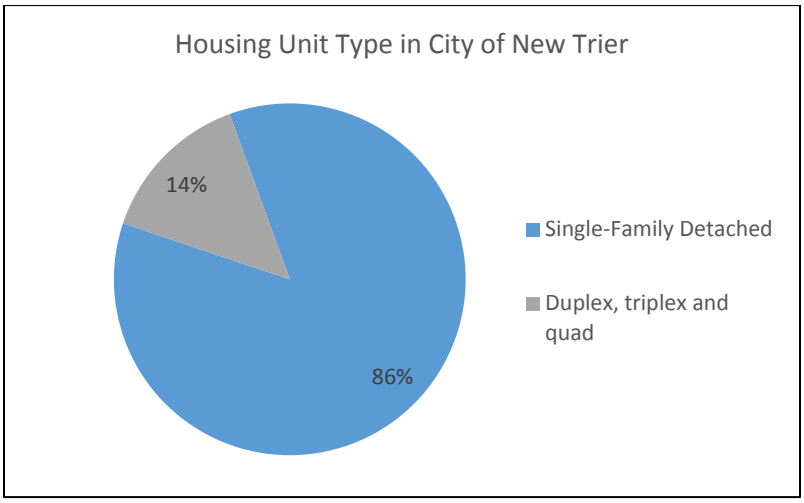
2015. Cost burden for renter households peaked at 100% in 2010. However, the small population size of the City also means there is a higher margin of error in sampling, meaning the percentage of cost burdened households may not accurately reflect current conditions.



Source: Metropolitan Council Tabulation of American Community Survey Data

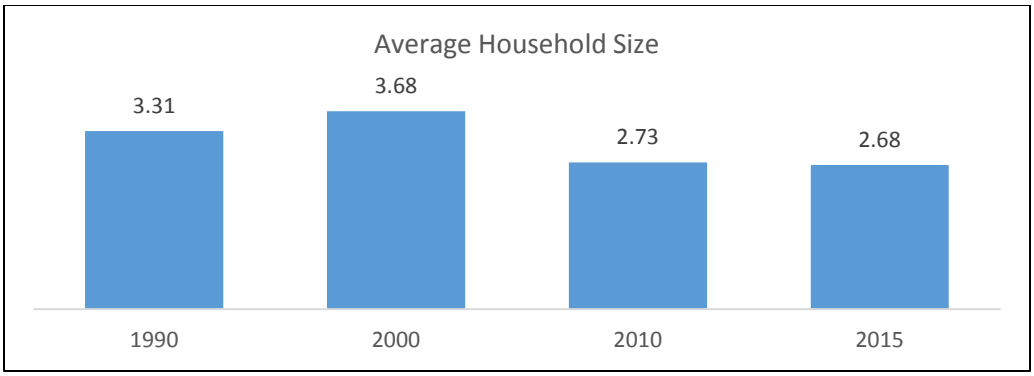
1. Housing Types

As noted above and detailed in the figure (left), most housing units in New Trier are single family, detached units. About 14% of housing units are duplexes, triplexes, or quads.



Source: Metropolitan Council Tabulation of American Community Survey Data

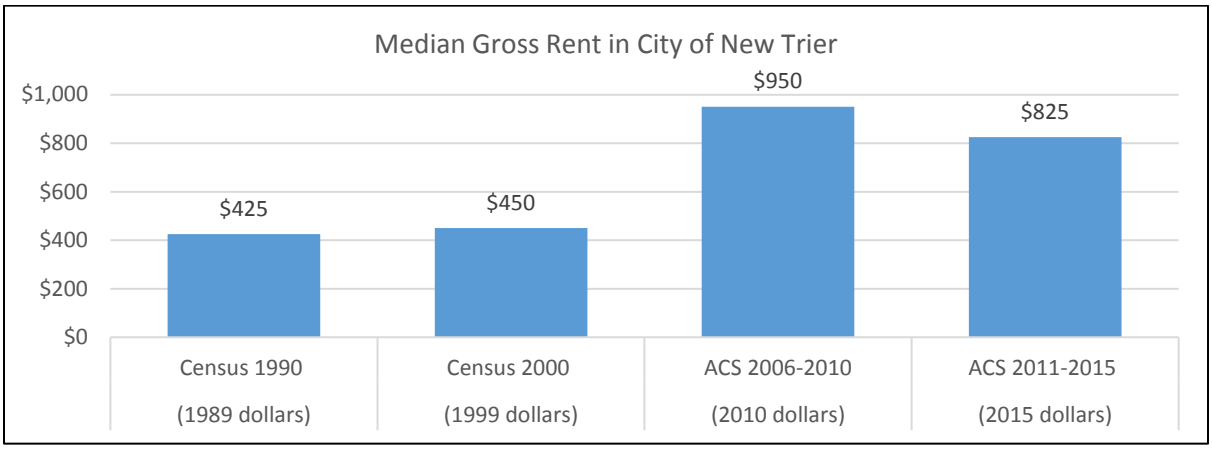
The average household size in the City of New Trier is 2.68 persons per household, which has decreased from 3.68 in 2000. This trend of decreasing average household size is being noted across the Twin Cities Metropolitan Area. If household sizes continue to decrease, more housing units will be needed to accommodate existing populations and the slight projected population growth.



Source: Metropolitan Council Tabulation of US Census and American Community Survey Data

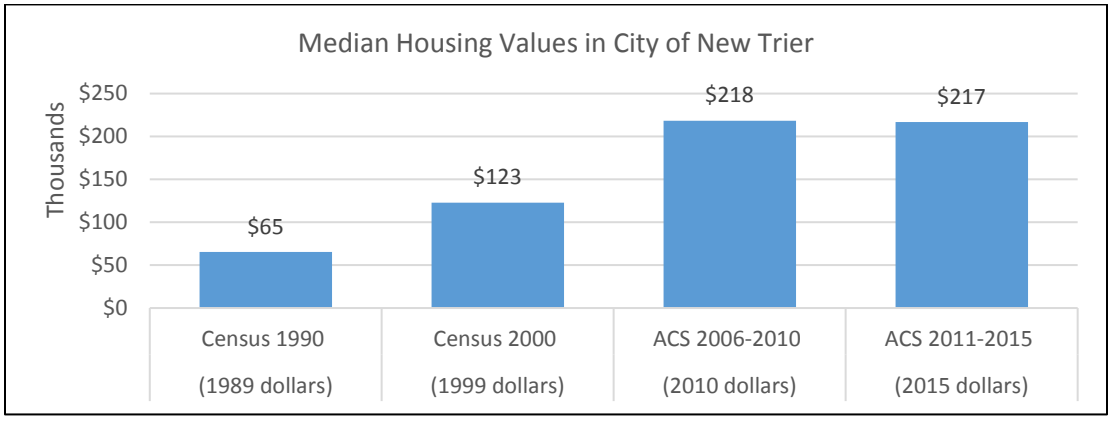
2. Housing Values and Costs

Median rent in New Trier have continued to rise with the largest increase (111%) occurring between 2000 and 2010. This may be due to the conversion of single family homes from owner to renter occupancy. This increase in rent is likely contributing to housing cost burden among renter households.



Source: Metropolitan Council Tabulation of US Census and American Community Survey Data

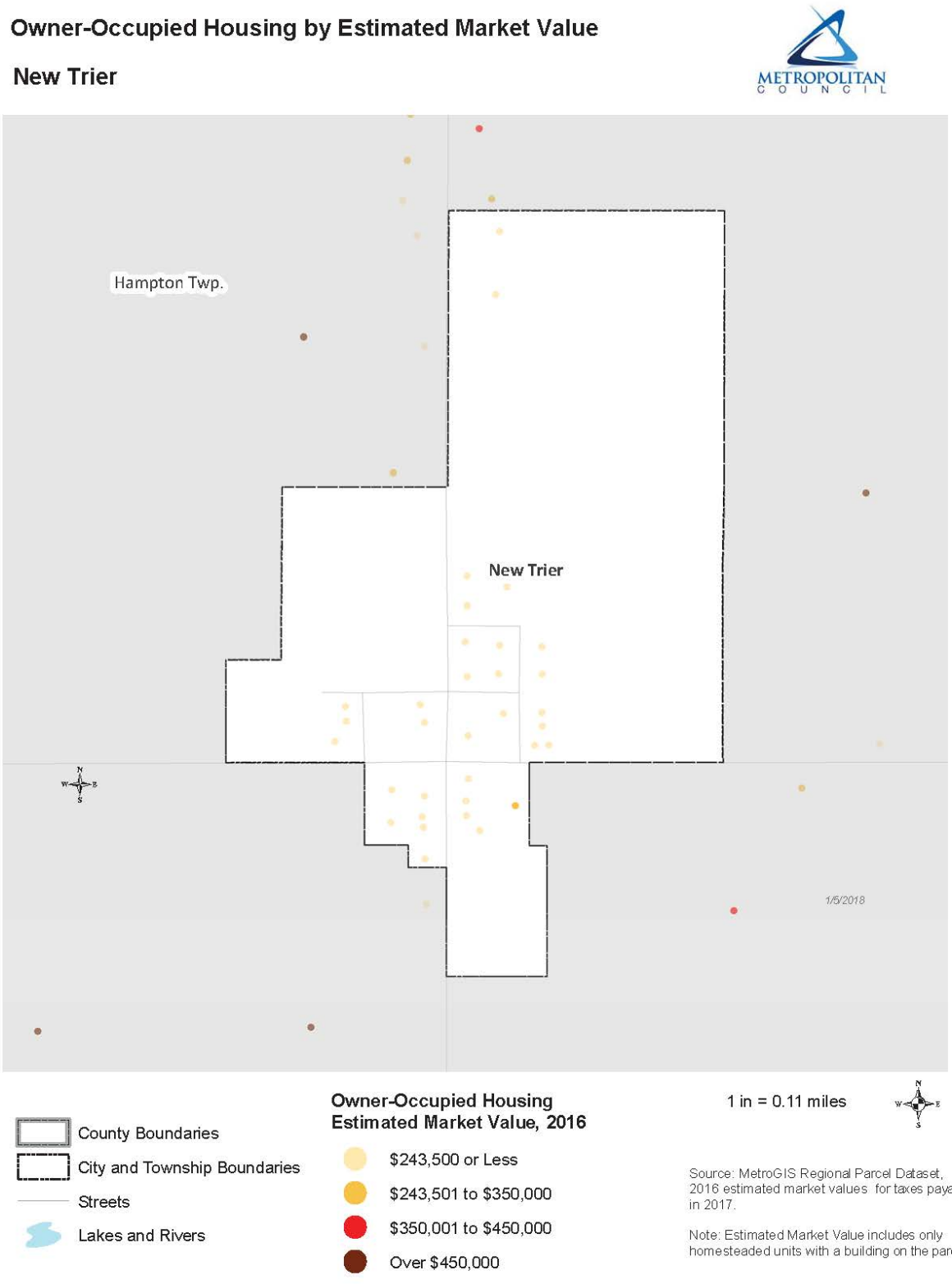
The City of New Trier has lower median housing values than Dakota County. This can help keep housing affordable. Historical housing values are provided in the following chart.



Source: Metropolitan Council Tabulation of US Census and American Community Survey Data

Figure 5 on the following page shows the values of owner occupied housing units.

Figure 5: Owner Occupied Housing Values Map



B. Projected Housing Needs

Projected household growth from 2010 to 2040 is depicted on Table 10. The City is expected to add about nine new households in this 30-year period. As the City's population is expected to be fairly stable over the next 30 years, additional housing units will likely accommodate smaller household sizes.

Table 10 – Projected Household Trends

2010	2020	2030	2040
41	50	50	50

Source: Metropolitan Council

C. Affordable Housing Allocation

The City of New Trier is not within the Metropolitan Urban Service Area (MUSA). As such, the City does not have an Affordable Housing Allocation reflecting the region's forecasted population that will need affordable housing.

D. Housing Implementation Plan

The City of New Trier will cooperate with the Dakota County Community Development Agency and the Minnesota Housing Finance Agency for home improvement, weatherization grant and loan programs, and homeownership resources. Affordable housing opportunities in rural communities are generally limited to the rehabilitation of and resale of existing homes due to limited sewer and low-density restrictions. The following tools will be considered on a case-by-case basis, as development occurs. New Trier must rely on the county community development authority to implement most of the available housing tools, because they do not have the statutory authority to implement these tools, or they may be cost prohibitive. Table 11 lists programs and resources offered by the Dakota County Community Development Authority.

Table 11– Housing Implementation

Housing Goal/Need	Available Tool	Opportunity and Sequence of Use	Potential Partners
Multi-Generational Community Living	Start-Up Loan Program	Assist first-time homebuyers with financing a home purchase and down payment assistance through a dedicated loan program	Minnesota Housing
	Home Improvement Loans	Assist homeowners in financing home maintenance projects to accommodating a physical disability	Dakota County CDA, Minnesota Housing
	ADU Ordinance	Communities will consider developing an ordinance permitting the construction of accessory dwelling units or guest homes in specific zoning districts	Property Owners
	Program or Framework	Work with groups and stakeholders to develop guiding principles, frameworks, and action plans to consider and incorporate the needs of older residents into development decisions	Senior advocacy groups or networks, residents

Maintaining Existing Housing Units	Home Improvement Loans	Assist homeowners in financing home maintenance projects like roof repair, plumbing and electrical work, accommodating a physical disability, or select energy efficiency improvement projects	Dakota County CDA, Minnesota Housing
	Foreclosure Prevention	Connect homeowners with resources, education, and counseling to prevent foreclosures	Dakota County CDA, Minnesota Housing
	CDBG	Communities may consider using a portion of their total CDBG allocation to develop and maintain a home/property rehab program for low and moderate income households	Dakota County CDA
Housing Affordability (all income levels)	Planned Unit Developments (PUDs)	Communities may consider planned unit developments to meet overall community land use, housing, density goals that may otherwise not be permitted through regular zoning requirements.	Property owners, developers
	Community Land Trust	Communities may consider partnering with relevant agencies to develop a community land trust or bank to create affordable housing options for households at or below 60% AMI	Dakota County CDA, developers, non-profit organizations
	Housing Bonds	Communities may consider issuing housing bonds to support developments including units affordable to households at or below 80% AMI.	Dakota County CDA, Minnesota Housing
	Housing Opportunities Enhancement Program (HOPE)	Dakota County has been providing gap financing to assist in the development and preservation of affordable housing throughout the county. Funding is provided in the form of a deferred loan, and requires a 2:1 match of other public or private funding sources. HOPE funds must be used to provide rental housing opportunities for households at or below 50% of area median income or homeownerships opportunities for households at or below 80% of area median income.	Affordable housing between below 80% AMI; since all Collaborative Communities except Empire Township do not have an affordable housing allocation for this income bracket, this program is unlikely to be utilized.

IV. PARKS AND TRAILS

A. Regional Parks and Trails

There are no regional, state, or federal parks located in the City of New Trier. There are also no regional trails located in New Trier. There are no plans for regional park facilities or planned regional trails in the City at this time. The Dakota Country Rural Collaborative Plan provides information about regional parks in nearby communities.

B. Local Parks and Trails

There are no local parks or trails located in the City of New Trier. There are recreation amenities located at St. Mary's Catholic Church. The park land is owned by St. Mary's Church and leased by the City of New Trier for park purposes. These amenities, detailed in Table 12, are publically maintained.

Table 12 – Park Amenities

Park	Park Size (Acres)	Walking/Hiking Trails	Picnic Area/Shelter	Playground	Ice Skating	Disc Golf	Restroom	Tennis Court	Ballfield	Basketball	Parking
Church of St. Mary's Ballfield (publicly maintained)	2.3		X	X					1	1	X

Figure 6: Parks and Trails

V. TRANSPORTATION

A. Overview

The primary purpose of this Transportation chapter is provide guidance to the City of New Trier residents and elected officials regarding the implementation of effective, integrated transportation facilities and programs through the 2040 planning timeframe. This chapter is consistent with regional requirements for transportation as captured in the Metropolitan Council's *2040 Local Planning Handbook.* The Dakota County Rural Collaborative Comprehensive Plan and the Dakota County 2040 Comprehensive Plan provide additional details regarding the roadway system in adjacent communities.

B. Existing Roadway Conditions

1. Existing Traffic Volumes

The most basic characteristic of a given roadway is the volume of traffic that it carries. Existing traffic volumes, or the most recent volumes available, on roadways within the City of New Trier are presented in Figure 7. This data was obtained from either MnDOT or Dakota County.

2. Jurisdictional Classification

Roadways are classified on the basis of which level of government has jurisdiction over them. Figure 8 depicts the existing roadway jurisdictional classification system in New Trier.

Figure 7: Existing Traffic Volumes

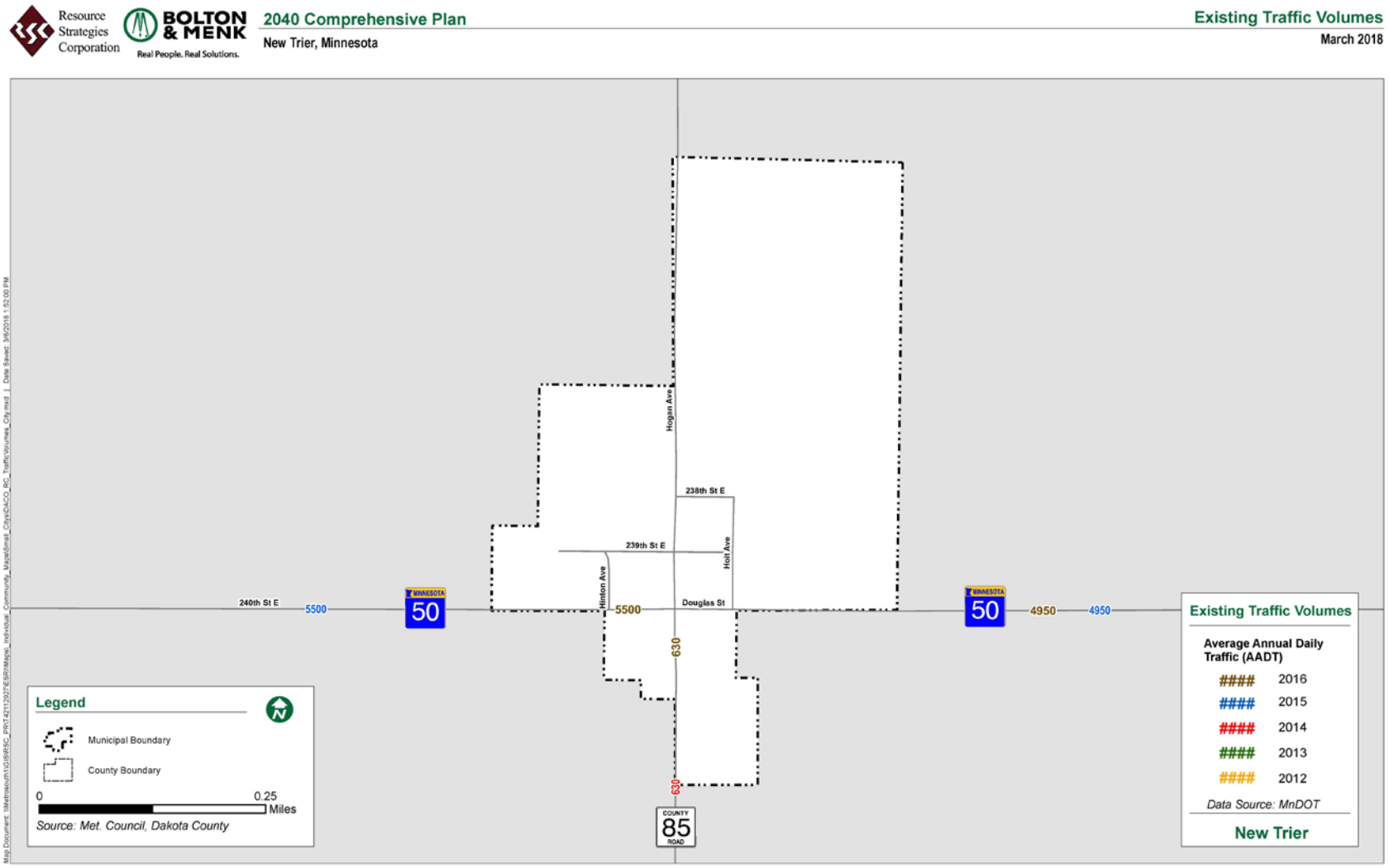
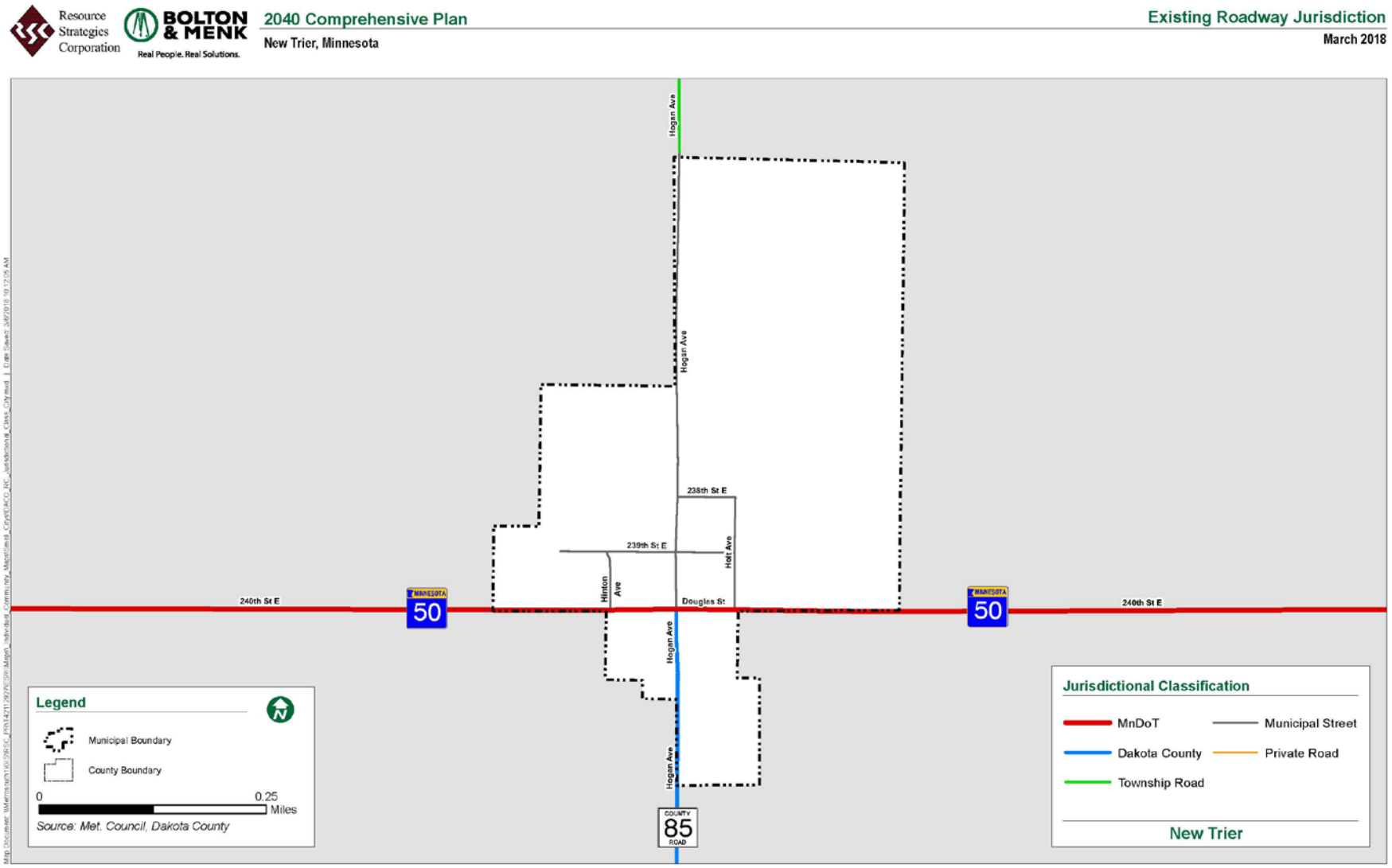


Figure 8: Existing Jurisdictional Classification



3. Functional Classification

Functional classification is a cornerstone of transportation planning. The functional classification system is a roadway network that distributes traffic from neighborhood streets to collector roadways, then to minor arterials, and ultimately the Metropolitan Highway System[3]. Roads are placed into functional categories based on the degree to which they provide **access** to adjacent land uses and lower level roadways versus providing higher-speed **mobility** for "through" traffic. Within this approach, roads are located and designed to perform their designated function.

The current roadway functional classification map for the City of New Trier as identified by the Metropolitan Council is presented in Figure 9**.** The roadway system in New Trier presently consists of three functional roadway classifications:

- "A" minor arterial
- Major collector
- Local street

The Metropolitan Council has defined four sub-categories of "A" minor arterials: reliever, expander, connector, and augmenter. These sub-categories have to do primarily with Metropolitan Council's allocation of federal funding roadway improvements but do not translate into specific design characteristics or requirements. In New Trier, all "A" minor arterials are connectors.

"A" Minor Arterials

These roads connect important locations within the City of New Trier with access points of the Metropolitan Highway System and with important locations outside the City. These arterials are intended to carry short to medium trips that would otherwise use principal arterials. While "A" minor arterial roadways provide more access than principal arterials, their primary function is also to provide mobility rather than access to lower level roadways or adjacent land uses. The "A" minor arterial roadways in New Trier are identified in Figure 9 and in Table 13, below:

Table 13 – "A" Minor Arterial Roadways

Roadway	From	To	Number of Travel Lanes
MN Hwy 50/ 220th Street W/ Hampton Ave/ 240th Street E	Empire Twp	Douglas Twp	2

Major and Minor Collectors

Collector roadways provide a balance of the mobility and land-use access functions discussed above. They generally serve trips that are entirely within a municipality and connect neighborhoods and smaller commercial areas to the arterial network. Minor collectors generally are shorter in length, with lower volumes and lower speeds than major collectors. Current collector roadways are identified in Figure 9 and in Table 14.

Table 14 – Major Collector Roadways

Roadway	From	To	Number of Travel Lanes
CR/CSAH 85/ Hogan Avenue/ Goodwin Ave	Northern Randolph Twp boundary	Nininger Twp	2

[3] The Metropolitan Highway System is made up of the region's principal arterials. These roads are part of the National Highway System and are owned and operated by MnDOT and the seven metropolitan counties (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington).

Figure 9: Existing Functional Classification

4. Summary of Relevant Transportation Studies and Plans

A summary of transportation studies relevant to New Trier's roadway system is provided below.

Dakota County Studies and Plans

Dakota County Pedestrian and Bicycle Plan (Current)
Dakota County is developing a pedestrian and bicycle plan to create a comprehensive, cohesive vision for countywide walking and bicycling networks. This plan will analyze existing conditions for walking and biking, develop a countywide pedestrian and bicycle system plan, and provide a toolkit of policies, strategies, and best practices for implantation. This plan will be completed in mid-late 2018.

Dakota County Principal Arterial Study (2018)
The Dakota County Principal Arterial Study studied potential highways in the county for designation as future principal arterials. This is intended to provide a safe and efficient transportation system in the long term and filling transportation needs. Presently, there are no principal arterials running east/west south of CR/CSAH 42, and there are no principal arterials running north/south west of US TH 52 within Dakota County. This limits access and connectivity. Traffic volumes, connections to other principal arterials, and the ability to support freight were considered as part of analysis. Corridors recommended for future principal arterial designation within the Rural Collaborative include:

- US Highway 61
- MN Highway 3
- MN Highway 50
- County Road 86

This study will be completed in early-mid 2018.

Dakota County 2030 Transportation Plan (2012)
Dakota County updated its 2030 Transportation Plan, adopted in 2008, to incorporate updates from the county's 2030 Comprehensive Plan, adopted in 2009, as well as relevant state and regional transportation plans, updated traffic modeling, and completed county and regional transportation studies. The county is in the process of updating its Transportation Plan as part of the county's 2040 Comprehensive Plan.

C. Roadway System Plan

1. Assumed 2040 Roadway Network

The roadway network assumed for the 2040 analysis includes the existing network, plus programmed and/or planned projects. There are no programmed or planned roadway projects in the City of New Trier. The Dakota County Rural Collaborative Comprehensive Plan discusses roadway projects and improvements in neighboring communities.

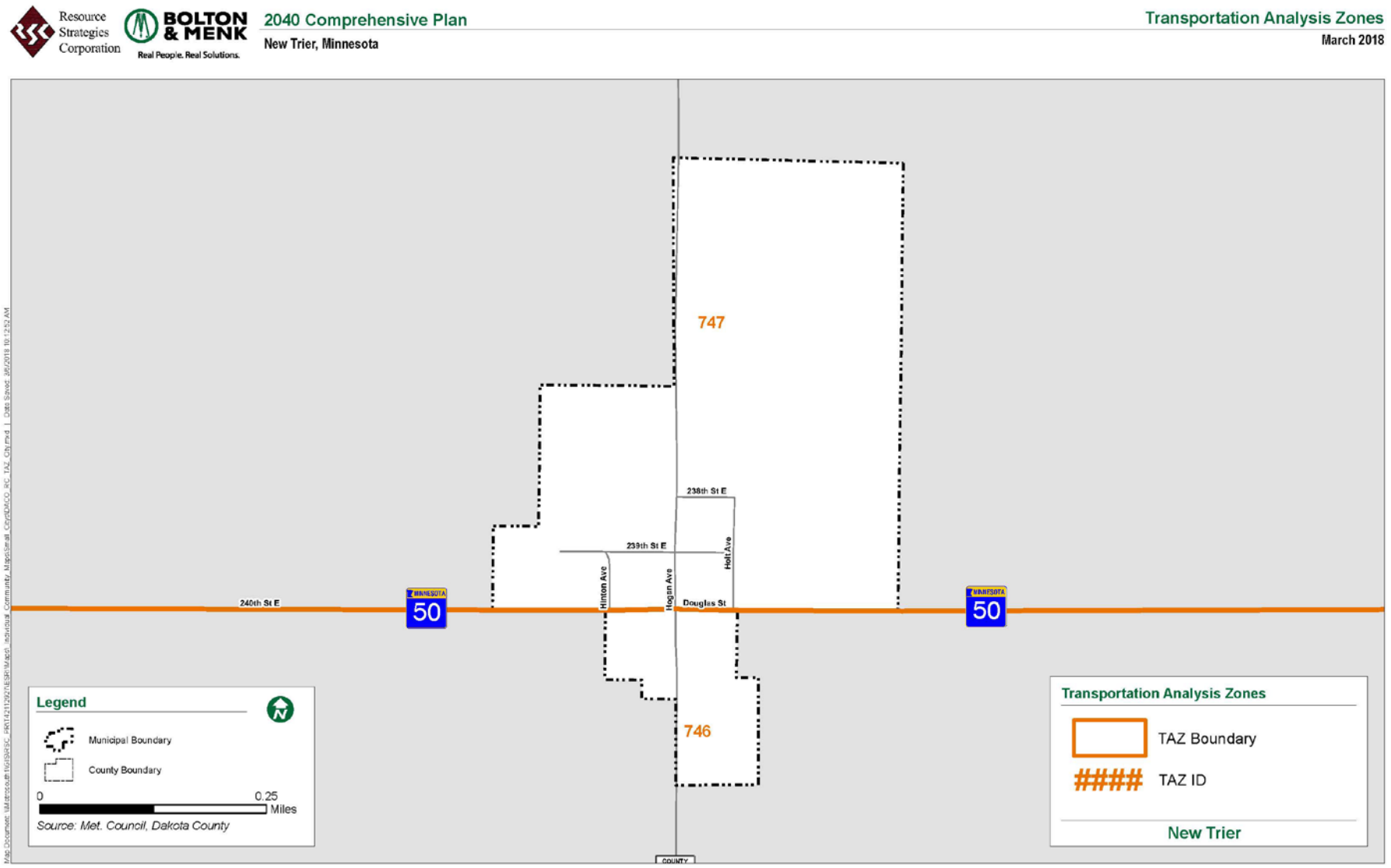
2. Assumed 2040 Land Use and Transportation Analysis Zone Information

Traffic projections are based on the use of Transportation Analysis Zones (TAZs). The TAZs for the City of New Trier, as defined by the Metropolitan Council, are presented in Figure 10. The anticipated land use patterns discussed in Chapter II of this Comprehensive Plan were assumed for the 2040 transportation projections. The 2040 land use map for the City of New Trier is presented in that chapter. The TAZ socioeconomic data projected for 2040 conditions are presented in Table 15. These numbers show projections for the full TAZ area; both TAZ 746 and 747 are shared between Hampton Township and the City of New Trier.

Table 15 – TAZ Data						
TAZ	*Year*	*Population*	*Households*	*Retail Jobs*	*Non-Retail Jobs*	*Total Jobs*
746	2010	28	12	0	3	3
	2020	38	15	0	10	10
	2030	35	15	0	12	12
	2040	35	15	0	13	13
747	2010	84	29	3	30	33
	2020	92	35	5	35	40
	2030	85	35	8	40	48
	2040	85	35	7	40	47

Source: Metropolitan Council

Figure 10: TAZ



3. 2040 Traffic Projections

2040 traffic projections were made using a combination of methods and sources including the following:

- Historic trend analysis for volumes
- Assessment of anticipated local and regional development patterns and associated TAZ information
- Discussion and coordination with Dakota County Transportation staff
- Review of other studies and plans for consistency

The projected 2040 traffic volumes are presented in the Dakota County Collaborative Comprehensive Plan.

4. Future Capacity Deficiencies

A planning-level analysis was performed to identify roadway segments where capacity problems are anticipated to occur by 2040. Based on the projected 2040 traffic volumes and the assumed 2040 roadway network, an analysis of anticipated future congestion conditions was performed. This analysis used the volume-to-capacity method. The volumes were taken from the 2040 projections discussed under the previous heading. The capacity is based on typical capacity levels for different non-freeway types and configurations of roadways present in the City of New Trier as summarized in Table 16.

Table 16 – Typical Traffic Capacity by Roadway Type/Configuration

Facility Type	Functional Classification	Planning Level Capacity (ADT)
Gravel Road	Local Road	1,000
2-Lane Local/Residential Road		1,700
Rural 2-Lane Highway	Major Collector, Minor Arterial, Principal Arterial	13,000

Based on the above table and projected 2040 traffic volumes, there are no roads at or approaching capacity in New Trier.

5. Future Functional Classification

There are no planned functional classification changes for roadways within the City of New Trier. Existing functional classification is presented in Figure 9.

6. Future Jurisdictional Classification

The Dakota County 2030 Transportation Plan identifies existing county roads that are candidates for jurisdictional transfer or turnback to local units of government. Such turnbacks will add responsibilities for additional roadway maintenance to local communities. None of the roads located in New Trier are turnback candidates, as identified in the Dakota County 2030 Transportation Plan.

7. Access Management

Access management refers to balancing the need for connections to local land uses (access) with the need for network-level movement (mobility) on the overall roadway system. Arterials generally have limited access in the form of driveways and low volume side streets because their role in the network is to support relatively long, high speed traffic movements; collectors allow a greater degree of access given their combined mobility/access function, and local streets have relatively few limits on access. Dakota County has identified and adopted guidelines from MnDOT for access locations on all major roadways, which are provided in the Dakota County Rural Collaborative Comprehensive Plan.

D. Transit Plan

1. Transit Market Area

The Metropolitan Council has defined Transit Market Areas based on the following primary factors:

- Density of population and jobs
- Interconnectedness of the local street system
- Number of autos owned by residents

In general, areas with high density of population and jobs, highly interconnected local streets, and relatively low auto ownership rates will have the greatest demand for transit services and facilities. Transit Market Areas are a tool used to guide transit planning decisions. They help ensure that the types and levels of transit service provided match the anticipated demand for a given community or area.

Based on this analysis, the Metropolitan Council categorizes the City of New Trier in Transit Market Area V. As identified in Appendix G of the Metropolitan Council's 2040 Transportation Policy Plan (TPP), the characteristics of this category area are as follows:

Transit Market Area V has very low population and employment densities and tends to be primarily rural communities and Agricultural uses. General public dial-a-ride service may be appropriate here, but due to the very low-intensity land uses these areas are not well-suited for fixed-route transit service. Transit Market Index Range (TMI) is less than 32.0.

Also from Appendix G of the 2040 TPP (Table G-2), the typical transit service within this Market Area consists of the lowest potential ridership and is not well-suited for fixed route service. Primary emphasis is on general dial-a-ride service.

2. Current and Planned Service Facilities

The City of New Trier is outside the Transit Taxing District. There are no existing transit facilities or services and no plans for transit services in the City. The closest regularly scheduled services are in the City of Rosemount at the Rosemount Transit Station (Routes 420, 476, 478, and 484) or the City of Apple Valley at the 157th Street Station (Routes 477 and 479). Dial-a-Ride services provided through Dakota County serve transit needs within New Trier.

<u>Dial-a-Ride Service</u>

The City of New Trier is serviced by Transit Link, the dial-a-ride service provided through the Metropolitan Council at the county level. Transit Link provides metro-wide transit connections and access to qualifying rides, such as last mile service, connections between transit stations, or to and from area not serviced by regular bus routes. Any member of the public may reserve a qualifying ride. Upon reservation, each trip is assessed to ensure it does not overlap with regular route bus services. Starting and ending destinations must be more than ¼ mile from regular route transit in winter months (November – March) and more than ½ mile from regular route transit in summer months (April- October). Transit Link Service does not operate on Thanksgiving Day, Christmas Day, and New Year's Day.

Transit Link fares are determined by distance traveled. Trips less than 10 miles are $2.25 one way, trips between 10 and 20 miles are $4.50 one way, and trips more than $20 miles are $6.75 one way. ADA-certified riders pay a maximum of $4.50 one way regardless of distance traveled. This fare includes transfer to a regular service route except for the Northstar Line or peak hour services.

Transit Link service offered through Dakota County serves all cities and townships in the county. Service is available Monday-Friday from 6:00am – 7:00pm. Transfers between Transfer Link and regular service

routes take place at one of the following transit hubs: Signal Hills Shopping Center, Eagan Transit Center, Apple Valley Transit Center, Burnsville Shopping Center, and Burnsville Transit Station. The following stations in Hennepin County are also available for transfer service: Bloomington South Transit Center and Mall of America Transit Center.

Metro Mobility is also available to qualified individuals with disabilities on an on-call basis throughout the seven-county metropolitan area.

E. Non-Motorized Transportation Plan

1. Existing Bicycle Facilities

There are no existing bicycle trails in the City of New Trier.

In addition, the Metropolitan Council has designated the Regional Bicycle Transportation Network (RBTN). This consists of prioritized alignments and corridors (where alignments have not yet been established) that were adopted in the Metropolitan Council's *2040 Transportation Policy Plan*. There are no Tier 2 corridor/alignments in the City, shown in the Parks and Trails Chapter.

2. Planned Bicycle Facilities

As noted in Section C-5, Dakota County is currently in the process of developing a Pedestrian and Bicycle Plan. At present, future trail corridors have been identified by Dakota County as part of a "Greenways" network. These proposed alignments are primarily located along the major rivers in rural areas, meaning no planned trails are located in the City of New Trier. These facilities are shown and discussed in detail in the Parks and Trails Chapter of the Dakota County Rural Collaborative Comprehensive Plan.

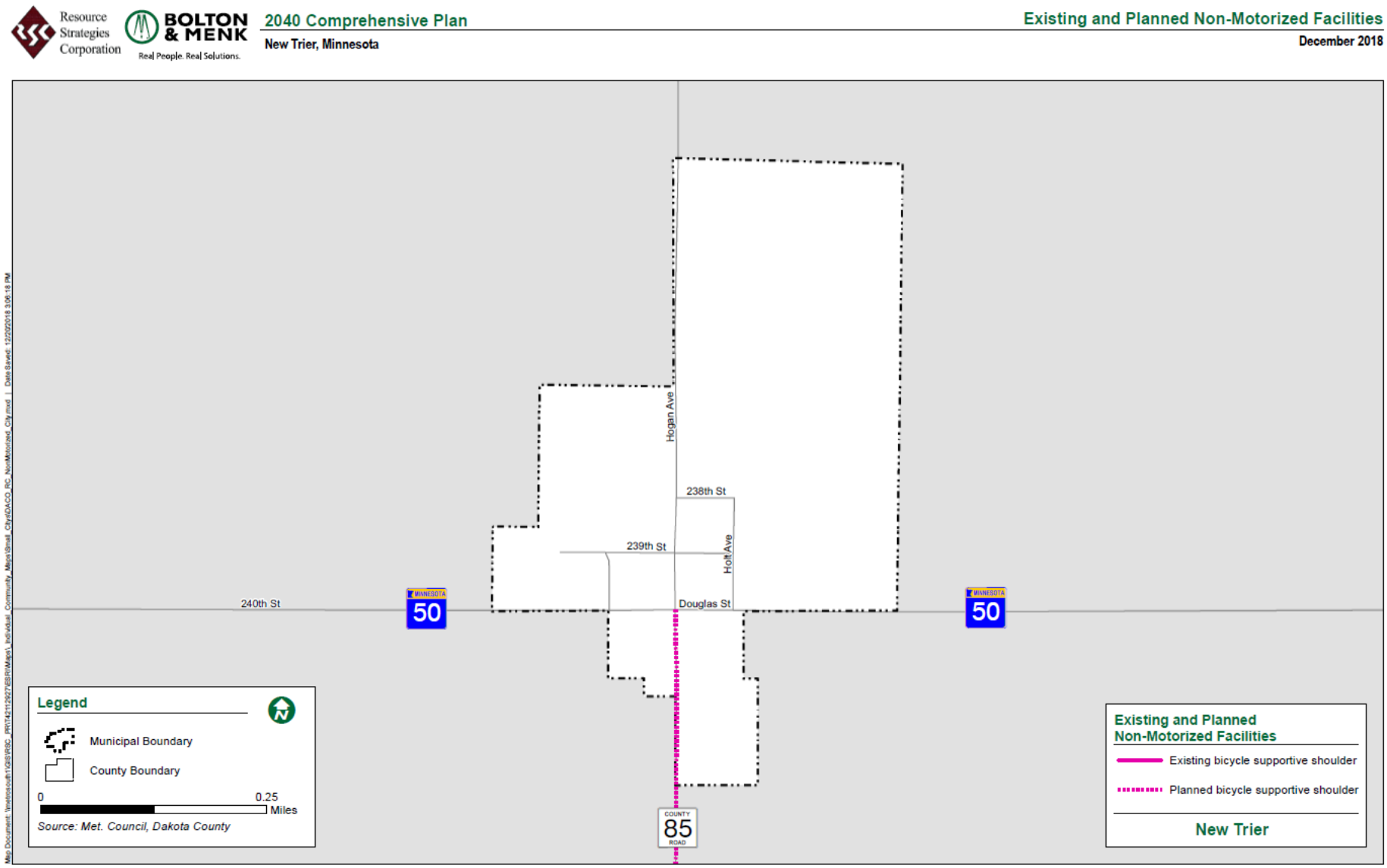
F. Aviation Plan

There are no airports located in the City of New Trier. The City of New Trier has a responsibility to identify policies and ordinances that protect regional airspace from obstructions, including meeting any Federal Aviation Administration (FAA) notification requirements. Any land use application that proposes to construct a structure 200 feet above the ground that could affect navigable airspace level must get appropriate approvals. The Federal Aviation Administration and the Minnesota Department of Transportation must be notified at least 30 days in advance in advance of construction, as required by law per MCAR 8800.1200, Subpart 3 and FAA Form 7460-8.

G. Freight Plan

Given the small size of the city and its distance from principal arterials, there is no freight movement through the City of New Trier. There are not freight terminals or industrial parks generating freight in the city. There are no railway lines, existing or abandoned, in the City.

Figure 11: Existing and Planned Non-Motorized Facilities



VI. WATER RESOURCES

A. Wastewater

1. Forecast Table

According the Metropolitan Council population, household, and employment forecasts, the City of New Trier will have the following sewer demands, as detailed in Table 17.

Table 17 – Population, Housing, & Employment Sewer Allocation Forecasts

	Forecast Component	2010	2020	2030	2040
Population	Unsewered	112	130	120	120
Households	Unsewered	41	50	50	50
Employment	Unsewered	35	50	60	60

2. Existing System

All households and places of employment in the City of New Trier utilize individual sewage treatment systems.

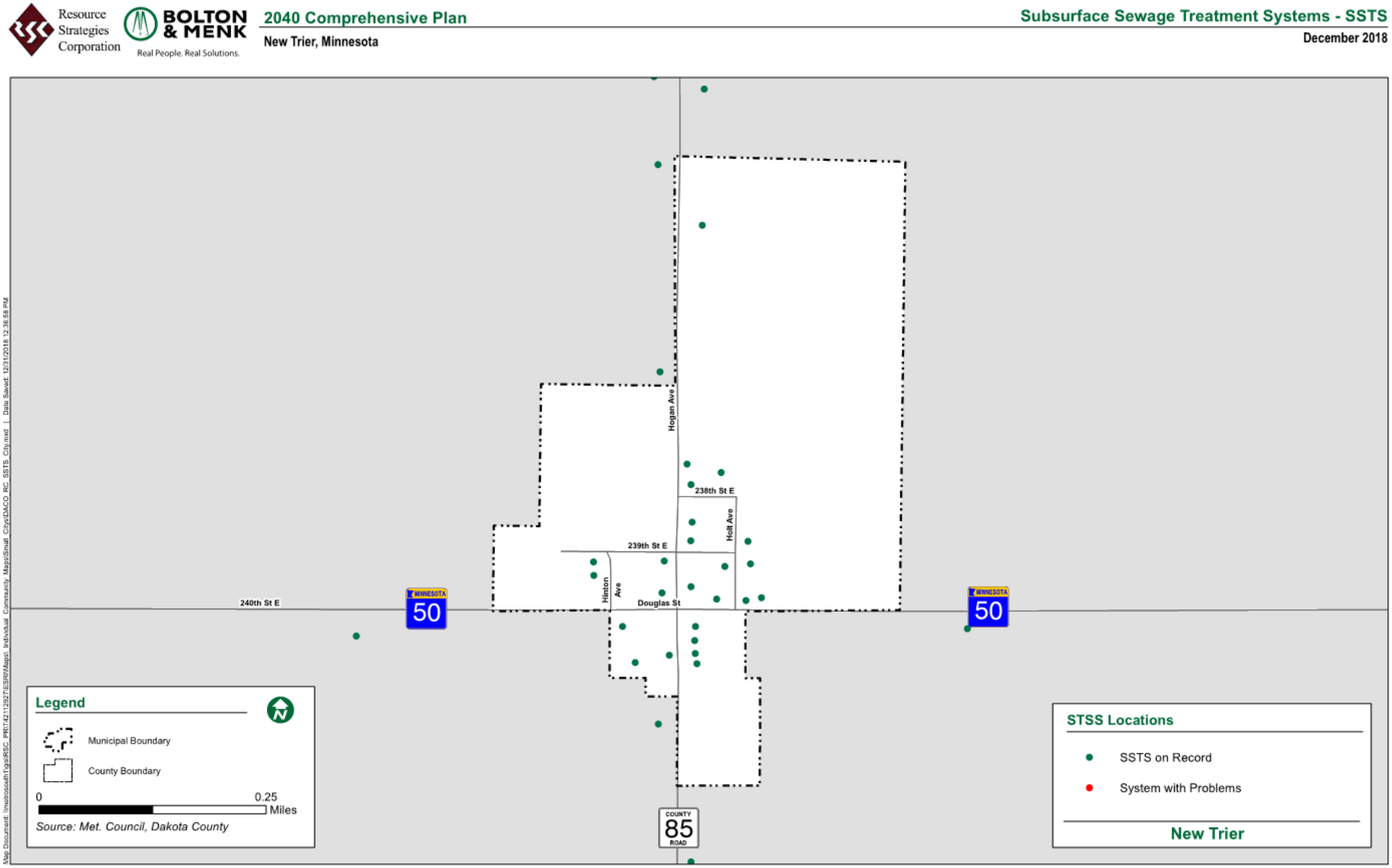
Minnesota Pollution Control Agency Rules Chapter 7080 (now amended to incorporate Chapters 7081-7083), require that certain standards be met for all SSTS installers, pumpers, haulers, designers and inspectors, as well as administration and enforcement of the Rules by local units of government. Dakota County Ordinance #113 governs SSTS regulations in areas of its jurisdiction. The ordinance provides standards, guidelines and regulations for the compliance and enforcement of the proper siting, design, construction, installation, operation, maintenance, repair, reconstruction, inspection and permanent abandonment of SSTSs.

Many of the provisions in Dakota County Ordinance #113 are more restrictive than MPCA Rules Chapter 7080, including requirements to submit “as-built” records by local installers, prohibiting repair or modification of cesspools, seepage pits and dry wells into septic tanks, requiring a State-licensed inspector, and requiring a seller of property to have a sewage system compliance inspection. Dakota County is currently working with area building officials to review amendments needed to Ordinance #113 and to develop a local model ordinance that will incorporate new provisions of MPCA Rules Chapters 7080-7083. The City of New Trier has adopted Ordinance #113 and is responsible for the review, permitting, and inspections of new and existing SSTSs. All SSTS designers, installers, inspectors, and pumpers must be licensed by the MPCA. Dakota County maintains authority for permitting and inspections within shoreland and floodplain areas.

Dakota County maintains authority for permitting and inspections of individual septic systems The City of New Trier and Dakota County have established a cooperative 3-year inspection program for SSTS monitoring and maintenance. The County provides notification to approximately one-third of the SSTS owners in each community every year. The notification includes the requirement for the pumping of septic tanks and visual inspection of the system.

SSTS owners are required to contract with licensed pumpers for the maintenance and inspection program. Pumpers are required to submit pumping and inspection records to the County. If the inspection reveals necessary or potential repairs to a system the County refers the action to the local unit for appropriate enforcement. If SSTS owners do not respond to the maintenance and inspection requirement after a third notice, the County refers the matter to the local unit for enforcement. Inspection violations, complaints, and potential repairs are referred to local Building Officials for enforcement. If the Building Official cannot remedy violations and repairs through normal enforcement procedures, the matter is turned over to the City Attorney for prosecution.

Figure 12: Subsurface Sewage Treatment Systems



Source: Metropolitan Council

B. Surface Water: Local Water Management Plan

1. Executive Summary

This Local Water Management Plan (LWMP) contains the elements needed to be consistent with the requirements Minnesota Statutes 103B and Minnesota Rules 8410. This plan is consistent with the goals and policies of the Metropolitan Council's Water Resources Management Policy Plan and the watershed management organizations having jurisdiction within the planning area. The LWMP includes the following:

- Water Resource Related Agreements
- Physical Environmental and Land Use
- Existing and Potential Water Resource Problems
- Goals and Policies
- Implementation Priorities
- Amendment Procedures

Dakota County has primary responsibility for enforcement of zoning regulations to protect rivers, streams and lakes in the unincorporated townships through administration of the County Shoreland and Floodplain Management Regulations, while the responsibility within incorporated areas lies with each individual city. The County regulations are in conformity with the shoreland and floodplain regulations established by the Department of Natural Resources.

2. Water Resource Related Agreements

The City of New Trier is located within the North Cannon River Watershed. The North Cannon River Watershed Organization (NCRWMO) adopted its current watershed plan in 2013 and has adopted by reference the NCRWMO Watershed Management Plan (August 2013).

In adopting the Vermillion River Watershed Management Plan by reference, New Trier has agreed to submit proposed plans to the VRWJPO for review and comment if plans include the following attributes:

- Variances from local ordinances that affect surface water or impact surface water/groundwater interactions
- Diversions
- Intercommunity flows (to or from)
- Project site size of 40 acres or more
- Activities directly adjacent to the Vermillion River, its tributaries, a lake, or a protected water.

NCRWMO has been participating in the development of a Comprehensive Watershed Management Plan for the Cannon River Planning Area. This planning effort is part of the Board of Water and Soil Resources One Watershed, One Plan (1W1P) program. The vision for 1W1P is to align local water planning on major watershed boundaries with state strategies towards prioritized, targeted and measurable implementation plans. The NCRWMO intends to adopt the Cannon River Comprehensive Watershed Management Plan as the NCRWMO Watershed Management Plan. The NCRWMO member communities will be able to adopt the Comprehensive Watershed Management Plan by reference just as they have done with the previous NCRWMO Watershed Management Plans.

3. Physical Environment and Land Use

The NCRWMO adopted its Watershed Management Plan in November, 2013. Implementation of the 2013 plan will require the City to adopt and enforce ordinances and is required to comply with and report their actions to complete and enforce the policies of the watershed plan. The NCRWMO may adopt the Comprehensive Watershed Management Plan when it is complete and approved by BWSR. Goals intend

to stay the same regardless of which Plan is referenced. The Dakota County Soil and Water Conservation District (SWCD) acts as administrator and technical advisor to the NCRWMO. The NCRWMO Watershed Management Plan includes the following goals:

North Cannon River Watershed

The NCRWMO adopted its Watershed Management Plan in November, 2013. The Dakota County Soil and Water Conservation District (SWCD) acts as administrator and technical advisor to the NCRWMO. The NCRWMO Watershed Management Plan includes the following goals:

- Wildlife, Habitat and Recreation: To promote the protection and restoration of high quality natural areas throughout the watershed including wetlands, woodlands, prairies, and riparian corridors for the improvement of water-based recreation, fish and wildlife habitat, and water quality.
- Wetlands: To protect wetlands from destruction or deterioration and to restore wetlands where possible.
- Groundwater: To protect groundwater quality and quantity.
- Soil Erosion and Sedimentation: To reduce soil erosion throughout the watershed.
- Surface Water Quality: To protect and improve the water quality of streams, rivers, and lakes such that each water body is "fully supporting" for its use designations according to MN State Standards.
- Surface Water Quantity: To decrease the rate and volume of water that may contribute to flooding or non-point source pollution from overland runoff and subsurface drainage and dewatering activities.
- Education and Outreach: To increase the awareness of water resources and practices needed for their improvement or protection among all sectors of the community.
- Administration: To fulfill statutory requirements and effectively and efficiently perform the strategies of this Watershed Management Plan.

The North Cannon River watershed plans has an extensive inventory of the water resources in the respective watersheds. See these plans for additional information on:

- Topography
- Soils
- Geology
- Groundwater
- Precipitation
- Land Use and Recreation
- Water Quality and Quantity

There are no surface water features in New Trier. The steam identified in Figure 12 is intermittent/a ditch.

4. Existing and Potential Water Resource Related Problems

The NCRWMO plan identifies issues associated within the organization. The primary surface water management issues in are summarized below:

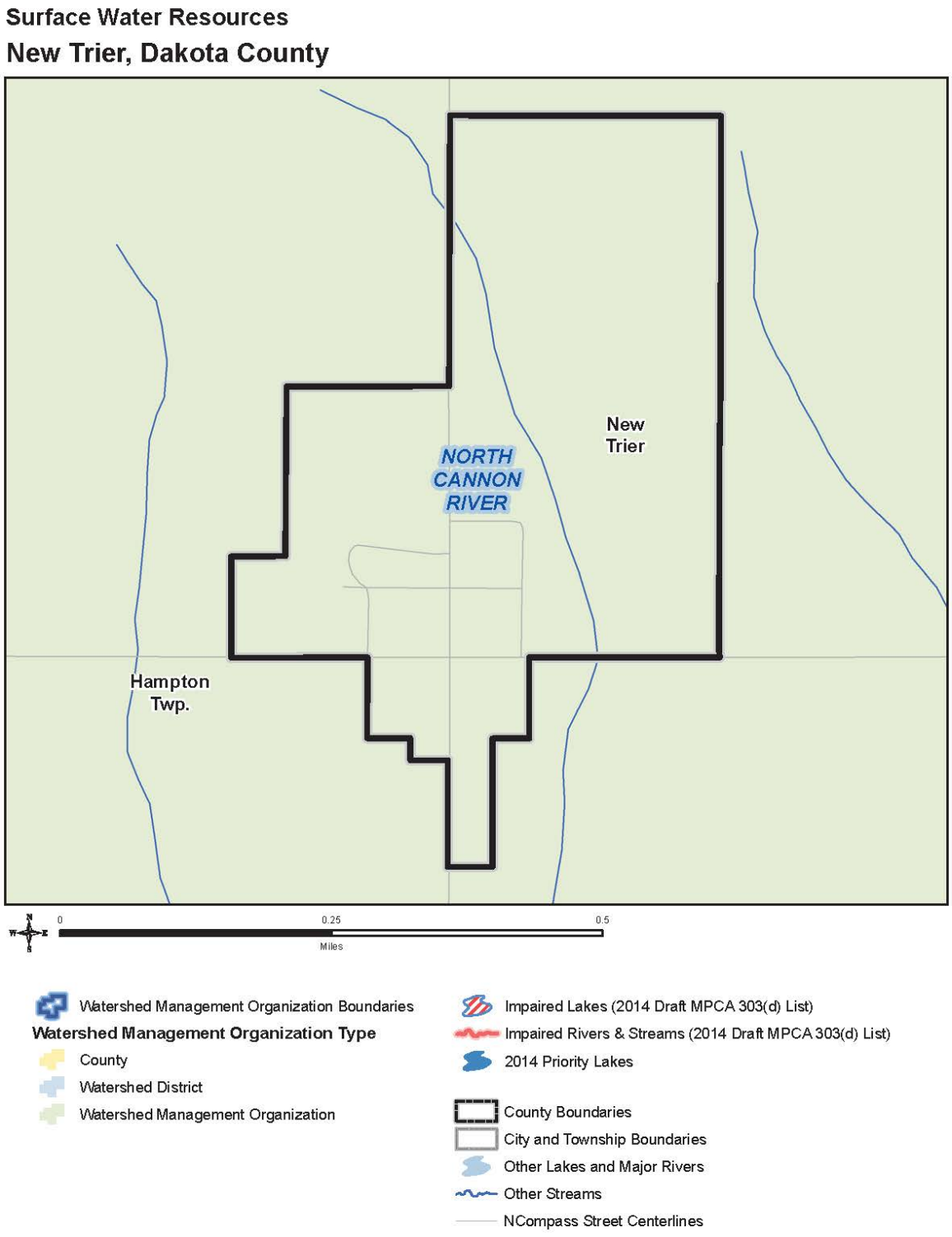
- An increase in agricultural field drainage which alters normal stream flow and can lead to streambank erosion, channel cutting, and high turbidity levels.
- Changing climate patterns pose a threat to water quality, wildlife and infrastructure.
- Enforcement of ordinances related to subsurface sewage treatment systems (SSTS)
- Erosion along watercourses due to tree removal and lack of riparian buffers.
- Groundwater consumption increase threatens future supply and health risks due to nitrate in some areas.
- Loss of wetlands due to farming practices, sod farms and some development.
- Loss of wildlife habitat due to an increase in row crops and some development.
- Additional water resource education of watershed residents of the following: buffers, nitrates, innovative practices or latest agricultural best management practices.

- Administrative issues include the need for additional collaboration with agencies and organizations, a concern about overreaching mandates and requirements that unfairly impact watershed residents.

Other than managing storm water on a development basis, the city is only beginning to incorporate a city and region-wide approach to stormwater and how it impacts the city. Both from an ongoing maintenance perspective, but also from understanding the dynamics of stormwater in the community in the larger citywide and regional context so that future development can be evaluated within this context. As the design and management of drainage systems continues to become more complex, the City will work with the North Cannon River Watershed Management Organization to implement ordinances and procedures to encourage or require stormwater runoff reduction, infiltration, pollutant removal, groundwater recharge and stream protection

A wetland management ordinance, prepared by the NCRWMO, requires wetland delineations to be completed where land disturbances may impact any wetland. The ordinance also requires a Minnesota Rapid Assessment Methodology (MnRAM) functional assessment of wetlands, or other accepted methodology under the Wetland Conservation Act. The wetland management ordinance currently classifies wetlands and buffer easement requirements based upon exceptional, high, medium, and low quality wetland functions. New Trier is the LGU for all water resources permitting.

Figure 13: Surface and Impaired Waters



5. Implementation Priorities

The City of New Trier will continue to implement the standards of the North Cannon River WMO, as they apply. The City of New Trier will continue to work with the Dakota County SWCD in implementation of the Wetland Conservation Act (WCA), and the SWCD will continue to act as the Local Government Unit (LGU) in administering the WCA.

6. Amendment Procedures

The Local Water Management Plan may be amended as needed, following the same procedures that are used to amend the Comprehensive Plan. See the Plan Amendment Process in Section VII - Implementation for additional information about the amendment process.

C. Water Supply

The City has one water tower (elevated storage tank) with a capacity of 50,000 gallons and one well, which were both constructed in 1979. The original well was drilled to a depth of 680 feet. The City derives all of its potable water from Well No. 1, which can produce 275 gallons per minute. At this rate the well could produce 3.96 thousand gallons of water per day, assuming the pump ran 24 hours per day. The existing distribution system was also constructed in 1979 to serve the existing developed area in the city and to accommodate future growth within the City was also constructed. The City's water treatment facilities consist of chemical feed pumps located at the well house and the water is treated with chlorination for disinfection and fluoridation.

The location of wells has an impact on the environment. The Ordinance contains a section describing that wells may be prohibited if it is found by Dakota County or the Minnesota Department of Health that the location of the well endangers the environment and groundwater quality or quantity.

All public water suppliers in Minnesota that operate a public water distribution system, serve more than 1,000 people and/or all cities in the seven-county metropolitan area, must have a water supply plan approved by the Department of Natural Resources (DNR). Water supply plans must be updated and submitted to the DNR for approval every ten years. This requirement, in place since the 1990s, is designed to encourage communities to deal proactively with providing sustainable drinking water for citizens, businesses, and industry. The City of New Trier will be submitting the plan through the Minnesota DNR Permitting and Reporting System (MPARS). A brief summary of the plan is provided in this section.

Figure 14: Water Supply Management Area

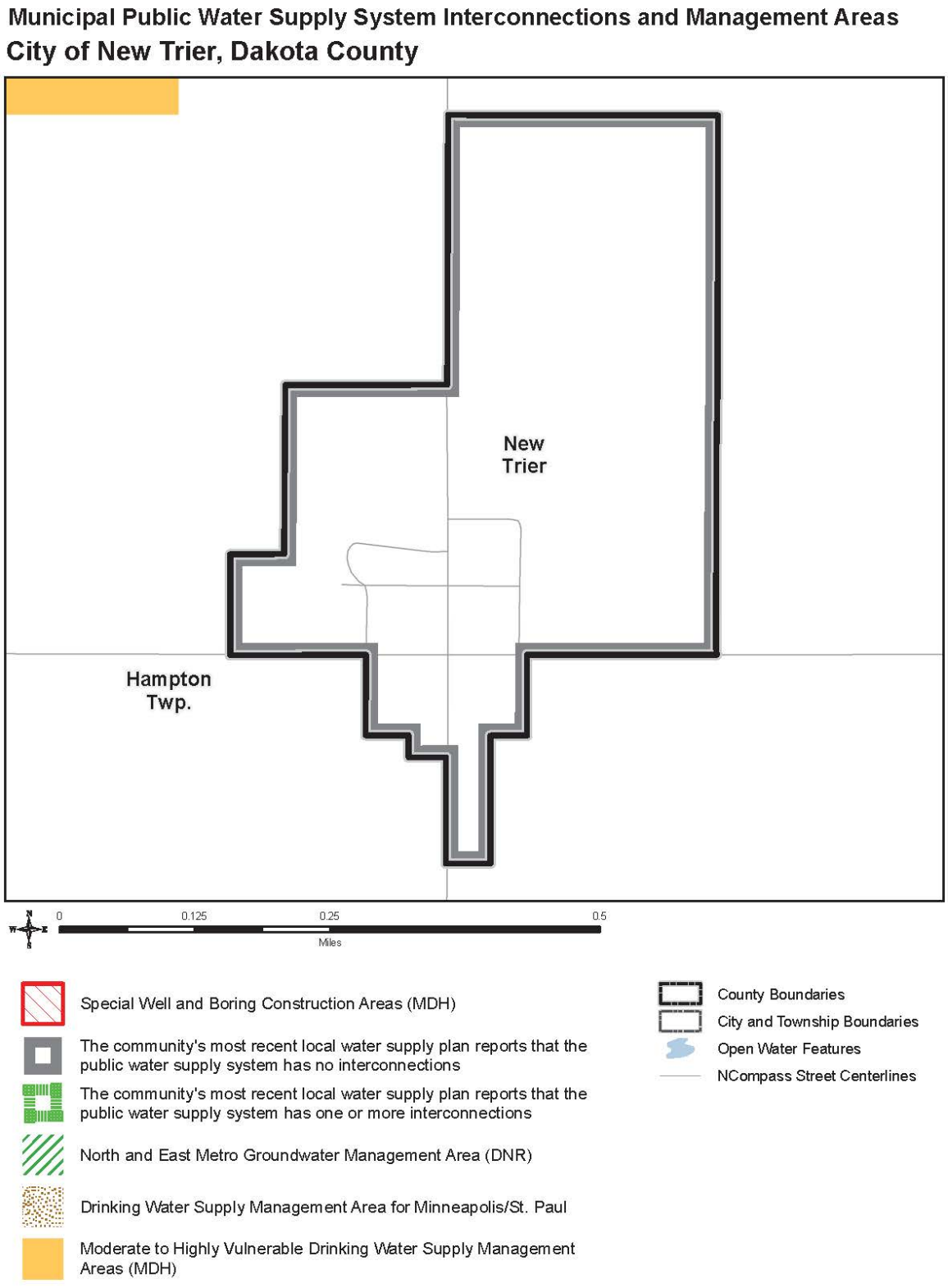
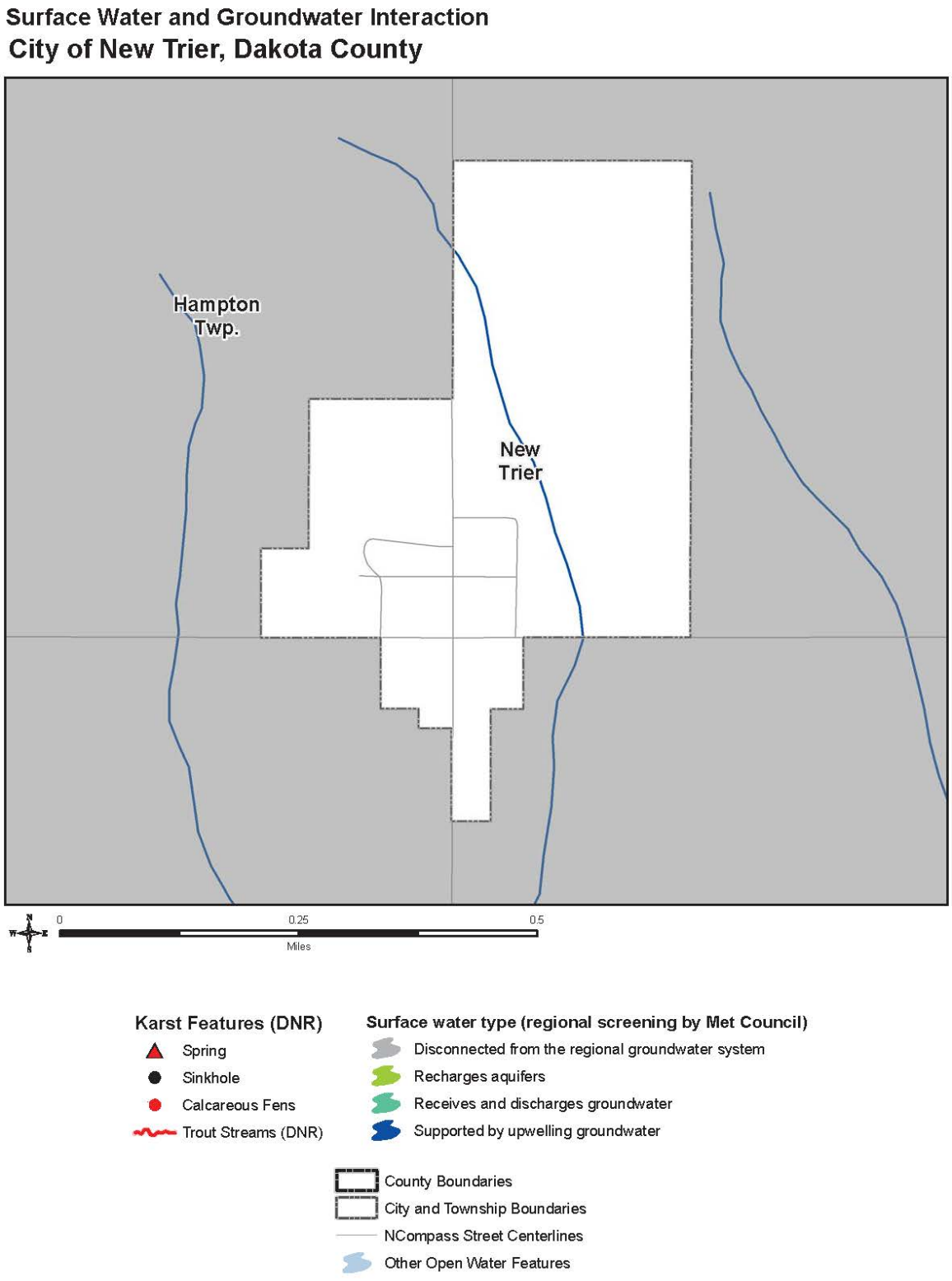


Figure 15: Surface and Ground Water Interaction



VII. IMPLEMENTATION

A. Implementation Plans

The Comprehensive plan creates a vision for the City of New Trier and guides land use and infrastructure improvements so that the City can meet the needs of the community in the future. The vision of the plan can only be realized if the plan is used. Tools to implement the plan will vary in that some will be reactive, such as zoning and subdivision ordinances that guide private developments, and others will be proactive for undertaking public improvement projects.

In order to implement the goal and policies of this Comprehensive Plan the City of New Trier will need to pursue the following implementation strategies:

- Develop a long term financing plan
- Revise and update the City's zoning and subdivision ordinances to be consistent with the Comprehensive Plan
- Adopt Floodplain Ordinance
- Recodify the City Code
- Adopt or revise a nuisance ordinance
- Adopt or revise a water use ordinance
- Adopt or revise an ISTS Ordinance
- Develop an annexation policy
- Update and adopt surface water management regulations consistent with this plan, the Metropolitan Council's Water Resources Management Policy Plan, and the North Cannon River Watershed Management Organization Water Management Plan.

1. Official Controls

The City of New Trier will be evaluating existing zoning and subdivision ordinances for consistency with this Comprehensive Plan and the Rural Collaborative Plan. Potential amendments to local ordinances will reflect any revised policy directions as identified in this Plan and will eliminate any inconsistencies with this Plan.

The North Cannon River Watershed Organization (NCRWMO) adopted the collaborative local water management plan in 2013. The City has completed the Water Resources Management Ordinance, approved by the NCRWMO, to implement the local water management plan.

The City of New Trier is responsible for the adoption and enforcement of local zoning and subdivision ordinances. Subdivision and platting of land within the city will be required to conform to provisions of the local zoning and subdivision ordinances. Local zoning ordinances also have performance standards that address development requirements as they relate to densities, lot size, and other dimensional standards.

Dakota County administers the County Contiguous Plat Ordinance, which places requirements on residential development in unincorporated areas of the County and adjacent to County roads. The County Plat Commission is authorized to review plats of proposed subdivisions adjacent to County roads and to limit direct access to County roads. The Plat Commission reviews access requests according to a set of access spacing guidelines adopted by the County Board. The Plat Commission requires sub-dividers to place access restrictions on new plats as a condition of approval.

Dakota County administers Ordinance No. 113, which establishes provisions for SSTS permitting, monitoring, and inspections in the County. The collaborative communities permit and inspect new SSTSs, while the County assists the communities in a three-year inspection and maintenance program of existing

SSTSs. The collaborative communities are responsible for enforcement of the inspection and maintenance program, unless the entire management of the program is assigned to the County; Dakota County is responsible for septic inspection in Randolph Township, Waterford Township, and the Cities of New Trier and Randolph. The County also has SSTS permitting and land use management authority within shoreland and floodplain areas. Dakota County amended Ordinance No. 113 for consistency with recent amendments to the Minnesota Pollution Control Agency Rules Chapter 7080, governing SSTSs in 2008.

2. Schedule of Changes

To meet the goals of the 2040 Comprehensive Plan update and remove any potential inconsistencies in policy, changes and amendments to the zoning code and ordinances will need to be made. The City of New Trier will begin review and consideration nine months after the official adoption of the 2040 Comprehensive Plan update.

3. Plan Amendment Process

The provisions of the zoning ordinances will be maintained and preserved through the term of the Comprehensive Plan, unless formally amended. Amendments to the local zoning ordinances will be consistent with the Comprehensive Plan.

When considering amendments to this plan, local units will use the following procedure:

1. Landowners, the Planning Commission, the City Council or other interested parties may initiate amendments.
2. The Planning Commission will conduct a thorough analysis of the proposed amendment.
3. The Planning Commission will prepare a report analyzing the proposed changes, including their findings and recommendations regarding the proposed plan amendment.
4. The Planning Commission will hold a formal public hearing on the proposed amendment.
5. Following the public hearing, the Planning Commission will make a recommendation to the City Council.
6. The City Council will receive the recommendation from the Planning Commission and make a final decision on whether to adopt the amendment.
7. All amendments to the plan will be submitted to adjacent and affected jurisdictions and the Metropolitan Council for review prior to implementation, as required by State law.

4. Zoning

City zoning codes regulate land use to promote the health, safety, order, convenience, and general welfare of all citizens. The City of New Trier is divided into a handful zoning districts. There are permitted and accessory uses in most districts, as well as the other allowed uses under conditional use permit, interim use permits, or administrative permits.

Appendix A: Resolution Approving the 2040 Comprehensive Plan

RESOLUTION NO. 2018-04

City of New Trier
Dakota County, Minnesota

A RESOLUTION APPROVING THE DRAFT DAKOTA COUNTY RURAL COLLABORATIVE 2040 COMPREHENSIVE PLAN FOR AFFECTED JURISDICTION AND METROPOLITAN COUNCIL REVIEW AND AUTHORIZING HOUSEKEEPING AMENDMENTS TO THE PLAN

WHEREAS, the City of New Trier participated in the preparation of the 16-community Dakota County Rural Collaborative 2040 Comprehensive Plan Update; and

WHEREAS, the Dakota County Rural Collaborative 2040 Comprehensive Plan Update will be forwarded to adjacent communities, area school districts, watershed management organizations, Dakota County, Scott County, Washington County, MN Department of Transportation and MN Department of Natural Resources (affected jurisdictions) for review in May 2018; and

WHEREAS, the mandatory 6-month review by affected jurisdictions may not be completed until November 2018; and

WHEREAS, the Dakota County Rural Collaborative 2040 Comprehensive Plan Update must be forwarded to the Metropolitan Council by December 31, 2018; and

WHEREAS, it is not practical for all collaborative plan member communities to review last minute comments and meet collectively or individually to approve any revisions to the Dakota County Rural Collaborative 2040 Comprehensive Plan Update prior to December 31, 2018; and

WHEREAS, it is unlikely that comments from any affected jurisdictions will require any substantive changes in the Dakota County Rural Collaborative 2040 Comprehensive Plan Update but may require housekeeping amendments or minor clarifications to the plan.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of New Trier approves the Dakota County Rural Collaborative 2040 Comprehensive Plan Update and individual City plan for affected jurisdictions and Metropolitan Council review and authorizes housekeeping amendments and minor clarifications or revisions to the plans.

BE IT FURTHER RESOLVED, the City Council reserves the right to review any substantive revisions to the Dakota County Rural Collaborative 2040 Comprehensive Plan Update but waives any further comments on collaborative member comprehensive plans.

Approved and adopted by the City Council of the City of New Trier this 9th day of April, 2018.

Mayor

ATTEST:

Clerk

Appendix B: North Cannon Watershed Management Organization. Adoption of Watershed Management Plan

RESOLUTION NO. ___2018-05_____

City of New Trier
Dakota County, Minnesota

A RESOLUTION ADOPTING THE NORTH CANNON RIVER WATERSHED MANAGEMENT ORGANIZATION WATERSHED MANAGEMENT PLAN AS THE LOCAL WATER MANAGEMENT PLAN WITHIN THE NORTH CANNON RIVER WATERSHED

WHEREAS, the North Cannon River Watershed Management Organization (NCRWMO) was created in 1983 by joint powers to manage surface waters within the North Cannon River watershed, and

WHEREAS, the NCRWMO consists of eight townships and three rural cities covering approximately 150 square miles in southern Dakota County, and

WHEREAS, the NCRWMO adopted watershed management plans in 1988 and 2003 to govern land use activities and establish goals, policies, and standards for the protection of water resources and fish and wildlife habitat, and

WHEREAS, the NCRWMO adopted a third generation watershed management plan in August 2013, and

WHEREAS, Minnesota Statutes require local communities in the seven county metropolitan area, retaining permitting authority for water management activities, to adopt local watershed management plans, and

WHEREAS, the NCRWMO has determined that member communities may adopt the 2013 NCRWMO Watershed Management Plan as the local water management plan.

NOW, THEREFORE, BE IT RESOLVED, the City Council of the City of New Trier hereby adopts the 2013 NCRWMO Watershed Management Plan by reference as the local water management plan for the City within the North Cannon River Watershed.

BE IT FURTHER RESOLVED, the City Council of the City of New Trier adopts the NCRWMO Model Stormwater Ordinance, dated November, 2005, for implementation of the 2013 stormwater management plan.

Adopted this 9th day of April, 2018.

Patricia E. Brom
Mayor

ATTEST:

Brenda A. Langfield
Clerk

Appendix C: Adjacent and Agency Comments

Dakota County Rural Collaborative Comprehensive Plan Comment Tracker

Land Use

Incomplete Comments

Number	Plan Comment Applies to	Comment	From	Response
1.1	Full Collaborative, Vermillion, New Trier, Miesville, Randolph, Coates	Pg 25: Update reference to the “Dakota County Farmland & Natural Area Program” to Dakota County Land Conservation Program," because the program name has changed since the last comp plan.	Dakota County	Thank you for the correction; the text has been updated.
1.2	Full Collaborative	On pp. 23-24, Tables 11 and Table 12 should be specific for the "stand alone" plans of Empire Township and the City of Vermillion as staged development and redevelopment applies to growth in the communities with wastewater services. Staging of rural development is not needed.	Met Council	We have added tables specific for Empire Township and the City of Vermillion, given their different requirements.
1.3	Full Collaborative	The Plan is incomplete for MRCCA. The Plan has been forwarded on to Minnesota Department of Natural Resources (MDNR) staff for their separate completeness review of the MRCCA element. Council staff will send our comments on this element will be sent directly to the Collaborative under separate cover.	Met Council/ MnDNR	We have received comments about the MRCCA from MnDNR staff and will incorporate their comments into this section/appendix.
1.4	Empire Twp, Vermillion	To meet Emerging Suburban/Rural Center community designation requirements, the stand-alone Plan needs to plan for an average net density of at least 3 units/acre.	Met Council	Thank you for your comment. We have modified tables to clearly show 3 unit/acre minimum densities in sewered portions of the communities.
	Advisory Comment			
Number	Plan Comment Applies to	Comment	From	Response
1.1	Full Collaborative	Consider updating maps on pg 17 and pg 3-34, to show County Park Conservation areas. County staff will provide a map to show County Park Conservation areas	Dakota County	Thank you for your comment. Your recommendation has been taken under advisement.

Natural Resources/Special Resources/Resilience

Incomplete Comments

Number	Plan Comment Applies to	Comment	From	Response
1.2	Full Collaborative, ~~Empire~~, ~~Vermillion~~, New Trier, ~~Miesville~~, Randolph, Coates	Solar map inadequate. The individual Solar Suitability Analysis Map for each of the 16 communities should be included in Appendix B for the Plan to be considered complete and consistent for the required Solar Access Protection and Development component of the Plan.	Met Council	The map for the Full Collaborative was obtained through the Metropolitan Council website. Individual community maps will be included as appendices for individual community plans.

Advisory Comment

Number	Plan Comment Applies to	Comment	From	Response
1.1	Full Collaborative, Empire Twp	Dakota County is working on land protection and management through its Land Conservation Program, and supports this goal [Enviro resources goals, pg 4] and the concept of working together with the Rural Collaborative communities on natural resource protection and management.	Dakota County	Thank you for your comment and support of Rural Collaborative goals.
1.2	Full Collaborative, Empire, Vermillion, New Trier, Miesville, Randolph, Coates	Pg 4. Consider adding protection of wildlife and rare native species to the environmental goal of protecting natural habitat qualities and biodiversity of the area.	MnDNR	Thank you for your comment. Your recommendation has been taken under advisement.
1.3	Full Collaborative, Empire Twp, Vermillion, New Trier, Miesville, Randolph	Recommend adding goals and strategies to address how rare species and plant communities will be protected.	MnDNR	Thank you for your comment. Your recommendation has been taken under advisement.
1.4	Full Collaborative, Empire Twp, Vermillion, New Trier, Miesville, Randolph	Recommend inclusion of maps of MBS Sites of Outstanding or High Biodiversity Significance and DNR plant communities with conservation status ranks of S1, S2, or S3 along with a list of the types of native plants documented within the Collaborative Area.	MnDNR	Thank you for your comment. Your recommendation has been taken under advisement.
1.5	Full Collaborative, Empire Twp, Vermillion, New Trier, Miesville, Randolph	Encourages Collaborative communities to list NHIS rare features and state-listed species found within the collaborative area.	MnDNR	Thank you for your comment. Your recommendation has been taken under advisement.

1.6	Full Collaborative, Empire Twp, Vermillion, New Trier, Miesville, Randolph	Pg. 5 Grasslands could be added to the list of areas called out in the policy to "enforce provisions in local ordinances that provide for and promote the protection of regionally and locally important natural areas"	MnDNR	Thank you for your comment. Your recommendation has been taken under advisement.
	Full Collaborative, Empire, Vermillion, New Trier, Miesville, Randolph, Coates	Consider including a community forestry component to help address the threats of emerald ash borer and oak wilt.	MnDNR	Thank you for your comment. Your recommendation has been taken under advisement.
1.3	Full Collaborative, Empire, Vermillion, New Trier, Miesville, Randolph	Council staff recommend enrolling in and/or utilizing the following cost-free programs and resources, which are designed to provide planning, technical, and policy assistance to local Minnesota governments, as additional "solar implementation strategies" in your Plan: • U.S. Dept of Energy's SolSmart Program - Solar Permitting, Zoning, & Development • MN GreenStep Cities Program - Sustainability Best Practices • Xcel Energy's Partners in Energy Program - Energy Action Plan Development	Met Council	Thank you for your comment. Your recommendation has been taken under advisement.

Housing

Incomplete Comments

Number	Plan Comment Applies to	Comment	From	Response
1.1	Full Collaborative	The narrative analysis of existing housing needs must address the components of the existing housing assessment. For example, the lack of any publicly subsidized housing and the number of households that are housing cost burdened are not discussed in the context of housing needs nor are they identified as housing needs in Table 17.	Met Council	In response to your comment, we have added a few sentences about housing affordability in section B and expanded the housing tools detailed in Table 17 that may be considered to support housing development.
1.2	Full Collaborative	Inconsistency in text: Table 14 reflects a total of 914 households experiencing housing cost burden while Table 15 provides a total of 1,304 households experiencing housing cost burden.	Met Council	Table 14 cost burden data is from the Met Council, Table 15 is from 2015 ACS estimates, yielding two different totals. Since table 15 is not required, and may create confusion about current housing conditions in the Rural Collaborative, the table will be deleted.

1.3	Full Collaborative	Inconsistency in text: The tools noted in Table 17 to address housing needs do not include what circumstances and what timing, if applicable, in which they would be deployed. The final document should indicate if Collaborative communities intend to develop an ADU ordinance and provide a timeline when that will occur.	Met Council	Inserted following text on pg 31: *The following tools will be considered by Dakota County Rural Collaborative Communities on a case-by-case basis, as development occurs.*
1.4	Full Collaborative	The final document needs to describe how Collaborative cities and townships will implement the tools mentioned in the text; specific information on how they will administer, apply, refer, or advocate for such programs is needed.	Met Council	We have inserted the following text: *The following tools will be considered by Dakota County Rural Collaborative Communities on a case-by-case basis, as development occurs.*
	Empire Twp	To be consistent with Council policy, the Plan needs to consider all widely accepted tools to address Empire's housing needs. Many widely used tools are not included in the Housing Implementation plan, including: • Housing Bonds • Tax Abatement and Tax Increment Financing • Minnesota Housing's Consolidated RFP, which includes applications for tax credits, preservation of naturally occurring affordable housing, and single family home programs. • Livable Communities Act programs. to which Empire Township could consider becoming a participant. • Dakota County CDA's Housing Opportunities Enhancement Program (HOPE) • Effective referrals • Fair Housing policy (see additional information in the advisory comments) • Rental licensing & inspections • Support for the creation of a Community Land Trust model in Dakota County	Met Council	We have expanded the housing tools detailed in Table 17 that may be considered to support housing development.
1.5	Full Collaborative, Empire Twp	Other tools noted elsewhere, such as PUDs to allow higher densities, do not include the circumstances in which Empire Township would consider its use. This will need to be addressed specifically in the "stand alone" plans that will be submitted. Tools described to address housing needs do not consider Empire Township's allocation within the bands of affordability. Empire Township's allocation is identified within the three levels of affordability, and tools should therefore be addressed within the levels of affordability as well.	Met Council	We have expanded the housing tools detailed in Table 17 that may be considered to support housing development. We have also included the following text: *The following tools will be considered by Dakota County Rural Collaborative Communities on a case-by-case basis, as development occurs. Collaborative Communities do not consider tax increment financing (TIF) for housing development.*

1.4	Full Collaborative	Include a map of owner occupied housing values with a differentiation between those affordable to households earning 80% of AMI or below and those that are not. These maps are available in the Local Planning Handbook within each individual community's Community Page.	Met Council	We included this in Appendix C.
Advisory Comment				
Number	Plan Comment Applies to	Comment	From	Response
1.1	Empire Twp	Local Fair Housing policies do not mean that cities should or can manage or administer Fair Housing complaints. A local fair housing policy rather ensures the city is aware of fair housing requirements with regard to housing decisions and provides sufficient resources to educate and refer residents who feel their fair housing rights have been violated (this can be as simple as having links to resources on the City's website). Met Council will require a local Fair Housing policy as a requirement to draw upon Livable Communities Act (LCA) awards beginning in 2019.	Met Council	Thank you for your comment. Your recommendation has been taken under advisement.

Parks and Trails

Incomplete Comments

Number	Plan Comment Applies to	Comment	From	Response
1.1	Empire Twp	Page 28 - Parks and Trails, Regional Trails: first paragraph refers to regional trail segments in Empire Township that are part of the Vermillion River Greenway and the "Mississippi River Regional Trail Greenway." The latter should be identified as the Vermillion Highlands Regional Greenway.	Dakota County	Thank you for the correction. The text has been updated.
Advisory Comment				
Number	Plan Comment Applies to	Comment	From	Response
1.1	Full Collaborative	Page 34: County supports and recommends continued work on connected trails to regional systems and collaboration with the Dakota for a Greenway system	Washington County	Thank you for your comment. Your recommendation has been taken under advisement.
1.2	Full Collaborative	Pages 35-36: Consideration for notes or references to park and trail access that is ADA compliant and/or consider future adaptive playground equipment	Washington County	Thank you for your comment. Your recommendation has been taken under advisement.
1.3	Full Collaborative, Empire,	Could include snowmobile trail inventories to raise awareness of this recreation option; many of these trails are state supported & connect to a larger network.	MnDNR	Thank you for your comment. Your recommendation has been taken under advisement.

	Vermillion, New Trier, Miesville, Randolph, Coates			
1.4	Full Collaborative	Pg 25. SNAs (Hastings Sand Coulee and Chimney Rock) and trout streams are an appropriate addition to the inventory list.	MnDNR	Thank you for your comment. Your recommendation has been taken under advisement.
1.5	Full Collaborative	Cannon River is a State Water trail managed for canoeing and kayaking and is a Wild and Scenic River	MnDNR	Thank you for your comment. Your recommendation has been taken under advisement.

Transportation

Incomplete Comments

Number	Plan Comment Applies to	Comment	From	Response
1.1	Full Collaborative, Empire Twp	The Metropolitan Council's Functional Classification map identifies the following roadways that are not shown in the Rural Collaborative Plan. Please consider adding the following roads to the Plan's functional classification map: • 190th Street, between TH 3 and Biscayne Avenue, as a future A-Minor Expander roadway in Empire. • Biscayne Avenue, between 190th Street and CSAH 66, as a future A-Minor Expander roadway in Empire.	Dakota County	Our future functional class map shows 190th Street as a Minor Connector. However, the road label has hidden the road; we will edit the map to make this road segment clearer. We will update our future functional class map to show Biscayne Ave as a Minor Connector.
1.2	Full Collaborative, Empire Twp	Dakota County identifies several future county highways within Empire, Nininger, Marshan, and Greenvale Townships based on existing plans and studies. Please consider adding these future County highways to the Rural Collaborative Plan: • Diamond Path (new road between CSAH 46 & 178th) • Hastings Area Roadway System Study identifies a future CSAH 47 alignment on Jacob Ave, between CSAH 47 and TH 55, in Marshan and Nininger Townships • *Northwest Northfield Highway Corridor Study* identifies a new alignment of CSAH 23, between CR 96 and TH 19, in Greenvale Township	Dakota County	CSAH 47/Jacob Ave alignment: We will add roadway to our map. Diamond Path: This roadway is shown on map but cannot tell due to symbology /layer order. We will edit the map to ensure this is visible. The future roads identified in the UMore study are included in our future functional class map. We will review the *Northwest Northfield Highway Corridor Study.*

1.3	Full Collaborative, Empire Twp, Coates	The turnback list includes several road segments that have already been turned back. Please remove the following jurisdictional transfers: • CR 53 N/ Alverno Ave: 1 mile in Castle Rock Township • CR 79/ Blaine Ave: 1 mile in Empire Township • CR 80/ 250th Ave W/ Biscayne Ave: 2 miles in Castle Rock Township • CR 87 / Lock Blvd: 2.2 mile in Nininger Township, to CR 42 intersection • CR 51/ 255th Street W/ Biscayne Ave: 2 miles in Castle Rock Township The list is missing a transfer from the 2012 plan: CR 81 alignment south of Coates in Empire & Vermillion Townships (dependent on new alignment per *Rosemount/UMore/Empire Area Transportation System Study).*	Dakota County	Thank you for your comment. We have updated the turnback table to reflect these updates. The CR 81 turnback is included in the table.
1.4	Full Collaborative	The final submittal must identify policies and ordinances that protect regional airspace from obstructions. Include how communities will notify the FAA of proposed structures.	Met Council	Thank you for your comment. We have inserted text identifying notification requirements.
1.5	Full Collaborative	The Transportation Analysis Zone forecasts in Table 22 are inconsistent with total forecast for Dakota County Rural Collaborative communities. The total for individual TAZ forecasts in Table 22 exceeds forecasts for Dakota County Rural Collaborative communities (shown in the table referenced above). It appears the table includes forecasts for the total area of each TAZ, including areas that fall outside Dakota County Rural Collaborative communities. For completeness, the TAZ forecasts in Table 22 should just include portions of TAZs that are inside the Dakota County Rural Collaborative, and these TAZ forecasts should add up to the total 16 community forecasts used elsewhere in the Plan.	Met Council	We obtained updated data from the Metropolitan Council that divided TAZ by community. We will update the plan with this break-down and ensure they add up to the community forecasts used throughout the plan.
1.6	Full Collaborative	Maps should show streets classified by the community as major and minor collectors and local streets. Changes to classifications should follow criteria found in Appendix D of the 2040 Transportation Policy Plan (TPP). The Plan should also include a map or table highlighting differences between the community map and the regional functional classification map, so the regional map can be updated.	Met Council	Most of the roads within Rural Collaborative Communities are under Dakota County jurisdiction. There are no known changes to functional classification; any changes will be included in the Dakota County Transportation Plan update.
1.7	Full Collaborative	The Plan needs to include a map of current traffic volumes including heavy commercial volumes including both ADT and HCAADT; current traffic volumes are mapped on Figure 5, but HCAADT not included.	Met Council	We include HCAADT in the freight, rail, and commercial corridors figure (Figure 16).
1.8	Full Collaborative	The Plan needs to identify future rights-of-way that need to be preserved. This is not specifically called out, though perhaps implied under "Proposed New and Extended Roads." If there is more information to share about right-of-way preservation, please include it in the Plan.	Met Council	Most of the roads within Rural Collaborative Communities are under Dakota County jurisdiction. Additional information about new and expanded county roads will be included in the

				Dakota County Transportation Plan update.
1.9	Full Collaborative	The Plan needs to include and incorporate access management guidelines from MNDOT or those of Dakota County.	Met Council	This in included in Appendix D.
1.10	Full Collaborative	The Plan needs to show planned trails (as shown in Figure 4 of Parks and Trails chapter) within and connecting to the RBTN Tier 2 corridor along the east edge of Empire Township (shown in Figure 15 of bike/ped chapter).	Met Council	After deliberation, planned greenways and bikeways are shown on two different maps for clarity, as there are several planned trails and bikeways in the Rural Collaborative Area. Detailing all trails on one figure were very messy and confusing to read, making a combined map unusable.
1.11	Full Collaborative	The Plan should describe planned trails as they relate to RBTN under section F.2. on page 70 of Transportation section.	Met Council	Added the following sentence: *Planned greenways (Lake Marion Greenway and an unnamed north/south greenway) loosely align with Tier 2 RBTN search corridors near and in Empire Township.*
1.12	Full Collaborative, Randolph	The Plan needs to identify railways, barge facilities, and truck or intermodal freight terminals within Collaborative, and identify other important nodes that may generate freight movement, such as industrial parks.	Met Council	Added the following text in response to comment: *Given the rural character of the Dakota County Collaborative communities, there is little freight generated within the Collaborative. Based on future land use plans, there is the potential for freight generation in a small industrially planned area in the City of Randolph and Randolph Township. This area, shown in the Future Land Use Map in the Land Use Chapter of this plan, is located off of a branch of the Canadian Pacific Railway and County Roads 86 and 94.*
1.13	Full Collaborative	Identify any local roadway issues or problem areas for goods movement, such as weight-restricted roads or bridges, bridges with insufficient height or width clearances, locations with unprotected road crossings of active rail lines, or intersections with inadequate turning radii.	Met Council	Most of the roads within Rural Collaborative Communities are under Dakota County jurisdiction. Any issues with roads, bridges, or freight movement will be noted in the updated of the Dakota County Transportation Plan.

Advisory Comment				
Number	Plan Comment Applies to	Comment	From	Response
1.1	Full Collaborative, Coates, Empire	Please consider adding the following expansions to the "Existing and Anticipated Number of Travel Lanes" Map: • Planned CSAH 23, between CR 96 and Northfield, should be shown as a planned four lane highway in Greenvale Township. • CSAH 46, between Lakeville and Biscayne Ave, should be shown as a planned six lane highway in Empire • CSAH 46, between Biscayne Ave & **TH** 52, should be shown as a planned four lane highway in Empire Township and Coates. • Planned 190th Street (CR 64), between TH 3 and Biscayne Ave, should be shown as a planned four lane highway in Empire Township. • Planned CR 73, between CSAH 46 and CSAH 66 (including portions of Biscayne Ave), should be shown as a planned four lane highway in Empire Township.	Dakota County	Thank you for your comment. Your recommendation has been taken under advisement.
1.2	Full Collaborative	Page 40: County supports and recommends further evaluation of traffic crashes on designated roadways.	Washington County	Thank you for your comment. Your recommendation has been taken under advisement.
1.3	Full Collaborative	Page 70: County supports and recommends continued work with Dakota County on the Bike and Pedestrian plan.	Washington County	Thank you for your comment. Your recommendation has been taken under advisement.
1.4	Full Collaborative	Page 70 - Non-Motorized Transportation Plan. Please consider including the following text: The *Dakota County Draft 2040 Comprehensive Plan* identifies planned bicycle supportive shoulders along County Roads. Shoulder width to support bicycles will be determined based on MnDOT State Aid guidance.	Dakota County	Thank you for your comment. Your recommendation has been taken under advisement.
1.5	Full Collaborative, Empire, Vermillion, New Trier, Miesville, Randolph	Consider consulting DNR's Best Practices for protection of species for mitigation practices when developing design and construction plans for new roads near the Vermillion Wildlife Management Area.	MnDNR	Thank you for your comment. Your recommendation has been taken under advisement.
1.6	Full Collaborative	Regarding seaplane use on surface waters as designated & regulated by MnDOT, both Nininger & Ravenna Townships are on the Mississippi. If not, seaplane use occurs near those Townships, then the plan should state that fact.	Met Council	Thank you for your comment. Your recommendation has been taken under advisement.

1.7	Full Collaborative	The term "B-Minor Arterials" (pages 43 and 66) is no longer used and should be replaced with "Other Arterials."	Met Council	Thank you for your comment. Your recommendation has been taken under advisement.
1.8	Full Collaborative	On page 66, rather than "Metropolitan Council," please consider substituting the text "Transportation Advisory Board" (or Metropolitan Council's Transportation Advisory Board).	Met Council	Thank you for your comment. Your recommendation has been taken under advisement.
1.4	Full Collaborative	Consider mapping and describing existing on and off-road biking facilities and any sidewalks.	Met Council	Thank you for your comment. Your recommendation has been taken under advisement.

Wastewater

Incomplete Comments

Number	Plan Comment Applies to	Comment	From	Response
1.1	Full Collaborative, New Trier, Randolph	Section VI.A.2: it should be noted that Dakota County regulates individual septic systems in communities that have turned back permitting to the County (City of Randolph, Waterford Twp., etc.), while other communities regulate locally. Please note that Dakota County now has septic inspection responsibility under Ordinance No 113 in Randolph and Waterford Townships and the Cities of New Trier and Randolph.	VRWJPO; Dakota County	We have added a sentence in Section VI.A.2 that reflects this fact. *Dakota County maintains authority for permitting and inspections within shoreland and floodplain areas, as well as regulates individual septic systems in communities that have turned back permitting to Dakota County (Randolph and Waterford Townships and the Cities of New Trier and Randolph).*
1.2	Full Collaborative, Empire, Vermillion, New Trier, Miesville, Randolph, Coates	Discuss with Dakota County Water Resources staff the language about "provisions in Dakota County Ordinance #132" being "more restrictive" than Minnesota Rules on septic systems because many of these provisions are in line with Minnesota Rules. Several items are incorrectly identified in the Rural Collaborative Plan as being more restrictive in Dakota County Ordinance No. 113 than in Minnesota Rules Chapter 7080. Please consider revising the following requirements, which are not more restrictive in County Ordinance No. 113:	VRWJPO; Dakota County	Ordinance 113 has been amended in early 2018. Need to amend or delete sentence. We removed the outdated paragraph stating the Dakota County ordinance was more restrictive than the State Rule. We have also amended the text

		Requirements to submit "as-built" records by local installers: submittal of as-built records by installers is not specifically listed as a requirement in ordinance except for the tax assessment program. **Prohibiting repair or modification of cesspools, seepages pits, and dry wells into septic tanks:** Cesspools, seepage pits, and drywells are prohibited in MN Rule 7080. Minnesota rule requires that septic tanks be water-tight, and these types of tanks, by definition, are not watertight. **Requiring a State-Licensed inspector:** This is a State requirement, not a more restrictive County requirement. The Plan states, "Dakota County is currently working with area building officials to review amendments needed to Ordinance #113 and to develop a local model ordinance that will incorporate new provisions of MPCA Rules Chapters 7080-7083" This may be out of date, since the ordinance has already been updated.		to read like the comments/corrections received.
1.3	Full Collaborative	Subsurface Sewage Policies: The second bullet refers to "alternative systems" allowed under MN Rules 7080-7083. Current Rules refer to non-standard systems rather than "alternative systems". Suggested change: Please consider modifying language about alternative systems, to note that MN Rules 7080 and Dakota County Ordinance No. 113 will only allow non-standard system types, generally types II through V, under special circumstances.	Dakota County	Thank you for your comment. We have edited the text to read "alternative and non-standard" and "under special circumstances."
1.3	Full Collaborative	Need to map SSTS within the Collaborative area, including the location of non-conforming systems or systems with problems.	Met Council	We have reached out to Dakota County Staff and have received "pumped" and "not pumped" reports for each Collaborative Community in 2018. The map provided in this chapter notes recorded and reported SSTS; not all SSTS in the Collaborative area may be represented by these data/this figure. "Systems with problems" only include systems pumped in 2018 that were recorded as leaking or experiencing drainage.
Advisory Comment				
Number	Plan Comment Applies to	Comment	From	Response

1.1	Full Collaborative	Plan refers to a "joint management program" and identifies a range of included services. Please clarify that the County and townships have a Joint Powers Agreement for the pump maintenance program, while inspection, record keeping, and repair or replacement of imminent threats are the responsibilities of the township and township septic inspector, and design and construction are the responsibilities of the licensed septic professional doing work	Dakota County	Text and bullets on pg 7 have been amended to reflect these responsibilities.
1.2	Full Collaborative	The Table 5 Forecasted Collaborative Population, Housing, & Employment estimate for 2015 households of 5225 on page 12 does not compare well with the Table 28 Sewer Allocation Forecasts section data on page 75 for the similar (arithmetically extrapolated) 2015 "Unsewered" household figure of 6713 (6546 + 6880/2). These data would indicate that the estimated number of SSTS serving households and businesses within the Collaborative would be expected to potentially be several hundred systems more than the estimated 5000, indicated in the text on page 75.	Met Council	Table 28 does not contain extrapolated 2015 data. The "Municipal Sewered" and "Unsewered" totals for each category and decade in Table have been updated to reflect the City of Vermillion's sewer data. The totals for population, households, and employment in Table 28 in each decade sum to the forecast totals in Table 5. The population, households, and employment for each community in each forecast year was obtained from each Community Page, as well as the sewer allocations for each decade/category.
1.3	Full Collaborative	State terminology has changed and the term "pumper" has been replaced by "maintainer" and there is a new license category called "service provider." (Similar language is also on pages 75-76.) Suggested changes: consider rewording to say inspectors, designers, installers, maintainers, and service providers must hold a valid license for the work they are performing.	Dakota County	Thank you for your comment. The noted term and category have been included.
1.4	Full Collaborative	Pg 7 - The first bullet refers to updating local ordinances for compliance with MN Rules 7080 - 7083. Suggested change: In addition to MN Rules, please also include a reference to County Ordinance 113.	Dakota County	Thank you for your comment. Your recommendation has been taken under advisement.

Surface Water

Incomplete Comments

Number	Plan Comment Applies to	Comment	From	Response
1.1	Full Collaborative	"Adoption by reference" should be explicitly stated in the Comprehensive Plan, and the Vermillion River Watershed Management Plan should be provided as an appendix or referenced with a hyperlink.	VRWJPO	Thank you for your comment. This is stated both in Chapter VI, Section B2 and Chapter VII, Section AI. A hyperlink to the Vermillion River Watershed Management Plan in Chapter VI, Section B2
	Full Collaborative, Empire Twp, Vermillion, Coates	Section VI.B.2: It should be noted that in adopting the Vermillion River Watershed Management Plan by reference, communities are agreeing to submit proposed plans to the VRWJPO for review and comment if plans include the following attributes: • Variances from local ordinances that affect surface water or impact surface water/groundwater interactions o Diversions o Intercommunity flows (to or from) o Project site size of 40 acres or more o Activities directly adjacent to the Vermillion River, its tributaries, a lake, or a protected water.	VRWJPO	Thank you for your comment. The text has been added.
1.2	Full Collaborative, Empire Twp, Vermillion, Coates	Section VI.B.2: The way local communities implement watershed Standards should be referenced in this section. The plan should note the "Water Resources Management Ordinance" is implemented by Dakota County Rural Collaborative communities to ensure that watershed standards are properly addressed.	VRWJPO	Thank you for your comment. The noted text/clarification has been added in section VI.B.3.
1.3	Full Collaborative	Section VI.B.2: "Water Resources Management Ordinance" was last updated in 2010 and will be updated within six months of adoption of the Comprehensive Plan to bring it into agreement with the more recent watershed plan revision.	VRWJPO	Thank you for your comment. The noted text/clarification has been added in section VI.B.2.
1.4	Full Collaborative	Section VI.B.3: Below the description of the VRWJPO Standards, the plan should note the current arrangement for implementation of the Standards. All rural collaborative communities currently implement the Standards through their own local ordinances. The Water Resources Management Ordinance (2010 Update) for the Dakota County Rural Collaborative is the controlling ordinance for local implementation of the Standards and will be updated to meet the VRWJPO Standards. If a local community is not implementing the ordinance or chooses to relinquish regulatory control, the VRWJPO will implement a permitting program and its Rules in the affected area of the community.	VRWJPO	Thank you for your comment. The noted text has been added.

1.5	Full Collaborative	Table 32: The VRWJPO Watershed Restoration and Protection Strategies (WRAPS) and Total Maximum Daily Load (TMDL) documents were completed in 2015, but the date at the top of the table says "as of 2012". Please verify that the impaired waters list is up-to-date with the WRAPS and TMDL documents and edit the table date if necessary.	VRWJPO	Thank you for your comment. Your recommendation has been taken under advisement.
1.6	Full Collaborative, Empire Twp, Vermillion, Coates	Section VI.B.4: Any references to "VRWMO" should be changed to Vermillion River Watershed Joint Powers Organization or VRWJPO.	VRWJPO	Thank you for your comment. The correction has been made.
1.7	Full Collaborative, New Trier, Miesville, Randolph	Insert paragraph under "Water Resource Related Agreements" about the Cannon River One Watershed, One Plan efforts. *Recommended text in comments, saved in drive*	NCRWMO	Thank you for your comment. The paragraph has been added.
1.8	Full Collaborative, New Trier, Miesville, Randolph	In NCRWMO section, include that the implementation of the 2013 plan will require LGUs to adopt & enforce a number of existence ordinances if they have not already done so. Member LGUs will also be required to comply with & report their actions to complete and enforce the policies of the watershed plan. See NCRWMO 2013 Plan, section 6.5.	NCRWMO	Thank you for your comment. The Sentence has been added.
1.9	Full Collaborative, New Trier, Miesville, Randolph	Add sentence after second sentence in first paragraph of North Cannon section *The NCRWMO may adopt the Comprehensive Watershed Management Plan when it is complete and approved by BWSR. Goals intend to stay the same regardless of which Plan is referenced.*	NCRWMO	Thank you for your comment. The Sentence has been added.
1.10	Full Collaborative	Resolution from communities that municipality has adopted the local watershed management plan by reference.	Met Council	Thank you for your comment. We will include copies of these resolutions.
Advisory Comment				
Number	Plan Comment Applies to	Comment	From	Response
1.1	Full Collaborative, Empire Twp, Vermillion	Section VI.B.3: A summary of the environmental and physical descriptions of the Vermillion River Watershed (and the North Cannon watershed) included in the watershed management plan should be included in this section. It is acceptable to the VRWJPO to adopt the plan by reference, but a description of the portions of the watershed that are located in the communities of the rural collaborative should be included here (e.g., the Vermillion River enters Empire Township just upstream of the connection of North Creek to the main channel).	VRWJPO	Thank you for your comment. Your recommendation has been taken under advisement.

1.2	Full Collaborative	Section VI.B.4: There is an item related to groundwater consumption and nitrate among the issues in the study area. Like the Vermillion River Watershed Management Plan, the groundwater consumption/supply issue should be listed as a separate issue as groundwater quality/elevated nitrate levels in drinking water sources.	VRWJPO	Thank you for your comment. Your recommendation has been taken under advisement.
1.3	Full Collaborative	Section VI.B.4: It is acceptable to the VRWJPO to adopt the plan by reference, and the issues selected and listed in the plan are good. Similar to the physical descriptions section, the collaborative should add some specificity in the form of examples of water bodies or subwatersheds that are experiencing the identified problem. The "declining water quality and increased sedimentation in Lake Byllesby" item demonstrates a good level of specificity.	VRWJPO	Thank you for your comment. Your recommendation has been taken under advisement.
1.4	Full Collaborative	Section VI.B.5: Under section VI, "Implementation Plan", the plan should reference the implementation plan in section 7 of the Vermillion River Watershed Management Plan. Specifically, the text should reference the subwatershed-level analysis of the VRWJPO implementation plan and where the local community's subwatersheds fall in the priority list. As noted in the plan, the communities do not have capital improvement plans for stormwater/water resources, so this statement can just generally address how the communities will participate in and/or support cost-share and monitoring projects.	VRWJPO	Thank you for your comment. The following sentences have been added. *In adopting the Vermillion River Watershed Plan by reference, Collaborative communities also adopt the implementation plan and will participate in and/or support projects located within their jurisdiction (see section 7 of the Vermillion River Watershed Management Plan). This implementation plan performed a subwatershed-level analysis to identify priorities and projects on a more local level.*
1.5	Full Collaborative	Highly recommended that (erosion and sediment) ordinance be updated to use and require minimal impact design standards and the use of Atlas 14 in place of Technical Paper 40 for designing stormwater practices and systems.	VRWJPO	Thank you for your comment. Your recommendation has been taken under advisement.
1.1	Full Collaborative	Section VI.B.3: Figure 17 (and Figure 18) referenced by this section do not have labels for the lakes identified in the text and in subsequent tables (e.g., Spring Lake and Lake Byllesby).	VRWJPO	Thank you for your comment. The figures have been updated.
1.5	Full Collaborative	Pg. 5 Trout streams could be added to the list of areas called out in the policy to "enforce provisions in local ordinances that provide for and promote the protection of regionally and locally important natural areas"	MnDNR	Thank you for your comment. Your recommendation has been taken under advisement.
1.2	Full Collaborative	There is more up-to-date information for trout stream designations.	MnDNR	Thank you for your comment. This information has been taken under consideration.

	Empire Twp	Section VI.B.4: If there are specific reaches of trout stream on the Vermillion River or other high priority resources in the Township, some additional detail could be provided in this section.	MnDNR	Thank you for your comment. Your recommendation has been taken under advisement.
	Vermillion, Coates	The City does not have capital improvement plans for stormwater/water resources, but a statement generally noting how the city will participate in and/or support cost-share projects and monitoring could be added.	VRWJPO	Thank you for your comment. Your recommendation has been taken under advisement.
1.6	Full Collaborative	The Plan incorporates the draft LWMP as a free-standing chapter in the body of the document, consistent with the Council's standard suggestion for Plan content. If completed at the time the Collaborative submits its formal Plan, the Collaborative must provide the final LWMP in the document, incorporating any recommended revisions from the Council and watershed organization reviews of the draft LWMP. If available at the time the formal Plan is submitted, we also request that the Collaborative provide to the Council the dates the watershed organizations approved the LWMP, and the date the Collaborative adopted the final LWMP.	Met Council	Thank you for your comment. We will provide the final LWMP if completed when we submit the formal comprehensive plan. Other adoptions will not be available when we submit the formal comprehensive plan.

Water Supply

Incomplete Comments

Number	Plan Comment Applies to	Comment	From	Response
1.1	Full Collaborative	Paragraph 1 on pg 83 says County Ordinance 114 applies to all wells in the County. It does not apply to community wells. (Suggest adding “except community wells” after second sentence.	Dakota County	Thank you for your comment. The noted text has been added.
1.2	Full Collaborative	State Statute 1031 allows construction of water-supply wells on land that is owned or leased by the individual and is used by the individual for farming or agricultural purposes or as an individual's place of abode. Suggested change to paragraph 2: add "except as allowed by state statute or code." At end of second sentence	Dakota County	Thank you for your comment. The noted text has been added.
1.3	Full Collaborative	Suggested change to paragraph 2, third sentence: "Annual Maintenance Permits are required for all environmental wells (monitoring, remedial, or product recovery) and dewatering wells that have been in use for fourteen months or longer and unused wells." To make sentence technically correct.	Dakota County	Thank you for your comment. The noted text has been added.
1.4	Full Collaborative	The Plan states that well testing results for coliform bacteria and nitrate-nitrogen content for new wells must be approved by the County Environmental Resources Department. While the Ordinance establishes	Dakota County	Thank you for your comment. The noted text has been added.

		acceptable standards for new or reconstructed wells, the County does not approve test results. Suggested change to paragraph 3: "Water tests results from new or reconstructed wells must meet the Acceptance Standards established in the Ordinance."		
1.5	Full Collaborative, Empire, New Trier, Randolph, and Vermillion	The Plan acknowledges that Empire Township and the cities of New Trier, Randolph, and Vermillion will submit local water supply plans through the MN ORN Permitting and Reporting System (MPARS). However, none of these plans have yet been received by Metropolitan Council for review. The final document must include those water supply plans.	Met Council	Thank you for your comment. Empire Township and the Cities of Randolph and Vermillion have completed their local water supply plans. These plans have (or soon will be) submitted to the MPARS system and will be included in the final documents.
Advisory Comment				
Number	Plan Comment Applies to	Comment	From	Response
1.1	Full Collaborative	Figure 19 illustrates the location of groundwater observation wells but does not include the organization responsible for the wells, and no well identification information is included. Please provide additional information.	Met Council	Thank you for your comment. Your recommendation has been taken under advisement.
1.2	Full Collaborative	Figure 20 illustrates areas designated as Drinking Water Supply Management Areas. However, the preliminary CPU does not discuss how these areas are used to inform how goals will be achieved or policies implemented. Please provide additional context about how this information will be used by communities to shape policy implementation.	Met Council	Thank you for your comment. Your recommendation has been taken under advisement.

Forecasts

Incomplete Comments				
Number	Plan Comment Applies to	Comment	From	Response
Advisory Comment				
Number	Plan Comment Applies to	Comment	From	Response
1.1	Full Collaborative	Plan needs to include a table with individual household forecasts for each of the 16 communities within the collaborative. Plan provides these tables for population and employment forecasts, but not for households.	Met Council	These forecasts are included in the Housing Chapter as part of the "Projected Needs" section instead of the Land Use Chapter.

1.2	Full Collaborative	The total 2040 employment forecast in Table 5 is shown as 3,660. The total 2040 employment forecast for the 16 communities is slightly higher at 3,670 jobs.	Met Council	Thank you for the correction; the text has been updated.
1.3	Full Collaborative	Table 7 shows projected 2040 employment for each of the communities. The individual employment forecasts are correct, but the subtotal at the bottom is incorrectly shown as 2,890. The correct subtotal is 3,670.	Met Council	Thank you for the correction; the text has been updated.

Implementation

Incomplete Comments

Number	Plan Comment Applies to	Comment	From	Response
1.1	Full Collaborative	Page 87, Paragraph 5 states the Collaborative Communities are responsible for septic inspections. The third sentence could be modified to reflect that Dakota County now has septic inspection responsibility in the Township of Randolph, the Township of Waterford, the City of New Trier, and the City of Randolph.	Dakota County	Thank you for your comment. The noted text has been added.
1.2	Full Collaborative	Last sentence indicates that Dakota County is amending the ordinance. The ordinance was amended in 2008.	Dakota County	Thank you for the correction; the text has been updated.
1.3	Full Collaborative	Define a timeline detailing when actions will be taken to implement plan elements.	Met Council	This is included in Chapter VII, Section A3. *These changes will begin review and consideration nine months after the official adoption of the 2040 Comprehensive Plan update.*
1.4	Full Collaborative	The Plan needs to include a Capital Improvement Program (CIP) for transportation. Please provide the sequence and timing for any local public investments.	Met Council	Most of the roads within Rural Collaborative Communities are under Dakota County jurisdiction. Additional information about funding for county roads, including the CIP, will be included in the Dakota County Transportation Plan update.
1.5	Full Collaborative	Include a schedule for the preparation, adoption, and implementation of needed changes to official controls.	Met Council	This is included in Chapter VII, Section A3. *These changes will begin review and consideration nine months after the official adoption of the 2040 Comprehensive Plan update.*

Advisory Comment

Number	Plan Comment Applies to	Comment	From	Response

1.1	Full Collaborative	Page 8 & Implementation Section VII: These sections mention opportunities for feedback, but could elaborate on the number and type of community responses and if the outcomes of citizen engagement is reflective of the overall community.	Washington County	Thank you for your comment. Your recommendation has been taken under advisement.

General/Other Comments

Number	Plan Comment Applies to	Comment	From	Response
1.1	Full Collaborative	Public Facility Policies & Goals: Please consider adding a goal statement to support that public facilities/parks provide the opportunity to recycle in their operations, consistent with Minn. Stat. §llSA.151 and the adopted Dakota County Solid Waste Master Plan.	Dakota County	Thank you for your comment. Your recommendation has been taken under advisement.
1.2	Full Collaborative	MRCCA Section IV. Public River Corridor Views Plan states that, "The opposite side of the Mississippi River from Nininger Township is the Point Douglas Regional Trail, an important public trail for the area providing valuable views of the river and bluff land with a tree canopy for much of its length. The identified public river corridor view is identified with photographs within this Collaborative Plan." **Please note that no photographs were included in the plan.**	MnDNR	Thank you for your comment. Photos will be included for Nininger Township, taken by Friends of the Mississippi River.
1.3	Full Collaborative	Appendix D of the Empire Township Individual Plan plan will be a Surface Water Management Plan according to the index, so there is somewhat of an understanding that more detail will be available in that plan as well (e.g., maps of stormwater basins, storm sewer, etc.). **Will there be a surface water management plan for the Rural Collaborative as well?**	VRWJPO	Thank you for your question. No, there will not be surface water plans for the Rural Collaborative. The Collaborative communities have adopted the Vermillion River Watershed Plan and/or the North Cannon River Watershed Plan by reference.
1.4	Full Collaborative	No Comment	Scott County	
1.5	Full Collaborative	No Comment	Cannon Falls Township	
1.6	Full Collaborative	No Comment	MnDOT	
1.7	Full Collaborative	No Comment	City of Hampton	
1.8	Full Collaborative	No Comment	ISD 196	
1.9	Full Collaborative	No Comment	City of Cannon Falls	

Appendix D: Access Guidelines

Mn DOT Access Management Guidelines

Chapter 3
Guidelines for Public Street and Driveway Connections

3.1 Overview

For each access category, guidelines have been developed for the spacing of public street connections and the allowance of driveways to the state trunk highway system. The guidelines are summarized in Figures 3.1 and 3.2.

3.2 Public Street Connections

3.2.1 Background and Approach

Guidelines for the spacing of public street connections to the trunk highway system are based on the following principles and technical considerations:

1. Network Connectivity

   To promote the development of a hierarchical network of interconnected roads throughout the state, the guidelines use a tiered approach to access connections. Access is limited and reserved first for primary, full-movement intersections connecting major public streets and highways. The guidelines provide for additional secondary public street intersections at one-half the spacing of full-movement intersections, under certain conditions.

2. Urban Arterials: Balancing Safety and Mobility through Coordinated Signal Progression

   State highways and major arterials extending through urban communities serve two groups of customers with somewhat competing needs: the through-trip drivers, who desire to travel through the community without undue speed reductions and signal delays, and the local-trip drivers, who need to cross or travel on a segment of the highway to get to home, work, and services within the community. To determine the optimal balance between these competing demands, Mn/DOT conducted corridor simulations for 1 mile, ½ mile, and ¼ mile intersection spacing to compare the mobility benefits of signal progression on the mainline with overall network travel time and delays.

   Based on these simulations, the recommended spacing of primary, full-movement intersections is directly related to the spacing of signals and the need to achieve signal progression. This is because every full-movement intersection represents the potential for a traffic signal. When signalized intersections are uniformly and adequately spaced, however, platoons of vehicles can travel in both directions through the corridor at uniform speeds without needing to stop for each signal. This reduces delays for through-movements and increases the carrying capacity of the roadway.

   The intersection spacing guidelines also make allowance for additional unsignalized intersections at one-half the spacing of signalized intersections, but restrict turning movements to right-in/right-out-only on higher-volume, divided roadways. This denser network of intersecting streets may disperse traffic among multiple access points and may actually eliminate or delay the need for signalization at an intersection. The additional street access also can reduce the need for individual driveways by providing a denser supporting road network for the corridor.

3. Rural Areas: Maintaining the Historical Road Network

   Throughout much of rural Minnesota, the Township-Range System and the US Public Land Survey's one-mile section grid have served as the framework for the development of a roadway grid system spaced at 1 mile, ½ mile, and ¼ mile intervals. Over time, some of these roads have assumed a more important function within the network and have been classified as minor arterials and collectors. Typically, the more important roads were about a mile apart and located on the township or range lines. This grid system remains the prevailing factor in the spacing allowance of rural intersections.

4. Rural Areas: Providing Adequate Intersection Geometrics

   The spacing of intersections on state highways in rural areas is also based on providing sufficient area for left-turn lanes. On two-lane rural highways, the distance needed to construct a left-turn lane typically exceeds 1000 feet.

3.2.2 Policy Guidelines for Public Street Connections

The location of new or reconstructed public street connections should conform to the recommended spacing, summarized in Figures 3.1 and 3.2, for the access category assigned to the roadway segment.

Primary Intersections on IRCs and Non-IRCs
Primary intersection allowance, as summarized in Figures 3.1and 3.2, refers to full-movement intersections that may be considered for signalization if the appropriate signal warrants have been met. The spacing of primary intersections is governed by the need to provide uniform spacing for effective signal coordination in urban/urbanizing areas and adequate spacing for left-turn lanes on unsignalized highways in both urban and rural areas.

Secondary Intersections on IRCs and Non-IRCs
Secondary intersection spacing and allowance, as summarized in Figures 3.1 and 3.2, refers to intersections that may be accommodated midway between primary intersections if they do not create a high-risk conflict condition.

1. On **undivided highways**, a secondary intersection may be provided if the analysis of future traffic conditions, per the *Gap Analysis Procedure* (Section 3.2.3), indicates that a low-risk conflict condition can be maintained. If the analysis indicates a high-risk conflict condition is anticipated, the intervening intersection should not be allowed. Where an undivided highway is planned to become a divided highway, the secondary intersection should be analyzed as if it were a divided highway.
2. On **rural divided highways**, a secondary intersection may provide full movement if the analysis of future traffic conditions, per the *Gap Analysis Procedure* (Section 3.2.3), indicates that a low-risk conflict condition can be maintained. A full-movement, intervening secondary intersection may be subject to future conversion to a right-in/right-out or to a ¾ movement (right-in/right-out/left-in-only) intersection if increased traffic growth creates the potential for a high-risk conflict.

   If the analysis indicates that a full-movement intersection on a divided highway would create a high-risk conflict condition, further analysis, per the *Gap Analysis Procedure* (Section 3.2.3), should be conducted to determine whether restricting the intersection to right-in/right-out-only would maintain a low-risk conflict condition. If the analysis indicates that a high-risk conflict condition would still be created, the intervening intersection should not be allowed, or it should be restricted to a right-in-only, if practicable, given the supporting road network.
3. On **urban/urbanizing and urban core divided highways**, the secondary intersection should be limited to right-in/right-out-only. Secondary intersections in urban/urbanizing areas are not conducive to two-way coordinated signal progression, and therefore, should not be signalized. If a secondary intersection meets warrants for a traffic signal, alternatives such as eliminating some turning movements or diverting some traffic should be considered instead of installing a traffic signal.

Figure 3.1 – Summary of Recommended Street Spacing for IRCs

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

Figure 3.2 – Summary of Recommended Street Spacing for Non-IRCs

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		

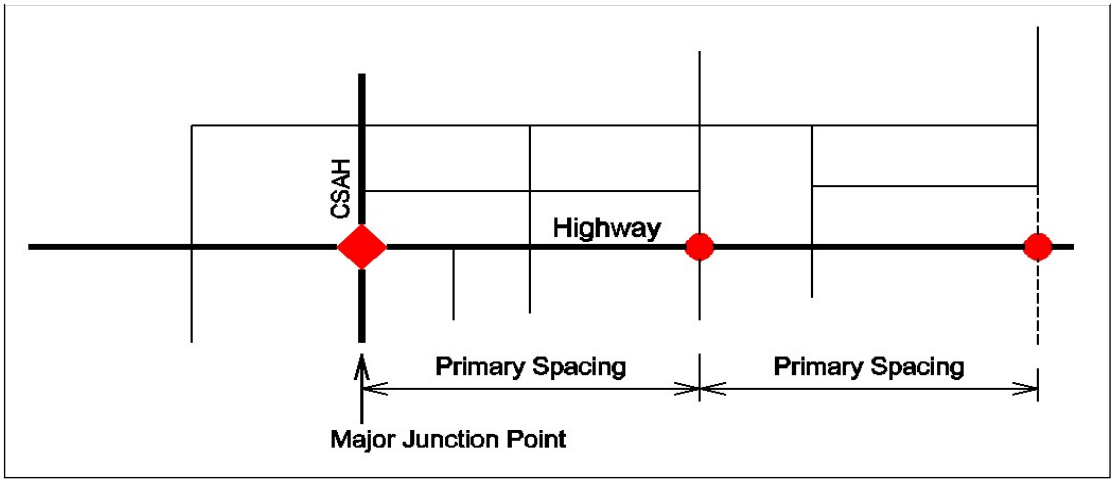
Identifying Primary and Secondary Intersections

Three steps are involved in the spacing of proposed public street intersections, as discussed in the following paragraph.

Step 1. To evaluate the consistency of a proposed public street intersection with the spacing guidelines, the reviewer must first determine the location of existing primary and secondary intersections along the corridor. Typically, a primary intersection is the junction between two major roads, and a secondary intersection is a junction between a major road and a minor road or a local street.

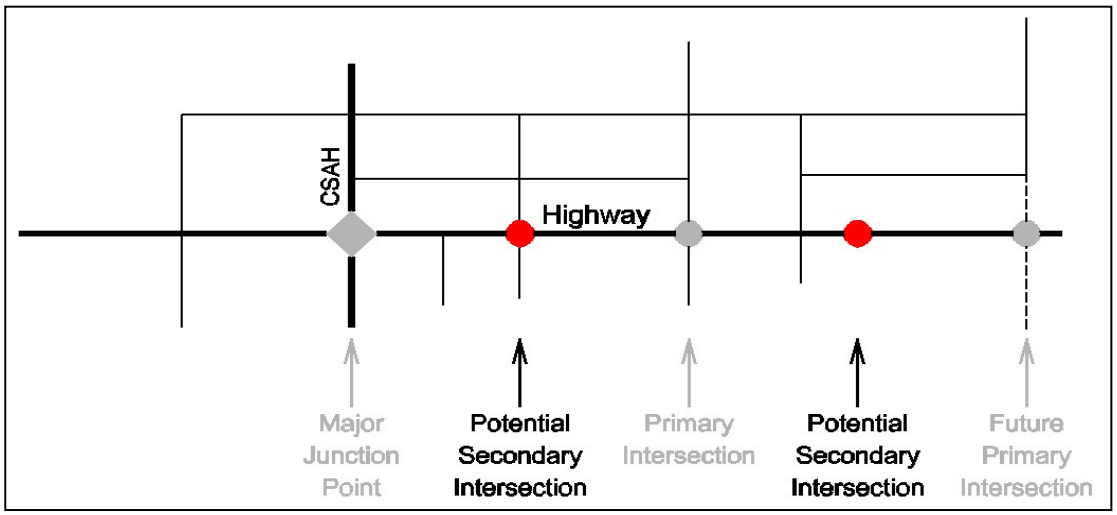
Step 2. Once identified, the major junction point becomes the beginning terminus from which the spacing of conforming intersections along the corridor is determined. In Figure 3.3, the junction of the CSAH and the trunk highway is identified as the major junction point. The primary intersection spacing is measured from that point.

Figure 3.3: Identifying Primary Intersection Spacing



Step 3. After the reviewer has determined the location of the primary and intersections along the corridor, they then identify the potential locations for secondary intersections. As shown in Figure 3.4, secondary intersections are typically located half way between the primary intersections.

Figure 3.4: Identifying Secondary Intersection Spacing



General Guidance for All Public Street Connections
The guidance below applies to all primary and secondary public street connections:

1. A high-volume driveway (Access Type 3) may substitute for an at-grade public street if:

   - The location is consistent with spacing guidelines for a public street connection;
   - The driveway is designed to provide access to a large development area encompassing multiple properties or structures served by a clearly-defined system of internal streets; and,
   - The driveway does not negatively impact the accessibility of adjacent land areas by disrupting the connectivity of the local supporting street network.

2. At-grade public street spacing should be measured from cross-street centerline to cross-street centerline along the primary highway. Minor variance, within 5% of the recommended spacing, constitutes conformance to the spacing guidelines if required to accommodate topographical constraints or connectivity to the established road network. Street spacing within 5% of the recommended distance should, in most cases, provide sufficient space to accommodate turn lanes, weaving maneuvers, and signal progression.

3. Breaks in existing access control to construct a new at-grade public street connection consistent with these guidelines may be considered, if necessary, to provide reasonable access and network connectivity. For Category 1F, 1AF, 2AF, 3AF, and 4AF highways, breaking access control should be considered only for a new interchange (Future chapters in this manual will provided additional guidance).

4. With regard to the impact of public street connections on the safety and operations of the transportation network, the location and design of each public street connection should be consistent not only with the guidance in this section, but also with the guidance provided in Section 3.4.

3.2.3 Secondary Intersections and Gap Analysis Procedure

Secondary Intersections Analysis
A secondary intersection is allowed between two primary intersections (per Section 3.2.2) if the secondary intersection does not create a potential risk to the safety and mobility. The Gap Analysis Procedure as described below and is illustrated with graphs (Figures 3.5 – 3.9) is part of the process of determining the appropriateness of a secondary intersection.

The Gap Analysis Procedure is used to evaluate the ability of vehicles at an access location to find adequate gaps in mainline traffic flows. If there are insufficient gaps, longer queues and delays will be experienced and the potential for greater risk-taking will occur. On low-volume highways, there will be fewer conflicting vehicles and many more gaps available. These low-volume roads allow for easier decision-making and less judgment by the driver. To identify potential high-risk areas where additional access is not advised, a simplified approach to gap analysis has been developed for application to unsignalized corridors.

This approach depends upon a series of risk-conflict graphs (Figures 3.5 – 3.7) that identify high-risk areas along unsignalized corridors, based on roadway configuration. These graphs are presented on the next page.

The gap analysis is intended for use on highways operating under a condition of random arrival. For this reason, the risk-conflict graphs are primarily applicable to unsignalized roadway segments. These unsignalized roadway segments include Category 1A, 2A, 3A, 4A, 5A, and 6A (rural areas) roadways.

Risk-Conflict Graphs

The risk-conflict graphs in Figures 3.5 – 3.7 were developed to be applied to specific roadway designs based on methodology in the *Highway Capacity Manual 2000*. The methodology assumes the following roadway design conditions:

- Side streets are stop-controlled;
- Traffic from nearby intersections does not impact the subject intersection or access point; and,
- Under wide median conditions (Figure 3.7), vehicles entering and crossing the mainline may use a two-step maneuver.

Figures 3.5 – 3.7 represent risk-conflict conditions based on roadway design. To select the appropriate figure to use, the reviewer chooses the graph representing the type of median on the primary roadway that is under consideration.

Figure 3.5 – Undivided Two-Lane Roadways

Figure 3.5 is used for all two-lane undivided roadways. Use this figure if there is no median along the primary highway.

Figure 3.5: Gap Analysis Graph for Undivided Two-Lane Roadways

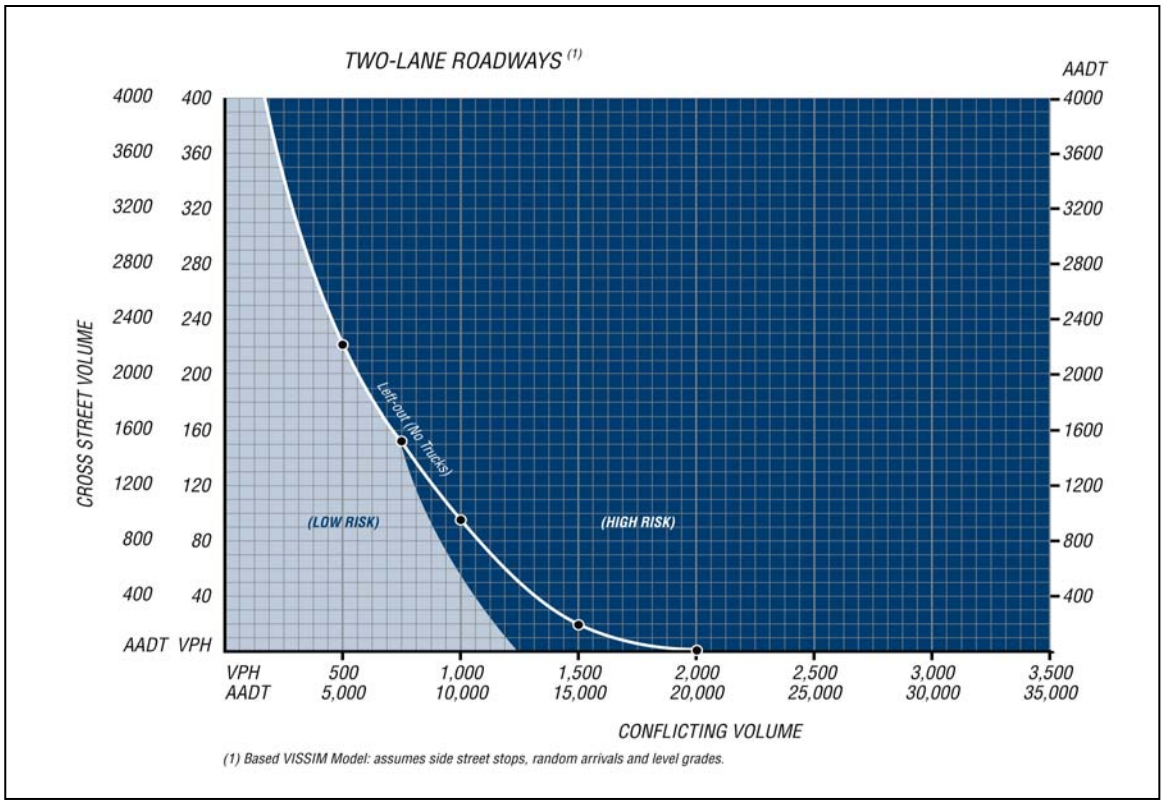


Figure 3.6 – Divided Four-Lane Roadways (with Narrow Medians)
Figure 3.6 is used for divided roadways with narrow medians. A narrow median is defined as having no storage space. Narrow medians require all vehicles crossing or turning left from the cross street to complete the maneuver as a single movement. This figure is also used when looking at right-in/right-out intersections.

Figure 3.6: Gap Analysis Graph for Divided Four-lane roadways with Narrow Medians

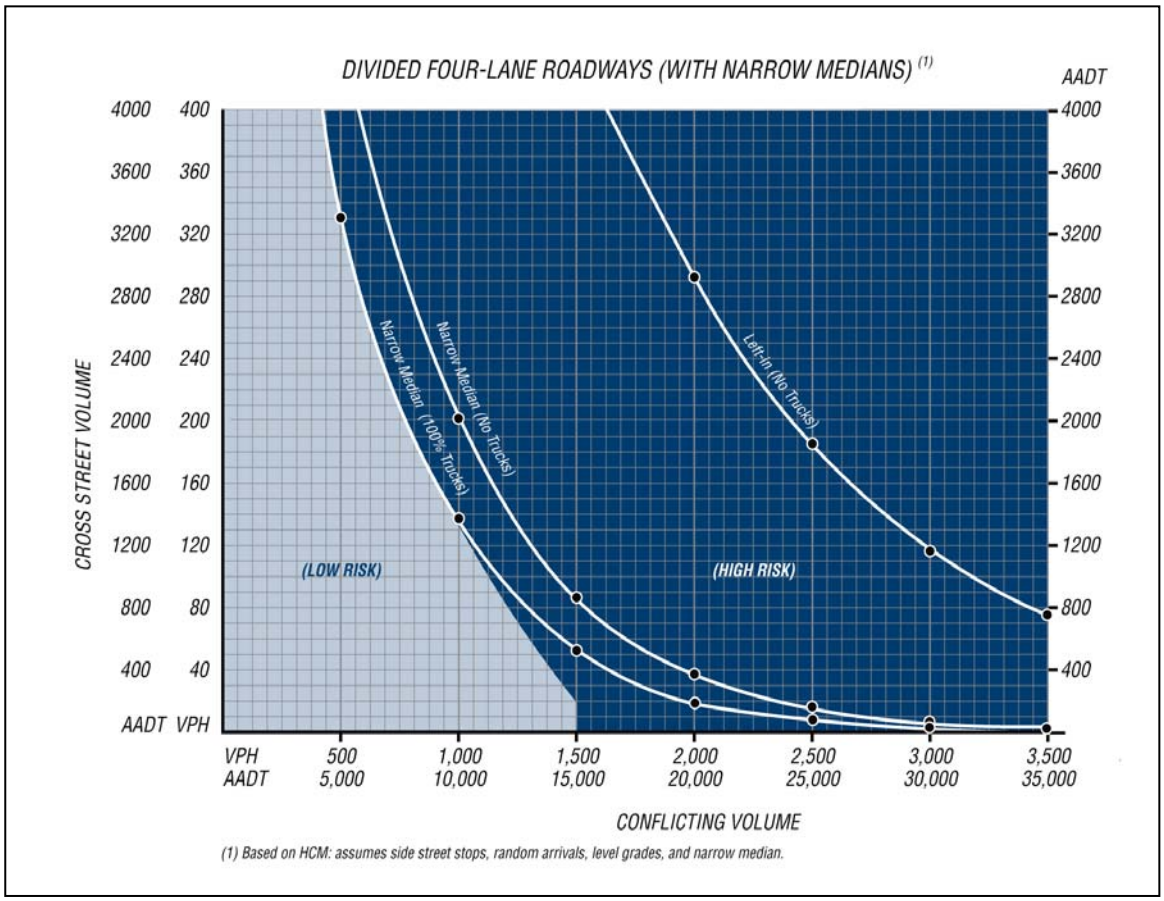
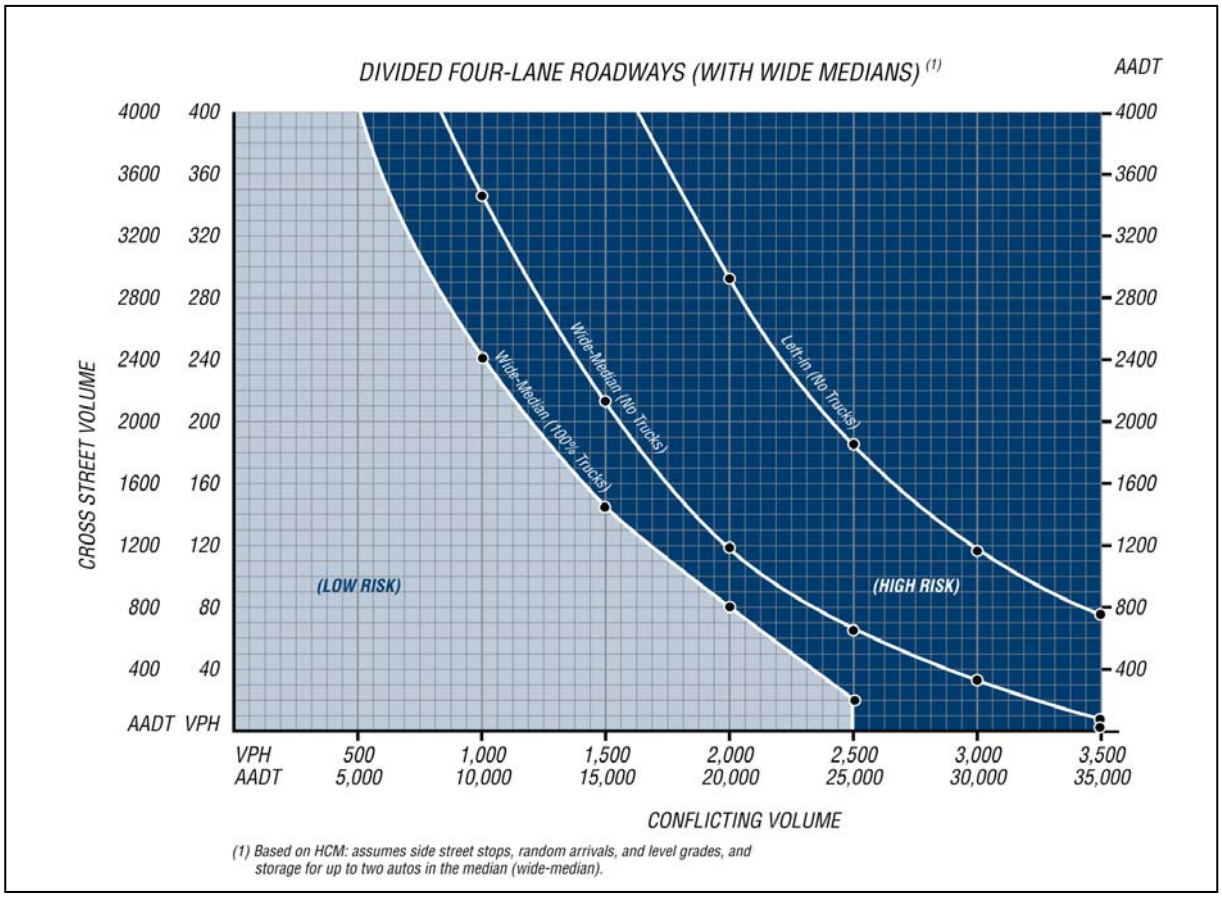


Figure 3.7 – Divided Four-Lane Roadways (with Wide Medians)
Figure 3.7 is used for divided roadways with wide medians. A wide median is defined as having storage for up to two vehicles in the median. This allows vehicles crossing or turning left from a side street to complete the maneuver in two steps.

Figure 3.7: Gap Analysis Graph for Divided Four-lane Roadways with Wide Medians



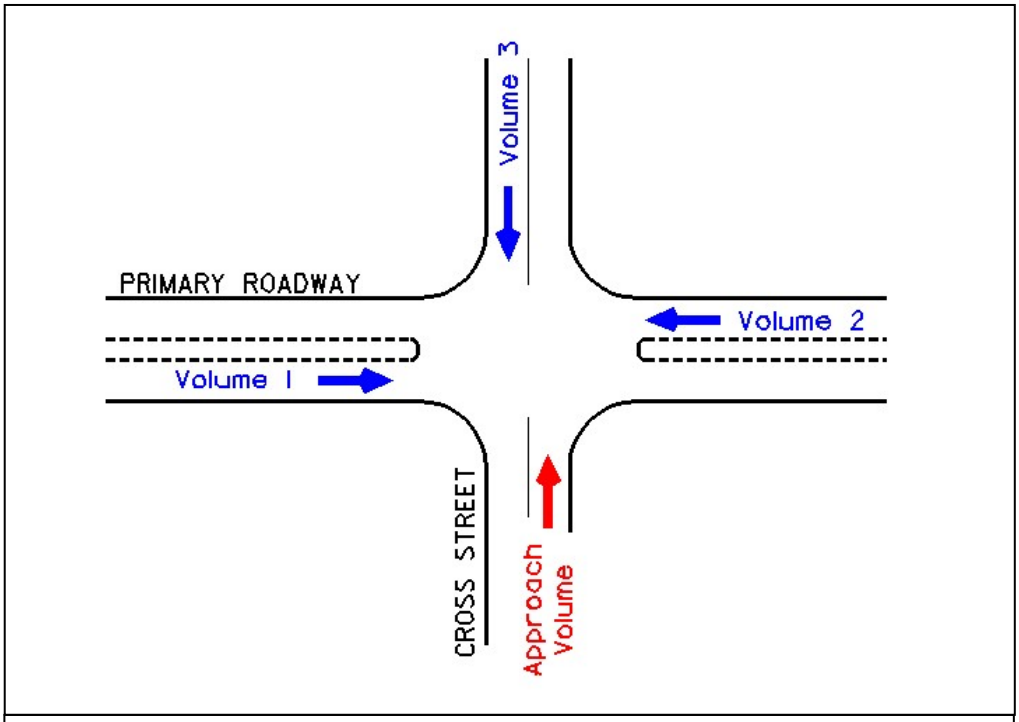
Using the Risk Conflict Graphs
The Risk Conflict Graphs are used to compare the approach volume on the potential secondary intersection with the conflicting volumes on the primary roadway and other legs of the potential intersection. The analysis looks first at whether the secondary intersection would safety operate as a full-movement intersection. If the secondary intersection would not safety operate as a full-movement intersection, it would be analyzed as a right-in/right-out-only intersection to see if would safely operate. If it would not operate safely either as full-movement intersection or a right-in/right-out-only intersection, the intersection should not be allowed. The following sections, and Figures 3.8 and 3.9, explain the calculations for determining the secondary intersection that should be allowed.

Full-movement Intersection Analysis

The following five steps determine whether a full-movement intersection is appropriate,

Step 1. The Conflicting Volume (horizontal axis on Figure 3.5, 3.6, or 3.7) is the estimated 20-year AADT of the primary roadway plus one-half of the 20-year cross street AADT (*in Figure 3.8, the Conflicting Volume is Volume 1 + Volume 2 + Volume 3*). At T-intersections, the horizontal axis of the graphs is only the estimated 20-year AADT of the primary roadway (*in Figure 3.8, the Conflicting Volume is Volume 1 + Volume 2*). The Approach Volume (vertical axis on Figure 3.5, 3.6, or 3.7) is one-half of the estimated 20-year AADT of the cross street or access point. If actual traffic data is available, that data should be used to determine the approach volume and the conflicting volumes.

Figure 3.8: Approach Volume and Conflicting Volumes for a Full-movement Intersection



Calculations:
Volume 1 = One-half of the Primary Roadway AADT
Volume 2 = One-half of the Primary Roadway AADT
Volume 3 = One half of the Cross Street AADT
Approach Volume = One-half of the Cross Street AADT
Conflicting Volume = Volume 1 + Volume 2 + Volume 3

Step 2. Determine which graph (Figure 3.5, 3.6, or 3.7) to use.

Step 3. Compare the Approach Volume (vertical axis) with the Conflicting Volume (horizontal axis) to determine the intersection condition. If the intersection falls within the low-risk conflict condition, a full- movement intersection may be allowed.

Step 4. If the intersection falls within the high-risk conflict condition and is located on a divided roadway, the intersection should be analyzed to determine if a right-in/right-out-only intersection is acceptable (see Right-in/Right-out-only Intersection Analysis below).

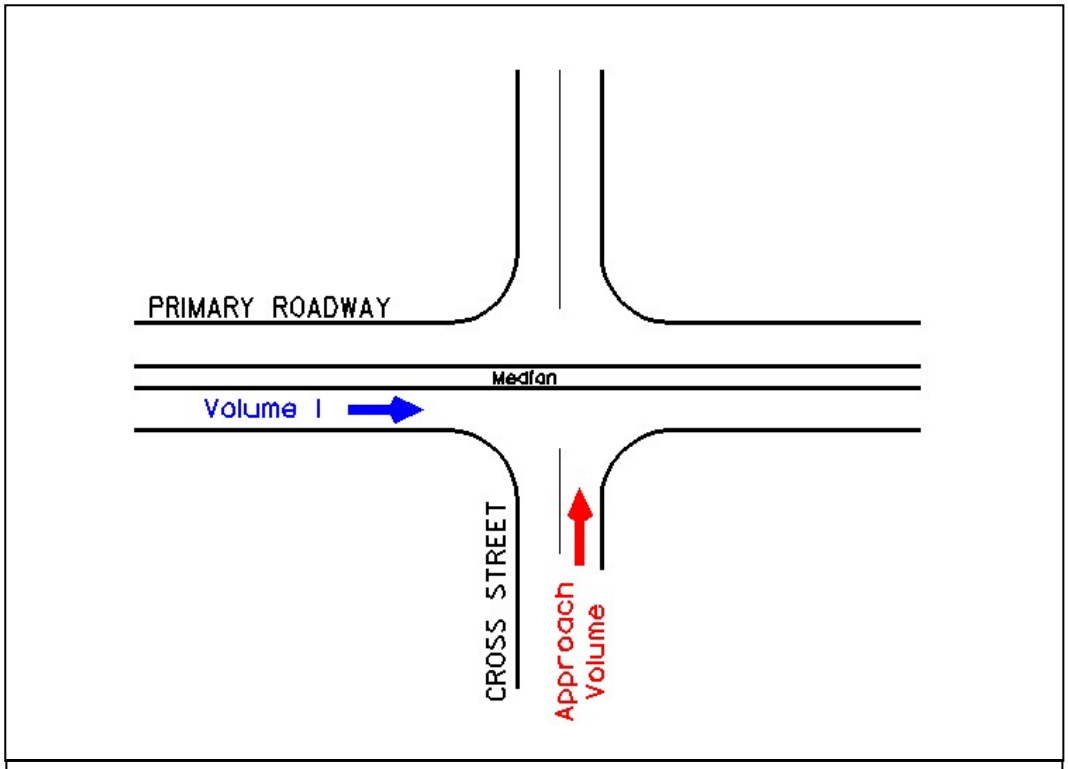
Step 5. If the intersection or access point falls within the high-risk conflict condition and is located on a two-lane undivided roadway, the intersection or access point should not be allowed.

Right-in/Right-out-only Intersection Analysis

The following two steps determine whether a right-in/right-out-only intersection is appropriate,

Step 1. Figure 3.6 represents the risk conflict conditions for right-in/right-out-only intersections. The Conflicting Volume (horizontal axis on Figure 3.6) Is one-half of the estimated 20-year AADT of the primary roadway (*in Figure 3.9, the Conflicting Volume is Volume 1*). The Approach Volume (vertical axis on Figure 3.6) is one-half of the estimated 20-year AADT of the cross street or access point.

Figure 3.9: Approach Volume and Conflicting Volumes for a Right-in/Right-out-only Intersection



Calculations:
Volume 1 = One-half of the Primary Roadway AADT
Approach Volume = One-half of the Cross Street AADT
Conflicting Volume = Volume 1

Step 2. Compare the Approach Volume (vertical axis) with the Conflicting Volume (horizontal axis) on Figure 3.6 to determine the intersection condition. If the intersection falls within the low-risk conflict condition, a right-in/right out only intersection may be allowed. If the intersection falls within the high-risk conflict condition, no intersection should be allowed. Alternatively, a right-in only intersection with a right-turn lane may be considered if connectivity to the supporting street network provides full circulation and return movements.

3.2.4 Guidelines for Supporting Street Connectivity

As communities grow and land is subdivided for development, it is important to promote the continuation and extension of the existing local street system. Dead-end streets, cul-de-sacs, and gated communities force traffic to use major roadways even for short local trips. Fragmented street systems also impede emergency access and increase the length of automobile trips.

A new public street connection to the trunk highway system should also provide direct connections to the existing or planned local street system.

Local subdivision regulations should also promote and support network connectivity.

In some cases, supporting street connectivity may not be feasible or appropriate, such as:

- Where existing topographical constraints or historical street patterns may prevent connectivity with the local street system;
- Where large developments with potential security concerns would warrant fewer access points, such as military bases, parks, airports, ports, and similar facilities; or,
- Where large regional developments would generate primarily long-distance or regional trips and would result in unacceptable traffic volumes on the local street system.

3.2.5 Guidelines for Signalization

Closely- or irregularly-spaced traffic signals result in frequent stops, unnecessary delays, increased fuel consumption, excessive vehicular emissions, and increased highway crash rates. Alternatively, uniform signal spacing facilitates coordinated signal timing plans that can effectively accommodate varying traffic conditions during peak and off-peak periods, and also allows for adaptation of a traffic control system as changes occur over time. Therefore, selecting uniform signalized intersection spacing is an essential element in establishing access spacing standards.

In rural areas, where traffic signals are usually isolated (spacing greater than one mile), this approach does not apply. Traffic signal spacing is most relevant in urban and urbanizing areas where through-traffic mobility and side-street accessibility are typically balanced through the use of signalized intersections.

The following tables (Figures 3.10 and 3.11) outline methods for determining signal spacing.

Figure 3.10: Signal Spacing Guidance for IRCs

Category	Signal Spacing Guidance
Interregional Corridors & Interstate Highways	
The Interregional Corridor system identifies important statewide mobility corridors. On these highways, performance targets have been developed based on overall corridor speed. A traffic signal on one of these corridors represents a delay penalty or a reduction in the corridor speed; therefore, a new traffic signal on an Interregional Corridor should generally be avoided, if possible. When a district is considering a new signal on an Interregional Corridor, the Office of Investment Management is available to assist in calculating the impact of the signal on the overall corridor performance.	
1F	All access to the interstate system is via interchanges. Signal spacing is not applicable.
1AF **2AF**	**Full Access-Controlled Highways:** All access to the highway system is via interchanges. Signal spacing is not applicable. **Transitioning Highways:** On IRC highways transitioning to a full freeway design, new traffic signals should not be considered unless no other economically feasible alternative is available. The new traffic signal should be considered interim, and a plan for its future removal should be developed. Wherever possible, the new traffic signal should be located where a future interchange is planned.
1A **2A**	On rural IRC highways, a new traffic signal may be considered if warranted and if it does not lower the performance of the corridor below the target speed. However, if the signal is warranted and needed for safety, and a cost-effective alternative is not feasible, an interim signal may be considered, even though it would lower the performance of the corridor below the target speed.
1B **2B**	On urban/urbanizing IRC highways, a new traffic signal may be considered if warranted, but it should be both uniformly-spaced and interconnected with other signals along the corridor to minimize delay and to promote platoon flow. • **Category 1B: The recommended signal spacing is one-half mile. The new traffic signal should be considered interim and a plan for its future removal should be developed.** • **Category 2B: The recommended signal spacing is one-half mile**.

Note:
The information provided in this Mn/DOT Access Management Manual does not supersede the Mn/DOT Traffic Engineering Manual or the Mn MUTCD.

Mn/DOT Traffic Engineering Manual:
"Traffic signals should not be installed unless one or more of the signal warrants in the Mn MUTCD are met, but the meeting of a warrant or warrants does not alone justify the installation of a signal."

Figure 3.11: Signal Spacing Guidance for Non-IRCs

Category	Signal Spacing Guidance
Non-IRC Highways	
3AF **4AF**	**Full Access-Controlled Highways:** All access to the highway system is via interchanges. Signal spacing is not applicable. **Transitioning Highways:** On highways transitioning to a full freeway design, new traffic signals should not be considered unless no other economically feasible alternative is available. The new traffic signal should be considered interim, and a plan for its future removal should be developed. Wherever possible, the new traffic signal should be located where a future interchange is planned.
3A **4A** **5A** **6A**	**Rural:** Because traffic signals located in rural areas are generally isolated, they do not directly impact the spacing of at-grade public street connections. In these areas, traffic progression is not an issue and traffic signals are generally installed to address safety concerns. In rare cases, two or more traffic signals may be closely spaced (spacing of one-half mile or less) along an otherwise rural and unsignalized highway. These signals should be interconnected and timing should be coordinated to minimize the impact on the mobility of the through-traffic.
1C **2C** **3B & 3C** **4B & 4C** **5B & 5C** **6B & 6C**	**Urban/Urbanizing and Urban Core:** The public street connection spacing policy is based on providing two-way coordinated traffic progression (or platoon flow) through a series of traffic signals. The policy balances mobility and accessibility and relies on the ability to provide uniform and interconnected traffic signal spacing. • **Categories 3B & 4B: The recommended signal spacing is one-half mile;** • **Categories 5B & 6B: The recommended signal spacing is one-quarter mile;** • **Category 1C: The recommended signal spacing is one-quarter mile. The new traffic signal should be considered an interim solution, and a plan for its future removal should be developed;** • **Categories 2C, 3C, 4C, & 5C: The recommended signal spacing is one-quarter mile;** • **Category 6C: The recommended signal spacing is one-eighth mile.**
7	By adopted plan

Note:
The information provided in this Mn/DOT Access Management Manual does not supersede the Mn/DOT Traffic Engineering Manual or the Mn MUTCD.

Mn/DOT Traffic Engineering Manual:
"Traffic signals should not be installed unless one or more of the signal warrants in the Mn MUTCD are met, but the meeting of a warrant or warrants does not alone justify the installation of a signal."

3.2.6 Guidelines for Other Higher-Level Traffic Control

Other higher-level traffic control, including roundabouts, four-way stop conditions, and continuous flow intersections may impact highway mobility and platoon flow. Where platoon flow is critical, these other traffic control methods need to be thoroughly analyzed with regards to corridor mobility before being considered as alternatives to traffic signals. The use of other higher level traffic control methods should be consistent with primary intersection spacing, as discussed above, in Section 3.2.2.

3.2.7 Interim Spacing on Transitioning Subcategory AF Highways

On subcategory AF highways transitioning to freeways, it is likely that both at-grade intersections and interchanges will be present. All at-grade intersections should be considered interim. The desirable spacing between an at-grade intersection and the merge point of the closest ramp should be a minimum of one-half mile (see Figure 3.35). If one-half mile cannot be attained, a shorter spacing may be considered if analysis shows that the shorter distance would not create unacceptable weaving operations.

The spacing between two at-grade, full-movement intersection spacing on an AF Highway should be one mile.

3.3 Driveway Connections

3.3.1 Background and Approach

Mn/DOT's policy on driveway connections is designed to respect the legal rights of abutting property owners while preserving safety and mobility on the trunk highway system. **Except where Mn/DOT has acquired access rights, abutting property owners are entitled to reasonably convenient and suitable access to the highway.**

Mn/DOT regulates access as an exercise of the police power of the state: the power to impose restraints on private rights as necessary for the general welfare. Regulations or restrictions on access that are legitimate exercises of the police power are generally not compensable. However, if the restriction on access denies a property owner reasonably convenient and suitable access, the denial becomes a taking of a property right, subject to compensation. The policy guidelines for driveway allowance are intended to support Mn/DOT's legitimate exercise of its regulatory authority without creating an unintended compensable taking.

The policy reflects the following considerations regarding driveways and property access:

- Property access via the **local street system**, when available, is generally preferred over direct driveway connections to the trunk highway system, as this is most conducive to safety and mobility. However property access via the local street system must provide reasonably convenient and suitable access.

- Within **urban/urbanizing areas**, Mn/DOT strongly encourages the development of a complete supporting local road network to serve as an alternative to direct driveway access to the trunk highway system. Urban/urbanizing areas offer the greatest opportunity to improve mobility and safety through access management.

- Within **rural areas**, Mn/DOT recognizes that developing a complete supporting road network may not be economically feasible. In many parts of the state, the road network is sparse and trunk highways must provide both mobility and property access. However, to preclude private access to the trunk highway altogether would overly restrict the economic use of the surrounding area.

- Where the combination of high speeds and high traffic volumes precludes the safe accommodation of driveways, Mn/DOT may seek to acquire access control or construct access roads to provide alternative access. On much of the rural trunk highway system, however, this level of investment is not feasible or cost-effective. Nevertheless, with proper consideration for location and design (Section 3.4), a driveway may be accommodated without unduly affecting safety and mobility.

The table that follows (Figure 3.12) provides an overview of Mn/DOT's policy on driveway connections to trunk highways.

Figure 3.12: Summary of Driveway Allowance

Category	Area or Facility Type	Driveway Allowance
1F	Interstate Freeways	• No private driveways are allowed
1AF, 2AF, 3AF & 4AF	Non-Interstate Freeways & High-Priority IRCs	• On facilities transitioning to full access control, driveways should not be permitted if reasonably convenient and suitable alternative access is available. • Where reasonably convenient and suitable alternative access is not available, an interim driveway may be permitted, and if possible, it should be designed so that traffic can be redirected to another road when the facility becomes fully access-controlled.
1A, 2A, 3A, 4A & 5A	Rural (Not planned for full access control)	• If a property retains access rights but no reasonably convenient and suitable alternative access is available, a driveway is permitted. • The driveway should be located and designed to minimize the impact on the safety and operations of the highway. • All driveways (Types 1, 2, and 3) should be spaced in accordance with Figure 3.27.
1B, 2B, 3B, 4B & 5B	Urban/ Urbanizing	• If a property retains access rights but no reasonably convenient and suitable alternative access is available, a driveway is permitted. • It is Mn/DOT's preference to permit public street connections rather than driveways in Urban/Urbanizing areas. Where possible, Mn/DOT should work with local agencies to encourage the development of a supporting road system to serve the property. • High-volume (Type 3) driveways should be spaced in accordance with Figure 3.27. • Driveways should be permitted as interim where a future supporting street system is anticipated.
1C, 2C, 3C, 4C & 5C	Urban Core	• If a property retains access rights but no reasonably convenient and suitable alternative access is available, a driveway is permitted. • The spacing of driveways will vary based on reasonableness of use and driver expectancy.
6A, 6B & 6C	All Collectors	• If a property retains access rights and no reasonably convenient and suitable alternative access is available, a driveway is permitted. • The spacing of driveways will vary based on reasonableness of use and driver expectancy.
7	Specific Access Plan	• The adopted Category 7 Plan should address the allowance and spacing of driveways.

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3.3.2 Policy on Driveway Connections

Policy
Where access rights have been acquired and complete access control established, direct property access is prohibited. At all other locations, driveways are allowed conditionally, subject to the following findings:

1. The property retains access rights (Section 3.3.3); and,
2. Reasonably convenient and suitable alternative access to the property is not otherwise available (Section 3.3.4).

If both of these findings are satisfied, a driveway should be allowed. Generally, only one driveway is allowed unless additional driveways are necessary to provide reasonably convenient and suitable access to the existing or proposed land use.

The location and design of the driveway should be considered after determining whether access is allowed. Considerations regarding the location and design of a driveway are described in Section 3.4.

Note: There may be circumstances where the reviewer determines that even though these two findings are satisfied, and location and design guidance are applied, the driveway connection would significantly impair the safety or mobility of the highway. In these situations, the District Engineer must determine whether investing in acquisition of the property's access rights to prevent the driveway is warranted.

3.3.3 Findings: The Property Retains Access Rights

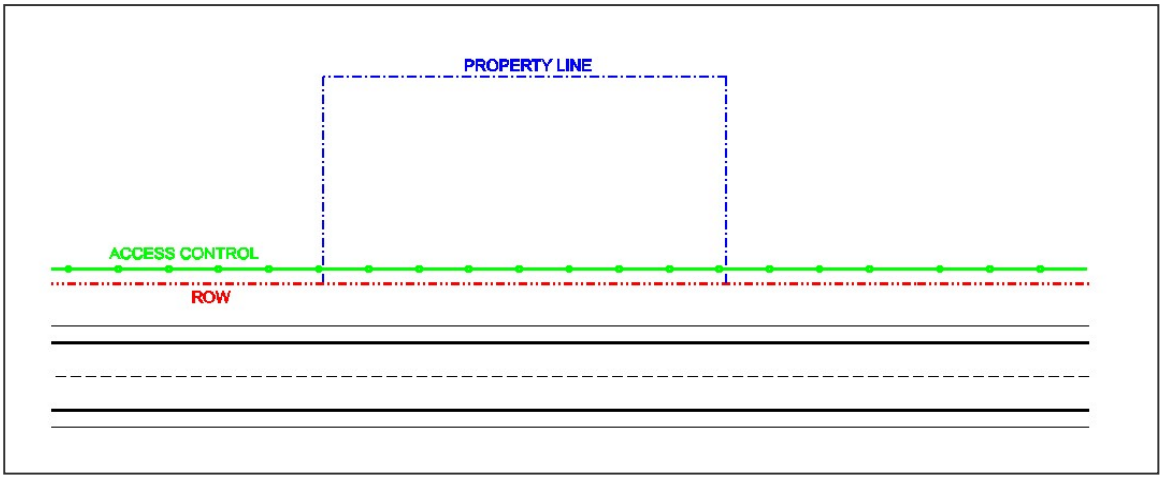
Mn/DOT and local governments have the authority to acquire access rights. The degree to which access rights are acquired will impact how Mn/DOT addresses driveway access.

Full Access Control

Full access control is the condition by which the right of access is acquired along the entire frontage of the property. The right of access may be acquired by Mn/DOT or by a local road authority through purchase, gift, or deed. Once the right of access is acquired along the property's frontage, it is considered Full Access Control, and the property retains **no right of access**.

Where Full Access Control exists, it is Mn/DOT's policy that driveway connections not be allowed.

Figure 3.13: Full Access Control

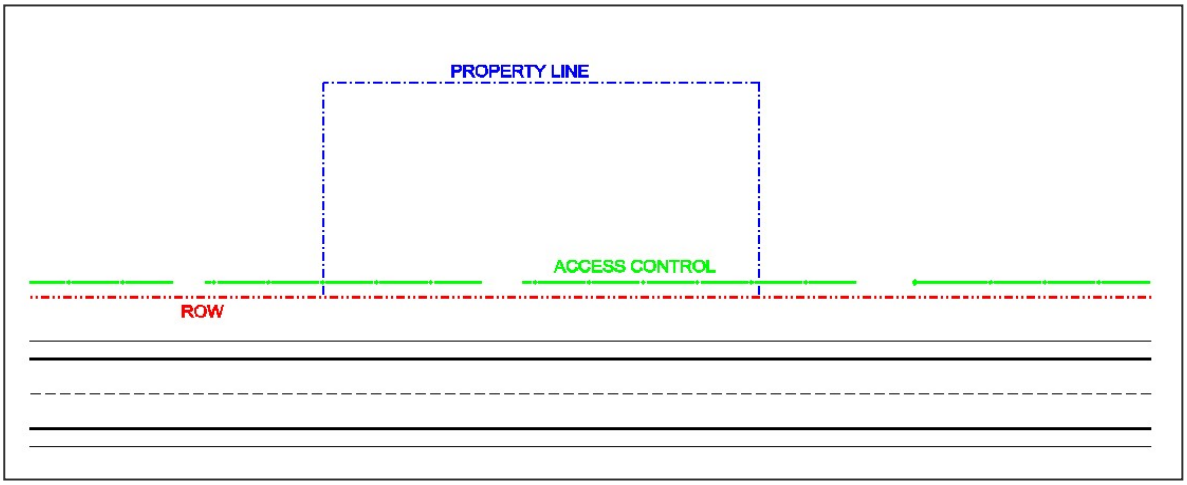


Partial Access Control

Partial Access Control is the condition by which the right of access is acquired along only parts of the property's frontage. The property owner retains the right of reasonably convenient and suitable access at those points or at remaining "openings" in access control where rights have not been acquired.

It is Mn/DOT policy that an opening established through the acquisition of partial access control does not confer an automatic right to a direct driveway connection at that point; rather, it is Mn/DOT's policy that a driveway be allowed at an opening in partial access control, subject to the finding that reasonably convenient and suitable alternate access is not available.

Figure 3.14: Partial Access Control

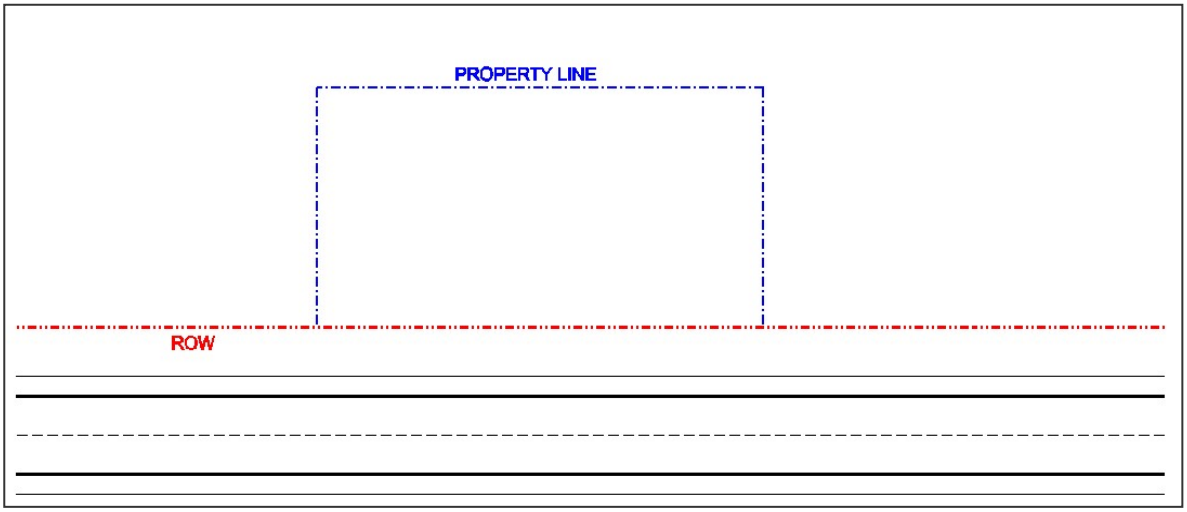


No Access Control

No Access Control is the condition by which the right of access has not been acquired at any point between a parcel and a highway.

It is Mn/DOT policy that a driveway be allowed from a property where Mn/DOT has not acquired any access rights, subject to the finding that reasonably convenient and suitable alternate access is not otherwise available.

Figure 3.15: No Access Control



Easements for Nonabutting Property

Minnesota Statute 160.18, Subdivision 3, provides statutory guidance regarding easements for property abutting a highway, as follows:

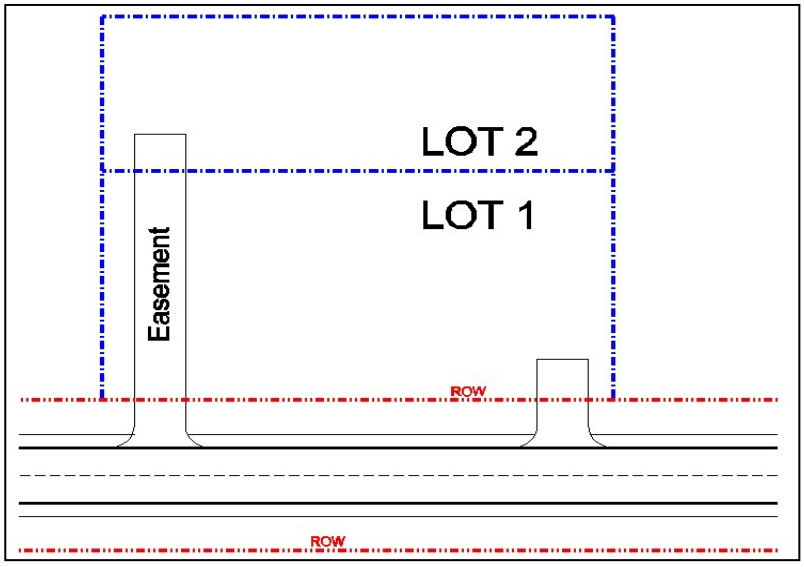
"The owner or occupant of property abutting upon a public highway, having a right of direct private access thereto, may provide such other or additional means of ingress from and egress to the highway as will facilitate the efficient use of the property for a particular lawful purpose, subject to reasonable regulation by and permit from the road authority as is necessary to prevent interference with the construction, maintenance and safe use of the highway and its appurtenances and the public use thereof."

Generally, only property abutting a highway has a right of access to the highway; therefore, it is Mn/DOT policy that a nonabutting parcel or lot does not have a right of access, unless all of the following findings are met:

- The nonabutting parcel or lot has a legal and documented easement; and,
- The easement represents the only reasonably convenient and suitable access to the nonabutting parcel or lot.

In Figure 3.16, Lot 2 is a nonabutting lot with an easement through Lot 1. If Lot 2 is landlocked and has no reasonably convenient and suitable alternative access, Lot 2 has a right to access to the highway, subject to the reasonable regulation as described in Section 3.4.

Figure 3.16: Access to Nonabutting Lot



An easement for a nonabutting parcel or lot is an unusual circumstance. Normally the local land use authority will not allow such a subdivision.

3.3.4 Findings: Reasonably Convenient and Suitable Alternative Access

Definition
The definition of "reasonably convenient and suitable alternative access" will vary depending on the specific circumstances of the property. It will also vary depending on the importance and function of the highway.

It is generally accepted that reasonably convenient and suitable access entitles the landowner access from the property to only the near lane of travel. On divided highways, the landowner is not legally entitled to a median opening.

What is reasonably convenient and suitable not only guides the location and design of a driveway, but also guides the determination of the number of driveways necessary to reasonably serve the property. In most cases, one driveway per parcel is sufficient to provide reasonably convenient and suitable access. In rare cases, though, multiple driveways may be necessary if the property cannot otherwise be developed or utilized using a single driveway.

In addition, Mn/DOT may recommend multiple driveways as an alternative to a single driveway where multiple driveways would lessen the impact on the safety and operations of the highway.

Guidance
While the ultimate decision on what is reasonably convenient and suitable alternative access can only be established through the judicial system, Mn/DOT staff must exercise administrative judgment when reviewing permits or designing projects. The following questions are provided as a guide to evaluating whether the potential alternative access is reasonably convenient and suitable:

- Are the existing or proposed structures and parking areas situated to allow use of the potential alternative access?
- Are there any environmental, topographic, or other physical constraints or easements associated with the property or surrounding area that would prevent reasonable use of the potential alternative access?
- Does the potential alternative access provide sufficient on-site circulation for the anticipated type of customer and delivery vehicles?
- Will the potential alternative access to the property be consistent or comparable with similar properties on the corridor?
- Are the potential alternative street routes functionally suitable and structurally capable of carrying the anticipated traffic volumes and vehicle types?
- Will the anticipated traffic volumes and vehicle types be compatible with the surrounding neighborhood?
- Is the functional classification of the potential alternative street route equal to or lower than that of the directly-abutting highway?
- Can the potential alternative access be constructed to meet design criteria, such as sight distance?
- Is the site adequately and safely served by a single access point?

3.4 Location and Design Considerations

The location and design of a public street connection or driveway should minimize the impact on the safety and operations of the transportation network to the greatest extent possible while still providing reasonably convenient and suitable access.

This section provides guidance and examples of access-related elements that should be considered when designating the location and design of a public street connection or driveway:

- Number of Driveways;
- Sight Distance;
- Spacing between Driveways;
- Corner Clearance and Access within the Functional Area of an Intersection;
- Offset Driveways and Streets;
- Restricted Movements and Median Openings;
- Shared Driveways;
- Interim Access; and
- Auxiliary or Turn Lanes.

3.4.1 Number of Driveways

Definitions
A **lot** is a designated tract or area of land established by plat, subdivision, or as otherwise permitted by law, to be separately owned, used, developed, or built upon.

A **parcel** is any contiguous quantity of land in the possession of, owned by, or recorded as the property of the same owner. A parcel may encompass one or more lots.

Guidance and Examples
The need for multiple driveways serving the same lot should be reviewed on a case-by-case basis.

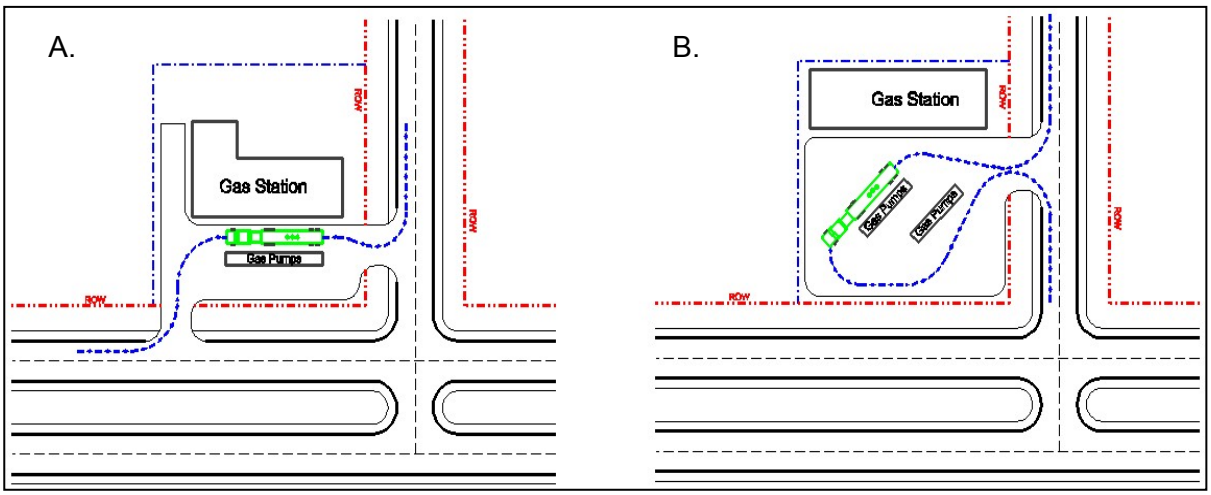
In most cases, one driveway per parcel is sufficient to provide reasonably convenient and suitable access. In rare cases, though, multiple driveways may be necessary if the property cannot otherwise be developed or utilized using a single driveway. Figure 3.17 demonstrates how the layout of a parcel can affect the number of driveways. In Figure 3.17A the location of the building and small pump area prevents a delivery truck from using a single driveway (without backing into the street). In Figure 3.17B the building is located back further and the pump area is larger, therefore a delivery truck would be able to enter and exit the property through a single driveway.

Examples of when an additional driveway may be considered include the situations cited below, as illustrated on the next few pages:

- A small parcel or lot where large delivery trucks are unable to safely maneuver and circulate on-site;

- A small parcel or lot serving highly-directional, highway-oriented traffic movements (such as service stations or drive-through banks, as shown in Figure 3.17) where the logical flow of traffic would be safely directed into the parcel at one driveway and out of the parcel at another driveway.

Figure 3.17: Multiple Driveways for Small Parcels



- A parcel or lot to separate incompatible vehicle uses (see Figure 3.18). *Examples of incompatible vehicle uses include: farms where one driveway would serve the house and another would serve an agribusiness; large commercial businesses where one driveway would serve employees and customers and another driveway would serve delivery trucks.*

Figure 3.18: Multiple Driveways for Incompatible Vehicle Uses

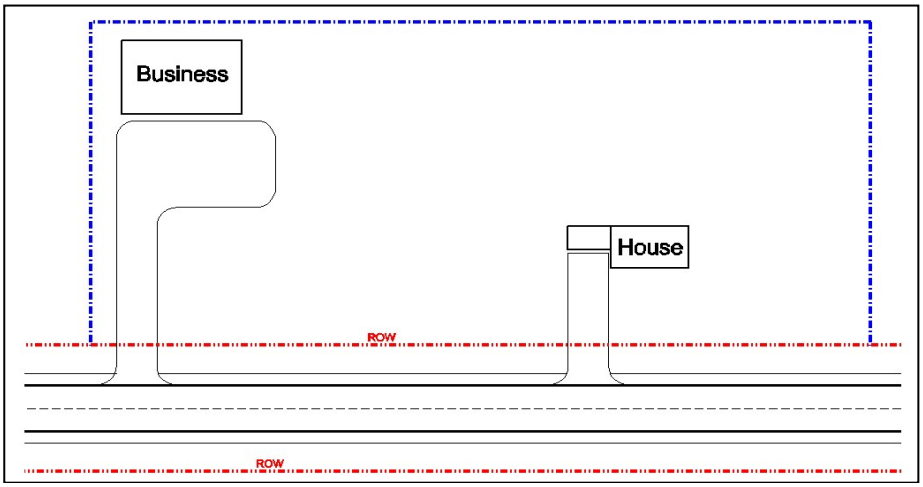
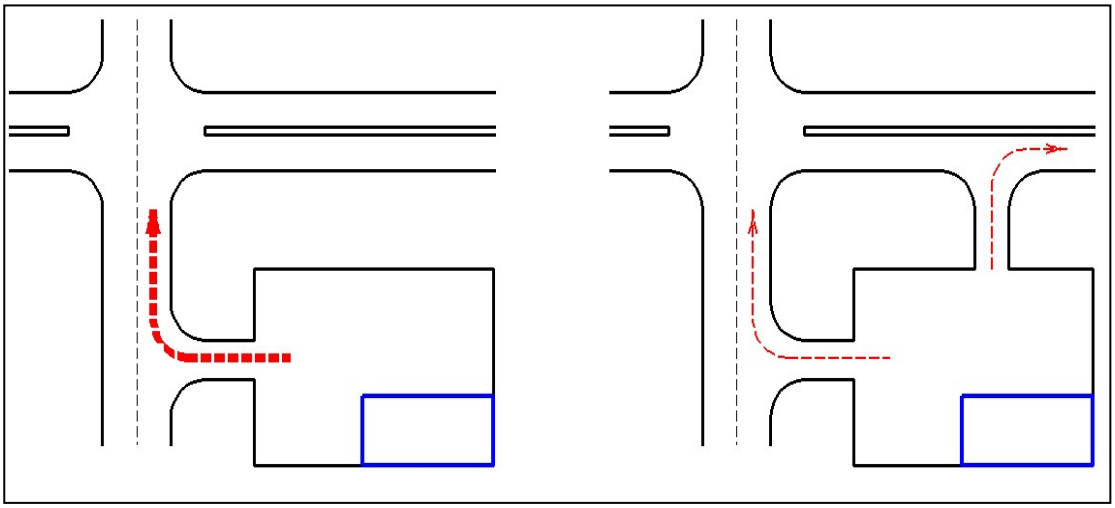


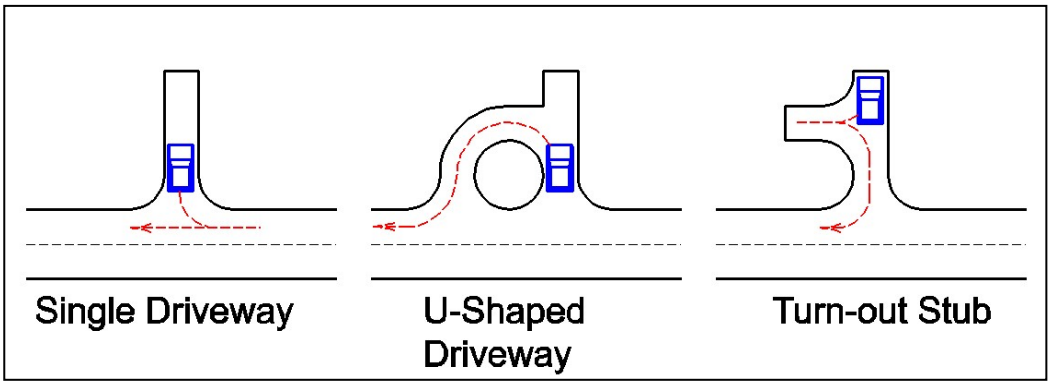
Figure 3.19: Multiple Driveways to Redirect Traffic



- A parcel or lot where there is a significant safety or congestion problem at one driveway or at a nearby public intersection. An additional driveway may be beneficial if the additional driveway would improve the travel patterns (see Figure 3.19). In some cases, an additional driveway may alleviate the immediate need for a traffic signal. *Example: if a public intersection serving a large development is overloaded, an additional driveway serving only the development may be considered to redirect traffic and relieve the traffic conditions at the public intersection. This approach may be more cost-effective than reconstructing the intersection.*

- A parcel or lot may be a candidate for a U-shaped driveway where exiting traffic would otherwise have to back up onto the highway, but where a turn-out stub is not practical. Generally, this is only applicable where having only one access point would greatly impact the safety of the highway, such as having large trucks or farm equipment backing up onto the highway. This is normally not the case with residential driveways.

Figure 3.20: U-Shaped Driveways & Turn-out Stubs

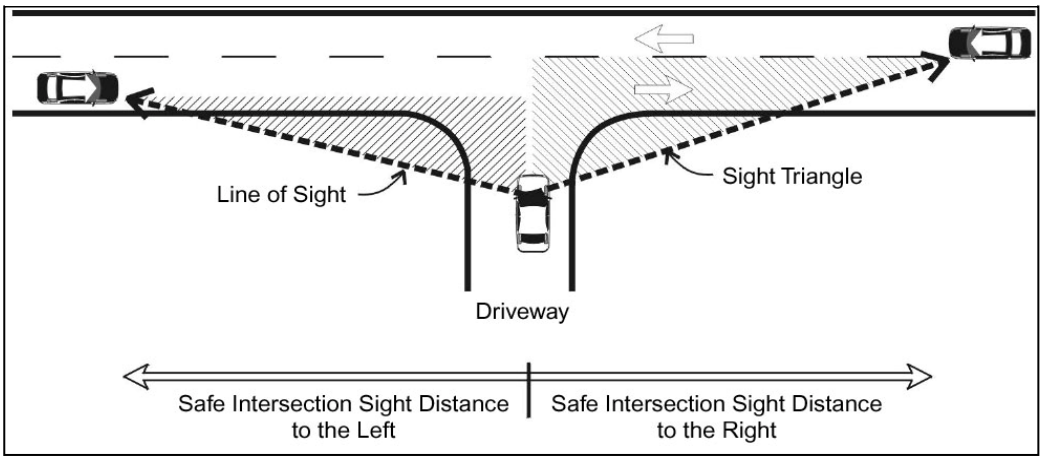


3.4.2 Sight Distance

Definitions

Intersection Sight Distance (ISD), as illustrated in Figure 3.21, allows vehicles entering a highway to turn into the through-lane and get up to running speed without adversely slowing down through-traffic. The *Mn/DOT Road Design Manual*, Section 5-2.02, provides a detailed description of Intersection Sight Distance.

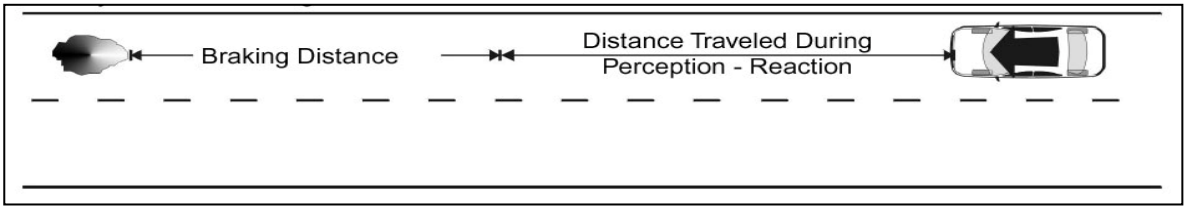
Figure 3.21: Intersection Sight Distance



Decision Sight Distance, also known as the Ten-Second Decision Sight Distance, allows a driver adequate time to react to a situation on the highway and maneuver, whether to stop or change lanes. Possible applications of Decision Sight Distance, including its application to driveways, are provided in the *Mn/DOT Road Design Manual*, Section 2-5.09.04. *As a rule of thumb, the Decision Sight Distance is determined by the distance at which an approaching vehicle has ten seconds from the moment it is within the driver's sight-line until the moment it reaches the access point.*

Stopping Sight Distance (SSD), shown in Figure 3.22, allows through-traffic adequate time and distance to stop in order to avoid a collision with a vehicle entering the highway from a driveway.

Figure 3.22: Stopping Sight Distance



Guidance and Examples

All public street connections and driveways should have adequate sight distance. This ensures that a vehicle entering the highway from a street or driveway can safely perform the maneuver while having a minimal impact on through-traffic. Adequate sight distance will vary, depending on the intensity of traffic at the access point. The recommended sight distance that should be applied, based on the access type, is shown in Figure 3.23.

Figure 3.23: Sight Distance Based on Access Type

Access Type		Recommended Sight Distance
1	Residential/Field Entrance	Decision Sight Distance
2	Low-volume Commercial	Decision Sight Distance
3	High-volume Commercial	Intersection Sight Distance
4	Public Intersections	Intersection Sight Distance

Sources:
Intersection Sight Distance (Mn/DOT Road Design Manual Section 5-2.02)
Decision Sight Distance (Mn/DOT Road Design Manual Section 2-5.09.04)

Figure 3.24: Stopping Sight Distance [(1)]

Design Speed (mph)	Stopping Sight Distance (feet) [(2)(3)]
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

(1) Stopping Sight Distance based on AASHTO Green Book, 5th Ed. 2004 and Mn/DOT Road Design Manual, Table 2-5.09A.

(2) The values shown in this table may be superceded to avoid the functional area (see Section 3.4.4) of adjacent intersections and driveways, or to accommodate turn lanes for the proposed access.

(3) Stopping Sight Distance is based on a level roadway without any horizontal curvature. In areas with vertical and horizontal curves, additional distance may be needed. See Mn/DOT Road Design Manual Table 2-5.09B.

When the recommended sight distance, as shown in Figure 3.23, cannot be met, the street connection or driveway should be located where the best possible sight distance can be achieved. Additional efforts to obtain the recommended sight distance may include the following:

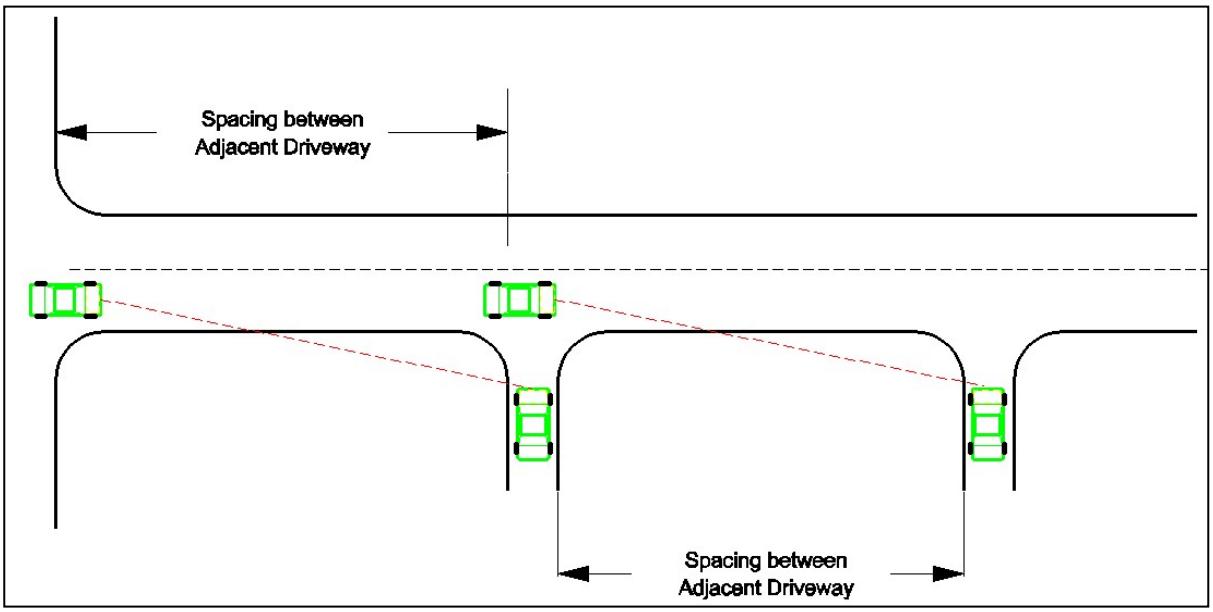
- Grading the slope or clearing a sight triangle to improve the sight distance;
- Installing warning signs along the highway;
- Recommending the construction of a turn lane (See Section 3.4.9); and,
- Developing a shared driveway with an adjacent parcel at a location where adequate sight distance exists (see Section 3.4.7). *(This condition cannot be required as a permit condition.)*

3.4.3 Spacing between Driveways

Definitions

The **Spacing between Driveways** is the spacing between adjacent driveways as measured from the near edges of each driveway (see Figure 3.25). The driveways may be on the same side of the highway or on opposing sides of the highway.

Figure 3.25: Spacing between Adjacent Driveways



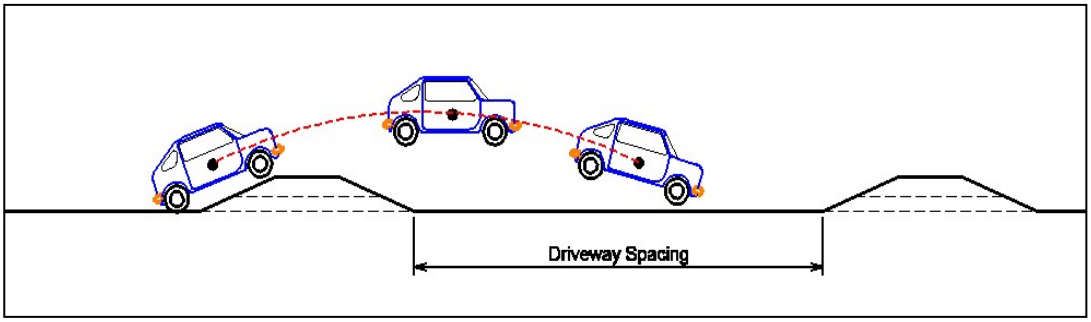
Guidance and Examples

The spacing between two driveways affects the safety and operations of a highway differently, depending on the design of the driveway and the volume of traffic using the driveway.

- The spacing of high-volume (Type 3) driveways along a high-speed highway has the potential to affect the safety and operations of the highway. The potential impact occurs when vehicles queuing at one driveway block the sight distance at an adjacent driveway. This generally is a concern only at high-volume driveways where vehicle queuing may take place. At low-volume (Types 1 and 2) driveways, vehicle queuing is unlikely, and the likelihood of vehicles entering the highway from adjacent driveways at the same time is also small. Spacing between high-volume driveways is also important in order to reduce the potential for overlapping right-turn lanes, should two adjacent high-volume driveways require turn lanes.

- The spacing of all types of rural design driveways (Types 1, 2, and 3) has the potential to affect the safety of the highway. The potential impact occurs when a vehicle runs off the road and hits the driveway side slope. To minimize the severity of the crash, all driveways should be designed in accordance with the *Mn/DOT Road Design Manual*. The spacing between the driveways is based on providing a clear landing area beyond a driveway for errant vehicles to safely land if they are launched over a driveway (see Figure 3.26).

Figure 3.26: Rural Driveway Spacing



- In rural areas (Subcategories AF and A), the spacing between low-volume (Types 1 and 2) driveways should provide a safe landing area for errant vehicles. Figure 3.27 lists the spacing needed to provide an adequate and safe landing area. The spacing is applicable for the following:
    - For two driveways serving the same parcel or adjacent parcels; and,
    - For two driveways on the same side of the highway.
- In rural and urban/urbanizing areas (Subcategories AF, A and B), the spacing between high-volume (Type 3) driveways should provide adequate stopping sight distance for the posted speed of the highway, as shown in Figure 3.27. This spacing is applicable for the following:
    - For two driveways serving the same parcel or adjacent parcels; and,
    - For two driveways on the same side of a highway or on opposing sides of an undivided highway.
- In urban core areas (Subcategory C), highway speeds are generally low and parcels are generally small. Using the Spacing between Adjacent Driveways as the basis for the spacing of adjacent driveways generally is not practical.

Figure 3.27: Spacing between Adjacent Driveways

Posted Speed Limit (mph)	Rural (Types 1 & 2) Spacing between Adjacent Driveways (feet) [2][4]	Rural & Urban/Urbanizing (Type 3) Spacing between Adjacent Driveways (feet) [1][2][3]
40	--	305
45	50	360
50	75	425
55	100	495
60	100	570
65	--	645

(1) The Spacing between Adjacent High-Volume Driveways is based on the Stopping Sight Distance described in the AASHTO Green Book 2001 and the Mn/DOT Road Design Manual, Table 2-5.09A, but uses the posted speed of the highway instead of the design speed.

(2) The values shown in this table may be superceded to avoid the functional area (see Section 3.4.4) of adjacent intersections and driveways, or to accommodate turn lanes for the proposed access.

(3) The spacing between adjacent driveways is based on a level roadway without any horizontal curvature. In areas with vertical and horizontal curves, additional distance may be needed.

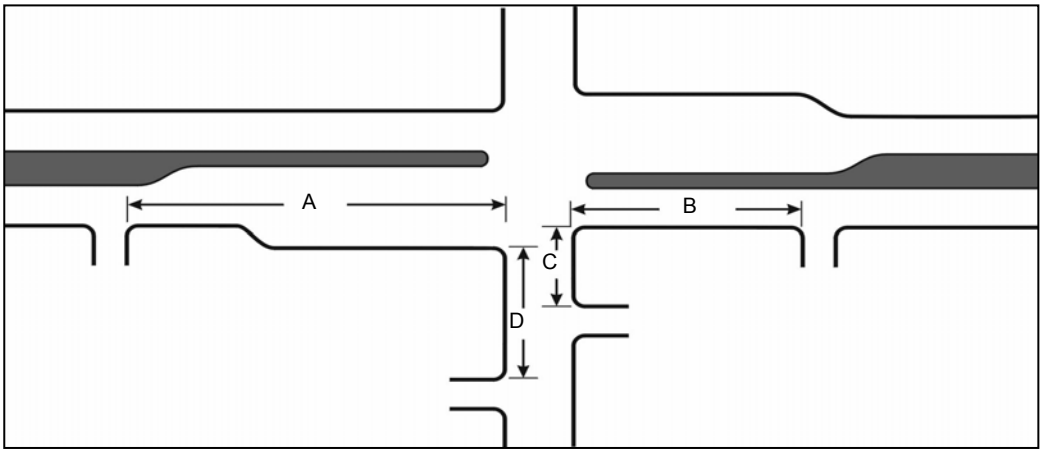
(4) Spacing based on the Texas Transportation Institute "Safety of Driveways in Close Proximity to Each Other." The spacing was modeled for speeds between 45 mph and 60 mph. No data is available for posted speeds below 45 mph or above 60 mph.

3.4.4 Access within the Functional Area of an Intersection

Definitions

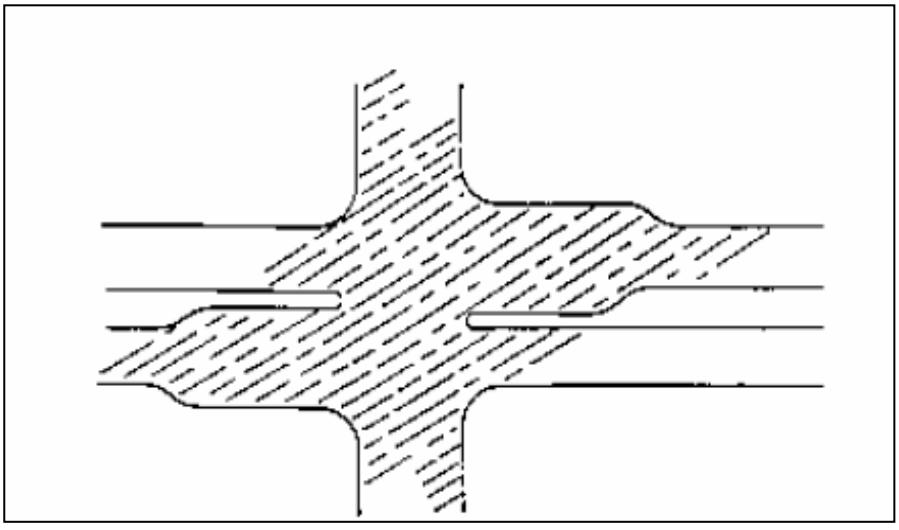
Corner Clearance – Mn/DOT defines corner clearance as the distance between the nearest edge of a driveway located next to an intersection and the nearest edge of the driving lane parallel to the driveway. The corner clearance may vary, depending on intersection geometrics, whether the driveway is located upstream or downstream of the intersection, and the priority of the intersection leg. In Figure 3.28, the distances "A," "B," "C," and "D" represent various corner clearances.

Figure 3.28: Corner Clearance



Functional Area –The functional area of an intersection, as shown in Figure 3.29, is the area beyond the physical intersection of intersecting roads that comprises decision and maneuvers distance, plus any required vehicle storage length. This area is protected through corner clearance standards and connection spacing standards.

Figure 3.29: General Intersection Functional Area

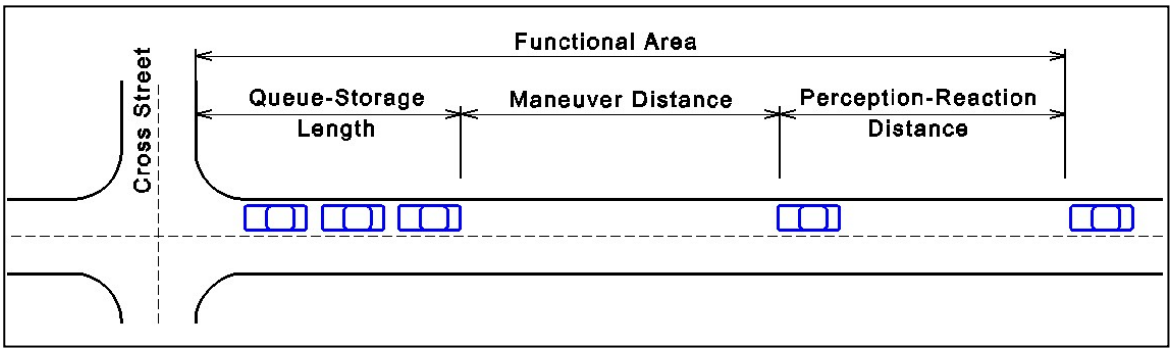


The functional area for each approach leg of an intersection consists of the three basic elements identified in Figure 3.30: perception-reaction distance, maneuver distance, and queue-storage length.

- The perception-reaction distance is the distance traveled during the perception-reaction time. The distance will depend upon vehicle speed, driver alertness, and driver familiarity with the location;
- The maneuver distance is the distance needed for both braking and lane changing (when a turn lane is present). In the absence of a turn lane, the maneuver distance is the braking distance required to make a comfortable stop; and,
- The queue-storage length is the distance needed to accommodate the longest queue that is expected most of the time, either in the turn lane or at the stop bar.

If no turn lane exists, the functional area of an intersection consists of only the perception-reaction distance and the maneuver distance and is considered the same as the Stopping Sight Distance (SSD) for the design speed on the highway (see Figure 3.24).

Figure 3.30: Basic Elements of Intersection Functional Area



Guidance and Examples

Mn/DOT delineates the functional area of an intersection by recommending corner clearance on each leg of an intersection. No access should be located within the corner clearance on a trunk highway. On non-trunk highway cross streets, the corner clearance is a recommendation to the local governmental unit.

Corner Clearance on Main Thoroughfares (Figure 3.28, "A" and "B")

In most cases, the main thoroughfare will be a trunk highway. The corner clearance on the main thoroughfare will vary, depending on the posted speed of the highway and whether a turn lane is present or planned. If a turn lane is present,

- On roadways with posted speeds of 45 mph or greater, the upstream corner clearance (distance "A" in Figure 3.28) is 650 feet; and,
- On roadways with posted speeds of less than 45 mph, the upstream corner clearance (distance "A" in Figure 3.28) is 435 feet.

If a turn lane is not present or planned on the highway, the upstream corner clearance is considered the same as the Stopping Sight Distance (SSD) for the design speed on the highway (see Figure 3.24).

On undivided roadways, the downstream corner clearance (distance "B" in Figure 3.28) is the same as the upstream corner clearance.

On divided roadways, the downstream corner clearance (distance "B" in Figure 3.28) is the greater of the following:

- If an acceleration lane is present or planned (including free-right turn merge areas): the length of the acceleration lane, or
- Stopping Sight Distance (Figure 3.24).

Corner Clearance on Cross Streets (Figure 3.28 "C" and "D")

The corner clearance on a cross street will vary, depending on the street's traffic volume:

- Major Cross Streets (Signalized Intersections) – On cross streets with an AADT greater than or equal to 2500, the upstream corner clearance (distance "C" in Figure 3.28) should be 225 feet;
- Minor Cross Streets – On cross streets with an AADT between 1000 and 2500, the upstream corner clearance (distance "C" in Figure 3.28) should be 125 feet;
- Local Cross Streets – On low-volume, low-speed local streets (AADT less than 1000), the upstream corner clearance (distances "C" in Figure 3.28) should be 75 feet; and,
- On all cross streets with existing or planned turn lanes, the access should be located outside the turn lane, if possible.

On undivided roadways, the downstream corner clearance (distance "D" in Figure 3.28) is the same as the upstream corner clearance (distance "C" in Figure 3.28).

On divided roadways, the downstream corner clearance (distance "D" in Figure 3.28) should be at least 75 feet.

When Corner Clearance Cannot Be Met

In some cases, no alternative access will be available, and an access will have to be provided. To minimize the impacts in these cases, the following options should be considered:

- The driveway should be located as far as possible on the parcel or lot from the intersection. A shared driveway with an adjacent parcel should be used to provide even greater clearance from the intersection (see Section 3.4.7);
- If a single driveway is being provided to a corner parcel, the driveway should be located on the cross street; and,
- A median may be installed on the approach legs to an intersection, or the driveway may be designed to prevent left-turn movements from crossing turn lanes.

3.4.5 Offset Driveways and Streets

Definitions
Figure 3.31, below, illustrates the varied configurations of aligned, offset**,** and overlapping driveways.

Guidance and Examples
On undivided highways, high-volume (Type 3) driveways and public street connections (Type 4) on opposite sides of a highway should be aligned with one another to the extent practicable, or they should be offset to minimize overlapping left turns and other maneuvers that could result in safety or operational problems.

High-volume (Type 3) Driveways

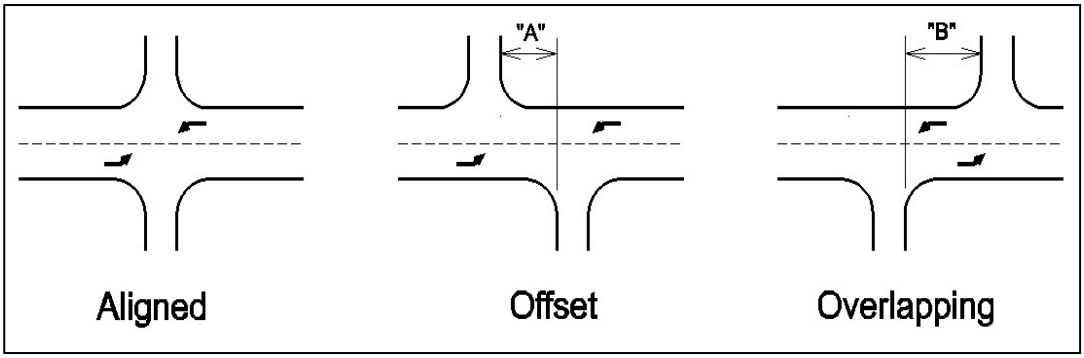
Aligned and Offset

High-volume (Type 3) driveways should be aligned to prevent opposing left-turning vehicles from blocking each other, as shown in Figure 3.31. The aligned and offset driveways allow opposing left-turn movements to occur at the same time. Offset driveways should be separated by at least the Spacing between Adjacent Driveways (Figure 3.27), as shown as distance “A” in Figure 3.31.

Overlapping

Overlapping driveways should be avoided, unless the access points can be separated by sufficient distance to allow back-to-back left-turn lanes (distance “B” in Figure 3.31).

Figure 3.31: Overlapping Driveways

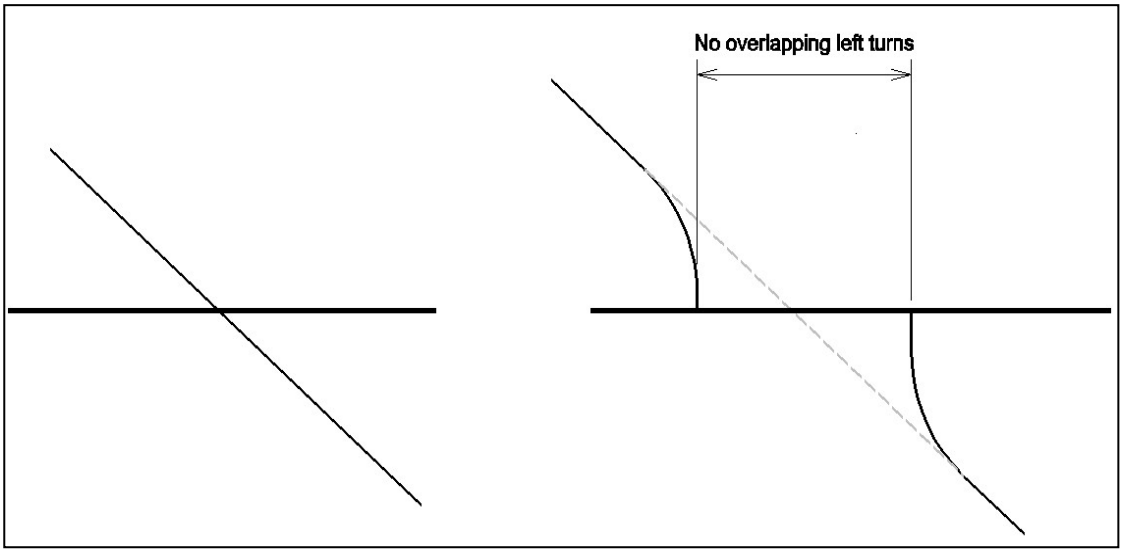


Public Street Connections (Type 4)

In some cases, an aligned four-legged intersection with a history of right-angle crashes or an intersection with an undesirable skew angle may be replaced with two “T” intersections. In these cases, left-turn movements should be carefully considered.

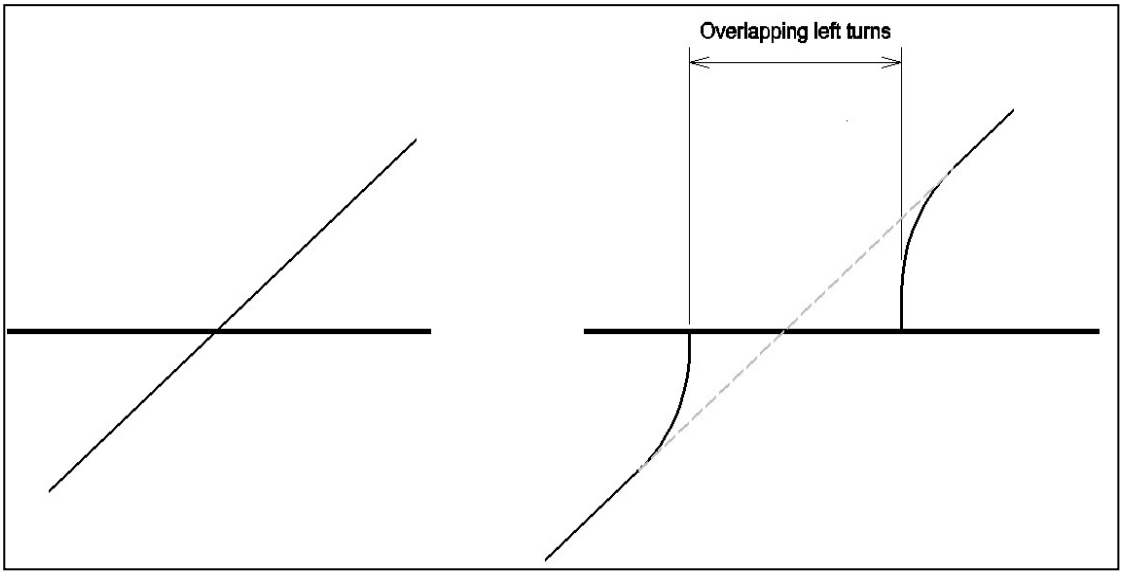
In Figure 3.32, left-turn movements are separated and do not overlap. The distance between the two “T” intersections should be at least the Spacing between Adjacent Driveways (Figure 3.27).

Figure 3.32: No Overlapping Left-turn Movements



In Figure 3.33, left-turn movements overlap, and the distance between the two "T" intersections should be sufficient of construct back-to-back turn lanes.

Figure 3.33: Overlapping Left-turn Movements



3.4.6 Restricted Movements and Median Openings

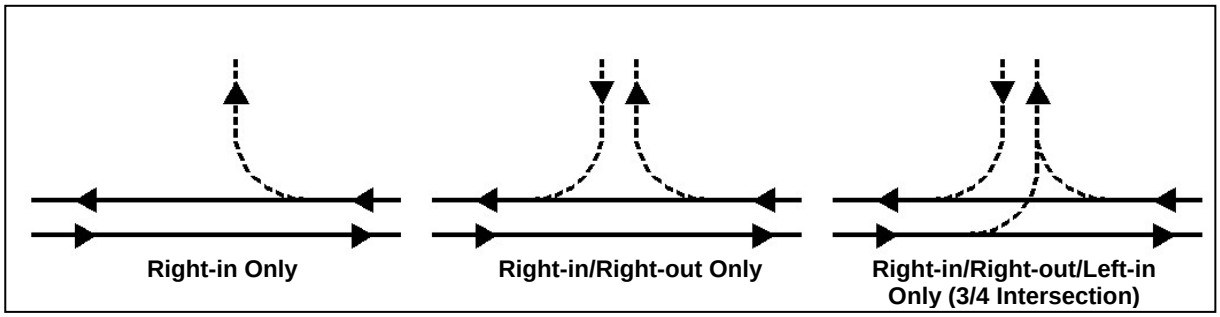
Definitions

Right-in-only permits access from the highway to a parcel or lot via a right-turn movement. Traffic leaving the parcel or lot cannot return to the highway using the same access.

Right-in/Right-out-only (RIRO) permits access between the highway and a parcel or lot via right-turn movements only. Left-turn movements are not permitted.

Right-in/Right-out/Left-in-only (3/4 Intersection) permits access between the highway and a parcel or lot via right-turn movements, and allows the left-turn movement from the highway into the parcel or lot. The left-turn movement returning to the highway is not permitted.

Figure 3.34: Restricted Turning Movement Definitions



Guidance and Examples

Turning and crossing movements at a public street connection or driveway may be restricted to address safety and operational concerns. Restricted movements are typically accomplished by the following methods:

- Closing a median opening on a divided highway;
- Constructing a median on an undivided highway; or
- Modifying the design of the driveway or intersection.

Restrictive signing and pavement markings may also be used but tend to be less effective where no physical barrier (median or traffic island) exists.

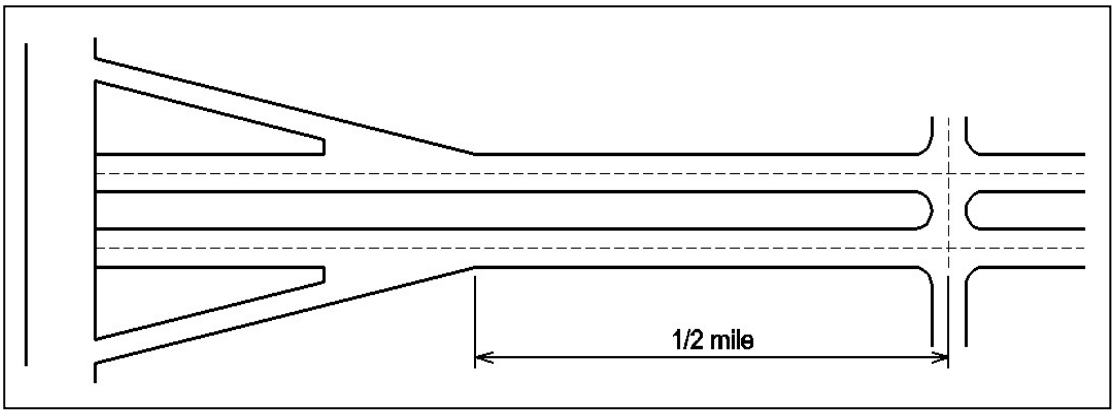
Restricting Movements using Medians
New median openings accommodating all turning movements should be provided only at public street connections, in accordance with Section 3.2.2.

New median openings should not be provided for driveways.

Existing, non-conforming median openings at either a public street connection or a driveway may be closed as a part of a construction project if the closure is considered necessary to address a safety or operational concern. Generally, a safety or operational concern includes any of the following:

- The median opening represents a high-risk conflict condition, as determined using the *Gap Analysis Procedure* (Section 3.2.3);
- The highway corridor has existing or planned signal coordination;
- There is a history of crashes of a type suitable to correction by closing the median (typically three or more left-turn crashes or right-angle crashes in one year) or where adequate trial of other remedies has failed to reduce the crash frequency;
- The median opening does not meet the intersection sight distance, and achieving adequate intersection sight distance is not economically feasible;
- The median opening is located within the functional area of an adjacent intersection and allows vehicles to cross through the turn lanes of the adjacent intersection;
- The median opening does not have a left-turn lane, and it would not be financially feasible to construct a turn lane to accommodate left-turn movements and U-turns;
- The median closure is part of a project converting a highway to a freeway;
- The median opening is located in an area transitioning from rural to urbanizing, and the closure is a part of a proactive and cost-effective plan to manage the transition; or,
- The median opening is located less than one-half mile from the merge point of an interchange ramp (as shown in Figure 3.35).

Figure 3.35: Spacing from Interchange Merge Point



Restricting Movements by Modifying the Access Point

Restricting movements by modifying the design of a driveway or intersection requires a combination of traffic islands, signing, and striping to be effective. This approach may be used both on undivided highways as well as in conjunction with medians on divided highways to address situations where the spacing guidance cannot be met. The design and approach will vary depending on the movements to be restricted. Some typical restrictions include the following:

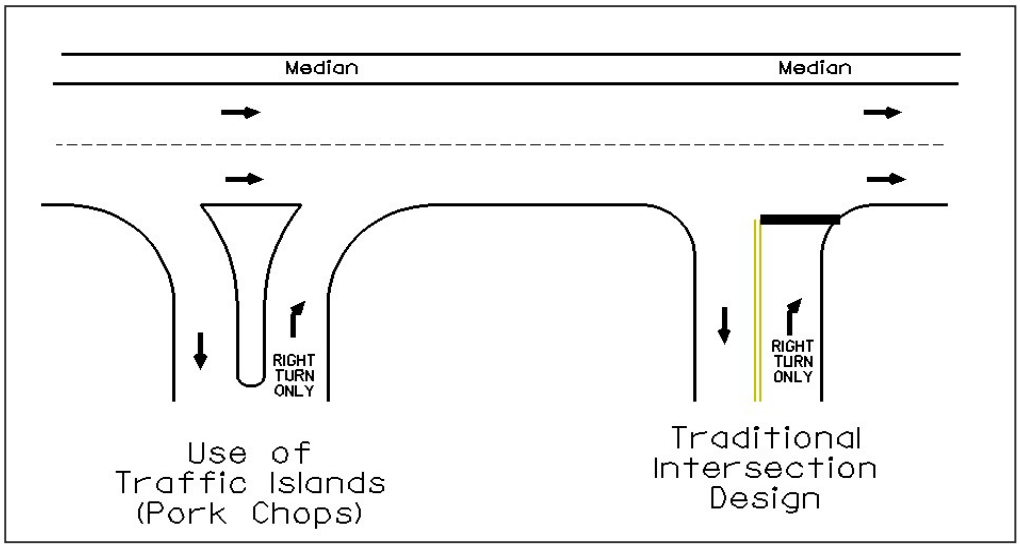
- When high traffic volumes result in a lack gaps for entering and exiting traffic to safely cross, left-turn movement and crossing movements may be restricted;
- When a driveway and an intersection are closely spaced such that a vehicle following a turning vehicle cannot anticipate where the lead vehicle will turn, right-in movements may be restricted;
- When an access is located where it may be blocked by queuing traffic from a nearby intersection, left-turn movements, crossing movements and right-out movements may be restricted;
- Where an access is needed for a specific movement such as a one-way driveway, the driveway may be limited to right-in-only or right-out-only;
- On a divided highway where a lack of gaps prevent entering traffic from safely weaving across multiple lanes to make a left-turn or U-turn, and a reasonably convenient and suitable alternative route is available, right-out movements may be restricted; or
- Where adequate sight distance does not exist for a specific movement, that movement may be restricted.

Considerations when Restricting Turning Movements

The impacts of restricting turning movements can extend beyond the immediate access point. The following issues should be considered before closing a median or restricting turning movements:

- Reasonably Convenient and Suitable Access – Restrictions on turning movements at a driveway cannot prevent reasonably convenient and suitable access for the existing or proposed land use;
- Redirection of Traffic – Restricting turn movements reduces the number of conflict points at the access by redirecting the traffic movements to other locations; it does not reduce the number of trips being generated by a development or along a cross street;
- Access Design – The design of the access point will vary depending of the characteristics of the access point and the highway (see Figure 3.36).
    - The use of traffic islands (pork chops) provides good directional guidance, thereby reducing illegal or wrong way maneuvers. Traffic islands also allow entering and exiting traffic to merge with through traffic, but the design of the islands may reduce the weaving distances to adjacent intersections and require acceleration and deceleration lanes.
    - The traditional intersection design requires entering traffic to stop and wait for a gap in through traffic, thereby eliminating weaving maneuvers. The traditional intersection also does a better job of accommodating the geometric issues associated with closely spaced access points, through additional signing and markings may be required to prevent wrong way movements. This design is ineffective on undivided highways because it does not provide a physical barrier to restrict movements.

Figure 3.36: Right-in/Right-out-only Examples



- Distance to Next Median Opening – The distance to adjacent median openings should allow reasonably convenient and suitable access for the users of the closed median opening. This distance generally should not exceed the recommended spacing of public intersections, per the Mn/DOT Access Management Policy;
- U-turn Operations at Next Opening – Adjacent median openings must facilitate u-turns for the design vehicle likely to make u-turns;
- Traffic Operations at Next Opening – Adjacent median openings should be analyzed to determine that the additional turning and u-turning traffic does not adversely affect safety and operations. This is critical at adjacent median openings with high traffic volumes or signalization;
- Impact to Local Street Network – The impact to cross-street traffic, adjacent neighborhoods, and the local street system should be reviewed with the local road authorities. The closure of a median opening should not redirect traffic to local streets not designed to accommodate the additional traffic or change in vehicle types (e.g., redirecting heavy truck traffic to residential streets).
- Pedestrians and Bikes – At median openings with measurable pedestrian and non-motorized vehicle traffic, the needs of non-motorized traffic must be reviewed by the local community. The closure of a median opening should not decrease the safety of non-motorized traffic or result in an unreasonable increase in the length of the trip. The Mn/DOT Bicycle Facility Design Guidelines provide additional guidance to address bicycle and pedestrian traffic;
- Emergency Vehicles – The median opening may be used by local emergency vehicles, the highway patrol, and maintenance vehicles. The local emergency services, highway patrol, and Mn/DOT District Maintenance staff should be contacted to determine if the median closure would have an adverse impact on their effectiveness.
- Trucks and Farm Equipment – At median openings that accommodate heavy truck and farm equipment traffic, the impacts of having heavy equipment crossing the highway compared to performing a u-turn movement should be reviewed. In some cases, the exposure time of heavy equipment to highway through-traffic has a greater impact on highway safety and operations during a u-turn maneuver than during a crossing maneuver; or,
- Coordination with Alternative Access – On highways transitioning to freeways, median closures should be coordinated with the construction of alternative access (such as frontage roads, service roads, or the redirecting of access to the local street system).

3.4.7 Shared Driveways

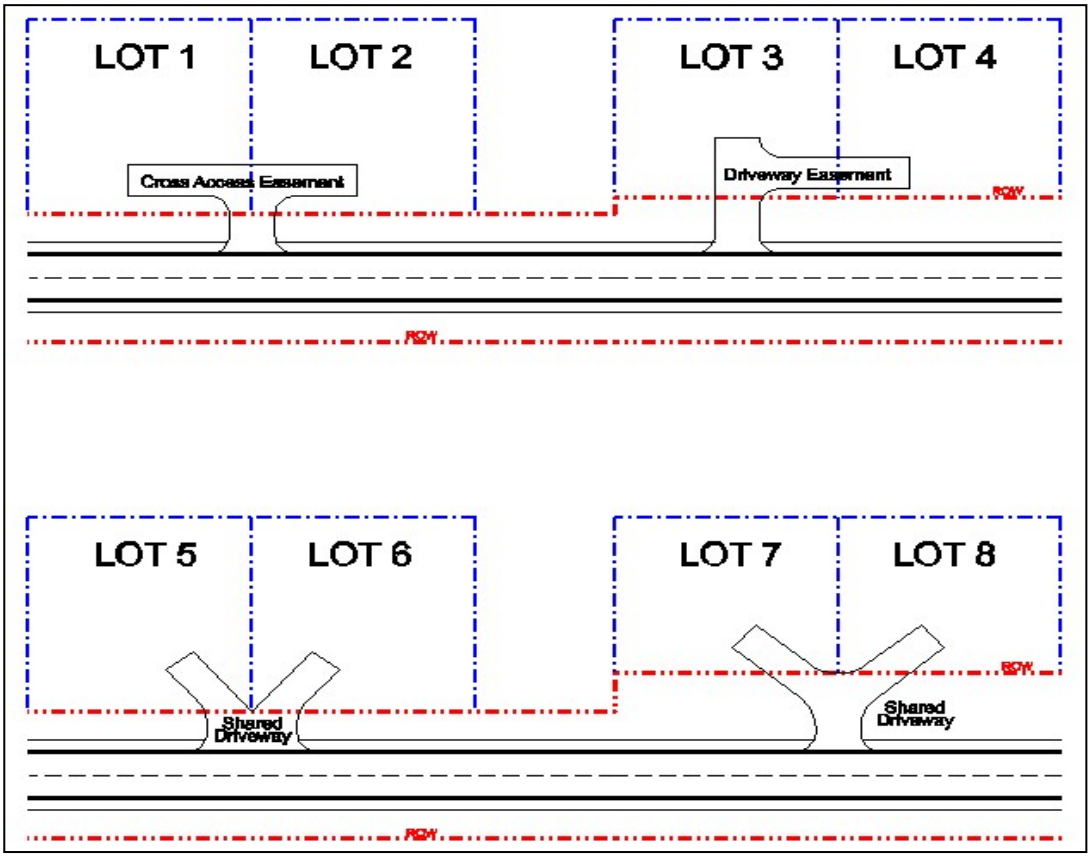
Definitions

A **Cross-Access Easement** allows two or more property owners to cross into each other's property for the purpose of accessing a public road. In Figure 3.37, lots 1 and 2 would require cross-access easements to share the driveway.

A **Driveway Easement** allows a property owner to cross through another parcel for the purpose of accessing a public road. In Figure 3.37, lot 4 is accessed via a driveway easement through lot 3.

A **Shared Driveway** is a single connection serving multiple lots or parcels. A shared driveway, in itself, does not allow property owners the right to use the portion of the driveway owned by another property owner. In Figure 3.37, lots 5 and 6, and lots 7 and 8 are served by shared driveways designed so property owners do not trespass.

Figure 3.37: Share Driveways, Cross-Access Easements & Driveway Easements



Guidance and Examples

A shared driveway, driveway easement, or cross-access easement may be considered to address the following safety or operational needs when:

- A driveway or private street connection is located within an existing turn lane or within the functional area of a public intersection without turn lanes;
- A driveway or private street connection does not have adequate stopping sight distance (Figure 3.24); or,
- Combining driveways would trigger the need for and construction of turn lanes and other geometric features.

For residential driveways, field entrances, and other low-volume driveways (Access Types 1 and 2), the combining of two driveways should be recommended for the purpose of removing a driveway from the functional area of an intersection, or for meeting stopping sight distance. This last solution should be considered only where sufficient right-of-way exists so that a cross-access easement would not be necessary.

The greatest advantage of a shared driveway is where ten or more low-volume driveways or multiple high-volume commercial driveways (Access Type 3) can be combined so that the shared driveway meets turn-lane warrants and turn lanes are constructed (see Section 3.4.9).

Additional guidance regarding driveways located within a turn lane or within the functional area of an intersection is found in Section 3.4.4.

Note: In all cases, a survey should be completed to determine exactly where the property line is before finalizing the location of the driveway. If a cross easement is provided, it should be legally recorded.

3.4.8 Interim Access

Definitions

An **Interim Access** is a public street agreement or driveway permit of limited duration. The agreement or permit specifies the time frame or conditions under which removal is required, requirements for the restoration of the right-of-way, and the location and design of any future access.

Guidance and Examples

An interim access may be considered if no reasonably convenient and suitable alternative access currently exists, but will exist in the future.

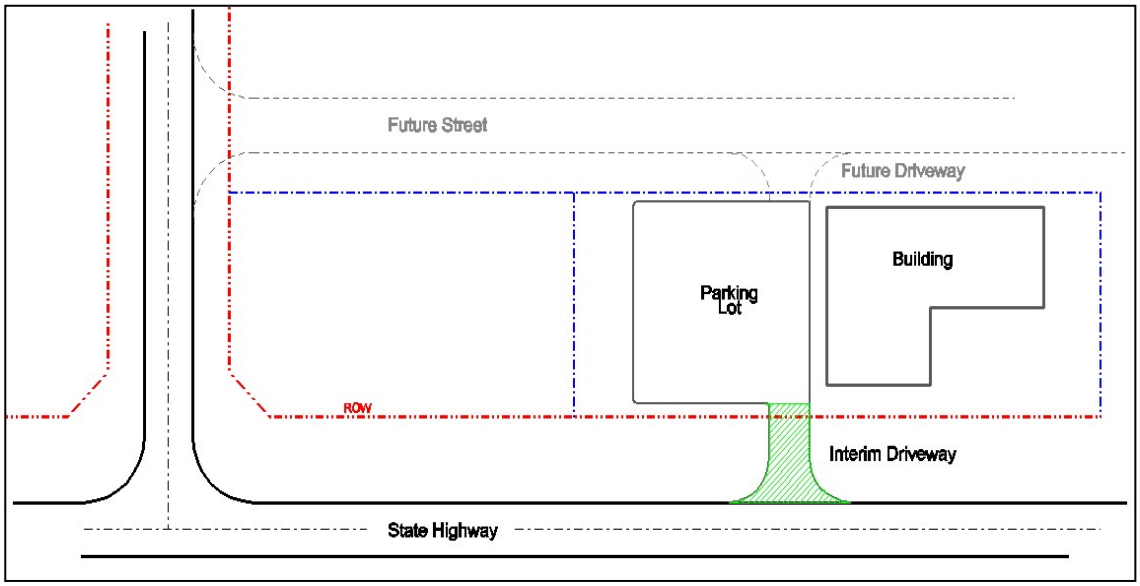
Improvements to the highway and local street system do not always occur in conjunction with the development or redevelopment of adjacent parcels. When parcels develop or redevelop before the road system does, it is preferable to have the parcel develop in a way that will function with any proposed changes to the highway. In this way, when the road system is improved, the impact on the development will be minimal. This can reduce the right-of-way costs and cost-to-cure damages due to the road improvements, and can limit disruption to the property.

Mitigation related to location

When a driveway cannot be located per the guidance shown in Section 3.4, an interim access may be necessary until a permanent solution is available.

Example: In Figure 3.38, a new development is constructed before the local street is constructed. An interim driveway is permitted, but when the future street is constructed, the interim driveway will be closed, and access will be provided from the future street. The proposed building and parking lot should be oriented to the future street.

Figure 3.38: Interim Access



Subcategory AF

Mn/DOT has categorized some highways as AF, indicating that they are either major mobility corridors with access only at interchanges, or they are moving towards having access only at interchanges. The transition to a fully access-controlled highway may take many years. Until that time, driveways may still be provided direct access with the understanding that some time in the future, alternative access will be required. Therefore, on subcategory AF highways, all new driveways should be considered interim. Where possible, these driveways should be designed to switch access to the local street system as the highway is converted to a fully access-controlled facility. The frontage of the building should be designed to take advantage of the future road system, and the parking lot should be constructed to provide circulation from the future access point.

3.4.9 Turn Lanes

Definitions

A **Turn Lane** is an auxiliary lane designed to separate turning vehicles from through-traffic. Turn lanes may be used on both divided and undivided highways (see Figure 3.39).

A **Right-Turn Treatment** is a modification to the roadway shoulder to accommodate right-turning vehicles (see Figure 3.39). A right-turn treatment may be used on divided or undivided highways and includes all of the following modifications to the outside shoulder:

- Widening the paved shoulder;
- Removing conflicting striping and shoulder rumble strips;
- Prohibiting on-street parking on the widened shoulder; and,
- Adding pavement thickness on the shoulder.

A **Bypass Lane** is an auxiliary lane on a two-lane undivided highway designed to guide through-traffic around left-turning vehicles stopped in the through-lane (see Figure 3.39).

Guidance and Examples

Turn lanes should be provided at public street connections and driveways in accordance with the Mn*/DOT Road Design Manual*, Section 5-3, and the guidance below.

Divided Highways

Left-Turn Lanes – A left-turn lane should be provided at all public street connections. For driveways, left-turn movements are generally not allowed; therefore, no left-turn lanes are needed. If a median opening is permitted, a left-turn lane should be provided.

Right-Turn Lanes – A right-turn lane should be provided at all public street connections, at all residential driveways serving more than five (5) units, and at all other driveways generating 50 or more trips per day.

Right-Turn Treatments – A right-turn treatment should be considered at all field entrances, residential driveways serving five (5) or fewer units, and all other driveways generating fewer than 50 trips per day.

Undivided Highways

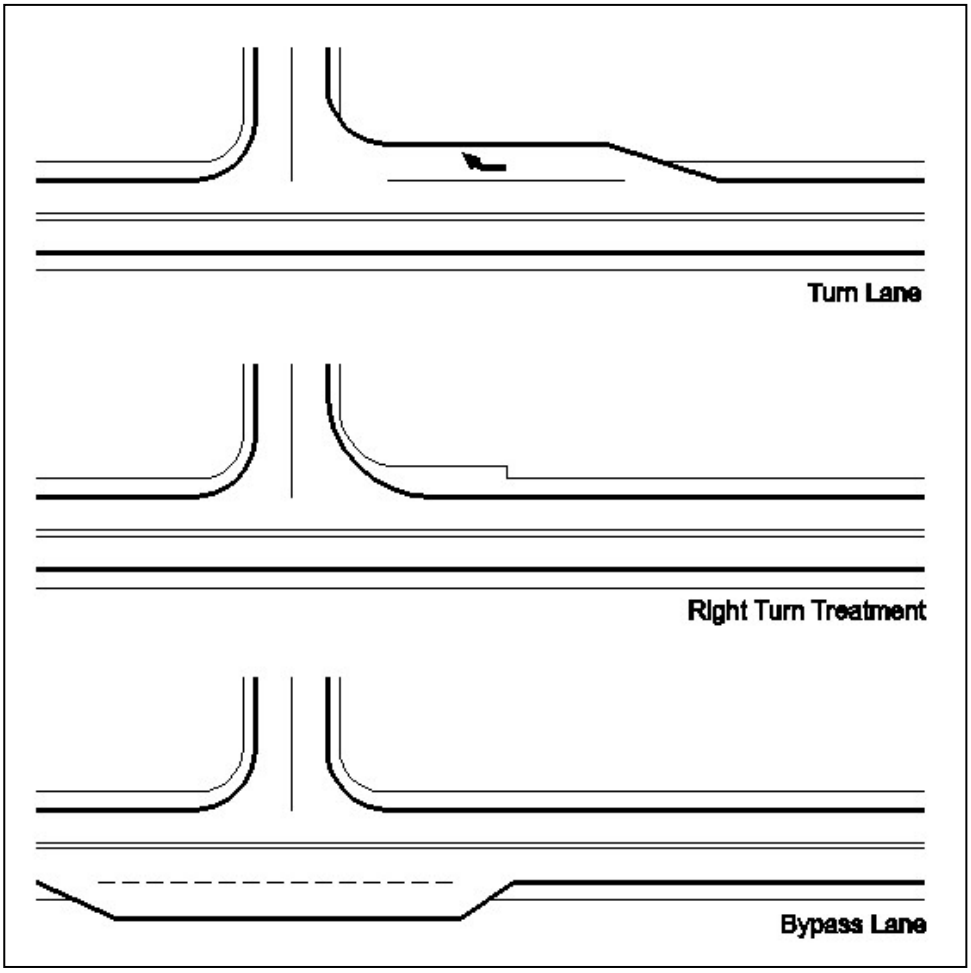
Left-Turn Lanes – A left-turn lane should be provided when there is a site-specific geometric or safety concern, as indicated by Turn-Lane Warrants 1 through 8 (shown below), or if the traffic volume levels meet Warrant 9, as shown in Figure 3.40.

Right-Turn Lanes – A right-turn lane should be provided when there is a site-specific geometric or safety concern, as indicated by Turn-Lane Warrants 1 through 8 (shown below), or if the traffic volume levels meet Warrant 9, as shown in Figure 3.41.

Bypass Lanes – A left-turn bypass lane may be considered when a left-turn lane is warranted but where its construction is not practical (due to limited right of way, steep terrain, existing structures, wetlands, or other protected features,). The bypass lane is for use at “T” intersections where no other public street connection or driveway will be located in the bypass lane or corresponding tapers.

Right-turn/bypass lanes at four-legged intersections should be used only after all other solutions have been found impractical and where the cross-street volume is low.

Figure 3.39: Right-turn Treatments & Bypass Lanes



Turn-Lane Warrants for Undivided Highways

The Turn-Lane Warrants for Undivided Highways are shown below. These warrants apply to both left-turn lanes and right-turn lanes.

- Warrant 1: Passing Lane/Climbing Lane – At high-volume driveways (> 100 trips per day) and all public street connections located on highway segments where passing lanes or climbing lanes are present in the approach direction.
- Warrant 2: Limited Sight Distance/Terrain – At all driveways and public street connections with inadequate stopping sight distance or located on short vertical curves or steep grades. Designers may consider alternative options, such as access relocation, vegetation removal, and spot grading as alternatives to building turn lanes.
- Warrant 3: Railroad Crossings – At high-volume driveways (> 100 trips per day) and all public street connections where a railroad is parallel to the highway and where the potential exists for vehicles delayed by a train to back up into the through-lanes of the highway, creating both safety and operational problems. At these locations, the queuing of traffic caused by train movements should be considered. If the cross street between the railroad and the highway does not provide adequate storage, then a turn lane or turn-lane treatment should be considered on the highway to provide the additional storage needed.

- Warrant 4: Signalized Intersections – At all signalized public street connections and driveways.
- Warrant 5: Heavy-Vehicle Traffic – At all driveways and public street connections on high-speed highways (posted speed ≥ 45 mph) where the heavy-vehicle turning volume is 15 or more vehicles per hour for at least eight hours a day for four months or more per year. Examples of this include gravel operations, large grain elevators, or large distribution centers.
- Warrant 6: School Entrances – At public and private school driveways on high-speed highways (posted speed ≥ 45 mph) used by school traffic.
- Warrant 7: Crash History – At high-volume driveways (>100 trips per day) and all public street connections that demonstrate a history of crashes of the type suitable to correction by a turn lane or turn-lane treatment (typically three or more correctable crashes in one year), or where adequate trial of other remedies has failed to reduce the crash frequency.
- Warrant 8: Corridor Crash Experience – On highway corridors that demonstrate a history of similar crash types suitable to correction by providing corridor-wide consistency in turn-lane use.
- Warrant 9: Vehicular Volume Warrant – At high-volume driveways (>100 trips per day) and all public street connections on high-speed highways (posted speed ≥ 45 mph) that satisfy the criteria in Figures 3.40 and 3.41 below.

Figure 3.40: Warrant 9 for Left-Turn Lanes

2-Lane Highway AADT	4-Lane Highway AADT	Cross Street or Driveway ADT	Turn Lane Requirement
1500 to 2999	3000 to 5999	> 1500	Left-turn lane warranted
3000 to 3999	6000 to 7999	> 1200	Left-turn lane warranted
4000 to 4999	8000 to 9999	> 1000	Left-turn lane warranted
5000 to 6499	10,000 to 12,999	> 800	Left-turn lane warranted
≥ 6500 AADT	≥ 13,000 AADT	101 to 400 > 400	Left-turn lane or bypass lane Left-turn lane warranted

Highway AADT one year after opening
Posted speed 45 mph or greater

Figure 3.41: Warrant 9 for Right-Turn Lanes

2-Lane Highway AADT	4-Lane Highway AADT	Cross Street or Driveway ADT	Turn Lane Requirement
≥ 1500 AADT	≥ 3000 AADT	> 100	Right-turn lane warranted

Highway AADT one year after opening
Posted speed 45 mph or greater