REPORT / RECOMMENDATION

To: Planning Commission

From: Mark K. Nolan, AICP, Transportation Planner

Date: March 25, 2015

Subject: Draft Living Streets Plan

Action ☐
Discussion ☒
Information ☐

Action Requested:

Review draft Living Streets Plan and share feedback with staff.

Information / Background:

Please recall that the City Council passed the Living Streets Policy August, 2013. From September of that year until late 2014, monthly meetings have been held with the Living Streets Advisory Group (LSAG), made up of members of Edina's boards and commissions, and an internal team comprised of Edina staff members from various departments. In February 2015, staff held two public meetings to share the draft Plan and to obtain input. Approximately 50 members of the community attended and while there were concerns expressed regarding sidewalks, the loss of on-street parking, and larger traffic issues, overall opinions were positive.

With feedback from the internal team, LSAG, Planning Commission, Transportation Commission (ETC) and the public, staff has prepared the draft Living Streets (Implementation) Plan and is requesting feedback from the Planning Commission (the ETC provided feedback at its Mar. 19 meeting). The proposed next steps are to post the draft Plan to the website to solicit public comment, and to hold a public hearing with Council in April and to ask for their approval of the Final Living Streets Plan at that time. It is anticipated that the Living Streets Plan may be included by reference, or some components of it may appear, in the next update of the Comprehensive Plan.

Please note that Chapter 2 of the draft Plan is the Living Streets Policy. Over the course of drafting and obtaining feedback on implementation, staff has found it necessary to revise the format of the policy (e.g. to include more clearly-stated Living Streets principles) and to include additional content regarding implementation and context, etc. When the final Living Streets Plan is approved by Council, Chapter 2 will replace (essentially serving as an update to) the policy approved in 2013. Additionally, the attached Plan is in draft stage and has yet to be proofed and formatted into a finished document by the Communications Department. This will take place after the Planning Commission review.

Attachment:

Draft Living Streets Plan

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1. 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 City, 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. Residents in these neighborhoods tend to become isolated due to the lack of walkable streets.

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 better position Edina for the future.

Existing Roadway Network

History

Much of (formerly the Village of) Morningside and Country Club neighborhoods in northeast Edina were developed in early 1900s, with the area north of W. 50th St 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 of the street.

In the 1940s Edina saw infrastructure and development expansion south to 58th St, 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 where 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 had previously 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

Each year the City of Edina is responsible for maintaining 487 lane miles of roadway within its borders, which amounts to over 27 million square feet of pavement. The cost to maintain one square foot of pavement over a 60-year life span is estimated to be $5 to $9. Moreover, it is anticipated that the City will likely replace 120 lane miles over the next decade.

Safety

Assuring 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 resident requests 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. These numbers have both increased since the 2010 Quality of Life survey.

Pedestrians (especially children, the elderly 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 the water we drink.

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 of these surface waters is vital to groundwater resources, but compromised surface water quality can carry risk to the wellhead. Streets and their associated drainage systems are major conduits of these pollutants.

Table 1. Impaired water bodies in Edina

Water Body	Impairment	Stressor(s)
Lake Cornelia	Aquatic Recreation	Nutrient, Biological
Lake Edina	Aquatic Recreation	Nutrient, Biological
Nine Mile Creek	Aquatic Life	Biota, Chloride, Clarity
Minnehaha Creek	Aquatic Life and Aquatic Recreation	Biota, Chloride, Dissolved Oxygen, Bacteria

Water bodies of local and regional significance 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 programmatic pollution prevention measures such as street sweeping, neighborhood

clean-ups, illicit discharge detection and elimination monitoring, construction site erosion and sediment control, wellhead protection and others. These programmatic elements 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 1950's and 60's. This era of development generally included some local flood control pipe networks that were built in the same right-of-way corridors to drain roads and neighborhoods. This efficient network of drainage pipes has polluted and degraded the integrity of surface waters. This large cohort of infrastructure is now nearing its service life, and major maintenance and rehabilitation is underway 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 opportunistically bringing in new grant funding sources and strategically and cost effectively implementing new stormwater infrastructure.

UNDERSTANDING LIVING STREETS

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 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 surface, 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 include 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

The benefits of Living Streets include safety, public health and the environment, transportation choice, economic benefits and community identity. These benefits are defined further below.

Safety

Living Streets foster safe travel for everyone that 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, the elderly and disabled, those on bicycles) then our streets become more calm and safe for all. Living Streets also exhibit a vibrant mix of people and uses that result in streets that are active throughout the day. 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 the provision of integrated yet separate 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.

Tree-lined Living Streets have environmental benefits as they 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 chose not to drive. Transportation choice is particularly important for children, elderly, 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.

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 (as measured by Walkscore.com), home values 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.

Community Identity

Living Streets incorporate place-making features that facilitate social interaction, such as sidewalks, outdoor gathering places, street furniture, public art and more. Local residents are involved in the street design and planning process, using their priorities and needs to improve their streets and allowing them to reflect the unique character of their individual neighborhoods. Living Streets encourages residents to take pride in, and identify with, their streets and public spaces.

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

2. 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.

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

Seventeen principles guide implementation of the Living Streets Policy in the areas of all users and all modes, connectivity, context sensitivity, sustainability, and efficient service delivery. 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, elderly 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: Edina designs, operates, and maintains a transportation system that provides a highly connected network of Living Streets that accommodate all modes of travel;

Principle 4: Edina 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: Edina 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 reflect the existing 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 with 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 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 resilience of municipal public works.

Efficient Service Delivery

Principle 16: The City will build infrastructure with consideration for lifecycle costs and ease of maintenance and will meet or exceed applicable regulatory standards for their construction; and

Principle 17: The project delivery system used to reconstruct and maintain municipal public works will be continually improved to deliver core public services while maintaining a standard level of customer service and minimizing non-project overhead cost.

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 though 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.
- Though 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:

- Proactively and systematically engage City of Edina residents and project stakeholders to better inform project-level recommendations.
- Proactively inform City of Edina residents and project stakeholders about Living Streets and the range of services they help provide.
- Follow minimum design requirements and standards.
- Manage construction impacts.

Network

The creation of a 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 memorialized 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 and modification (in most cases) 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 connection to key traffic generators or destinations provide immediate benefit to all network users and is a top priority.
- Connections serving vulnerable users such as children, the elderly and the disabled are a top priority.
- Connections serving high volume uses such as schools, retail destinations or regional public transit are a top priority.

- The creation of a sub-network that is not immediately connected to the greater network, provides less immediate benefit, but may be desirable because a project vehicle is available to deliver the sub network in an efficient manner and is a moderate priority.
- The addition of "spurs" that raise the service level of a section of street and provide a comfortable connection for a small subset of pedestrians or bicyclists can provide network access to a limited group of users and are a lower priority.

Networks will be planned and constructed to provide a consistent service level:

- Networks will be made up of individual facilities or segments that share an initial plan of construction.
- Service level will be defined by the safety, ease and comfort of travel experienced by an average user and consideration will be given for the most vulnerable users.
- Road, bicycle and pedestrian facilities will be classified based on volume of users and facility type.
- Road, bicycle and pedestrian facilities often share the same right of way, and frequently cross or interconnect. Crossing and interconnection points will be managed to enhance user safety.
- To provide a consistent service level for varying volumes of users, a facility may vary along a network based on context.
- Networks with consistent service levels are preferred, but networks can be made of facilities with varying service levels if constrained by context.

Context

Contextual variety can either constrain or create opportunity in projects that provide or expand service. 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 the 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, and project recommendations will be developed with a transparent and defined level of public engagement. The public will have access to the decision process and decision makers via public meetings and direct correspondence, and will be provided the opportunity to give input throughout the process and 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, and will apply to the following facilities:

- Vehicular Facilities
  - County roadways
  - Municipal State-Aid (MSA) roadways
  - Local roadways
- Pedestrian Facilities
  - "Active Routes to School" Sidewalks
  - Sidewalks with boulevard
  - Sidewalks without boulevard
  - Multiuse trails
  - Pedestrian crossings
- Bicycle Facilities
  - Bike lanes (dedicated and advisory)

- Shared lane markings
- Shared signed
- Bicycle or shared use path

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 single street in the City will have walking and biking facilities. It does mean 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 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 indeed 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

SERVICE DEFINITION

Living Streets will function in a realm of other public services and public infrastructure. When stakeholders interact, conflicting individual, department or organizational missions can sometimes cause contradiction. In interpreting the Living Streets policy, network, individual project context, and design elements, the core and ancillary function should be viewed in context to overall core city services. The following lists some of the core and ancillary city services that influence, are influenced by, or are provided in part by Living Streets:

Transportation

- Accessibility for people
- Movement of goods and provision of services

Public Safety

- Fire safety
- Police protection
- Flood protection

Sanitation and Public Health

- Drainage
- Clean surface waters and related environmental services

Public Welfare

- Standards for, and management of construction

Orderly Land Use

- Zoning code and street setbacks

Public Parks, Places and Space

- Park and recreation facilities
- Right of way management

Non-core (tertiary) services enhanced by Living Streets include:

- Neighborhood Character
- Aesthetics

Living Streets represents an increasing service expectation for the core transportation service provided by the City of Edina.

3. NETWORK OF LIVING STREETS

INTRODUCTION

The creation of a network of local streets, pedestrian and bicycle facilities 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 quality of life.

The Living Streets Plan will define a classification of Living Streets that builds off and complements the current functional classification of roadways described in the Comprehensive Plan. Transportation and mobility services are delivered in large part by these physical infrastructures with each 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 classification of the City's streets based not only on their function, but also on the character of the street and 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.

Current Functional Classification

The functional street classification system 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 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. They allow access to individual homes, shops and similar traffic destinations. While through traffic is discouraged on local streets, a new street classification called the Local Connector is introduced below as part of the Living Streets Plan that may accommodate local through traffic.

- *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. Examples include West 70th Street and Wooddale Avenue.
- *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 (exceptions to this include minor arterials such as France Avenue, which includes sections with residential access). Minor arterials should connect to principal arterials, or other minor arterials, and collector streets. Examples include France Avenue and West 50th Street.
- *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 connect only with other Interstate freeways, other principal arterials, and select minor arterials and collectors. Examples include Trunk Highways 100, 169 and 62, and Interstate Highway 494. Principal arterials are not within the maintenance jurisdiction of the City, and as such will not be included in this Living Streets Plan.

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.

In terms of current functional classification, this Living Streets Plan would apply 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.

DRAFT

City of Edina
Classification of Living Streets

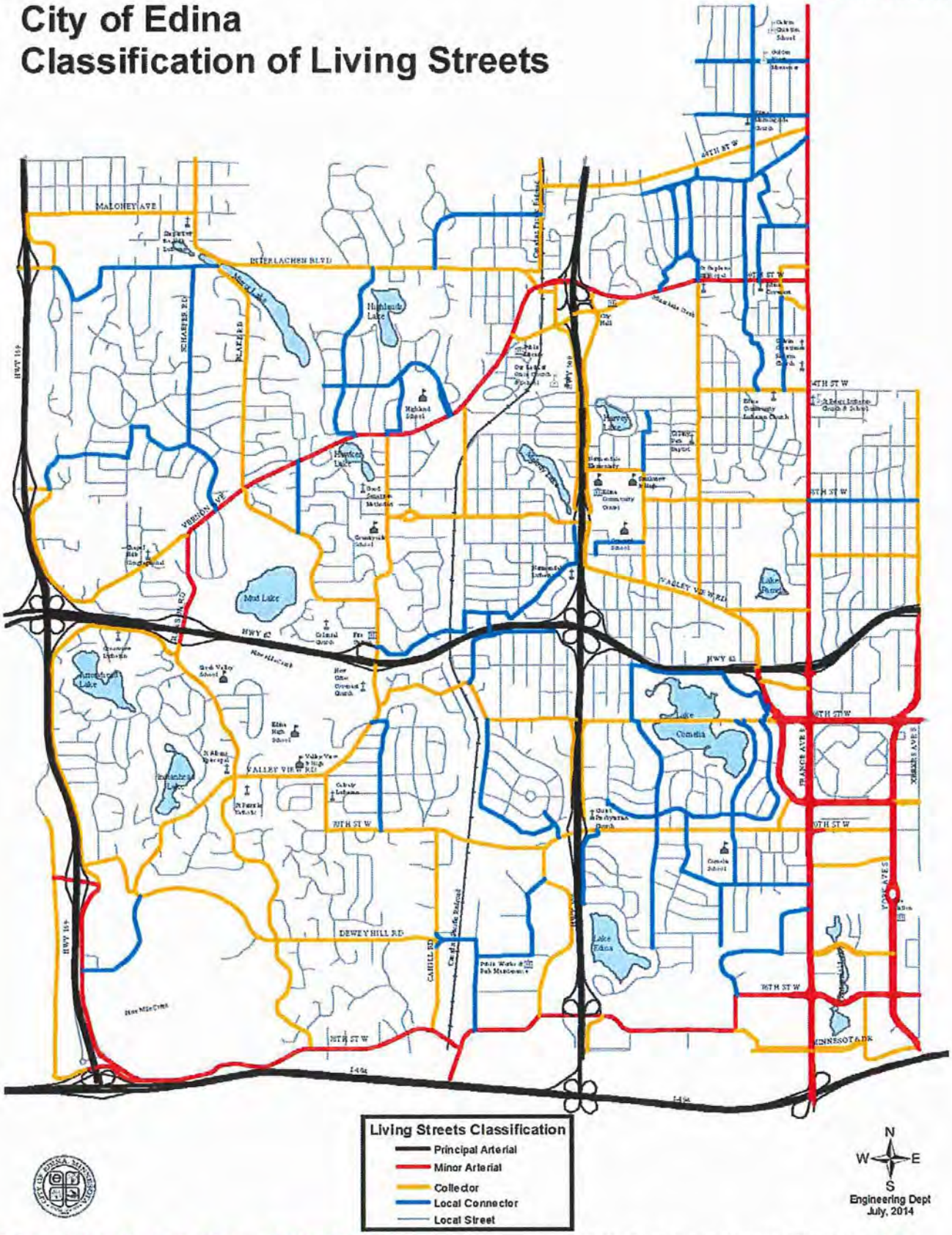


Figure 3.1. Edina Living Streets Classification Map

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 classifications of Living Streets. The following is a brief discussion of each classification of Living Street, 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.

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 <u>optional</u> sidewalk.

Table 3.1. Edina Living Streets: Street Classification

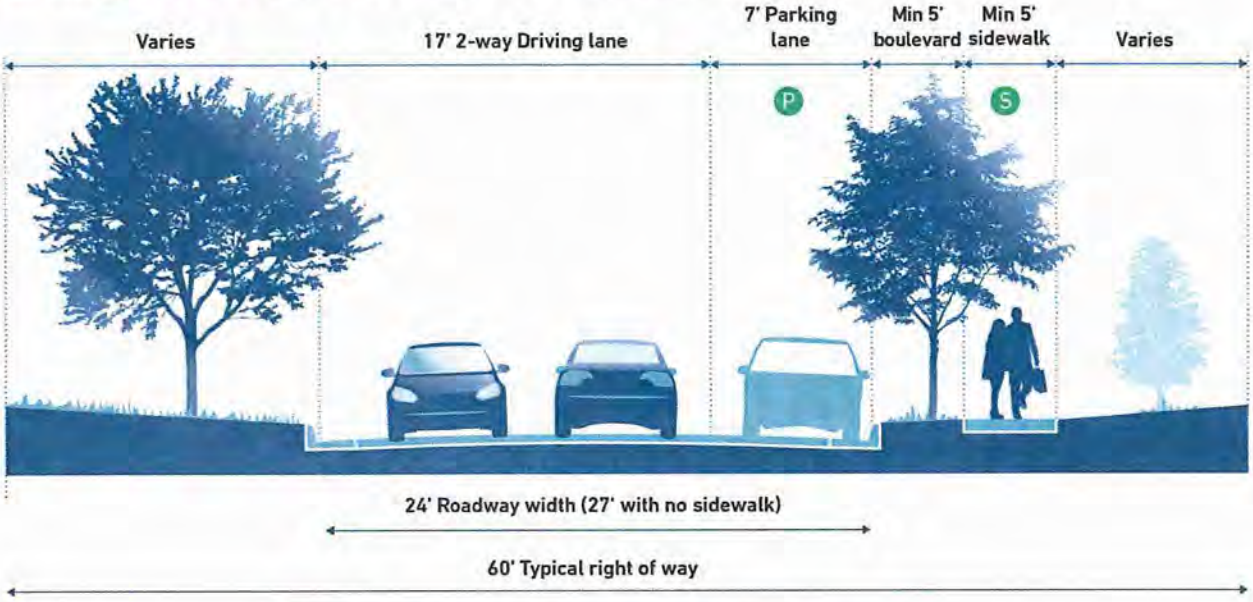
Local Street

For the purposes of the Living Streets Plan, Local Streets are those with a Local Street functional classification as defined in the Comprehensive Plan. 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 Street Classification



P Parking: None, one or both sides of the street, depending on context

S Sidewalk required on local streets when certain criteria are met.

See Pedestrian Facilities in Chapter 4

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:

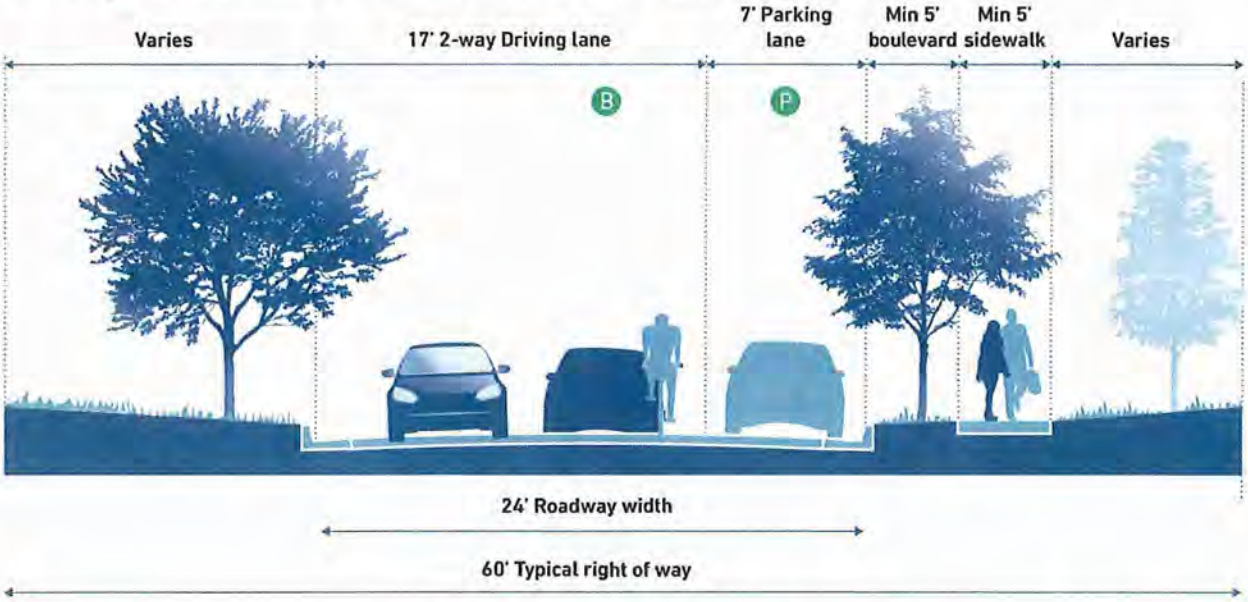
- Average daily traffic (ADT) of at least 1,000 vehicles
- Serves as a connection between neighborhoods, destinations and higher-level roadways.

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 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 on one side of the street at minimum, on both sides as determined by context. See Pedestrian Facilities chapter for more information.

Living Streets: Local Connector Classification



P Parking: None, one or both sides of the street, depending on context

B If an approved bike route, shared bicycle facilities are recommended

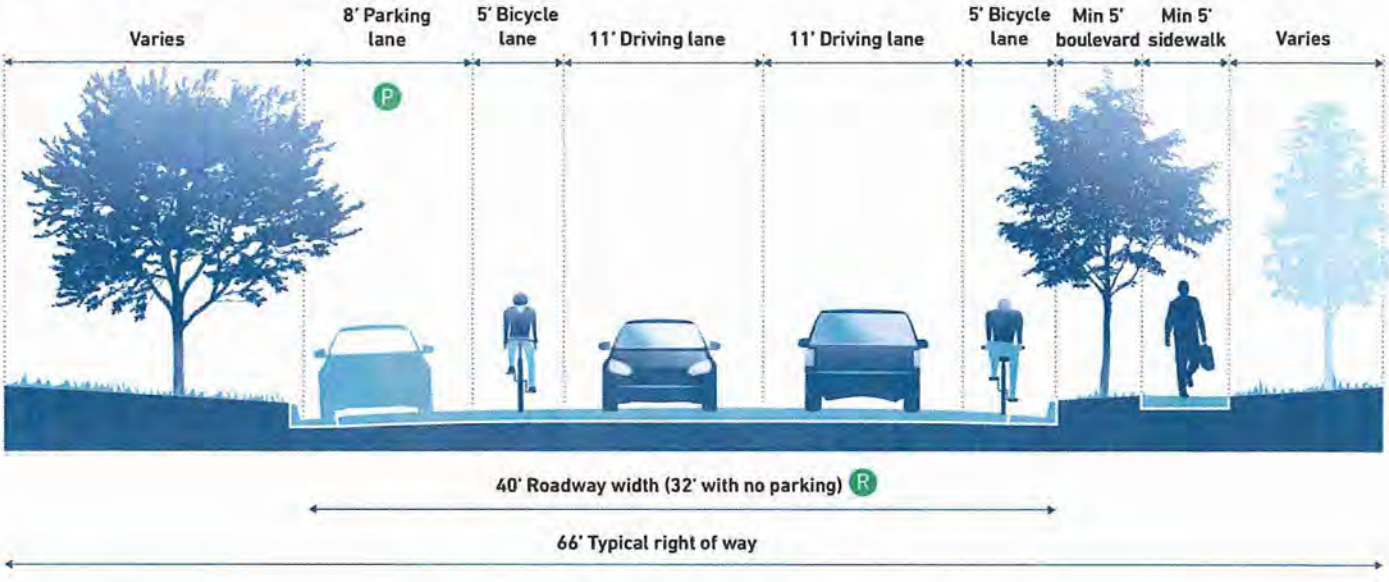
Collector Street

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 below), 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):

- *Street Width*: 32 feet to 52 feet, depending on context and facilities included (see below).
- *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: Collector Street Classification



P Parking: None, one or both sides of the street, depending on context
R Roadway width may increase due to additional turn lane

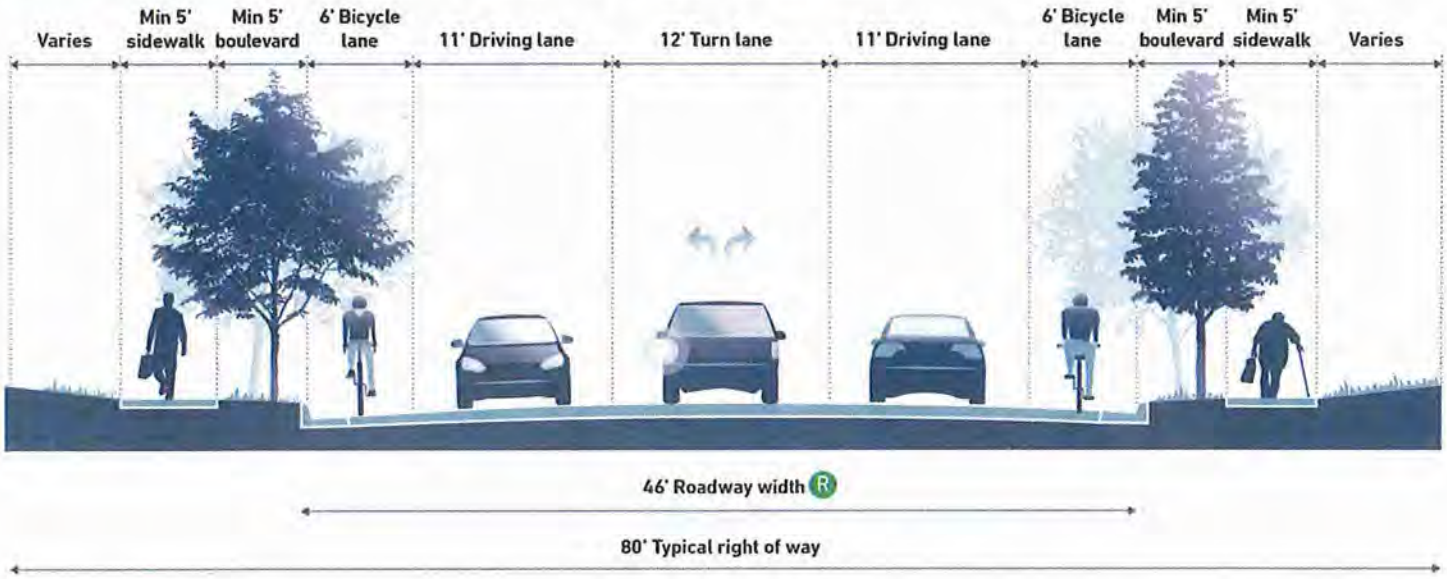
Minor Arterial

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):

- *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.

Living Streets: Minor Arterial Classification



P Parking: None, one or both sides of the street, depending on context

R Roadway width may increase due to additional parking, driving and/or turn lanes

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.

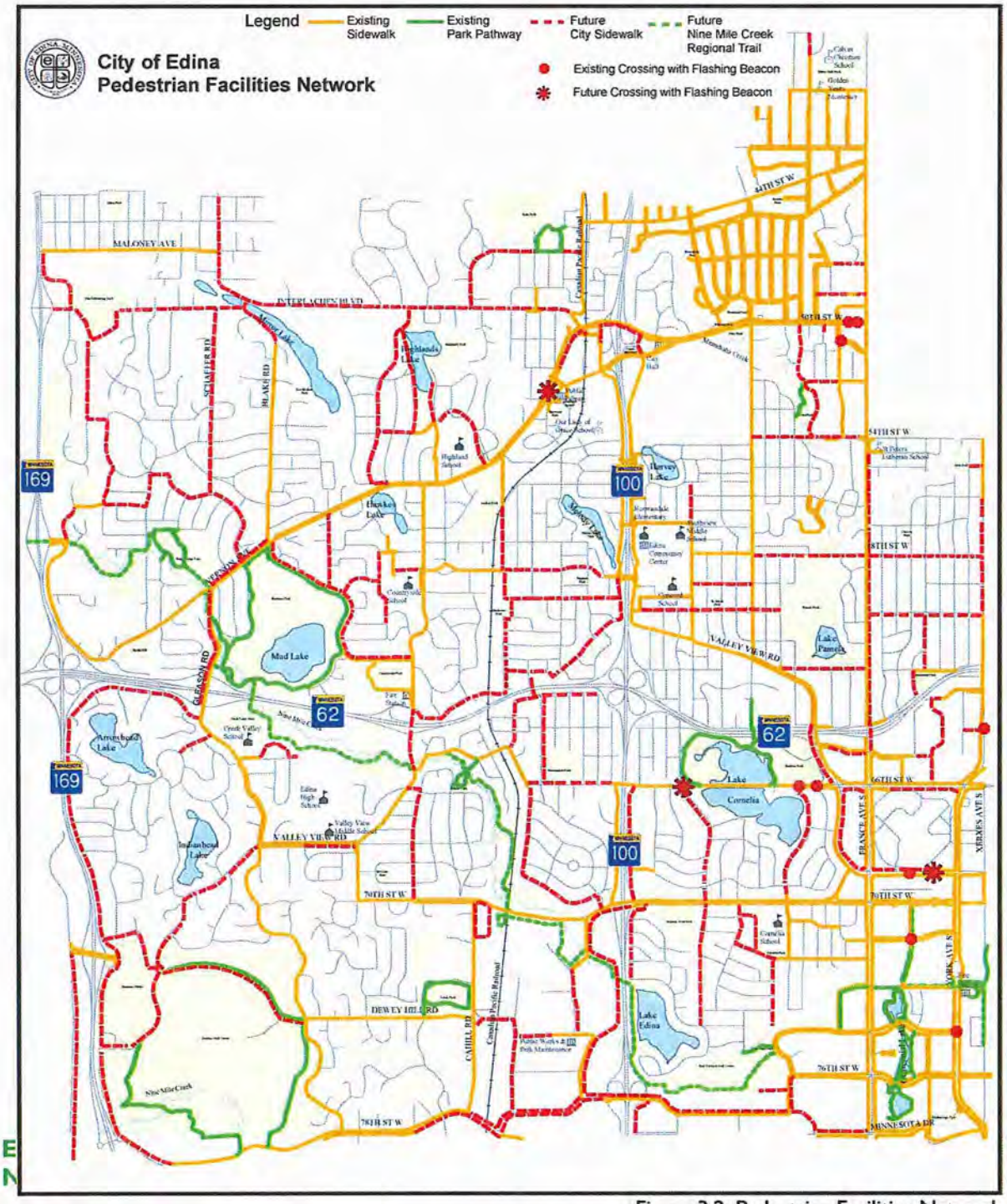


Figure 3.2. Pedestrian Facilities Network

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.

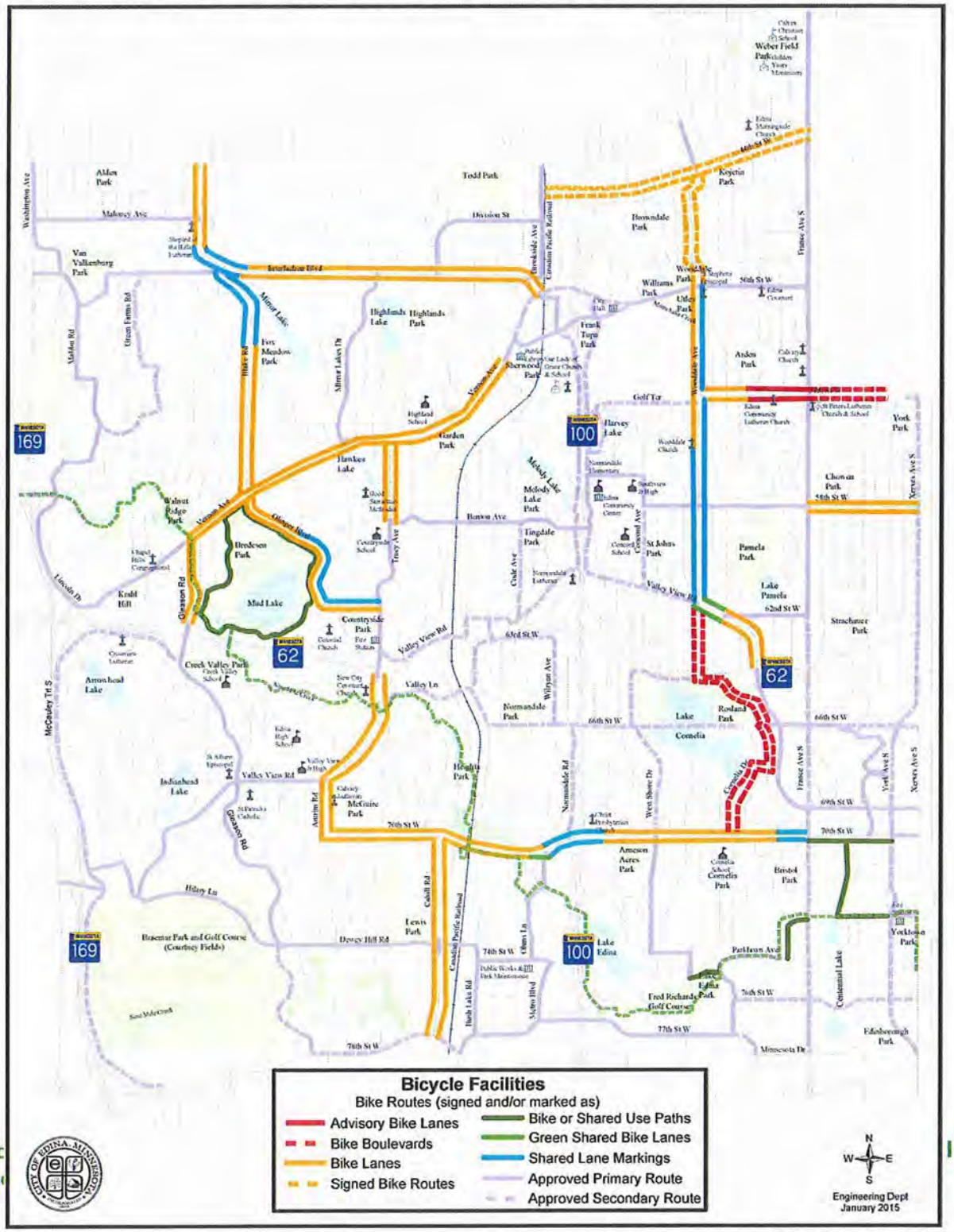


Figure 3.3. Bicycle Facilities Network

STORMWATER MANAGEMENT AND SUSTAINABLE INFRASTRUCTURE

Stormwater Management

A key understanding in the planning for living streets is to understand 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" (or 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 takes place in Comprehensive Water Resources Management Plan (CWRMP) dated December 2011 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 Comprehensive Plan Chapter 10. 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 projects 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 citizen volunteers on the Energy and Environment Commission.

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4. CONTEXT AND PRIORITIZATION

INTRODUCTION

A variety of context either constrains or creates opportunity to provide or expand service. The following are context that will be considered and 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 amended to the 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.

Parks

Not unlike connections to and from schools, it is important to assure 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 and 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 equally.

DEMOGRAPHICS AND NEIGHBORHOOD

In addition to the wide variety of users who access the City's transportation networks (automobile, bicyclist, and pedestrian counts may reveal a prevalent user type), 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, the elderly and disabled, community assets (e.g. parks and public facilities) and neighborhood character and aesthetic.

Children and Schools

Edina has six 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, the elderly and 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 and other parts of the city. 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, the elderly, 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 be proud of their streets, and the streets whenever possible should reflect the neighborhoods that they serve.

NATURAL RESOURCES

Natural resources provide either an opportunity for recreation and enjoyment and a 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 Park, Rosland Park, Pamela Park, Bredesen Park, provide additional park destinations were pedestrian travel and leisure intentionally encounter and 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 amphibian. 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 enhance 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, and for clean water include removal of sediment measured in tons and phosphorus measured in pounds.

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)

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 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 will vary by priority watershed, and practice, and the placement of individual practices. 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 actual safety issue. Safety will be a high priority and can be achieved through a variety of design tools each with varying cost and certainty.

- Realignment of intersections and horizontal and vertical curvature of roadway can be expensive but lasting improvement.
- Sight line issues can be corrected by reshaping of land, removal of trees or vegetation and 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, planting boulevard trees, among others.

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, 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, or 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 were predicted to increase more than 30%. 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 design process 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, 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, sidewalk, 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 MN 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, where 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 ordinance on 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 pay for 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, stormwater improvements and the like. 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 funding sources and funding for new capital improvements often compete for the same pool of funding, and after initial construction of an individual asset there is often a period of years or decades where 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 1950's and 60'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.

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 costs 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 implementation will vary by project type, based on the opportunity presented to cost effectively implement Living Streets. 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, etc.).

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 (see Funding Sources above for a summary of project types) 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, 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.

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5. 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 identify with. 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 you live on or near a street, use a street to walk, bike or drive, manage construction, operate public or private utilities, or own a business that relies on a street, you hold a stake in the function and service a street delivers. You are 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, 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.

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 space of a project cannot be defined without the help of the public.

Benefits of engagement :

- Effective community engagement is critical to increase the livability of the public realm and 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 in order to better define context and influence design.
- 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 process and decision makers and will be provided the opportunity to give input throughout the process and 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.

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: Kick-off 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: Construction starts
- October/November: Construction finishes
- 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, in-person, written (both on paper and electronic) and on-line communications.

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 question-and answers 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.

Council Decision / Public Hearing

City Council Public Hearing. This is when the Engineering Report for a vehicular, pedestrian or bicycle project is presented to City Council for their 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. 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/Commission meetings

- "Speak Up, Edina!" online discussion forums
- Biannual Quality of Life Survey
- Contact City staff and officials directly
- Petitions

6. 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 Engineer; 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 pavement width shall be 27 feet to accommodate pedestrians walking on the street.

Bicycle Lanes
- The preferred width for bicycle lanes is 6 feet in areas with high volumes of bicyclists and in areas of high parking turnover.
- Bicycle lanes 4 feet in width may be considreed on local or connector streets when not adjacent to on-street parking or at constrained intersections.

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 are measured to the curb face instead of the edge of the gutter pan or pavement.

Width

Lane width is determined by context; however, unnecessarily wide lanes should be avoided unless County or State regulations dictate otherwise (e.g. 11' travel lane widths are recommended for Collector Streets). 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:

Figure 6.2. Wooddale Avenue parking lane

- Living Street functional 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

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. When a street is reconstructed, parking should be limited to one side of the street and pavement width reduced accordingly (or converted 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 to users 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).

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.

Figure 6.3. Sidewalk in the Country Club neighborhood

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- 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 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 makes 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 minimum 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 providing space for snow storage (Figure 6.4). Minimum planted boulevard widths may be two feet (see following paragraph).

Figure 6.4. 5-foot sidewalk with planted boulevard

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).

Pedestrian Crossings

The safety of all street users, particularly more vulnerable groups such as children, the elderly 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.

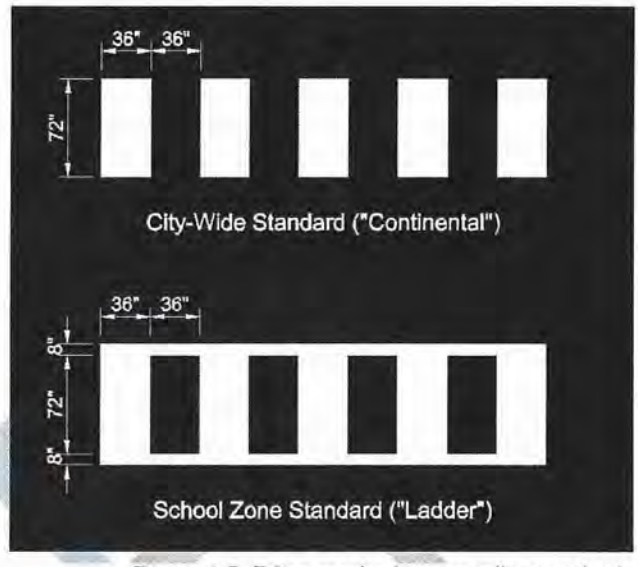

Figure 6.5. Edina marked crosswalks standards

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 x 72-inch long painted blocks, spaced at 36-inch intervals

Figure 6.7. Curb extension with crosswalk

- 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 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.

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

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 into Living Streets projects. 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

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

may be easier to obtain (Figure 6.9). Street furniture such as benches, bus shelters, trash receptacles, etc. not only provides the opportunity for a neighborhood to express its identity, but also for pedestrians to rest or otherwise site and enjoy their surroundings. Street furniture and public art should be interesting for pedestrians, provide a secure environment, should be well lit, and have adequate sightlines.

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.

Figure 6.10. Bike lane on Tracy Avenue

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.

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.

Figure 6.12. Bike Boulevard on Cornelia Drive

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 are designated with pavement markings that include a large bicycle symbol with the text "BLVD" (Figure 6.12). The markings are not intended to guide the bicyclists.

Shared Lane Markings

Shared lane markings or "sharrows" (derived from "shared" and "arrows") 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).

Figure 6.13. Shared lane markings or "sharrows"

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.

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.

Figure 6.14. 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).

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, and may be paved, gravel or dirt (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."

Figure 6.15. Example of a paved shoulder

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.
- 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.

Figure 6.17. Buffered bike lane

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).

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.

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 6.18. Protected bike lane

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.

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

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.

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

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 6.21. Green colored pavement highlighting a "conflict area" at W. 70th Street and Metro Boulevard

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

TRAFFIC CALMING

The primary goal of traffic calming is to slow motorists to a desired speed by using design in a context-sensitive manner while working with stakeholders. Traffic calming is acceptable and encouraged on all street classifications, and when utilized effectively can physically encourage motorists to drive at the desired speed.

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 6.24. Roadway before 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 typically are at locations with fewer than 15,000 vehicles per day.

Figure 6.23. Roadway after road diet

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).

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

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

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 allocate 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 W. 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.

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.

Figure 6.27. Brick crosswalk in the Country Club neighborhood

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

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	🟢	🟢	🟡	
Speed tables	🟡	🟡		

Legend:		
	🟢	Appropriate
	🟡	Appropriate in specific circumstances
		Not Appropriate

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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 District 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.

Streetscape Toolbox	Flood Protection Impact	Clean Water Impact	Sustainability Indicators
Impervious cover reduction	High	Medium	Reduced materials and energy, reduce heat island effect,
Soil / Turf / Trees	Medium	Low	Reduce heat island effect, wildlife habitat, reduce energy, noise reduction
Bio-retention / Rain Gardens	Medium	Medium	Reduce heat island effect, provide wildlife habitat, reduce energy, increase maintenance burden
Pervious Pavements	Medium	Medium	Reduce heat island effect, increase material energy and maintenance burden, reduce land used
Underground Sediment / Infiltration	Low	Medium	Reduce land used, increase material, energy and maintenance burden
Swales and Filters	Low	Medium	Provide wildlife habitat, reduce heat island effect,
Natural area creation, protection, restoration	High	High	Increase wildlife habitat, increase species diversity, project soil from erosion, reduce maintenance burden emissions.
Ponds and wetlands	High	Medium	Increase wildlife habitat, increase 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,

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.

Reduction of impervious surface is desirable because: it reduces the urban heat island effect, can cool neighborhoods and reduce associated cooling energy use, and it 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

Impact of street and utilities reconstruction can cause impact to 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 can provide habitat benefit, reduce net embodied energy, increase habitat for wildlife, reduce the heat island effect and associated cooling energy use and reduces 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.

Bio-retention and rain gardens

Rain gardens collect, filter and infiltrate stormwater from roads, driveway, roofs and other hard surfaces. 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, increase 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 citywide 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 removal.

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 allow water to soak though and store in the gaps between foundation-aggregate and there ii 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.

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.

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, increase 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, and can cool neighborhoods and reduce associated cooling energy use and they reduces total stormwater runoff volume and associated nutrients and pollutants into lakes and wetlands and provide ample wildlife habitat.

Conservation or 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 as 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, increase wildlife habitat, and reduced energy use.

There is little demand for maintenance of ponds and wetlands, but very occasional dredging can be large costs. Scale is important, 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.

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