5

Toolbox

This section includes a set of tools - from facilities to encouragement, enforcement and evaluation - for better integrating and leveraging walking and bicycling investments in Robbinsdale.

In this section

5.1 - Introduction

A variety of tools, treatments and approaches will be needed to address and improve conditions for pedestrians and cyclists in Robbinsdale. This chapter provides a toolbox made up of components, approaches and considerations that can be deployed to address existing needs, leverage current city assets, and achieve the success that is envisioned by city staff, residents and other project partners.

Walking and bicycling are accessible to people of all ages, incomes, and physical abilities.

5.1.1 - A Combination of Engineering and Programming Approaches

Communities working to increase walking and biking often dedicate exclusive focus to facility and infrastructure (engineering) approaches.

This Plan's recommendations respond to and recognize the primary importance of the availability of safe, comfortable, convenient and inviting infrastructure as a necessary precondition for inviting greater number of users to walking and biking. However, the Plan also recognizes that a combination of engineering and programming (education, promotion and encouragement, enforcement, and planning and evaluation) approaches are usually necessary. In fact, combining both approaches will result in much greater gains than woking on either alone.

Walking and biking for transportation are easy ways to integrate physical activity into the day.

5.2 - Selecting Treatments

Numerous types of facilities exist for accommodating pedestrian and bicyclist needs. The characteristics of the treatment selected for a specific route or location will determine the safety and perception of safety (comfort) experienced by users of that facility.

This section provides a discussion of user needs as well as tools to guide the selection of specific pedestrian and bicycle facilities in a specific given context.

A bicyclist in Robbinsdale uses a paved shoulder on 36th Avenue North.

5.2.1 - Addressing User Needs and Comfort

One of the determinants of whether a system will be successful or not is if it takes into account the needs of its users.

Research and experience from cities that have improved rates of walking and biking show that the way to make these modes a more inviting option for more residents (and thus increase their use for everyday travel) is to develop continuous networks that provide reasonably direct connections to useful destinations and that are made up of routes that do not exceed the level of tolerance for traffic stress of the mainstream adult population.

5.2.2 - Selecting Treatments to Improve Conditions for Walking

The following detailed guidance is provided to assist in selecting treatments to improve the conditions for pedestrians in Robbinsdale. Specific recommendations that have incorporated this guidance can be found in Chapter 4, Recommendations.

Most transit users are also pedestrians at some point in their trip.

A pedestrian in Robbinsdale walking along 36th Avenue North.

5.2.2.a - Criteria for Crossing Treatments at Uncontrolled Locations

Roadway Configuration	# of lanes crossed to reach a refuge (1)	# of multiple threat lanes per crossing (2)	Roadway ADT and Posted Speed															
			1,500 – 9,000 vpd				9,000 – 12,000 vpd				12,000 – 15,000 vpd				>15,000 vpd			
			≤ 30 mph	35 mph	40 mph	≥ 45 mph	≤ 30 mph	35 mph	40 mph	≥ 45 mph	≤ 30 mph	35 mph	40 mph	≥ 45 mph	≤ 30 mph	35 mph	40 mph	≥ 45 mph
2 Lanes (one way street)	2	1	A	B	C	E	A	B	C	E	B	B	C	E	B	C	C	E
2 Lanes (two way street, no median)	2	0	A	B	C	E	A	B	C	E	B	B	C	E	B	C	C	E
3 Lanes w/ Raised Median	1 or 2	0 or 1	A	B	D	E	A	C	D	E	B	D	D	E	C	D	D	E
3 Lanes w/ Striped Median	3	0 or 1	C	C	D	E	C	C	D	E	C	C	D	E	C	D	D	E
4 Lanes (two way street, no median)	4	2	A	D	D	E	B	D	D	E	B	D	D	E	D	D	D	E
5 Lanes w/ Raised Median	2 or 3	2	A	B	D	E	B	C	D	E	B	C	D	E	C	C	D	E
5 Lanes w/ Striped Median	5	2	D	D	D	E	D	D	D	E	D	D	D	E	D	D	D	E
6 Lanes (two way street with or without median)	3 to 6	4	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F

NOTES:
Painted medians shall not be considered a refuge for a crossing pedestrian. Similarly, a 4 foot wide raised median next to a left turn lane can only be considered a refuge for pedestrians if the left turning volume is less than 20 vehicles per hour (meaning that in most cases the left turn lane is not occupied while the pedestrian is crossing).
A multiple threat lane is defined as a through lane where it is possible for a pedestrian to step out from in front of a stopped vehicle in the adjacent travel lane (either through or turn lane).

Treatment Descriptions

A Install marked crosswalk with enhanced road-side signs
Specific Guidance: Install marked crosswalk with "State Law – Yield to Pedestrian" signs mounted on the side of the roadway with standard (W11–2) advance pedestrian warning signs; use S1–1 signs for School Crossing locations.

B Install marked crosswalk with enhanced road-side and in-roadway (bollard mounted) signs
Specific Guidance: Install marked crosswalk "State Law – Yield to Pedestrian" signs mounted on the side of the roadway and on in-roadway bollards; use standard (W11–2) advance pedestrian warning signs; use S1–1 signs for School Crossing locations.

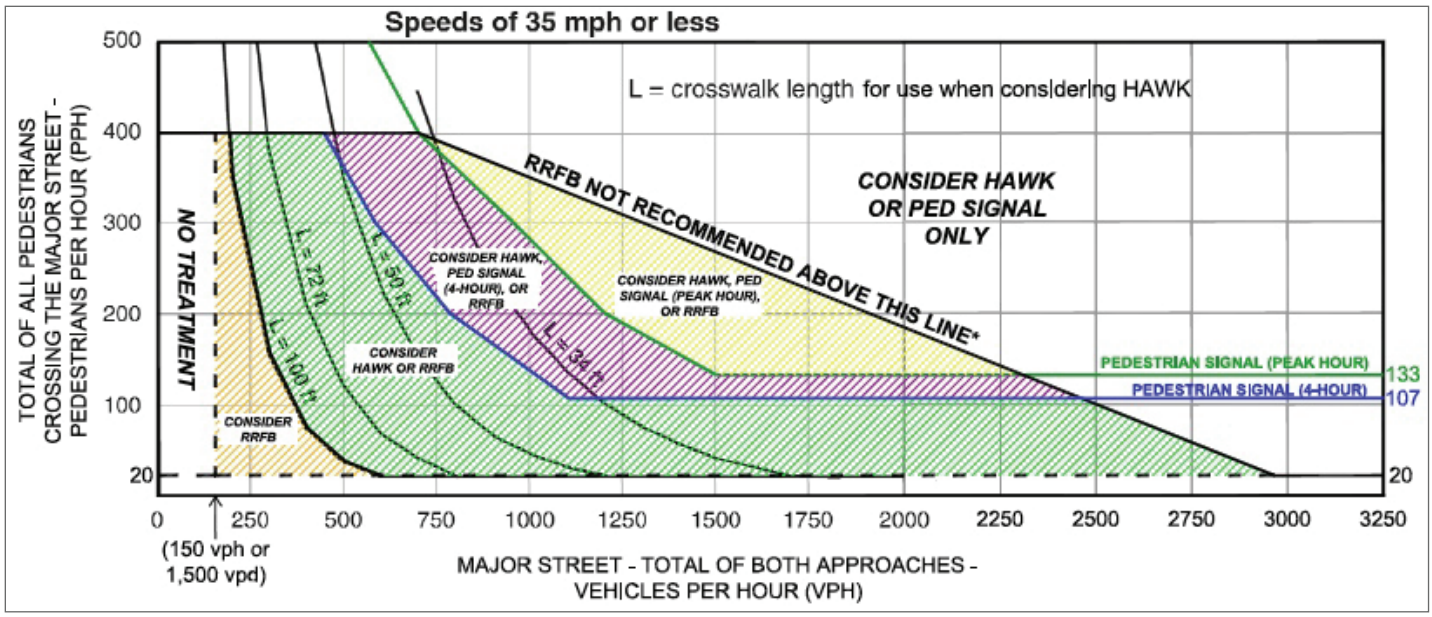
C Install marked crosswalk with enhanced signs and geometric improvements to increase pedestrian visibility and reduce exposure
Specific Guidance: For 2 or 3-lane roadways, install marked crosswalk with "State Law – Yield to Pedestrian" signs mounted on the side of the roadway and on in-roadway bollards or median mounted signs; use standard (W11–2) advance pedestrian warning signs; use S1–1 signs for School Crossing locations. Add neckdowns or median refuge islands to shorten the pedestrian crossing distance and increase pedestrian visibility to motorists.

D Install marked crosswalk with enhanced signs, pedestrian activated RRFBs, and geometric improvements to increase pedestrian visibility and reduce exposure.
Specific Guidance: Install raised median refuge island (unless it is a one-way street or one already exists) to shorted the pedestrian crossing distance and increase pedestrian visibility to motorists. [If a median refuge cannot be constructed on a two-way street, go to Scenario F]. Install marked crosswalk with "State Law – Yield to Pedestrian" signs WITH pedestrian activated RRFBs mounted on the side of the roadway and on median mounted signs; use standard (W11–2) advance pedestrian warning signs; use S1–1 signs for School Crossing locations. Consider adding neckdowns at the crossing if on-street parking exists on the roadway and storm drain considerations will allow. [Note: If pedestrian volume falls above the RRFB limit line in 5.2.2.b and 5.2.2.c, consider HAWK beacon, pedestrian traffic signal, or grade-separated crossing.]

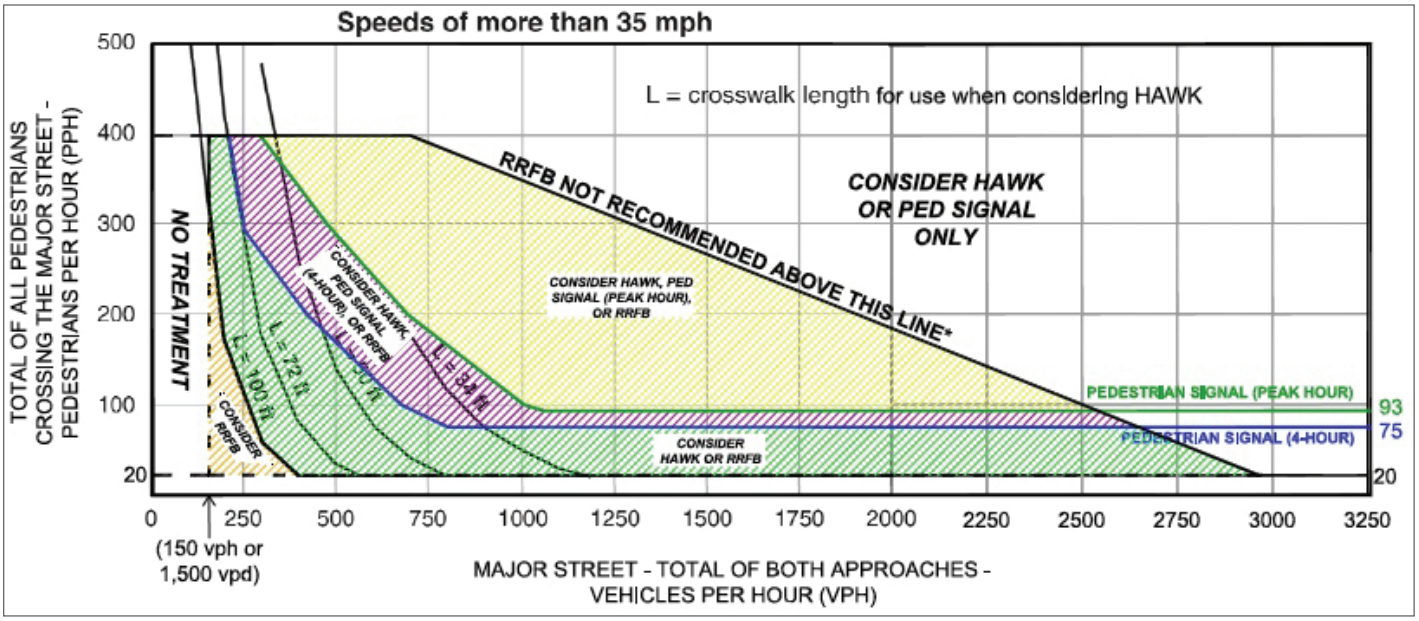
E Do not install marked crosswalk at uncontrolled crossing. Determine if the speed limit can be effectively reduced to 40 mph AND a raised refuge median can be installed. If so, utilize Scenario D criteria above. If this is not possible, or if pedestrian volume falls above the RRFB limit line on 5.2.2.b and 5.2.2.c, consider HAWK beacon, pedestrian traffic signal, or grade-separated crossing.
Specific Guidance: Consider HAWK beacon, pedestrian traffic signal or grade-separated crossing; application of these treatments will consider corridor signal progression, existing grades, physical constraints, and other engineering factors.

F Do not install marked crosswalk at uncontrolled crossing with 3 or more THROUGH lanes per direction or where the speed limit is ≥ 45 mph and/or there is not a median refuge on a 5-lane crossing. Consider HAWK beacon, pedestrian traffic signal, or grade-separated crossing.
Specific Guidance: Consider HAWK beacon, pedestrian traffic signal or grade-separated crossing; application of these treatments will consider corridor signal progression, existing grades, physical constraints, and other engineering factors.

5.2.2.b - Guidelines for the Installation of Pedestrian Hybrid (HAWK) Beacons, Pedestrian Signals, or Rectangular Rapid Flash Beacon (RRFB) Signs on Low-Speed Roadways from the City of Boulder Pedestrian Crossing Treatment Installation Guide



5.2.2.c - Guidelines for the Installation of Pedestrian Hybrid (HAWK) Beacons, Pedestrian Signals, or Rectangular Rapid Flash Beacon (RRFB) Signs on High-Speed Roadways from the City of Boulder Pedestrian Crossing Treatment Installation Guide



Note: 5.2.2.a, 5.2.2.b, and 5.2.2.c are from the 2011 City of Boulder, CO *Pedestrian Crossing Treatment Installation Guidelines*

5.2.3 - Selecting Treatments to Improve Conditions for Bicycling

The following detailed guidance is provided to assist in selecting treatments to improve the conditions for bicyclists in Robbinsdale. Specific recommendations that have incorporated this guidance can be found in Chapter 4, Recommendations.

A bicyclist in Robbinsdale rides along Shoreline Drive near Crystal Lake.

5.2.4 - Levels of Separation for Bike Facilities

Off-Street Bike Facilities (Shared-Use Facilities Shared with Pedestrians)

Shared-use side path

Shared-use path/trail

On-Street Bicycle Facilities Not Shared with Motor Vehicles

Roadway shoulder

Bike lane

Buffered bike lane

Cycletrack

On-Street Bicycle Facilities Shared with Motor Vehicles

Neighborhood slow street / Bicycle Boulevard

Sharrow (shared-lane arrow)

Increasing Separation from Motor Vehicles

Increasing Separation from Motor Vehicles

Note on Application of Facilities

In general, bicycle routes where higher motor vehicle traffic speeds and volumes are present should offer greater separation from motor vehicles. This will result in facilities that are more inviting to current and potential bicycle riders and will invite use by people through a greater range of ages and abilities.

5.2.5 - Selecting the Appropriate On-Street Bicycle Facility

Figure 5.2.5.a - Bikeway Design Selection for Rural (Shoulder and Ditch) Cross Section

Motor Vehicle ADT (2 Lane)		<500	500-1,000	1,000-2,000	2,000-5,000	5,000-10,000	>10,000
Motor Vehicle ADT (4 Lane)		N/A	N/A	2,000-4,000	4,000-10,000	10,000-20,000	>20,000
Motor Vehicle Speed	25 mph	PS = 4 ft* or SL	PS = 4 ft* or SL	PS = 4 ft* or WOL	PS = 4 ft*	PS = 4 ft*	N/A
	30 mph	PS = 4 ft* or SL	PS = 4 ft* or WOL	PS = 4 ft*	PS = 4 ft*	PS = 6 ft	PS = 4 ft*
	35-40 mph	PS = 4 ft* or SL	PS = 4 ft* or WOL	PS = 6 ft	PS = 6 ft	PS = 6 ft	PS = 8 ft
	45 mph and greater	PS = 4 ft*	PS = 4 ft*	PS = 6 ft	PS = 8 ft	PS = 8 ft	SUP or PS = 10 ft

*See discussion in Section 4-3.1 of the MnDOT Bikeway Facility Design Manual (below) regarding rumble strips on 4 ft shoulders.
PS = Paved Shoulder; SL = Shared Lane; SUP = Shared-Use Path; WOL = Wide Outside Lane

Figure 5.2.5.b - Bikeway Design Selection for Urban (Curb and Gutter) Cross Section

Motor Vehicle ADT (2 Lane)		<500	500-1,000	1,000-2,000	2,000-5,000	5,000-10,000	>10,000
Motor Vehicle ADT (4 Lane)		N/A	N/A	2,000-4,000	4,000-10,000	10,000-20,000	>20,000
Motor Vehicle Speed	25 mph	Bicycle Boulevard	Bicycle Boulevard	Bicycle Boulevard	Bicycle Boulevard or BL = 5 ft	BL = 5 ft	N/A
	30 mph	Bicycle Boulevard	BL = 5 ft	BL = 5 ft	BL = 5 ft	BL = 6 ft	BL = 6 ft
	35-40 mph	BL = 5 ft	BL = 5 ft	BL = 5 ft	BL = 6 ft	BL = 6 ft	BL = 6 ft or PS = 8 ft
	45 mph and greater	BL = 5 ft	BL = 5 ft	BL = 6 ft	BL = 6 ft	BL = 6 ft or PS = 8 ft	SUP or PS = 10 ft

BL = Bicycle Lane; PS = Paved Shoulder; SUP = Shared-Use Path

Notes:

- While the minimum widths for bike lanes are presented here, it is recommended that wider bike lanes be considered when the following conditions exist: an on-street facility with greater protection/separation from vehicles (such as buffered bike lanes or cycletracks) is warranted based on local road conditions, destinations, and expected and desired bicycle ridership.
- Preferred ADT for Bicycle Boulevards is 1,500, maximum is 3,000
- Adapted from MnDOT, AASHTO, NACTO guides.

5.3 - Facilities

This section provides an overview and additional locality-specific details for a selection of facilities recommended for application in Robbinsdale.

A "Toolbox of Pedestrian and Bicycle Treatments and Best Practices" report detailing all facilities with potential application in Robbinsdale is included in this Plan's Appendix.

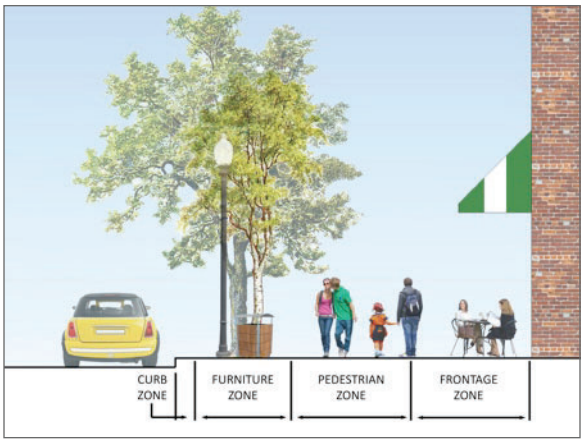
5.3.1 - Sidewalks

Sidewalks designate space for the use of pedestrians, and are a foundational element of pedestrian mobility. They are also a vital component of healthy commercial districts, providing access to businesses, space for street furniture and plantings, and for the casual interactions that support community interpersonal connections.

Sidewalks: Recommendations for Robbinsdale

Important considerations related to sidewalks in Robbinsdale include:

- Sidewalks should be installed on both sides of the roadway on all residential and commercial streets where pedestrian paths do not already exist;
- A minimum width of 5 feet is recommended;
- If a shared-use facility is used instead of a sidewalk, it should be a minimum of 10 feet wide;
- Sidewalk installation should be prioritized along roads that serve transit routes and include transit stops; and
- Sidewalks should be required on all new road construction and all road reconstruction projects.



Example of the four sidewalk "zones" in a commercial area.

Sidewalk zones

Current sidewalk design considers four distinct "zones" that allow them to function in different contexts, with dimensions that respond to the the land uses and locations they serve. The four zones are:

- **The pedestrian zone** is the zone where people walk. Width for Main Street / commercial districts should be between 6 to 8 feet, for residential districts should be at least 5 feet.
- **The frontage zone** is the portion of the sidewalk that provides access to businesses or other uses adjacent to the sidewalk.
- **The furniture zone** is the portion of the sidewalk where trees, newspaper stands, benches, signs and trash receptacles are placed. This zone increases the distance between the pedestrian zone and moving motor-vehicles, increasing the comfort for people on foot.
- **The curb zone** is the outermost edge of the pedestrian realm and provides a defined and safe separation between automobiles and pedestrians.

5.3.2 - Shared-Use Facilities

Off-road shared-use paths, often referred to as multi-use trails, offer space separated away from the street for pedestrians, bicyclists, and other users of non-motorized transportation. These paths often link parks and other recreation destinations, and some serve broader regional connection purposes. Shared-use paths can also exist in the form of shared use "sidepaths" that run along roadways and provide a space for pedestrians and bicyclists to access commercial, residential, and retail destinations.

A bicyclist rides in the pedestrian zone of a downtown Robbinsdale sidewalk. When comfortable bicycle facilities are not provided, many bicycle riders will use sidewalks and other pedestrian spaces for their travel, which decreases safety for all users.

Though users of shared-use paths are separated from automobile traffic, they still encounter potential conflicts with motor vehicles at intersections, and are also subject to conflicts with other users within the facility. For example, a family walking to the park, an inline skater, a child riding a bike, a jogger with a dog, and an experienced fitness cyclist may have to share the same space simultaneously. In order to allow a broad range of users to safely and comfortably share the same space, close attention should be paid to width and application, lane striping, and signage.

A pedestrian and bicyclist enjoy Victory Memorial Parkway.

Shared-use sidepaths may exist on one side of the street, or both. To avoid potential issues for users crossing busy roadways to access destinations, facilities should be provided on both sides of roadways, particularly along primary travel corridors such as Bottineau Boulevard where travel volumes for pedestrians and bicyclists are expected to be high, or where key trip destinations or generators are located on both sides of the street. Sidepaths should be marked as facilities to be shared by both pedestrians and bicyclists. Signage and striping should be used to indicate whether the path accommodates bicycle travel in one direction, or in both directions.

Width and Application

Recommended width for shared-use paths is dependent on the context, volume, and mix of users. The typical paved width for shared-use paths intended to accommodate two-way bicycle travel and pedestrians ranges from 10 to 15 feet. Wider paths are recommended in areas with higher pedestrian use (at least 30% of all users), or higher user

volumes in general (300 or more users at peak hour). Wider paths allow for a higher level of service (i.e. optimal conditions and a high quality user experience) when used frequently by pedestrians, bicyclists, and other users. Additionally, wider shared-use paths make maintenance and snow removal easier.

For most cases in Robbinsdale (unless user volumes are very high), segregation of user types is not necessary as the expected volume of users allows for the safe navigation of users around each other.

A minimum sidepath width of 8 feet is recommended when facilities are provided on both sides of a roadway. Where they are provided on only one side of a roadway, a minimum width of ten feet is recommended.

Trail signage helps to encourage behaviors like riding slow and keeping right.

Additional signage and pavement markings would make it clear to pedestrians and bicyclists that sidepaths are shared-use facilities.

Centerline Striping

Centerline striping within a path provides directional separation and also indicates to users when passing is permissible. Pedestrian and bicycle symbols and arrows on shared-use paths can also be used to indicate a shared facility and clearly mark the direction of travel. Options for centerline striping include:

- A dashed yellow center line should be provided on priority shared-use paths where two-way travel occurs. Bike and pedestrian stencils should be used to indicate that both modes are expected to share the same lane in the same direction.
- For paths with extremely heavy user volumes, it is recommended that users be separated further:
  - One option is to provide three separate lanes within a single path including two one-way lanes for bicycle travel and one bidirectional lane for pedestrian travel. A pathway width of at least 15 feet is recommended for such a configuration to allow 5 feet for each lane; and
  - The second option is to physically separate users by providing a distinct pathway for pedestrians.

Signage

Trail speed limit signs should be installed along shared-use paths with high volumes of bicycle users. Typical speed limits for shared-use paths range from 10 to 15 miles per hour. Speed limit considerations may include user visibility, pathway curvature, and user volumes. In areas with high volumes of both pedestrian and bicycle users, additional signage reminding users of passing etiquette (warn when passing slower trail users) and illustrating proper lane use are recommended to reduce conflict.

Off-Road Shared-Use Facilities: Recommendations for Robbinsdale

- Signage and/or pedestrian and bicycle stencils should be installed along shared-use paths and sidepaths indicating their use for pedestrians and bicyclists;
- If there is a shared-use path on only one side of the roadway, it should be signed and striped (with dashed yellow lines) as a two-way facility, and it should be at least 10 feet wide; and
- Major trail crossings should be designed with extra care and according to best practices included in this plan, Three Rivers Park District, and Minneapolis Park and Recreation Board.

Recommended Separation Between Shared-Use Paths and Roadways

Roadway With No Curb

Speed Limit (mph)	Separation (ft)
40 mph or less	20 ft (desired) 10 ft (minimum)
45 mph or greater	24–35 ft
Freeway	50 ft (minimum)

Roadway With Curb

Speed Limit (mph)	Separation (ft)
30 mph or less	5 ft (minimum) 3 ft (minimum, if parking allowed)
35–40 mph	5 ft (minimum)
45 mph or greater	10 ft (desired) 5 ft (minimum)
Freeway	50 ft (minimum)

Source: 2007 MnDOT Bikeway Facility Design Manual

5.3.3 - On-Street Bicycle Facilities

This Plan recommends developing a system of on-street bicycle facilities to complement an expanded shared-use path network within Robbinsdale. On-street bicycle facilities are a relatively low-cost improvement that can increase the number of people biking to destinations across the city.

Although on-street bicycle facilities offer lower levels of separation and user comfort than off-road facilities, they are appropriate on roadways with lower vehicle volumes and travel speeds and are sometimes preferred by commuters and other experienced bicyclists. On-street bicycle facilities allow bicyclists to travel at grade with motor vehicles, making it so that they do not have to "dip down" at intersections and crossings as is required on shared-use sidepaths.

There are a range a different on-street bicycle facilities, from "Neighborhood Slow Streets / Bicycle Boulevards," that can be implemented on low volume / low speed residential streets, to bike lanes, to buffered bicycle lanes and cycletracks which offer additional distance or barrier separation from motor vehicles.

Selecting the appropriate treatment, and designing the specific treatment along a given route depends on a number of factors, including:

- Speed of the roadway;
- Motor vehicle volume (AADT) of the roadway;
- Land use context/nearby destinations;
- Number of vehicle travel lanes;
- Width of existing pavement and existing right-of-way;
- Current and expected ridership; and
- Presence of on-street parking

Please refer to Chapter 5.2.4 for guidance on selecting bicycle facilities. A overview of use and design considerations for each type of on-street bicycle facility is included below.

A bicyclist travels in an on-street bicycle lane. Image courtesy of pedbikeimages.org, Jennifer Campos.

On-street parking is limited to two hours on West Broadway Avenue in downtown Robbinsdale.

On-Street Bicycle Lane

Bike lanes designate a portion of the roadway for preferential use by bicyclists. Lanes are defined by striping, pavement markings and signage and should be 5 feet wide at a minimum. Bike lanes create separation between bicyclists and motorists and increase cyclist comfort and visibility.

On some roads, the curb-to-curb width of the road pavement may be a constraint and expanding pavement may not be possible. There are some solutions that can address this issue and allow for on-street bicycle facilities. These include:

- Implementing a "road diet" by converting a four-lane roadway to three-lanes (two-lanes each direction with a center turn lane). An existing example in Robbinsdale is on Lake Drive / County Road 9, east of Bottineau Boulevard;
- Removing on-street parking; or
- Decreasing the width of travel lanes (down to 11 feet or 10 feet) in urban settings.

The Institute of Transportation Engineers (ITE), in *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities*, a report sponsored by the Federal Highway Administration (FHWA), recommends using a roadway's target (or desired) speed as guidance for the width of travel lanes provided. Consistent with AASHTO guidance and design flexibility, the study finds that 10 foot travel lanes are suitable for local and collector streets with operating speeds to 30 mph, while lane widths from 10 to 11 feet are suitable for use in arterials with operating speeds to 35 mph.

On-street bicycle lane created using the paved shoulder.

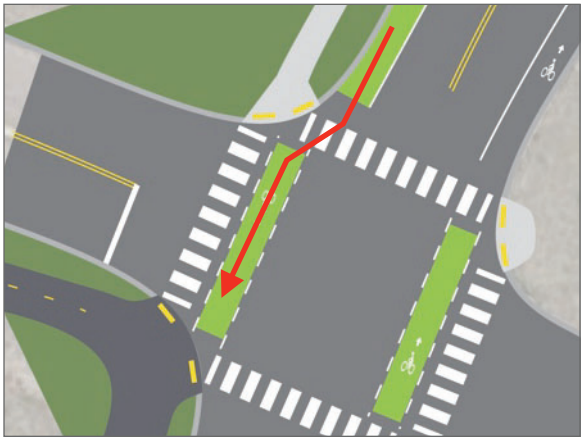
Travel lanes, a center turn lane, and paved shoulders on 36th Avenue N.

Bicycle Use of Paved Shoulder

Paved shoulders currently exist in Robbinsdale, however they are not designated bicycle facilities, as they lack pavement markings and signage. There are opportunities to reconfigure these shoulders into bicycle lanes (and potentially buffered-bicycle lanes) by restriping travel lanes. Additional bike route signage and designation of shoulder facilities as bicycle lanes would improve the safety and

comfort of bicyclists who wish to travel on the street network.

When turning paved shoulders into bicycle lanes, curbs used to divert storm water into catch basins should have bicycle-compatible designs. Pavement overlays and storm water catch basins should be designed to avoid leaving an abrupt edge within the riding area. In areas where an edge or significant seam is present, the bicycle lane should measure at least 5 feet, outside of the edge or seam.



Green paint can help direct bicyclists and alert motorists when there is a transition from an on-street to an off-street bicycle facility.

Neighborhood Slow Street / Bicycle Boulevard

A Neighborhood Slow Street Bicycle Boulevard (also sometimes known as a Neighborhood Greenway or Bike Boulevard) is a neighborhood residential street modified to calm automobile traffic and discourage cut-through traffic to make walking and bicycling on those streets more comfortable. Neighborhood Slow Streets are appropriate for most residential streets, and can provide useful parallel route alternatives to important destinations if located within block or two from a major thoroughfare with high traffic volumes.

Target speed for motor-vehicle traffic on a Neighborhood Slow Street should be 20 to 25 mph, with a preferred motor-vehicle volume of 3,000 ADT or less. Bicycle boulevards are an effective way of creating lower stress connections for bicycles in a city's network and are appropriate for several residential streets in Robbinsdale to connect with other routes.

A neighborhood slow street in Northeast Minneapolis. A traffic circle calms traffic along this route.

On-Street Bike Facilities: Recommendations for Robbinsdale

- Install on-street Bicycle Lanes and Neighborhood Slow Streets as recommended in Chapter 4.

5.3.4 - Protected Bicycle Facilities

Physical separation from motor vehicle traffic increases comfort for a significant population of existing and potential riders in a community (it has been estimated that approximately 60% of a community's residents would be interested in riding a bicycle more often if stresses related to interactions with motor vehicle traffic could be significantly reduced). As a result, more and more communities are implementing separated / protected bicycle facilities to establish on-road routes. These facilities offer a similar experience to bicycling on an off-road shared-use path while on the street itself. They include:

Cycletracks are a type of on-road bicycle facility that offer separation between bicyclists and motor vehicle traffic.

Buffered Bicycle Lanes

Buffered bike lanes provide cyclists with extra space between the bike lane and moving traffic, increasing their comfort. Buffers can provide cyclists with adequate room to pass without having to merge into automobile traffic. Buffered bicycle lanes are appropriate anywhere a traditional bicycle lane is proposed and where the right-of-way is available. Buffered bike lanes may provide a safer and more comfortable designated bicycling space for parents with schoolchildren than conventional bike lanes and should be considered for routes serving school locations.

A rendering of protected intersection for bicyclists. Elements such as advance vehicle stop bars, corner refuge islands, setback bike crossings, and bicycle-specific signals are included in this concept. Image courtesy of protectedintersection.com

Cycletracks (Protected Bikeways)

A cycletrack is an exclusive lane for cyclists separated from motor-vehicle traffic by a painted buffer and/or physical barrier (such as a curb, parked cars, or bollards), and separated and distinct from the sidewalk. Different forms of cycletracks include one-way protected cycletracks, raised cycletracks and two-way cycletracks. Cycletracks require more space and infrastructure than conventional bike lanes, and require special design attention at intersections.

Cycletracks have been shown to significantly increase bicycle ridership for people of all ages and experience levels because the significant separation from motorized vehicles greatly increases rider comfort. Cycletracks also increase safety by reducing the likelihood of 'dooring' accidents.

Protected Intersections

Protected intersections extend cycletracks into an intersection, and provide protected signal phasing for riders crossing at an intersection.

5.4 - Tools for Addressing Intersections and Trail Crossings

Intersections were frequently identified by Robbinsdale residents as barriers to walking and bicycling in the city.

Sidewalks, off-road shared-use paths/trails, and shared-use sidepaths through the city intersect many higher-volume / higher-speed arterial and collector streets. These, in combination with long crossing distances, make crossing on foot or bike difficult or not inviting.

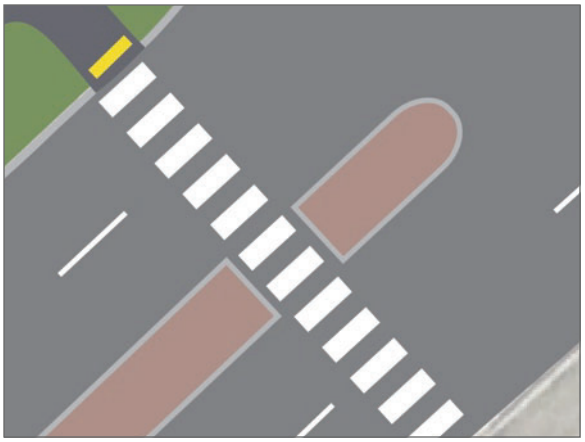
Intersections and crossings identified as highest priority for improvement are identified in Chapter 4 of this plan. This section offers guidance for improvements that can be made at any intersection to make conditions more comfortable for pedestrians and bicyclists. Improving conditions for walking and biking at identified priority intersections and other intersections across the city will significantly improve qualities of comfort and convenience for the overall walking and biking network.

Several factors contribute to the actual and perceived safety of pedestrians and bicyclists at intersections:

- Crossing distance and time;
- Traffic speed;
- Traffic volume; and
- Visibility to motorists/conflict points.

Several infrastructure improvements/approaches can be made to address these factors.

A pedestrian waits to cross Bottineau Boulevard at 41st Avenue N in Robbinsdale. This intersection has a high-visibility crosswalk, but would benefit from a "bull-nose" extension to protect pedestrians at the median, as illustrated below.



A "bull-nose" refuge island is created by extending the median beyond the crosswalk.

STRATEGY 1: Shorten and Break Up the Crossing Distance

Refuge Islands

Refuge islands help to break up pedestrian crossings across wide streets, allowing pedestrians to focus on crossing one direction of traffic at a time. Refuge islands also provide an additional traffic calming benefit by visually narrowing lanes and reducing turning radius of left-turning vehicles. Traffic calming benefits of medians can be increased with

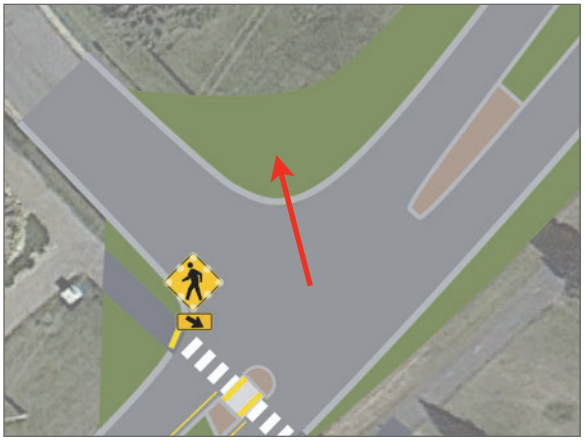
vegetation (as long as it does not block pedestrian visibility) and other design features.

Many major intersections in Robbinsdale already include traffic medians, though few of them currently function as pedestrian refuges. These existing medians should be extended beyond crosswalks to create "bull-nose" refuges providing additional protection to pedestrians and bicyclists crossing the street. In cases where shared-use paths cross intersections, refuge islands should be wide enough to accommodate pedestrians and bicyclists.

Curb Extensions

Curb extensions are the extension of the sidewalk and curb into the travelway at corners. These features (also known as bump-outs) improve pedestrian safety by increasing the visibility of pedestrians to motorists, by slowing down right-turning motorists, and by reducing crossing distance, thus decreasing the time it takes for a pedestrian to travel across an intersection.

Curb extensions should be considered for streets in Robbinsdale that include on-street parking, and in pedestrian-oriented areas including downtown, and around schools. Curb extensions should not extend into bicycle travel lanes.



By reducing the vehicle turning radius, the speed of turning motor-vehicles is reduced and the street becomes more comfortable for pedestrians and bicyclists to cross.

STRATEGY 2: Reduce Traffic Speed and Shorten Crossing Distance

Reduce Corner Radii

Minimizing corner radii is an intersection design solution that can benefit pedestrians and bicyclists by reducing traffic speeds and shortening crossing distances.

Smaller corner radii encourage motorists to turn at slower speeds, and also allow for shorter distances for pedestrians to cross. Most local streets in Robbinsdale already have small corner radii. However some corners, where city and county roads intersect, have wider corner radii. These locations should be reevaluated and updated when feasible. New roadway projects should use minimum turning radii recommendations based on best practice guidelines

according to AASHTO with careful consideration of the design vehicles selected when developing radius standards.

Modify Road Configurations

Additional modifications to roadways can be made to enhance the comfort of pedestrians and bicyclists traveling along and crossing them, by working to slow motor vehicle traffic. Road modifications may also provide the necessary space for on-street bicycle accommodations without the expansion of road pavement.

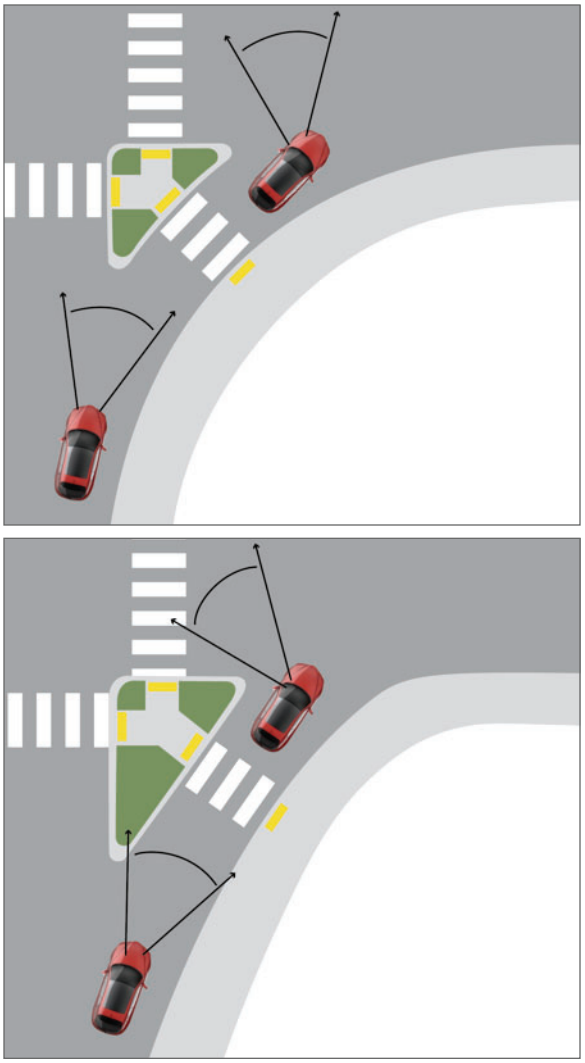
Possible street modifications include:

- Considering a "road diet" by removing motor vehicle travel lanes;
- Removing turn lanes at intersections;
- Removing center through-lanes and adding a center left-turn lane; and
- Reducing the width of motor vehicle travel lanes. 10 or 11 foot travel lanes are adequate for city streets.

Right-Turn Slip-Lane Design

Slight changes in the design of right-turn slip-lanes and pork chop islands can transform them from high-speed turn lanes into traffic-calming pedestrian refuges. Straightening and elongating the entry angle, reducing the width of the turn lane, and reducing the turning radius at the exit help to improve drivers' visibility of pedestrians and oncoming traffic when merging.

Crossings to pork chop islands in high-priority areas can be additionally enhanced by installing raised crosswalks to elevate and improve visibility of users, and further calm traffic. In central commercial areas, the City of Robbinsdale may wish to consider removing slip-lanes when possible in favor of increasing pedestrian and bicyclist convenience.



Two different slip lane configurations: the first prioritizes vehicle speed, the second improves pedestrian safety while also improving driver sight lines.

STRATEGY 3: Make Pedestrians and Bicyclists More Visible at Intersections and Crossings

High Visibility Crosswalks and Vehicle Stop Bars

High-visibility "continental" or "ladder" crosswalks with vehicle stop bars are recommended for all fully-controlled intersections where sidewalks exist (all-way stop signs or traffic lights). Consideration should be made for upgrading pavement markings at intersections in Robbinsdale, especially those identified as priority intersections, those undergoing reconstruction, and those at other intersections in identified priority areas.

A faded crosswalk in downtown Robbinsdale.

Additionally, green paint can be added to locations where bicycle facilities cross roadways to enhance bicyclist visibility. The city should consider green paint for intersections that include off-road or on-road bicycle facilities, particularly in priority areas or areas with potential turning conflicts.

A shared-use path crossing of Shoreline Drive.

Signage and Signals

Signage is an important element in comfortable and low-stress crossings, particularly where off-road paths/trails cross streets at mid-block locations. Adding signals and modifying the timing of existing signals can increase comfort for pedestrians and bicyclists at intersections and crossings. A few approaches involving signage and signals relevant to Robbinsdale are discussed below.

Signage should be prominent and visible to oncoming motor vehicle traffic from both directions. Advance warning crossing signage should be provided as well. Flashing beacons in conjunction with signage serve to further enhance the visibility of those crossing the street, as well as motorist compliance.

Countdown Timers

Countdown timers should be provided at all intersections where crossing signals are provided to alert pedestrians and bicyclists of the time they have to cross. Considerations should be made for extending crossing times to better accommodate pedestrians and bicyclists, and potentially

adding leading pedestrian intervals to timers to allow for pedestrians and bicyclists to begin crossing the street before motor vehicle are given the green light.

Rectangular Rapid Flashing Beacon (RRFB) and High-Intensity Activated Crosswalk (HAWK) Beacon

RRFBs and HAWKs are signals that can be used at mid-block crossings or at crossings where no signal is present. These signals result in a high level of motor-vehicle yielding to pedestrians crossing the street. Guidance for the installation of HAWKs and RRFBs is provided in Figure 5.2.2.b and 5.2.2.c.

Raised and colored crosswalks slow right-turning vehicles. Courtesy of flickr, Richard Drdul.

Enforcement

Enforcement and ticketing in tandem with intersection improvements may help to improve driver compliance and change attitudes about the way drivers should interact with pedestrians and bicyclists at crossing locations. Signage warning drivers not to block crosswalks may also help to educate drivers and discourage them from blocking the movement of users.

5.5 - Signs, Signals, and Wayfinding

5.5.1 - Wayfinding and Route Signage

The Minnesota MUTCD and NACTO guide both include wayfinding guidance, as does the Minneapolis Street and Sidewalk Design Guidelines. These guidelines may be used as a template to shape pedestrian and bicycle route signage throughout the City of Robbinsdale to improve the overall pedestrian and bicycle transportation network. A hierarchy of signs may include basic directional signage at key intersections, as well as comprehensive network map kiosks at major destinations or rest stops.

Signage used on the Grand Rounds National Scenic Byway directs users to key destinations and routes. The style and look of the signs provides elements of branding to the network of trails and corridors. Image courtesy of minneapolisparks.org/grandrounds.

Robbinsdale can use signage to direct trail users to its downtown. The current Grand Rounds National Scenic Byway is only 1.5 miles, or a 10 minute bike ride from downtown. It is approximately a 30 minute walk. The future Crystal Lake Regional Trail will bring trail users even closer to downtown.

Sign providing destination, time and distance information for bicyclists.

Three main components are needed for an effective wayfinding system. They can be thought of as the 3 "Ds":

Distance

- The distance and time component informs pedestrians and bicyclists how long their trips will be, adding a measure of certainty and convenience when planning trips. In addition, many people may be surprised and intrigued by seeing how quickly they can walk or bike to destinations to which they regularly drive. Distance should be communicated in miles, including 0.10 mile increments, as well as in time for both pedestrians and bicyclists.

Direction

- The direction component of an effective wayfinding system guides pedestrians and bicyclists to destinations. Directional signage also helps users avoid obstacles such as freeways, cul-de-sacs, and dead end roads. The

direction is indicated by using an arrow on the sign that directs users to proceed forward or to prepare to turn. Directional signage also gives motorists warning to expect cyclists on the road, and to anticipate cyclists' turning or crossing movements.

Destination

- The destination component of an effective route sign helps users choose the most effective route to desired destinations and helps decrease confusion or wrong turns, especially in areas where the street system does not follow a grid pattern. Rest stop information can also be included on wayfinding information to efficiently route users to restrooms, water fountains, or view points.

Wayfinding signage to help bicyclists follow an established route.

5.5.2 - Signals

Bicycle traffic signals can be installed at intersections where there are high volumes of bicyclists, or where there are bicycle-only movements. They increase bicyclist comfort by reducing stress and delays at the intersection, and improve safety by reducing illegal and unsafe crossing maneuvers.

Loop detectors for bicycles detect the presence of bikes on the roadway. These allow a bicyclist to activate a traffic control device without having to press a button. Pavement markings can be used to direct cyclists to the proper spot where the signal device may detect their presence. The markings also alert motorists that bicycles will be present in various locations at signalized intersections.

A traffic signal for bicycles in Minneapolis.

5.5.3 - Priority Route and Branding Opportunity for Robbinsdale

Directional wayfinding signage provides an excellent opportunity to link a number of important commercial, employment, and recreation destinations in Robbinsdale, and to attract a greater number of visitors and shoppers into its downtown. Wayfinding signage could be branded to prominently include the Robbinsdale bird logo, and different routes could be identified by different colors or other indicators. These routes could then be publicized for

pedestrians and bicyclists to experience, potentially attracting visitors who wish to explore the routes and destinations.

The following routes could be signed and branded:

- A "greenway" or recreation route linking Victory Memorial Parkway, Crystal Lake, Sochaki Park, recreation destinations, and other stops;
- An "employment and shopping" route linking retail destinations and primary employment destinations along Bottineau Boulevard such as North Memorial Medical Center, the Terrace Center, and the area near 41st Avenue North; and
- Downtown Robbinsdale, including the future LRT station, should be used as a central hub for routes. The Bottineau LRT Station Area Pre-Planning Study identified that LRT riders will primarily access the station by walking and biking. On the Bottineau LRT line, Robbinsdale is the only "Main Street" type of station.

Signage used on the Grand Rounds National Scenic Byway directs users to key destinations and routes. The style and look of the signs provides elements of branding to the network of trails and corridors. Image courtesy of trekity.com.

5.6 - Transit Integration

Integrating pedestrian and bicycle networks into current and future transit networks will increase the usefulness, convenience and use of each system, and will benefit Robbinsdale residents by increasing the range of their walking and biking trips, providing additional options for work and recreation trips, and making it easier to integrate Active Transportation into their daily routines.

The future Robbinsdale LRT station should be comfortable and convenient for pedestrians and bicyclists to allow for multimodal trips. Improved connections between residential and employment areas will benefit Robbinsdale residents and workers. Image courtesy of metrotransit.org.

5.6.1 - Key Opportunity

The Bottineau LRT / Blue Line Extension presents a key opportunity to dramatically increase the use walking and biking as a daily transportation option for Robbinsdale residents and workers. The future Bottineau LRT Blue Line Extension will provide service from Robbinsdale to Crystal, Brooklyn Park, Golden Valley and Downtown Minneapolis, and interlink with the existing Blue Line providing service to Bloomington, MSP International Airport, and Mall of America. The existing Robbinsdale Transit Center / Hubbard Marketplace will serve as the Robbinsdale stop for the Bottineau LRT.

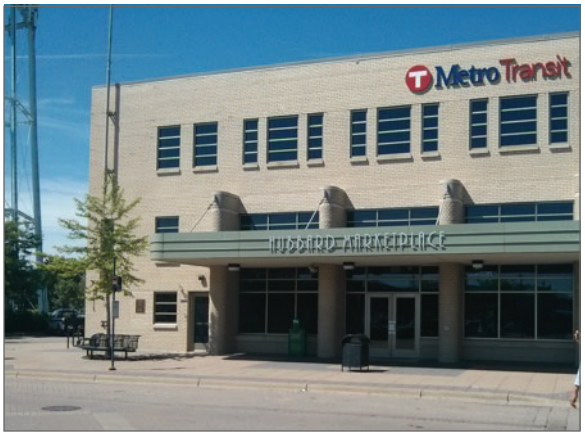
Developing comfortable and convenient connections between residential and employment areas and the Blue Line station will benefit Robbinsdale residents and workers. Improving pedestrian and bicycle access to the city's LRT station was an important focus for the work of this plan.

5.6.2 - Improving Pedestrian and Bicyclist Access to Transit

Providing a continuous low-stress network of sidewalks and shared-use paths connecting residential and employment concentrations to transit stations are an effective way of supporting non-motorized access to transit. In addition, pedestrian crossings should be located along the nearest intersection on both sides of transit stops. If transit stops are not located near convenient intersections, mid-block crossings should be investigated for implementation.

5.6.3 - Recommendations for Transit Stops

At a minimum, all transit stops should include a paved landing area for riders to wait outside of the pedestrian/bicycle travel-way, and to improve ease of loading and unloading. Stops serving high numbers of riders should include covered waiting areas. Heated bus shelters should also be considered at locations with high ridership for winter users.



Hubbard Marketplace, site of the current Robbinsdale Transit Center and the future Bottineau LRT station.

Availability of seating increases comfort for riders while waiting for transit. Seating is strongly recommended at stops serving high numbers of elderly riders, disabled persons, or children. Transit stops near grocery stores and shopping centers should also be prioritized for shelter and seating to accommodate riders returning with goods.

Transit stops and approaching walkways and crossings should be well lit to improve rider comfort and safety, and to improve visibility of riders to transit drivers.

Signage at bus stops should include time tables and route maps so that users can easily plan their transit trip. This is a priority at the future LRT station and at key shopping and employment destinations. The time tables and maps also helps market transit to non-users as it advertises that bus service is available, and may help to encourage people to try transit for a future trip. Robbinsdale can work with Metro Transit to increase the number of bus stops with more information.

5.6.4 - Bike Parking at Transit Stops and Stations

Providing secure long-term bicycle parking at transit stations helps reassure bike commuters that their bikes will still be there when they return from work, and will encourage bike commuting to transit. Short-term bicycle parking (which takes up less space) may also be provided at transit stops serving high numbers of riders. Typically, a mix of short-term and long-term bicycle parking is provided at transit centers.

5.6.5 - Bike Stations at Transit Centers

"Bike stations" provide cyclists with robust facilities for storage and maintenance of bicycles, and are generally located near transit hubs or other major destinations. Bicyclists who ride their bikes to transit can leave their bikes to be stored and serviced as needed while they continue their commute via transit. Bike stations often include amenities such as long-term bike parking and shower and locker facilities.

This fix-it station provides basic bicycle repair tools and parts with a vending machine and permanent repair stand.

Another option similar to the full-scale "bike station" described above is a "fix-it station." Fix-it stations are generally installed at transit centers. These stand-alone stations consist of a vending machine of bike parts and a set of bike tools attached to a permanent repair stand.

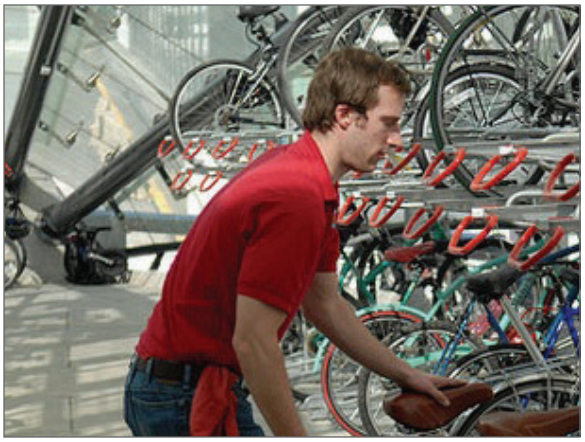
5.6.6 - Bike Share

A bike share program such as Nice Ride Minnesota can be a great way to increase the reach and effectiveness of a transit center. By siting rental kiosks at the future Robbinsdale LRT station and at locations within the city, commuters are given the option for hassle-free bike access to the transit system, and to the larger bike share system within the Twin Cities. The City of Robbinsdale is exploring the possibility of partnering with North Memorial Medical Center to bring Nice Ride to Robbinsdale.

Bikeshare can increase the range and convenience of bicycle trips, especially if combined with transit.

5.6.7 - Transit Integration: Recommendations for Robbinsdale

- Work with Metro Transit to provide comfortable connections for pedestrians and bicyclists to the Robbinsdale Transit Center, as well as short and long-term bicycle parking;
- Encourage and support expansion of Nice Ride in the city to supplement transit services;
- Work with Metro Transit to increase the number of bus stops with timetables and maps;
- Future Bottineau LRT station and the future Park and Ride should provide long- and short-term bicycle parking. Consider a bicycle station or fix-it station at the future LRT station; and
- Clear signage should direct pedestrians and bicyclists to the future LRT station.



The Bikestation in Washington, D.C. is a comprehensive bike facility which provides amenities such as bike parking, maintenance, changing facilities, retail services, and bicycle rentals for people who commute into the area without a bicycle. Image courtesy of home.bikestation.com/bikestation-washington-dc

5.7 - Ancillary, End of Trip, and Rest Facilities

Ancillary, End of Trip, and Rest facilities are those provisions made for pedestrians and bicyclists for the beginning, end, and intermediate portions of their trip.

Bicycle parking, for example, is an end of trip facility that makes it more convenient to travel by bicycle to a destination. Provision of adequate end of trip facilities cannot be overlooked: if they are not available (e.g. if no bike parking is available), the user will next time choose a different mode for arriving or may choose another destination altogether, even if the provided routes are perfectly safe and convenient.

Navigating across parking lots to key destinations can be a challenge for pedestrians and bicyclists.

Provision of adequate ancillary and rest facilities, which is sometimes viewed as an optional component of a transportation or land use plan, is as important for making non-motorized travel more convenient and inviting as is providing adequate parking for automobiles when designing shopping destinations, transit Park and Ride lots, or new residential or commercial development.

Benches at the Robbinsdale Transit Center.

5.7.1 - Pedestrian and Bicyclist Connections to Buildings from Streets

Navigating large parking lots on foot or bike can be uncomfortable. Providing clear access from the street to the building entrance, not just from motor-vehicle parking lots, but also from the routes pedestrians and bicyclists would be using to access a site, can make the destination more inviting. Cities can include requirements for these considerations (including bicycle parking and other ancillary facilities) in building and zoning codes, particularly at key employment and retail destinations, and transit stations. Establishing a Pedestrian/Bicycle Zoning Overlay District (please see Chapter 5.10 Policy Recommendations) could help Robbinsdale guide property developers to provide comfortable access to final destinations

5.7.2 - Bicycle Parking

Bicycle parking is a key element in encouraging more people to bike more often. Bicycle parking is commonly grouped into two types:

- **Short-term bicycle parking** accommodates visitors, customers, messengers and others who arrive at a destination and are expected to depart within a couple of hours. A standard "inverted U" rack, appropriate location and placement, and weather protection is recommended. On-street bicycle corrals may be considered in lieu of vehicle parking spaces where bike parking demand is high. Short-term bicycle parking is recommended for Robbinsdale's employment and shopping districts, for the transit center, and for city parks.
- **Long-term bicycle parking** accommodates employees, students, residents, commuters, multi-modal (bike-to-transit) travelers, and others expected to leave their bikes unattended for more than two hours. This type of parking should be secure, weather-protected and in a visible and convenient location. It may be provided by using standard "inverted U" racks in a visible, sheltered, secured, or supervised location, or by offering a locked room with standard racks and access limited to cyclists only (See Bike Stations in Chapter 5.6). Long- term bicycle parking should be provided at schools, office and employment sites, and transit stations.

Destinations where bicycle parking should be available include:

- Parks, trail heads, recreational destinations;
- Restaurants and commercial centers;
- Transit hubs (Robbinsdale Transit Center and Future LRT Station);
- Schools;
- Employment centers (e.g. North Memorial Medical Center);
- Community centers;
- Health/fitness centers; and
- Shopping destinations (e.g. downtown Robbinsdale).

Inverted-U style bicycle parking should be installed at key destinations close to the primary entrance to the building.

Growing bicycle parking

Bike parking is an inexpensive way to make bicycle travel more convenient, and cost-sharing programs are a great tool to increase the availability of bicycle parking near business and employment destinations.

The City of Minneapolis runs a program that provides a "50/50 cost share at eligible locations" in addition to installation of bike racks free of charge for public facilities such as schools, libraries and parks. Find more information at www.ci.minneapolis.mn.us/bicycles/parking/bicycles_bikeparking-rack.

Hennepin County guidance on bike parking

Hennepin County will soon publish a guide on bicycle parking in conjunction with its Bicycle Plan. The guide will offer recommendations for choosing the correct bicycle rack, placing racks, and other considerations. The guide will be available at http://www.hennepin.us/residents/transportation/bike-walk

The style and placement of bicycle parking have important implications for its use and security. Parking racks should be located near building entrances along the natural path of a bicyclist towards their destination, and should be placed in an area where they can be easily seen by others to reduce theft and vandalism. The style of parking rack selected should allows cyclists to securely lock their bike to the rack (including the frame and the tire), and should not require the cyclist to lift the bike to properly position it. The parking rack should support the frame of the bike to keep it from falling if bumped. Examples of preferred styles include Inverted-U and Post & Loop styles. During the community engagement process (including the WikiMap), resident comments indicated need for bicycle parking at public facilities and local shopping destinations.

Information kiosks can provide helpful direction to trail users. Image: Minnesota River Bluffs Regional Trail.

5.7.3 - Seating and Rest Stop Facilities

Rest stop facilities along popular routes invite a wider range of users (especially families with children and seniors) to travel on foot or bike by breaking up long distances into manageable segments, while also benefitting long-distance commuting cyclists, joggers, and other trail users. Rest stops may include restrooms, seating, waste receptacles, water fountains, wayfinding kiosks, bicycle parking, and other facilities. Facilities like benches and waste receptacles can easily be grouped with wayfinding kiosks at a natural stopping point.

Benches such as these along Bottineau Boulevard help create a sense of place, make a statement to pedestrians that they are welcome, and offer a valuable place to rest.

Rest stops placed at locations with scenic sight lines, places that provide respite from traffic, or landings at the tops of hills, and neighborhood parks, allow users to rest, enjoy nature, or stop for a snack.

Facilities should be placed off the trail for users to comfortably relax without impeding other trail users. Transit stops may also be designed to simultaneously provide seating for transit riders, and a rest area for trail users. Robbinsdale, with its many neighborhood parks and scenic features could consider incorporating rest stop features in its off-road trail network.

5.7.4 - Lighting of Pedestrian and Bicycle Facilities

Standard lighting should be provided on pedestrian and bicycle facilities for ease of use during night hours. This request was shared by many residents during the community engagement process. Concerns for personal safety were a high priority. Additionally, poor lighting can create difficult environments for persons with limited mobility.

5.7.5 - Showers and Changing Facilities

Provision of showers, changing facilities, and lockers at employment centers can encourage more employees to try bicycling to work. Requirements for provision of showers and changing facilities can be included into a city's regulations to ensure that future office developments include them.

5.7.6 - Ancillary, End of Trip, and Rest Stop Facilities: Recommendations for Robbinsdale

- Investigate the installation of benches along major pedestrian routes, at scenic vistas, adjacent to commercial and employment areas, and at other logical stopping points;
- Consider policies that require the installation of convenient bicycle parking, and clear pedestrian and bicycle walkways to the entrance of final destinations;
- Partner with existing businesses to set up a cost-sharing program that covers 50% of the cost to install short-term bicycle parking at key business and employment destinations;
- Focus bicycle parking efforts at Robbinsdale schools, public facilities, and at commercial and employment destinations in priority areas such as the future LRT station, and North Memorial Medical Center; and
- Increase the amount of bicycle parking in downtown Robbinsdale, in anticipation of increased bicycle traffic.

Recommended Inverted-U style bicycle racks in Downtown Robbinsdale.

On-street bicycle corrals may be used in lieu of vehicle parking spaces where bicycle traffic is high. Corrals can park 10+ bicycles. Installing corrals at corners provides curb extension benefits for pedestrians as well. Image courtesy of J. Maus and bikeportland.org.

More information on bike corrals

The City of Minneapolis has a bike corral program in place. Minneapolis estimates costs for a 10-bike corral to be $1,800 the first year and $225 in subsequent years for maintenance.

Frequently asked question information about the Minneapolis program is available here: http://www.ci.minneapolis.mn.us/www/groups/public/@publicworks/documents/webcontent/wcms1p-128772.pdf

5.8 - Operations and Maintenance

This chapter provides an overview of maintenance recommendations for sidewalks and bikeways in Robbinsdale. For additional guidance and information please consult Chapter 9 (Maintenance) of the Minnesota Department of Transportation Bikeway Facility Design Manual, which is incorporated into this Plan by reference.

Walking and biking facilities should receive adequate maintenance to protect the investments made by Robbinsdale and its partners, and to ensure that they continue to serve residents and visitors well into the future.

Maintenance work on a sidewalk in Downtown Robbinsdale.

5.8.1 - User Needs

Pedestrians

Pedestrians or wheelchair users depend on having a level, slip-resistant surface for their travel. Walking surfaces that are free from unexpected bumps, holes or cracks, and free from ice or other slippery materials, are paramount for their safety and comfort. Pedestrians also depend on the ability of motorists to anticipate and respond to their presence while crossing streets or when otherwise exposed to motor-vehicle traffic; therefore, signs, signals and markings should be maintained and kept in good working condition.

Maintenance is a year-round requirement for a comfortable and convenient network of walking and biking facilities. Snow and ice can make travel difficult.

Bicyclists

A cyclist rides on two very narrow, high-pressure tires. What may be an adequate roadway surface for automobiles (which have suspension and shock-absorbing systems and travel on four wide, low-pressure tires) can be treacherous for cyclists: small rocks can deflect a bicycle wheel; a crack in the pavement or a poorly-placed drainage grate can trap a wheel; wet leaves, ice, and the gravel that gets blown off the travel lane are slippery and can cause a fall.

5.8.2 - General Considerations

Maintenance Budget

Preventive maintenance reduces hazards and future repair costs. Maintenance costs and responsibility for maintenance should be assigned when projects are planned and budgets

developed; typical annual maintenance costs range from 3 to 5 percent of infrastructure replacement costs - for example, a $100,000 facility should include a $5,000 annual maintenance budget. Life-cycle cost analysis is recommended to determine the net value of using longer-lasting, higher-quality materials during construction if they reduce yearly maintenance expenditures.

Management Plans

A management plan is a tool to identify maintenance needs and responsible parties. A management plan that includes the maintenance component for a proposed facility should be in place before construction. Additionally, a management plan should include a means for users of the system to report maintenance and related issues and to promptly address them.

A facility's management plan answers basic operational and staffing questions such as: How frequently are preventive maintenance tasks performed? Who fills potholes? Who removes downed or dangerous trees? Responds to vandalism and trespassing? Removes litter? Replaces stolen or damaged signs? Waters and weeds landscaping? Acts as the main contact? Does the work? Pays the bills?

User-Initiated Maintenance Requests

The users of Robbinsdale's pedestrian and bicycle network will likely be the first parties to notice hazards, maintenance issues, or opportunities to bring improvement to the system. Establishing a formal mechanism for receiving requests for maintenance can help focus and prioritize investments, avert deterioration of the city's infrastructure investments, provide effective management, and reinforce resident-ownership of Robbinsdale's non-motorized network assets.

Maintenance Request Program

One simple, low-cost way of establishing this program would be through the addition of a "Pedestrian / Bicycle Facility Maintenance Request" button on the city's existing website which would take visitors to a web form where they would be prompted to identify the location and nature of the issue they are reporting. Potential issues that might be reported include small-scale, low-cost improvements, such as sweeping, repairing surface problems, trimming vegetation blocking signs or obstructing routes, and replacing unsafe gratings. The online WikiMap previously created for engagement may be an appropriate tool for implementing such a request program in Robbinsdale.

5.8.3 - Routine Maintenance

Snow and Ice Removal

Snow removal is a critical component of pedestrian and bicycle safety. The presence of snow or ice on sidewalks, curb ramps, or bikeways will deter pedestrian and cyclist use of those facilities to a much higher degree than cold temperature alone.

Seniors and other vulnerable adults will avoid walking in locations where ice or snow accumulation creates slippery conditions that may cause a fall. Curb ramps that are blocked by ice or snow effectively sever access to pedestrian facilities for wheelchair users and seniors. If water or ice accumulates at curb ramps, nearby drainage facilities should be reviewed. Additionally, inadequately maintained facilities may force pedestrians and bicyclists onto facilities that may not offer safe or adequate accommodations, or that require them to take a route that is a longer distance.

When the surface of a road is covered by snow, the pavement markings that guide and warn motorists, pedestrians and bicyclists may be difficult to see.

Care should be taken to clear roads so that pavement markings are identifiable. Snow should be cleared from a roadway's entire surface to allow pedestrians or bicyclists to travel as far as possible to the right side of the road or shoulder.

Prioritizing Snow Clearing Operations

A useful approach for maximizing the efficiency of maintenance investments is to identify locations where accumulation of snow or ice would significantly impede pedestrian and bicycling access and safety so that these locations are prioritized for clearing by maintenance immediately after a storm event.

The city should prioritize its snow removal on identified routes. On priority routes that are not maintained by the city, the city should work directly with property owners to encourage and/or enforce snow removal.

A Year-Round Approach

Snow and ice removal must be planned with the expectation that walking and bicycle facilities will continue to be used during winter months. Care should be taken to place snow and ice well out of the portion of sidewalks, bike lanes and shoulders that pedestrians and bicyclists use. Bike trails and paths should also be swept with regularity.

Sidewalks, bikeways, gutters and curb ramps should not be used as snow storage areas for snow removed from streets; city policies should address the clearance of snow from walkways, bikeways and road shoulders as being of equal importance as clearance of snow from the automobile travel lanes in streets.

Sweeping

Loose sand and debris on the surface of bicycle lanes, paved shoulders, and paved sections of shared use paths should be removed at least once a year, normally in the spring. Sand and debris will tend to accumulate on bicycle lanes because automobile traffic will sweep these materials from the automobile portions of the roadway. This is especially true for bicycle lanes that are located directly adjacent to a curb, where debris collects already.

Surface Repairs

Pedestrians and bicyclists are more sensitive and more vulnerable to problems in the roadway surface than motor vehicles. A smooth surface, free of potholes and other major surface irregularities, should be provided and maintained. Care should be taken to eliminate other physical problems. Requests for surface improvements could be made through the Pedestrian / Bicycle Facility Maintenance Request Program described above.

Resurfacing / Pavement overlays

Street resurfacing projects provide ideal opportunities to greatly improve conditions for pedestrians and cyclists - by narrowing automobile travel lanes, widening shoulders, or adding bicycle lanes, for example. However, if not done correctly (by, for example, leaving a ridge or a joint in a shoulder or bicycle lane), some conditions may worsen.

Items to consider on resurfacing projects that will help improve conditions for pedestrians and cyclists include:

- Gravel driveways and alleys should be paved back 5 to 10 feet from the edge of pavement or right-of-way to prevent gravel from spilling onto the shoulders or bike lanes;
- The loose gravel used during the installation process for chip seals creates hazardous bicycle riding conditions, especially in shoulder areas. Provide warning signs for bicycle riders as well as bicycle route detours during installation; and

- Avoid leaving a ridge in the area where cyclists ride, which occurs where an overlay extends only part-way into a shoulder or bike lane. If possible, the overlay should be extended over the entire surface of the roadway to avoid leaving an abrupt edge.

Signs and Pavement Markings

Signs and pavement markings are important features of walkways, bikeways and roadways, and help ensure continued safe and convenient use of these facilities. It is critical that bikeway signs, striping, and legends be kept in a readable condition.

Some recommendations to address these infrastructure elements include:

- Regular inspection of bikeway signs and legends, including an inventory of signs to account for missing or damaged signs;
- Replacement of defective or obsolete signs as soon as possible;
- Regular inspection of striping, and prompt reapplication as needed;
- Depending on wear, bike lanes may need to be repainted on an annual basis. Bike lane stripes may wear out less often on lower traffic volume streets than on higher volume streets; and
- Durable cold plastic should be used for skip-striping bike lanes across right turn lanes.

Vegetation

Vegetation encroaching into and under a sidewalk, shared-use path, or trail crossing creates a nuisance and a hazard for pedestrians (especially for those with sight or mobility impairments) and for bicycle riders. The management of vegetation is generally considered the responsibility of city maintenance staff. To provide long-term control of vegetation, its management should be considered during design and construction. Vegetation management helps to maintain smooth pavement surface, as well as clear zones, sight lines, and sight corners to promote pedestrian and cyclist safety.

Vegetation management issues identified by users (e.g. tree roots causing heaving of sidewalk surfaces) may be reported through the Pedestrian / Bicycle Facility Maintenance Request Program described above.

Drainage issues

Drainage facilities may change grades and deteriorate over time. Ensuring that bicycle-safe drainage grates are located at the proper height greatly improves cyclist safety; it may sometimes be necessary to adjust or replace catch basins to ensure continued safe operations and improve drainage. The small asphalt dams that are sometimes constructed on roadway shoulders to divert storm water into catch basins are a hazard to cyclists and their use should be avoided.

Event-related drainage issues (e.g. backed-up grates) and long-term drainage hazards (unsafe grates) can be reported and addressed through the Pedestrian / Bicycle Facility Maintenance Request Program, and should be proactively addressed whenever street improvements are made.

5.8.4 - Other Maintenance Activities

Patching activities

Loose asphalt materials from patching operations often end up on the shoulder, where the larger particles adhere to the existing surfacing, creating a very rough surface for pedestrians and cyclists. Fresh loose materials should be swept off the road before they have a chance to adhere to the pavement.

Utility Cuts

Utility cuts can leave a rough surface for cyclists if not back-filled with care. Cuts should be backfilled and compacted so that the cut will be flush with the existing surface when completed. Extra care should be used when cuts are made parallel to bicycle traffic to avoid a ridge or groove in the bicycle wheel track.

Description of Recommendations

- Investigate creating a Pedestrian / Bicycle Facility Maintenance Request Program, and consider utilizing the online WikiMap and the city's existing website;
- Prioritize maintenance such as snow removal, ice removal, and sweeping along bicycle and pedestrian routes identified in the Ch. 4 recommendations; and
- Coordinate maintenance needs with Hennepin County and the Minneapolis Park and Recreation Board as needed.

5.9 - Education, Encouragement, and Promotion

Developing walking and bicycle infrastructure is only the first part of increasing walking and biking in a community, as even the best-planned walking or bicycle network will fail to live up to its full promise if potential users are unaware of its existence, or if it's difficult to figure out how to get from one destination to another. In addition, walkers, bicyclists and motorists will each do better if they learn how to consistently and courteously share road space with each other and to coexist within Robbinsdale's transportation and recreation infrastructure.

Open Streets events offer a chance for residents to be active and engaged, and to experience city streets in a new way.

This chapter presents some ideas that may help Robbinsdale invite its residents, businesses and visitors to safely and effectively use the route network that develops from this plan. It is titled "education and encouragement" to acknowledge that both of these activities build on each other, and that learning about safe riding and disseminating information about the city's walking and bikeway networks will lead to more people using them as part of their transportation and recreational activities.

Special events offer a chance to take part in "tactical urbanism" and try out infrastructure treatments before they become permanent. Here, users try out a "pop-up" protected bikeway treatment at an Open Streets event.

5.9.1 - Inviting Users to the City's Network

Network Maps

People won't use a walking or biking network if they are unaware of its existence, or if they don't know how it may help them reach their routine destinations. Printing and distributing bikeway maps is a high-benefit, low-cost project that can help bicyclists locate bikeways, walkers identify better route choices for their trip, and the city promote its local businesses and festivals.

Map inserts can provide information covering such topics as Rules of the Road, bicycle safety and maintenance, and connecting with mass transit. Another low-cost and potentially helpful tool is the addition of existing web-based trip planner services to the Robbinsdale city website (like Cyclopath or Google Maps) where pedestrians and bicyclists

type in their destination and receive one (or several) recommended routes.

Promotion of Transit

Educating people about existing transit facilities is one of the best ways to encourage and increase their use. Sharing information on the practical benefits of transit, especially in combination with bicycling, will encourage people to use transit. These practical benefits include: greater radius of reachable distance, convenient connection to destinations, health benefits from physical activity, and potential time and cost savings over driving an automobile.

Incentive programs which offer transit discounts to people who arrive at a destination by bus or bike can help to increase the number of bicycle and transit users. Programs like MetroTransit's "Guaranteed Ride Home" for cyclists who ride their bikes to work three times a week or more can also help reduce reluctance to traveling without an automobile.

Open Streets and Other Special Community Walking and Biking Events

Special events offer an opportunity to bring attention to practical, fun, and healthy aspects of walking and bicycling as tools for getting places and for recreation. Because these events are community-wide and of limited duration, people are more open to participating without feeling like they have to commit to making a long-term change in their travel or recreation habits - they are just skating, walking or biking in their city once, not everyday. But sometimes that's all that is needed to open the door to adopting new travel behaviors over the long term.

Some events and programs that can encourage participation include:

- Monthly group rides with the City Council or the Mayor or other important local personalities can help promote bicycling in Robbinsdale;
- Open Streets events that close a road or two to auto traffic once a month and make it a bike and pedestrian-only event;

Effective Safe Routes to School Programs help to make biking and walking a regular part of students' daily routine.

Did You Know?

- 40% of all trips made in the United States are shorter than 2 miles in length.
- Students living 2 miles or less from school could bike to school in 20 minutes or less.
- According to the CDC, children should receive at least 60 minutes of aerobic physical activity each day.
- According to a 2010 National Household Travel Survey brief, just over 7 minutes were spent walking or biking each day by children age 5-10, and just over 14 minutes by children age 11-15.

- Parks and recreation programs can work with non-profit or bicycling advocacy groups to sponsor bicycling events and activities, especially on trails and regional bicycling routes; and
- Special bicycle commuter events can help raise the profile and potential for bicycle commuting. Bike to Work Week events, which typically include special publicity, route guidance to first-time bicycle commuters, and group breakfasts, offer an opportunity to try bicycling in a safe, relaxed and fun environment. Bike to Work Week events have been held in many Minnesota communities over the last several years.

Visitor Programs

Tourist promotion materials can highlight walking and bicycling as great ways to access and experience Robbinsdale's parks and charming downtown. Several communities in Minnesota boast of their bicycling orientation as part of their identity and as a draw for potential visitors. Addressing comfort and connectivity of Robbinsdales's network could help bring additional visitors to the city and customers to commercial destinations along West Broadway Avenue.

Student Programs / Safe Routes to School

Encouraging student walking and bicycling to school helps instill life-long habits of health and activity, and provides proof to students that walking and biking are serious and valid transportation options.

Some strategies and programs that could be implemented in Robbinsdale to encourage student bicycling include:

- Working with local schools to encourage students and staff to walk and bike to school;
- Working to integrate the new Walk! Bike! Fun! curriculum and other walking and bicycling education into physical education classes;
- Formally encouraging school Safe Routes to School programs and planning efforts;
- Offering discounts to area bicycle shops as prizes for outstanding students; and

A bicycle rodeo and safety fair is an effective way to involve local law enforcement in promoting walking and biking among youth populations. Image courtesy of newspapers-online.com/tecumseth.

Rules of the Road

- Rules of the road for pedestrians, bicyclists, and motor vehicles are detailed in the Minnesota State Statutes:
  - Pedestrian: 169.21
  - Bicycle: 169.222
  - Motor Vehicle: 169.18
- The Minnesota Department of Transportation operates a "Share the Road" campaign for pedestrians and bicyclists. More information can be found at http://www.dot.state.mn.us/sharetheroad.

Involve the Robbinsdale Police Department

The Robbinsdale Police Department can play a critical role in improving conditions walking and biking in Robbinsdale, and encouraging more people to walk and bike.

Active enforcement, participating in training and outreach activities centered on walking and biking, and even being seen walking and biking in the community all can play a role in improving conditions in the city.

- Establishing awards and incentives programs for completion of bicycle classes, or for walking and biking to school so many times per week, etc.

Rider Incentive and TDM programs

Increased use of walking and biking can help achieve Transportation Demand Management (TDM) objectives for workplaces and communities while improving community health and supporting local economic development. Several types of incentive programs are in use in communities throughout the United States. Among the most popular are:

- Business associations provide discounts to shoppers who arrive by bike; and
- Employers offer parking cash-out benefits, which give commuters who don't drive the cash equivalent of the parking subsidies provided to drivers.

These programs help address issues of lack of parking and increasing congestion that often hinder successful commercial areas. Robbinsdale businesses could offer discounts for customers who arrive by transit, foot or by bike.

5.9.2 - Learning to Ride Safely

Walking and bicycling are health-promoting and safe activities that can become even safer with improved education. Motorists, bicyclists, and pedestrians each have much to contribute to making walking and bicycling (and other modes of travel) safer and more effective: one of the leading causes of crashes is the unexpected behavior of at least one of the parties involved. Cyclist, motorist, and pedestrian safety programs can help reduce the risk of crashes and injuries while giving new bicyclists the confidence needed to ride more regularly. In fact, safety training has been shown to be an effective and cost-efficient way of reducing collisions and encouraging bicycling.

Three main components of safety training are addressed under this section. They center on:

- Developing safe bicycling skills in children;
- Teaching adult bicyclists their rights and responsibilities; and
- Increasing motorists' awareness of bicyclists' rights on the road, and teaching them how to safely share the road with bicycles.

For Children and Young People

It is important to share information on safe walking and bicycling with young people from early on. This will help them be safe and will also reinforce the message that walking and bicycling are useful and mainstream means of transport. While it is not uncommon for schools in the US to provide automobile driver education for children 16 or older, it is rare to find similar provision of bicycling education, even though most children seven and older are able to ride a bicycle and (because of generally poor provision of separated trails) routinely ride in streets that are also used by automobiles.

In European countries where bicycling serves a much larger portion of all trips it is a given that schools provide formal training in safe bicycling for children starting in elementary school. In the Netherlands, for example, children undergo a three week training on bicycling rules and maneuvers each year. It is easy to imagine that Robbinsdale students could receive similar training, perhaps as a component within physical education classes (and one which could help promote a lifetime of safe and enjoyable physical activity). It is also a given that schools, parks and other places where young people congregate need to provide a physical infrastructure that supports children's bicycling by making sure that adequate bike parking, and well-marked trails or lanes, are available (covered elsewhere in this Plan).

Some Approaches

School children are most effectively reached when an action-oriented teaching approach and a repetitive practice process are coupled with awards and incentives. Awards and incentives can consist of certificates of completion or bicycle/pedestrian licenses, free or reduced-cost bicycle helmets and other accessories, or discount coupons for area bicycle shops.

Messages

The following messages should be consistently taught:

- Wear a helmet. In the event of a bicycle crash, wearing a helmet can reduce the risk of serious head injury by up to 85%.
- Obey all traffic laws. Bicyclists have the same rights, and consequently the same responsibilities, as motorists.
- Look both ways before crossing streets.
- Always ride with the flow of traffic.
- Be predictable and always signal your intentions.
- Be visible; wear light-colored clothing and bright or reflective clothing and always use a front light and rear reflectors at night.
- In addition, very young children (seven or less) should ride with supervision.

For Adults

Adult bicyclists range in skills and confidence. Some adults are comfortable riding on busy streets and mixing with traffic while others prefer quieter streets or off-street paths. There are adults who ride a bicycle only a few times a year and those who ride often but primarily for recreation. Each type of cyclist has his or her own concerns and philosophy about how bicycles fit into the transportation system - education efforts must recognize this and tailor messages to each group.

Messages

The following messages should be consistently taught:

- Be alert. Watch for other users and sudden behavior changes. Pay careful attention to potential road hazards, such as potholes and gravel. Adjust speed to maintain control of the bicycle.
- Obey all traffic laws; bicyclists have the same rights, and consequently the same responsibilities, as motorists. Disobeying traffic laws makes it more difficult for motorists to know what to expect from bicyclists and is potentially dangerous.
- Always ride with the flow of traffic. Ride where motorists and others expect bicyclists, and never against traffic.
- Avoid riding on sidewalks. It is illegal in commercial districts in Minnesota, and puts pedestrians at risk. It also makes it more difficult for motorists to see bicyclists - research demonstrates that sidewalk riding is much more dangerous than riding on the street, even in places where no bicycle facilities are provided.
- Be predictable. Signal your turns and do not weave in and out of traffic.
- Be visible. Wear light-colored, bright or reflective clothing and use front lights and rear reflectors or lights at night.
- Wear a helmet.

For Motorists

The goal in educating motorists is to foster a broad and general public awareness and respect for bicycling. Many motorists are already occasional or regular bicyclists, and may begin riding more often if they see and feel the emphasis on providing safe conditions for all road users. Bicycle route signs and markings are also helpful for motorists because they remind them of the presence of bicyclists and of the need to share space with other users of the road. Information on the rights of bicyclists

should be included as part of training for all automobile drivers.

Messages

- Share the road. Bicyclists have the right to travel on all roads and streets except limited access freeways.
- Give room. Follow and pass at a safe distance. Never get closer than three feet to a cyclist under any circumstance. It is dangerous, and is illegal under Minnesota law.
- Be alert. Watch for bicyclists and other users and for sudden behavior changes. Pay attention especially at intersections.
- Obey all traffic laws. What would amount to a minor fender bender between two motor vehicles could be a serious injury for a cyclist in a bicycle-motor vehicle crash. Driving the speed limit and coming to a full stop at red lights creates a safer environment for all.
- Be predictable. Signal turns well before an intersection.
- Bicyclists have the right to take full possession of a travel lane in several situations, including when avoiding fixed or moving objects on the road (like vehicles, pedestrians or road surface hazards) and when the provided road space is too narrow to allow a motor vehicle to safely pass with three feet of clearance of the cyclist.
- Be patient and courteous with bicyclists and other users. Passing bicyclists just before a stop light or sign creates an atmosphere of unnecessary hostility.
- Do not honk unless absolutely necessary. Bicyclists can hear and see motor vehicles; honking simply jars their nerves.

Providing education to potential bike commuters is an important component of becoming a Bicycle Friendly Community. Photo courtesy of Bike Commute Tips.

5.9.3 - Becoming a Bicycle Friendly Community

The Bicycle Friendly Community (BFC) Program is a national program to which communities can apply based on their commitment to the five Es of bike planning:

- Education
- Encouragement
- Engineering
- Enforcement
- Evaluation & Planning

Photo courtesy of The League of American Bicyclists.

Becoming a BFC has important benefits for a community like Robbinsdale, including recognition, promotion of community amenities, technical assistance, benchmarking, and inspiration for further improvements for cycling. Robbinsdale can also partner with local businesses as a part of the Bicycle Friendly Business program.

Currently, Minnesota is ranked as the #2 Bike Friendly State in the US, and #1 in the Midwest Region with 5 Bicycle Friendly Communities, 35 Bicycle Friendly Businesses, and 1 Bicycle Friendly University.

The next review cycle deadline is in February 2015. There are two application deadlines per year, one in February and one in August. More information is available at: http://bikeleague.org/content/communities

5.10 - Policy Recommendations

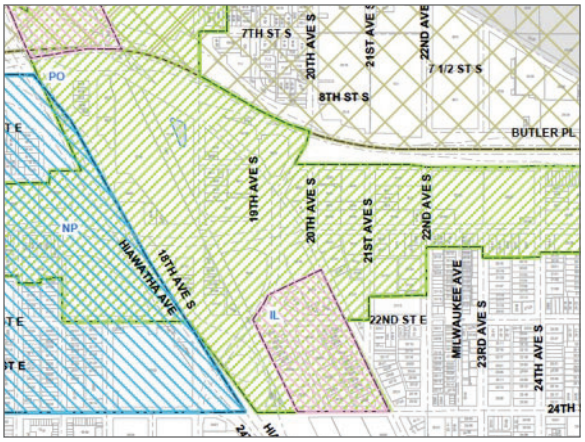
Several policy changes can help create a framework for facilitating walking and biking improvements, and increasing the number of people who travel on foot and by bike across the system in Robbinsdale.

5.10.1 - Establish a Pedestrian/Bicycle Zoning Overlay District

The city may wish designate certain areas of the city under a Pedestrian and Bicycle Overlay District to establish a policy framework for facilitating walking and biking trips. An overlay district is a specific area that is designated to have a zoning classification that is more (or less) restrictive than the underlying primary zoning district. The intent of overlay districts is to protect or encourage specific types of development form and function in a particular area of interest.

Areas in and around the future LRT station, downtown Robbinsdale, the North Memorial Medical Center, the Terrace Center, and other shopping areas may be likely candidates for the establishment of a pedestrian-oriented or bicycle-oriented overlay district. These areas have a concentration of retail, employment, transit, and other destinations, and are areas of potential redevelopment in Robbinsdale. They are and will continue to be primary destinations for useful daily trips in Robbinsdale.

An overlay district for pedestrians and/or for bicyclists in these areas could help guide development occurring in the area to better accommodate pedestrians and bicyclists. The districts could work to regulate building orientation and design, the provision of walking facilities and bicycle parking facilities on building sites, and establishing certain measures that mitigate effects that motor vehicles and parking lots may have on the rates of walking and biking. This includes traffic calming measures, provision of separated walking and biking facilities, landscaping, and other strategies on properties to facilitate walking and biking enjoyment, comfort, access, and circulation.



The City of Minneapolis has Pedestrian Oriented Overlay Zones in areas around LRT stations.

Complete Streets in Robbinsdale

In July 2013, the City of Robbinsdale formally adopted a Complete Streets Policy and proclaimed its support for designing, constructing, and operating the city's transportation system to enable safe access for users of all modes of transportation, and of all ages and abilities. The City outlined specific principles including connecting system gaps and installing pedestrian and bike-specific infrastructure elements.

5.10.2 - Form a City Pedestrian and Bicycle Advisory Committee

This plan recommends the creation of a Pedestrian and Bicycle Advisory Committee within the City of Robbinsdale to promote walking and bicycling for transportation and recreation, to advocate for infrastructure improvements, to disseminate information about safe travel behavior for users of all modes, and to involve interested residents in pedestrian and bicycle planning issues. The committee would consist of interested residents and city staff working on related issues. The committee would serve as an advisory committee to the Mayor and City Council, and in Community Development, Parks and Recreation, and Public Works planning decisions.

It is recommended that one or more members of the Pedestrian and Bicycle Advisory Committee work closely with and also serve on, the Planning Commission, and the Parks, Recreation, and Forestry Commission. These members should have an active role in the development, updating, and implementation of area plans, plans for the Bottineau LRT station, the comprehensive plan, and other planning efforts that affect transportation, parks, and the built environment in Robbinsdale.

Committee members should also work closely with members of the Hennepin County Bicycle Advisory Committee and Hennepin County staff.

The Pedestrian and Bicycle Advisory Committee may elect to have a number of subcommittees. Examples include:

- Pedestrian Subcommittee;
- Bicycle Subcommittee;
- Education, Encouragement, and Enforcement Subcommittee; and
- Engineering, Equity, and Evaluation Subcommittee.

Continuing Resident Engagement

Resident engagement is a critical component for implementation of the recommendations in this plan, and for communicating, operating, and maintaining a walking and biking network that is comfortable and convenient for Robbinsdale residents.

Robbinsdale can engage residents in the following ways:

- Create a Pedestrian and Bicycle Advisory Committee comprised of residents and city staff; and
- Continue to provide information about walking and biking to Robbinsdale residents and engage them with online tools such as the WikiMap. Residents should be informed about decisions affecting walking and biking in the city, and invited to offer their comments in-person and through online means.

5.10.3 - Continue to Partner with Hennepin County

As right-of-way is modified, it is beneficial for the city to offer clear guidance for the type of pedestrian and bicycle improvements it wishes to see along roadways, at intersections, and at regional trails and transit corridors. Even though many Robbinsdale roads are under county jurisdiction, identifying the type and location of desired improvements and articulating them clearly in this plan makes it more likely that the county will implement the treatments in its projects. Hennepin County values local Pedestrian and Bicycle Plans and looks to them for guidance when implementing improvements within a municipality. Other jurisdictions may also reference this plan as they plan future facilities.

Recommendations for working with Hennepin County for implementing pedestrian and bicycling improvements within Robbinsdale include:

- Maintain a close working relationship with Hennepin County Bicycle and Pedestrian Staff;
- Monitor the progress of implementation of the following county and regional plans:
  - *Hennepin County Pedestrian Plan*;
  - *Hennepin County Bicycle Plan*; and
  - *Metropolitan Council Regional Bicycle System Study*.
- Attend Hennepin County Bicycle Advisory Committee meetings, and work closely with committee members appointed by the District 1 Commissioner, currently Mike Opat;
- Continuing to engage with the county, as Robbinsdale has already done, in applying for and receiving grant funding for pedestrian and bicycle improvements.

Hennepin County Bicycle Advisory Committee

This committee meets on a monthly basis at locations across the county. Appointed members serve a three-year term. More information about the committee can be found at http://www.hennepin.us/residents/transportation/bike-walk.

Did you know?

Hennepin County dedicates funds every year as part of its capital budget to support the development of Complete Streets along its road network and bicycle system:

- **For sidewalks:** $200,000 annual budget, providing up to 25% of the cost of a sidewalk along a county road;
- **For bikeways:** $300,000 annual budget, providing up to 50% of the cost of trail or on-street bikeway identified on the Hennepin County bicycle system plan or gap map; and
- **For bikeway gaps:** $300,000 annual budget, providing up to 50% of the cost of trail or on-street bikeway identified on the Hennepin County bicycle system gap map.

Several important streets in Robbinsdale are part of the Hennepin County road network, including Broadway Avenue W (CR 8), Lake Drive / 42nd Avenue N / 45th Avenue N (CR 9), and Bottineau Boulevard (CR 81).

5.10.4 - Hire a City Pedestrian and Bicycle Coordinator

The City of Robbinsdale should consider creating and funding a new "Pedestrian and Bicycle Coordinator" position to coordinate implementation, attend to and coordinate response to pedestrian and bicycle network maintenance and operations issues, and to advocate for needs of pedestrians and bicyclists as other transportation and land use projects are designed and implemented.

This position may be part-time, but it should be permanently funded, and allow a new or existing staff person to dedicate a minimum of 10 hours per week to pedestrian and bicycle-related issues within and around the geographic area of Robbinsdale. Tasks and responsibilities would at a minimum include:

Planning

- Coordinate and integrate pedestrian and bicycle planning and network implementation with other city, county, regional parks district and state programs, agencies, and bodies;
- Review all roadway and land use plans for impacts on pedestrian and bicycle travel and conditions; make and pursue recommendations for improvement as needed before projects are constructed;
- Review traffic-calming and other roadway measures for impacts on conditions for pedestrians and bicyclists;
- Coordinate implementation of route recommendations as part of other projects (for example recommending that bicycle-friendly curb-and-gutter is specified in street reconstruction projects);
- Represent the interests of Robbinsdale's pedestrians and bicyclists by serving as liaison with adjoining jurisdictions and regional entities during design and implementation of their respective local and regional bicycle and general transportation infrastructure;
- Provide advice to policymakers, including members of the Robbinsdale City Council and Robbinsdale Planning Commission, on transportation and land use issues with the aim of improving conditions for pedestrians and bicyclists in Robbinsdale; and
- Coordinate pedestrian and bicycle-related transit infrastructure improvements.

Maintenance and Operations

- Create and manage a spot improvement / Pedestrian and Bicycle Facility Maintenance Request program to reduce roadway hazards and to quickly respond to pedestrians and bicyclists' requests for maintenance or repair of pedestrian and bicycle infrastructure.

Public Engagement

- Serve as the City of Robbinsdale liaison to residents' groups working on improving conditions for walking and bicycling in Robbinsdale, and in the future act as a liaison to the Bicycle Advisory Committee, when established.

Education and Encouragement

- Provide information and conduct workshops to improve bicycling safety, including coordinating with Robbinsdale schools to include bicycle education as part of physical education programs, and coordinating community requests for training for adults; and
- Coordinate preparation and publication of Robbinsdale bicycle network maps.

Measurement

- Collect and maintain bicycle use data, including regularly monitored bicycle counts, studies of origins and destinations, crash information and infraction data; and
- Develop yearly reports detailing use of the pedestrian and bicycle facility network, identifying focus areas for improvement and tracking user counts.

Fundraising

- Pursue local, state, federal, and private funds for improving pedestrian and bicycle infrastructure, for encouraging greater use of Robbinsdale pedestrian and bicycle network assets, and for conducting education and encouragement campaigns.

5.11 - Enforcement

Enforcement is an important strategy in making Robbinsdale safer and more comfortable for pedestrians and bicyclists. Working with Robbinsdale law enforcement will be a key step in creating a more welcoming environment for non-motorized travelers.

5.11.1 - Enforcing Speed Limits

High-speed motor vehicle traffic is a primary barrier to walking and biking in Robbinsdale, and in many other cities. Residents routinely mention their desire for separation from motor vehicles on routes and at crossings, and often cite conflicts with vehicles as the primary real and perceived safety concern to walking and biking.

Improved walking and biking infrastructure can help to increase the comfort and visibility of non-motorized users, but enforcement is a vital component of improving the overall culture and environment in which pedestrians and bicyclists operate.

Police department focus on speed enforcement on certain road segments is recommended. These road segments include those that are known to have speeding vehicles within one mile of schools and other important destinations.

Adjusting Speed Limits

According to current Minnesota State Statutes, Minnesota cities must, in general, defer to the Minnesota Department of Transportation when setting or adjusting speed limits, even on their own road facilities.

Minnesota State Statutes, however, also reserve the right for cities to set their own speed limits on their road facilities under the following circumstances, according to Minnesota State Statutes § 169.14 and § 160.263

- A city may, without any additional engineering or traffic investigation, reduce the speed limit to not less than 25 mph on roads that have a designated bicycle lane;

Residential streets may be good candidates for reduction to 25 mph with the addition of an on-street bike lane.

Lowering speed limits in Minnesota cities

Minnesota statutes currently allow cities and other jurisdictions to **lower speed limits to 25 miles per hour without need of any additional engineering or traffic study if a bicycle lane is provided.**

According to Minnesota Statute 160.263, Bicycle lanes and ways, Subdivision 4, Speed on street with bicycle lane:

"Notwithstanding section 169.14, subdivision 5, the governing body of any political subdivision, by resolution or ordinance and without an engineering or traffic investigation, may designate a safe speed for any street or highway under its authority upon which it has established a bicycle lane; provided that such safe speed shall not be lower than 25 miles per hour. The ordinance or resolution designating a safe speed is effective when appropriate signs designating the speed are erected along the street or highway, as provided by the governing body."

- A city, without any additional engineering or traffic investigation, reduce the speed limit to 25 mph on a "residential roadway." (A city street or town road whose total length is up to a half-mile);
- A city may, without any additional engineering or traffic investigation, reduce speed limits to 30 mph for a city street in an "urban district" (Any segment of a city street or town road that is built up with structures spaced less than 100 feet apart for a minimum distance of a quarter-mile); and,
- A city may, with support from an engineering or traffic study, reduce the speed limit to not less than 15 mph, or more than 30 mph below the surrounding speed limit in school zones (A segment of street or highway that abuts school grounds where children have access to the roadway or where a school crossing is in place).

Bicycle police can help to enforce walking and bicycling laws.

5.11.2 - Enforcement: Recommendations for Robbinsdale

- Reexamine speed limits on its streets, particularly on those adjacent to critical destinations, relative to the above provisions;
- Consider lowering the speed limit to 25 mph along routes recommended for on-street bike lanes in this plan, to better accommodate bicyclists. This would make the environment more conducive for pedestrians as well; and
- Implement targeted speed enforcement near schools and other important destinations such as Downtown Robbinsdale.

5.12 - Evaluation and Performance Measures

Performance measures are instruments that help assess the extent to which progress is being made in implementing a Plan. They are a set of goals, trends or targets that are meant to be met at a certain point of time in the future - for example, to double the rate of cycling in Robbinsdale within ten years of the adoption of this pedestrian and bicycle plan. Targets or trends can also be checked at recurring intervals, or at a closer or farther time in the future.

The performance measures recommended for the Robbinsdale Pedestrian and Bicycle System address four broad categories:

- Safety and user comfort
- Use of facilities
- Facilities and network
- Community and municipal awareness and support

Proposed performance measures include:

5.12.1 - Safety and user comfort

Pedestrian and bicycle crashes should be tracked. Fewer crashes per year would indicate an improved environment, especially if more people are walking and biking for their daily trips. Data can be obtained from the Minnesota Department of Public Safety.

Recommended measures

- Number of pedestrian crashes
- Number of bicyclist crashes

Optional measures

- Pedestrian sense of safety (intercept or general community survey)
- Bicyclist sense of safety (intercept or general community survey)
- Automobile compliance and awareness in areas with high rates of pedestrian and bicycle use (observation)

5.12.2 - Use of facilities

Volunteer counts are conducted in many communities in the Twin Cities to measure how many people are walking or riding bicycles across a given corridor, or at a given intersection. Robbinsdale can work with the County to establish a bicycle and pedestrian counting program. Using volunteers this program could be implemented with a minimum of staff time. More observed bicyclists and pedestrians would indicate an improved environment, especially if there are fewer pedestrian and bicyclist crashes.

Recommended measures

- Number of pedestrians observed at specific locations
- Number of bicyclist observed at specific shared-use paths, bicycle lanes or other facilities

5.12.3 - Facilities and network

A system's physical facilities and network provide the foundation for increasing travel by foot or bike. Measuring progress in the implementation and development of facilities will help measure success in plan implementation, and provide additional context for understanding potential gains in user safety and facility use that may occur as new facilities are added.

Recommended measures

- Miles of sidewalks
- Miles of shared-use paths
- Miles of on-street bicycle facilities
- Number of new pedestrian benches
- Number of new bicycle parking spaces
- Number of gaps in pedestrian network

- Number of gaps in bicycle network
- Percent of planned facilities installed

5.12.4 - Community and municipal awareness and support

Effective implementation of the Plan and the realization of its goals require the participation of government and community partners, and the interest and engagement of the broader community. The performance measures included in this category describe the level to which walking and bicycle interests, attitudes, and practice have permeated Robbinsdale's culture. Performance measures that help evaluate awareness and support include:

Recommended measures

- Adoption of a Pedestrian and Bicycle Plan
- A pedestrian and bicycle counts program is set up and maintained
- A "Pedestrian / Bicycle Coordinator" position is included in a city / MPO structure
- Pedestrian and bicycle maps and information are available to the public
- Open Streets events are held regularly
- Police regularly enforce laws that protect pedestrians and bicyclists (crosswalk enforcement, 3 ft passing law)
- Total number of staff hours spent on pedestrian and bicycling planning and engineering among city staff
- Number of public interest or advocacy clubs or organizations
- Safe Routes To School (SRTS) programs are deployed throughout Robbinsdale schools
- Presence of programs in schools or the community focusing on increasing the number, awareness, and safety of bicyclists and pedestrians.

Measuring Neighborhood and Business Satisfaction

Before an improvement project is installed, a questionnaire should be given to nearby neighborhood residents and/or business owners. After the project is completed, the same questionnaire can be given to measure satisfaction with the results.

In addition, a second post-project questionnaire should be given at a much later date, to track long-term satisfaction. For example, residents may initially be unsure about the introduction of traffic-calming measures in their neighborhood, but may eventually be very happy with the result!

5.13 - Potential Funding Sources

A variety of funding sources and programs are available to partially or wholly support the improvement of pedestrian and/or bicycle facilities in Robbinsdale. This section presents a compilation that may serve as a starting point for future efforts.

Grant or Program name	Organization	Walk? / Bike? / Both?	Program description	Additional information	Potential project
Livable Communities Development Account	Metropolitan Council	Both	Intended to link housing, jobs, and other amenities through comprehensive, well-designed networks. Projects can occur on both local and regional scales.	http://www.metrocouncil.org/services/livcomm/LCAresources.htm	Bike lanes and bicycle boulevards downtown and linking to downtown locations.
Hennepin County Complete Streets Cost Participation Policy	Hennepin County	Both	Cost participation policy to support the development of Complete Streets along Hennepin County's road network: **For sidewalks:** $200,000, up to 25% of the cost of a sidewalk along a county road. **For bikeways:** $300,000, up to 50% of the cost of trail or on-street bikeway.	http://www.hennepin.us/~/media/hennepinus/residents/transportation/documents/cost-part-policy-feb-2012-final.pdf	Hennepin County roadways, including Broadway Avenue W (CR 8), Lake Drive / 42nd Avenue N / 45th Avenue N (CR 9), and Bottineau Boulevard (CR 81).
Hennepin County Transit Oriented Development Grant	Hennepin County	Both	To be used with multi-jurisdictional projects in order to connect people with transit. This includes the provision of pedestrian and bicycle facilities.	http://hennepin.us/portal/site/HennepinUS/menuitem.b1ab75471750e40fa01dfb47ccf06498/?vgnextoid=665fb42321ff5210VgnVCM20000048114689RCRD	Cycletracks or bike lanes linking the future Bottineau LRT station to other portions of the city.
Hazard Elimination and Railway-Highway Crossing Programs	Federal Highway Administration (FHWA)	Both	Uses funds from Highway Safety Improvement Program (HSIP) to eliminate hazards at railroad crossings and to provide safe crossing facilities.	http://safety.fhwa.dot.gov/safetealu/fact_sheets/ftsht1401d.cfm	Various railroad crossings near the location of the future Bottineau LRT station, such as CR 9 / 42nd Ave N and Noble Ave / 41st Ave N.
National Highway System (NHS)	Federal Highway Administration (FHWA)	Both	The NHS provides a number of different grants, including some that pertain to pedestrian and bicycle safety and facilities.	http://www.fhwa.dot.gov/planning/national_highway_system/	

Grant or Program name	Organization	Walk? / Bike? / Both?	Program description	Additional information	Potential project
Surface Transportation Program (STP)	Federal Highway Administration (FHWA)	Both	Can be used for pedestrian or bicycle facilities, or the creation of non-construction projects such as maps or education.	www.fs.fed.us/eng/pubs/pdf/07771814.pdf	
Congestion Mitigation and Air Quality Act (CMAQ)	Federal Highway Administration (FHWA)	Both	Intended to reduce air pollution and congestion by encouraging cycling and walking through provision of facilities or other resources such as maps and education.	http://www.fhwa.dot.gov/environment/air_quality/cmaq/	
National Scenic Byways Program (NSBP)	Federal Highway Administration (FHWA)	Walk	This grant is used for construction of pedestrian walkways along scenic byways. It requires 20% local contribution.	http://www.bywaysonline.org/grants/	
Recreational Trails Program	Federal Highway Administration (FHWA)	Both	Can be used for construction and/or maintenance of recreational trails for motorized or non-motorized transport. At least a 5% local contribution is required.	http://www.fhwa.dot.gov/environment/recreational_trails/	Improvements / maintenance related to the Grand Rounds Regional LRT Trail, and the planned Crystal Lake Trail.
Highway Safety Improvement Program (HSIP)	Federal Highway Administration (FHWA)	Both	Intended to increase safety and reduce fatalities on the National Highway System. This includes pedestrian and bicycle facilities. A 10% local contribution is required.	http://safety.fhwa.dot.gov/hsip/	
Transportation Enhancements (TE)	Federal Highway Administration (FHWA)	Both	Intended to provide transportation enhancements including rail-to-trail programs, 'main street' projects, and streetscape improvements among others.	http://www.fhwa.dot.gov/environment/transportation_enhancements/	Sidewalk gaps throughout the city; bike lane projects.
Safe Routes To School (SRTS)	National Center for Safe Routes to School	Both	This grant provides funding for pedestrian and bicycle facilities along school routes.	http://www.saferoutesinfo.org/	Improvements (such as on 36th Ave N) near Robbinsdale Middle School.
Safe Routes To School (SRTS)	Minnesota Department of Transportation (MnDOT)	Both	This grant provides funding for pedestrian and bicycle facilities along school routes.	http://dot.state.mn.us/saferoutes/grants.html	Improvements (such as on 36th Ave N) near Robbinsdale Middle School.
Safe Kids Walk This Way	Safe Kids USA	Walk	Intended to create a safer pedestrian environment by educating motorists and children. This goal is achieved through community engagement practices.	http://www.safekids.org/in-your-area/coalitions/minnesota-state.html	

Grant or Program name	Organization	Walk? / Bike? / Both?	Program description	Additional information	Potential project
Job Access and Reverse Commute Grants	Federal Transit Administration (FTA)	Both	This program aims to connect low-income residents and welfare recipients to work places via transit access and pedestrians and bicycle facilities.	http://fta.dot.gov/grants/13093_3550.html	
Land and Water Conservation Fund (LWCF)	Minnesota Department of Natural Resources (DNR)	Both	Intended to protect local land and water resources in a number of ways including trails which promote the enjoyment and protection of resources via non-motorized transportation.	http://www.dnr.state.mn.us/grants/recreation/parkroads.html	
Rivers, Trails, and Conservation Assistance Program	National Park Service (NPS)	Both	Provides guidance to communities for the preservation of land and water as well as the development of recreational trails and greenways.	http://www.nps.gov/ncrc/programs/rtca/contactus/cu_apply.html	
Active Living Research	Active Living Research	Both	Supports studies which promote active living through policy, particularly in relation to childhood obesity.	http://www.activelivingresearch.org/grantsearch/grantopportunities	

5.14 - Estimating Implementation Costs

The following tables are provided as a first step toward estimating probable costs for implementation projects. Contingency, engineering/design, construction and administration costs are not included. See additional information at www.bicyclinginfo.org/bikecost/ and at http://katana.hsrc.unc.edu/cms/downloads/Countermeasure%20Costs_Report_Nov2013.pdf

General costs per type of facility

Facility	Unit Cost
Sidewalks (one side of the street)	$209,100 per mile
On-street bicycle lanes on both sides of the street with on-street parking on both sides of the street	$45,200 per mile
On-street bicycle lanes on both sides of the street with on-street parking on one side of the street	$37,300 per mile
On-street bicycle lanes on both sides of the street with no on-street parking	$29,400 per mile
Neighborhood Slow Street	$108,200 per mile
Typical Intersection Improvements	$135,700 per intersection

Striping

Treatment description	Unit	Unit cost
Bike lane symbol (paint)	EA	$75.00
Bike lane symbol (thermoplastic)	EA	$200.00
Shared lane marking (thermoplastic)	EA	$275.00
Green bike lane (paint)	LF	$19.00
Colored pavement (thermoplastic)	SF	$10.00

Intersection treatments / traffic calming

Treatment description	Unit	Unit cost
Median extension for pedestrian refuge (6 ft x 8 ft)	EA	$5,000
Curb extension / Bump-out (6ft x 20ft)	EA	$12,500
Pedestrian refuge island, small (1100 sf)	EA	$12,000
Pedestrian refuge island, large (2300 sf)	EA	$25,000
Speed hump (raised crossing)	EA	$2,500

Pavement Markings

Treatment description	Unit	Unit cost
4" Dashed	LF	$0.75
6" Dashed	LF	$1.00
8" Dashed	LF	$1.25
4" Solid	LF	$1.00
6" Solid	LF	$1.50
8" Solid	LF	$2.00
"Zebra" striped crosswalk (thermoplastic)	LF	$120.00

Signs, Signals and Wayfinding

Treatment description	Unit	Estimated Unit Cost
Wayfinding sign (including post and base)	EA	$400
Regulatory/warning sign (including post and base)	EA	$300
Rectangular Rapid Flashing Beacon (RRFB)	EA	$15,000
Pedestrian hybrid beacon (PHB / HAWK)	EA	$100,000
Bicycle signal	EA	$10,000
Loop detector	EA	$1,500

Other

Treatment description	Unit	Estimated Unit Cost
Bicycle parking (inverted U)	EA	$190
On-street bicycle corral (for 10 bikes)	EA	$1,800
Street lights	EA	$3,700
Bollard	EA	$150
ADA Curb ramp	EA	$1,500
Concrete Sidewalk	SF	$8