TRAVERSE CITY STREET DESIGN MANUAL

2018

ACKNOWLEDGEMENTS

CITY OF TRAVERSE CITY

The following City departments have been involved in developing this street design manual and related resources, and are critical partners in the design, maintenance, and operation of City streets.

- Mayor, Jim Carruthers
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- Fire Department
- Planning Department, Russell A. Soyring, AICP
- Police Department
- Traverse City Light and Power

CONSULTANT TEAM

MKSK

- Brad Strader, Principal, PTP, AICP
- Lauren Cardoni, Planner

EXISTING RESOURCES

The following are existing City of Traverse City documents that were used as a foundation for this design manual.

- Traverse City Complete Streets Resolution
- Traverse City Traffic Calming Policy
- Traverse City Stops for Pedestrians Local Ordinance
- Traverse City Portable In-Street Pedestrians Signs Policy
- Traverse City Infrastructure Policy
- Traverse City Stormwater Management Report
- Traverse City Public Participation Strategy
- Traverse City Master Plan
- Traverse City Corridors Master Plan

REFERENCE MATERIAL

The following are national guidelines and standards that were used as a reference in developing this design manual.

- National Association of City Transportation Officials (NACTO) Urban Street Design Guide
- NACTO Urban Bikeway Design Guide
- NACTO Designing for All Ages & Abilities
- NACTO Transit Street Design Guide
- NACTO Urban Street Stormwater Guide
- Federal Highway Administration (FHWA) Separated Bike Lane Planning and Design
- American Association of State Highway and Transportation Officials (AASHTO) Policy on Geometric Design of Highways and Streets
- ITE Designing Walkable Urban Thoroughfares: A Context Sensitive Approach
- MDOT complete sheets, M2D2 (Multi-Modal Design and Delivery) and other policies and relevant design manuals.

CONTENTS

INTRODUCTION WHY A STREET DESIGN MANUAL?

INTENT OF DOCUMENT

This manual is intended to provide a comprehensive toolkit for the creation of safe, pleasant, efficient, and high quality streets in Traverse City. The materials in this manual provide policy and design guidance for the City, other agencies, consultants, private developers, and community residents on the planning and design of streets within Traverse City.

Street design is a complex task, and must respond to varying contexts and conditions. While this manual provides overall guidance, decisions in specific situations will require flexibility and may need to be adjusted based on engineering judgement. Additionally, these guidelines will need to evolve over time as conditions change, new design techniques emerge, and national guidelines are updated.

VISION AND GOALS

Traverse City has established a vision of building a community that is designed for healthy, active living through the provision and promotion of safe, inviting, efficient, and inclusive access to public and private attractions regardless of age, physical ability, or choice of transportation.

This vision influences the decisions that are made regarding planning and design of public spaces, including streets. The Traverse City Street Design Manual integrates this vision with City standards and policies for street design and reconstruction projects, and is driven by the following four goals.

1. CONNECT NEIGHBORHOODS

Ensuring that neighborhoods are connected to schools, activity centers, recreational facilities, and other destinations via all modes of transportation helps to establish safer, more accessible, and more livable communities. Providing opportunities for people to walk or bike also helps to build healthier communities and reduce the number of vehicle trips.

2. FILL IN THE GAPS

It is important to think about the city's transportation system as a network. If there are gaps in the network, such as a missing bike lane or sidewalk or even a dead-end street, it is much less convenient to get around. Filling in the gaps between existing facilities is key to providing safe and convenient connections.

3. PROMOTE TRANSPORTATION CHOICES

Access to multiple transportation options that are equally safe and convenient provides community residents with choices. This is important for community vitality and environmental health, and requires investment in all modes of transportation to achieve an appropriate balance.

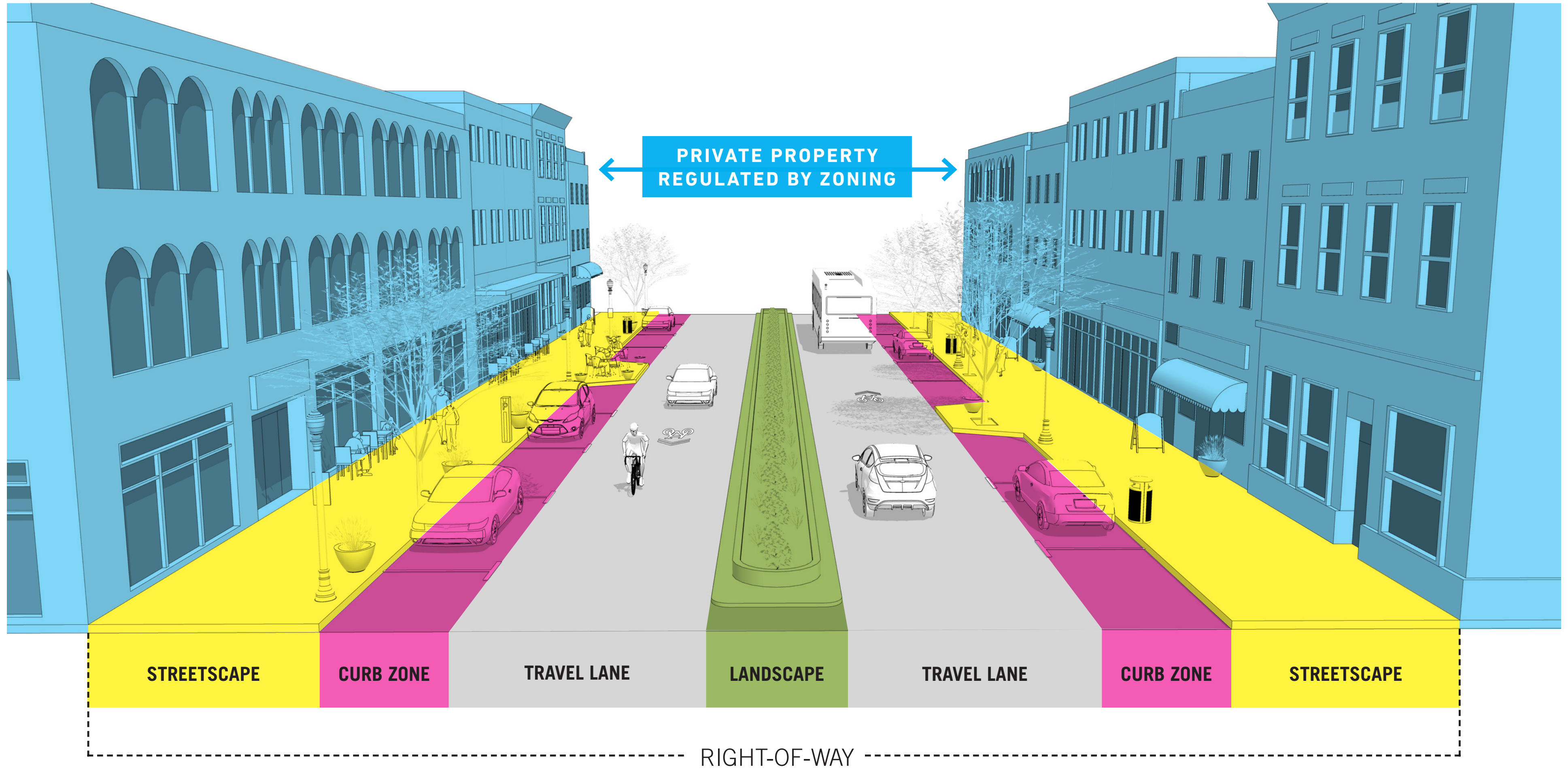
4. STRENGTHEN COOPERATION

A process for effectively engaging communities in discussions about street design can help to foster a more collaborative and cohesive relationship between the City, community residents, and neighboring communities. These interactions provide opportunities to better understand key factors for a particular area or street that can result in more effective design solutions.

5. COLLABORATION WITH OTHER TRANSPORTATION AGENCIES

This manual is intended to help promote communication and work with the Bay Area Transportation Authority (BATA) on future transit projects and the Michigan Department of Transportation (MDOT) regarding any future highway improvement projects.

DESIGN PROCESS HOW DOES THIS WORK?



APPLICATION

This street design manual provides guidelines for how the public right-of-way, or the space between building faces (or private property lines) should be designed. This space includes the street from curb to curb, but also the space above the curb which often includes sidewalks and streetscape. It can also sometimes include space beyond the private property lines that is integrated with the public space of the street.

STEPS IN THE PROCESS

While the process for each project may vary depending upon the extent of the work and requirements of funding sources, a typical process for street design projects includes the five steps illustrated here. Each of these five steps in the process are described on the following pages.

Street design projects that go through this process include any work conducted within the right-of-way of the street, including but not limited to sidewalks, streetscapes, lighting, stormwater infrastructure, bike facilities, transit stops, traffic signals, and vehicular travel lanes.

01 PROJECT IDENTIFICATION
Projects are initiated and potential funding sources are identified

02 PUBLIC ENGAGEMENT
Notification and engagement with the community begins

03 DESIGN REVIEW AND TESTING
Preliminary designs are drafted, reviewed, costs estimated, and adjusted

04 FINAL DESIGN AND BID
Final design is approved and sent out to bid

05 CONSTRUCTION
Street closure, detours, noise, dust!

06 PERFORMANCE MONITORING
Results and impacts of the project are measured

CAPITAL IMPROVEMENT PROJECTS

HOW ARE THEY IDENTIFIED?

THE PROGRAM

The Capital Improvement Program (CIP) includes a range of projects, such as: buildings, parks, major underground utility projects, sidewalks, bikeway, trail, streets, and other major physical projects. The selection process helps improve coordination, so that replacement of water or sewer lines is done in conjunction with a street construction project. The 6-year CIP is approved annually by the Planning Commission, with a focus on projects for the upcoming year.

More information about the Traverse City Capital Improvement Program can be found online at:

www.traversecitymi.gov/capitalimprove.asp

THE SELECTION PROCESS

Selection and priorities for street and right-of-way projects for the CIP are determined based on factors such as:

- Physical condition of the street, sidewalks, and streetscape.
- Potential to coordinate capital improvements in the same project area.
- Locations with relatively higher crash rates.
- Location such as proximity to a school, park or major employer, and critical public services.
- Recommendations in adopted City Plans and Policies.
- Input from city staff and the Community.
- Project cost vs. funding available.
- Opportunity to share costs with another organization.

STEP 1: PROJECT IDENTIFICATION

Street design projects can be initiated through a series of paths: general maintenance or operational needs; private development projects; Special Improvement District Projects; the City's Capital Improvement Plan; or MDOT or Grand Traverse County Road Commission projects.

General maintenance and operations projects, such as street resurfacing or signalization changes, are typically limited in scale and have small budgets – these types of projects do not typically require public engagement, and move right into the Design Review & Testing phase. However, if the project will significantly alter the function or character of the street, a public engagement process may be utilized.

Private development projects can include a variety of projects, such as private site construction that impacts the public right-of-way. Generally, private development must comply with the street design guidelines.

Special Improvement District (SID) Projects are projects within the right-of-way that are requested and partially funded by the adjacent property owners. Any improvement within the right-of-way may be proposed, but must be approved by the City Commission and follow the Special Improvement District (SID) process[1].

Due to the funding commitment provided by adjacent property owners, approved SID projects are considered higher priority projects for the use of city funds.

City capital projects that go through the street design process are first identified in the City's annual Capital Improvement Program (CIP). These types of projects typically involve the most extensive change to the street or right-of-way. Capital projects could involve removal or addition of parking, significant changes to streetscape, or significant changes in the overall design of the street, such as changing the number of travel lanes. These projects typically include public engagement, and must go through each step in the street design process. However, the extent to which the project has had previous community input through a planning process is also a consideration.

The Project Identification phase is also when potential funding sources for a project are identified and initial design components and concepts are discussed.

County Road and State Highway projects are managed, and implemented by the Grand Traverse County Road Commission or the Michigan Department of Transportation.

Projects on MDOT's highways US 31, M-72 and M-37 that travel through the City's jurisdiction will follow MDOT's Context Sensitive Solutions Policy and the State's Complete Streets Policy. MDOT's Context Sensitive Solutions provides design flexibility that involves a collaborative, interdisciplinary approach to balance safety and mobility needs with community values and road context. Included in this process is effective decision making that balances stakeholder desires with the need for safe transportation systems and the overall public good.

1 www.traversecitymi.gov/downloads/steps_for_sid.pdf

STEP 2: PUBLIC ENGAGEMENT

The extent of public engagement required for a street design project depends upon the scope of the project and level of previous engagement efforts. This could include:

- Notification to affected property and business owners of an upcoming project (not necessarily for input);
- Engagement with key community and neighborhood groups or community leaders to coordinate on a project for a particular community;
- Full public involvement with public meetings to develop project vision, design concepts, and final design alternatives.

When public engagement is required for a project, the Planning Department mails letters to affected residents and property owners, providing information and when appropriate, inviting input on the project. The Planning Department is also responsible for gathering all public comments and sharing the information with the Engineering and Streets Departments to consider in their design review.

For projects with more involved public engagement, additional effort should be made to reach the community, including online outreach methods and in-person public workshops, to gather the most input possible. The Engineering and Streets Departments should be involved in the process so the feedback and designs can be discussed in real-time.

STEP 3: DESIGN REVIEW & TESTING

After the initial design components and/or concepts have been developed, and public input has been received, the City Engineer/Consultants review comments and move the concept into a more detailed design phase. All projects must meet accepted engineering design principles, but there is design flexibility in some situations. During this step, costs are estimated to compare to any previous budgeted amounts.

The Planning Commission reviews preliminary designs to determine consistency with the Traverse City Master Plan and other official City plans/policies in terms of location, character, and extent. The designs should also be reviewed for compliance with the street design guidelines. If a project design is found to be inconsistent with any adopted documents/plans, the project moves back to the City Engineer/Consultants for additional adjustments.

The City Commission can overrule the Planning Commission's decision with a 2/3 majority vote.

There may be certain projects where a design alternative may be implemented on a temporary basis to assess the operations before a project is fully designed or permanently constructed. This type of temporary demonstration or pilot project is described on the previous page.

PILOT PROJECTS

Cities across the country are experimenting with temporary demonstrations and pilot project installations to test new designs in their streets and public spaces. These methods have been found to speed up the typical process for street design projects, while helping cities to understand the benefits as well as potential consequences of their designs. They also serve as an effective tool for public outreach.

Temporary Curb Extension at Monroe and Bay Intersection

The temporary nature of these types of projects allows cities to test new design ideas without the costs and burden of a full construction project. If the design works as intended, the project can then move forward into full design and more permanent construction with the confidence that it will be worth the investment. If the design does not work as intended, the temporary materials can be removed and the street can go back to its previous state with minimal cost and effort.

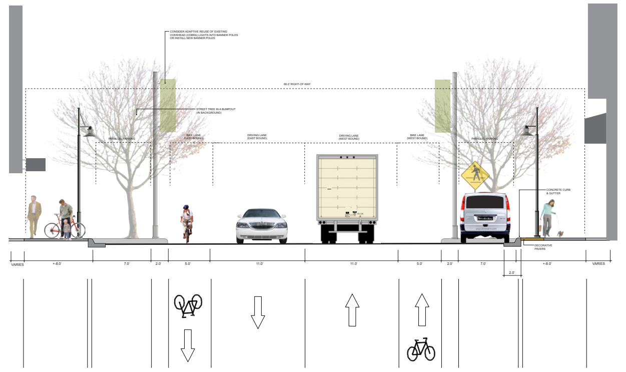
These interim design strategies may not be the best solution for every space, and should still involve a stakeholder and community engagement process. The process should include clear communication about the objectives as well as the duration of the installation. A methodology should also be developed for how the project impacts will be measured and evaluated while the installation is in place.

Types of Near-Term Project Applications from Quick Builds for Better Streets - *Source: Peopleforbikes.org*

STEP 4: FINAL DESIGN & BID

After the preliminary design is reviewed and approved, the City Engineer/Consultants develop the final project design and engineering plans. These final designs include the details needed for construction such as materials, dimensions, signage, lighting, any changes to underground and overhead utilities, and design amenities.

The project is then sent out to receive competitive bids for construction. A recommendation is made to the City Commission for a contractor, and the Commission awards the contract for construction.



Example of a Conceptual Design, Pre-Engineering

STEP 5: CONSTRUCTION

During this phase the project is constructed. For larger projects, the city may provide information to the residents or businesses impacted. A construction management plan may be needed such as signs, storage of equipment, detour routes and monitoring to control dust and stormwater runoff.

STEP 6: PERFORMANCE MONITORING

Performance monitoring is a key phase of street design projects that alter the function of the street. Collecting data on the usage of the street before and after the project is implemented can help to assess the impact and benefits of the design. Because resources for conducting this data collection can be limited, it is critical to set up a consistent system for collecting, managing, and analyzing data.

Metrics for evaluating a project should be determined during the initial phase of project identification, when considering the components and conceptual design. They should relate to the overall goals of the project and specific desire outcomes. Metrics should be qualitative and quantitative, and the methods for measurement should be clearly defined.

Baseline data should be collected prior to project implementation for a specified period of time, and during a time of year where usage of the existing facility is at a typical level. A similar period of time for data collection post-implementation should also be defined.

STREET TYPES WHAT DOES IT MEAN?

STREET CLASSIFICATION

This design manual outlines the overall city street design requirements for Traverse City streets and describes street functionality by the type of street in order to best meet the needs of current and future development in the city.

Traditional street classifications are based on the Federal Functional Class system that categorizes streets as “arterial,” “collector,” and “local.” These classifications are primarily based on traffic conditions and operational characteristics.

While Traverse City streets may functional like traditional streets, their history, location, context, use, and purpose vary from the traditional model. To better accommodate these differences and design streets that will better serve the residents of Traverse City, a new system of street typologies was created.

NEW STREET TYPES

The new system of city street typologies created for Traverse City is illustrated in the map on the following page and includes the street types listed below:

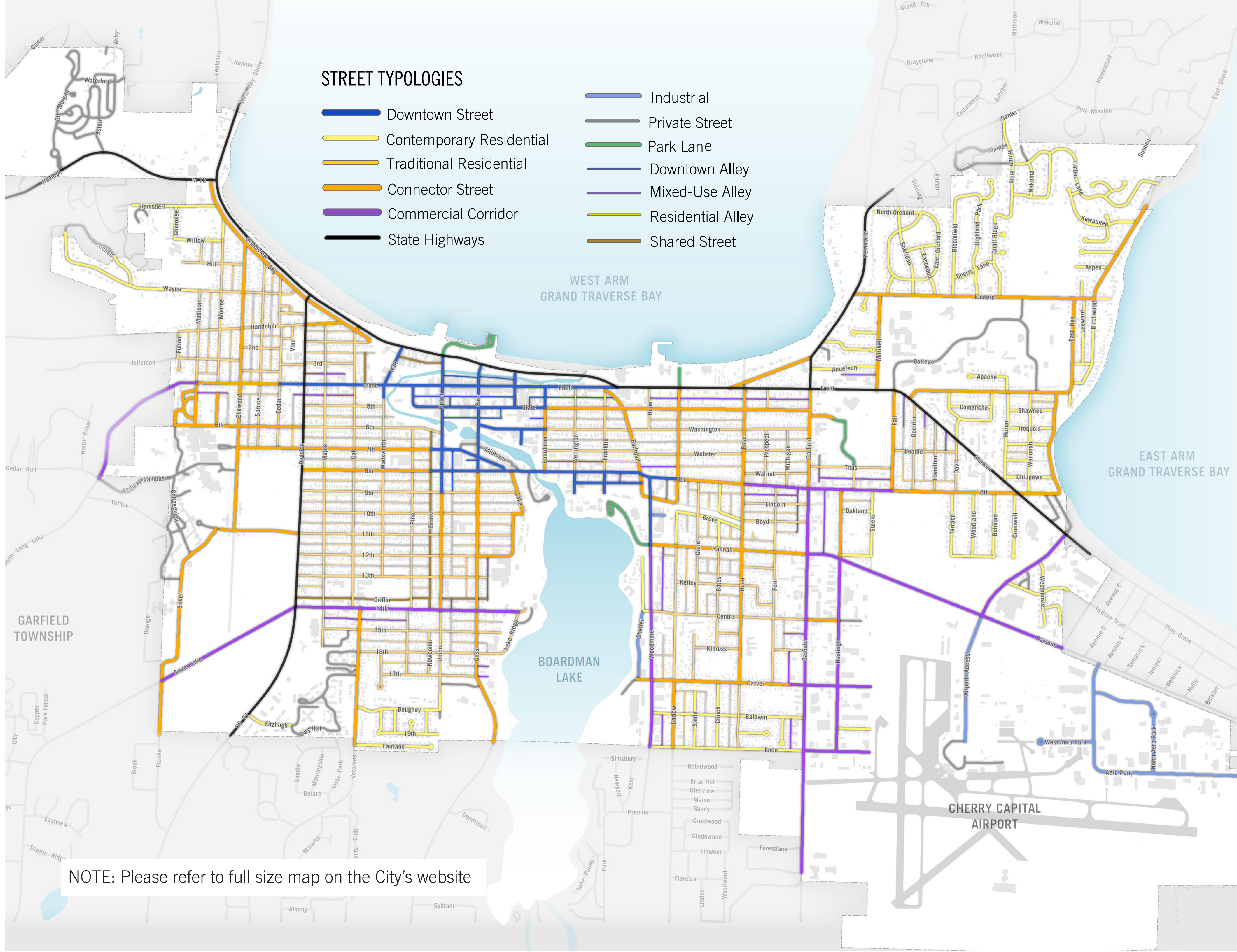
- Downtown Street
- Commercial Corridor
- Connector Street
- Traditional Residential
- Contemporary Residential
- Park Lane
- Private Street
- Industrial
- Alleys
- Shared Street

These new city street types are described in further detail on the following pages, including their associated contexts, functions, and desired composition. The illustrations that accompany each street type are representative of those elements that make up the specific typology, and include approximate ranges for appropriate dimensions of relevant street design features. These dimensions represent the preferred standards for those design features, but may not be feasible in all situations. Engineering judgement may be required to adjust design dimensions to fit within the constraints of existing street conditions. Typically street rights-of-way are 66 feet wide. The right-of-way typically includes travel lanes, sidewalks, street trees and public utilities. Alley rights-of-way are 33 feet wide.

STATE HIGHWAYS

State Highways are designed, managed, and maintained by MDOT and are subject to Federal and State highway design standards.

The State and Federal highways that travel through the city are US 31, M-72, and M-37 and are mainly the connector and commuter routes into and out of the city. US 31 has several distinct designations. US 31 is listed in the National Highway Systems, is a State Corridor of Significance, is a national truck route, and is classified as a principal arterial highway.



Downtown Street

CONTEXT

Downtown is the most formally and intensely developed of the two types of commercial neighborhoods in Traverse City. The focus is on high intensity, regional, commercial, street-oriented activity. The overall level of intensity generated within downtown is the highest of all neighborhood types. This includes mixes of uses and 24-hour and late night services.

FUNCTION

Downtown streets are utilized to access mixed use and commercial areas. These streets typically carry a higher volume of low-speed traffic and have more pedestrians and bicyclist activity. Transit is also an active component of these areas and inter-modal connections are prioritized.

COMPOSITION

The pedestrian zone is defined and enhanced through wider sidewalks, mid-block crosswalks, human-scale lighting, benches, bike parking, and public green spaces. Urban-like plazas are present and can include outdoor cafes, public gardens, public art, and other enhancements. Trees are desired on downtown streets to provide shade and enhance the streetscape.

Parking is typically provided on both sides of the street and parking spaces are typically delineated with striping and meters. Angled parking may be appropriate where the right-of-way width allows.

Curb and gutter is standard on this type of street and drainage is properly accounted for using best management practices.

Example Downtown Street - East Front Street

Example Downtown Street - West Front Street

	DOOR ZONE	PED ZONE	TREE ZONE	CURB ZONE	BIKE LANE	TRAVEL LANE	TRAVEL LANE	BIKE LANE	CURB ZONE	TREE ZONE	PED ZONE	DOOR ZONE
Preferred Standard	2'	5-8'	3-8'	7-8'	5-8'	10-11'	10-11'	5-8'	7-8'	3-8'	5-8'	2'

minimum 60', maximum 86'

NOTE:

1. Curb zone can include parking, loading, etc.
2. Door zone is typically private property due to 2.5-foot building setback
3. Typical right-of-way is 66 feet wide.

Commercial Corridor

CONTEXT

The land use and development context adjacent to Commercial Corridors in Traverse City includes commercially and industrially focused uses as well as higher intensity residential buildings, usually of commercial scale. These areas are the least formally developed of the two types of commercial neighborhoods in the city with a focus on commercial innovation.

FUNCTION

These streets serve as high travel volume corridors, efficiently moving both goods and people. They may be characterized as city thoroughfares, providing direct access through the city to major destinations. These streets provide access to commercial and mixed use areas and provide an efficient connection for all users.

COMPOSITION

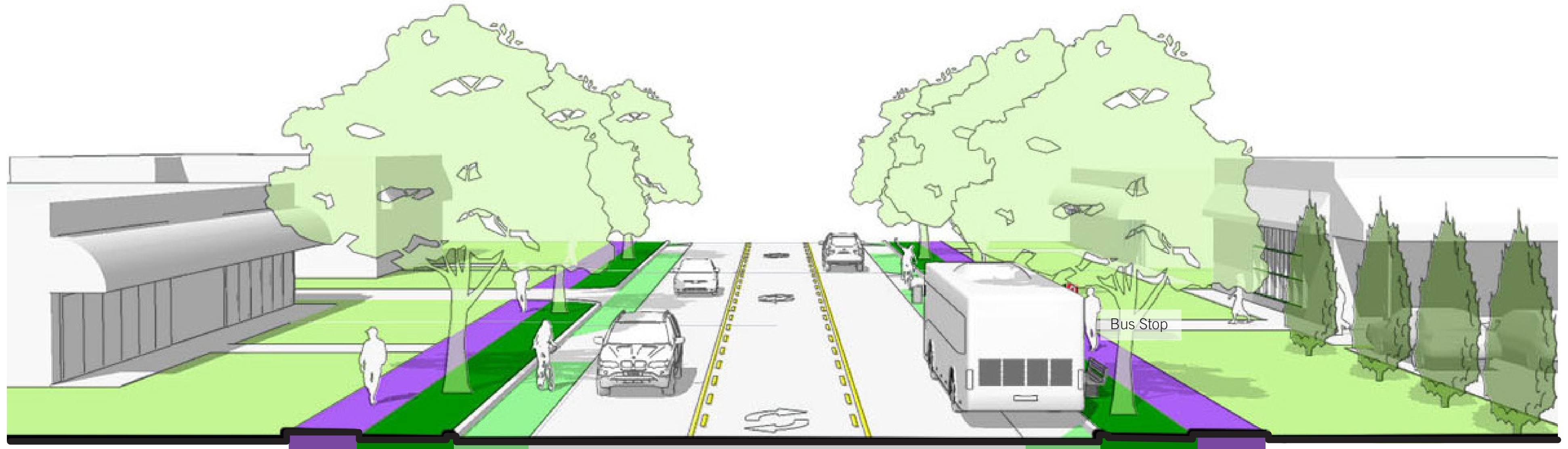
These streets are typically characterized with two or more travel lanes delineated with striping. Many of these streets are used as transit routes by BATA, with designated bus stops. Sidewalks and are typically provided on both sides of the street where development is present. Bike lanes and/or shared use paths are provided to accommodate bicyclists, either on-street or off-street, depending on right-of-way constraints.

Street lighting is present in areas to delineate character transitions, at intersections, and in higher density areas. On-street parking may be provided on Commercial Corridors where the specific character of the area warrants parking.

These streets are typically constructed with curb and gutter and large canopy street trees that give vertical dimension to define the street edge. Drainage is properly accounted for using best

Example Commercial Corridor


Example Commercial Corridor



	PED ZONE	TREE ZONE	CURB ZONE	TRAVEL LANE	TURN LANE	TRAVEL LANE	CURB ZONE	TREE ZONE	PED ZONE
Preferred Standard	5-8'	6-10'	5-8'	10-11'	9-10'	10-11'	5-8'	6-10'	5-8'

62-84'

NOTE:

1. Curb zone can include bike facilities, parking, loading, etc.
2. Most right-of-ways are 66 feet wide.

Connector Street

CONTEXT

Connector Streets typically serve areas of moderate-density residential or transition zones between residential and commercial. These areas have a more neighborhood-focused development style, with community facilities and neighborhood commercial amenities.

FUNCTION

These streets may serve as transit corridors, or key bicycle connections, linking residents to jobs and amenities. They may be characterized as either providing access from one area type to another or consisting of different character areas in their overall make up, thus transitioning users through the city. These streets provide access to residential, commercial, and mixed use areas and provide a connection to the rest of the community.

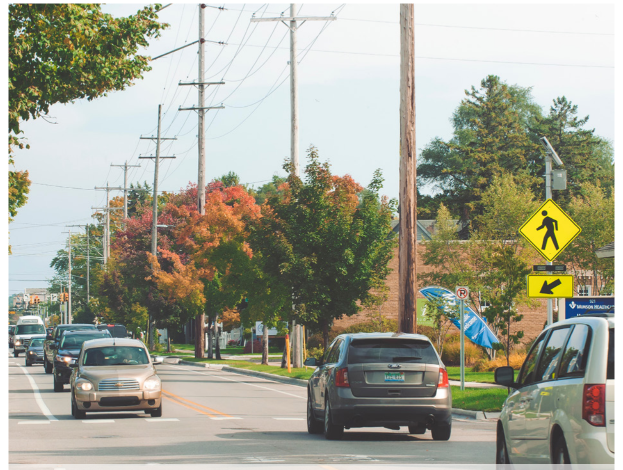
COMPOSITION

Connector streets are typically limited to two lanes delineated with striping. Sidewalks are provided on both sides of the street and are detached from the curb to allow for an adequate tree lawn with street trees. On-street parking or bike lanes may be present, depending on the adjacent land uses and right-of-way constraints.

Street lighting is present in areas to delineate character transitions, at intersections, and in higher density areas. If alternative access is available via alleys, minor streets, or shared access through neighboring properties, curb cuts for driveways are not allowed for new construction or major property renovation.

These streets are typically constructed with curb and gutter, and drainage is properly accounted for using best management practices. Utilities are provided within the right of way.


Example Connector Street - Eastern Avenue


Example Connector Street - West Front Street

	PED ZONE	TREE ZONE	CURB ZONE	TRAVEL LANE	TRAVEL LANE	CURB ZONE	TREE ZONE	PED ZONE
Preferred Standard	5-8'	6-10'	5-7'	10-11'	10-11'	5-7'	6-10'	5-8'

52-72'

NOTE:

1. Curb zone can include bike facilities, parking, loading, etc.
2. Row is typically 66 feet wide.
3. No on-street parallel parking unless curb zone is at least 7 feet wide.

Traditional Residential

CONTEXT

Traditional Residential streets are the streets that serve the traditional urban neighborhoods within Traverse City. These areas are the most formally developed of the two types of residential with a focus on historic patterns. The level of intensity generated within this areas includes closely-spaced single family housing.

FUNCTION

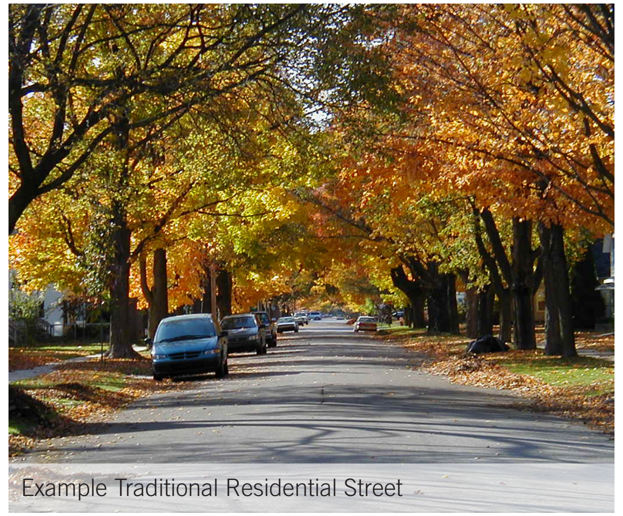
Traditional Residential streets provide access to, in, and through residential neighborhoods. These are typically narrow, low-volume streets that connect residents to the larger transportation network. These streets often have parallel alleys that provide rear access to garages or private parking areas for the residents.

COMPOSITION

Sidewalks are provided on both sides of the street and are detached from the curb to allow for a tree lawn with street trees. Parking is allowed on these streets. Street lighting is provided at intersections and in some areas low level pedestrian lighting is provided.

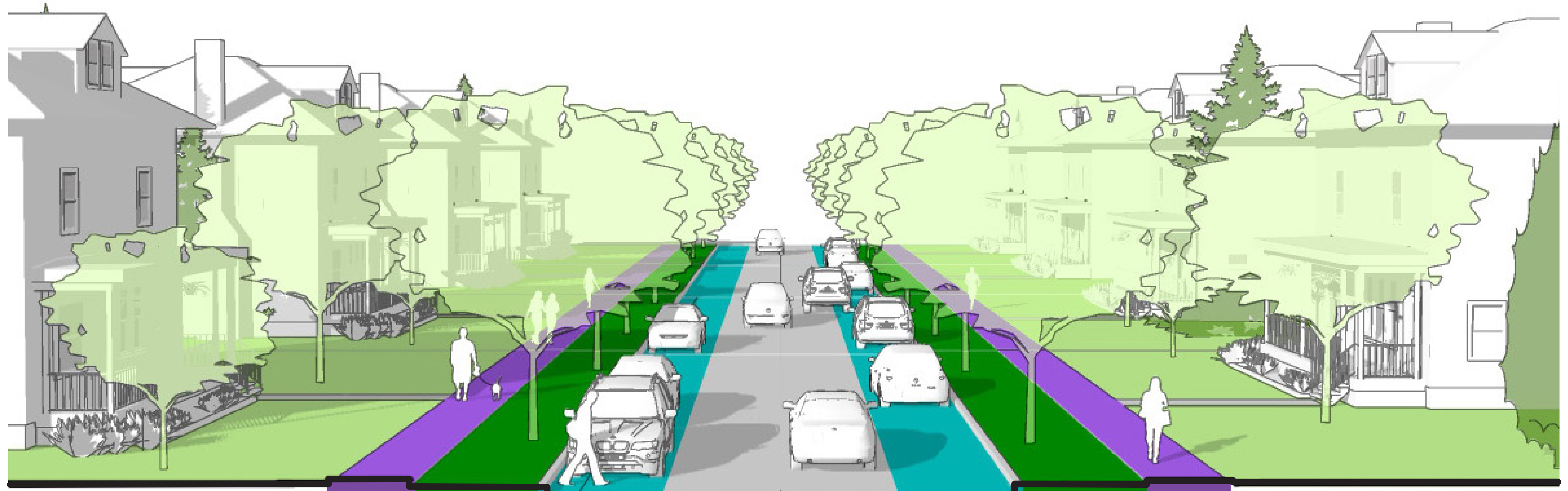
Curb and gutter is standard on these types of streets and drainage is properly accounted for with best management practices. Curb cuts for driveways onto the street are not allowed, if alley access is available, for new construction or major property renovation.

Typically water main and storm sewer utilities are located in the street right-of-way, while sanitary sewer service is provided in the alley.



Example Traditional Residential Street

Example Traditional Residential Street



	PED ZONE	TREE ZONE	CURB ZONE	TRAVEL ZONE	CURB ZONE	TREE ZONE	PED ZONE
Preferred Standard	5-8'	6-10'	4-7'	20'	4-7'	6-10'	5-8'
			28 - 34'				
	Typical 66'						

NOTE:

1. Curb zone can include bike facilities, parking, loading, etc.
2. Typical right-of-way is 66 feet wide.
3. Streets less than 30 feet wide allow for parallel parking on one side only.

Contemporary Residential

CONTEXT

Contemporary Residential streets serve the least formally developed areas of Traverse City. These areas are focused around single family housing, or low density multi-family.

FUNCTION

Contemporary Residential streets offer the least formal connectivity and may follow the contours of the land. Public transportation is limited to streets on the perimeter of these neighborhoods, if present at all. These streets typically have low traffic volumes and provide residents with access to the larger street network and other areas of the city.

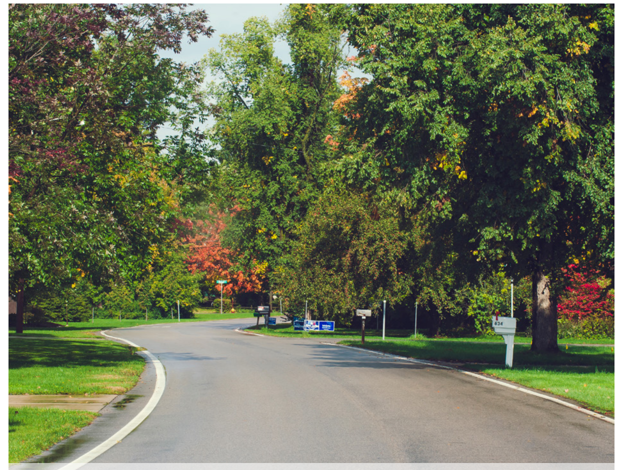
COMPOSITION

Many of these streets are characterized by their geographic/topographic nature. Landscaping is much less formal than in other areas.

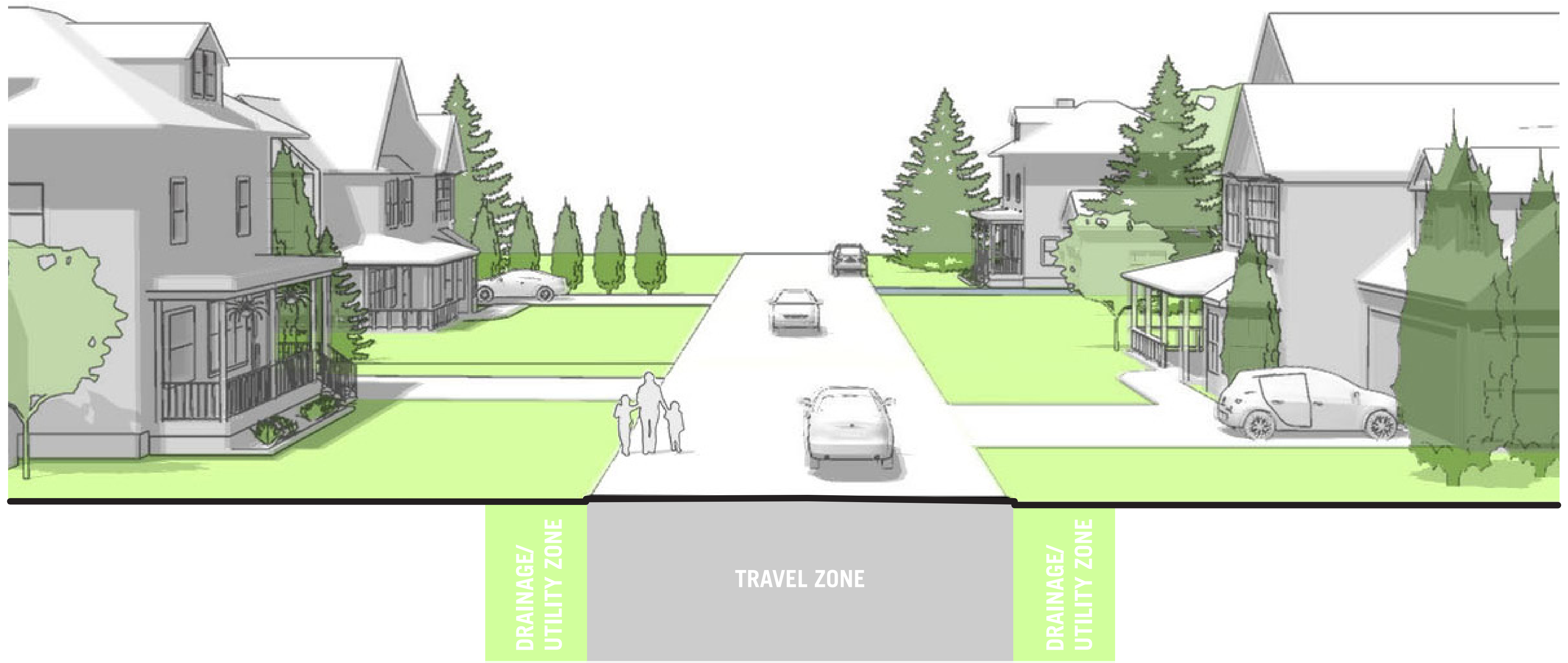
There are typically no sidewalks on streets of this nature due to right-of-way constraints, or because of the low traffic volumes. These streets often serve as “shared” streets, accommodating pedestrians, bicyclists, and vehicles with minimal conflict due to low travel speeds.

Streets may be striped in order to provide the best use of the right of way and not limit mobility. Right-of-way, geographic, or topographic limitations may not allow for on-street parking.

Curb and Gutter tends to be absent on these streets and drainage facilities are provided via swales and ditches adjacent to the street. All utilities are typically located in the right of way.


Example Contemporary Residential Street


Example Contemporary Residential Street



Preferred Standard	15-21’	20-24’	15-21’

R.O.W. Typical 66’

Park Lane

CONTEXT

Park Lane streets typically serve public park areas and provide access to public facilities or parking lots.

FUNCTION

Park Lane streets offer limited connectivity, primarily functioning as driveways to parking lots or park areas. Public transportation may be present on these streets if they serve a high-volume destination. These streets typically have low traffic volumes and provide residents with access to public spaces.

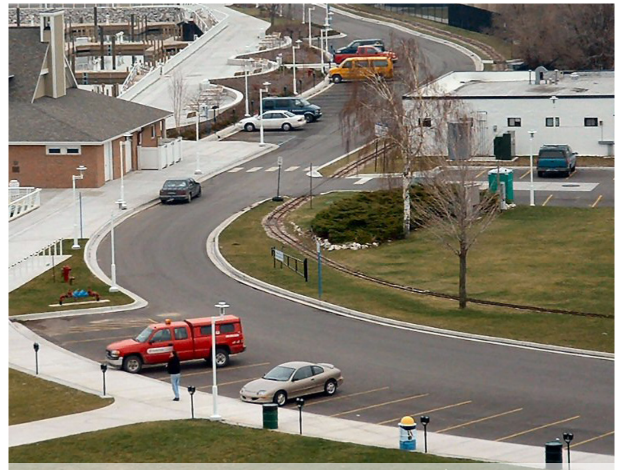
COMPOSITION

These streets are characterized by their context, which is often public park space with landscaping that is more natural.

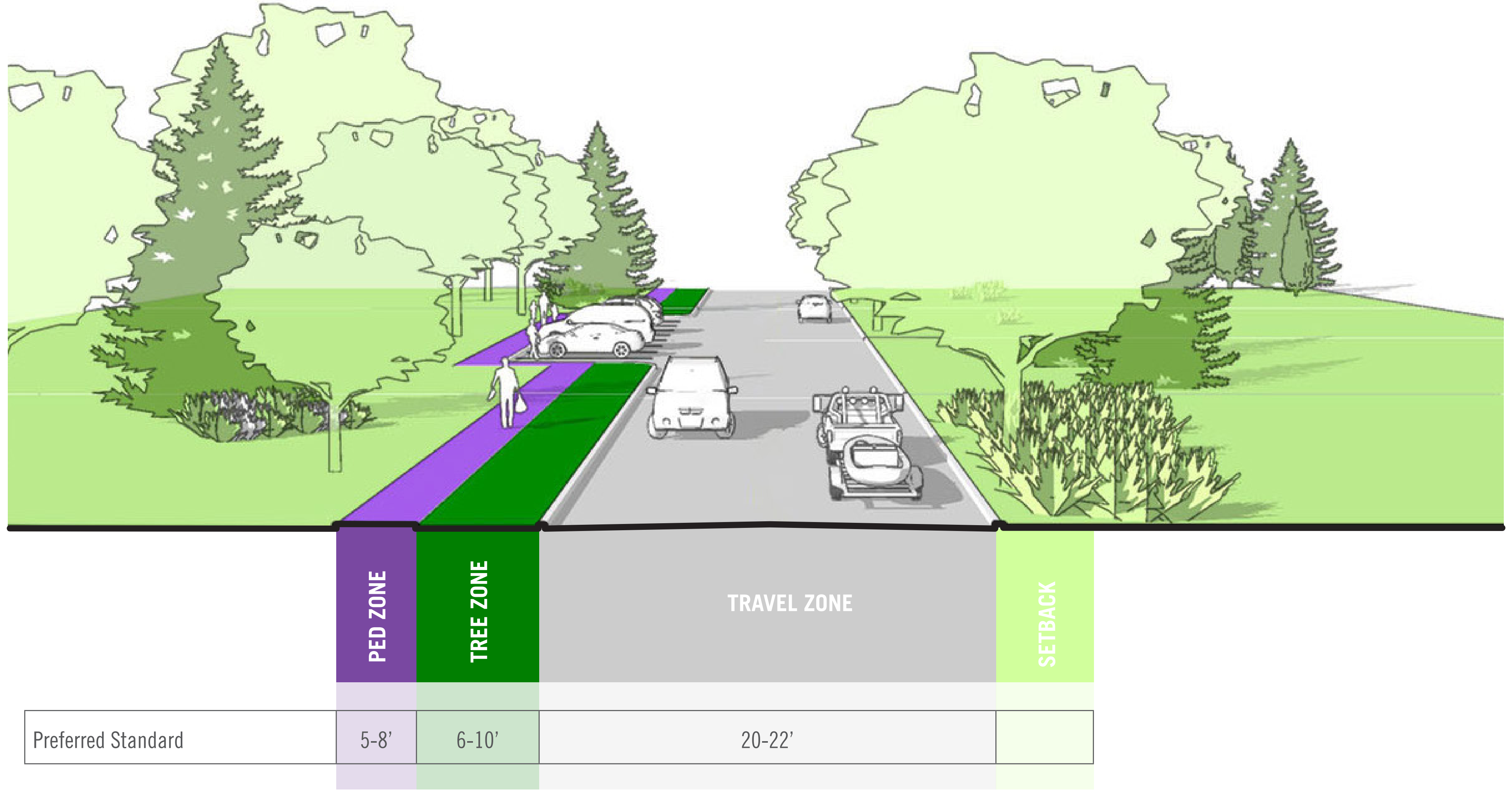
There may be a sidewalk provided on these streets on one or both sides, depending on where parking and other facilities are located. These streets might function more as “shared” streets, accommodating pedestrians, bicyclists, and vehicles with minimal conflict due to low travel speeds.

Streets may be striped in order to provide the best use of the right of way and not limit mobility. On-street parking may be provide in the form of single-bay parking rather than parallel.

Curb and Gutter may be provided on these streets and all utilities are typically located in the right of way.


Example Park Lane


Example Park Lane



Private Street

CONTEXT

Private streets are similar to Contemporary Residential streets in that they serve the least formally developed areas of Traverse City. These areas are focused around single family housing, low density multi-family or within Grand Traverse Commons and Morgan Farms, the mixed use neighborhoods.

FUNCTION

Private streets offer the least formal connectivity and may follow the contours of the land. Public transportation is limited to streets on the perimeter of these neighborhoods, if present at all. These privately maintained streets typically have low traffic volumes and provide residents with access to the larger street network and other areas of the city.

COMPOSITION

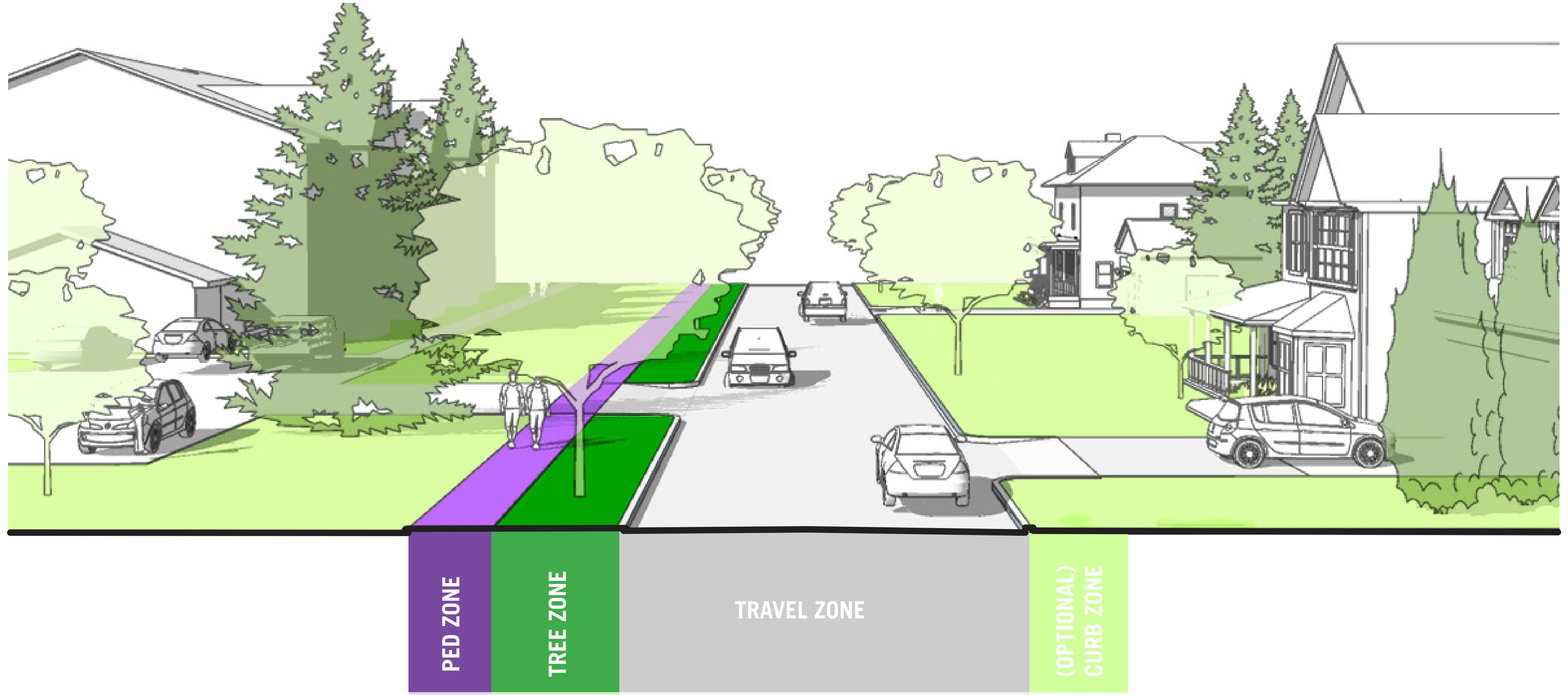
There may be no sidewalks or only a sidewalk on one side on streets of this nature due to right-of-way constraints, or because of the low traffic volumes. These streets may serve as "shared" streets, accommodating pedestrians, bicyclists, and vehicles with minimal conflict due to low travel speeds.

Streets may be striped in order to provide the best use of the right of way and not limit mobility. Right-of-way, geographic, or topographic limitations may not allow for on-street parking.

Curb and Gutter may be absent on these streets with drainage facilities provided via swales and ditches adjacent to the street. All utilities are typically located in the right of way.

Example Private Street - Ahgosa Trail

Example Private Street - Camrose Circle



Preferred Standard	5-7'	6-10'	18-20'	5-7'

NOTE:

1. Private streets are privately maintained.
2. Private streets can be accepted as public streets if the street is brought up to public street standards and if approved by the city commission.

Industrial

CONTEXT

The land use and development context adjacent to Industrial streets includes commercially and industrially focused uses as well as higher intensity residential buildings, usually of commercial scale. These areas are the least formally developed of any neighborhood in the city.

FUNCTION

These streets serve as lower volume, commercial traffic corridors. They are primary access points for warehouses and other commercial/industrial uses.

COMPOSITION

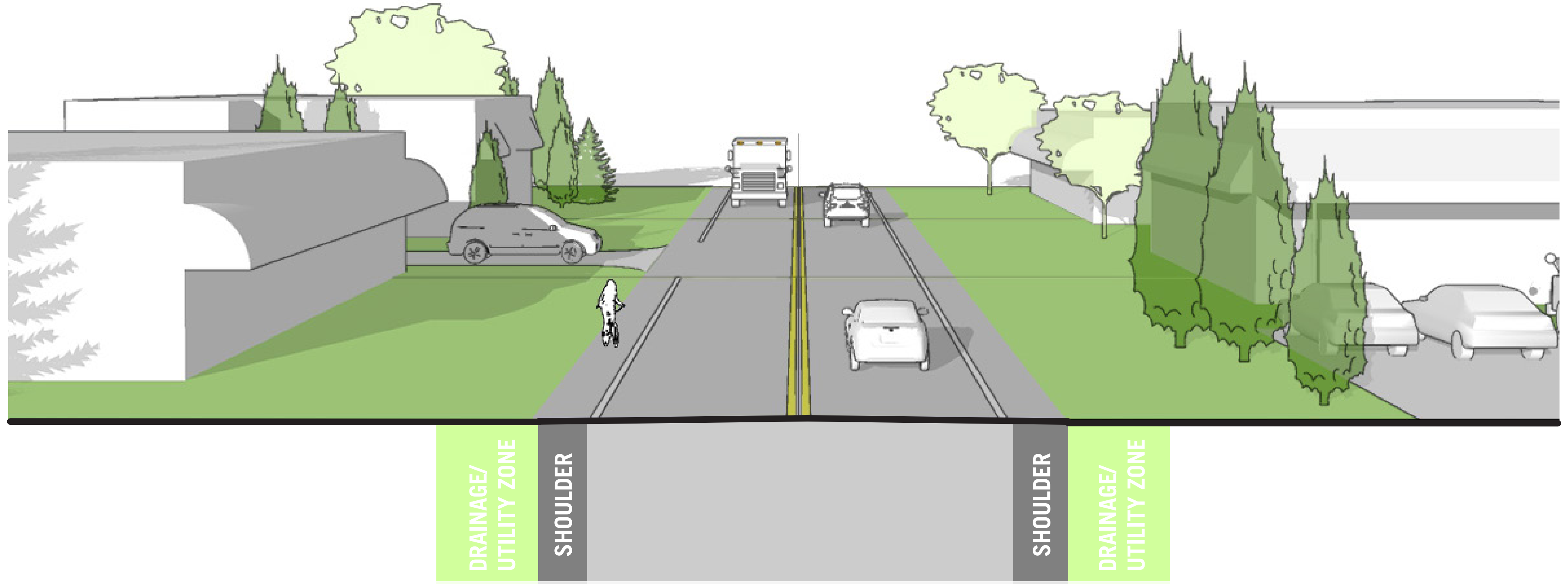
These streets are typically characterized as having two lanes with wide shoulders, all delineated with striping. Sidewalks are typically not present, but an off-street shared path may be provided to connect other facilities.

Street lighting is typically only present at major intersections, with lighting primarily provided by adjacent buildings. On-street parking is prohibited on Industrial streets.

These streets typically do not have curb and gutter, with drainage facilities provided via swales and ditches adjacent to the street. All utilities are typically located in the right of way.

Example Industrial Street

Example Industrial Street



Preferred Standard	10-11’	5-7’	10-11’	10-11’	5-7’	10-11’

30-36’

Typical 66’

NOTE:

1. Shoulders provide space for walking and bicycling unless a sidewalk or shared path is present.
2. Typical row is 66’ wide.

Alleys

FUNCTION AND COMPOSITION

Alleys provide access to the overall transportation network from residential garages and commercial parking areas. Alleys are narrower than typical streets with limited right-of-way. State law prohibits on-street parking in alleys.

Alleys are often used to access parking areas and also serve uses such as trash and recycling pick-up. Alley access is limited by their width and the travel zone must remain unencumbered to allow for snow removal and other public services.

Pedestrians and bicyclists can utilize alleys as alternative connections, instead of the parallel higher traffic streets.

Alleys typically have sanitary sewer and overhead electric/communication utilities. Residential and mixed-use alleys typically sheet drain to the alley edge, and can provide opportunities for green infrastructure that aids stormwater management, particularly in the downtown area and adjacent to the Boardman River.

TYPES OF ALLEYS

There are three different types of alleys in Traverse City:

» Downtown Alley
» Mixed-Use Alley
» Residential Alley

Example Downtown Alley

Example Downtown Alley

DOWNTOWN ALLEY

	SHOULDER	TRAVEL ZONE	SHOULDER
Preferred Standard	5.5-6.5'	20-22'	5.5-6.5'
	31-35'		

NOTE:

1. Some Downtown Alleys may be as narrow as 12 feet wide, but are typically 20 feet wide.
2. A typical alley row is 33 feet wide.


Example Mixed-Use Alley

MIXED-USE ALLEY

	(OPTIONAL) SHOULDER	TRAVEL ZONE
Preferred Standard	5-7'	18-22'


Example Residential Alley

RESIDENTIAL ALLEY

	TRAVEL ZONE
Preferred Standard	16-20'

NOTE:

1. Typical alley is 20 feet wide.
2. One way alleys may be as narrow as 12 feet wide.
3. Alley right-of-way is typically 33 feet wide.

Shared Street

CONTEXT

Shared Streets typically are located within mixed-use developments or higher density areas with a balanced mix of transportation users.

FUNCTION

These streets may function similarly to alleys due to their low speeds and low volumes. They serve a mix of users, accommodating pedestrians, bicyclists, and vehicles with minimal conflict due to the low travel speeds.

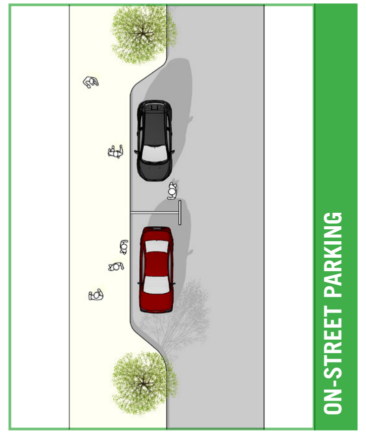
COMPOSITION

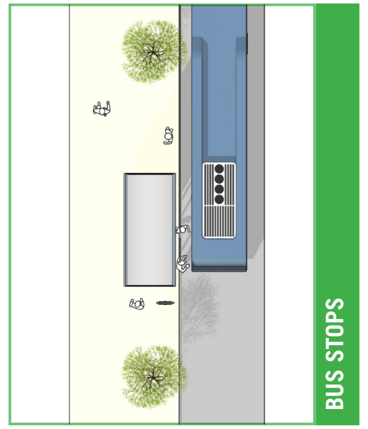
These streets typically have limited or constrained right-of-way, creating a need to share the available space. On-street parking may be present, depending on the right-of-way width and adjacent uses. Sidewalks are typically incorporated into the overall design of the street, often delineated only by a change in pavement material rather than a curb and tree zone.

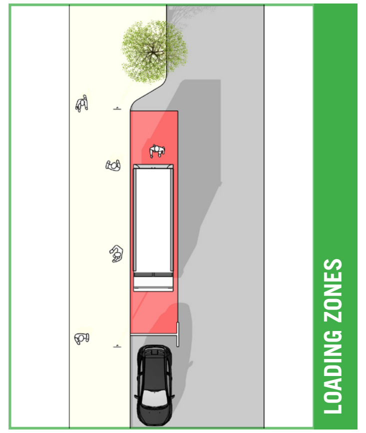

Example Shared Street

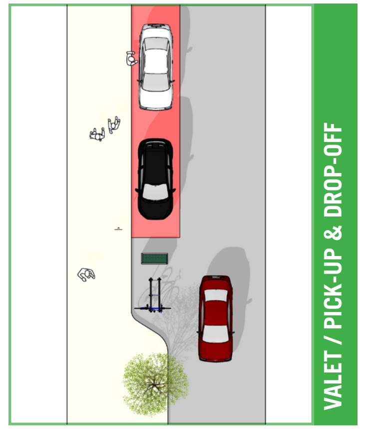

Example Shared Street

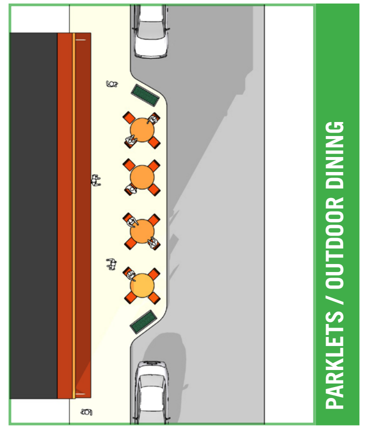
CURBSIDE USES PRIORITIZING ACTIVITIES

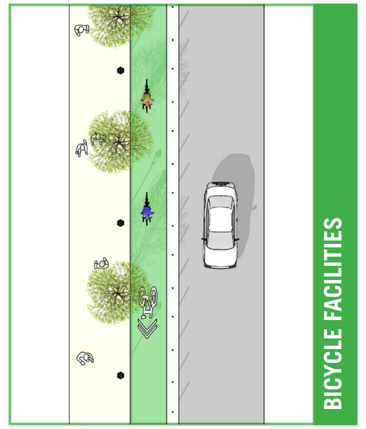












REGULATING USES

Curbside use refers to the numerous activities that occur on the street adjacent to the curb. This may include valet or loading zones, on-street parking, waste and recycling pickup, bus stops, curb bump-outs, bicycle parking, and bicycle lanes. New technologies and mobility services have created and will continue to create new, competing needs for curbside use, such as rideshare vehicles waiting for their customers and autonomous vehicles. When left unchecked, demands for curbside use can lead to double or illegal parking, blocking access to bus stops, dangerous conditions or other challenges.

It is important to regulate curbside uses to maintain traffic flow and pedestrian safety, as many of these uses often compete for space at the curb. Regulating curbside uses requires an understanding of the adjacent land uses because they heavily influence the activities occurring along the curb. For example, valet zones are common in front of hotels and restaurants, while commercial and retail zones often need curbside space for loading and unloading goods, or parking.

Curbside uses should be regulated based on adjacent land uses and specific needs and demands of those uses. This could include specific curbside designations for short term waiting zones or signs that restrict use for certain activities to specific periods of the day.

ON-STREET PARKING

On-street parking is appropriate and beneficial in most contexts, but may require meters and pricing in areas with high demand. Corridors with high peak-period traffic volumes may require the use of the parking lane for travel, and regulations can be set limiting the times of day when on-street parking can occur on those corridors. On-street parking times can also be coordinated with specific times for loading and valet on corridors with high demand for those activities. For most streets overnight parking is restricted to allow for street sweeping and snow plowing.

LOADING AND VALET

Loading zones are parking spaces designated for loading and unloading of commercial goods, often limited to short time periods at specific times of day. Loading zones can also be used for loading and unloading passengers. Where alleys and alternative loading areas are not available, loading zones should be designated within the on-street parking lane. Valet zones typically are desired in the same areas as loading zones and can often be coordinated within the same space. For example, an on-street parking space could be designated for loading only during the hours of 6am to 10am, for on-street parking only from 10am to 6pm and 10pm to 6am, and for valet only from 6pm to 10pm.

Loading and Valet zones are only appropriate on streets with on-street parking lanes, and commercial or mixed-use contexts. The space designated for these zones should be a minimum of 30 feet in length to accommodate delivery trucks. Time limits for loading zones should be designated as 30 minutes or less. Loading zones should also be located near the intersection and where the amenity zone is clear of obstruction to allow for easier goods movement between trucks and businesses.

SNOW PLOWING

An additional curbside consideration for places like Traverse City with heavy snowfall through the winter is accommodating all of the snow that must be plowed from the streets and sidewalks. Snow is often piled up in on-street parking lanes and along the edge of the curb and can take up a lot of space. In more urban areas of the city, consideration should be given to designing the curb and tree zones to accommodate these snow piles. Snow should be cleared in a manner that safely accommodates pedestrians and does not obstruct accessible paths.

BICYCLE FACILITIES

Bicycle facilities often compete with other uses, such as on-street parking, for space within the street. Bicycle facilities may not be appropriate on every street and the Traverse City Active Transportation Map should be referenced to determine where bicycle facilities are desired.

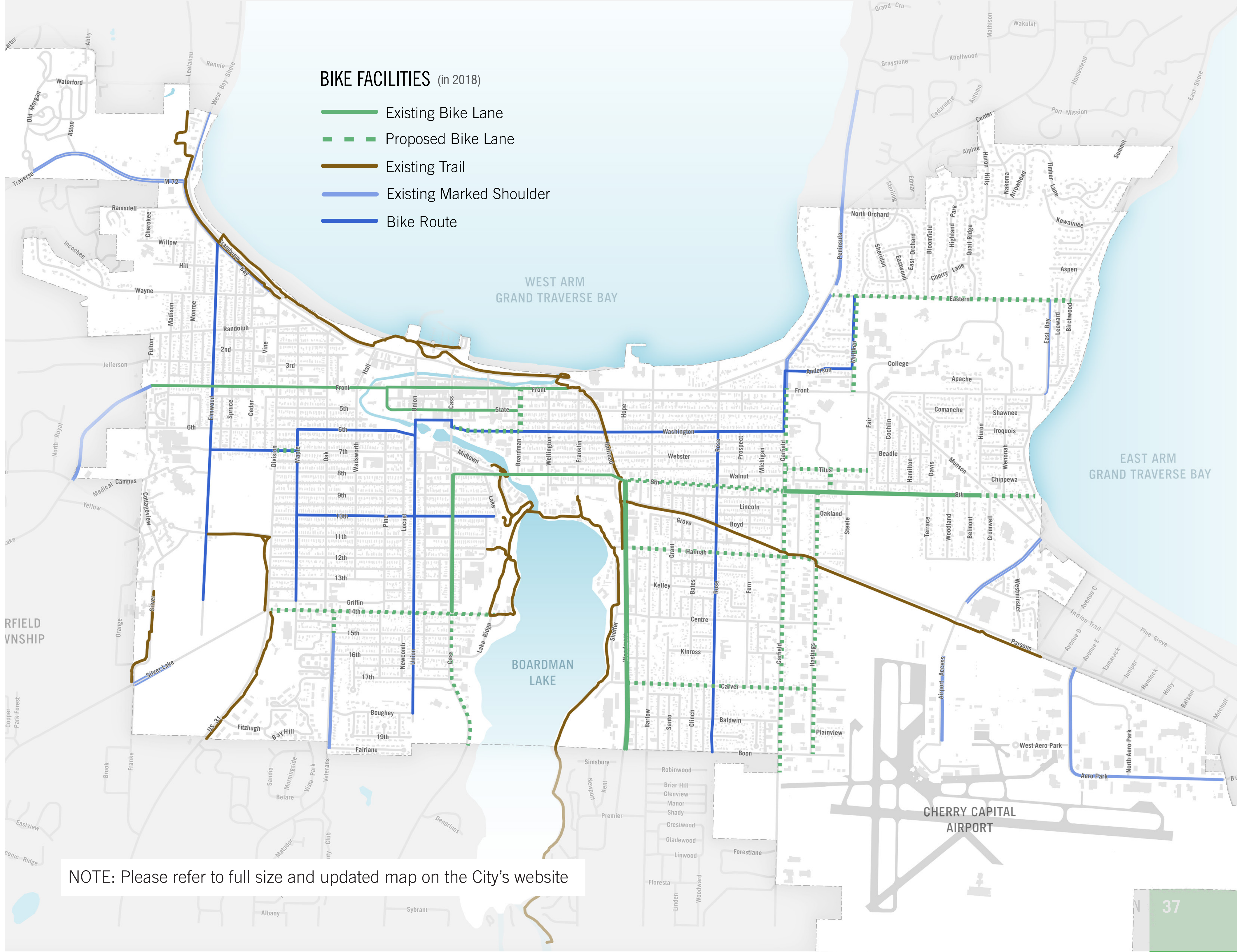
ACTIVE TRANSPORTATION DESIGNING COMPLETE STREETS

COMPLETE STREETS

In 2011, the City Commission adopted a Resolution in support of the concept of Complete Streets. The concept of Complete Streets represents a design strategy that enables and encourages safe and convenient access for all users, including pedestrians, bicyclists, transit riders, and drivers. This section of the Street Design Manual focuses on how to enhance the "complete-ness" of Traverse City streets through the integration of design standards for active transportation (walking and bicycling).

BICYCLE FACILITIES

A primary goal of bicycle facility design is to create facilities that people feel safe riding in. Thus, the type of bicycle facility selected for a street should be determined based on the travel speeds, traffic volumes, and other characteristics of the street. The map on the following page illustrates the existing and planned bicycle facilities within Traverse City. However, due to right-of-way constraints and other challenges, the desired facility type may not always be feasible on a given roadway.



BICYCLE FACILITY TOOLKIT

The facilities discussed in this manual represent the bicycle facility types used throughout the United States today. Each type of facility serves a different purpose, and the desired level of comfort for the users should be taken into consideration when designing a bicycle facility. The information provided in this manual should serve as a guide for the appropriate selection of bicycle facilities. Refer to the NACTO Urban Bikeway Design Guide for bicycle facility design standards.

SHARED TRAVEL LANES

Shared lane markings, or sharrows, are pavement markings that indicate bicyclists and motorists must share the travel lane. These markings alert motorists that they can reasonably expect to encounter bicyclists in the roadway, but they can also be used to designate the desired location for bicyclists to travel within the lane. This is particularly useful when the travel lane is adjacent to a parking lane, and the markings are painted at a distance to keep bicyclists out of the “dooring zone” from the parked vehicles.

Shared travel lanes provide the least amount of comfort for bicyclists and should only be used as a last resort when considering a bicycle facility. These facilities are referred for use on streets with low volumes (fewer than 4,000 vehicles per day) and low average speeds (less than 25 mph).

CONVENTIONAL BICYCLE LANES

Standard bicycle lanes provide a designated space within the roadway for bicyclists. These lanes offer some separation from motorists, but are typically immediately adjacent to vehicular travel lanes. Standard bicycle lanes require the least amount of space of any designated bicycle facility, but often require trade-offs with other elements in the right-of-way, such as on-street parking.

Designated bicycle lanes provide a more comfortable experience for bicyclists than shared travel lanes, but do not provide a high enough level of comfort for many types of riders. These facilities should only be used on streets with moderate traffic volumes (less than 15,000 vehicles per day) and moderate speeds (less than 35 mph).

BUFFERED BICYCLE LANES

Buffered bicycle lanes offer an additional level of separation between bicyclists and moving vehicles, creating a greater sense of comfort for less experienced riders. Buffers are typically created through the use of paint, and do not provide any physical protection from adjacent travel lanes. Buffers can also be used between the bicycle lane and an adjacent parking lane to protect bicyclists from the dooring zone.

Buffered facilities are ideal for streets with moderate traffic volumes and speeds, and should be used on any street that has the space to accommodate them. Buffers typically add at least 3 feet onto a standard bicycle lane, but can take up to an additional 6 feet to provide buffers on each side.

PROTECTED BICYCLE LANES

Protected bicycle lanes are similar to buffered bicycle lanes, but provide a physical barrier or other form of protection from moving vehicles. This barrier can be provided in the form of parked vehicles, a concrete median, and other vertical design elements that would prevent a vehicle from entering the bicycle lane. This physical protection significantly increases the level of comfort for bicyclists.

Protected bicycle facilities can be used on streets with high traffic volumes and speeds, but do require more space within the right-of-way to provide adequate protection. In some cases, the barrier can be as narrow as a curb, but wider separation is recommended for these facilities, particularly on streets with high volumes and speeds.

SEPARATED BICYCLE FACILITIES

Separated bicycle facilities offer the highest level of comfort for bicyclists, because they are fully separated from the street. These facilities are often provided in the form of shared-use paths in place of sidewalks.

Separated bicycle facilities are most appropriate on streets with expansive right-of-way, where there is plenty of space to accommodate both bicyclists and pedestrians above the curb. The shared-use path is ideal for more suburban contexts where there is less conflict with adjacent uses.

All of these facility types require special treatments at intersections and driveways to mitigate conflict between bicyclists, pedestrians, and turning vehicles.

ACTIVE TRANSPORTATION DESIGNING COMPLETE STREETS

PEDESTRIAN CROSSINGS

Pedestrian crossings are a key factor in designing walkable, complete street environments. Unmarked pedestrian crossings are crossing locations where curb ramps are installed, but no pavement markings or signs are in place. Unmarked crossings simply provide an improvement for a low volume pedestrian crossing where there are rarely pedestrian and motorist conflicts.

Alternatively, marked crosswalks provide a clearly designated path for pedestrians to cross the street through the use of curb ramps and pavement markings, and may also include improvements such as refuge islands, in street signs, and bump outs. Marked crosswalks signal to motorists that they can reasonably expect pedestrians to cross in that location and are particularly important in areas where there are high volumes of both pedestrians and motorists. At signalized intersections, marked crosswalks, pedestrian signals, and curb ramps should be provided on all legs of the intersection.

Pedestrians will typically cross the street at the most direct path to their destination, and may not walk to the nearest marked crossing to do so. Spacing crosswalks approximately every 200-400 feet in areas with high volumes of pedestrians can help to minimize unsafe crossing by pedestrians. It should be noted that, per City of Traverse City local ordinance, drivers must stop to yield to pedestrians in a marked crosswalk. Signage indicating these requirements can be placed at crossing locations to remind motorists that they must stop for pedestrians.

Physical improvements such as bump-outs and center medians can be used to improve pedestrian crossing safety by narrowing the crossing distance for pedestrians and making them more visible to motorists. These elements can be used at both intersections and mid-block crossing locations.

The design of crosswalks should be compliant with the standards provided in the Michigan MUTCD. City Policies also provide guidelines on appropriate crosswalk design.

TRAFFIC CALMING DESIGNING SAFER STREETS

TRAFFIC CALMING PROGRAM

Traffic Calming is a design strategy to mitigate speeding and improve safety for all users of a street. Traverse City has a Residential Traffic Calming Program (RTCP) that operates through a collaboration between City staff and neighborhood residents. The goal of the program is to establish a consistent and comprehensive process to address traffic concerns in city neighborhoods. Through implementation of traffic calming measures, the City is working to make streets safer, quieter, and more inviting.

The program objectives include:

- Reduction of motor vehicle speeding
- Create attractive streets
- Improve the safety and convenience of travel within the City
- Improve the quality of life within residential neighborhoods

IDENTIFYING CANDIDATES

Projects are initiated through submittal of an application by neighborhood residents to the City. The application serves to identify the traffic concern and make an official request for traffic calming. A Transportation Committee at the City reviews the application and assesses the identified issue based on set criteria established by City policy.

Traffic Calming Considerations:

- Citizen input including needs, values, suggestions, etc.
- Traffic observations including volumes, speed, parking, safety, access, etc.
- Environmental concerns including noise and air pollution, safety, access for pedestrians and cyclists, visual quality, etc.
- Observation of resident activities including street activities, cycling, pedestrians, disabled, parking etc.
- Collect data, as necessary, such as historical traffic data, crash statistics, volume and speed counts, land use data, etc.

Traffic Calming Threshold Criteria:

Once the information about the location in the application has been collected and analyzed, it must be determined if the street meets the minimum conditions to qualify for the Traffic Calming Program.

- The average daily traffic must meet a minimum volume of 500 vehicles/day and maximum volume of 5,000 vehicles/day.
- The 85th percentile speed must be over the posted speed limit.
- The street must be classified as a city local or city major, as indicated on the Transportation Network Functional Classification map.
- The street must not be a primary emergency route (for elements like speed humps).
- Streets used as bus routes for Bay Area Transportation Authority or public school systems must have their input into the plan.

Additional information on traffic volumes, speed counts, and other traffic calming program criteria can be found on the City's website.

IMPLEMENTATION

If an application is approved for traffic calming based on these criteria, City staff will determine the appropriate tool to mitigate the identified issue. Implementation of the traffic calming tool will prioritized amongst other approved traffic calming projects, and funded through the City's Traffic Calming Fund.

EVALUATION

Each traffic calming installation will be evaluated for effectiveness, based on the same factors that measured the problem and design. The City will measure the actual change in speed, crashes, volumes, etc. after the traffic calming is installed too determine if the measure is working as intended. If an installation does not get the anticipated results, the City will continue to work with the applicant to try to effectively mitigate the problem.

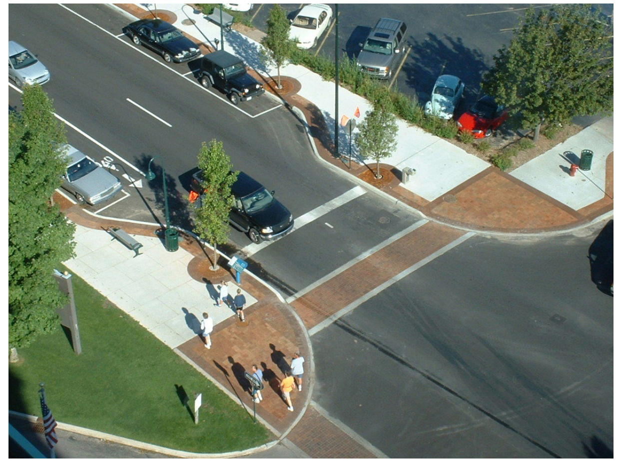
TRAFFIC CALMING DESIGNING SAFER STREETS

TOOLS AND STRATEGIES

Traffic calming can be implemented through a number of different tools, but each tool falls primarily into one of two categories: structural or non-structural.

Non-structural traffic calming tools include pavement markings, vertical elements at the curb such as trees, as well as signage. The most basic form of a non-structural traffic calming tool, and often the most effective, is the addition of on-street parking. The parking helps to narrow the travel-way and provide a buffer between traffic and pedestrians walking on the sidewalk. Other non-structural tools include striping lanes (travel lanes and/or parking lanes), as well as re-striping lanes to narrow them or re-purpose space for other uses through a road diet.

In addition to these methods are the structural tools described on this page. This can include both vertical and horizontal elements that serve to interrupt the normal flow of traffic and alert motorists that they may be driving too quickly. The tools described on this page are best practices in traffic calming design that are recommended for use in Traverse City.



BUMP-OUTS OR CHOKERS

Bump-outs and chokers are effective tools for slowing traffic at intersections and mid-block locations, typically in the downtown area or where there are high volumes of pedestrian crossings. These design tools extend the curb into the street, thereby narrowing the street width and slowing driver speeds. These bump-outs can also mitigate illegal parking at corners, and shorten the crossing distance for pedestrians.

ON-STREET PARKING

On-street parking by itself can be an effective traffic calming tool, but it can be even more effective when combined with bump-outs or chicanes. Chicanes are similar to bump-outs in that they are horizontal extensions of the curb into the street, but are offset to create lateral shifts in the path of travel. These tools effectively realign otherwise straight streets to form more of an S-shaped curve.

MEDIANS OR MID-BLOCK DEFLECTOR ISLANDS

Medians work well on streets with long blocks and require drivers to shift their path of travel on otherwise straight streets. These design tools can be placed at the entrance to a neighborhood to create an attractive gateway in addition to serving as traffic calming. Medians can also be combined with pedestrian crossings to serve as a pedestrian refuge island.

TRAFFIC CIRCLES

Small traffic circles are raised, circular islands located most commonly at four-legged intersections. These design tools allow for traffic to continue moving through intersections without stopping, but at a much slower speed due to the lateral shift in the path of travel. Traffic circles can also provide an attractive gateway feature into a neighborhood.

STREET AND ON-STREET PARKING

Striping can be used to physically narrow the travel lanes on a street and reduce speeding. Street trees and on-street parking can also help to visually reduce the width of a street. Reducing the radius of street corners can help make street intersections tighter and slow down driver speeds when turning the corner. These tighter corners also help to shorten the crossing distance for pedestrians by slightly narrowing the street.

GREEN INFRASTRUCTURE DESIGNING FOR STORMWATER

WHAT IS GREEN INFRASTRUCTURE?

Green infrastructure is a design strategy that can be incorporated into the streetscape in a variety of ways to help capture and mitigate stormwater runoff in a more sustainable and potentially aesthetically pleasing manner. The actual design of the green infrastructure varies based on the desired function, the available space within the right-of-way, and the desired aesthetic.

Design of green infrastructure typically includes plant material and other landscape elements to filter and treat the stormwater runoff that is collected within the facility, which can help reduce the amount of water piped into the sewer system. However, in some cases the facility may be completely underground, and thus not visible to people passing by. Additionally, "greening" existing infrastructure could simply include narrowing a street and reducing the amount of impervious surface and related run-off.

WHEN TO GO GREEN

Opportunities to install green infrastructure can arise through retrofits of existing street infrastructure, reconstruction of existing streets, or even construction of new streets. Traditional stormwater infrastructure can be quite costly, while green infrastructure that is appropriately integrated into the street can provide a less costly alternative.

The different green infrastructure tools can include permeable pavement, vegetated swales, pervious planting strips, stormwater planters, and other facility types. Pervious planting strips and stormwater planters can be incorporated into existing streetscapes by replacing existing planting beds or tree lawns, or by designing the infrastructure into new or reconstructed curb extensions.

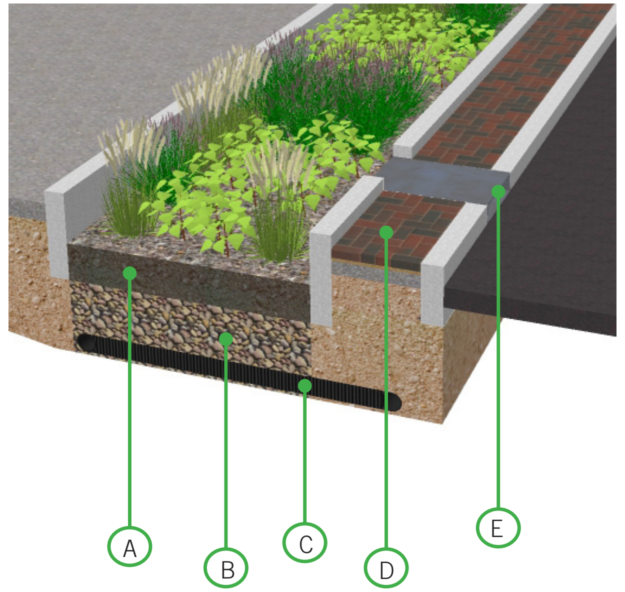
Storm water infiltration should not be utilized in known soil contamination areas, as this will exacerbate the issue and move contaminants into the ground water.

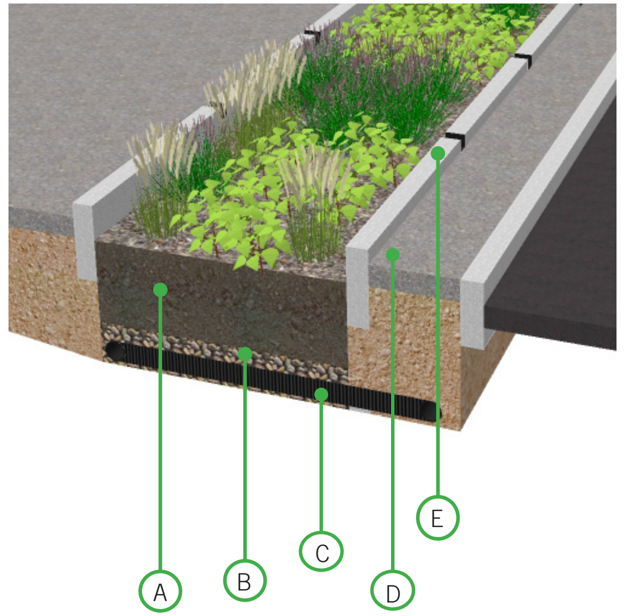
CONSIDERATIONS

There are a number of important factors to consider when designing green infrastructure into a streetscape. Some key elements that should influence the design of a stormwater facility include:

- Existing soil and drainage conditions
- Existing street trees to preserve
- Volume of runoff to manage or mitigate
- Required size of feature vs. available space
- Pollutants that may need to be treated
- Maintenance requirements

The following section describes the elements and design characteristics of typical green infrastructure and provides a toolkit of different facility types that can be used. The toolkit includes a variety of options for different contexts, street types, and space availability.





DESIGN ELEMENTS

The following elements represent some of the design considerations for stormwater planters to effectively collect and treat runoff:

A & B. The depth and type of soil media and stone layer will depend on desired function of the stormwater feature (e.g., retention or filtration), the amount of runoff, the existing soil conditions (sandy vs. clay), and the size of the feature. Each feature will require engineering to determine these factors.

C. All features should be designed with an underdrain, as well as overflow drainage infrastructure for heavy rain events.

D. Adequate space should be provided along the curb edge to allow for parking meters, vehicle access, and maintenance access.

E. For stormwater planters with curbs, drainage channels or small curb cuts are needed to direct stormwater runoff from the roadway/sidewalk into the planter.

In addition to these elements, it is important to consider the context of the location where the infrastructure will be installed. Curbed planters may be appropriate for more urban locations, but might not be for more natural settings. Streets with bus stops will also require appropriate spacing of planters to ensure that passengers have adequate space to board the bus that meets ADA standards.

GREEN INFRASTRUCTURE TOOLKIT

The following images represent above-ground green infrastructure design that is currently used or recommended for use in Traverse City. Refer to the NACTO Urban Street Stormwater Guide for more information about each tool. A maintenance plan is a necessary component when installing green infrastructure.

STORMWATER PLANTER

A stormwater planter is a streetscape planter that is designed to collect and treat stormwater. Depending on the design, the planter will filter the captured stormwater through a mix of bioretention soil media and plant roots to absorb any pollutants before allowing the treated stormwater to infiltrate the ground or discharge into the stormwater drainage system.

These planters offer a flexible design option for urban contexts, and can be sized to fit almost any space. Multiple planters can be linked together to allow water to flow from one planter to another as the wells fill up to prevent overloading. The depth of these planters offers a much higher capacity for stormwater than most other green infrastructure tools.

TREE WELL

The tree wells used in Traverse City are large, concrete containers that are designed for high stormwater volume treatment and pollutant removal. These are ideal for urban locations with constrained spaces and concentrated pollutants. The facility absorbs the pollutants and allows the treated water to filter through to an underdrain that connects to the city stormwater system.

VEGETATED SWALE

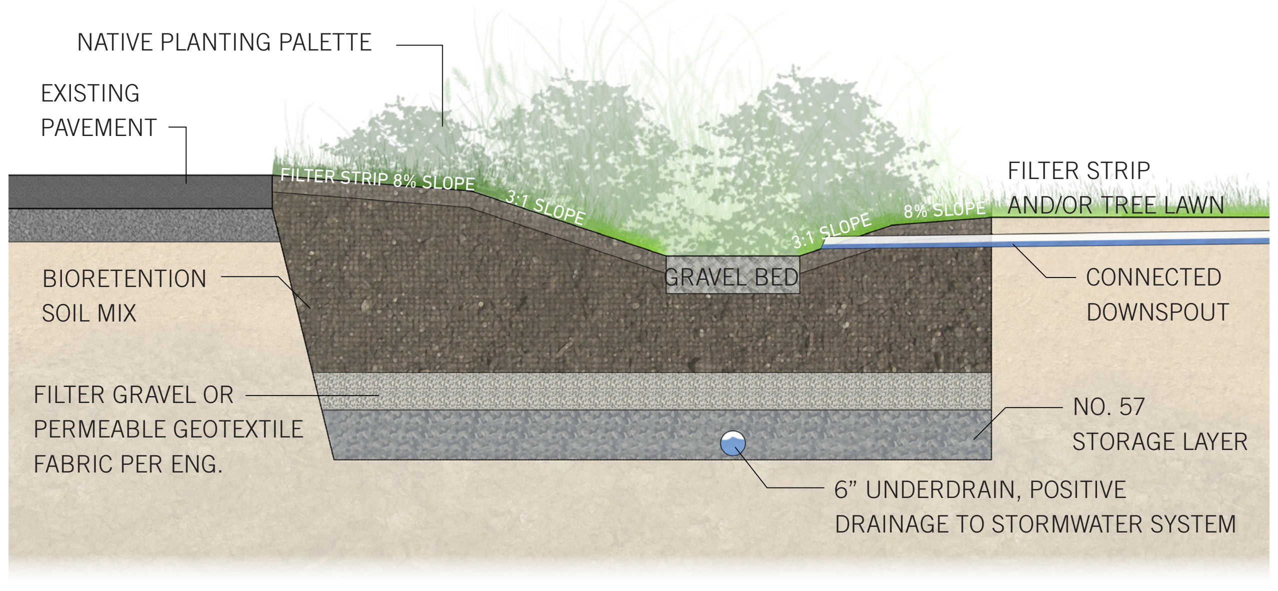
Vegetated swales, also known as rain gardens, are typically a more naturalized version of stormwater planter. They are shallow depressions with sloped, planted edges rather than curbed walls. While they are less expensive to build than stormwater planters, they are not able to handle as much water and often require more space.

Vegetated swales are more appropriate for lower density areas with less traffic, such as residential streets. They are most often designed to be flush with the street edge to allow for sheet flow directly into the swale. However, small curb cuts or drains can be used on streets with curbs to allow for runoff to filter into the swale.

PERMEABLE PAVEMENT

Permeable pavement allows for stormwater to filter through the pavement surface and reduce the amount of runoff. Options for permeable pavement can include porous asphalt, permeable pavers, and pervious concrete. They can be used on lower volume streets, in alleys, and on sidewalks, but require regular maintenance to ensure continued effectiveness.

TYPICAL SECTION - VEGETATED SWALE



TYPICAL DESIGN

Most stormwater facilities are designed with the same fundamental principles and only differ in the design of the structure that contains them. As shown in the section diagram here, most of these facilities include a layer of porous soil mixture that allows stormwater to filter through while the planting material absorbs and treats any pollutants. An additional, transition layer of sand or filter gravel can be provided to continue treatment and filtration of the stormwater before it is allowed to infiltrate the subsurface or is discharged through an underdrain into the stormwater drainage system. The underdrain is placed within a separate layer of gravel to prevent any debris from clogging the pipe.

The structural design elements that differ between facility types include curbs, retaining walls, and slopes. The image shown here is representative of a typical vegetated swale with sloping edges and no curbs. This allows for more naturalized treatment and planted edges, compared to a stormwater planter with hard edges and curbed walls. While the two facility types look quite different, the primary difference between them is in capacity, not function.

GREEN ALLEYS

Alleys make up a significant percentage of impervious surfaces in cities and are often not constructed with any connection to existing stormwater infrastructure. Green alleys are one approach to mitigating this uncontrolled stormwater runoff that many cities are adopting. In most cases, the design of a green alley is as basic as installing permeable pavement surfaces to allow runoff to filter into the ground as much as possible.

Cities like Dubuque Iowa, Washington DC, Chicago, and many others have established citywide programs for replacing existing, impervious alleys with new "green" alley treatments to help mitigate their stormwater issues. The installations have helped to reduce flooding in alleys, but have also improved the general condition and appearance of the alleys.

In Dubuque, the City established a Green Alley Reconstruction program to convert 240 alleys within the Bee Branch Watershed to green alleys. The goal for the program is to reduce stormwater runoff from alleys within the Watershed by up to 80 percent. More than 80 alleys have been completed so far, and the remaining alleys are scheduled for reconstruction before the year 2038.

Much of the cost for this program is covered by grant funding, but the remainder (typically about 15%) is assessed to adjacent property owners based on the size of their property.

In Chicago, the City developed a Green Alley Handbook to guide the design and installation of the alley improvements. Some of the techniques they use include:

- Reconstructing alleys with proper pitch and grade to allow for better drainage
- Installing permeable pavement to allow water to percolate through the ground
- Using recycled construction materials to reduce waste as well as use of new materials

Since the program's inception in 2001, more than 300 green alleys have been installed throughout Chicago.

Green Alley Installation in Dubuque, Iowa

Green Alley Installation in Chicago, Illinois