edina living streets

our streets connect us all

DRAFT

CITY OF EDINA, MINNESOTA
INCORPORATED 1888

Table of Contents

Background 1
Living Streets Policy 8
Network of Living Streets 16
Context and Prioritization 27
Community Engagement 36
Design Guidelines 40

BACKGROUND

THE CHALLENGE

As a suburban city, many feel that Edina will have to change in order to thrive and meet the health, environmental and economic challenges of the coming decades. Because of its form – often widely separated land uses and disconnected street networks throughout much of the community – many areas in Edina lack walkability and require that people travel by car for most of their needs. This has serious environmental consequences (poor air quality, climate change, and high energy consumption) as well as health consequences for those who live in environments that discourage active transportation and favor driving.

There is a wide variety of walkability through the city, with areas developed earlier (northeast Edina) having a much more connected street network and pedestrian infrastructure than areas developed later (southwest Edina). As Edina continues to evolve into the coming decades, there is a need not only to address this inequality, but also to change the way we construct and maintain our streets and stormwater infrastructure to help put Edina in a strong position for the future.

EXISTING ROADWAY NETWORK

History

Much of the Morningside and Country Club neighborhoods in northeast Edina were developed in early 1900s, with the area north of West 50th Street and east of Highway 100 dating before 1940. Because the popularity of the motor vehicle had yet to fully form, these neighborhoods have the highest density of sidewalk facilities in the city, with many streets having sidewalks on both sides.

Figure 1.1 Grandview & Wooddale Area

In the 1940s, Edina saw infrastructure and development expansion south to 58th Street, but still remained east of Highway 100. (The highway's section through Edina was completed by 1941, and was then called the "belt line.") By 1960, development had spread southwest to nearly half of the land area of the current city, to an irregular line northwest to southeast. The 1950s was the decade when Edina experienced the most development (in terms of land area). In 1960, nearly all of Edina was still primarily residential.

During the 1960s, construction continued southwest in Edina, and began to include more commercial and retail development in the southern and southeastern portions of the City (Southdale Center opened in 1956). During the1970s and after, construction and development filled the city's borders to Highway 169 (to the northwest) and just north of 494 (to the southwest and southeast portions of the city).

Maintenance

Much of the Morningside and Country Club neighborhoods in northeast Edina were developed in early 1900s, with the area north of West 50th Street and east of Highway 100 dating before 1940. Because the popularity of the motor vehicle had yet to fully form, these neighborhoods have the highest density of sidewalk facilities in the city, with many streets having sidewalks on both sides.

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SAFETY

Ensuring the safety of Edina's street users is a key goal for the community and its stakeholders. Between 2009 and 2013, the City received an average of 87 requests from residents each year to look into traffic safety issues in their neighborhoods. Most concerns were related to bicycle or pedestrian safety. Additionally, in Edina's 2013 Quality of Life survey, 40% of respondents identified speeding as a "very serious" or "somewhat serious" problem, and 33% of respondents identified stop sign violations a "very serious" or "somewhat serious" problem. Those numbers increased since the 2011 Quality of Life survey.

Pedestrians (especially children, seniors and the disabled) and bicyclists are the most vulnerable users of our streets. These users bear a far greater burden of injury than vehicle occupants and are particularly at risk of being injured or killed in a road traffic crash. As of 2010, Edina had the largest percentage of residents over the age of 65 (21 percent of the population) in the metro area, and the city has a growing population of school age children; over 24 percent of Edina residents are under 18 years old. These groups are less likely to be safe on streets designed only for motor vehicles.

WATER RESOURCES MANAGEMENT

Minnesota lakes, wetlands streams and

rivers are critical natural resources. They provide cultural and recreational opportunities, wildlife habitat and aesthetic enjoyment. These surface waters are also often an expression of the top edge of a greater underground reservoir: the source of most of the water we drink.

Figure 1.2. Minnehaha Creek

Urban surface water bodies are under pressure from a variety of stressors. Historically high volumes of water from paved and impervious surfaces are routed through flood protection pipe networks causing flooding. Wash-off of urban pollutants such as leaves and grass clippings, lawn fertilizer, pesticides and chlorides from road salt degrade water quality and wildlife habitat. The infiltration into the ground of these surface waters is vital to increasing groundwater resources, but decreased surface water quality can negatively affect water at the wellhead. Streets and their associated drainage systems are major conduits of these pollutants.

WATER BODY	IMPAIRMENT	STRESSORS
Lake Cornelia	Aquatic Recreation	Nutrient, Biological
Lake Edina	Aquatic Recreation	Nutrient, Biological
Nine Mile Creek	Aquatic Life, Aquatic Recreation	Biota, Chloride, Clarity
Minnehaha Creek	Aquatic Life, Aquatic Recreation	Biota, Chloride, Dissolved Oxygen, Bacteria

Table 1. Impaired water bodies in Edina

Water bodies of local and regional significance are contained or flow though Edina, and include 11 lakes and two streams. Many of these waters are classified as impaired waters (see Table 1). To treat this impairment, the City uses a variety of measures such as street sweeping, neighborhood clean-ups, illicit discharge detection and elimination monitoring, construction site erosion and sediment control, and wellhead protection. These measures are combined with stormwater infrastructure such as ponds, wetlands, pervious pavements, tree trenches, sediment structures, bio-retention and infiltration systems, rain gardens and cisterns.

As a first-ring suburb, the City of Edina experienced rapid growth in the 1950s and 60s. This era of development generally included some local flood control pipe networks that were built in the same right-of-way corridors as streets to drain roads and neighborhoods. The water flowing through this efficient network of drainage pipes has polluted and degraded the integrity of surface waters. This large cohort of infrastructure is now nearing the end of its service life, and major maintenance and rehabilitation is under way throughout the community. Living Streets envisions the creation of stormwater infrastructure combined with neighborhood reconstruction. As roads and utilities are rebuilt, flood protection and clean water services are added. Living Streets will go above and beyond the typical watershed district requirements to provide additional flood protection and clean water service by bringing in new grant funding sources and strategically and cost effectively implementing new stormwater infrastructure.

Mini Fact

The City of Edina's Engineering Department aims to add 2.5 miles of new bike facilities each year.

UNDERSTANDING LIVING STREETS

As Recently, a shift has been occurring in the way the City of Edina's residents, workers and visitors think about our streets, the way they have been designed, and how (and by whom) they are used. We have been moving toward a city that is more active and "livable," with streets that are more human-centered. Living Streets are designed and engineered to be safe and convenient for everyone – not just drivers, but also bicyclists, transit riders, wheelchair users and pedestrians of all ages and abilities.

Living Streets are designed to improve residents' health and quality of life while enhancing a neighborhood's social and economic vitality. As such, Living Streets refers to public realm and street design that:

- Provides for multiple modes of transportation,
- Reduces environmental impacts by reducing impervious surfaces, managing stormwater and providing shade, and
- Focuses on quality of life aspects and community identity.

In many ways, the concept of Living Streets is similar to Complete Streets. In 2010, the State of Minnesota passed Complete Streets legislation, the goal of which was to develop a balanced transportation system that integrates all modes, and to accommodate transportation users of all types, ages and abilities. However, Edina's Living Streets takes Complete Streets further by incorporating the City's active living focus as well as addressing environmental and sustainability concerns more directly.

BENEFITS OF LIVING STREETS

Living Streets afford added benefits to safety, public health and the environment, transportation choice, economic benefits and community identity. These added benefits are defined further below.

Safety

Living Streets foster safe travel for everyone who uses Edina's streets, including those using both motorized and non-motorized transportation. As Living Streets increase the safety and comfort of the most vulnerable users of our roadways (e.g. children, seniors, disabled and those on bicycles), then our streets become calmer and safer for all. Living Streets also support a vibrant mix of people and uses that result in streets that are active throughout the day. Research shows that this increased activity improves security by providing more "eyes on the street," meaning that crime is deterred by the presence of more people on the streets. This, when considered alongside sidewalk and bicycle facilities, results in a safer public realm where these facilities exist.

Public Health and the Environment

A lack of comfortable and safe walking and bicycling environments often discourages people from taking part in routine physical activity. Living Streets provide safe and convenient routes for walking and bicycling, which will allow Edina residents to integrate physical activity into their daily routine. Studies have shown that routine physical activity can help reduce the risk of chronic health problems such as obesity, diabetes and heart disease.

Figure 1.3. Tracy Avenue

Tree-lined Living Streets have environmental benefits as trees filter the air, soak up stormwater, stabilize the soils and shade our streets. Moreover, Living Streets can help reduce dependency on the automobile (see Transportation Choice below), which protects air and water quality and reduces greenhouse gas emissions. This reduced exposure to air pollution can lead to additional public health benefits, given that air pollution is the leading cause of asthma and other respiratory illnesses (especially among children).

Transportation Choice

Living Streets support multiple ways of moving about the City, including driving, walking, biking and using transit. These transportation options result in a city more accessible for people of all ages and abilities, including those who are not able, cannot afford, or choose not to drive. Transportation choice is particularly important for children, seniors, disabled and lower-income members of the population. Moreover, Living Streets allows for more direct connections to destinations by multiple means, allowing people to meet some of their daily needs by walking or biking.

Figure 1.4.
50th & France Business District

Economic Benefits

By providing accessible connections, Living Streets can increase the number of people who can easily and independently access retail and commercial destinations. This is attractive to private investors, and it has been demonstrated that public investment in Living Streets features helps attract new jobs, businesses and increased sales for merchants. Additionally, families that live in neighborhoods that give them the option to walk, bike or take transit to their destinations often pay less in combined housing and transportation costs.

Living Streets can also raise property values. Studies have shown that as the walkability of a neighborhood increases home values (as measured by Walkscore.com) and retail rents increase. Bicycle facilities and design elements such as street trees have also been shown to add thousands of dollars to home values.

SUPPORTING CITY PLANS

This Living Streets Plan builds upon the City's planning efforts and documents that have come before it. The following are major adopted or approved City plans that support the Living Streets Plan. The plans below are referred to in this Plan and like it will be updated periodically over time.

- Vision Edina
- 2008 Comprehensive Plan
- Comprehensive Bicycle Master Plan
- Edina Active Routes to School Comprehensive Plan
- Comprehensive Water Resources Management Plan

Mini Fact

In May 2014, Edina was named a bronze-level Bicycle Friendly Community by the League of American Bicyclists.

Living Streets Policy

INTRODUCTION

The Living Streets Policy was developed to provide the framework for a Living Streets Plan. The policy initially stood alone and included sections to guide the creation of the Living Street Plan. This revised policy is now an integral part of the Living Streets Plan.

The Living Streets Policy ties directly to key community goals outlined in the City's 2008 Comprehensive Plan. Those goals include safe walking, bicycling and driving; reduced storm water runoff, reduced energy consumption, and promoting health. The Living Streets Policy also compliments voluntary City initiatives such the "do.town" effort related to community health, Tree City USA and the Green Step Cities programs related to sustainability. In other cases, the Living Streets Policy will assist the City in meeting mandatory requirements set by other agencies.

The Living Streets Policy is broken up into three parts: Vision, Principles and Implementation. The Policy is followed by a description of core services provided by the City of Edina that are related to or implemented in part through Living Streets.

Mini Fact

Expect cyclists on the road. Watch for cyclists on the road. Treat them as you would any slow-moving vehicle.

POLICY

Living Streets balance the needs of motorists, bicyclists, pedestrians and transit riders in ways that promote safety and convenience, enhance community identity, create economic vitality, improve environmental sustainability, and provide meaningful opportunities for active living and better health. The Living Streets Policy defines Edina's vision for Living Streets, the principles Living Streets will embody, and the plan that will guide implementation of their construction.

LIVING STREETS VISION

Edina is a place where ...

- Transportation utilizing all modes is equally safe and accessible;
- Residents and families regularly choose to walk or bike;
- Streets enhance neighborhood character and community identity;
- Streets are safe, inviting places that encourage human interaction and physical activity;
- Public policy strives to promote sustainability through balanced infrastructure investments;
- Environmental stewardship and reduced energy consumption are pursued in public and private sectors alike; and
- Streets support vibrant commerce and add to the value of adjacent land uses.

LIVING STREETS PRINCIPLES

Fifteen principles guide implementation of the Living Streets Policy in the areas of all users and all modes, connectivity, context sensitivity and sustainability. The City will incorporate these principles when planning for and designing the local transportation network and when making public and private land use decisions.

All Users and All Modes

Principle 1: Living Streets are high-quality transportation facilities that meet the needs of the most vulnerable users such as pedestrians, cyclists, children, seniors and the disabled; and

Principle 2: Living Streets provide access and mobility for all transportation modes while enhancing safety and convenience for all users.

Connectivity

Principle 3: The City designs, operates and maintains a transportation system that provides a highly connected network of streets that accommodate all modes of travel;

Principle 4: The City seeks opportunities to overcome barriers to active transportation by preserving and repurposing existing rights-of-way and adding new rights-of-way to enhance connectivity for pedestrians, bicyclists and transit;

Principle 5: The City prioritizes improvements to non-motorized connections to key destinations such as public facilities, public transit, the regional transportation network and commercial areas;

Principle 6: The City will require new developments to provide interconnected street and sidewalk networks that connect to existing or planned streets or sidewalks on the perimeter of the development; and

Principle 7: Projects will include consideration of the logical termini by mode. For example, the logical termini for a bike lane or sidewalk may extend beyond the traditional limits of a street construction or reconstruction project, in order to ensure multimodal connectivity and continuity.

Context Sensitivity

Principle 8: Living Streets are developed with input from stakeholders and designed to consider neighborhood character and promote a strong sense of place;

Principle 9: Living Streets preserve and protect natural features such as waterways, urban forest, sensitive slopes and soils;

Principle 10: Living Streets are designed and built with coordination between business and property owners along commercial corridors to develop vibrant commercial districts;

Principle 11: Living Streets coordinate with regional transit networks and regional authorities; and

Principle 12: The City will consider the fiscal context of projects and potential financial impacts when implementing Living Streets at the project level.

Sustainability

Principle 13: Living Streets will improve the current and future quality of life of the public,

Principle 14: Living Streets will reduce environmental impacts associated with the construction and operation of roadways; and

Principle 15: The City will increase the life span and resilience of its infrastructure and will build infrastructure with consideration for lifecycle costs and ease of maintenance.

LIVING STREETS IMPLEMENTATION

The City of Edina will develop Living Streets in the regular course of business of maintaining, expanding or redeveloping the road network and will be guided by the Vision and Principles established above. Implementation will happen predominantly through the neighborhood street reconstruction program, but also though specific stand-alone stormwater utility, pedestrian, bicycle or safety projects.

Project prioritization is not specifically part of the Living Streets Plan. Prioritization of projects takes place in the City's Capital Improvement Program and Budget and is determined by the City Council with guidance from the Living Streets Vision and Principles.

The City will actively promote and apply the Living Streets Policy and Plan by:

- Applying the Living Streets Policy and Plan to all street projects, including those involving operations, maintenance, new construction, reconstruction, retrofits, repaving, rehabilitation or changes in the allocation of pavement space on an existing roadway. This also includes privately built roads, sidewalks, paths and trails.
- Drawing on all sources of transportation funding and actively pursuing grants, cost-sharing opportunities and other new or special funding sources as applicable.
- Through all City departments supporting the vision and principles outlined in this Plan in their work.
- By acting as an advocate for Living Streets principles when a local transportation or land use decision is under the jurisdiction of another agency.

Projects that implement Living Streets will be guided by pedestrian and cyclist network plans and roadway classifications and will consider the physical, social, ecologic, regulatory and economic context in a given project area.

The project delivery system used to build Living Streets will:

- Systematically engage Edina residents and project stakeholders to better inform project-level recommendations.
- Keep Edina residents and project stakeholders informed about Living Streets and the range of services they help provide.
- Follow minimum Living Streets design requirements and standards.
- Manage construction impacts to residents and users of streets.

Network

The creation of a Living Streets network of road, pedestrian and bicycle facilities provides mobility, accessibility and access to people, places and spaces. The resulting interconnection of neighborhoods links people to goods and services and to one another, and increases quality of life for those who live in, work in, or visit the city.

Existing and planned transportation networks are identified in the City of Edina Comprehensive Plan and other approved/adopted plans. Network plans include:

- Roadway Network (Functional Classification, Jurisdictional Classification)
- Sidewalk Facilities
- Bicycle Facilities (Comprehensive Bicycle Transportation Plan)
- Active Routes to School Comprehensive Plan
- Transit Service

Network plans are approved by the City Council. In most cases, modification requires an amendment of the Comprehensive Plan.

The expansion, creation and improvement of pedestrian and bicycle networks will be well planned and prioritized:

- Expansion of existing networks and providing connections to key traffic generators or destinations provide immediate benefit to all network users and is a top priority.
- Network connections serving vulnerable users such as children, seniors and the disabled are a top priority.
- Network connections serving high-volume uses such as schools, retail destinations or regional public transit are a top priority.

Context

Contextual variety can either constrain or create opportunity in roadway and other infrastructure projects. The following are contexts that will be considered and will influence the planning, design and implementation of Living Streets.

Contexts of Living Streets		
Ecological	Water resource, ponds, wetlands, lakes, streams	
	Natural resources, trees, and urban forest	
	Air quality	
	Climate	
	Sun and shade	
	Materials, waste, energy, sustainability	
Regulatory	State Aid roadway	
	Watershed rules	
Operational	Maintenance operations	
	Traffic control or functional constraints	
Project Type	Public	Neighborhood street reconstruction
		Neighborhood street reconstruction with major associated utility work
		State Aid street reconstruction
		Stand-alone sidewalk, bicycle or utility project
	Public partner lead	State
		County
		Transit agency
		Parks district
	Private development	Will remain private
		Future public

Exceptions

Living Streets principles will be included in all street construction, reconstruction, repaving and rehabilitation projects, except under one or more of the conditions listed below. City staff will document proposed exceptions as part of a project proposal.

- A project involves only ordinary maintenance activities designed to keep assets in serviceable condition, such as mowing, cleaning, sweeping, spot repair, concrete joint repair or pothole filling, or when interim measures are implemented on a temporary detour. Such maintenance activities, however, shall consider and meet the needs of bicyclists and pedestrians.

- The City exempts a project due to an excessively disproportionate cost of establishing a bikeway, walkway or transit enhancement as part of a project.
- The City determines that the construction is not practically feasible or cost effective because of significant or adverse environmental impacts to waterways, flood plains, remnants or native vegetation, wetlands or other critical areas.
- Available budget is constrained or project timing allows more efficient construction at a later date.

Engagement

Members of the public have an interest in understanding and providing input for public projects. Project recommendations will be developed with a transparent and defined level of public engagement. The public will have access to the decision-making process and decision makers via public meetings and other correspondence and will be provided the opportunity to give input throughout the process. Project reports will discuss how their input helped to influence recommendations and decisions. The City of Edina's Living Streets will continue to engage and solicit public input as a vital component of the project implementation process. See Chapter 5 for a more detailed discussion regarding the purpose of and opportunities for public engagement.

Design

The guidelines contained in the Living Streets Plan will be used to direct the planning, funding, design, construction, operation and maintenance of new and modified streets, sidewalks, paths and trails. The guidelines allow for context-sensitive designs.

The Design Guidelines (see Chapter 6):

- Keep street pavement widths to the minimum necessary.
- Provide well-designed pedestrian accommodation in the form of sidewalks or shared-use pathways on all arterial, collector and local connector streets. Sidewalks shall also be required where streets abut a public school, public building, community playfield or neighborhood park. Termini will be determined by context.
- Provide frequent, convenient and safe street crossings. These may be at intersections designed to be pedestrian friendly, or at mid-block locations where needed and appropriate.
- Provide bicycle accommodation on all primary bike routes.
- Allocate right-of-way for boulevards.
- Allocate right-of-way for parking only when necessary and not in conflict with Living Streets principles.
- Consider streets as part of our natural ecosystem and incorporate landscaping, trees, rain gardens and other features to improve air and water quality.

The Design Guidelines in this Plan will be incorporated into other City plans, manuals, rules, regulations and programs as appropriate. As new and better practices evolve, the City will update this Living Streets Plan. Minimum standards will guide how vehicular, pedestrian and bicycle networks interact and share public right of way.

Benchmarks and Performance Measures
The ability to measure the performance of a plan, as well as knowing that it is functioning as it is intended, is vitally important to overall success and the ability to sustain it. With this in mind, the City will monitor and measure its performance relative to the Living Streets Policy. Benchmarks that will demonstrate success include:

Every street and neighborhood is a comfortable place for walking and bicycling.
This does not mean that every street in the city will have walking and biking facilities. It means that each neighborhood will provide a network of these facilities such that walking and biking to and through neighborhoods is a comfortable experience.

Every child can walk or bike to school or a park safely.
It is essential that alternatives to driving to school or parks be provided to children and their caregivers. These alternatives – walking or bicycling – will be both safe and convenient modes of transportation. See the Edina Active Routes to School Plan for more information.

Seniors, children, and disabled people can cross all streets safely and comfortably.
Opportunities to cross all streets in Edina, including local, collectors and arterial streets, will be provided. These crossings will be safe and comfortable for all users, regardless of age or ability.

An active way of life is available to all.
Opportunities for active living should be made available to all members of the Edina community by connecting centers of activity via active, multimodal transportation. Each resident of and visitor to Edina will have the ability to lead an active way of life.

There are zero traffic fatalities or serious injuries.
Perhaps the ultimate safety benchmark is zero traffic fatalities or serious injuries. Modeled from the Vision Zero Initiative (www.visionzeroinitiative.com), an aspirational yet primary goal of Living Streets is to achieve this high level of safety on the City's roadways.

Reduce untreated street water flows into local waterways and reduce storm water volume.
Cost-effective stormwater best management practices (BMPs) are strategically selected to go above and beyond regulatory requirements to provide for flood protection and clean water services through the use of infrastructure that retains, settles, filters, infiltrates, diverts or reduces the volume of stormwater that flows to local surface waters.

Retail streets stay or become popular regional destinations.
Part of Edina's Living Streets vision is that "streets support vibrant commerce." While most of the city's streets are residential, Edina's business districts are a vital part of the community. The benefits of Living Streets extend to retail streets as well, making them more attractive to businesses and consumers alike.

The City will draw on the following data to measure performance:

- Number of crashes or transportation-related injuries reported to the Police Department.
- Number and type of traffic safety complaints or requests.
- Resident responses to transportation related questions in resident surveys.
- Resident responses to post-project surveys.
- The number of trips by walking, bicycling and transit (if applicable) as measured before and after the project.
- Envision ratings from the Institute for Sustainable Infrastructure.
- Additional performance measures may be identified as this Policy is implemented.

Mini Fact

Motorists must stop behind all crosswalks.

Network of Living Streets

INTRODUCTION

The creation of local streets, pedestrian and bicycle facilities networks provides mobility, accessibility and access to people, places and spaces. This interconnection of neighborhoods connects people to goods and services and to one another, and increases their quality of life.
The Living Streets Plan defines a classification of all City streets that builds off and complements the current functional classification of roadways described in the Comprehensive Plan.

Transportation and mobility services are delivered by these networks, with each transportation mode using a portion of the shared right-of-way network. This chapter defines a network plan for each primary mode of transportation: automobile, bicycle and pedestrian (the public transit network is defined by Metro Transit).

CLASSIFICATION AND ROLES OF LIVING STREETS

Edina Living Streets revises the current functional classification of the City's streets (as defined below and taken from the 2008 Comprehensive Plan) based not only on their function, but also on the character of the streets and their adjacent land uses. The primary revision is the addition of the Local Connector, which can be considered a subset of the current Local Street functional classification (see below). The following Living Streets classifications were developed to guide future road design projects and are meant to replace the traditional functional classification system of streets. The new street classifications support Living Streets principles and designs, and reflect the diverse range of conditions in Edina.

Every Edina street is unique and each street classification plays an important role in its surrounding neighborhood and within the City's overall street network. Designs should balance the accommodation of motor vehicles with the Living Streets vision of promoting safety and convenience, enhancing community identity, creating economic vitality, improving sustainability and providing meaningful opportunities for active living and better health.

2008 Comprehensive Plan Functional Classification Definitions

The functional street classification system as it is currently defined in the Comprehensive Plan uses a hierarchy to group classes of streets based on the relative emphasis of motor vehicle mobility and capacity versus non-motorized transportation and property access. The City of Edina's 2008 Comprehensive Plan identifies the following street functional classification hierarchy:

- Local Streets: These roadways provide the most access and the least mobility within the overall system. Through traffic is discouraged on local streets.
- Collector Streets: The collector system provides connections between neighborhoods, from neighborhoods to minor business concentrations, and between major traffic generators. Mobility and land access are equally important, and direct access should predominantly be to developed concentrations. Collector streets carry traffic between the arterial system and the local streets.
- Minor Arterials: The emphasis on these roadways is on mobility as opposed to access; only concentrations of commercial or industrial land uses should have direct access to them. Minor arterials should connect to principal arterials, or other minor arterials and collector streets.

- Principal Arterials: These types of roadways carry the highest volumes of traffic and include all Interstate freeways. The emphasis is on mobility as opposed to land access. Principal arterials are not within the maintenance jurisdiction of the City, and as such will not be included in this Living Streets Plan.

Living Streets Classification

This traditional functional classification system by itself, however, is not sufficient when designing an Edina Living Street. Street design should also take into consideration neighborhood context and the diverse uses and users of Edina's streets. The Living Streets classifications contained in this Plan were developed to provide a range of options to help make informed decisions regarding street design.

A new street classification called the "Local Connector," accommodating local through traffic, is introduced as part of the Living Streets Plan.

In terms of current functional classification, this Living Streets Plan applies to the Local Streets, Collectors and Minor Arterials as defined in the Comprehensive Plan. When the next required update to the Comprehensive Plan occurs, it is recommended that the Local Connector be added to the City's functional classifications, including the definition that differentiates it from the Local Street classification. See Living Streets Classification Map (Figure 3.1) for locations of Living Streets classifications, and refer to Table 3.1 for a summary of each street classification and their major design elements.

Mini Fact

Respect is a two-way street. Motorists, bicyclists and pedestrians must all embrace Edina's Living Streets and share the road.

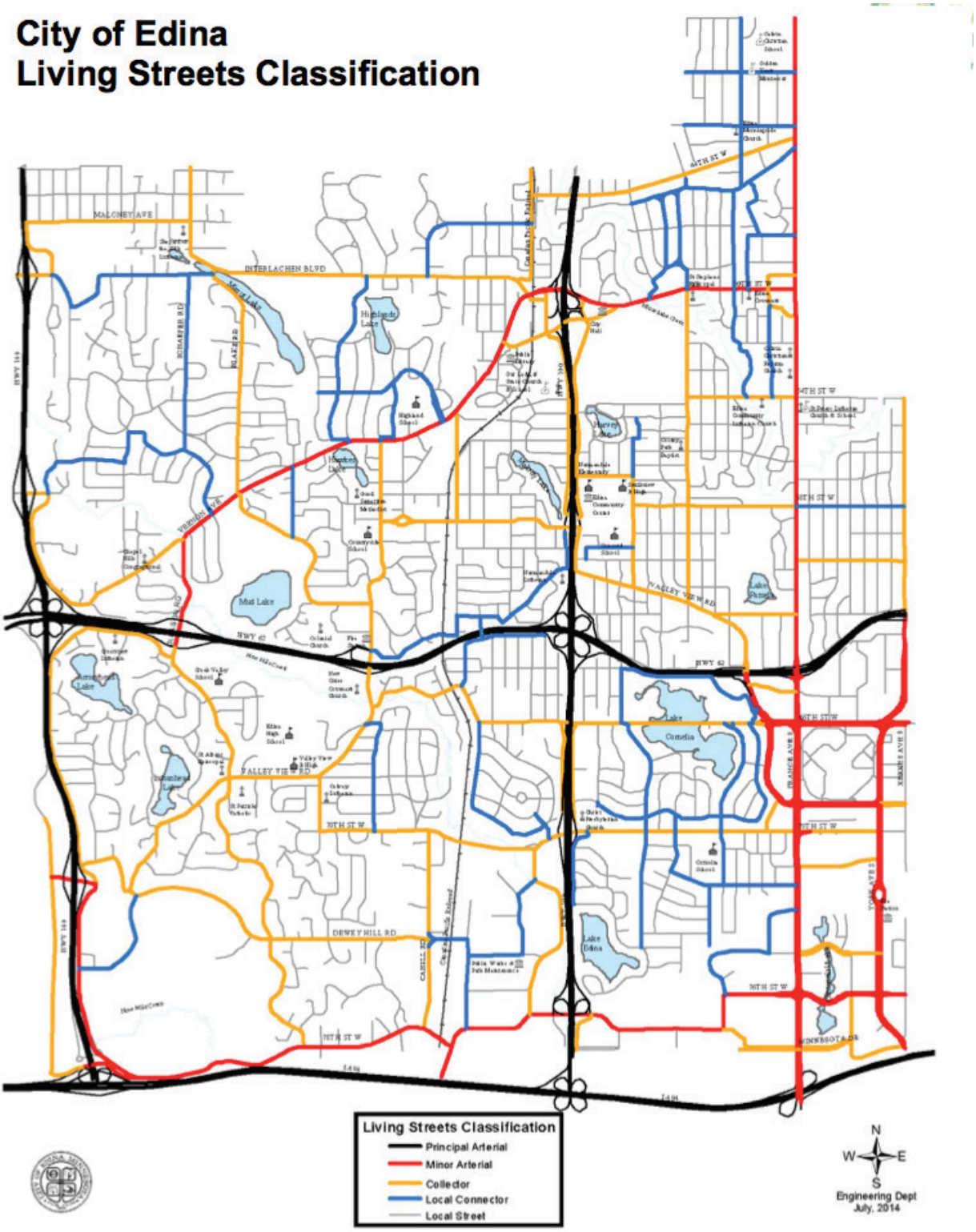


Figure 3.1. Edina Living Streets Classification Map

Table 3.1. Edina Living Streets: Street Classification

Edina Living Streets Classification										
Classification	Driving Lanes			Parking Lanes [1]			Bike Facilities [2]	Sidewalk(s) [3, 8]		
	2	3	4	0	1	2		0	1	2
Local Street	● [5]				○	○	○ [4]	○ [6]	○ [7]	○
Local Connector	● [5]				○	○	○ [4]		●	○
Collector Street	●	○		○	○	○	●		●	○
Minor Arterial	●	○	○	○	○	○	●			●

○ = Optional feature

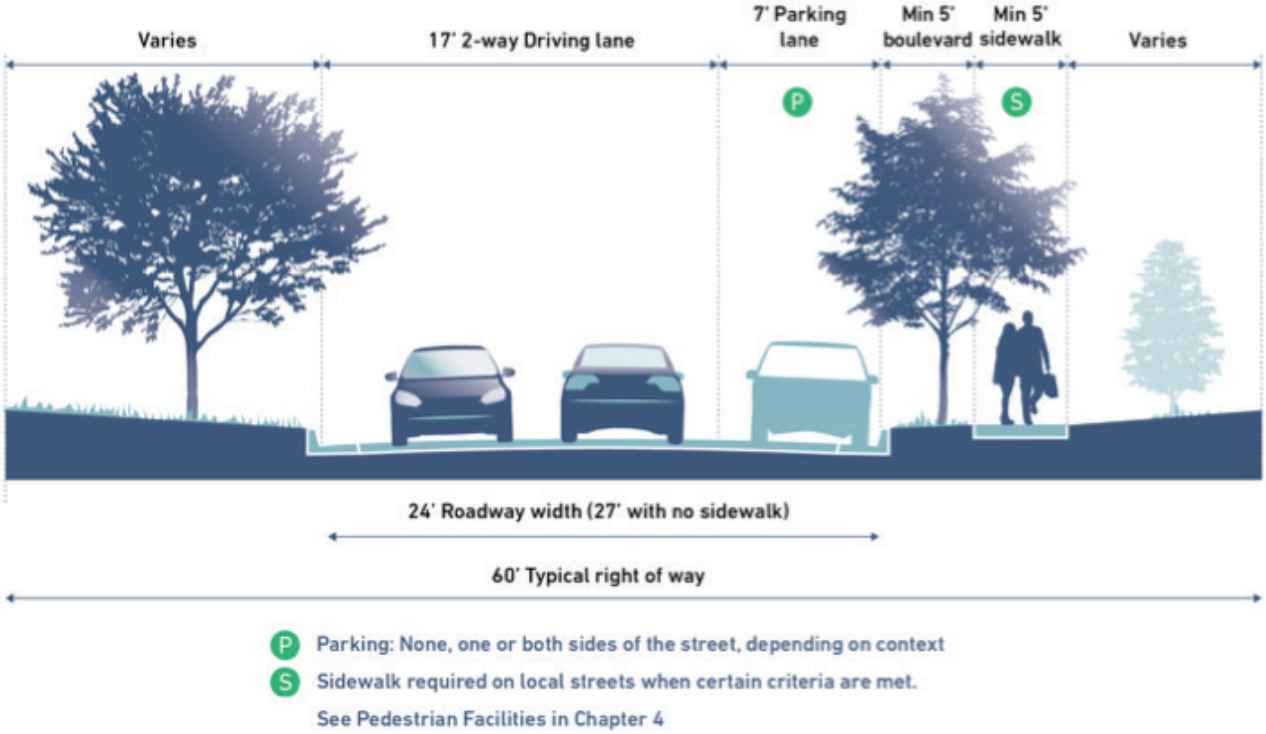
● = Required feature

Notes:
1. Parking shall fit context, and be limited where unnecessary or to improve safety.
2. Refer to the Bicycle Transportation Plan for location of approved bicycle routes.
3. Multi-use paved path may be used where appropriate.
4. If included, shared bicycle facilities are recommended on local and local connector streets.
5. Travel and parking lanes typically not striped.
6. Requires wider street width to accommodate pedestrians in roadway.
7. Required where street abuts or is in the vicinity of a public school, park or public building.
8. Refer to Context Criteria when considering an optional sidewalk.

LIVING STREETS CLASSIFICATION

The matrix below (Table 3.1) was prepared to summarize the options for each element that are available on each of the four Living Streets classifications. The following is a brief discussion of each classification, including example design templates (cross sections). For all four street classifications, there are options for design elements such as the number of driving lanes, whether or not there are parking and/or bike facilities, whether or not sidewalks are to be provided, etc. The design templates represent the minimum and maximum roadway widths and number of design elements for each roadway classification; the templates are not meant to represent all options and combinations of design elements and so should not be viewed as standards to be applied in all situations.

LIVING STREETS: LOCAL STREET CLASSIFICATION



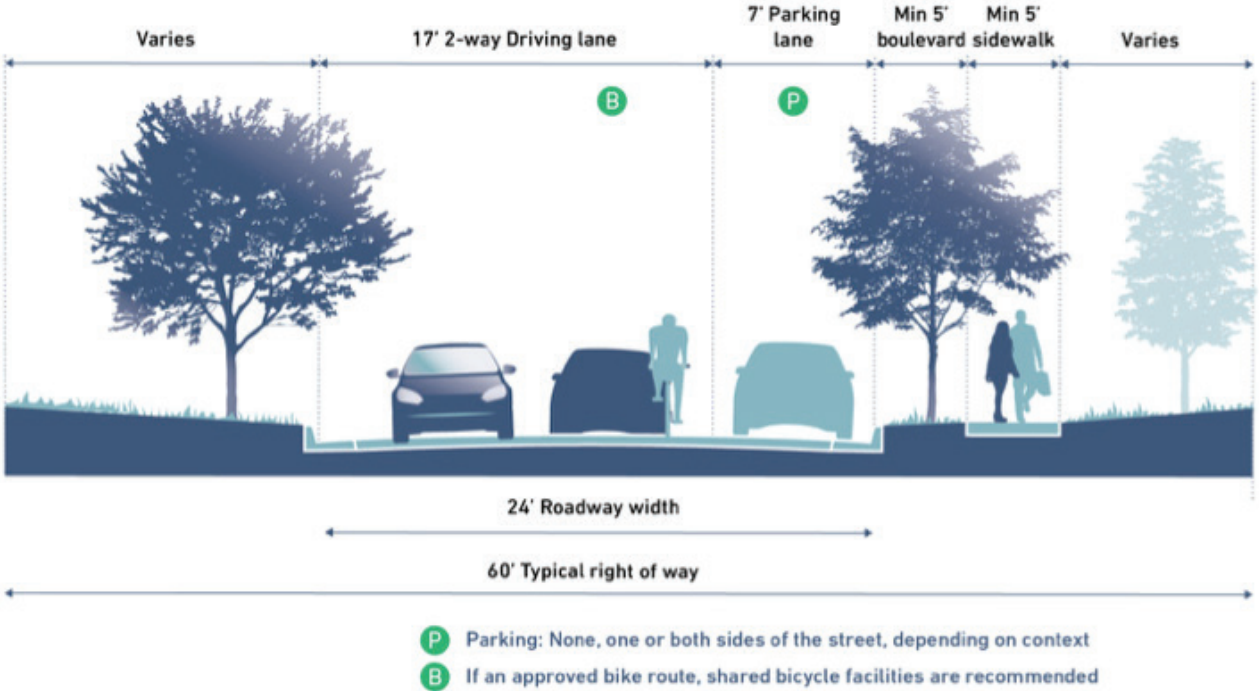
Local Street

For the purposes of the Living Streets Plan, Local Streets are those with a Local Street functional classification as defined in the Comprehensive Plan, excluding Local Connectors (see above). These streets provide immediate access to residences and are used primarily for local trips and are characterized by lower vehicle and pedestrian volumes. The primary role of Local Streets is to contribute to a high quality of life for residents of Edina.

The following Living Streets standards and typical street cross-sections apply to Local Streets. (The typical section below is a representative example of this street classification and is not meant to represent all possible configurations.)

- *Street Width:* 24 feet to 27 feet, depending on context and facilities included (see below).
- *Travel Lanes:* Two, typically without pavement markings.
- *Parking:* Provided along one side of the street, or along both sides if deemed necessary.
- *Bicycle Facilities:* Required if on an approved primary bike route, recommended if on an approved secondary bike route.
- *Sidewalks:* Required where the street is near a public school, public building, community playing field or neighborhood park. Recommended on one or both sides of the street where determined by context. See Pedestrian Facilities chapter for more information.

LIVING STREETS: LOCAL CONNECTOR CLASSIFICATION



Local Connector

For the purposes of the Living Streets Plan, Local Connectors are those with a Local Street functional classification as defined in the Comprehensive Plan, and meets at least one of the following two criteria:

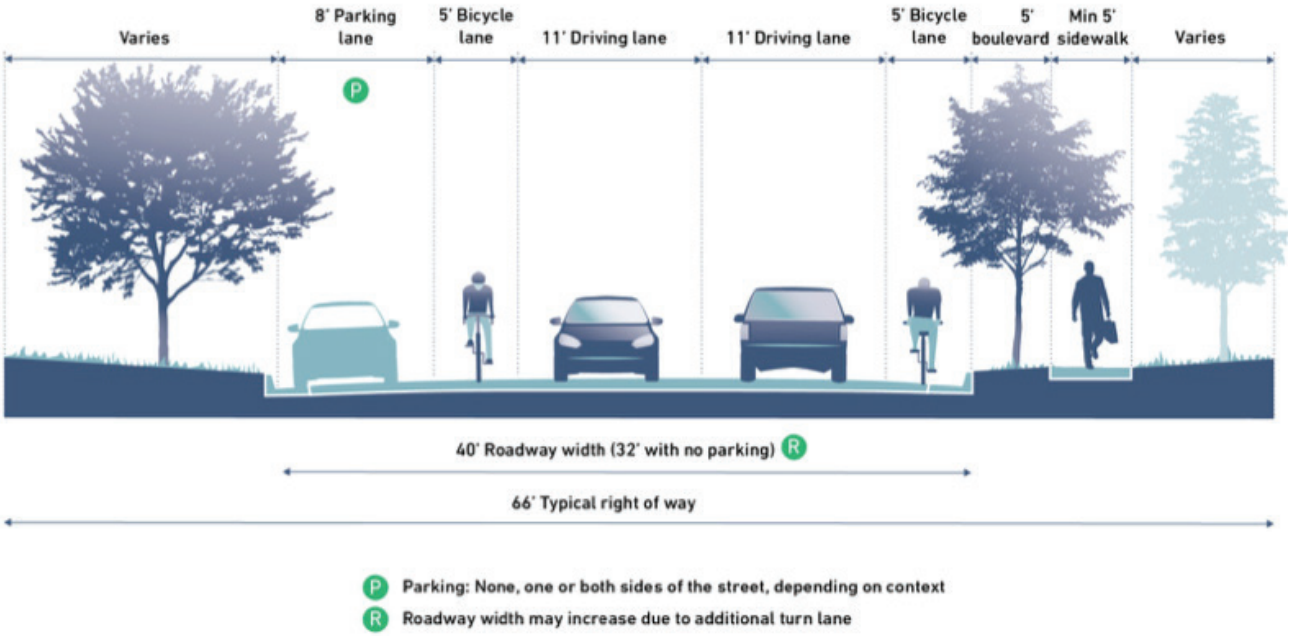
- Average daily traffic (ADT) of at least 1,000 vehicles.
- Serves as a connection between neighborhoods, destinations and higher-level roadways.

Local Connectors provide continuous walking and bicycling routes, and some may accommodate transit routes as well. While they are essential to the flow of people between neighborhoods and destinations, the needs of people passing through must be balanced with the needs of those who live and work along Local Connectors.

The following Living Streets standards and typical street cross-sections apply to Local Connectors. (The typical section below is a representative example of this street classification and is not meant to represent all possible configurations.)

- *Street Width:* 24 feet to 30 feet, depending on context and facilities included (see above).
- *Travel Lanes:* Two, typically without pavement markings.
- *Parking:* Provided along one side of the street, or along both sides if deemed necessary.
- *Bicycle Facilities:* Required if on an approved primary bike route, recommended if on an approved secondary bike route.
- *Sidewalks:* Required on one side of the street at minimum, on both sides as determined by context. See Pedestrian Facilities chapter for more information.

LIVING STREETS: COLLECTOR STREET CLASSIFICATION



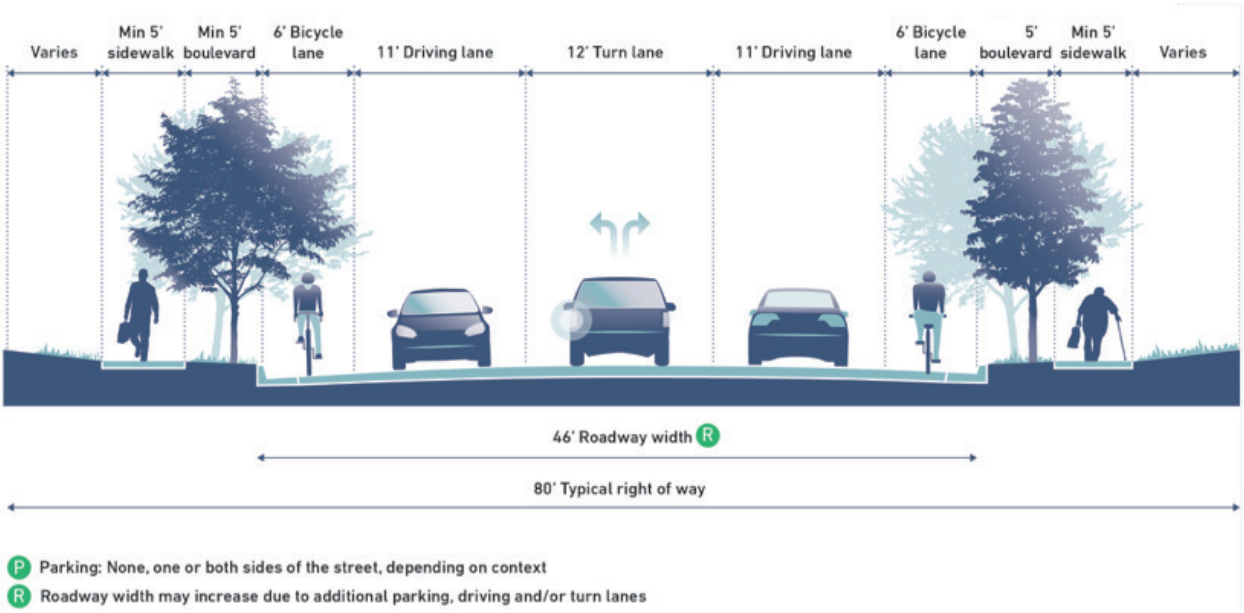
Collector Street

For the purposes of the Living Streets Plan, Collector Streets are any streets having a collector street functional classification as defined in the Comprehensive Plan. Collector Streets provide connections between neighborhoods, from neighborhoods to minor business concentrations, and between major traffic generators. Mobility and land access are equally important, and direct access should predominantly be to developed concentrations. Like for Minor Arterials (see above), safe and accessible pedestrian and bicycle accommodations should be provided at intersections along Collector Streets.

The following Living Streets standards and typical street cross-sections apply to Collector Streets. (The typical section below is a representative example of this street classification and is not meant to represent all possible configurations.) It should be noted that many of Edina's Collector Streets are Minnesota State Aid (MSA) or Hennepin County streets and must meet their standards when reconstructed:

- *Street Width:* 32 feet to 52 feet, depending on context and facilities included (see above).
- *Travel Lanes:* Two or three.
- *Parking:* None, one or both sides of the street, depending on context.
- *Bicycle Facilities:* Required if on an approved primary or secondary bike route.
- *Sidewalks:* Required on one side of the street at minimum, on both sides as determined by context. See Pedestrian Facilities chapter for more information.

LIVING STREETS: MINOR ARTERIAL CLASSIFICATION



Minor Arterial

For the purposes of the Living Streets Plan, Minor Arterials are any streets having a minor arterial functional classification as defined in the Comprehensive Plan. As Minor Arterials have fewer intersections, which is convenient for motor vehicles, the combination of higher speeds and longer distances between signalized crossings can make these streets difficult for pedestrians and bicyclists to cross. Thus, it is important to provide safe and accessible pedestrian and bicycle accommodations at intersections along Minor Arterials.

The following Living Streets standards apply to Minor Arterials, with the exception of minor arterials under Hennepin County jurisdiction. (The typical section below is a representative example of this street classification and is not meant to represent all possible configurations.) It should be noted that many of Edina's Minor Arterial streets are MSA or Hennepin County streets and must meet their standards when reconstructed:

- *Street Width:* Varies, depending on context and facilities included.
- *Travel Lanes:* Two, three or four.
- *Parking:* None, one or both sides if the street, depending on context.
- *Bicycle Facilities:* Required.
- *Sidewalks:* Required on both sides of the street. See Pedestrian Facilities chapter for more information.

PEDESTRIAN NETWORK

The goal of the City's pedestrian network is to provide safe movement for all ages and abilities and to encourage active lifestyles. It should provide network continuity with broad geographic coverage and without notable gaps. Figure 3.2 below indicates locations of existing and future proposed pedestrian facilities. Refer to "Pedestrian Facilities" design guidelines in Chapter 6 for specific guidance regarding the application of these facilities.

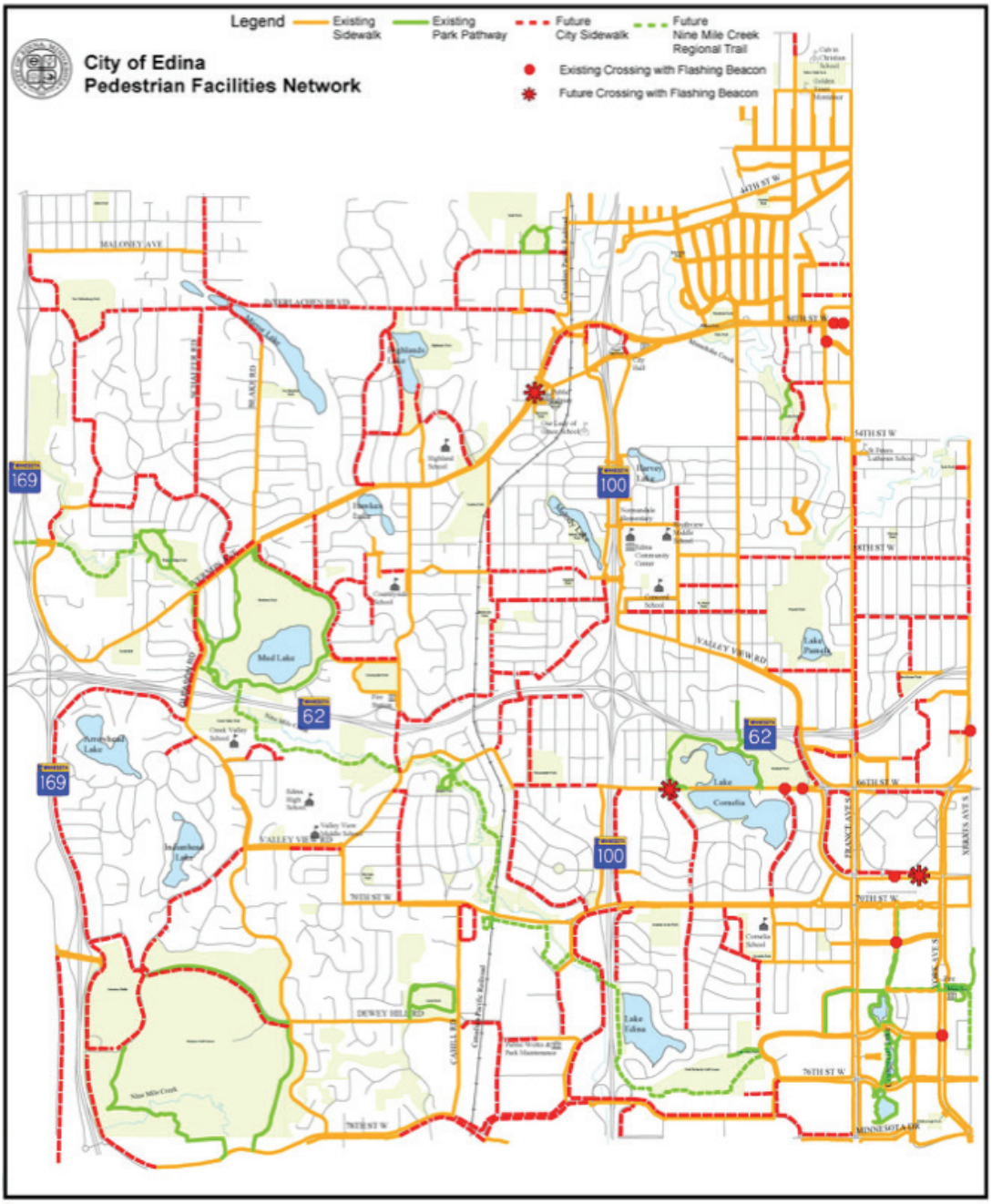


Figure 3.2. Pedestrian Facilities Network

BICYCLE NETWORK

Edina's Living Streets should provide safe, convenient and comfortable access for bicyclists throughout the city. Edina's network of Living Streets shall accommodate all types, levels, and ages of bicyclists. Figure 3.3 below indicates locations of existing and future proposed bicycle facilities. Refer to "Bicycle Facilities" design guidelines in Chapter 6 for specific guidance regarding the application of these facilities.

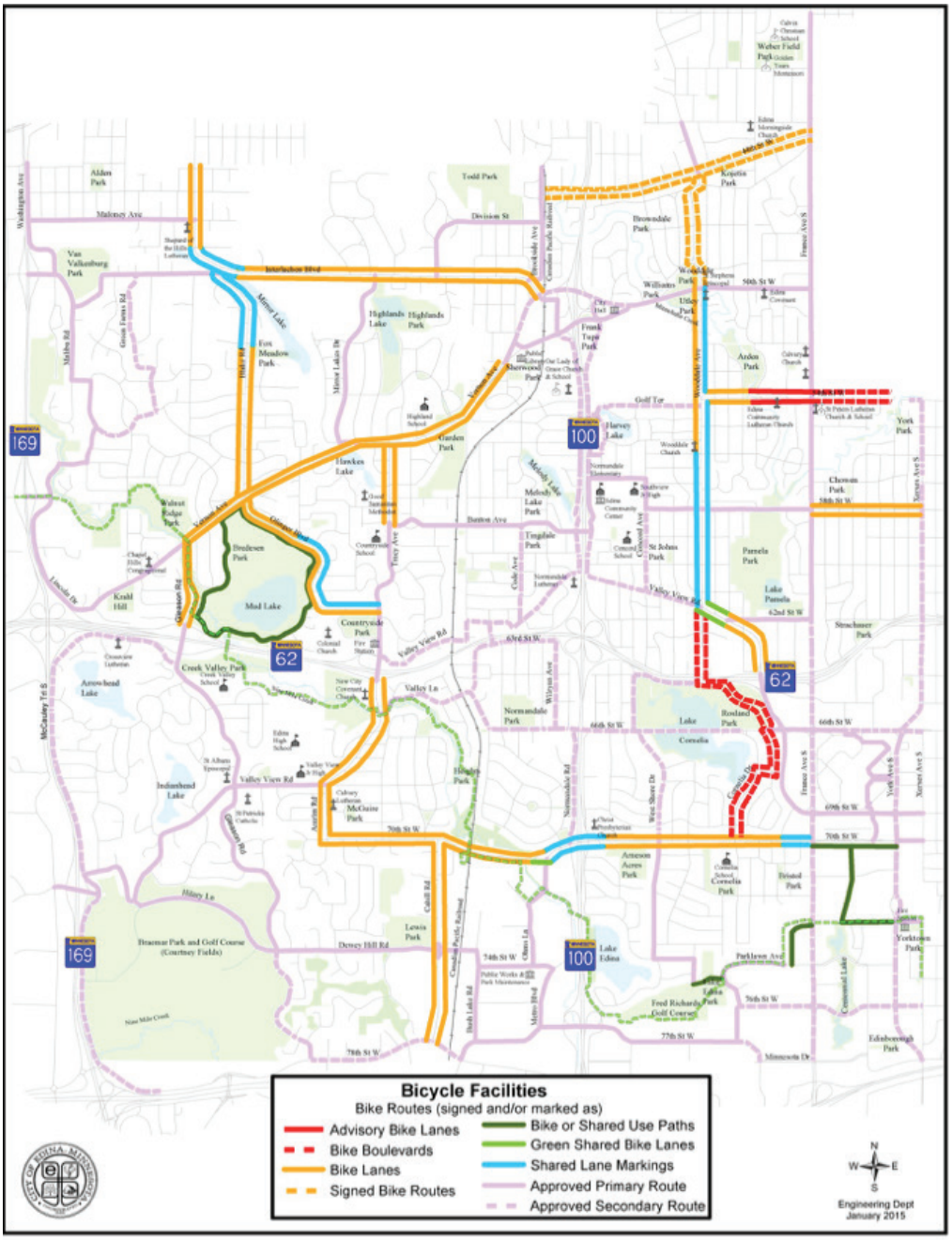


Figure 3.3. Bicycle Facilities Network

STORMWATER MANAGEMENT AND SUSTAINABLE INFRASTRUCTURE

Stormwater Management

Key to understanding the planning for Living Streets is knowing how its concepts overlap with existing City services and funding sources. The implementation of Living Streets practices has the potential to enhance two core services of the stormwater utility – flood protection and clean water – by retaining water on the landscape and filtering runoff. Living streets stormwater practices are sometimes broadly named "Low Impact Development" (LID) practices, and also referred to as "Green Infrastructure (GI)." These Living Streets practices have the potential to increase the sustainability of urban infrastructure while providing multiple benefits such a beautiful streetscape, flourishing trees, benefit air quality, preservation or enhancement of natural areas.

The planning and prioritization of flood protection and clean water service levels is defined in the December 2011 Comprehensive Water Resources Management Plan (CWRMP) by Barr Engineering. Road networks can overlap a variety of watershed and subwatersheds along a single project. The design goals for any project will vary based on these local conditions.

Sustainability

While LID practices focus on primarily on flood protection and clean water services, LID and GI practices provide multiple benefits and can improve quality of life and public health. These practices are over and above regulatory standards and typical street reconstruction standards of practice.

Sustainability goals for the City of Edina are described in Chapter 10 of the Comprehensive Plan. These considerations are not core services and do not come with funding sources to implement, but often the choices made in the planning and development of a street reconstruction project can affect the overall environmental impact of the project, and neighborhood for the life of the infrastructure.

Rather than create a management framework from scratch, the City should rely on a process of continuous improvement of operations by utilizing Envision ratings from the Institute for Sustainable Infrastructure and engagement of the Energy & Environment Commission.

Mini Fact

Bicyclists must ride no more than two abreast in a single lane and not impede normal and reasonable movement of traffic.

Context and Prioritization

INTRODUCTION

Context can either constrain or create opportunity to provide or expand service. The following are contexts that will be considered and that influence planning and design of Living Streets.
This chapter explains and sets forth guidelines to promote connectivity, better understand user demographics, protect or enhance key natural resources, plan and react to physical site constraints, cost effectively align funds to outcomes, and choose project scope to efficiently deliver service.

CONNECTIVITY GUIDELINES

Pedestrian, bicycle and automobile networks are described in Chapter 3. Often, key traffic generators or destinations are sited along these networks. The following cases may warrant or require improvement, connections to a network, an enhanced aesthetic, improvements to signage, or enhanced or modified design to accommodate users.

Regional Networks

Connections to regional transportation networks are a vital component of Edina's Living Streets. It is important to ensure that both residents of and visitors to Edina have safe and comfortable access to and through the city and its environs. Living Streets elements will be incorporated where connections are made between Edina's transportation networks and regional networks such as:

- County roads and state highways,
- Metro Transit bus routes,
- Southwest (Green Line) light rail transit, and
- Regional trails (i.e. the Nine Mile Creek Regional Trail)

Schools

Living Streets will help make it safe and comfortable for students and their families to walk or bike to school in Edina. The infrastructure recommendations contained in Edina's Comprehensive Active Routes to School Plan have been incorporated into the Living Streets Plan and the amended Comprehensive Plan. These improvements (e.g. increased sidewalks, bike facilities and bike parking) will help connect schools to the rest of the city, and vice versa.

Figure 4.1. Creek Valley Elementary School

Parks

Not unlike routes to and from schools, it is important to ensure that Edina's parks are not only connected to its Living Streets but that they also reflect its principles in a seamless way. The City's Parks & Recreation Department is currently preparing a strategic plan, with a key component being connecting the City's

parks to one another via bicycle and pedestrian facilities. In addition to pedestrian and bicycle facilities, Living Streets elements such as traffic calming, landscaping, stormwater management and wayfinding can all help integrate park space with Living Streets.
Private Development

The Living Streets Policy states that "the City will actively promote and apply the Living Streets Policy and Plan… to all street projects, including those involving operations, maintenance, new construction, reconstruction, retrofits, repaving, rehabilitation or changes in the allocation of pavement space on an existing roadway. This also includes privately built roads, sidewalks, paths and trails." It is important to be consistent in the application of Living Streets elements in both the public realm and private development so that all residents and stakeholders in Edina benefit from Living Streets.

DEMOGRAPHICS AND NEIGHBORHOOD

In addition to the wide variety of users who access the City's transportation networks, other factors may warrant a modification of design to serve a vulnerable user group. Demographic and neighborhood contextual factors include the presence of children and schools, seniors and the disabled, community assets (e.g. parks and public facilities) and neighborhood character and aesthetic.

Figure 4.2. Children on their way to school on Gleason Road

Children and Schools

Edina has six public elementary schools, two middle schools and one high school. In addition, there are four private schools located in the city. Inherently, there will be more children at and near these locations, arriving by bus, car, bicycle or on foot. Children are among the most vulnerable users of our streets and Living Streets design elements must reflect this.

Elderly and Disabled

Also vulnerable users of our roadways, seniors and the disabled must also be considered when designing streets. Edina has the highest percentage of residents over the age of 65 in Hennepin County, and many of these residents reside in housing concentrated in the Southdale area. Likewise, disabled residents and visitors to the city also require special accommodations so as not to impede their ability to travel through Edina.

Community Assets, Parks and Places

For the reasons stated above, streets and open spaces around the City's public parks and buildings also shall incorporate Living Streets elements as appropriate to accommodate children, seniors, the disabled and all other users of Edina's facilities. The City's cherished community assets should be available and accessible for all.

Neighborhood Character and Aesthetic

In addition to demographics and public facilities, special design consideration should be given when designing streets in any of the City's 45 distinct neighborhoods. A key principle of Living Streets is that residents should take pride in their streets, and the streets whenever possible should reflect the neighborhoods that they serve.

Figure 4.3. Lake Cornelia

NATURAL RESOURCES

Natural resources provide either an opportunity for recreation and enjoyment or potentially constrain the alignment or widths of transportation infrastructure. Urban forested and natural areas, boulevard trees, lakes, streams and wetlands will all be considered during the development of Living Streets.

Urban Forest

Urban street trees provide valuable shading and energy efficiency, neighborhood aesthetic benefit, can provide traffic-calming affects, and can mitigate traffic noise and benefit local air quality.
Urban recreation trails such as those in Braemar, Rosland, Pamelaand Bredesen parks provide additional park destinations where pedestrian travel and intentionally weave through the urban forest.

Lakes and Streams

Urban lakes and streams provide habitat for a variety of native terrestrial and aquatic vegetation and also serve as home or refuge for a variety of wildlife, including insects, birds, fish and amphibians. Protection of lakes and streams by promoting pollution reduction and clean water goals increase these habitat and wildlife benefits.

Urban lakes and streams also provide valuable water storage and infiltration that promote aquifer recharge, and storage and conveyance of flood waters that promote flood protection services. The urban landscape is highly connected to water bodies though modern drainage networks that often follow and drain roadways. Recreational trails use pond and lake corridors and can be a destination themselves for pedestrian and leisure.

Living Streets will be constrained or enhanced by urban lakes and streams. The City of Edina stormwater utility provides two services to the public: flood protection and clean water. Stormwater management priorities are described in the City of Edina Comprehensive Water Resources Management Plan (December 2011). Performance measurements for flood protection include peak rate measured in cubic feet per second and runoff volume measured in acre-feet. Performance measurements for clean water include removal of sediment measured in tons and phosphorus measured in pounds.

In general, Living Streets will reduce runoff of water and pollutants by reducing impervious surface, including structural water treatment practices, and using design practices that are sensitive to pollutant

Service	Performance Measure	Service
Flood Protection	Peak rate control in cubic feet per second	cfs
Flood Protection	Flood volume control in acre feet volume	ac-ft
Clean Water	Phosphorus pollutant removal in pounds	lb (phosphorus)
Clean Water	Gross and fine solids removal in tons	tons (sediment)

flows through the urban environment and that are resilient to flood waters. Living Streets will exceed minimum regulatory standards and use engineering review and cost benefit comparison to maximize clean water and flood protection benefits, but will be constrained by the available budget. The most effective selection of Low Impact Development Practices will vary by priority watershed. For structural practices, generally larger systems treating larger watershed areas provide better cost effectiveness. The following is a list of practices to consider and their relative cost effectiveness.

Low Impact Development Practices	Flood Protection	Clean Water	Relative Cost Effectiveness
Impervious cover reduction	High	Medium	Very High / Savings
Soil/Turf/Trees	Medium	Low	High
Bio-retention/Rain Gardens	Medium	Medium	Medium
Pervious Pavements	Medium	Medium	Very Low
Underground Sediment/Infiltration	Low	Medium	Low
Swales, filters/other	Low	Medium	Medium
Natural area creation, protection, restoration	High	High	Very High / Savings
Regional ponds and wetlands	High	Medium	Medium
Pollution prevention	Low	High	Very High

The demand for flood protection and clean water services that support core city services of sanitation and public safety far outstrip available resources. Sometimes, the goals of drainage, flood protection and clean water can be counter to one another and other natural resource and sustainability goals. The public demand for drainage service is strong and the redevelopment of private property can impact public flood and water quality service.

Making this series of tradeoffs in a transparent and productive way is a generational challenge. The continual improvement of the state of the practice for building Living Streets to provide these services in an increasingly cost-effective manner will require designers and neighborhoods to make partnerships where they can and take opportunities where they are found.

SITE CONSTRAINTS AND FUNCTION

Various issues limit physical space, traffic speed and infrastructure geometry. The right-of-way will be managed to reduce these constraints, but when they occur, designers are often left with a choice of an unusual expense or a constrained facility design that affects service level. The following are examples of constraints and guidance for their consideration in the development of Living Streets.

Safety

Historic traffic safety complaints or a record of vehicle crashes could reveal a perception of or an actual safety issue. Safety will be a high priority and can be achieved through a variety of design tools, each with varying cost and effectiveness.

- Realignment of intersections and horizontal and vertical curvature of roadway can be an expensive but lasting improvement.
- Sight-line issues can be corrected by reshaping land, removing trees or vegetation and making other non-structural improvements.
- Confusing intersections or traffic movements can be abated with standardized signage or striping.
- Traffic-calming measures can be implemented and have been described elsewhere in this plan. These measures include reducing street area, constructing roundabouts or traffic circles, narrowing intersections, adding pedestrian refuges and planting boulevard trees.

Traffic Volume

Traffic volume, intersection density and traffic flow issues can influence design. Roadway functional classifications and Living Street classifications and standardized markings will be used to guide design. Traffic, pedestrian and bicycle counts can inform transportation modeling of potential alternatives for intersection design. Signal timing and emergency vehicle preemptions enhance or limit traffic flow and volume.

Traffic variety, vehicle type and land use will vary. Industrial and commercial areas with high truck traffic and delivery truck turning, queuing loading and unloading can often be accommodated or limited by site design.

Physical

Narrow right-of-way, atypical intersection geometry, steep slopes and other physical constraints can limit design options and provide opportunity for unique design that highlight neighborhood character.

Regulatory/Increasing Agency Requirements

Wetlands, waters of the state, watershed permitting, public project partners, Municipal State Aid and county roads, transit planning, contaminated soils, and many other design level issues can cause constraints on design. These issues are generally foreseen in project planning, but can occur suddenly if addressed or uncovered late in design or during construction. Examples of regulatory and agency context include:

- Agencies that regulate streets, storm sewers, and other municipal infrastructure are: Minnesota Pollution Control Agency (MPCA), Minnesota Department of Health (MDH), Minnesota Department of Natural Resources (DNR), Minnesota Department of Transportation (MnDOT), Hennepin County, Mine Mile Creek Watershed District (NMCWD), Minnehaha Creek Watershed District (MCWD) and Metropolitan Council Environmental Services (MCES).
- Municipal State Aid streets must meet specific design criteria dictating pavement thickness, lane width, grade, curvature and slope, and others. The City may apply to MnDOT Office of State Aid for design specific variances to these standards.
- As a result of meeting increasing clean water and flood protection services, metro-wide storm sewer permitting costs are predicted to increase more than 30 percent. These regulations and others will require the City to do business differently to both meet mandates and protect our environment for future generations.

With an intentional public and stakeholder engagement process, and forward-looking environmental planning, the development of Living Streets can turn some of these regulatory hurdles into opportunities. With early review and planning (sometimes 2-3 years ahead of a project,) project stakeholders can sometimes become project partners and assist and inspire design and funding. The ability to find and exploit these opportunities will vary, but identifying and improving planning and project scope and the design process in order to be on the lookout for these opportunities is recommended.

Utilities

Roads, trails and bike lanes share public right-of-way with public utilities, including storm, sanitary, water main and private utilities such as electric, gas and communications. This subset of physical constraints is worth noting because they can bring additional costs or service level tradeoffs to those infrastructure systems.

COST AND FUNDING SOURCES

The creation of roadway, bicycle lanes, trails and sidewalks and the associated stormwater drainage networks rely on a variety of funding sources, each supporting core service demands system wide. The prioritization, project scope decision making, and management of transportation and utility services can be inspired by opportunities presented by Living Streets, and the development of Living Streets will be constrained by these funding decisions. Some funding sources like Minnesota State Statutes Chapter 429 Special Assessments and Municipal State Aid have minimum requirements that constrain design.

Funding Sources

Chapter 429 Special Assessments

Special assessments are a charge imposed on properties for a particular improvement that benefits the owners of those selected properties. The authority to use special assessments originates in the State constitution which allows the State Legislature to give cities and other governmental units the authority "to levy and collect assessments for local improvements upon property benefited thereby." The Legislature confers that authority to cities in Minnesota State Statutes Chapter 429.

An example of when the City may use special assessments is a street reconstruction project, for which adjacent properties pay for all or a portion of the construction costs. Such improvements may include Living Streets elements as described in this Plan.

Pedestrian and Cyclist Safety (PACS) Fund

The PACS Fund was approved by City Council to fund projects that make the community more walkable and bikeable, including improvements supported by City plans, and especially the Living Streets Plan. Revenue for the PACS Fund is generated by a franchise fee paid by customers of Xcel Energy and CenterPoint Energy.

The revenue in the PACS Fund will be used exclusively for specific improvements to and maintenance of the City's non-motorized transportation network. As such, the majority of Living Streets elements proposed by this Plan may be funded at least in part by the PACS Fund. The non-motorized transportation network includes sidewalks, trails and other bicyclist-related facilities. Other possible costs the PACS Fund would cover include maintenance of current sidewalks, signage, lighting, pedestrian crossing signals and street striping.

Utility Funding

To the extent that implementation of Living Streets concepts coincides with stormwater management goals and overlaps with identified watershed priorities, funding from the City of Edina stormwater utility is available for public improvement. Some water-friendly techniques and the specific location and efficiency of any technique will vary based on design and location in the watershed.

Grants

In order to offset the costs of infrastructure improvements, the City often applies for grants from other agencies to pay for all or a portion of a project. Such projects include street reconstruction, installation of non-motorized transportation infrastructure and stormwater improvements. Agencies such as Hennepin County, MnDOT, watershed districts and others offer such grants to cities; reaching out to partners and applying for these funds will help Edina implement the Living Streets Plan.

Cost Drivers

Understanding the variety of cost drivers can provide opportunity or constrain Living Streets implementation.

Capital and Maintenance
Maintenance and new capital improvements often compete for the same pool of funding. After initial construction of an individual asset, there is often a period of years or decades in which maintenance costs are low. Being able to reliably predict and fund maintenance to avoid deferring these costs to the point where services suffer is a challenge. Ours is an aging first-ring suburb, where the major cohort of development from the 1950s and 6's is coming due for major repair or replacement now and in the coming decades. The rate of reconstruction provides both opportunity for and constraint to the implementation of Living Streets.

Figure 4.3 Site conditions such as steep slopes, retaining walls and utilities can be constraints to Living Streets implementation

Unique Site Conditions
Occasionally, unique site conditions will constrain the development of Living Streets. Known conditions such as steep slopes, existing retaining walls and other grade issues can be cost prohibitive to development. Soil conditions are a significant cost driver to road and trail construction. The cost difference of development on suitable structural soils and structurally unsuitable peat or expansive clay soils can be large. While soil borings are common in the study of project feasibility and are considered in the project scope decision, unknown soil conditions, contamination of soils and buried solid waste have occurred as late as the construction phase of a project.

Utilities
The context of overlapping project scopes between utility and transportation projects can provide constraint or opportunity to the implementation of Living Streets. The City renews its aging infrastructure though annual Neighborhood Street Reconstruction projects that bundle roadway and utility improvements. The extent of either improvement depends on need. Where utilities are oldest and in need of more extensive repair, individual utility services are dug up, thus disturbing road base and curb lines. When this disturbance is extensive, whole new curb and road base are planned, and the opportunity arises to narrow and realign streets. Where utilities are new, a street reconstruction can take advantage of existing road base and curb without the need to disturb utilities with useful life remaining. Public and private utilities can also constrain the alignment or raise the costs of a project. The need to impact electrical, communications or other infrastructure could be cost prohibitive.

PROJECT TYPES

The level of Living Streets implementation will vary by project type, based on the ability to do so cost effectively. As City policy, the Living Streets Plan will be applied to all street projects including those involving operations, maintenance, new construction, reconstruction, retrofits, repaving, rehabilitation, or changes in the allocation of pavement space on an existing roadway.

Annual Residential Roadway Reconstruction
These involve the reconstruction of (typically) residential neighborhood roadways and provide an opportunity to plan Living Streets in a more holistic way. This project type often includes pedestrian and/or bicycle improvements. When the project is associated with major repair and replacement of utility infrastructure and curb alignments are substantially impacted, even more opportunity exists.

Municipal State Aid
These projects involve the reconstruction or rehabilitation of State Aid roadways in the city. State Aid roads typically carry more vehicular traffic than local roads and are at least partially funded by State Aid funds. Again, this project type often includes pedestrian and/or bicycle improvements.

Private Development
This also includes privately built roads, sidewalks, paths and trails. In addition, the City will also strongly advocate for the incorporation of Living Streets elements into street and infrastructure projects undertaken in the City by other agencies (e.g. Hennepin County, MnDOT, watershed districts).

Private development will be required to incorporate Living Streets principles as a condition of project approval.

Stand-Alone Pedestrian and Cyclist Safety (PACS) Fund Projects
These projects typically involve the construction or maintenance of sidewalks, trails, pedestrian crossings and bicycle facilities. They are constructed as stand-alone projects, without associated road construction or reconstruction.

Major Maintenance
Major maintenance, repaving and rehabilitation projects will provide opportunity to change pavement markings, lane alignment and the overall allocation of pavement space on an existing roadway.

Stand-Alone Utility Fund Projects
These projects are constructed as stand-alone projects, without associated road construction or reconstruction. This category of project may present limited opportunity to implement elements of Living Streets if they involve the impact to curb lines, sidewalks, trails, pedestrian crossings pavement markings or bicycle facilities.

Mini Fact

There are 230 miles of roadway in the City of Edina.

Community Engagement

Urban infrastructure such as roads, bridges, sidewalks, trails and utilities provide functional core public services that also contribute to a sense of place that community members can depend on and with which they can identify. While necessary to renew an aging infrastructure, a project that proposes changes to this sense of place can be very personal to residents and infrastructure users. Additionally, the renewal of aging infrastructure presents opportunities to inform, reassess and celebrate individual and public perceptions and renew our commitment in the place we live. The development of Living Streets will involve the community to inform decisions on this change.

A variety of people will interact during the course of a construction project. If a person lives on or near a street; uses a street to walk, bikes or drive; manages construction; operates public or private utilities; or owns a business that relies on a street, he or she holds a stake in the function and service a street delivers. He or she is a stakeholder.

During the course of a project, project teams will attempt to identify, reach out to and engage these stakeholders. The City will provide a forum to inform, take public input from and involve the public in the development of Living Streets. While the level of engagement may vary by stakeholder, project or topic, a public and transparent forum should explore issues of private and public development, cost and benefit, opportunity and risk, and context and design.

This chapter describes the purpose and process of engagement and provides guidance to the public and project teams.

Figure 5.1. Online community engagement tool Speak Up, Edina!

PURPOSE OF ENGAGEMENT

The previous chapter describes the context that provides opportunity or constrains a project. While some project context is fixed by regulatory requirements or physical constraints – and the project teams traditionally define some of the context with soil borings, site survey, cost estimation, traffic data and standard design – the opportunity a project presents cannot be defined without the help of the public.
Benefits of engagement:

- Effectively engaging stakeholders is critical to increasing the livability of the public realm they inhabit, and ultimately to support active transportation.
- Project success is often judged by the perceptions of affected parties; the project team's understanding and response to local conditions can build support for the work and lead custom solutions to unique or previously undefined problems.
- When people most affected by a project are involved from the beginning of the planning and design process, the likelihood of unexpected conditions, undefined problems or project opposition during construction is reduced.

As a public agency, the City of Edina plans, designs and implements projects to maintain and expand the public infrastructure that provides core public services. These projects are funded using funds collected from public tax dollars, public utility ratepayer and/or special assessments to benefitting properties, and utility franchise fees. Projects and the underlying public infrastructure systems provide a variety of public goods, but also have externalities.

- The public has a right to know how and what services are provided by the City of Edina to make an assessment of costs and benefit, opportunity and risk.
- An informed and engaged public can influence project recommendations to increase public benefit and reduce risk.

Project Stakeholder Engagement

Members of the public have an interest in understanding and providing input for public projects, and project recommendations will be developed with a transparent and defined level of public engagement. The public will have access to the decision-making process and decision makers and will be provided the opportunity to give input throughout the process. Project reports will discuss how their input helped to influence recommendations and decisions.

During the development of project recommendations, the City of Edina will:

- Clearly define the scope of the project and the engagement process that will take place;
- Communicate the latitude afforded to the stakeholder to influence the project recommendations;
- Proactively share data that support preliminary recommendations;
- Invite the public to the process as early as possible and conduct open and public forum(s) that welcomes conversation and builds trust;
- Encourage a wide diversity of stakeholder communication over multiple channels of communication/media;
- Set a civil tone and encourage communication among neighbors to build the capacity of neighborhoods to work together to define and solve problems; and
- Keep records of public input and summarize issues and consideration in project recommendations.

Mini Fact

Pedestrians should cross where they have the right-of-way – at intersections or marked crosswalks when not at an intersection.

COMMUNICATION AND OUTREACH: STREET RECONSTRUCTION PROCESS

The City of Edina has established a program for communication and outreach as part of its annual street reconstruction process. Engagement about Living Streets will become a part of this program. The following is a typical timeline for resident engagement for roadway reconstruction projects.

- August: Informational Letter to residents (for preceding two years construction)
- Mid-September: Open House (for preceding two years construction)
- May/June: Resident Feedback Requested by Questionnaire
- July/August: Neighborhood Informational Meeting
- December: Feasibility Report/Public Hearing
- January – March: Plan Preparation/Bidding
- April/May: Start of Construction
- October/November: Completion of Construction
- Following Spring: Warranty Work
- Following Summer/Fall: Final Assessment Hearing

OPPORTUNITIES FOR PUBLIC ENGAGEMENT

In addition to the street reconstruction process, there are many opportunities for those who live, work and play in Edina to provide input and to stay engaged before, during and after the design and construction of Living Streets. The formal and informal engagement opportunities listed below allow for a variety of avenues for input, including large and small groups, face-to-face communication, written (both on paper and electronic) and online communications.

Figure 5.2. City of Edina website, www.EdinaMN.gov

Pre-Council Decision / Planning and Design Phase

Neighborhood Street Reconstruction Open Houses. These meetings typically begin with a brief presentation by City staff, followed by a question-and-answer period from participants (both in a large group and informal, one-on-one settings). Participants are asked to sign in and fill out comment cards.

Neighborhood Informational Meetings. These meetings are very similar to Neighborhood Street Reconstruction Open Houses, but often focus on

a smaller project or geographic area and have more specific details about the project.

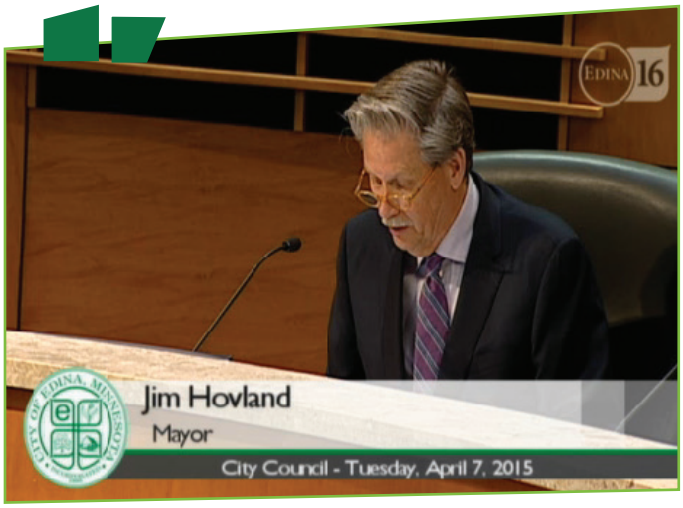


Figure 5.3. Mayor James Hovland

Council Decision / Public Hearing
City Council Public Hearing. This is when the Engineering Department's report for a vehicular, pedestrian or bicycle project is presented to City Council for its approval. Staff will often give a presentation to Council, followed by public testimony. This is the only opportunity for members of the public to testify to the City Council about the project that is being considered. Each person has three minutes to testify. Although this is the only opportunity for public comment, input is welcomed by the City Council prior to the Public Hearing by other means such as e-mail, letter or phone conversations.

Post-Council Decision / Construction Phase
Engineering technician. During construction of any infrastructure project, a City engineering Technician(s) will be on site to answer specific resident questions pertaining to the construction project. The Engineering Technician's primary role is to listen to specific concerns from residents and determine an appropriate course of action to address them. The course of action may be dictated by project constraints discussed earlier and the staff level required to approve a course of action.

Other Public Input
The following are opportunities for more general input, or to submit specific questions or inquiries at any time throughout the year.

- Public input during Comprehensive Planning process
- "Community Comment" during City Council and Board or Commission meetings
- "Speak Up, Edina!" online discussion forums at www.SpeakUpEdina.org
- Requests submitted through the City's website and social media outlets
- Biannual Quality of Life Survey
- Direct contact with City staff and officials
- Petitions

Design Guidelines

INTRODUCTION

A network (Chapter 3) of Living Streets is built one project at a time, and each project will be defined by its transportation infrastructure role and place within context (Chapter 4) unique to its site, neighborhood and users. A project will integrate stakeholder and community engagement (Chapter 5) with a collaborative process to help determine its context. These details inform the design process. The design (Chapter 6) of Living Streets will include minimum standards depending on network and classification and will ultimately be the recommendation of the City's Engineering Director; however, design concepts can also be a part of the community engagement process. A Living Streets design is made up of individual elements; this chapter will discuss the many design elements that can make up a Living Street.

Refer to Table 3.1 for a summary of how each element below is applied to each Living Street classification.

Figure 6.1 below indicates minimum widths for pedestrian facilities and roadway lanes.

Street Type	Sidewalk	Boulevard	Turn Lane	Travel Lane	Bike Lane	Parking Lane
Local Street	5'	5'	Local streets are one to two travel lanes, with parking on one or both sides, and do not have pavement markings.			
Local Connector	5'	5'	Local connectors are one to two travel lanes, with parking on one or both sides, and do not have pavement markings.			
Collector Street	5'	5'	12'	11'	5'	8'
Minor Arterial	5'	5'	12'	11'	6'	8'

Notes

Travel Lanes	• On local and connector streets with parking on one side of the street and without shared-lane bicycle pavement markings, the overall minimum pavement width shall be 24 feet. • On streets without sidewalks, total minimum pavement width shall be 27 feet to accommodate pedestrians walking on the street.
Bicycle Lanes	• The preferred width for bicycle lanes is 6 feet (more if bicycle lanes are buffered) in areas with high volumes of bicyclists and in areas of high parking turnover.
Parking Lanes	• Decisions regarding parking lane width when adjacent to bicycle lanes should consider parking turnover rates and volumes of heavy vehicles.
Sidewalk	• On collector and minor arterial Street Types, or where pedestrians are likely to travel in groups, wider sidewalks (8 to 12 feet) may be recommended.
Boulevard	• Boulevard width may vary depending on right-of-way or topographical constraints. • In shopping districts characterized by zero-lot lines, street furniture and/or on-street parking, the boulevard may be narrowed or eliminated to accommodate a wider sidewalk. • Stormwater best management practices (e.g. rain gardens, street trees) will be located in the boulevard where deemed appropriate.

Figure 6.1. Minimum widths for pedestrian facilities and roadway lanes

VEHICULAR FACILITIES

Driving Lanes

Driving lanes provide travel space for all motorized and non-motorized vehicles. It is recommended that lane widths be minimized to reduce impervious surface and construction and maintenance costs. Reduced lane widths encourage slower motor vehicle speeds, thereby calming traffic, and also free up space that can then be devoted to dedicated bike lanes or other purposes. Where curb and gutter exist, lane widths discussed below are measured to the curb face instead of the edge of the gutter pan or pavement.

Width

Lane width is determined by context and regulations; however, unnecessarily wide lanes should be avoided unless County or State regulations dictate otherwise. Where dedicated pedestrian and/or pedestrian facilities are not provided, the outside travel lane may be widened to accommodate non-motorized roadway users.

Parking Lanes

On-street parking can be important in the built environment to provide parking for residents and their guests, as a buffer for pedestrians using a sidewalk when no boulevard exists, to help calm traffic speeds, and for the success of adjacent retail businesses. The need for on-street parking shall be evaluated with each project. The evaluation shall consider:

- Living Street classification
- Adjacent land uses
- Parking demand (on-street parking that is not used results in unnecessarily wide streets, potentially increasing motor vehicle speeds)
- Competing uses for road or right-of-way space
- Construction and maintenance costs

Figure 6.2. Wooddale Avenue parking lane

The construction of unnecessary parking should be avoided, with parking prioritized below all travel modes when designing a street. Where possible, on-street parking should be inset and coordinated with the use of curb extensions.

Placement

Parking is permitted on one or both sides of local and local connector streets (with possible exceptions due to safety concerns). When a street is reconstructed, the option to limit parking to one side of the street should be considered, reducing pavement width accordingly or converting it for non-motorized vehicle use. Parking should be provided along one side of collector and minor arterial streets unless prohibited. On-street parking may be considered along both sides of these streets, depending upon context.

Width
On-street parking lanes shall be no less than 7 feet wide; unnecessarily wide parking lanes (i.e. greater than 8 feet) should be avoided. On streets where traffic levels or speed limits are higher than 30 mph (e.g. on some collectors and minor arterials), parking lane width may be increased to eight feet.

Pavement Markings and Signage
Pavement markings and signage are necessary and integral components of roadways. They work together to indicate safety and regulatory requirements as well as to provide advisory guidance or wayfinding. Pavement markings and signage will play a key role in Living Streets as well; however, attention will be paid to the resulting aesthetics of these elements without sacrificing safety or convenience. For example, roadways classified as Local Streets will typically not have pavement markings due to their setting and low motor vehicle traffic levels. Additionally, while engineering requirements have to be met, street signs will be kept to a minimum in residential areas (e.g. No Parking signs on Local Streets can be spaced at the maximum allowable sight and regulatory guidelines distance).

Figure 6.3. Sidewalk in the Country Club Neighborhood

PEDESTRIAN FACILITIES

Refer to the Pedestrian Facilities Network map (Figure 3.2) for locations of sidewalks, park pathways and signalized pedestrian crossings. Sidewalks and other pedestrian facilities shall conform to requirements of the Americans with Disabilities Act (ADA).

Sidewalks
Sidewalks should provide a comfortable space for pedestrians between the roadway and adjacent land uses. Sidewalks are the most important component of pedestrian mobility. They provide opportunities for active living and access to destinations and critical connections between multiple modes of travel, as users of motor vehicles, transit and bicycles all must walk at some time during their trip.
Sidewalks are required where (see Table 3.1 for further information):

- A street abuts or is in the vicinity of a public school, public building, community playfield or neighborhood park. Termini to be determined by context.
- On both sides of minor arterial streets.
- On one or both sides of collector streets.
- On one side of local connectors, or both sides as determined by context (see below).
- As required by zoning code or condition of plan approval.
- Context Criteria

The following context criteria may be used when determining whether an otherwise optional sidewalk should be required. The criteria may be applied in any combination, using engineering judgment. An optional sidewalk may be required when:

- Average daily traffic is greater than 500 vehicles.
- 85th percentile speed is greater than 30 mph.
- There is a history of crashes involving pedestrians walking along the roadway.
- Transit stop(s) are present.
- The street is identified as an Active (Safe) Route to School, park or commercial destination.
- A sidewalk would create a logical connection between destinations.
- Site lines, roadway geometry or insufficient lighting make(s) it difficult for motorists to see pedestrians walking along the roadway.
- The street width is less than 27 feet.

Width

Sidewalks shall be a minimum of 5 feet wide to provide adequate space for two pedestrians to comfortably pass side by side. Wider sidewalks (8 to 12 feet) are recommended where pedestrians are likely to travel in groups, such as near schools and in shopping districts, or where adjacent to transit stops.

Boulevard

A standard 5-foot boulevard (the space between the sidewalk and the curb or edge of pavement) shall be provided whenever possible to increase pedestrian safety and comfort, as well as provide space for snow storage (Figure 6.4). Minimum planted boulevard widths may be two feet (see following paragraph). In shopping districts characterized by zero-lot lines, street furniture and/or on-street parking, sidewalks may be wider with no boulevard. Additionally, a shallower boulevard or curbside sidewalk may be constructed when the cost of constructing a five-foot boulevard would be excessively disproportionate due to existing right-of-way or topographical constraints. Curbside sidewalks shall have a minimum width of 6 feet unobstructed for travel (5 feet clear of sign posts, traffic signals, utility poles, etc., plus one foot for snow storage/clearing operations).

Figure 6.4. 5-foot sidewalk with planted boulevard

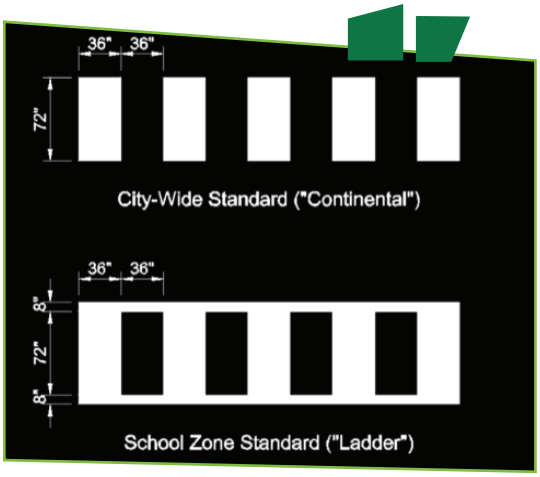


Figure 6.5. Edina marked crosswalks standards

Pedestrian Crossings

The safety of all street users, particularly more vulnerable groups such as children, seniors and those with disabilities must be considered when designing a street. This is particularly pronounced at potential conflict points where pedestrians must cross streets.

Both real and perceived safety must be considered when designing crosswalks; pedestrian crossings must be comfortable. A safe crossing that no one uses serves no purpose.

Refer to Edina's Traffic Safety Committee and the Minnesota Manual on Uniform Traffic Control Devices (MNMUTCD) for local traffic control policies regarding marked pedestrian crosswalks.

Marked Crosswalks

Marked crosswalks are commonly used at intersections and sometimes at mid-block locations, and are often the first tool used to address pedestrian crossing safety issues. By State law, every intersection has crosswalks, whether marked or unmarked, and motorists are required to yield to pedestrians in these crosswalks (unless pedestrian crossing is prohibited). Marked crosswalks alert drivers to expect crossing pedestrians and direct pedestrians to desired crossing locations; however, marking crosswalks at every intersection is not necessary or desirable.

Figure 6.6. Crossing island

The City of Edina has standards for types or styles of marked crosswalks (see Figure 6.5). The type of marked crosswalk shall be determined by context and the following general principles:

- City-wide standard (Continental) crosswalk: 36-inch wide by 72-inch long painted blocks, spaced at 36-inch intervals
- School zone standard (Ladder): Same as Continental (above), with 8-inch lateral painted lines
- Specialty crosswalks: May include brick inlay crosswalks (such as in the Countryside Neighborhood), colored concrete crosswalks (50th & France district) or existing patterned Duratherm crosswalks

Crossing Islands and Curb Extensions

Raised islands/medians and curb extensions are effective measures for improving street crossings. These tools reduce the distance and complexity of crossing wide streets with traffic coming from two opposing directions at once. They can also slow vehicle traffic (see Traffic Calming, below). With the

Figure 6.7. Curb extension with crosswalk

use of crossing islands – sometimes referred to as a "median refuge" – conflicts occur in only one direction at a time (Figure 6.6). Curb extensions (Figure 6.7) shorten crossing distance, reduce time it takes for a pedestrian to cross a street and their exposure to moving vehicles, and can increase pedestrian visibility. See Table 6.2 for recommended applications of crossing islands/median and curb extensions at pedestrian crossings.

Activated Mounted Flashers

In addition to crossing islands and curb extensions, there are other measures to enhance and improve marked crosswalks. Enhanced crossing measures that may be applied in Edina include pedestrian-activated pedestal and overhead mounted flashers (Figure 6.8). While these techniques are typically applied at mid-block crossings to warn drivers that pedestrians may be present, they can also be used at crosswalks at uncontrolled intersections.

If activated mounted flashers are used (including Rectangular Rapid Flashing Beacons, or RRFBs), they should be placed in conjunction with signs and crosswalks. An engineering study may be conducted to determine if a crossing may benefit from pedestrian-activated mounted flashers. Refer to the City's local traffic control policies for further information.

Street Furniture and Public Art

Living Streets are designed to be inviting, pleasing places. It is strongly encouraged to incorporate appealing street furniture, landscaping and public art that reflects the neighborhood's uniqueness. This is especially encouraged in commercial areas, near parks and other public spaces, where more activity is likely to be present and where funding for these amenities may be easier to obtain (Figure 6.9). Street furniture such as benches, bus shelters and trash receptacles provides the opportunity for a neighborhood to express its identity and for pedestrians to rest or otherwise sit and enjoy their surroundings. Street furniture and public art should be interesting for pedestrians, provide a secure environment, be well lit and have adequate sightlines.

Figure 6.8. Crossing with activated mounted flashers (Rectangular Rapid Flashing Beacons)

Figure 6.9. Street furniture and public art at 50th & France

BICYCLE FACILITIES

The Living Streets Policy and Plan indicates that bicyclists – just like motorists and pedestrians – should have safe, convenient and comfortable access to all destinations in the city. Indeed, every street (excepting principal arterials) is a bicycle street, regardless of bikeway designation. Edina's network of Living Streets shall accommodate all types, levels and ages of bicyclists. Bicycle facilities should take into account vehicle speeds and volumes, with shared use on low volume, low-speed road and separation on higher-volume, higher-speed roads.

Refer to the Bicycle Facilities Network map (Figure 3.3) for locations of planned bicycle facilities.

Types and Placement

Table 3.1 indicates on which street classifications bicycle facilities (shared or separated) shall be located/considered. The City of Edina Comprehensive Bicycle Transportation Plan shall be consulted to determine where approved bike routes are located. Refer to Table 6.1 for guidance on the application of each type of bicycle facility.

Figure 6.10. Bike lane on Tracy Avenue

Share The Road

"Share The Road" reminds motorists, bicyclists and pedestrians that all modes of transportation may use the roadway. "Share The Road" may be posted in conjunction with shared lane markings, on a bike boulevard, or on a bike route without pavement markings (Figure 6.11). Where a bike lane ends, but the bike route continues, "Share The Road" may also be posted. Signage that indicates "Bikes May Use Full Lane" may also be considered where appropriate.

Figure 6.11. "Share the Road" signage

Although all roads in Edina are shared, these signs communicate to motorists and cyclists that the road has been identified to encourage use by cyclists, but lacks separate bicycle facilities.

Bike Boulevard

A bike boulevard is a lower-volume residential street that has been improved for bike traffic, often serving as an alternative bicycle route to a street with higher traffic volumes. Bike boulevards may include traffic-calming measures such as traffic circles and are meant to create a lower stress, bicycle-prioritized route (e.g. by removing stop signs in through direction). Bike boulevards may be designated with pavement markings that include a large bicycle symbol

Figure 6.12. Bike Boulevard on Cornelia Drive

with the text "BLVD" (Figure 6.12). The markings are not intended to guide the bicyclists.

Shared Lane Markings

Shared lane markings or "sharrows" are pavement markings used to mark a designated bike route. Placed in the travel lane, they encourage bicyclists to ride in a safe position outside of the door zone (where driver's side doors of parked cars open).

Shared lane markings include a bicycle symbol and a double chevron indicating the direction of travel (Figure 6.13). They do not designate any part of the roadway as exclusive to either motorists or bicyclists. Rather, shared lane markings emphasize that the travel lane is shared.

Figure 6.13. Shared lane markings or "sharrows"

Advisory Bike Lanes

Advisory bike lanes are used on streets that are too narrow for dedicated bike lanes. Advisory bike lanes look like dedicated bike lanes, except a dashed line is used in place of a solid bike lane stripe (Figure 6.14). A dashed line signals to drivers that they may drive in the advisory bike lane. Advisory bike lanes do not narrow the travel lanes or reduce the amount of roadway space that can be used by motor vehicles. Additionally, they bring greater awareness to the roadway as shared space and can help to reduce vehicle speeds and improve roadway safety. At present, advisory bike lanes are considered experimental by the Federal Highway Administration (FHWA).

Figure 6.14. Advisory bike lane

Paved Shoulders

The shoulder is the part of the street that is contiguous to and on the same level as the part of the street that is regularly used for vehicle travel. (Figure 6.15). The shoulder is typically separated from the traveled part of the street by a solid white line, called an "edge line" or "fog line."

Paved shoulders can look a lot like bike lanes, but differ from bike lanes in some important ways:

- Bike lanes have bicycle pavement markings and Bike Lane signs; paved shoulders do not.
- Bike lanes have been designed for cycling; paved shoulders have not.

Figure 6.15. Example of a paved shoulder

- Parking is not permitted on bike lanes unless posted otherwise; parking is permitted on paved shoulders unless posted otherwise.
- Cyclists may use the shoulder, but are not required to.

Figure 6.16. Shared use path along Gallagher Drive

Bike Lanes
Bike lanes provide dedicated space on the roadway for bicycle use. Bike lanes are separated from the lane used by motor vehicles by a solid white line. Bike lanes are also marked with a white bicycle symbol and arrow on the pavement and signed at regular intervals (Figure 6.10). "Buffered" bike lanes are similar to regular bike lanes, but also include a marked buffer between the bike lane and the adjacent driving lane. This buffer area is marked with white diagonals or chevrons to indicate that no vehicles are allowed to travel in the buffered area.

As a bike lane approaches an intersection or bus stop, a dashed line may be used instead of a solid white line to indicate the space is shared by motorists and bicyclists. A dashed line may also be used to stripe the bike lane through intersections.

Bicycle or Shared Use Path
A bicycle or shared use path is a facility that has been designed for bicycle use and constructed separately from the roadway or shoulder. A bicycle path may be for exclusive use by bicyclists (bike path), or it may be shared with pedestrians (shared use). A bicycle path that is adjacent to a roadway is a side path (Figure 6.16).

Figure 6.17. Buffered bike lane

Buffered Bike Lanes
A buffered bike lane is a bike lane with pavement marking "buffers" that provide separation from motor vehicle driving or parking lanes. Buffers are typically18 to 48 inches wide, with larger buffers often including chevron or crosshatch markings (Figure 6.17). Buffered bike lanes can provide space for the parked car "door zone" and for passing other bicyclists, and can visually narrow the street to calm traffic.

Figure 6.18. Protected bike lane

Protected Bike Lanes
A protected bike lane is a street-level facility marked similarly to a buffered bike lane, but is also protected from traffic by bollards, planters, parked cars or other barriers from traffic (Figure 6.18). This facility type provides physically protected, exclusive space for bicyclists separate from motor vehicles and pedestrians. Vehicles are prevented from driving or parking in the facility.

Figure 6.19. Bicycle facility signage near West 54th St and Wooddale Avenue. The Living Streets Plan does not recommend the use of the green "wayfinding" signage.

Signage and Wayfinding

Similar to signage for motor vehicles (see Pavement Markings and Signage, above), certain signs are required when installing bicycle facilities on roadways (this is particularly true for on-street facilities). In the past, the City has installed "wayfinding" signage on some bicycle routes to indicate the direction and distance to other nearby bicycle routes. While wayfinding signage of this type can be considered on a project-by-project basis, at this time, the Living Streets Plan recommends discontinuing the use of these signs to reduce "sign pollution" cited by some residents.

Table 6.1. Appropriateness of bicycle facilities

BICYCLE FACILITIES	Living Streets Classification			
	Local Street	Local Connector	Collector Street	Minor Arterial
"Share the Road"	●	○	○	○
Bike Boulevard	●	●		
Shared Lane Markings/Sharrows	○	●	●	○
Advisory Bike Lanes		●	○	
Paved Shoulders	●	●	●	●
Bike Lanes		○	●	●
Buffered Bike Lanes			●	●
Protected Bike Lanes			○	●
Shared Use Path	●	●	●	●

Legend:
- ● Appropriate
- ○ Appropriate in specific circumstances
- Not Appropriate

Intersections

Given that intersections are junctions where different modes of transportation meet, a well-designed intersection should facilitate the interaction between bicyclists, pedestrians, motorists and transit. This should be done in a safe and efficient manner that reduces conflicts between bicyclists and vehicles, including heightening the visibility, denoting a clear right-of-way and ensuring all users are aware of each other.

Bike Lane Markings

Pavement markings for bike lanes (see above) should extend up to the crosswalk (or stop bar if crosswalk is not marked) to ensure that separation, guidance on proper positioning, and awareness by motorists are maintained through these conflict areas. At right-turn lanes, a bike lane "pocket" (Figure 6.20) shall be placed between the right-turn lane and the rightmost through lane. If a full bike lane cannot be accommodated, a shared bicycle/right-turn lane can be installed that places a standard-width bike lane on the left side of the right-turn lane. A dashed stripe delineates the space for bicyclist and motorists within the shared lane. Sharrows are another option for marking a bike lane through an intersection where a bike lane pocket cannot be accommodated.

Figure 6.20. Bike lane "pocket" on West 70th Street

Figure 6.21. In-pavement bicycle detector loop on 54th Street at France Avenue

Green Bike Lanes at Conflict Points
Green colored pavements are used to highlight conflict areas between bicycles and motor vehicles at heavy turning and merging locations approaching and within intersections (Figure 6.21). Green colored pavement can be used in conjunction with sharrows and/or dashed white stripes to delineate the edge of the green colored pavement.

Bicycle Signal Detection
Bicycle detection is used at actuated traffic signals to alert the signal controller of bicycle crossing demand on a particular intersection approach. Bicycle detection can occur by automated means such as in-pavement detection loops (Figure 6.22). Such loops have increased sensitivity to detect bicycles. Signage and pavement markings should be used to provide clear guidance to bicyclists on how to actuate detection.

Figure 6.22. Green colored pavement highlighting a "conflict area" at West 70th Street and Metro Boulevard

TRAFFIC CALMING

The primary goal of traffic calming is to slow motorists to a desired speed by using design in a context-sensitive manner. Traffic calming determined with stakeholders is acceptable and encouraged on all street classifications. When utilized effectively, traffic calming can physically encourage motorists to drive at the desired speed. Not all traffic-calming techniques listed below are appropriate on all streets.

Figure 6.24. Roadway before road diet

Traffic calming uses a combination of physical measures that alter driver behavior and improve conditions for non-motorized street users while accommodating the needs of motorists. While speed reduction of motor vehicles and increased motorist awareness of non-motorized road users are the primary goals of traffic calming, these measures can also be designed to treat and manage stormwater and improve the aesthetics of the street.

Please refer to Table 6.2 for guidance regarding the applicability of the traffic calming techniques described below. It should be noted that often a combination of techniques is needed to calm traffic effectively, and their application should take into account overall traffic flow and emergency vehicle access throughout the corridor.

Figure 6.23. Roadway after road diet

Road Diet

A road diet entails the narrowing and/or removal of driving lanes from the street cross-section (both of which are traffic-calming measures). The

reclaimed roadway space can be used for bicycle lanes, sidewalks, landscaped boulevards or medians, and/or on-street parking. A common road diet involves converting an undivided four-lane roadway into a three-lane roadway made up of two through lanes, a center two-way left turn lane, and a shoulder/bike lane (Figure 6.23 and Figure 6.24). The most successful road diet implementations are typically at locations with fewer than 15,000 vehicles per day.

Raised Medians

Often used as components of a road diet, raised, planted medians can calm traffic in multiple ways. Medians can help define the travel lane, while the vertical curb and median plantings provide visual cues to motorists to slow speeds. Medians that extend through intersections can also provide volume control by blocking through movement at a cross street. Additionally, medians can provide a refuge (if designed appropriately) for pedestrians crossing a wide, multi-lane street. (See "Crossing Island and Curb Extensions" above.)

Figure 6.25. Traffic circle at West 54th Street and Drew Avenue South

Roundabouts and Traffic Circles

Roundabouts and traffic circles require traffic to circulate counterclockwise around a center island. Traffic circles are raised islands placed in intersections and are effective for calming traffic at these locations (Figure 6.25). This is especially true within neighborhoods, where large vehicle traffic is not a major concern, but speeds, volumes and safety are problems. Traffic circles replace stop signs at intersections, which can improve safety at locations where stop sign compliance may be lower.

Roundabouts, unlike traffic circles, are used on higher-volume streets to minimize conflicts between competing movements (Figure 6.26). Roundabout have been shown to be reduce the number and severity of crashes while at the same time more efficiently moving vehicles through an intersection when compared to traditional signalized intersections. Roundabouts can moderate speeds on collector and arterial streets and are aesthetically pleasing if well-landscaped.

Figure 6.26. Roundabout at West 70th Street and Valley View Road

Curb Extensions

In addition to shortening the crossing distance for pedestrians (see "Crossing Island and Curb Extensions" above), curb extensions (sometimes referred to as "bumpouts" or "neckdowns") can also help to reduce the speed of vehicles. This is accomplished by reducing the roadway width from curb to curb at planned locations, and by tightening the curb radii at intersection corners, reducing the speeds of turning vehicles. Curb extensions also protect on-street parking bays and provide opportunities for landscaping and rain gardens (see Stormwater Management and Sustainable Infrastructure, below).

On-Street Parking

On-street parking also functions as a traffic-calming device when vehicles are regularly parked in the parking lane. Vehicles parked in the street physically and visually narrow the roadway and can increase the level of activity on the street as people come and go from parked cars. This can cause motorists to be more alert and slow vehicle speeds. On-street parking (when striped and/or utilized) can also provide a buffer between moving vehicles and pedestrians who may be walking on an adjacent sidewalk.

Bike Lanes/Buffered Bike Lanes

Like on-street parking, marked on-street bike lanes provide a buffer between pedestrians on an adjacent sidewalk and motor vehicle traffic. Additionally, the lane markings indicate where motorists should be driving and effectively narrow the travel lane. The potential presence of cyclists can also alert motorists to slow down and be aware.

Street Trees

In addition to their environmental benefits (see Stormwater Management and Sustainable Infrastructure, below), trees, when located on both sides of the street (especially in boulevards and medians) create a sense of enclosure that discourages drivers from speeding. Street trees create vertical walls that frame streets and provide a defined edge. This helps motorists guide their movement and assess their speed, which can lead to overall speed reduction. Also, the presence of street trees creates a safer walking environment by providing distinct edges to sidewalks so that motorists can better distinguish between their environment and the one shared with people.

Figure 6.27. Brick crosswalk in the Country Club Neighborhood

Raised Intersections/Crosswalks

A raised intersection is a flat raised area covering an entire intersection, with ramps on all approaches and often combined with textured materials (see below) on the flat section. Typically, they raise to just below the level of the sidewalk. Raised intersections are more readily perceived by motorists to be "pedestrian territory" and the change in grade slows vehicle speeds.

Similarly, raised crosswalks are often marked by different materials to provide pedestrians with a level street crossing and to make them more visible to approaching motorists. They can act as "speed tables" to slow vehicle speeds.

Textured and/or Colored Pavement

Textured and colored pavement includes the use of stamped pavement or alternate paving materials to create an uneven surface for vehicles to traverse. They may be used to emphasize either an entire intersection or a pedestrian crossing, and are sometimes used along entire street blocks. Locations where textured and/or colored pavement are often used include parking lanes, bike lanes, pedestrian crossings (Figure 6.27), and intersections.

Table 6.2. Applicability of Traffic Calming Measures

Traffic Calming Measure	Living Streets Classification			
	Local Street	Local Connector	Collector Street	Minor Arterial
Reduction in number of lanes	🟡	🟢	🟢	🟢
Lane width reduction	🟢	🟢	🟢	🟢
Median refuge		🟡	🟢	🟢
Curb extention	🟢	🟢	🟢	🟢
On-street parking	🟢	🟢	🟢	🟡
Bike lanes/protected bike lanes		🟡	🟢	🟢
Street trees	🟢	🟢	🟢	🟢
Textured and/or colored paving materials	🟡	🟢	🟢	🟢
Roundabouts		🟡	🟢	🟢
Traffic Circles	🟢	🟢		
Raised intersections	🟢	🟢	🟡	
Raised crosswalks	🟢	🟢	🟡	

Legend:		
	🟢	Appropriate
	🟡	Appropriate in specific circumstances
		Not Appropriate

Other tools that can be used to calm traffic include fixed and temporary dynamic speed signs and enforcement of traffic laws.

STORMWATER MANAGEMENT AND SUSTAINABLE INFRASTRUCTURE

The reduction of the environmental footprint of infrastructure is a generational challenge requiring a continuous-improvement approach. Implementation of Living Streets will seek to continually reduce the environmental footprint of transporation infrastructure.

The Institute for Sustainable Infrastructure ENVISION rating system is the current standard of practice manual that can be used to track and explore issues of sustainability on a project-by-project approach. Along with a focus on stormwater management goals specific to Edina and its local watershed districts in the City of Edina Comprehensive Water Resources Management Plan, this section provides tools for designers and neighborhood to explore topic area review of stormwater and sustainability issues. Sustainability and water resources review will supplement normal watershed, environmental permitting and stakeholder engagement and be included in project documents.

Streetscape, Sustainability and Stormwater Management Toolbox

The following table provides an overview of water resource and sustainability indicators for a variety of practices.

Each of the toolbox items are detailed below to describe purpose, benefit and cost or limitations.

Impervious cover reduction

Realignment of intersections, replacement of curb and gutter, narrowing of streets, and addition of sidewalk all present the opportunity to increase or decrease impervious surfaces. The potential reduction of road base, rock, curb and pavement presents a potential savings to project budgets and often makes room for boulevard improvements, trees and sidewalks.

Streetscape Toolbox	Flood Protection Impact	Clean Water Impact	Sustainability Indicators
Impervious cover reduction	High	Medium	Reduced materials and energy, reduced heat island effect
Soil/Turf/Trees	Medium	Low	Reduced heat island effect, provides wildlife habitat, reduced energy, reduced noise
Bio-retention/Rain Gardens	Medium	Medium	Reduced heat island effect, provides wildlife habitat, reduced energy, increased maintenance burden
Pervious Pavements	Medium	Medium	Reduced heat island effect, increased material energy and maintenance burden, reduced land used
Underground Sediment/Infiltration	Low	Medium	Reduced land used, increased material, reduced energy and maintenance burden
Swales and Filters	Low	Medium	Provides wildlife habitat, reduced heat island effect
Natural area creation, protection, restoration	High	High	Increased wildlife habitat, increased species diversity, reduced erosion, reduced maintenance burden emissions
Ponds and wetlands	High	Medium	Increased wildlife habitat, increased species diversity, reduced maintenance burden emissions
Pollution prevention	Low	High	Material and waste control, increased recycling and reuse of materials, regional material preference, reduced soil hauling

Reduction of impervious surface is desirable because it reduces the urban heat island effect, can cool neighborhoods and reduce associated cooling energy use, and reduces total stormwater runoff volume and associated nutrients and pollutants into lakes and wetlands.

The reduction of impervious surfaces is generally a cost savings to a project, and can reduce long-term maintenance. Care must be taken to reduce functionality or maintainability of hardscapes. Sometimes, standard equipment widths may limit how narrow a paved surface can be.

Soil, turf and trees
Street and utilities reconstruction can impact soils, trees and turf. The careful treatment of these natural resources and the replacement of their environmental function should be considered in the development of Living Streets.

Careful treatment of existing soils, turf and trees, and the replacement and addition of high-quality soils, grass seed and street trees (see Figure 6.28) can provide habitat benefit, reduce net embodied energy, increase habitat for wildlife, reduce the heat island effect and associated cooling energy use, and reduce total stormwater runoff volume and associated nutrients and pollutants into lakes and wetlands. High-quality topsoil also can hold moisture and reduce irrigation demand and decrease neighborhood noise levels.

Natural practices such as these are durable and self-repairing. Turf and trees require minor trimming in the boulevard and can be damaged by winter salt-spray.

Figure 6.28. Boulevard trees

Figure 6.29. Rain gardens

Bio-retention and rain gardens
Rain gardens collect, filter and infiltrate stormwater from roads, driveway, roofs and other hard surfaces (Figure 6.29). A rain garden uses water runoff as a resource to grow flowers and trees, and replenish local groundwater. Rain gardens are generally well landscaped with native plants and greenhouse cultivars and tend toward ornamental arrangements of flowers and grasses. Rain gardens are subset of bio-retention practice.

Storage, detention, filtration and infiltration of stormwater in bio-retention practices can provide good clean water and flood protection benefit and has multiple sustainability indicators such as reduced heat island, increased wildlife habitat and reduced energy use.

The care and maintenance of rain gardens and bio-retention is labor intensive. Scale is important, and generally there are more cost effective approaches to flood and clean water when viewed from a city-wide approach. The multiple natural resource benefits may be worth paying a premium in certain contexts. Occasionally, plant materials must be replanted and accumulated sediment needs to be removed.

Pervious pavements
Typical pavements can shed nearly all water that falls on them, and provide an efficient path for drainage and associated pollutants and nutrients. Pervious pavements (Figure 6.30) allow water to soak though and store in the gaps between foundation-aggregate and there it slowly infiltrates or drains.

Using less land than typical stormwater treatments, pervious pavements can reduce island effect. This practice can reduce, store and clean surface water runoff and reduce pollutant transfer.

Figure 6.30. Pervious pavement parking lanes.

Figure 6.31. Underground infiltration system

Material costs and embodied energy may be higher during the project, and as a non-standard practice, maintenance burden is increased. Pervious pavements can clog from high sediment loads, and technology to clean and maintain them is still untested in long-term applications.

Underground sediment capture and underground infiltration
Storage, detention, filtration and infiltration of stormwater in underground chambers can treat and capture pollutants in the flow and reduce overall runoff volume, thus reducing pollutant and flood flow (see Figure 6.31).

Underground chambers use less land than competing stormwater treatments and are a standard practice.
Material costs and embodied energy are higher for underground practices than other options, and these practices don't provide multiple benefits. Maintenance can take place with standard equipment.

Swales, sand filters and other controls
Flowing stormwater over pervious surfaces such as ditches, swales or sand filters can slow flow and reduce pollutants. Water can also store in nearby soils and be used as a resource for nearby plant material.
Like bio-retention practices, swales and filters can provide good clean water and flood protection benefit and provide multiple sustainability indicators such as reduced heat island, increased wildlife habitat and reduced energy use.

The aesthetics may not as appealing as rain gardens or bio-retention, but maintenance burden is reduced in this application.

Natural area creation, enhancement or conservation
Projects often abut nearby unimproved areas. These areas can sometimes seem a waste or blank canvas for development. The potential to conserve or enhance the natural resource, water resource or wildlife habitat benefit of a natural area can provide a unique neighborhood amenity.

Conservation, creation and enhancement of natural areas are very desirable because they reduce the urban heat island effect, can cool neighborhoods and reduce associated cooling energy use, and reduce total stormwater runoff volume and associated nutrients and pollutants into lakes and wetlands and provide ample wildlife habitat.

Conservation is generally a cost savings to a project, and can reduce long-term maintenance burden. Enhancement, restoration or creation can be outside a typical project scope, and unless there are compelling stormwater treatment benefits, funding sources can be hard to find.

Ponds and wetlands
Ponds and wetlands collect, filter and infiltrate stormwater from roads, driveway, roofs and other hard surfaces. They use water runoff and provide aquatic plant and wildlife habitat. Ponds and wetlands are less well landscaped than bio-retention features, and are left more natural.

Storage, detention, filtration and infiltration of stormwater in ponds and wetland can provide good, clean water and flood protection benefit and has multiple sustainability indicators, such as reduced heat island, increased wildlife habitat and reduced energy use.

There is little demand for maintenance of ponds and wetlands, but very occasional dredging can be expensive. Scale is important and these practices are much more land intensive than other options.

Pollution prevention
Pollution prevention techniques including sediment and erosion control, good material and solid waste handling practices, street sweeping, appropriate use and storage of chemicals in construction, appropriate concrete washout procedures, among others, reduce environmental, water and air quality impact.

These practices are almost uniformly more effective than structural or treatment solutions. Additionally, they often cost little, or save money.

Acknowledgements

The City of Edina Engineering Department thanks the following for their work in developing the Living Streets Plan:

Edina City Council
Mayor James B. Hovland, past Member Joni Bennett, Member Mary Brindle, past Member Josh Sprague, Member Kevin Staunton, Member Bob Stewart, Member Ann Swenson

Transportation Commission
Katherine Bass, Emily Boettge, Surya Iyer, Jennifer Janovy, Tom LaForce, Rolf Loeffelholz, Paul Nelson, Larry Olson, Dawn Spanhake

Executive Leadership Team
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Living Streets Internal Advisory Group:
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Living Streets External Advisory Group:
Human Rights & Relations Commission member Arnie Bigbee, Planning Commission member Claudia Carr, Transportation Commission member Jennifer Janovy, Park Board member Ellen Jones, Arts & Culture Commission member Bill McCabe, Transportation Commission member Paul Nelson, Planning Commission member Mike Platteter, Energy & Environment Commission member Julie Risser, Energy & Environment Commission member Paul Thompson and Transportation Commission member Courtney Whited.

Sections of this plan were modeled after the Maplewood Living Streets Policy and the "Model Design Manual for Living Streets" from Los Angeles County.

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