

MITCHELL STATION

CITY OF EDEN PRAIRIE

SOUTHWEST CORRIDOR INVESTMENT FRAMEWORK
TRANSITIONAL STATION AREA ACTION PLAN

ABOUT THIS CHAPTER:

The Transitional Station Area Action Plans are the product of a Hennepin County led effort to help communities along the Southwest LRT corridor prepare for SW LRT's opening day in 2018 and beyond.

An individualized plan has been created for each of the 17 stations in the Southwest Corridor, each plan comprising a chapter in the larger Southwest Corridor Investment Framework. The station area action plans suggest ways to build on local assets, enhance mobility, identify infrastructure needs, and capitalize on promising opportunities for development and redevelopment near each station.

Note: The Metropolitan Council has not determined the Southwest LRT project scope and budget. As of December 2013, the Southwest Project Office recommends terminating the line at the Southwest station.

Plan Components:

INTRODUCTION 18-2

A brief overview of the station location and its surroundings

WHERE ARE WE TODAY? 18-4

A description of existing conditions in the station area, including:

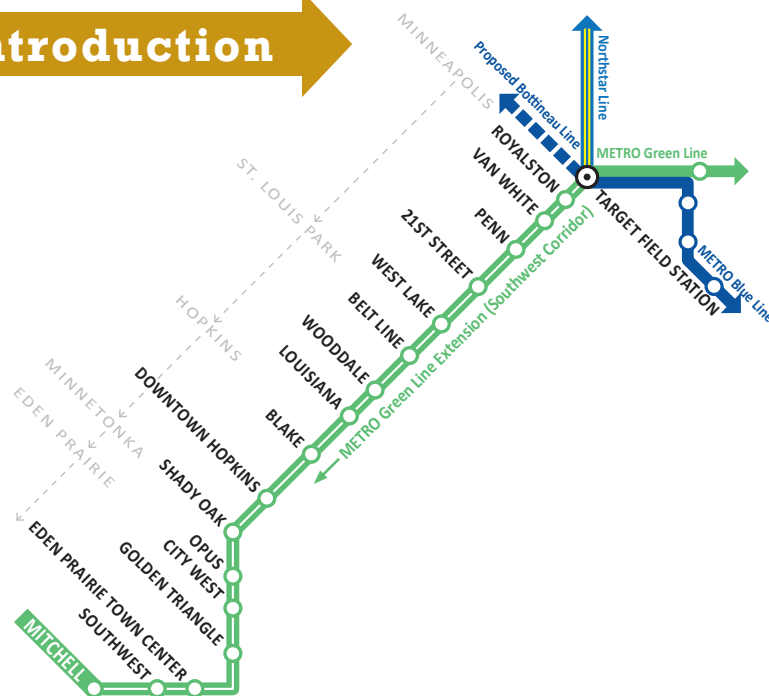
- » Land Use
- » Transit Connections
- » Access + Circulation Issues (Bike, Ped, and Auto)
- » Infrastructure Needs

WHERE ARE WE GOING? 18-8

This section presents a number of recommendations for the station area in anticipation of opening day needs and the long-term TOD environment. Recommendations are provided for both potential station locations. This includes:

- » Access + Circulation Plan
- » Station Area Site Plan
- » Infrastructure Plan
- » Development Potential
- » Summary of Key Initiatives

Introduction



MITCHELL STATION WITHIN THE CORRIDOR:

The gateway to Eden Prairie City Hall, C.H. Robinson and other businesses, and an important point of access for people traveling to the Southwest Corridor from the west.

EMPLOYMENT The Mitchell station is located at the southwest terminus of the corridor and is described as an Employment and Institutional station along the line (see Place Types discussion beginning on p. 1-19). The station area is surrounded by suburban office and industrial parks, including the current home of the C.H. Robinson office campus.

CIVIC AMENITIES The lands adjacent to the station are occupied primarily by institutional/civic facilities including the two-story Eden Prairie City Hall, public works facility, community center, and fire department. Direct connection from the station to these municipal services will help to enhance access for residents of Eden Prairie to their community representatives and services and support transit ridership at the station.

NEIGHBORHOODS Single-family residential dwellings are located at the far reaches of the station walkshed, south of Scenic Heights Road. The extension of Hiawatha Ave north towards the station will provide area residents with a more convenient walking route to the station.

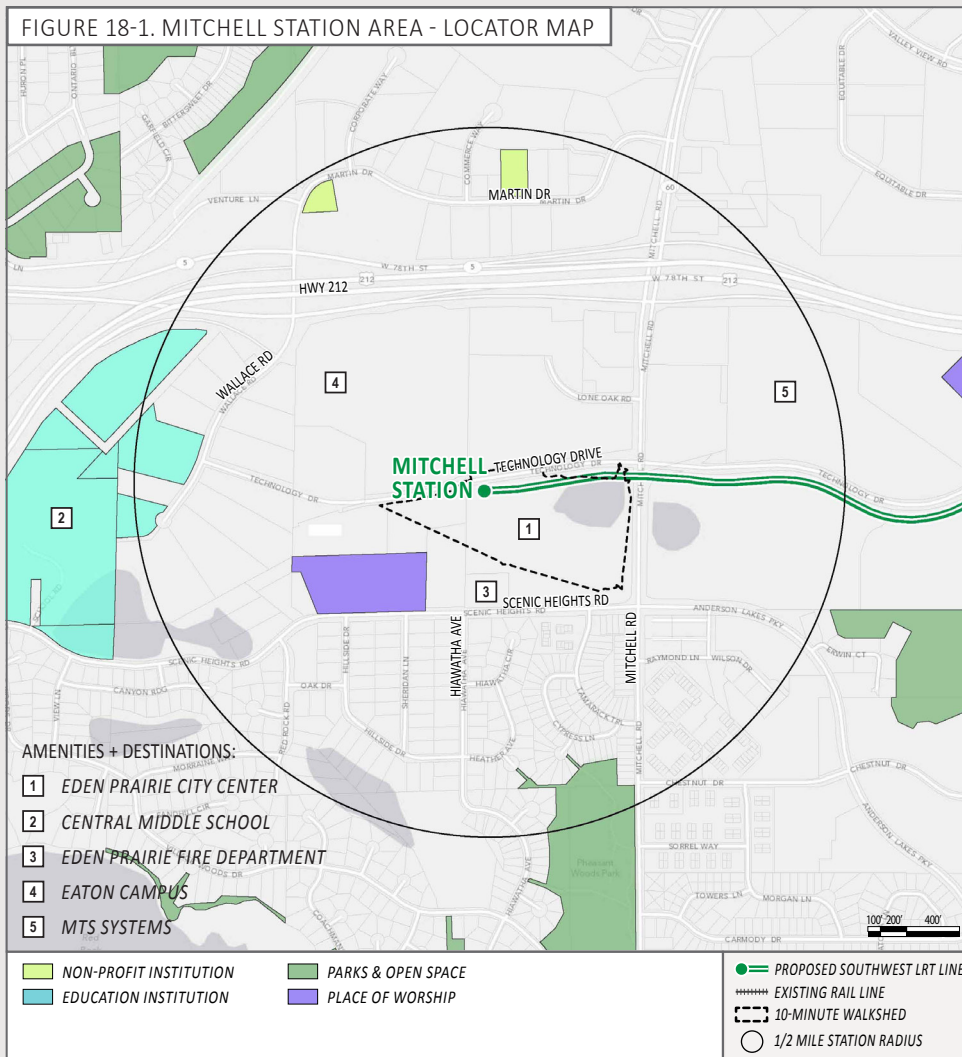
TRAIL CONNECTIONS Existing regional trails can be accessed off several roads including Technology Drive, Mitchell Road, and Scenic Heights Drive.

OTHER DESTINATIONS The station's location at the end of the line makes it an ideal spot for a major park-and-ride facility serving passengers travelling downtown from the west. For this reason the area has been identified as the site of a park and ride facility with access from Highway 212 and Highway 5. This function, in addition to the employment emphasis, will play an important role in the character and function of the station area and will need to be balanced against objectives related to serving City Hall.

Station Location

The proposed Mitchell station, is located at the far southwest end of the LRT line, along Technology Drive and adjacent to the Eden Prairie City Center, a destination for businesses and residents of Eden Prairie.

Other land uses near the Mitchell station include office, light industrial, retail, and other public facilities, including the Eden Prairie Fire Department, Public Works and Central Middle School. South of Scenic Heights Road, the land uses are residential; a single-family neighborhood with some homes within the Mitchell station walkshed. The Mitchell station has convenient access to Highway 212 from Wallace Road or Mitchell Road. The Mitchell station is expected to serve the local businesses, residents, and users of the Eden Prairie City Center. In addition, the Mitchell station is anticipated to serve park and ride users from the southwest metro area.



NOTE: 10-minute walkshed approximates the area accessible within a 10-minute walk from the station platform using only the existing sidewalk/trail network. See Glossary for walkshed assumptions and methodology.

MITCHELL STATION AREA TODAY:



City Hall



Office/retail building along Mitchell Road



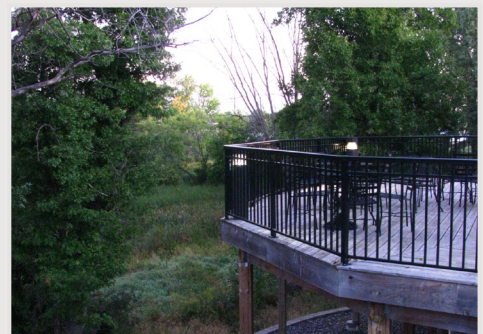
MTS Systems Office



Neighborhood retail



Eden Prairie Water Treatment Facility



View of local wetland

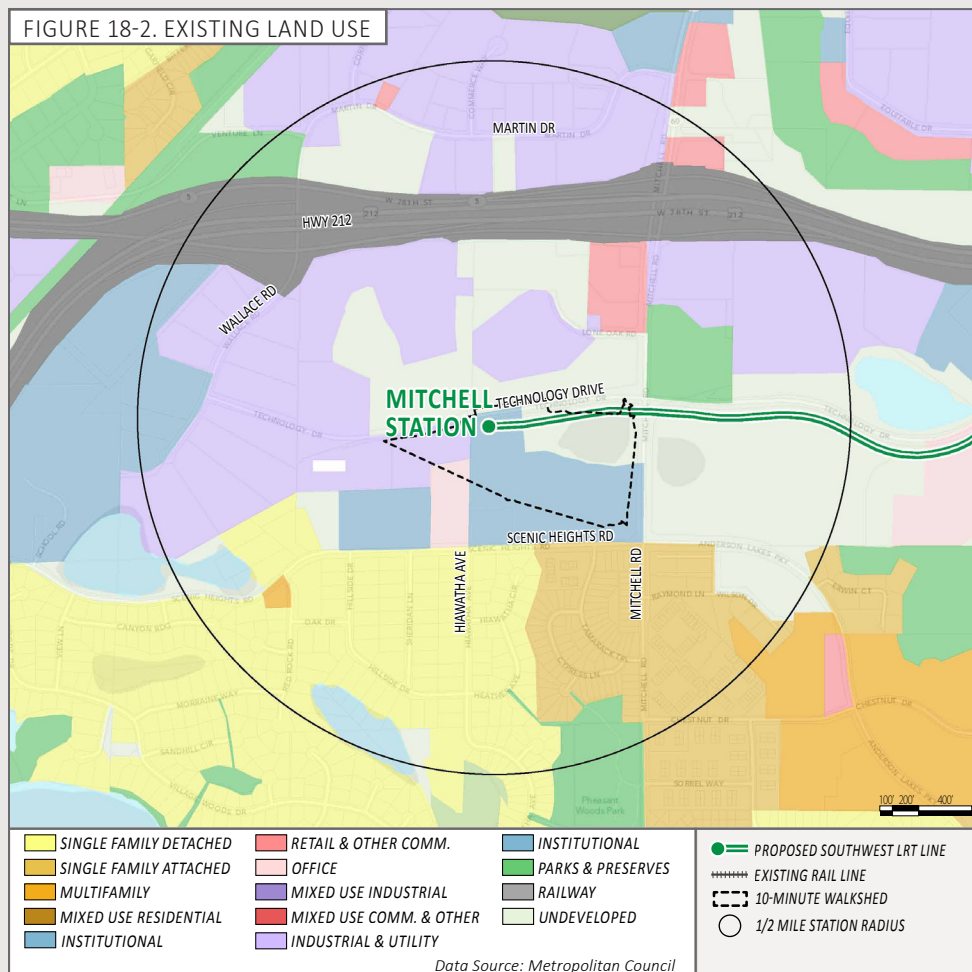
Where Are We Today?

The following section describes the station area's **EXISTING CONDITIONS**, including the local context, land uses, transit and transportation systems, pedestrian and bicycle facilities, assets, destinations, and barriers to accessing the station. This analysis of current conditions presents key issues and opportunities in the station area and informs the recommendations for future station area improvements.

NOTE: Existing conditions maps are based on data provided by Hennepin County and local municipalities. The data used to create each map is collected to varying degrees of accuracy and represents infrastructure and conditions at varying points in time. Actual conditions may vary slightly from what is shown.

Land Use

Land uses in the Mitchell station area include a mix of office, light industrial, retail, bank, residential, and public facilities, including the Eden Prairie City Center, Fire Department, Public Works and Central Middle School. Office, light industrial, and public facilities are located along Technology Drive and Highway 212. A single-family residential neighborhood is located south of Scenic Heights Road. Highway 212 limits access points for businesses located north of the highway to Mitchell Road and Wallace Road.



Roadway Network

The roadway network in the Mitchell station area is limited north of Scenic Heights Road. The area is characterized by large block sizes and few roadways. Technology Drive provides east-west movement and access to businesses and public facilities located along it. Mitchell Road and Wallace Road provide north-south access, including interchanges with Highway 212. Highway 212 runs east-west across the north part of the Mitchell Station walkshed, limiting access to parcels to the north. Scenic Heights Drive runs east-west, along the south portion of the Mitchell station walkshed, providing access to homes, businesses, and the fire station. Uses to the south of Scenic Heights Drive are residential. The roadway network in this area is more fine-grained with smaller block sizes and more local streets. Access to the station from this residential area is currently off Mitchell Road to Technology Drive. There is an opportunity to extend Hiawatha Avenue north to Technology Drive and more effectively serve this neighborhood.

Transit

The Mitchell station area is currently served by Southwest Transit express bus routes #684, #690, #695, and #698 along Technology Drive and Mitchell Road, with stops located on Wallace Road and Mitchell Road.

FIGURE 18-3. EXISTING ROADWAY NETWORK

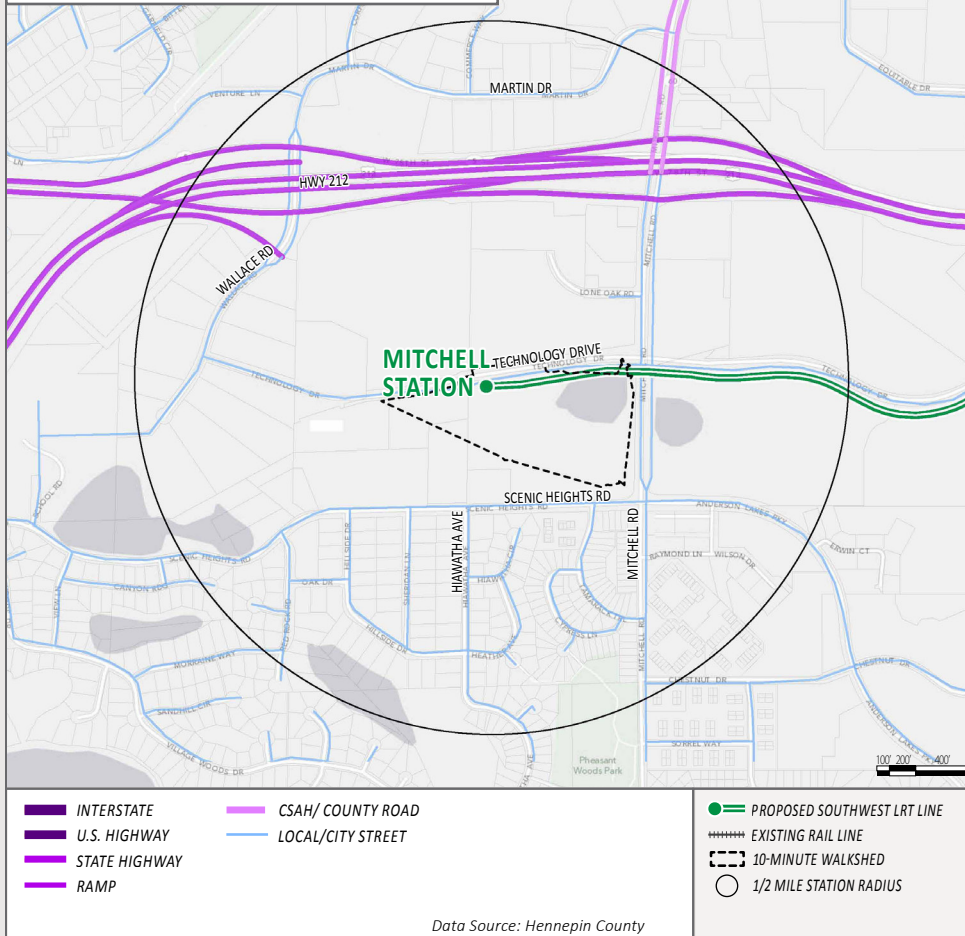
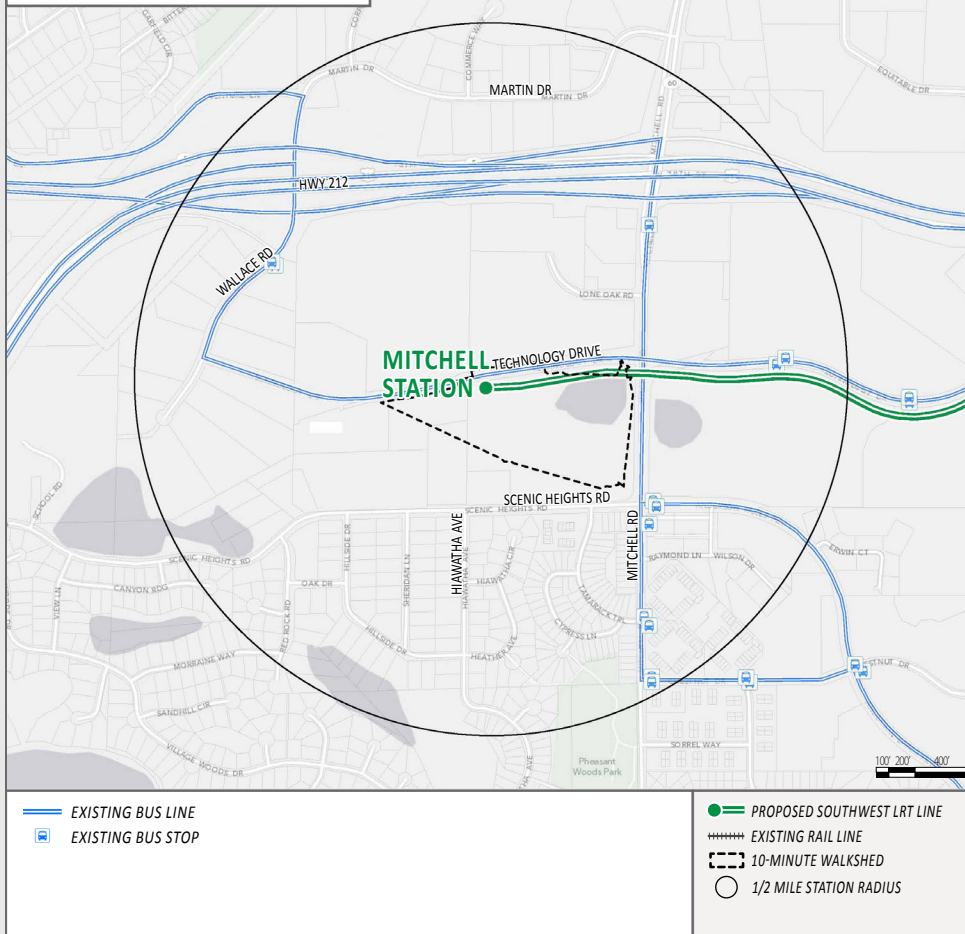


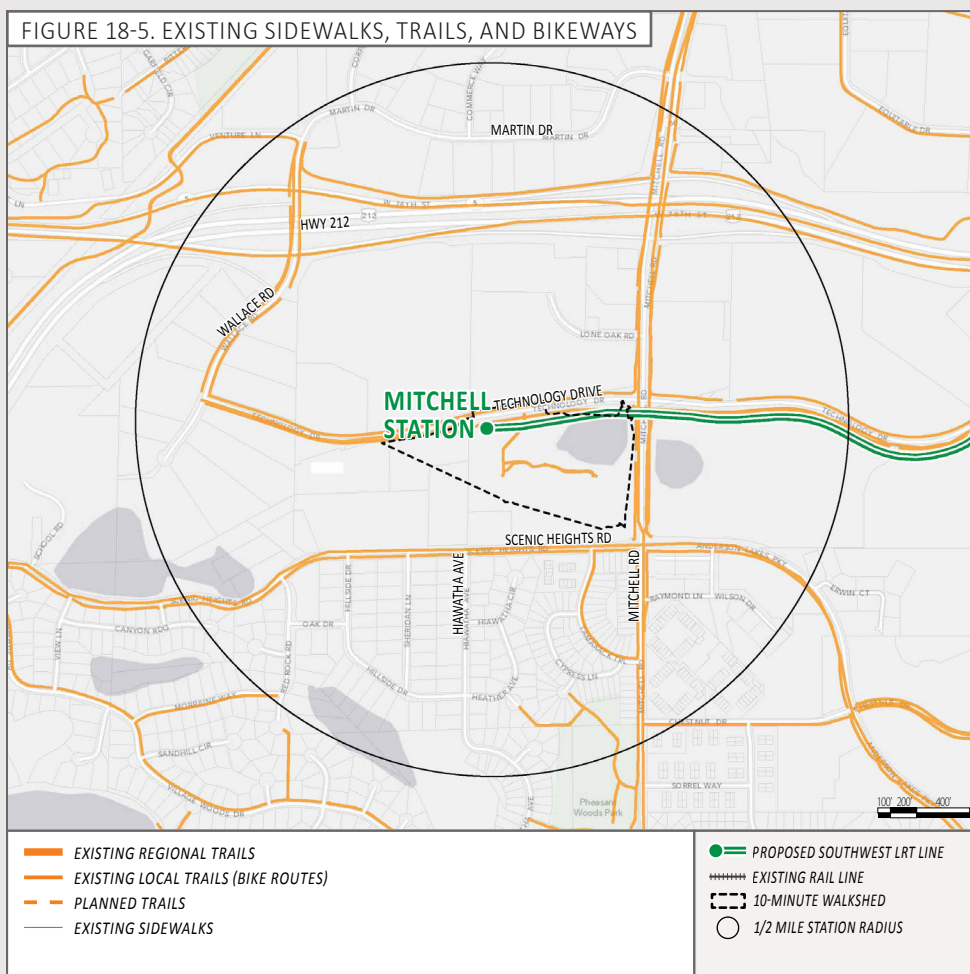
FIGURE 18-4. EXISTING TRANSIT



Sidewalk, Trails and Bikeways

The sidewalk system in the Mitchell station area is very limited. Few streets have sidewalks on them, however, several roadways include multi-use trails. Key roads in the area with trail connections include Technology Drive, Mitchell Road, Scenic Heights Road, Wallace Road, Highway 212, and Village Woods Drive. A finer grained system of trails, bikeways, and sidewalks would enhance connectivity to the station.

FIGURE 18-5. EXISTING SIDEWALKS, TRAILS, AND BIKEWAYS

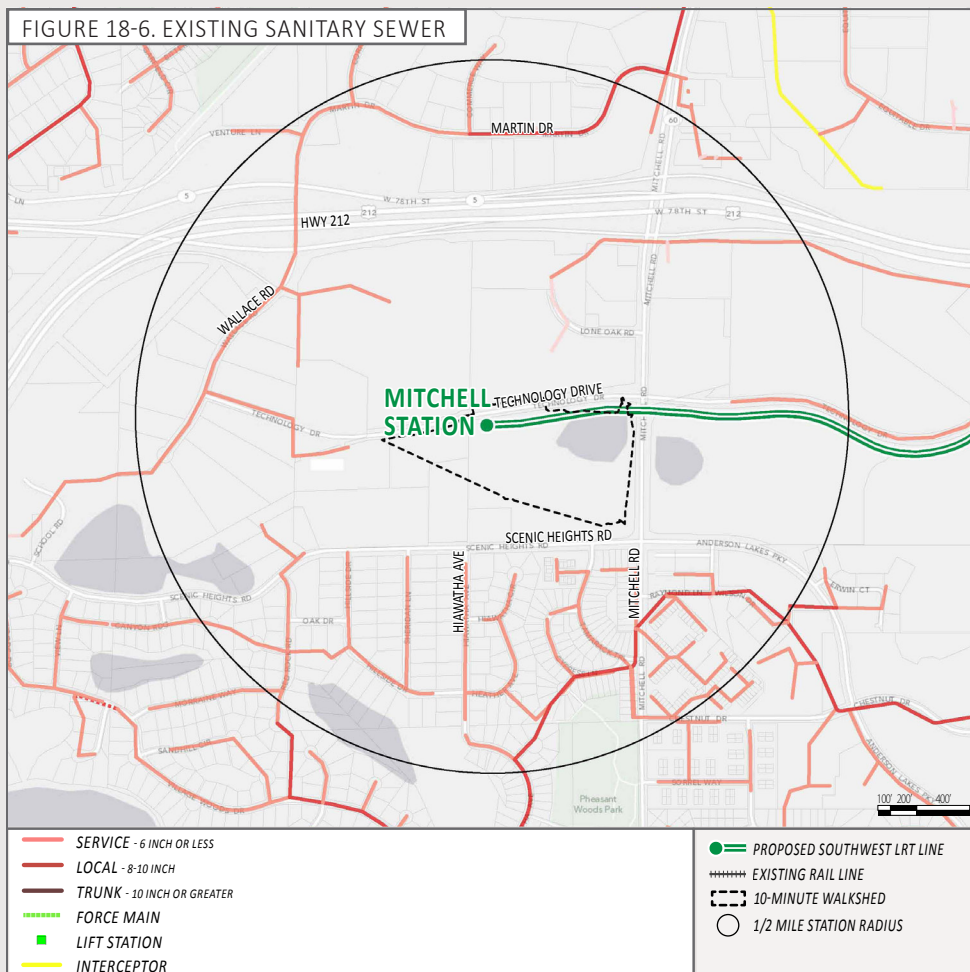


Sanitary Sewer

Sanitary sewer infrastructure consists of a collection of gravity flow sewer mains, lift stations, and pressurized forcemains that transport sewage to a wastewater treatment plant (WWTP). An efficient collection system has the capacity to accommodate all of the existing land uses within its particular sewershed. Beyond capacity, the material and age of pipes within a system can also impact a system's effectiveness.

Sanitary sewer infrastructure within the project area is typically maintained by either the City of Eden Prairie or by the Metropolitan Council Environmental Services (MCES) Division. MCES maintains a series of interceptor trunk sewers which collect sewage at key locations and convey sewage across community boundaries to regional WWTPs. Wastewater from the station area is treated by the MCES Blue Lake WWTP located in Shakopee.

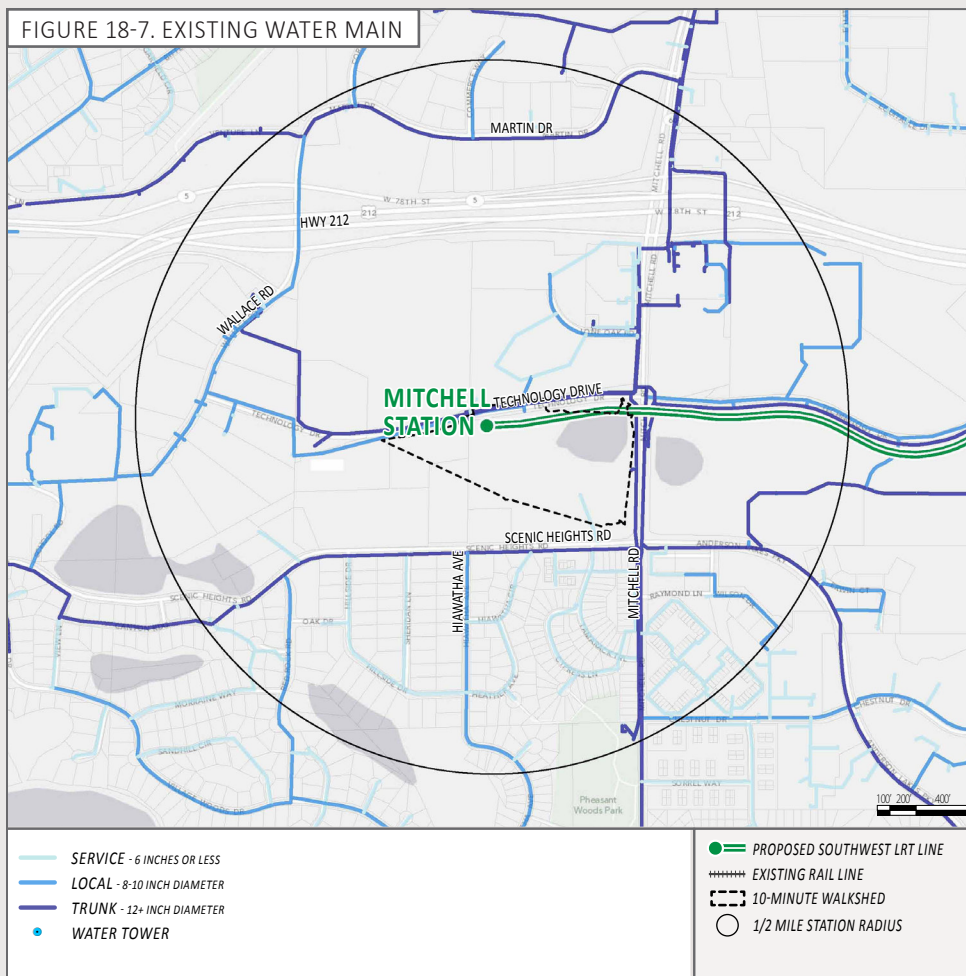
FIGURE 18-6. EXISTING SANITARY SEWER



Water Main

Water main distribution systems serve to supply potable water to individual properties and to support fire suppression throughout the community. A well-designed system can maintain adequate pressure to support demand of individual properties and provide high flow rates to fire hydrants/fire suppression systems in emergency situations. Because of the complexity of water distribution networks and the importance of pressure, flow, and water quality, City water system models are used to evaluate a system's adequacy. The material and age of the system's water mains can also be factors in system breaks, leaks, and pressure and flow degradations.

Water pressure and flow rates can be influenced by: the size of water main serving an area, proximity and elevation relative to a water tower, proximity to a trunk water main with high flow capacity, if the water main creates a loop, the demand of adjacent land uses, and the condition of the water main.



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Where Are We Going?

The plans and diagrams on the following pages illustrate a range of recommendations for infrastructure improvements, station amenities, and potential redevelopment opportunities within the station area.

The ACCESS AND CIRCULATION PLAN shown in Figure 18-8 provides a high level view of how future transit, automobile, bike, and pedestrian systems will connect to the station area and its surroundings.

Figure 18-9 illustrates the STATION AREA IMPROVEMENTS that will facilitate access to and from the station and catalyze redevelopment in the station area. This includes opening day and long-term station area improvements

Figure 18-10 focuses on OPENING DAY STATION AREA IMPROVEMENTS only. These recommendations represent the improvements necessary to enhance the efficient function of the transit station, roadways, pedestrian and bicycle connections, and transit connections on opening day in 2018.

Station Area Improvements

The discussion below outlines a range of future station area improvements. While some of the identified improvements may be constructed as part of the LRT project itself, other improvements must be funded, designed and constructed by other entities and will require coordination between the City, County, and Metro Transit as well as local stakeholder and community groups.

ROADWAYS

Long-Term Improvements:

- » Extend Hiawatha Avenue roadway from Scenic Heights Drive to Technology Drive.

PEDESTRIAN CONNECTIONS

Opening Day Improvements:

- » Focus sidewalk and streetscape enhancements along Technology Drive, Mitchell Road, Scenic Heights Road, and Hiawatha Avenue. Include new sidewalks and trails along these roadways where they do not exist today.
- » Extend multi-use trail on the west side of the fire station north to Technology Drive to better connect the residential neighborhood to the south of Scenic Heights Drive to the LRT station.
- » Improve connections to the station from surrounding businesses and destinations with new trails, wayfinding, and enhanced pedestrian crossings. Provide enhanced pedestrian crossings along Technology Drive, Mitchell Road, and Scenic Heights Drive.

BIKE CONNECTIONS

Opening Day Improvements:

- » Provide a multi-use trail connection to Technology Drive along Hiawatha Ave to connect to neighborhoods to the south.
- » Provide a multi-use trail along Wallace Road to connect to neighborhoods to the north of Highway 212

- » Provide bike parking and locker facilities in a highly visible area near the station platform.

TRANSIT CONNECTIONS

Opening Day Improvements:

- » Enhance the pedestrian environment along Technology Drive to improve transfer interface between the local bus stops and the LRT station.
- » Include wayfinding and signage at bus stops and the LRT transit station to direct transit users.



Pedestrian-friendly streetscape improvements



Station platform with shelter, lighting, seating, and signage



Clear walking route between transit station and City Center

PARK AND RIDE

Opening Day Improvements:

- » Provide a park and ride ramp on the northwest quadrant of the Eden Prairie City Center site with access off Technology Drive. Provide safe auto, bike, and pedestrian access to, from and around the park and ride facility.

KISS AND RIDE

Opening Day Improvements:

- » Provide kiss and ride drop-off facilities near the park and ride site with access off Technology Drive. Ensure that kiss and ride loop is designed to accommodate full-size buses.

STATION AMENITIES (Beyond SW LRT Base Project Scope)

Opening Day Improvements:

- » Wayfinding – include signage and wayfinding near the station area platform, the park and ride facility, and along trails and sidewalks near the station.
- » Seating – provide comfortable and durable seating near the station platform and at the park and ride facility.
- » Lighting – provide adequate lighting for the safety of pedestrians, bicyclists, transit users, and motorists near the station platform, at the park and ride facility, and near the kiss and ride drop-off.
- » Plaza – provide a small public plaza area near the station platform to provide transit users with a paved queue area to wait for LRT trains and move about the station area.
- » Public Art – provide public art in the station area.
- » Bike Facilities – provide bicycle parking and locker facilities in a highly visible area near the station platform.

POTENTIAL DEVELOPMENT

Long-Term Improvements:

- » See the “Development Potential” discussion on page 18-16 for more on long-term development opportunities.

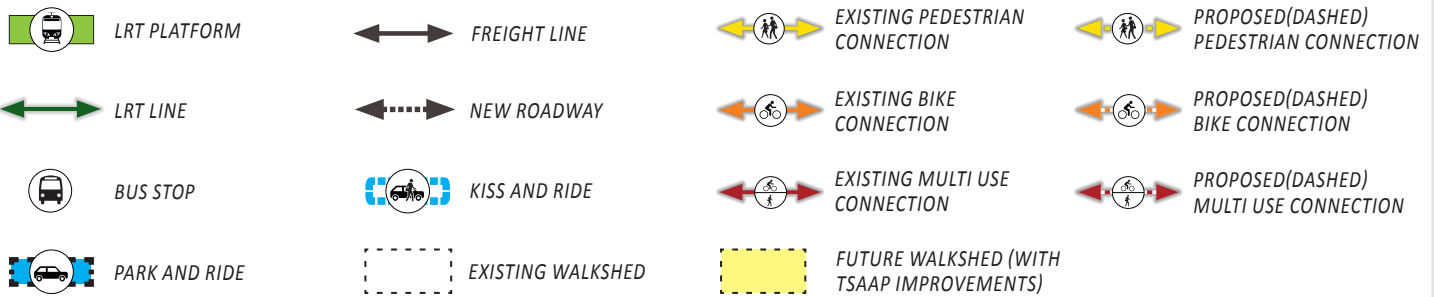
UTILITIES

- » See the “Station Area Utility Plan” beginning on page 18-18 for all utility recommendations.

FIGURE 18-8. ACCESS + CIRCULATION PLAN

WHERE ARE WE GOING?

MITCHELL



NOTE: Existing walkshed approximates the area accessible within a 10-minute walk from the station platform using only the existing sidewalk/trail network. Future walkshed incorporates all proposed improvements to the sidewalk/trail network. Walksheds are based on GIS modeling and available sidewalk/trail information- and may not reflect exact on-the-ground conditions. See Glossary for detailed explanation of walkshed assumptions and methodology.

WHERE ARE WE GOING?

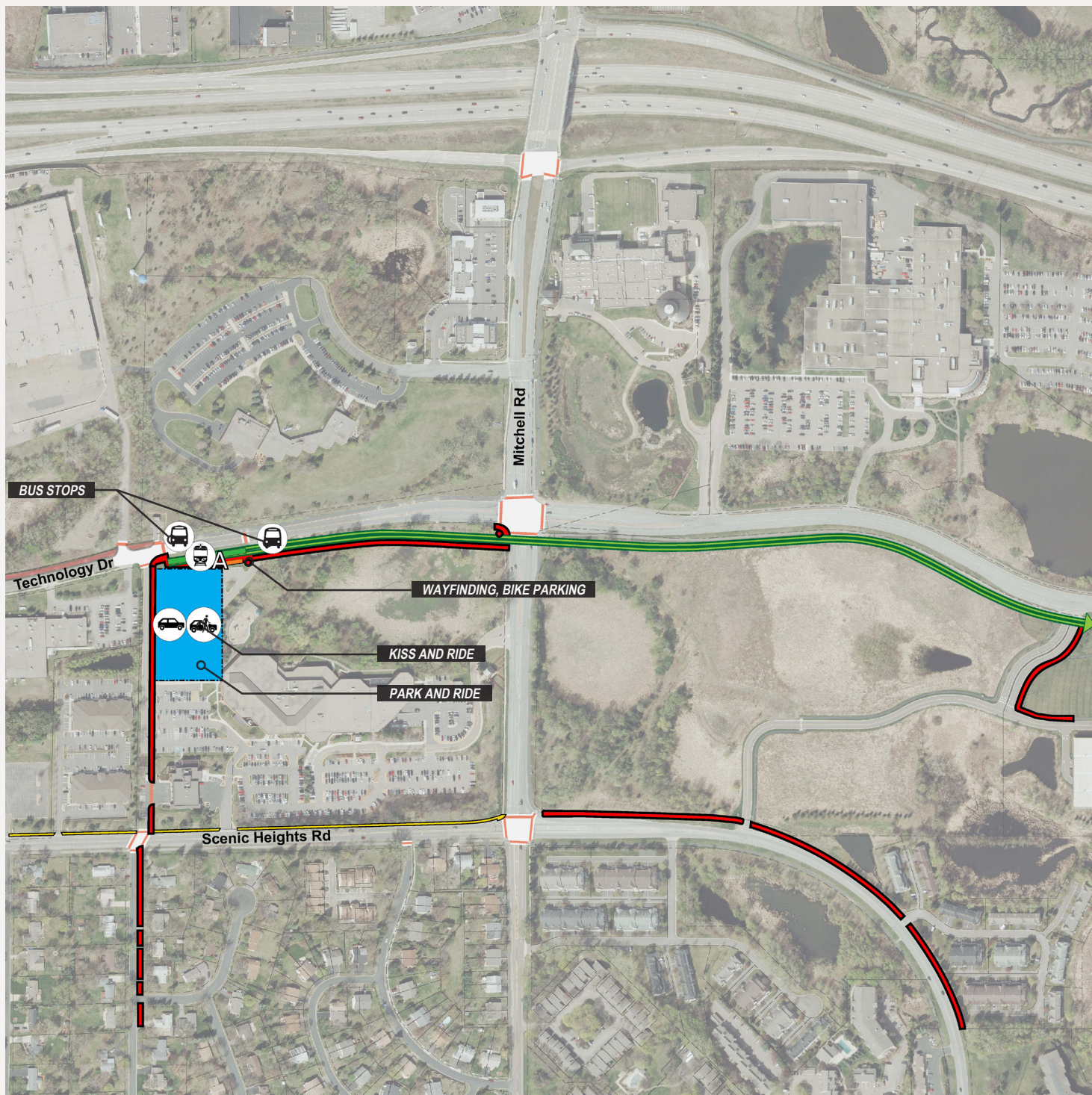


SOUTHWEST CORRIDOR INVESTMENT FRAMEWORK - TRANSITIONAL STATION AREA ACTION PLANS 18-11

FIGURE 18-10. OPENING DAY STATION AREA IMPROVEMENTS

WHERE ARE WE GOING?

MITCHELL



- | | | | | | | | |
|--|--------------|--|-------------------------------------|--|---------------|--|-------------------------------------|
| | LRT PLATFORM | | NEW SIDEWALK / SIDEWALK IMPROVEMENT | | NEW ROADWAY | | BIKE PARKING |
| | FREIGHT LINE | | ON STREET BIKE INFRASTRUCTURE | | STREETSCAPE | | WAYFINDING |
| | BUS STOP | | MULTI-USE PATH | | PARK AND RIDE | | PUBLIC ART OPPORTUNITY |
| | BUS SHELTER | | NEW CROSSING / CROSSING IMPROVEMENT | | KISS AND RIDE | | POTENTIAL DEVELOPMENT SITE |
| | | | NEW SIGNALIZED INTERSECTION | | | | PLAZA SPACE / BUILDING SETBACK AREA |

Conceptual Street Sections

The street cross section illustrated below is conceptual and represents a potential future streetscape condition, addressing facilities for a variety of transportation modes, streetscape amenities, and the relationship between buildings and the street edge. Further design and engineering work will be required to ensure the streetscape is in compliance with City and/or County design standards and needs.

HIAWATHA LANE

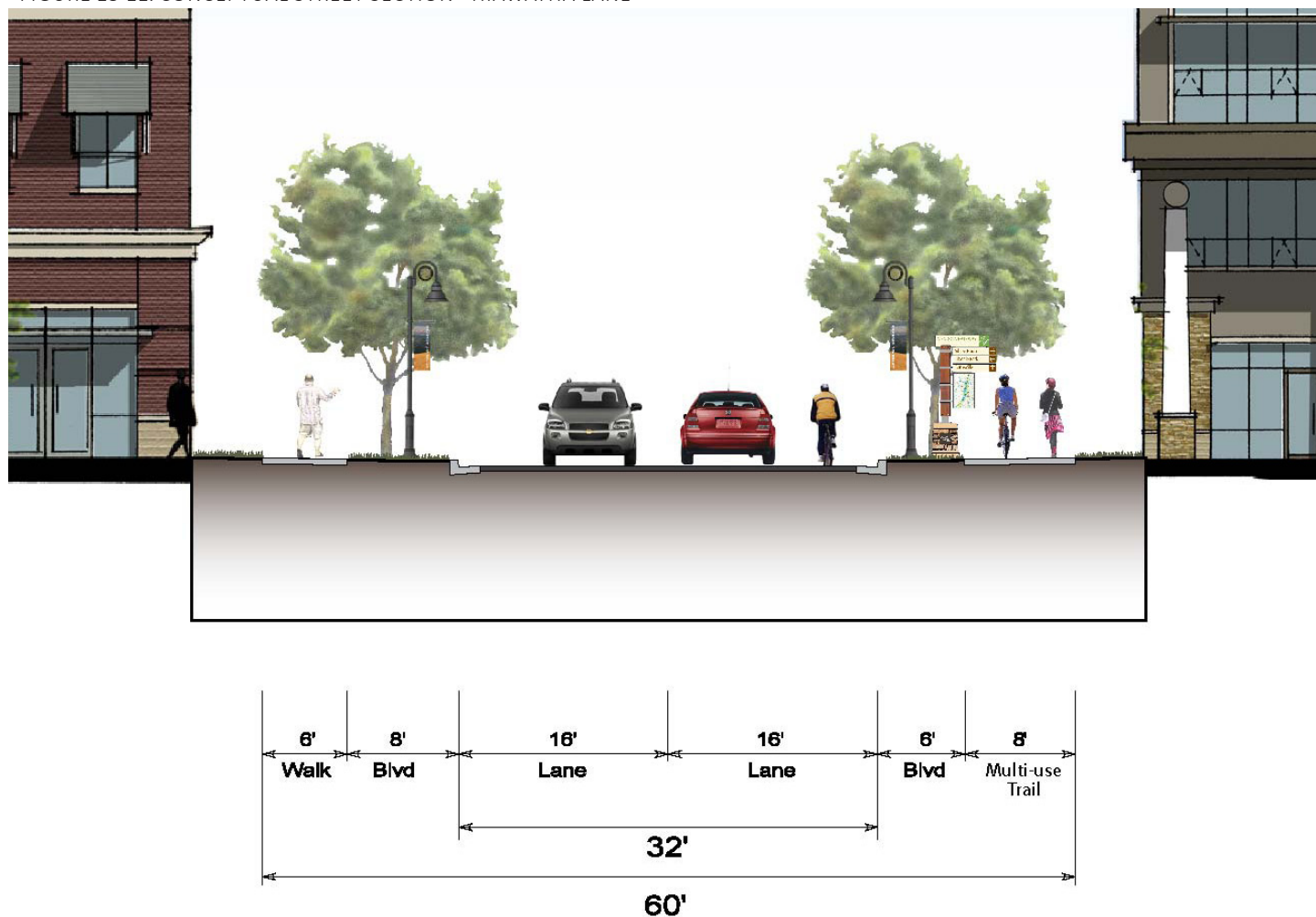
Dimensional Criteria:

- » 60 feet Right-of-Way Width
- » 32 feet Pavement Width (2-way)
- » 20'-30' o/c Street Tree Spacing
- » 6'-0" Sidewalk Width
- » 8'-0" Trail Width

Design Features:

- » Sidewalk (one side of street)
- » Trail (one side of street)
- » Street Trees/Plantings/Raingardens
- » Signage/Wayfinding
- » Street and Pedestrian Lighting
- » Pedestrian-Friendly Crossings (markings, ADA features)

FIGURE 18-11. CONCEPTUAL STREET SECTION - HIAWATHA LANE



Opening Day Improvements

The following tables and diagrams outline the proposed improvements to be implemented in advance of SW LRT's opening day in 2018. As of December 2013, the Southwest Project Office recommends terminating the line at Southwest Station; the Mitchell Station is not part of the SW LRT base project scope, but is presented here as a concept scope. Table 18-1 and Figure 18-12 show opening day improvements that are part of the concept scope (i.e. improvements that could be part of the SW LRT base project scope should this station ultimately be built). Table 18-2 and Figure 18-13 include opening day improvements that are recommended as part of the Southwest Corridor Investment Framework and are beyond the concept scope. Table 18-3 (also shown in Figure 18-13) includes concept "betterments" - or improvements that cities have requested to be included in the concept scope pending funding availability.

TABLE 18-1. SOUTHWEST LRT CONCEPT SCOPE - OPENING DAY STATION AREA IMPROVEMENTS

PLAN KEY	IMPROVEMENT	PROJECT LOCATION	PROJECT NOTES
A	LRT Platform	Along south side of Technology Drive, at northwest quadrant of City Center	Includes related LRT infrastructure
B	Park and Ride	Adjacent to station platform	Approx. 900 stall park and ride plus replacement stalls (includes lighting, signage and access to station platform)
C	Kiss and Ride	Within park and ride ramp	Pullout dropoff area and turnaround
D	Sidewalk/Trail	Technology Dr, from park and ride ramp to Mitchell Rd	Trail connection
E	Bike Facilities	Near station platform	Allowance for bike storage
F	Wayfinding	Near station platform	Allowance
G	Landscaping*	Near station platform	Allowance
H	Water*	Near station platform	New water service and fire hydrant to station
I	Utilities*	Project limit area	Adjustment of existing utilities
J	Stormwater management*	Near station platform and park and ride lot	Allowance

Note: The Metropolitan Council has not determined the project scope and budget. As of December 2013, the Southwest Project Office recommends terminating the line at Southwest Station.

** Improvement not symbolized on opening day figures (exact location to be determined as part of the base project scope if station is ultimately included in the project)*

TABLE 18-2. SOUTHWEST CORRIDOR INVESTMENT FRAMEWORK (TSAAP) - OPENING DAY STATION AREA IMPROVEMENTS

PLAN KEY	IMPROVEMENT	PROJECT LOCATION	PROJECT NOTES	PRIORITY
1	Sidewalk/Trail	Scenic Heights Rd and east side of Hiawatha Ave south of Scenic Heights Rd	Sidewalk and multi-use trail connections	Secondary
2	Public Art	Station area	Public art (beyond SPO Improvements)	Secondary
3	Public Plaza	Near station platform	Includes paving, plantings, seating, and lighting (beyond SPO improvements)	Primary
4	Bike Facilities	Near station platform	Bike parking, lockers and bike share facilities (beyond SPO improvements)	Primary
5	Stormwater Management*	Technology Drive, near station platform, and potential redevelopment and infill sites	Includes green infrastructure strategies (beyond SPO improvements)	Primary

** Improvement not symbolized on opening day figures*

TABLE 18-3. SOUTHWEST LRT LOCALLY REQUESTED CONCEPT BETTERMENTS - OPENING DAY STATION AREA IMPROVEMENTS

PLAN KEY	IMPROVEMENT	PROJECT LOCATION	PROJECT NOTES
B1	Roadway/Trail	Hiawatha Ave Extension- Between Technology Dr and Scenic Heights Rd	Multi-use trail and Road Extension
B2	Wayfinding	Near station platform and along Technology Drive	Signage and wayfinding (beyond SPO improvements)

WHERE ARE WE GOING?



MITCHELL

MITCHELL



MITCHELL

Development Potential

OVERVIEW

Key factors at the Mitchell station that present opportunities for future redevelopment include the presence of older, low-rise, light industrial buildings near the proposed station platform that may be ready for redevelopment into more intense and mixed land uses. Land availability near the Mitchell station is also an asset that could influence development interest and potential in the area.

The land uses in the Mitchell station area include a mix of office, light industrial, civic/institutional, community service, commercial/retail, and residential uses. Some underutilized office and industrial sites present opportunities for future infill and redevelopment in the area.

Key challenges that should be addressed to facilitate development potential include land uses, additional roadways and existing roadway improvements, sidewalk and trail connectivity in the station area.

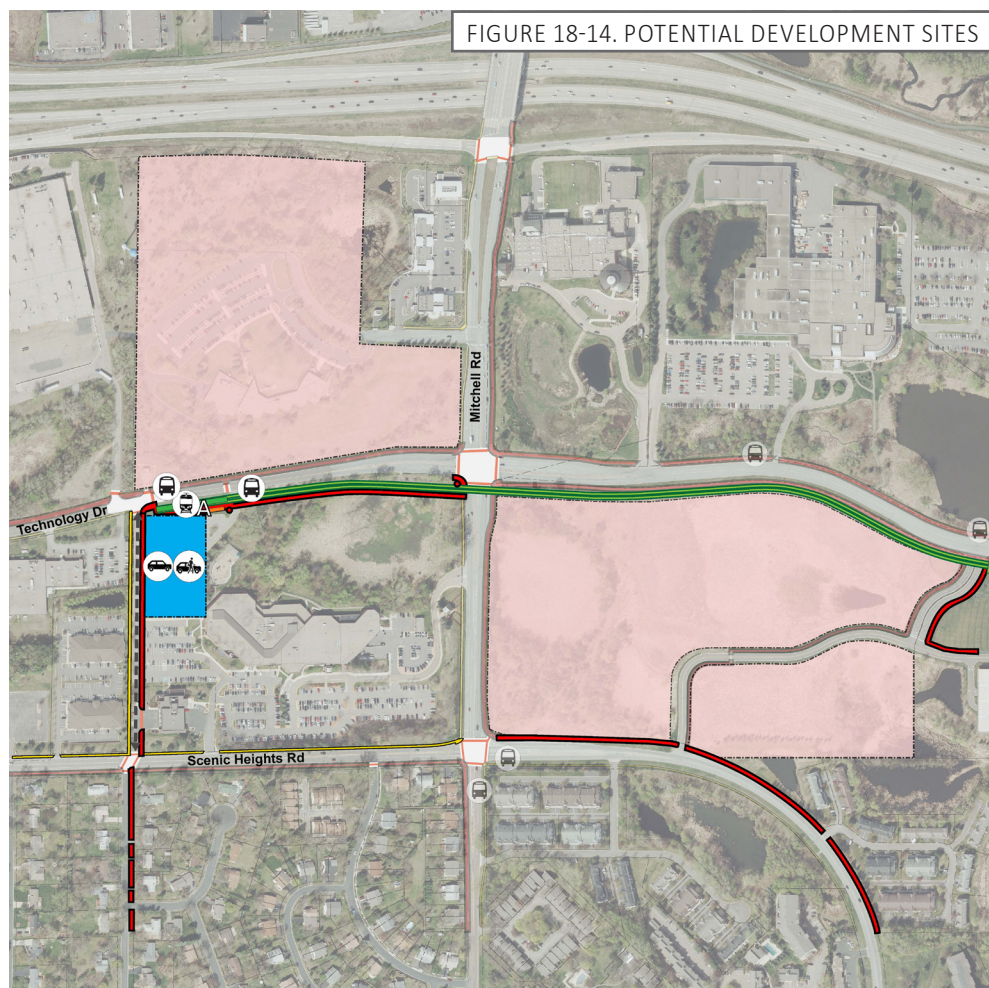
LAND USES

Development potential for the Mitchell station area could include a mix of office and light industrial uses.

PLANNING STRATEGIES

Strategies that should be considered to facilitate future development in the station area include streetscape and trail improvements connecting the station area with potential development sites, local destinations, businesses, and neighborhoods.

FIGURE 18-14. POTENTIAL DEVELOPMENT SITES



Key Considerations for Change and Development Over Time

Development within the station area over time should seek to increase density and mix of uses, reinforce the relationship between the station and city hall and support connectivity to neighborhoods to the south. Key considerations should include:

BUILT FORM AND LAND USE

- » Introduce a greater mix of uses, encourage higher densities and provide active street level uses adjacent to the station in order to support transit ridership and make it easier for city hall employees to access food and other services without having to drive.
- » Locate and orient the park and ride to preserve a clear and direct pedestrian connection between the station platform and entrance to City Hall.
- » Ensure that the design of the park and ride facility preserves opportunities for new development and incorporates active uses at street level that can animate the station area.
- » Design new buildings to enhance pedestrian access by orienting them towards the street and locating them as close to the street line as possible.
- » Design new industrial and employment buildings to contribute to the character and pedestrian-friendliness of the district by locating active uses such as office and cafeteria space towards the street with warehousing to the rear.

PUBLIC REALM

- » Initiate landscape and public realm enhancements around City Hall to improve the connection and establish a generous pedestrian promenade between the station and City Hall entrance.

MOBILITY

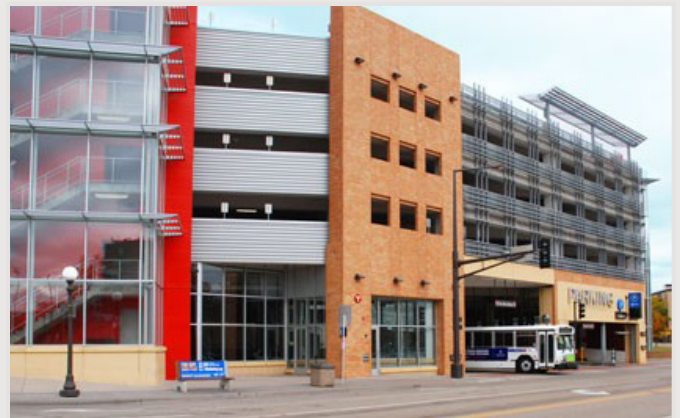
- » Extend Hiawatha Avenue north to Technology Drive to improve connectivity between the station and residential areas to the south of Scenic Heights Road.
- » Support pedestrians through the introduction of sidewalks on all streets within the station area, new crossings, and curb cuts for people in wheel chairs or other mobility devices.
- » Initiate intersection improvements at along Hiawatha Avenue at Scenic Heights Road and Technology Drive once the road is extended to improve crossing conditions for pedestrians.
- » Minimize the impact of parking and circulation on pedestrians by locating parking to the rear or side of new buildings and consolidating access and service drives.
- » Accommodate parking in shared parking facilities and encourage structured parking to minimize large, single-use parking lots.
- » Limit vehicular access points along Technology Drive and Mitchell Road.



Corporate campus



High intensity office



Park & ride facility



Trail connection to residential neighborhoods

Station Area Utility Plan

OVERVIEW

The station area utility plan and strategies recommended below were developed by considering future transit-oriented development within the station area, as depicted by the Station Area Improvements Plan (Figure 18-9). Eden Prairie will need to apply these localized recommendations to the city wide system to ensure that the potential development/redevelopment will not be limited by larger system constraints. Existing models or other methods can be used to check for system constraints in the station areas.

Eden Prairie should also consider reviewing the condition of the existing utilities in the station development area. The station construction would provide Eden Prairie an opportunity to address any utilities needing repairs. Once the larger system has been reviewed for system constraints, Eden Prairie will be able to accurately plan for necessary utility improvements in their city Capital Improvement Program (CIP). All utilities located beneath the proposed LRT rail or station platform should be encased prior to the construction of these facilities. The cost associated with encasing these facilities is assumed to be a project cost and is not included in potential improvements identified for the City of Eden Prairie CIP.

APPROACH

Utility improvement strategies are outlined in this report for the ultimate station area development (2030), as well as improvements which should be considered prior to opening day anticipated in 2018. Although recommendations are categorized in one of these two timeframes, Eden Prairie should weigh the benefits of completing more or less of these improvements as land becomes available for future development. Eden Prairie should take the utility analysis a level further and model future utilities in their city utility system models.

The proposed development and redevelopment areas were evaluated based on Metropolitan Commission Sewer Availability Charge (SAC) usage rates and estimated flows. Estimated flows for one possible development scenario in this area indicate that internal to the station area, no more than eight inch pipe are necessary to serve the mix of proposed and existing development. Each utility system should still be reviewed to identify capacity and demand constraints to the larger system associated with increase in flows from the proposed developments and existing developments in the area. Eden Prairie should anticipate the construction of new municipal utilities in conjunction with new or realigned roadways.

GENERAL RECOMMENDATIONS - SANITARY SEWER

Sanitary sewer recommendations for station area improvements include opportunities for Eden Prairie to improve the existing sanitary sewer network, without necessarily replacing existing sanitary sewers. When recommendations for “improving” existing sanitary sewer are noted, Eden Prairie should consider the level to which each specific sewer should be improved. Methods of improvement could include: lining the existing sewer, pipe joint repair, sewer manhole repair, relocation, and complete replacement.

The following items should be evaluated prior to opening day of the station, although action may not be required until necessary for development:

- » Televising existing sewer mains in the station area and proposed development area to determine the condition of the sewer mains, susceptibility for backups or other issues and evaluate for Infiltration and Inflow (I&I).
- » Locations of known I&I. If previous sewer televising records, city maintenance records, or an I&I study have shown problems, the city should consider taking measures to address the problem.
- » The age and material of existing gravity and/or forcemain sanitary sewer in the identified station area. If the lines are older than the material’s typical design life or materials which are susceptible to corrosion relative to soils in the area, the city should consider repairing, lining or replacing the mains.
- » Locations of known capacity constraints or areas where city sewer models indicate capacity issues. If there are known limitations, the city should further evaluate the benefit of increasing pipe sizes.
- » City sewer system models (existing and future). A review of these models with future development would assist Eden Prairie in determining if sewers in the project area should be increased to meet existing or future city system needs.
- » Existing sewer pipes should be relocated or encased in areas where they cross or are immediately adjacent to the LRT line/station.

GENERAL RECOMMENDATIONS - WATER MAIN

Water main recommendations for station area improvements also include opportunities for Eden Prairie to improve the existing water system network. Creating loops in the network can help prevent stagnant water from accumulating along water main stubs, and creating loops of similar sized water main provides the city a level of redundancy in their water network. Redundancy helps reduce the impacts to the community during system repairs, and also helps stabilize the pressure in the network.

The following items should be evaluated prior to opening day of the station, although action may not be required until necessary for development:

- » The age and material of the existing mains in the identified station area. If the mains are older than the materials typical design life or materials which are susceptible to corrosion relative to soils in the area, the city should consider replacing the main.
- » Locations of previous water main breaks. If water main breaks repeatedly occur in specific areas, the city should consider replacing or repairing the main.
- » Locations with known water pressure issues or areas where city model indicate low pressure. If there are known limitations (for either fire suppression or domestic uses), the city should further evaluate the benefit of increasing main sizes.
- » Locations with known or potential water quality issues. If there are mains known to be affecting the water quality (color, taste, odor, etc.) of their system, Eden Prairie should consider taking measures to address the problem affecting water quality.
- » City water system models (existing and future). A review of these models with future development would assist Eden Prairie in determining if mains in the project area should be improved to meet existing or future city system needs based on demand constraints.
- » Existing water main pipes should be relocated or encased in areas where they cross or are immediately adjacent to the LRT line/station.

GENERAL RECOMMENDATIONS – STORM SEWER

Local storm sewer improvements are recommended to be completed in conjunction with other improvements in the station area. Improvements which will likely require storm sewer modifications include: roadway realignments, roadway extensions, and pedestrian sidewalk/street scape improvements. Storm sewer improvements may consist of: storm sewer construction, manhole reconstruction, drain tile extensions, storm sewer relocation, and complete replacement. These local storm sewer improvements are included as part of the overall cost of roadway and streetscape improvements recommended in this plan. Where roadway/streetscape improvements are part of the Southwest LRT anticipated base project scope, associated storm sewer improvements are assumed to be a project cost. Eden Prairie should also consider coordinating with the local watershed district and other agencies to review the condition of and capacity of existing trunk storm sewer systems serving more regional surface water needs.

NOTE: No site specific utility needs (related to sanitary sewer, water main, and storm sewer) have been identified for this station beyond these general utility recommendations and utility improvements identified as part of the SW LRT Anticipated Base Project Scope (see Table 14-1). As such, no diagram is provided for the station area utility plan. General utility recommendations should be reviewed prior to site construction.

STORMWATER BEST MANAGEMENT PRACTICES

There are numerous stormwater best management practices (BMPs) that can be used to address stormwater quality and quantity. As part of this project, BMP guides were developed for four stations (Royalston, Blake, Shady Oak, and Mitchell) which exemplify the range of development intensity and character in the urbanized environment along the Southwest LRT Corridor. The recommendations and practices identified in each of the four BMP guides are applicable to various stations along the corridor.

The following section includes a detailed stormwater analysis, stormwater management scenario, and BMP guide for Mitchell station. These BMPs may also be applicable to the station area at City West. Cities should consider incorporating these practices where appropriate as development/redevelopment occurs.

Stormwater Management Recommendations

INVENTORY:

Mitchell station is located within the Riley Purgatory Bluff Creek Watershed District. The station area drains to a wetland that lies in the southwest quadrant of the Technology Drive/Mitchell Road intersection. Ultimately, runoff from the station makes its way to Purgatory Creek, about one mile east of the station, and then to Staring Lake which is listed as impaired by the MPCA due to mercury in fish tissue and nutrient eutrophication. Purgatory Creek continues south from Staring Lake to the Minnesota River, which is also listed as impaired. More importantly the Minnesota River is subject to an approved TMDL for dissolved oxygen and a TMDL near completion for total suspended solids.

Even though this station area may be considered a greenfield, it falls into a historic agricultural setting where years of farming, as well as recent urbanization, have led to significant water quality impacts downstream. Wetlands are prevalent throughout the station impact area. Potential redevelopment is constrained by these wetlands. In addition, the station impact area has steep and variable slopes which increase potential of erosion and sedimentation.

CONSTRAINTS:

Impaired Waters

Discharging within one mile of an impaired water may trigger additional Minnesota Pollution Control Agency NPDES (National Pollution Discharge Elimination System) requirements which require additional stormwater management. For impaired waters where a TMDL (Total Maximum Daily Load) has been approved, these requirements may increase further.

Slopes

Due to steep slopes, stormwater management ponds and gardens may need to hug contours and may end up being very linear with a tendency to tie into steep matching slopes toward the higher ground. These slopes are often subject to periodic wetting through water fluctuation and may slough after being cut, resulting in erosion/material deposition to the bottom of the slope.

Floodplain

There are is 100-year floodplain located north of Highway 212, within the station impact area. Zoning requirements and being located within the 100-year floodplain may limit development/redevelopment potential. In addition, there are numerous wetlands which must be considered in developing the station area.

Contamination

No contaminated properties have been identified in the station impact area.

Soils

The majority of the soils within the 10-minute walk zone have been identified as hydrologic group B or Urban. Type B soils typically allow for infiltration. Urban soils are highly variable as

significant development and/or fill has occurred in these areas. There is also a presence of type A, C, and D soils within the 10-minute walk zone.

Stormwater Management

The City of Eden Prairie serves as the local governmental unit for regulating stormwater within the Riley Purgatory Bluff Creek Watershed District. Riley, Purgatory, Bluff Creek Watershed District participates in project review and offers its comments through the Eden Prairie process. It is anticipated that the Watershed District will have stormwater management rules, including infiltration, in place in 2014.

Eden Prairie City Code requires NURP ponds for development and the use of infiltration if stormwater facilities are required by the City. The City also requires that development must minimize runoff velocities and reduce and delay runoff volumes. It is noted that land disturbance is also regulated under the MPCA NPDES construction stormwater permit. The new construction permit contains a requirement for one-inch of infiltration off new impervious surfaces.

The City is very involved in GreenStep Cities program and, specifically, recycling of stormwater runoff for other uses particularly irrigation. The program challenges its partners to consider more ambitious (though voluntary) stormwater management goals. More information regarding the City's involvement in the GreenStep Cities program is outline in the opportunities discussion below.

STORMWATER MANAGEMENT CALCULATION:

Total redevelopment area is approximately 64 acres. The 64 acres can be categorized into 3 groups; Station improvements, ROW improvements, and individual site redevelopment. The following is the area breakdown by category. Note this breakdown is highly variable depending on the timeline of ROW and individual site redevelopment.

- » Station improvements (park and ride, LRT platform) – 4 acres
- » ROW improvements – 2 acres
- » Individual site redevelopment – 58 acres

Based on City of Eden Prairie and MPCA NPDES rules shown above, these areas will likely need to provide stormwater management to meet volume control and rate control.

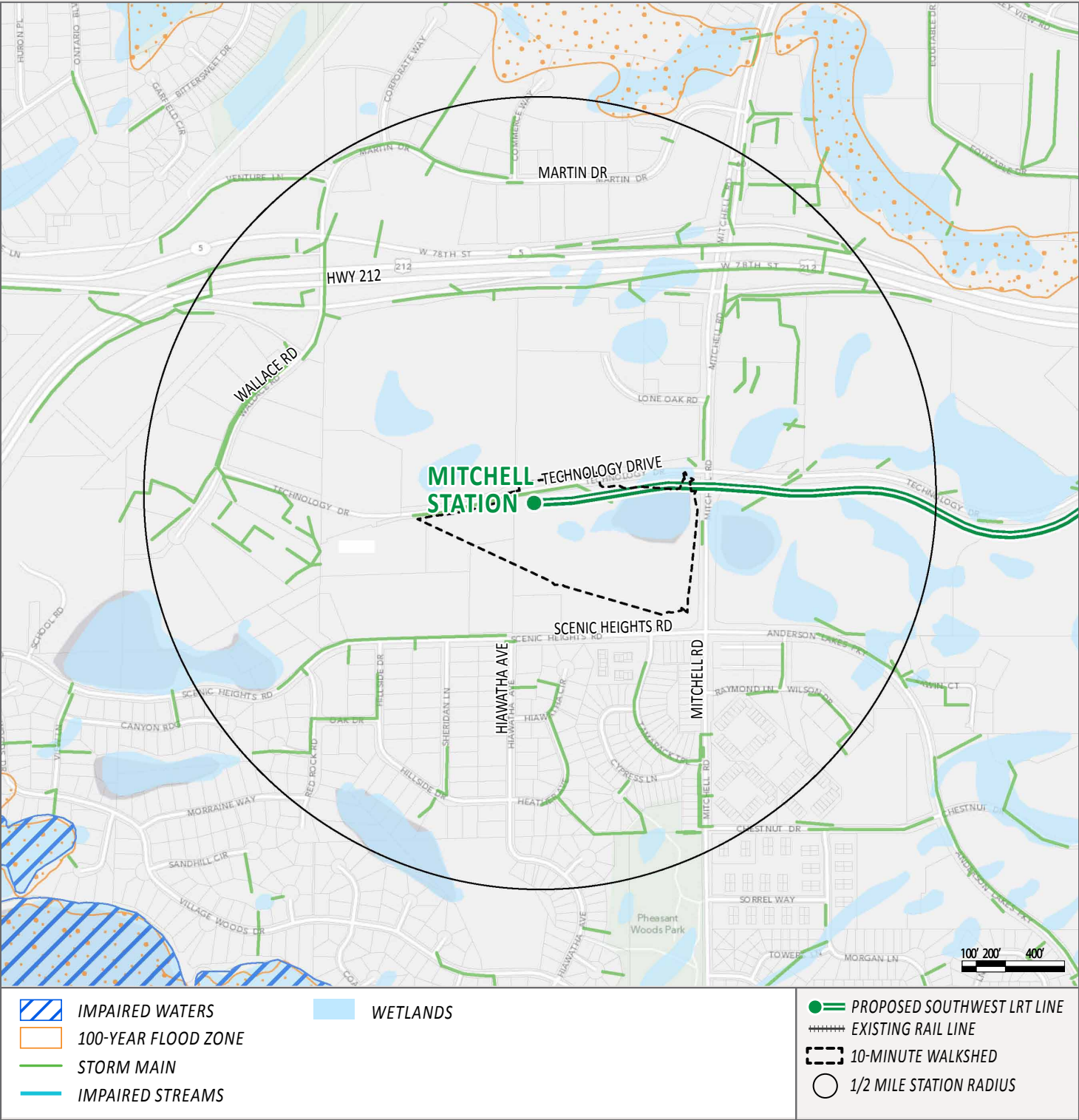
Volume Control

Volume control will need to be provided for the majority of the 64 acres estimated to develop/redevelop.

The following impervious coverages are assumed for the different types of development/redevelopment. These numbers are highly variable depending on the type and configuration of development that occurs.

- » Station improvements (park and ride, LRT platform, OMF site) – 75% (3 acres)
- » ROW improvements – 55% (1.1 acres)
- » Individual site redevelopment – 65% (37.7 acres)

FIGURE 18-15. EXISTING STORMWATER



Stormwater Management Recommendations (Continued)

Using the assumed impervious coverages the following volume control is anticipated to be required:

$$3 \text{ acres} \times \frac{1 \text{ inch}}{12 \text{ in/ft}} + 1.1 \text{ acres} \times \frac{1 \text{ inch}}{12 \text{ in/ft}} + 37.7 \text{ acres} \times \frac{1 \text{ inch}}{12 \text{ in/ft}} = 3.5 \text{ Acre Feet}$$

$$3 \text{ acres} \times (1 \text{ inch}) / (12 \text{ in/ft}) + 1.1 \text{ acres} \times (1 \text{ inch}) / (12 \text{ in/ft}) + 37.7 \text{ acres} \times (1 \text{ inch}) / (12 \text{ in/ft}) = 3.5 \text{ Acre Feet}$$

Pollutant Removal

Based on development/redevelopment of 64 acres and providing volume control for the first inch of runoff, it is estimated that 60-80% reduction of total phosphorus would be achieved (depending on the site) to result in an annual reduction of 38-51 pounds of phosphorus. Volume control is likely to be a viable option in most locations; however some areas may have high groundwater or poor soils present, which may trigger the use of filtration to treat stormwater.

Rate Control

Rate control is not anticipated to be a controlling requirement given the need to provide volume control along with the City's NURP ponding requirement. As a result, proposed discharge rates are anticipated to be significantly less than existing discharge rates.

EXAMPLE STORMWATER MANAGEMENT SCENARIO:

The adjacent figure shows a possible stormwater management scenario for meeting the City of Eden Prairie and MPCA NPDES development/redevelopment requirements. The scenario below has been developed to meet the stormwater volume control requirement of 3.5 acre feet.

The following BMPs are considered in this scenario:

Storage & Reuse: Two large detention basins are shown; one on each of the redevelopment parcels east of Mitchell Road. These regional basins may be combined with an enhanced media filter as well as a reuse system to irrigate vegetated areas and landscape features adjacent to the basins. It is anticipated that these two reuse systems will treat approximately two acre feet of stormwater runoff volume.

Biofiltration Cells: A large biofiltration cell is shown on the redevelopment parcel north of technology drive, adjacent to the existing wetland. This biofiltration cell may be combined with an enhanced media filter to provide additional treatment. It is anticipated that the biofiltration cell will treat approximately one acre foot of stormwater runoff volume.

Streetside Treatment Swale: A streetside treatment swale is shown near the tracks and the proposed path, just south of Technology Drive. It is anticipated that this BMP will treat approximately a third of an acre foot of stormwater runoff volume.

Landscape Filters: Landscape filters are currently shown adjacent to the proposed paths throughout the redeveloping area. These stormwater filters will be used to collect and treat stormwater prior to discharge downstream into additional stormwater facilities. These systems will be used primarily as pretreatment to the other best management practices.

Enhanced Media Filter: Enhanced media filters are shown adjacent to the two large regional basins and the biofiltration cell to provide enhanced treatment. Depending on the amount of infiltration that can be received, these enhanced media filters may not be necessary.

Permeable Pavement: Permeable pavement is shown on the park and ride lot. This will reduce the impervious footprint by approximately 3 acres which will reduce the required stormwater treatment volume by approximately 0.2 acre feet.

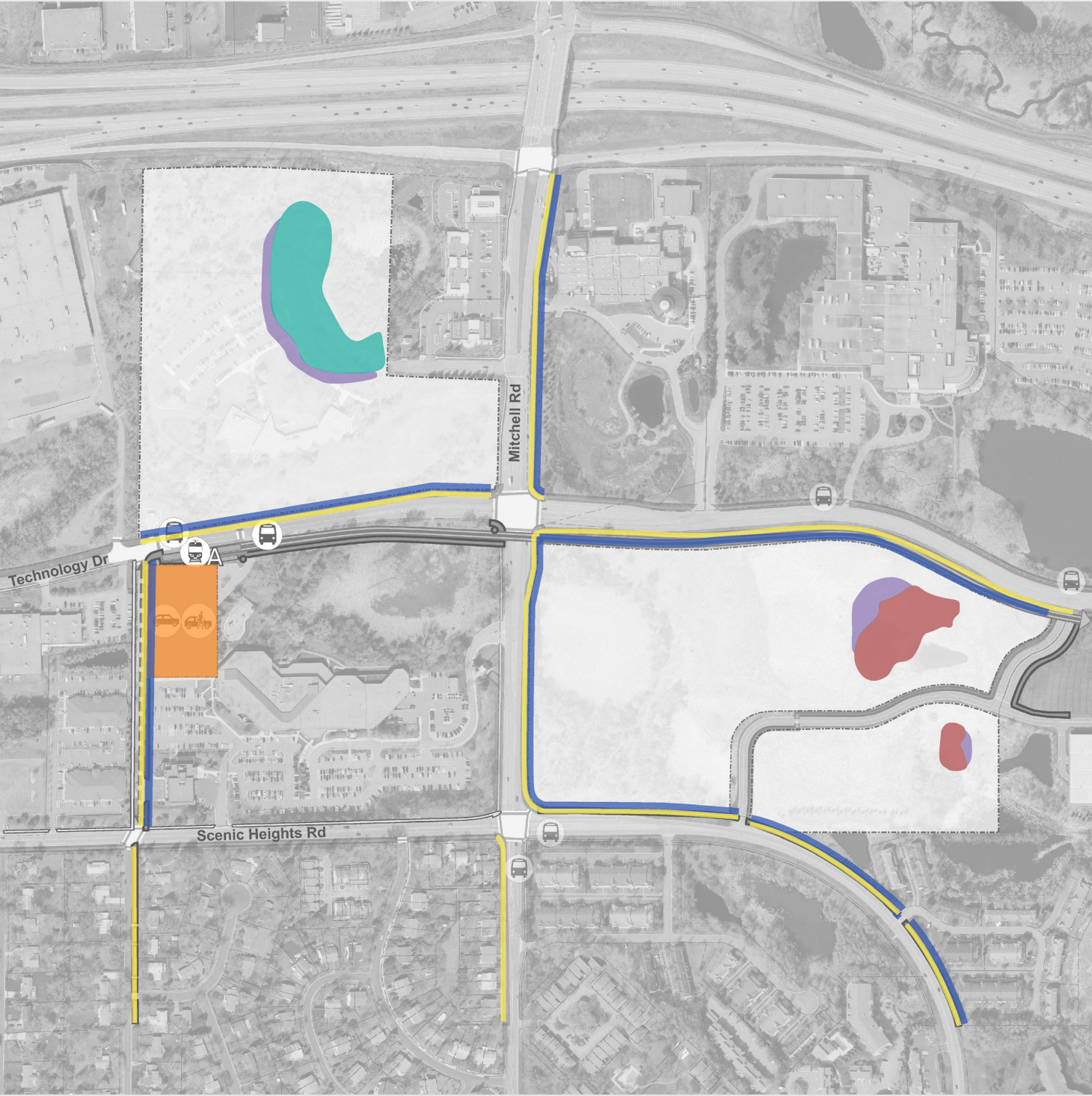
The table below summarizes the costs and stormwater management information related to each BMP shown in the example scenario. These numbers are highly variable based on conditions at the time of redevelopment, some of which include ultimate BMP location, size, elevation, soil type, development features, and other unknown conditions at this time. It is important to note that storm sewer to collect and convey stormwater is included in the cost estimate for street improvements and therefore is not included in the cost estimate below to avoid duplication.

TABLE 18-4. STORMWATER MANAGEMENT SCENARIO - COST SUMMARY







BEST MANAGEMENT PRACTICE (BMP)	DRAINAGE AREA (ACRES)	VOLUME RESTRICTION (AF)	ANNUAL TOTAL PHOSPHORUS REDUCTION (LBS)	SIZE OF BMP	COST OF BMP (\$/UNIT)	TOTAL COST (\$)
Storage & Reuse	32	2	21	12,000 CY	\$40/CY	\$480,000
Biofiltration Cells	26	1	13	5,000 CY	\$40/CY	\$200,000
Streetside Treatment Swale	8	0.3	4	1,500 CY	\$40/CY	\$60,000
Landscape Filters	2	Pretreatment	-	75 Filter Boxes	\$1,000/Box	\$75,000
Enhanced Media Filter	58	0.5	10	2,000 CY	\$75/CY	\$150,000
Permeable Pavement	3	0.2	3	10,000 SY	\$30/SY*	\$300,000
TOTAL	-	3	51	-	-	\$1,265,000

* More than standard parking lot section

FIGURE 18-16. STORMWATER MANAGEMENT SCENARIO



STORMWATER BEST MANAGEMENT PRACTICES:

- | | | |
|---|--|--|
|  ENHANCED MEDIA FILTER |  STORAGE AND REUSE |  BIOFILTRATION CELLS |
|  LANDSCAPE FILTERS |  PERMEABLE PAVEMENT |  STREETSIDE TREATMENT SWALE |

Stormwater Management Recommendations (Continued)

OPPORTUNITIES:

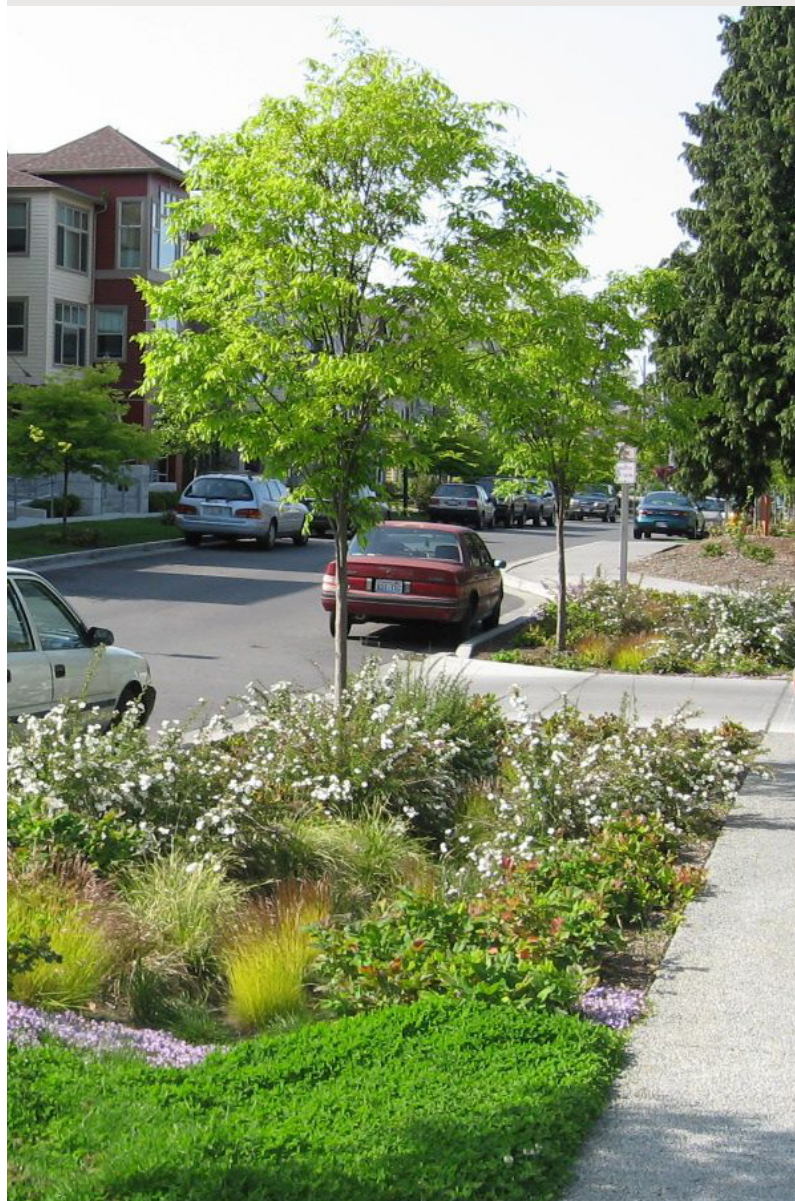
Eden Prairie is very active in issues of water conservation and is an active participant in the Minnesota GreenStep Cities Program. Continuing the water conservation theme into development/redevelopment of the station impact area suggests stormwater recycling for irrigation and, potentially, other uses. The GreenStep Cities Program identifies best management practice actions that should be considered in the redevelopment of the station impact area:

- » Narrower roadways
- » Infiltrating all runoff from a 1.5-inch rainfall
- » Limit stormwater volume to predevelopment volume for a 5-year, 24-hour rainfall event
- » Recycling and reuse of stormwater
- » Implement standards for the use of permeable/pervious pavements, rain gardens and green roofs, cisterns and rainbarrels, and green alleys and green parking lots

Stormwater Best Management Practices (BMP) Guide

The following section summarizes the key features and design considerations related to each of the stormwater best management practices recommended for the Mitchell station area.

NOTE: These BMPs may also be applicable to the station area at City West. Cities should consider incorporating these practices where appropriate as development/redevelopment occurs.





STORAGE AND REUSE

Features:

- » Large basin to reduce stormwater discharge rates and serve as an irrigation reservoir.
- » Volume control through irrigation or circulating of stormwater.
- » Reduces potable water demand for irrigation.

Design Considerations:

- » Large basin to reduce stormwater discharge rates and serve as an irrigation reservoir.
- » Volume control through irrigation or circulating of stormwater.
- » Reduces potable water demand for irrigation.



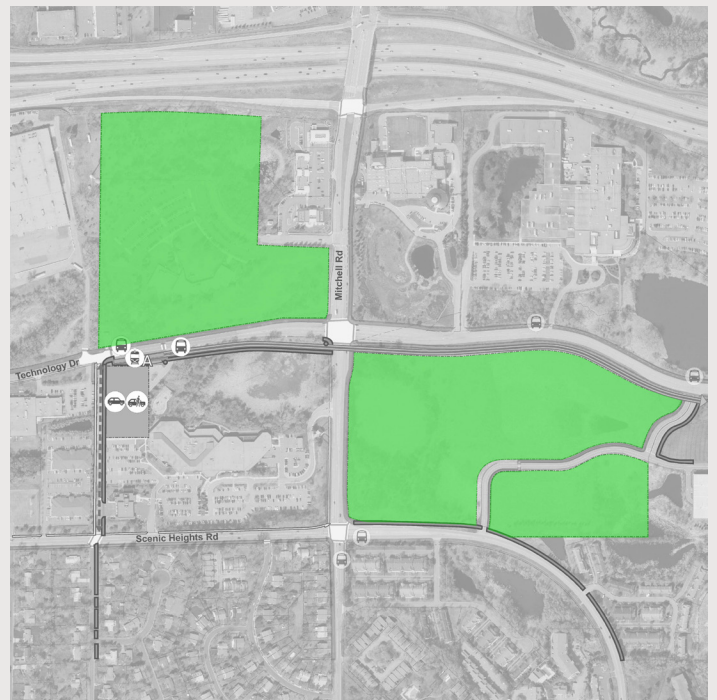
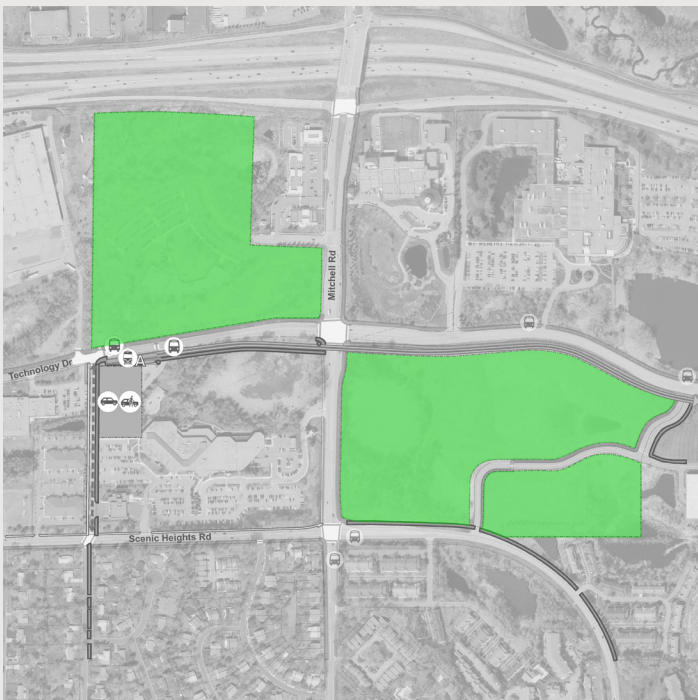
BIOFILTRATION CELLS

Features

- » Treats stormwater through filtration, vegetative uptake, and infiltration.
- » Retains stormwater to reduce peak flows.
- » Creates naturally vegetated green space adjacent to development.

Design Considerations

- » Many different native vegetation options and combinations; trees, shrubs, grasses.
- » In-situ soils determine infiltration potential.
- » Noxious weeds will need to be managed to maintain native landscape.
- » Drantile can be added to help facilitate filtration.



■ POSSIBLE AREAS FOR IMPLEMENTATION



STREETSIDE TREATMENT SWALE

Features

- » Volume control through infiltration and vegetative uptake.
- » Retains stormwater to reduce peak flows.
- » Reduces storm sewer needed to collect/convey stormwater.

Design Considerations

- » In-situ soils determine infiltration potential.
- » Vegetation will need to tolerate both wet and dry conditions.
- » Periodic maintenance of vegetation will be required.



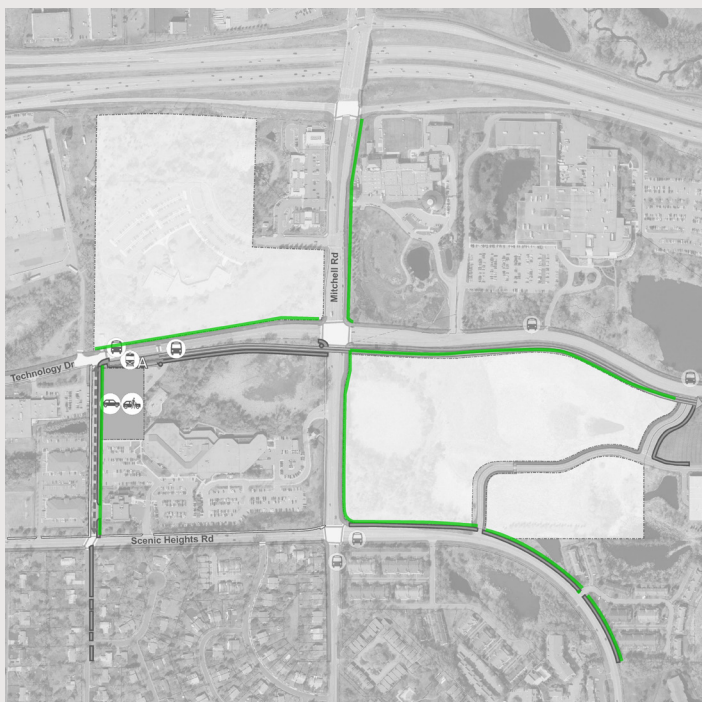
LANDSCAPE FILTERS

Features:

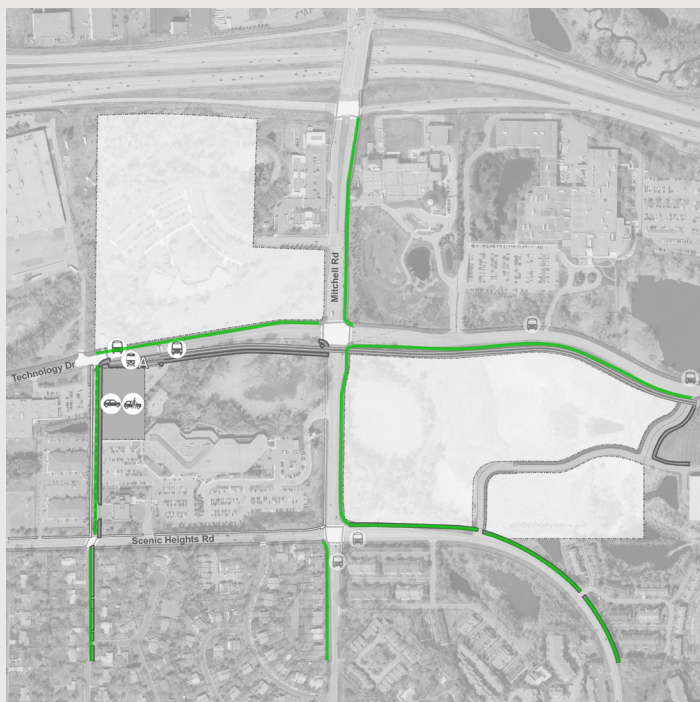
- » Volume control through infiltration and vegetative uptake.
- » Treatment by filtration and infiltration.
- » Detention capacity to reduce peak flow rates.
- » Irrigation of aesthetic landscaping features.
- » Minimal footprint.

Design Considerations:

- » In-situ soils determine infiltration potential.
- » Periodic maintenance of underground filter system will be required to ensure performance.



■ POSSIBLE AREAS FOR IMPLEMENTATION



■ POSSIBLE AREAS FOR IMPLEMENTATION



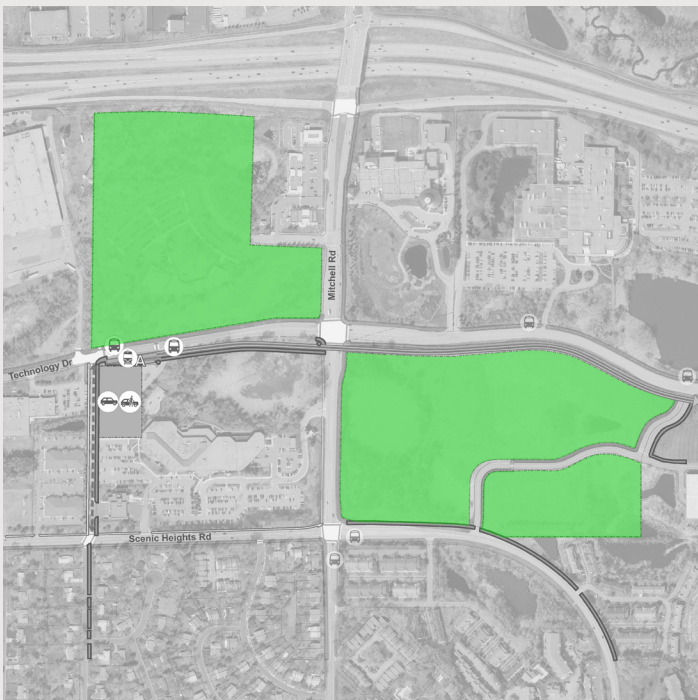
ENHANCED MEDIA FILTER

Features

- » Treatment provided by filtering stormwater.
- » Enhanced treatment, to target dissolved pollutants, can be achieved by adding iron filings or spent lime to the filtration media.
- » Allows for dissolved pollutant removal without infiltration (may be necessary in or near contaminated areas).

Design Considerations

- » Free draining system is necessary to achieve desired pollutant removal.
- » Vegetation should be planted that tolerates enhanced media.
- » Regular maintenance will be needed to ensure functioning filter.
- » Valves can be incorporated to verify system functionality.



POSSIBLE AREAS FOR IMPLEMENTATION



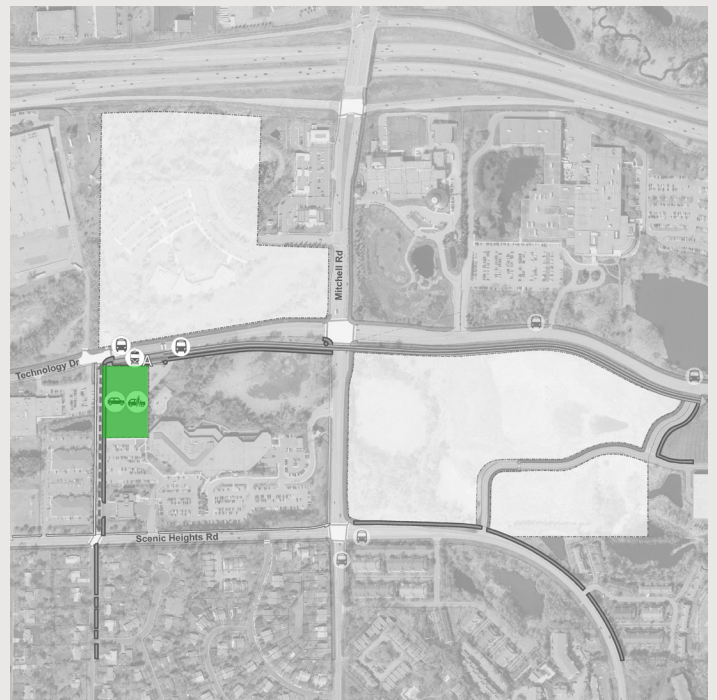
PERMEABLE PAVEMENT

Features

- » Multiple types of permeable pavements; bituminous, concrete, and pavers.
- » Provides volume control by reducing impervious surface.
- » Treats stormwater using filtration and infiltration.

Design Considerations

- » In-situ soils beneath pavement will control infiltration potential.
- » Special vacuum truck required to maintain pavement surface.
- » ADT criteria, low traffic preferred.
- » Parking bumpouts as pervious area.



POSSIBLE AREAS FOR IMPLEMENTATION

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