RE-IMAGINING MONTGOMERY

COMMUNITY REDEVELOPMENT PLAN

UNIVERSITY OF CALGARY
SCHOOL OF ARCHITECTURE, PLANNING AND LANDSCAPE

MGR Planning & Consulting
Jolene Moran | Cong Gu | Azadeh Rasouli

Prepared for Montgomery Community Association as part of University of Calgary's course EVDP644-Advance Professional Planning Project, Winter 2020

Prepared by

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ACKNOWLEDGMENTS

We would like to share our heartfelt thanks to everyone who lent their time and effort to the creation of this plan. In particular, we would like to extend our special thanks to the following:

The Steering Committee:
City of Calgary
John Hall

CivicWorks
Ben Bailey

Montgomery Community Association
Janice Mackett, *Planning Committee Chair*
Marilyn Wannamaker
Laura Kornfeld
Neal Greywall

Community members that attended our workshop

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EXECUTIVE SUMMARY

MGR Planning and Consulting is pleased to present a Community Re-Development Plan for Montgomery, in the north west quadrant of Calgary. As The City continues to grow, inner city communities play a role in smart development and sustainable growth. We have taken the plan past the development phase to Re-Imagine Montgomery and propose some features, designs and strategies which may be realized in the short term, while others are more long term. We feel both are needed, can work together with phasing and as the community population grows to The City of Calgary estimates for 2042.

The following document outlines past and current settings in the community, as well as a comprehensive site analysis with suggestions for future growth and development. This Community Re-Development Plan will aid in placement of sustainable land use, efficient mobility and connectivity and the efficient use of public realm. Our intention is to aid the community in decision making and provide future options for adapting current spaces to benefit all community members. We have also dreamed big for Montgomery to make it the Place to be, with special sites of interest, Place-Making Anchors. Practical solutions combined with future dreams are presented and will move Montgomery into the future.

01

INTRODUCTION

1.1 TEAM INTRODUCTION

MGR Planning and Consulting

Jolene Moran

Anthropologist, Biologist and Urban Planner / BSc., MPlan

Jolene is a second year Master of Planning student at the University of Calgary. She has a background in public engagement, wildlife husbandry and management and experience studying in Switzerland. She brings with her a focus on bridging people with nature in the city.

Cong Gu

Transportation Engineer, Urban Planner, Urban Designer/ BSc., MEng, MPlan

Cong is a second year Master of Planning student at the University of Calgary. She has a background in transportation planning and consulting and experience studying in the United States, Switzerland and China. She is interested in how to connect people to places.

Azadeh Rasouli Yazdi

Architect, Landscape Architect and Urban Planner / BSc., MLA, MPlan

Azadeh is a second year Master of Planning student at the University of Calgary. She has a background in architecture and landscape architecture, with experience studying in Iran. She is interested in the psychology of human behaviour and how to design an inclusive community for all.

1.2 PROJECT INTRODUCTION

The community of Montgomery is located in the north west quadrant of The City of Calgary and is considered an inner city community (Land Use Planning and Policy, 2005). Situated along the Bow River escarpment, and the Bow River, Montgomery has close access to numerous natural environments (Montgomery Community Association, 2019). Montgomery was an independent town, annexed by The City in 1963 (Montgomery Community Association, 2019). Montgomery has a population of roughly 4,000 residents as measured in 2016 by The City Census. Montgomery covers an area of three km squared and has a density of 1,290/ km squared (City of Calgary).

The residents in Montgomery are varied, with 15% of the population between the ages of 0-14, which is slightly lower than the Calgary statistic of 19% (City of Calgary, 2016). Looking at seniors over 65, Montgomery has 12% which is two percent higher than Calgary (City of Calgary, 2016). The mean age of residents in Montgomery is 40 (Great News, n.d.)

Our assumptions are as per the Calgary City Census Data, Montgomery can expect to see a population increase of 54% by 2042, to roughly 6, 200 people (City of Calgary, 2016). This projected population for Montgomery would actually not be new. Back around 1960, Montgomery had a population of around 6,000 residents. Regardless, Montgomery does need to accommodate new community members and those people will expect quality housing, services, amenities, adequate transportation and public spaces with parks and open space.

Further assumptions include the need to stay the course with adapting to climate change. With possible extreme future weather patterns, we must be thinking about resilience and planning ahead. Offering alternate options for residents to commute to work, rather than driving a personal vehicle, to planting more street trees in the community along Main Street to link the urban canopy, to subdividing lots and having shared spaces with laneway housing options, we need to be forward thinking and look at alternate solutions.

Trans Canada highway, or 16th Ave NW runs east-west through the community. This major thoroughfare is one site of two busy streets in Montgomery. Early in Montgomery's development the primary road into the community acted as a generator for growth and establishment. However now this highway is seen as a separator and divides the community. This highway leads west out of Calgary to the mountains and is a gateway to The City moving east. The second busy street is Bowness Road. Trans Canada highway is a commercial corridor with many auto-centred uses. Bowness Road has a Main Street portion running between 43rd St and 46th St. NW. It is a challenge for any community to maintain a vibrant street realm with one Main Street and is even harder with two such streets two blocks away from each other, in the same community. The need to set good policy to establish these areas as regional and local destinations is important for Montgomery moving into the future. The City has identified these two streets as critical to future growth.

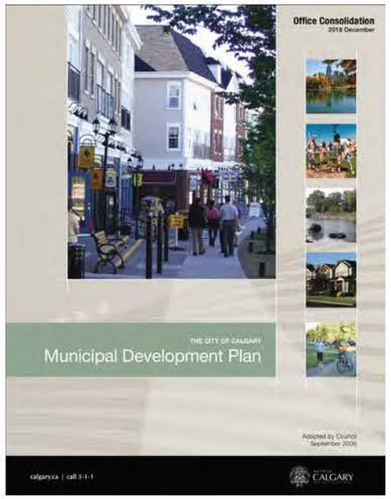
Montgomery's ARP states the community's residential vision for the future is to maintain a predominately low-density community feel, while building up to a form of good quality, medium density, along Bowness Road and 46th St. NW (Land Use and Planning Policy, 2005). This is a challenge as to maintain a vibrant and busy Main Street and Commercial Corridor, a larger population base would be beneficial to support the local businesses. Thus we need to strategically and sensitively plan where we can allocate 2,000 additional people to accommodate the future growth, while maintaining the community character and feel of the small town that residents have come to expect and enjoy.

Montgomery has a great many natural areas close by, but the pathways and trails are needing links and improved connectivity to allow residents and regional users to better access and enjoy the parks and open spaces. There is also a critical need to create gathering places, within the public realm for residents to enjoy. Naturalizing boulevards with vegetation, improved amenities and services will be necessary for current residents to share in the future with new residents.

This community plan is a joint effort with several contributing partners. The Montgomery Community Association is looking to explore options and possibilities regarding the future of the neighbourhood for planning growth. As such, The University of Calgary has partnered with the community association to consider possible targeted development. Over four months we completed a process including a detailed analysis, a community workshop and draft plan presentations. Final completed recommendations are presented in this booklet.

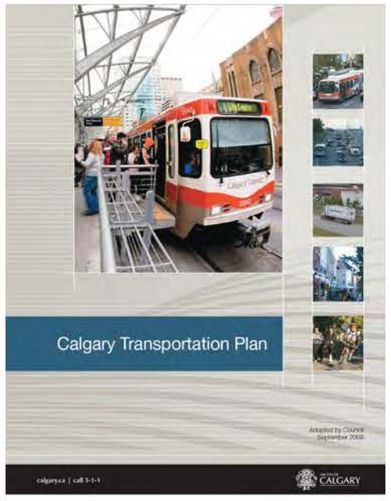
Our team vision is to work towards building inclusive, sustainable and resilient communities.

1.3 LEGAL FRAMEWORK



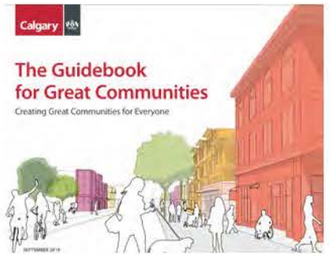
Calgary's Municipal Development Plan

The MDP is a statutory planning document that defines the vision for Calgary's growth and development over the next 30 to 60 years. It aims to build a city with a variety of housing types in unique communities. It works together with the Calgary Transportation Plan to provide multiple transportation options. It aims to create an environment that is financially sustainable, while protecting the natural environment and supporting a prosperous economy.



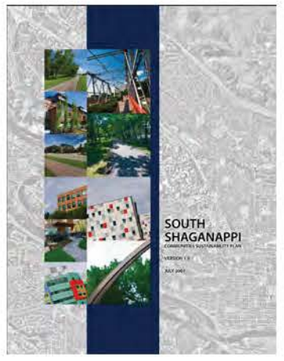
Calgary Transportation Plan

CTP is a long-term plan that provides policy direction for how transportation options will be delivered to people for the next 60 years. CTP provides guidance for improving services in existing, new and developing communities, help the movement of people and goods throughout the city, enhance safety on roads, make walking, cycling and public transit a better option.



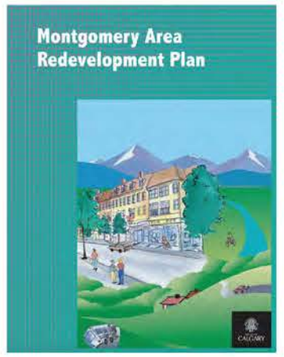
The Guidebook for Great Communities

This document aims to implement the MDP and bridge higher level policies with local area plans and site-specific planning applications. The policies in the Guidebook are based on the following principles: opportunity and choice, health and wellness, social interaction, the natural environment, economic vitality, identity and place.



South Shaganappi Communities Sustainability Plan

The Plan is governed by the seven underlying principles: strengthen the **integrity** of South Shaganappi by creating communities that enhance the quality of life; sustain community **viability**; high **aesthetic** standards; increase **connectivity** for pedestrians and cyclists; provide for **mobility**; achieve positive community benefits, integrity, and viability through gradual redevelopment that ensures adequate **respect for context**; assure community support for redevelopment by engaging citizens in a **fair, open, transparent, and honest** development process.



Montgomery Area Redevelopment Plan

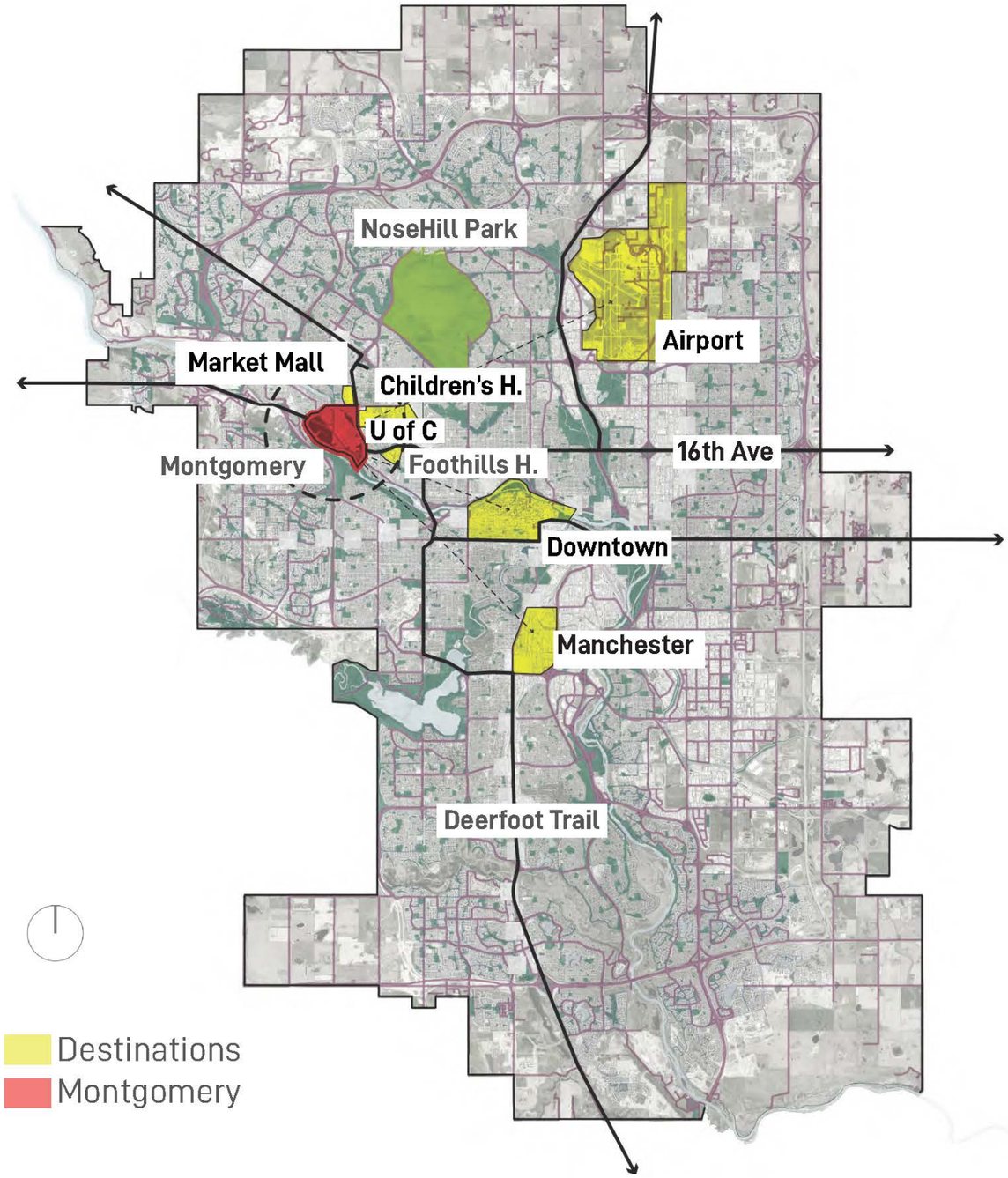
The Montgomery Area Redevelopment Plan is a statutory document. It is a planning document that sets out comprehensive land use policies to help guide the future of the community and must be considered in conjunction with other applicable statutory plans, bylaws and policy documents.

1.4 SITE AND CONTEXT OVERVIEW

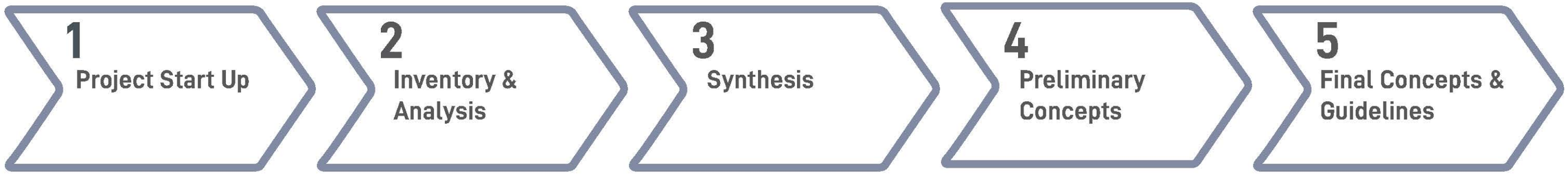
The subject study area is Montgomery, a desirable inner city community located in the north west quadrant of Calgary. It is an older, well established neighbourhood, with roots going back to early pioneers who settled in the area around 1880. This community is strategically located close to several important employment centres, including Market Mall, The AB Children's Hospital, The Foothills Hospital and The University of Calgary. Montgomery also has several prime recreational amenities with its boundary, including the Shouldice Athletic Park and Aquatic Centre. Further unique features in the community include the physical environment with the Bow River and the slopes of the Bow River escarpment. The community is fortunate to have some green spaces. While Montgomery has a classic grid pattern in its street design, its auto-centred nature has created a less inviting pedestrian and cycling realm. Increasing development pressures include the need to accommodate more mixed uses and a variety of housing options.

Our approach is multi-faceted with numerous steps and phases to our project. These are detailed in our Methodology.

Our analysis and community engagement process has revealed Montgomery is made up of a diverse population with strong ties to the neighbourhood. A number of residents have lived here for an extended period of time. This is expressed in their fondness for the community. Through our analysis we have decided with pressures for redevelopment, residents need a variety of places to live, the ability to connect to services and access to parks and open spaces. As such, our community recommendations are divided into four sections; housing and development, mobility and connectivity, and public realm including parks and open space. An additional section on special sites is added to offer design ideas regarding improvements around the community for three areas of public realm.



1.5 METHODOLOGY



Learning about the site required the use of many tools, including maps. Information such as grid layout, road networks, block patterns, and building footprints can be revealed with the use of maps. A look at historical photos revealed changes in the neighbourhood patterns. Walking the site numerous times gave us clarity on the community prior to the workshop.

Further research included gathering a detailed breakdown of numerous materials. This included researching community issues. Next, we studied the physical environment such as topography, vegetation and slopes. A historic evolution included a timeline to reveal changes in Montgomery. A detailed evaluation of the census data to gain a picture of the community through demographics was conducted.

A study of land use revealed the portion of the community where low density residential land use is focused. We further looked at housing typologies and zoning. A road network analysis, plus a look at the sidewalks, pathways, trails and cycle network was analyzed. We looked at the transit services in the area, plus the pedestrian network. Finally, we looked at public realm, combined with the parks and open space.

Model Construction:
We built a physical model of the community which we were able to present to the community during the workshop.

Open House
We met with the steering committee members and some community members at an open house workshop to hear from the residents of Montgomery what they feel is going on in their neighbourhood. We bought large printed maps plus the physical model for the residents to work with. This engagement workshop hosted about 20 community members who each spent 2 hours with us, answering focused questions and telling us their side and story. We made sure to listen to their issues, hopes and concerns plus write down and record their comments. We focused on issues, constraints and opportunities. Finally, we had a few minutes at the end to reveal our poster analysis to a few residents.

After listening to the communities needs and wants during the open house, we were able to begin designing and planning interventions to help provide solutions to problems. We could also offer plans that were tailored to the community's requests and goals. Areas considered in our plans were Land Use and Density, Housing Typology, Mobility for pedestrians, cyclists and vehicles, Commercial Areas, and public realm, parks and open space. At this stage our design phase switched gears and due to health concerns with Covid19, we were now adapting to working from home rather than in school. From here our initial work plan was modified and group collaboration occurred over Skype, Zoom and by phone.

We presented our concept designs via a PowerPoint MP4 and the steering committee was able to give us feedback on the beginning designs. From there we were encouraged to pursue our ideas and take those initial ideas to follow them through.

We completed our final designs and put them together in a final PowerPoint MP4, which were played for a steering committee and our classmates. We received feedback on our community plans from numerous Montgomery Planning Committee Members, and Professional Planners working in various capacities throughout Calgary.

02

SITE ANALYSIS

2.1 MONTGOMERY HISTORICAL CONTEXT

Timeline

Source: Glenbow Archives

1877
Eagle Rib, a Blackfoot Chief is one of many to sign Treaty 7

1879
Mary & James Shouldice wed

Source: Glenbow Archives

1906
Shouldice family purchase a ranch six miles west of Calgary

1910
Shouldice Bridge is built, the only existing Pratt through truss bridge remaining in Calgary

Source: Glenbow Archives

1910
J. Shouldice donates 100 acres of ranch to The City of Calgary to be dedicated for park space

1911
Shouldice Park Electric Streetcar Line opened

Source: Glenbow Archives

1912
Car driving up Brickburn Hill, revealing Bow River and Shouldice Bridge

Source: Glenbow Archives

1915
Calgary Streetcar

1921
Shouldice Park Italian Band

Source: Glenbow Archives

1924
Shouldice Ranch

Source: Glenbow Archives

J. Shouldice is a pioneer rancher, one of the first in AB to breed Hereford cattle- Calgary, n.d.

Source: Glenbow Archives

1926
School group near Shouldice Bridge

Source: Glenbow Archives

1930
Shouldice family home, a 25 room red brick mansion is build in **1911**

Source: Glenbow Archives

1931
View of Shouldice Bridge

Source: Glenbow Archives

1937
Shouldice home converted into Calgary's first crematorium

Source: Glenbow Archives

1943
Shouldice Terrace and Town of Shouldice have post office issues resulting in local area renaming to Montgomery

1946
General Sir Bernard Montgomery, for whom the community is named

1952
Terrace Road Elementary School built

Source: MGR

1952
New home built in Montgomery

Source: Glenbow Archives

1956
Montgomery Jr. High School built

Source: MGR

1957
Bowness Rd. direction is diverted, changes to highway which divides the community

1962
Montgomery Recreation Centre was built

Source: MGR

1958
Montgomery is designated a town

1964
Bow River and Shouldice Bridge

Source: Glenbow Archives

1972
Former Shouldice mansion and crematorium is torn down due to slope instability

1979
Vast growth in Shouldice Athletic Park

1982
Archie Henderson of Montgomery plays in the NHL for the Hartford Whalers

Source: pintrest.com

1992
The Montgomery Recreation Centre is renamed the Montgomery Community Centre

2002
Shouldice Park is renovated, adding picnic tables, pathways and landscaping

Source: MGR

Source: MGR

2013
Montgomery Place building is completed along Main Street Bowness Rd.,with condos on top of small retails and restaurants, changing the street character

Source: MGR

2018
Shouldice Park boat ramp redevelopment opens

1958
Safeway built

Source: MGR

1971
Dairy Queen opens

Source: Glenbow Archives

Source: Glenbow Archives

1963
Montgomery is annexed by The City of Calgary as Montgomery Mayor Kemp hands keys to Calgary Mayor MacEwan

1980
The former outdoor Shouldice Pool is renovated, enclosed and a dive tank is added

Source: MGR

1986
A new Shouldice Bridge is built and the old one is used by pedestrians and cyclists

Source: MGR

Source: MGR

1997
Safeway and Montgomery Shopping Centre redevelop to resolve circulation issues

2013
Significant 1-100 yr. flood occurs in Calgary, affecting parts of Montgomery, temporarily closing Shouldice Bridge

Source: calgaryjournal.ca

2018
Shouldice playground is upgraded to an accessible, inclusive space

Source: MGR

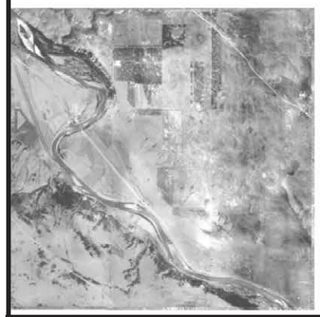
2.1 HISTORICAL CONTEXT

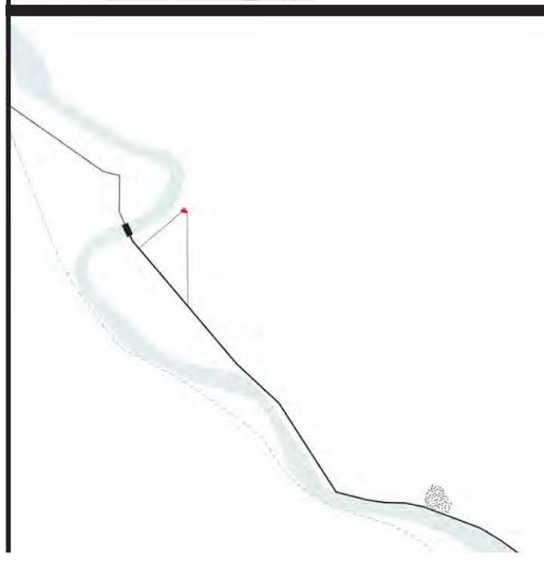
Historical Evolution On the Ground

The area now known as Montgomery was settled in the late 1880's. One family in particular, the Shouldice family established in this area in 1906. They became well known for ranching as agricultural pioneers. Over time the area grew and developed, seeing large growth shortly after 1952, when two schools in the area were built. The grid pattern and density developed around the schools and the main road, Bowness Road paired with Shouldice Bridge which generated development through accessibility.

The Shouldice Bridge and main road facilitate movement in the area, with the Shouldice mansion built.

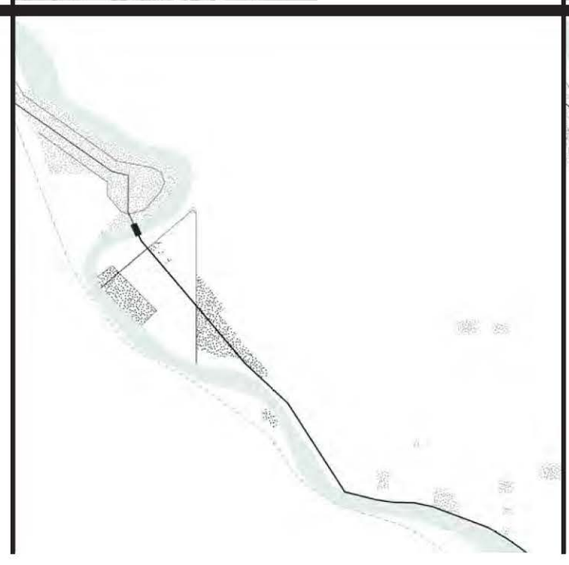
1924





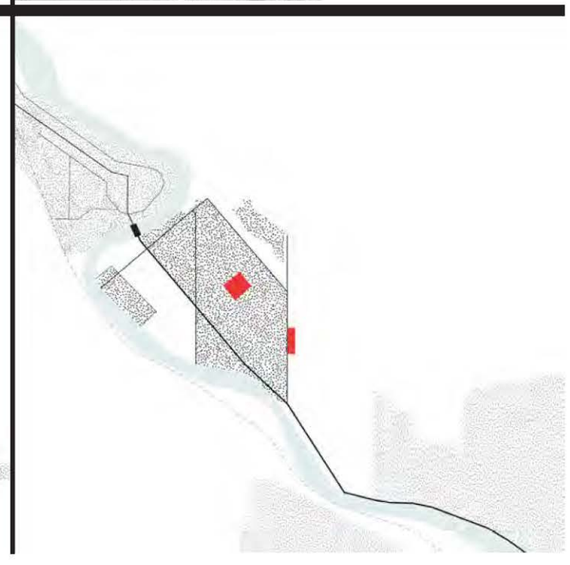
The Shouldice Bridge and main road act as generators for development in Montgomery, enabling density to establish.

1948



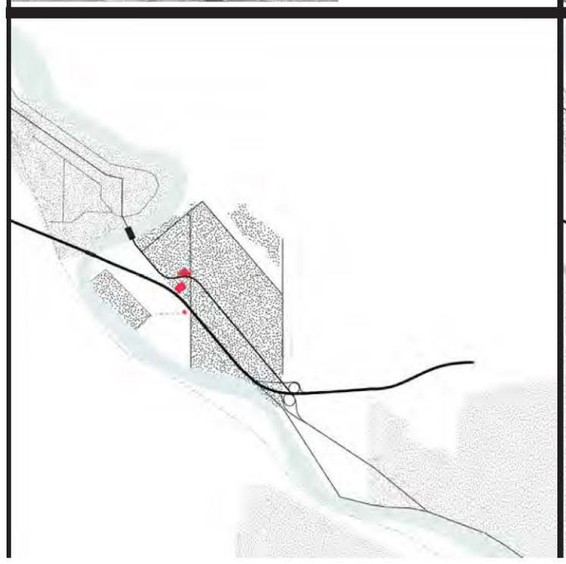
The completion of two schools in the area encourages the residents of Montgomery to set down family roots. Density continues to establish around the schools in a grid pattern.

1957



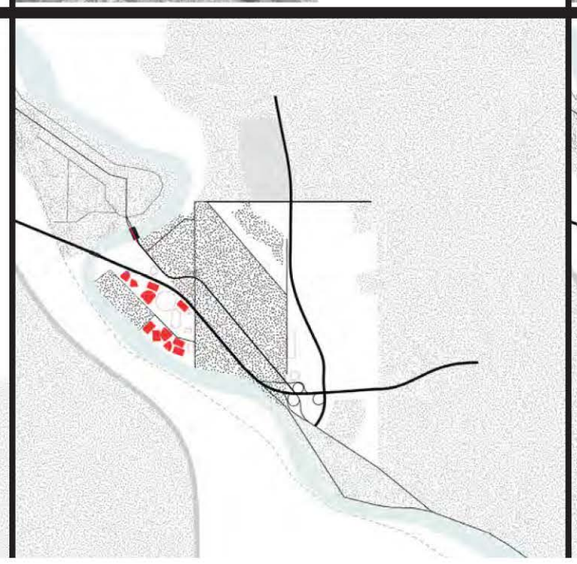
The community character changes when Bowness Rd. splits with the building of Safeway and with the expansion of Trans Canada Highway which evolves from a generator to a community separator.

1962



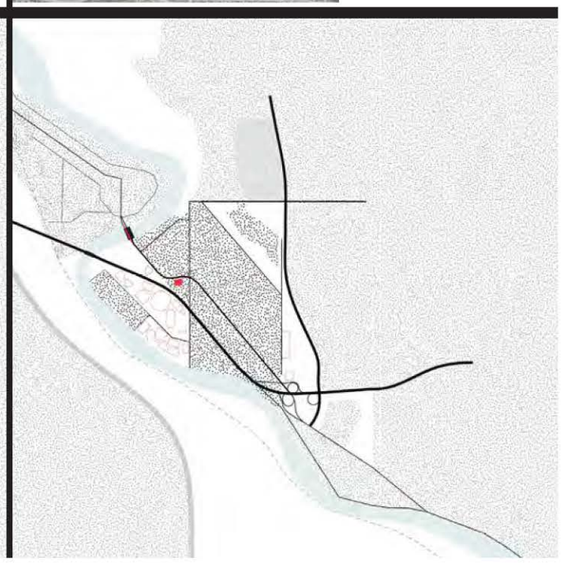
Further density is apparent with Bow Landing condos, Shouldice Terrace affordable housing and Bow View Manor senior's care centre being constructed.

1995



Changes around the Safeway parking lot and building orientation facilitate loading docks and ease of traffic flow. Shouldice Park has the addition of an inclusive playground.

2019



When Bowness Road splits after Safeway is built in 1958, and Trans Canada Highway cuts through the community, we see the road system turning from a community generator to a separator, around 1962. This is still happening today, the north and south sides of the community are divided by the highway.

Our historical analysis revealed while Montgomery is rich in history, it is largely not celebrated, with two exceptions- the historic bridge and the named park space. This is a missed opportunity and can add pride, character and identity to the community.

2.2 COMMUNITY PROFILE

Community Profile: Who Lives in Montgomery?
2016 Census Data Snap Shot

1, 222, 390 (City)
Population
3975 (Montgomery)

62%
Families with Children at Home
56%

71%
People by Age Range 15-64
73%

66%
Employment Rate
66%

31
New Canadians
17%

22%
Households spending =>30% on shelter
23%

3%
Indigenous Peoples
7%

$97,329
Median Household Income
$84,860

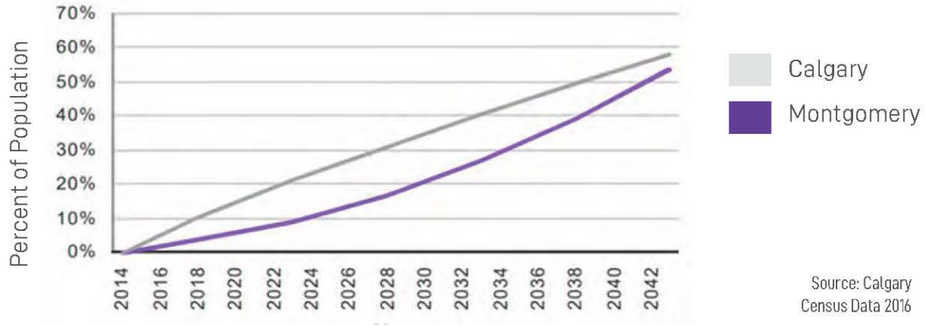
Source: Calgary Census Data 2016

A comparison of Montgomery residents to Calgary residents.

Projected Local Population Growth

---- Increase by Over 50% in the Next 20 years

Projected Population Increase in Calgary and Montgomery



Source: Calgary Census Data 2016

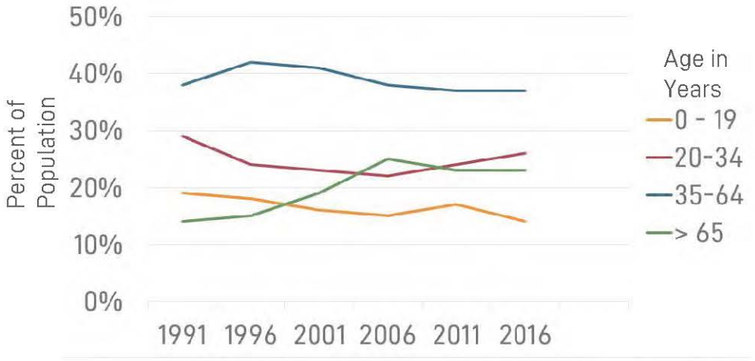
Calgary's Population increases by 57% to an estimated 1.9 million.

Montgomery's Population increases by 54% to an estimated 6,200.

Age Breakdown

----High Share of Working-Age Population

Demographic Changes in Population by Age Breakdown in Montgomery



Source: Calgary Census Data 2016

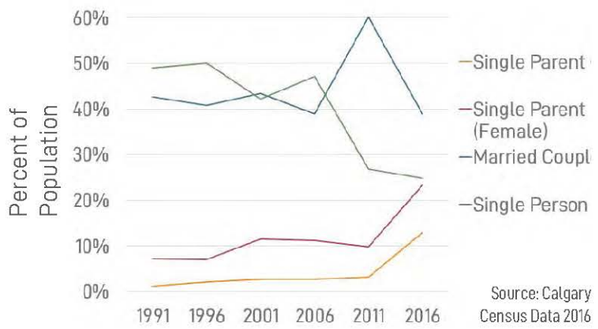
High proportion of working-age people, 43% of the population in 2016.

2.2 COMMUNITY PROFILE

Household Composition

----Majority of Population are Married Couples

Demographic Changes in Household Composition

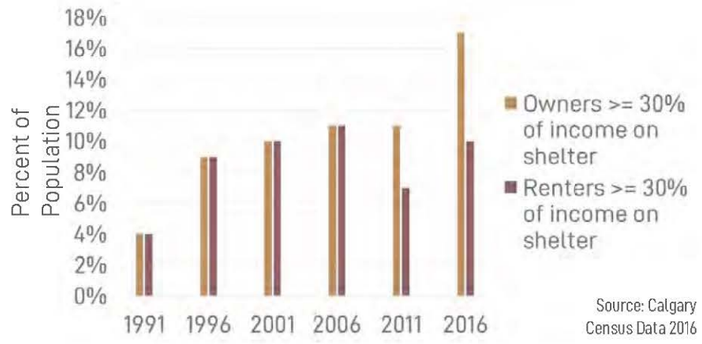


Roughly 40% of residents in Montgomery are married couples.

Shelter Affordability

----An Increase in Owners' Spending on Shelter

Renters vs Owners Spending +30% of Household Income on Shelter

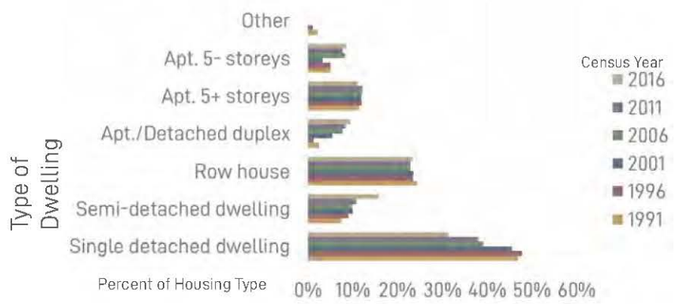


Recent trend of increase in home owners' spending over 30% of income on shelter and a spike up 6% in 2016.

Structural Type of Dwelling

----Majority of Dwellings are Single Detached Homes

Occupied Private Dwellings by Structural Type in Montgomery



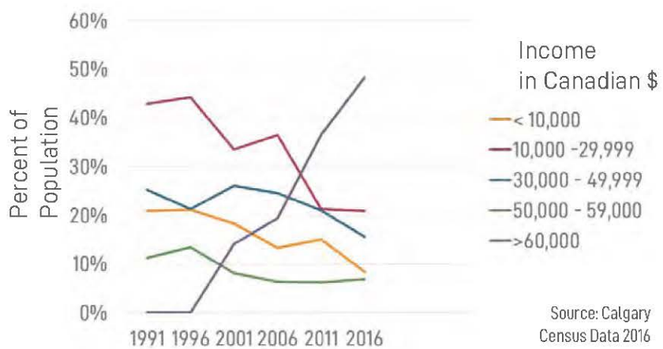
By 2016, single family homes are on the decline, formerly as high as 56% of the housing stock, falling to 32% of the housing stock.

Source: Calgary Census Data 2016

Household Income

----Middle and Lower Incomes are Decreasing

Demographic Changes in Household Income

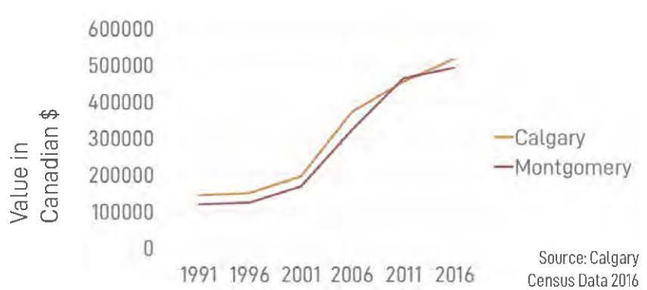


Trend of higher incomes over $60,000 are significantly increasing, in over 50% of the population in 2016.

Average Value of Dwelling

----Significant Increases in Home Prices

Average Value of Dwelling in Calgary and Montgomery

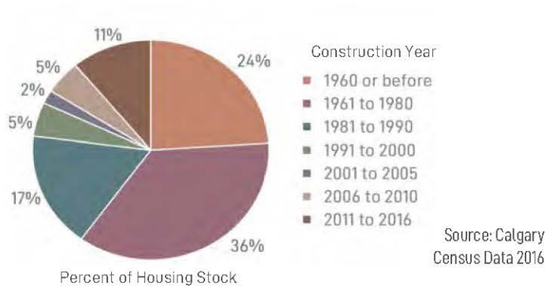


Over the last 25 years, the cost of homes in Montgomery has increased by $365,000.

Housing Construction Year

----Large Amount of Old Housing Stock

Occupied Private Dwellings by Period of Construction



Montgomery has a large percentage of housing stock built before 1980.

2.2 COMMUNITY PROFILE

Summary of Community Profile

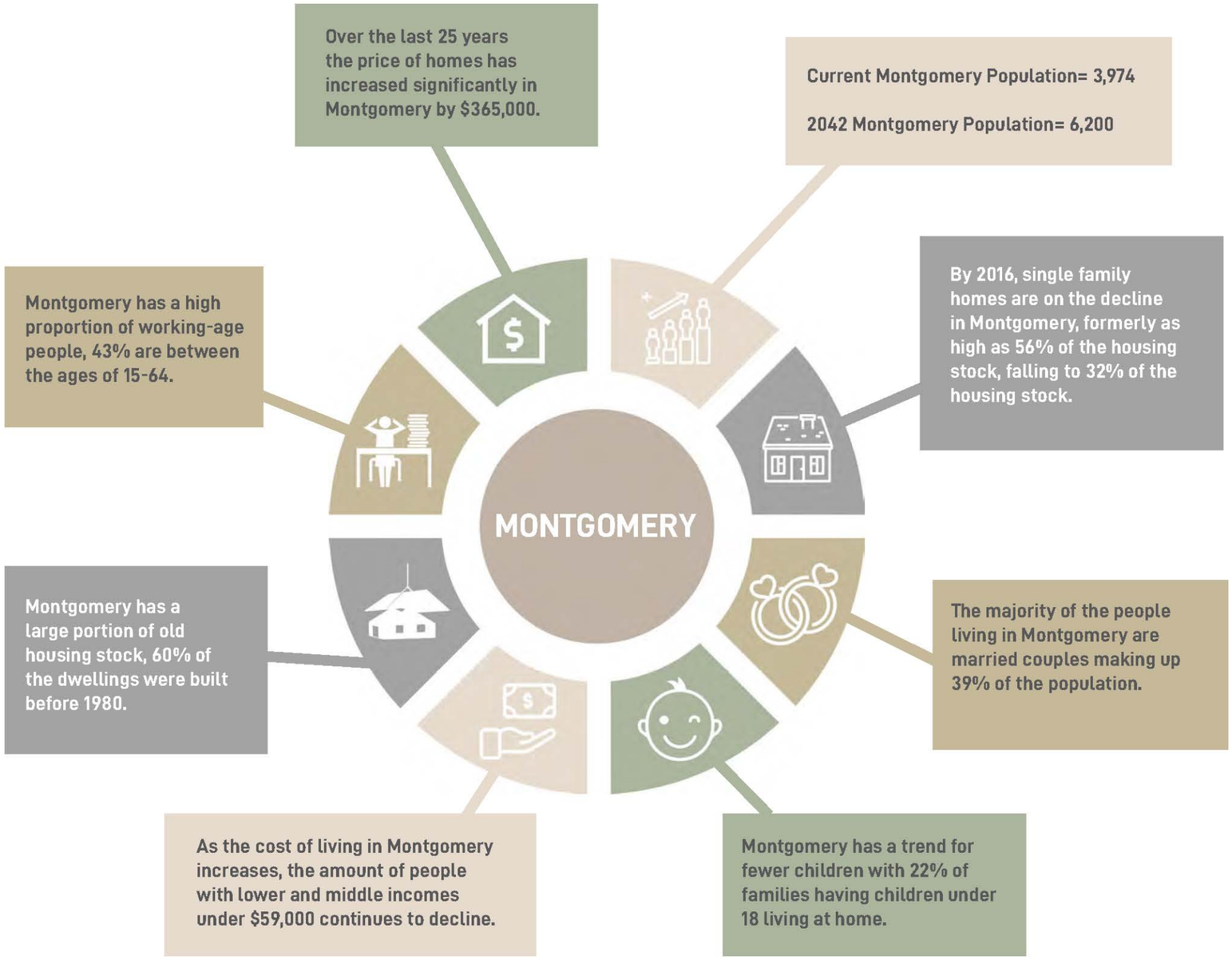
A look at the population and break down of who lives there is important to inform what systems and amenities to plan for the people living there.

Observations

Lower incomes are decreasing while the higher incomes are increasing.
Montgomery has a large working age population, fewer children and a number of seniors.
Montgomery has a large stock of older single family homes.

Conclusion

With the future population increase, Montgomery must plan for an additional 2000 community members.
The census date reveals the increasing cost of living in Montgomery is pushing out some of the population, a case of gentrification.
A large portion of single-family homes were built before 1980 and provide opportunities for renovation and redevelopment, providing variety and choice for homeowners.

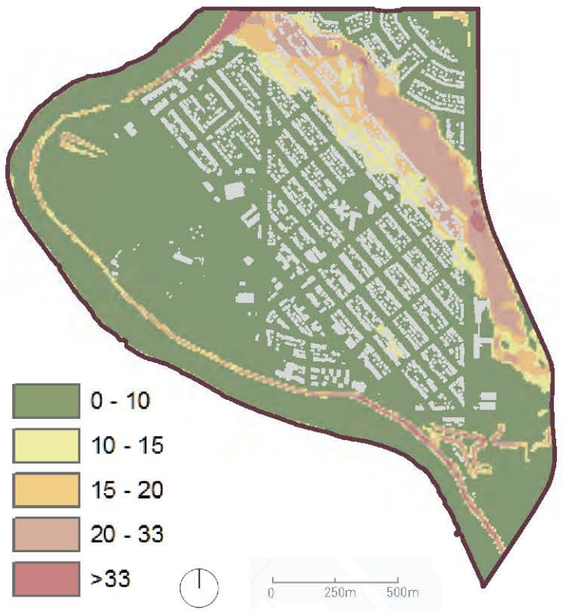


2.3 PHYSICAL ENVIRONMENT

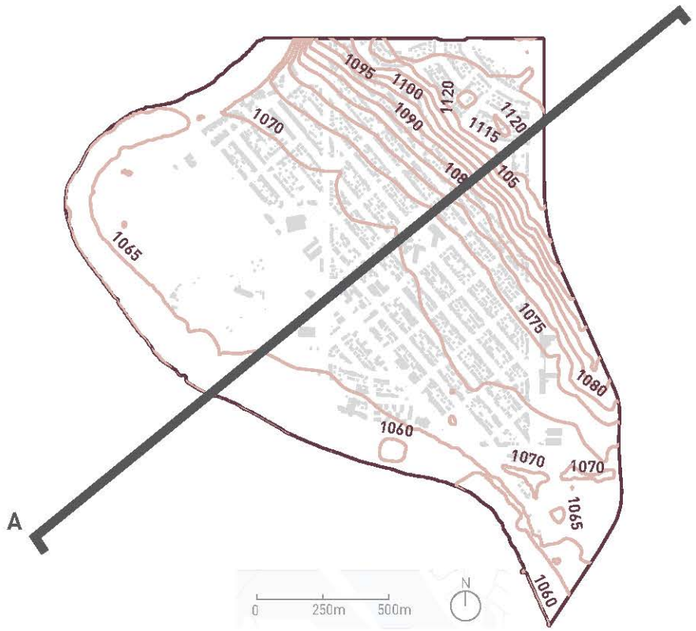
Topography

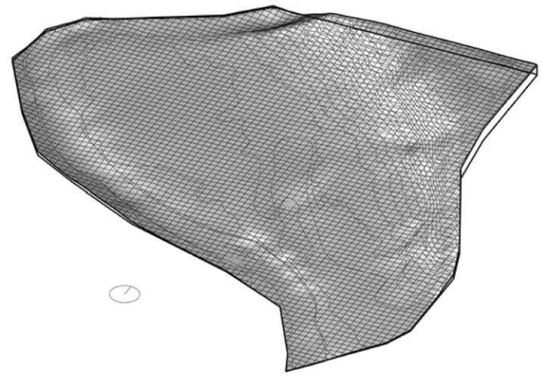
Montgomery has a significant slope along the north east part of the community where the escarpment runs into the river valley.

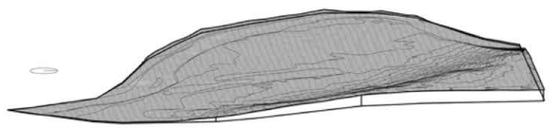
Slope of Area (%)



Contour



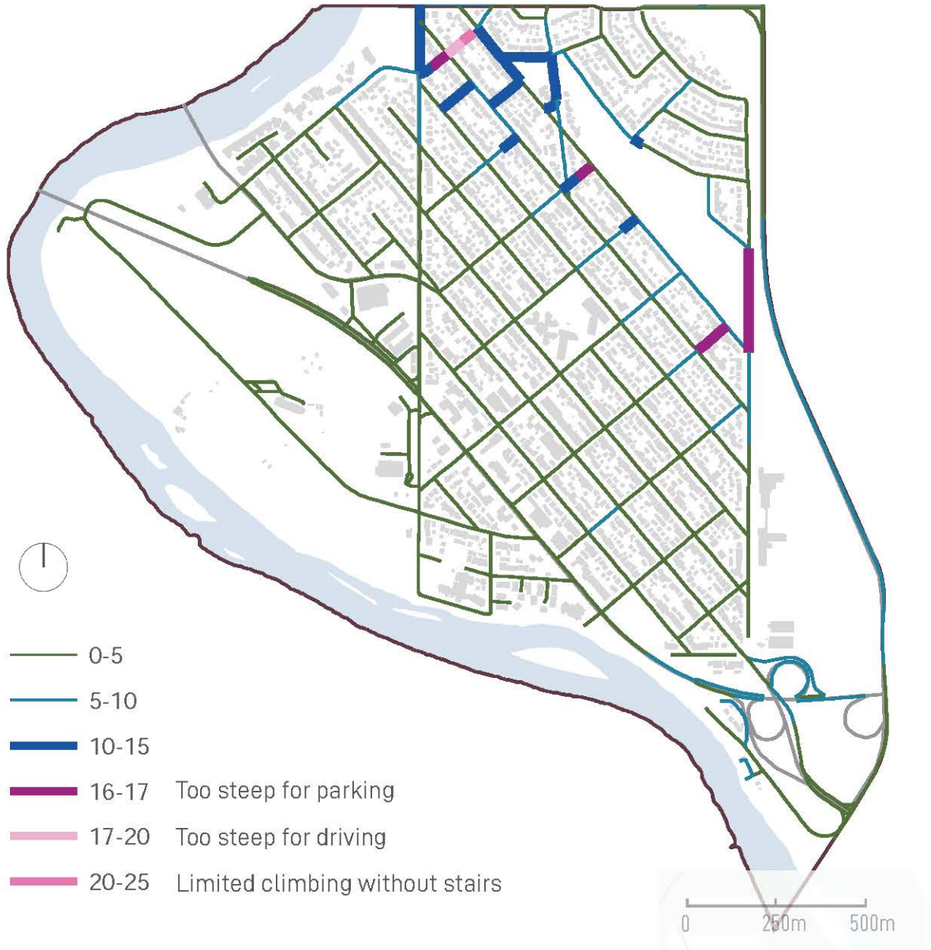




2.3 PHYSICAL ENVIRONMENT

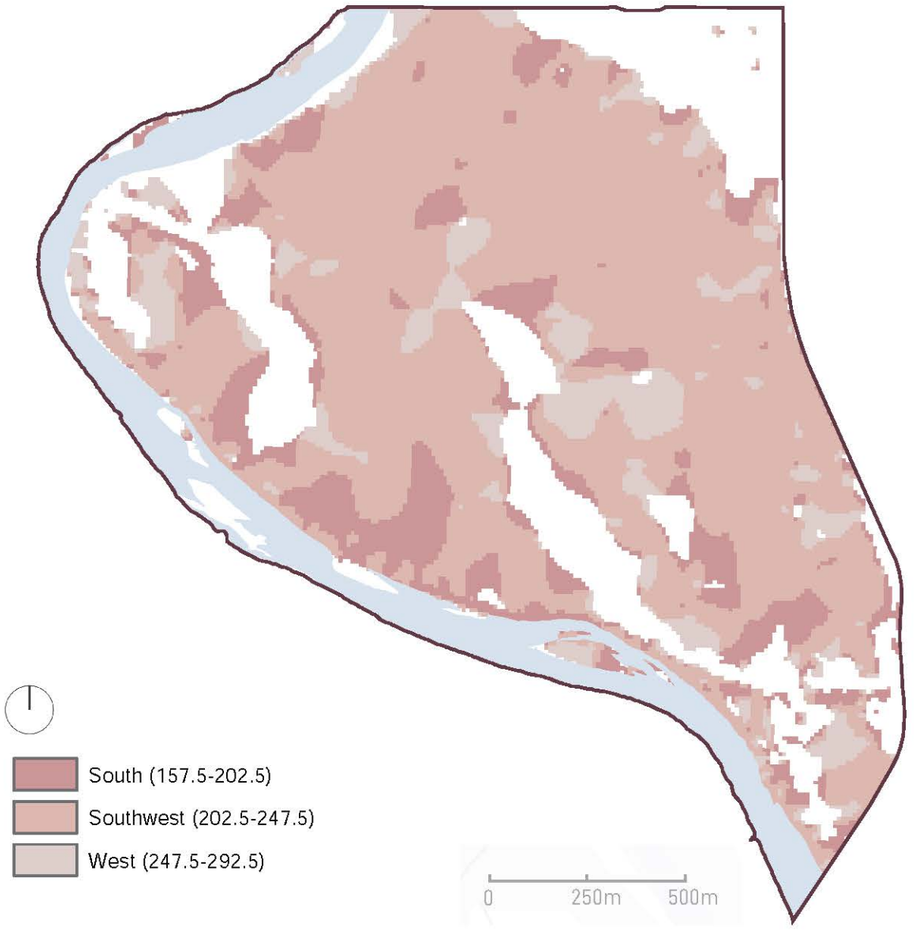
Topography

Slope of Road (%)



When a slope is greater than 17 %, it is not safe for driving.
But such slope has potential to be redeveloped as public space (with stairs) as shown on the map.

Slope Aspects

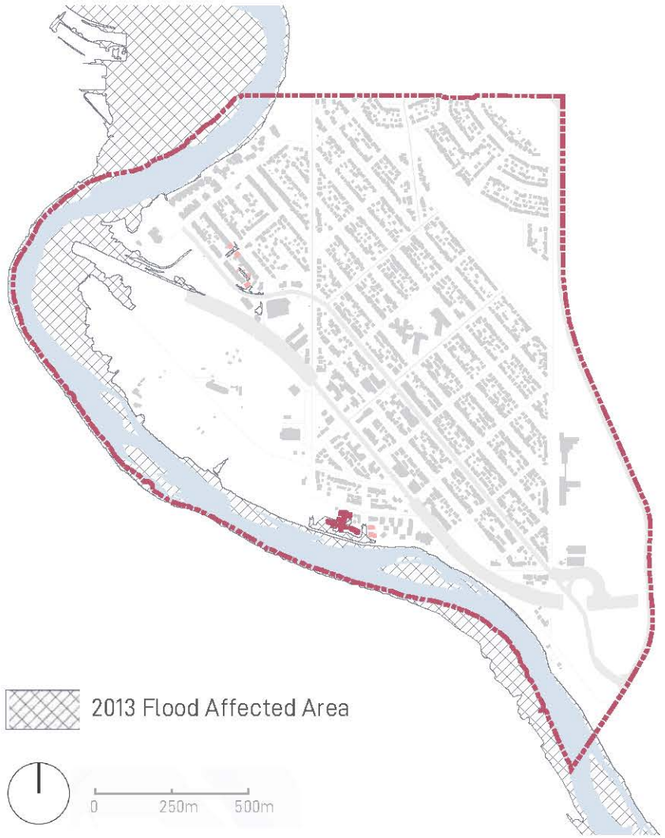


Over 80% of the site has a great south, southwest or west facing sun exposure.

2.3 PHYSICAL ENVIRONMENT

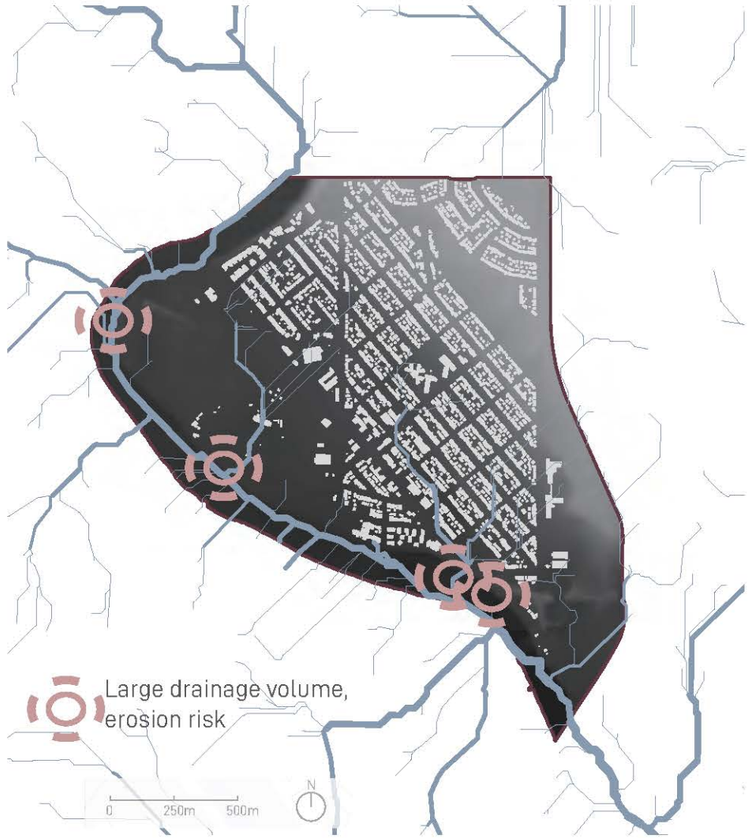
Water

Flood



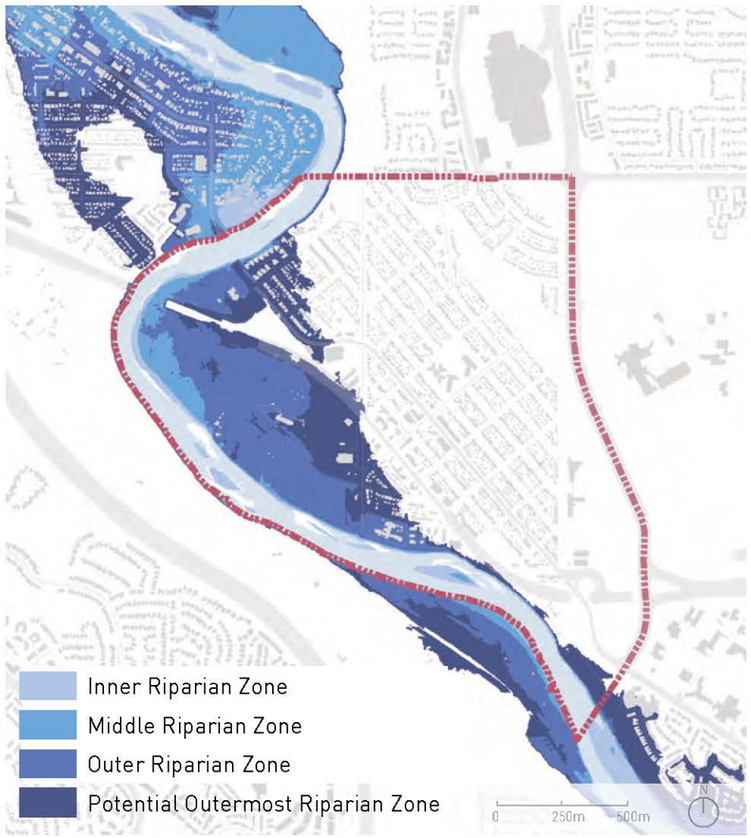
Areas affected in Montgomery by the most recent 2013 flood are shown in the gray cross hatch. These appear largely along the Shouldice Athletic Park Boat Launch under the Trans Canada bridge.

Predicted Natural Drainage Path



There are four sites of erosion risk along the Bow River in Montgomery.

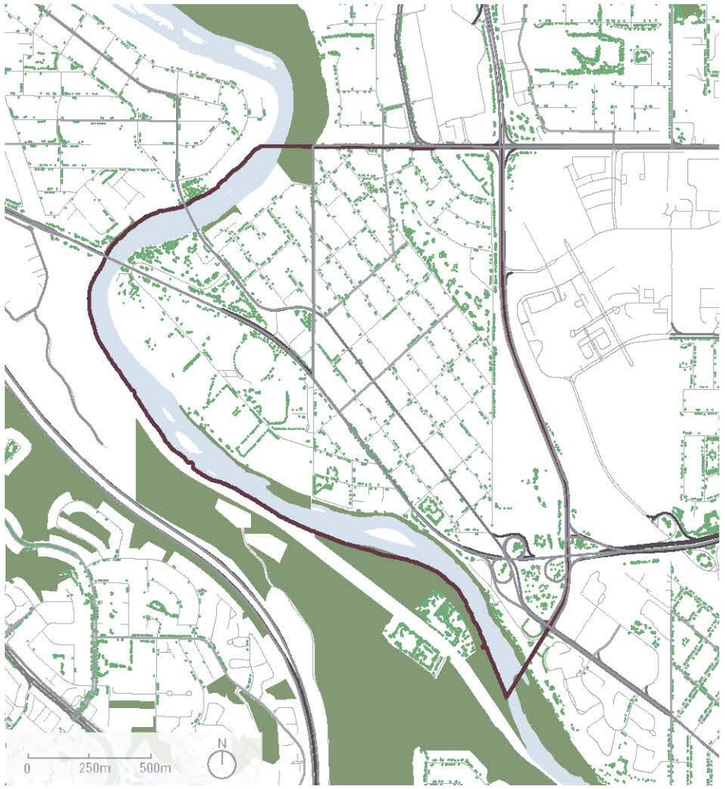
Environmentally Sensitive Area



Montgomery has an extensive Riparian Zone due to its location along the river.

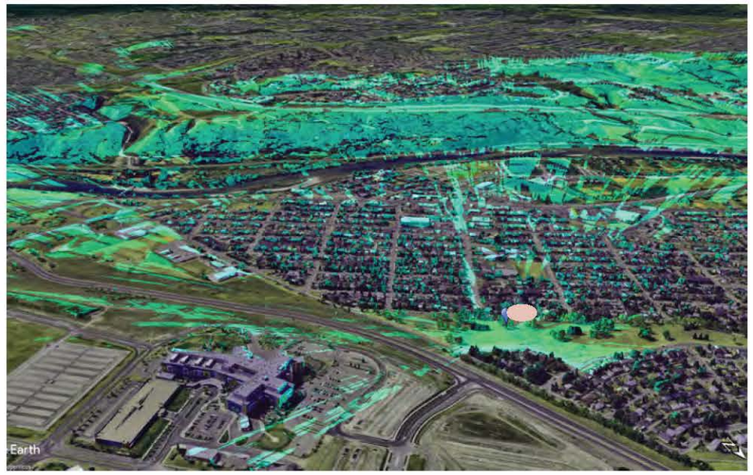
2.3 PHYSICAL ENVIRONMENT

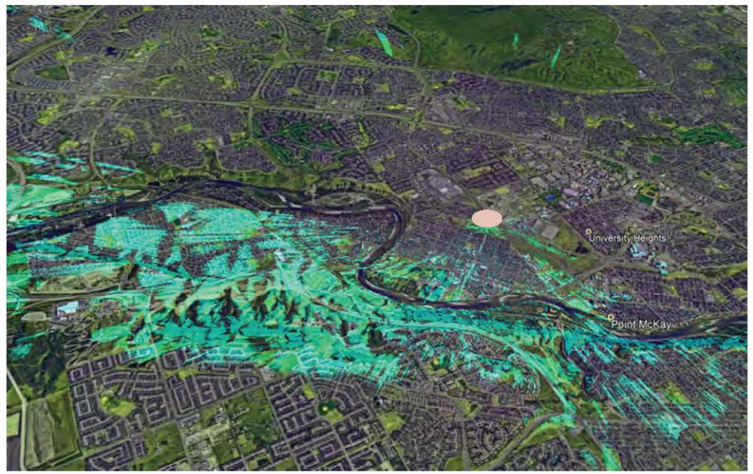
Urban Forest + Natural Area



We can see Montgomery has a fair tree canopy along the river park system, but more trees are needed within the urban context.

View from Montalban Park





There is a grand view from Montalban Park to the south and west.

Summary of Physical Environmental System Analysis

An environmental analysis is important to look at the physical components that influence the site and inform our team of areas we can highlight and bring to front.

Observations

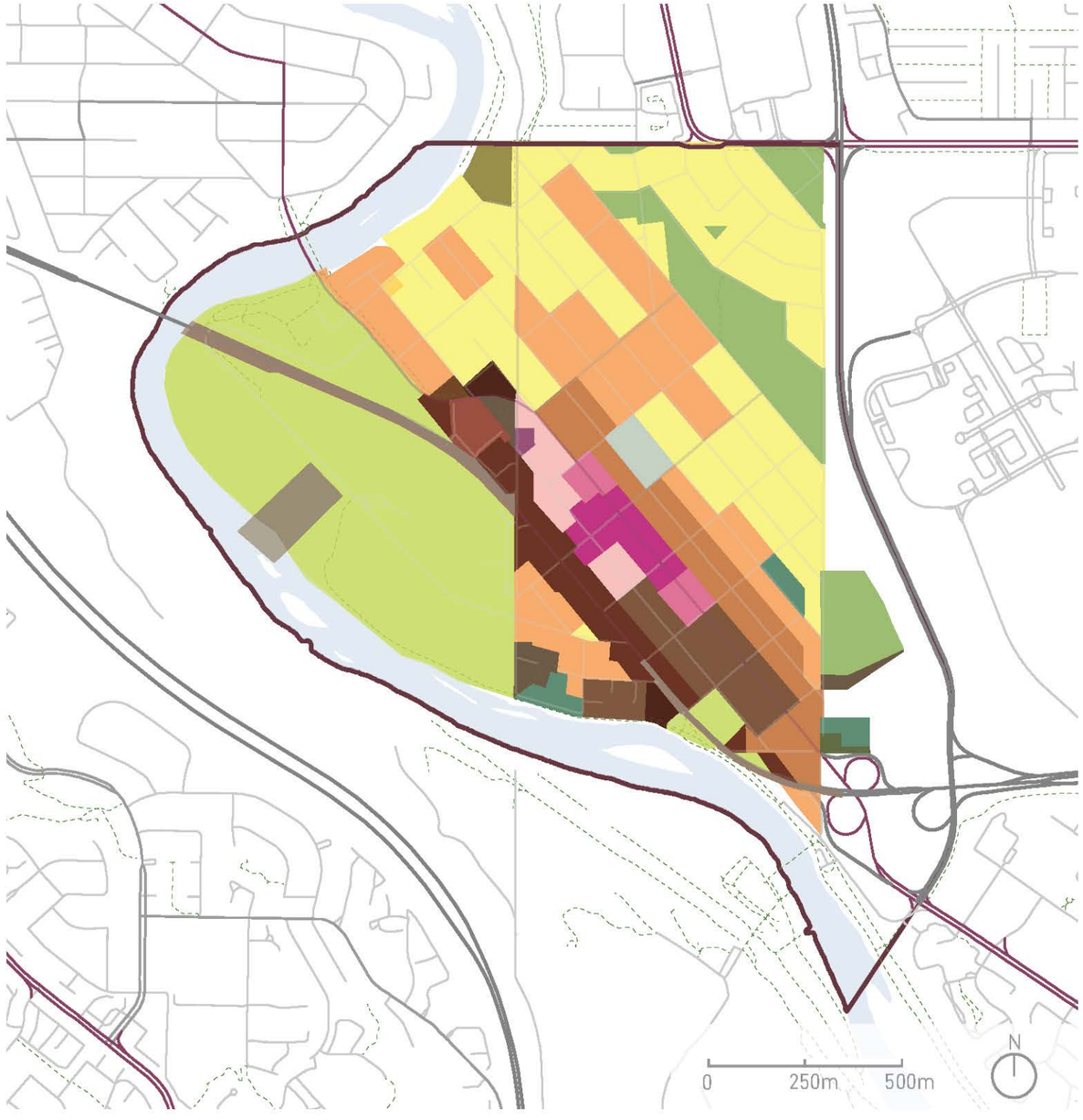
The slope of Montalban Park is significant and must be considered prior to developing around this area.
Knowing Calgary is in a prairie ecosystem, water is precious and looking at water flow and stormwater management running off the slope should be considered.
There is a large gap in the tree canopy in Montgomery along the urban corridors while the river park system has good tree canopy coverage.

Conclusion

Areas prone to flood and erosion should be studied and avoided for development.
The environmentally sensitive riparian areas along the river in Shouldice Park are an excellent buffer for future flooding and should be preserved.
The direction of the dominant slope is creating a unique opportunity for sun exposure and grand views.

2.4 ZONING, LAND USE AND BUILT FORM

Current Zoning

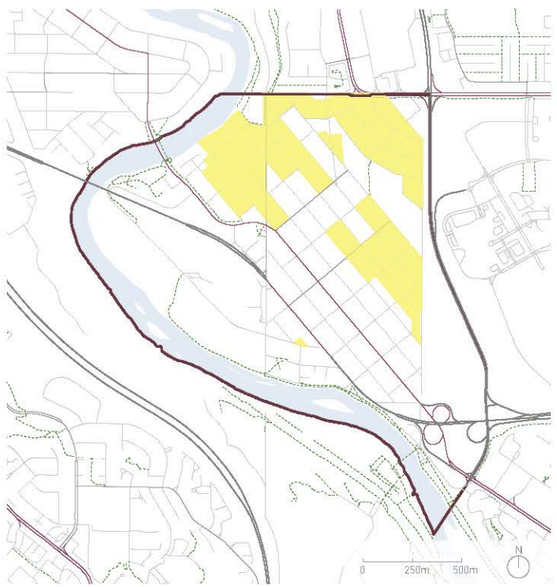


According to bylaw 1P2007, this map represents the current land use districts in the community. In the next section, a detailed explanation of each district is provided.

R-C1	Contextual dwelling
R-C1s	Contextual one dwelling (suite)
R-C1N	Contextual doweling - narrow parcel one Dwelling
R-C2	Duplex and semi-detached
R-CG	Rowhouse, duplex semi-detached (grade oriented infill)
M-C1	Multi-residential contextual
M-CG	Multi-residential grade oriented
M-X1	Multi-residential commercial
M-U1	Mixed use (general)
M-U2	Mixed use
C-C1	Commercial
C-COR2	Commercial corridor
C-O	Commercial office
DC	Direct control
S-R	Special purpose – recreation district
S-SRP	Special purpose – school and parks
S-FUD	Special purpose – Future urban development
S-CS	Special purpose – community service
S-CRI	Special purpose – city and regional infrastructure
S-UN	Special purpose – urban nature
S-CI	Special purpose – community institution district

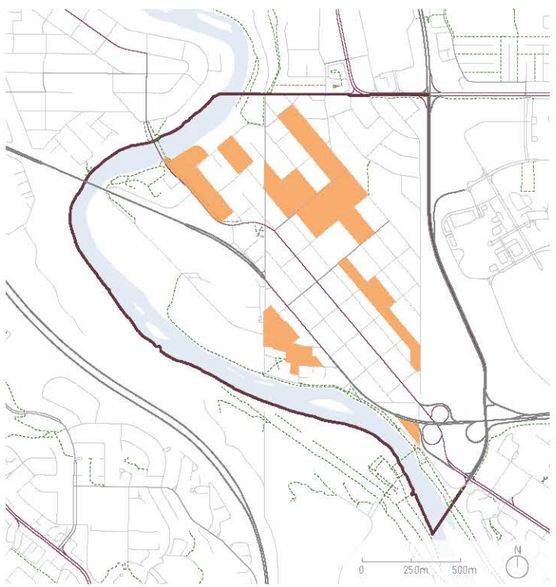
2.4 ZONING, LAND USE AND BUILT FORM

Current Zoning



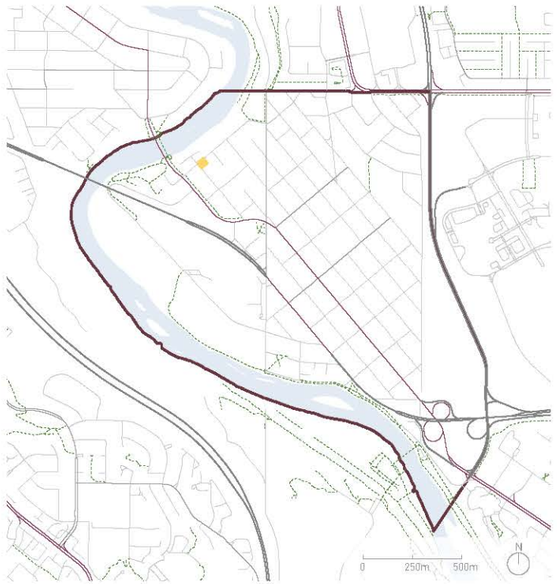
R-C1
R-C1s

Contextual One Dwelling (R-C1) (R-C1s) District
The Residential – Contextual One Dwelling District is intended to accommodate existing residential development and contextually sensitive redevelopment in the form of Single Detached Dwellings in the Developed Area. Parcels designated R-C1s are intended to accommodate a Secondary Suite as a permitted use on the same parcel as a Single Detached Dwelling.
Bylaw 1P2007



R-C2

Residential – Contextual One / Two Dwelling (R-C2) District
The Residential – Contextual One / Two Dwelling District is intended to accommodate existing residential development and contextually sensitive redevelopment in the form of Duplex Dwellings, Semi-detached Dwellings, and Single Detached Dwellings in the Developed Area.
Bylaw 1P2007



R-C1N

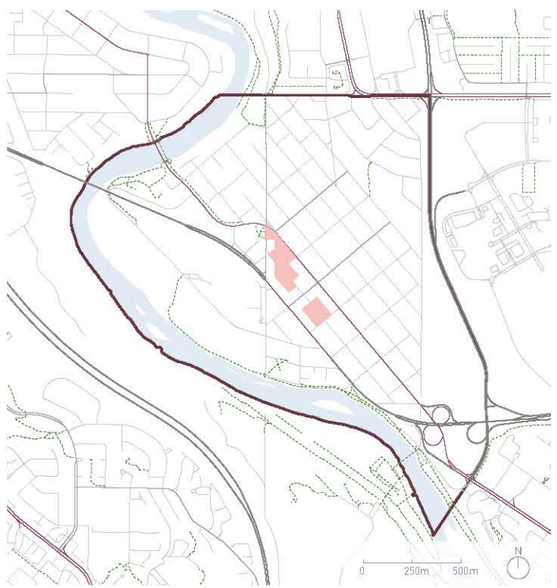
Residential – Contextual Narrow Parcel One Dwelling (R-C1N) District
The Residential – Contextual Narrow Parcel One Dwelling District is intended to accommodate existing residential development and contextually sensitive redevelopment in the form of Single Detached Dwellings in the Developed Area on narrow or small parcels.
Bylaw 1P2007

R-CG

The Residential – Grade-Oriented Infill (R-CG) District:
Accommodates existing residential development; accommodates grade-oriented development in the form of Rowhouse Buildings, Duplex Dwellings, Semi-detached Dwellings and Cottage Housing Clusters. Accommodates Secondary Suites and Backyard Suites with new and existing residential development; provides flexible parcel dimensions and building setbacks that facilitate integration of a diversity of grade-oriented housing over time; and accommodates site and building design that is adaptable to the functional requirements of evolving household needs.
Bylaw 1P2007

2.4 ZONING, LAND USE AND BUILT FORM

Current Zoning



M-C1

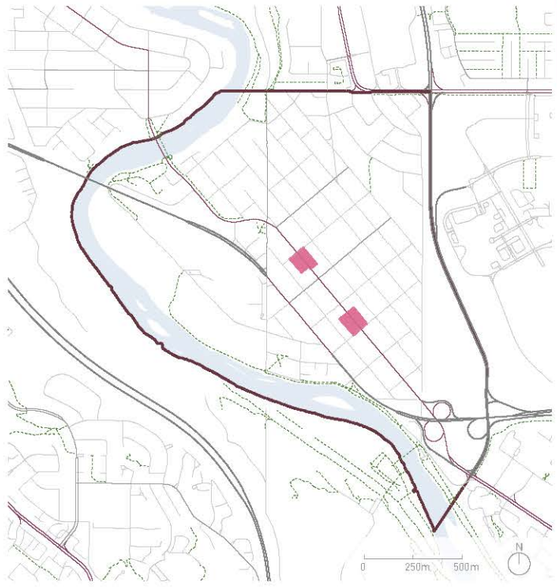
The Multi-Residential – Contextual Low Profile District:
Is intended to apply to the Developed Area; has Multi-Residential Development that will typically have higher numbers of Dwelling Units and traffic generation than low density residential dwellings and M-CG District; provides for Multi-Residential Development in a variety of forms; has Multi-Residential Development of low height and medium density; allows for varied building height and front setback areas in a manner that reflects the immediate context.
Bylaw 1P2007

M-X1

The Multi-Residential – Low Profile Support Commercial District:
Is intended to provide for Multi-Residential Development with support commercial uses in the Developed Area and the Developing Area; has Multi-Residential Developments that will typically provide higher numbers of Dwelling Units and traffic generation than low density residential dwellings, and the M-G and M-CG Districts; provides for Multi-Residential Development in a variety of forms; includes a limited range of support commercial multi-residential uses, restricted in size and location within the building.
Bylaw 1P2007

M-CG

The Multi-Residential – Contextual Grade-Oriented District:
Is intended to apply to the Developed Area ; has Multi- Residential Development that will typically have higher numbers of Dwelling Units and traffic generation than low density residential dwellings; has Multi- Residential Development designed to provide some or all units with direct access to grade; provides for Multi- Residential Development in a variety of forms; has Multi- Residential Development of low height and low density; allows for varied building height and front setback areas in a manner that reflects the immediate context.
Bylaw 1P2007

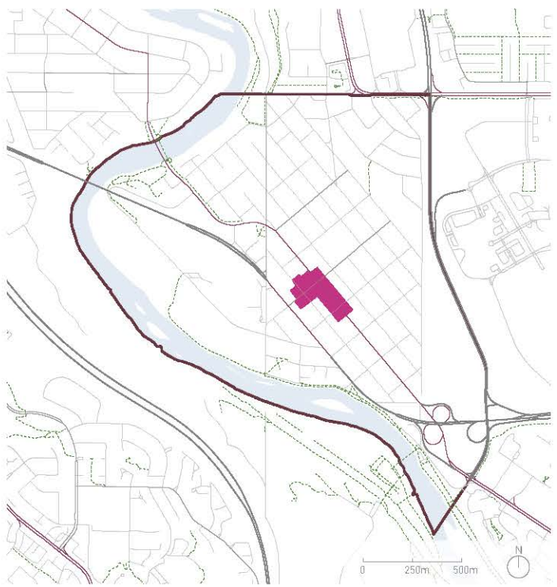


M-U1

The Mixed Use – General District is intended to:
Be located along commercial streets where both residential uses and commercial uses are supported at grade facing the commercial street; accommodate a mix of residential and commercial uses in the same building or in multiple buildings throughout an area; and respond to local area context by establishing maximum building height for individual parcels.
The Mixed Use – General District should only be located where a local area plan, or other policy, supports land use and development aligned with the purpose statements in subsection.
Bylaw 1P2007

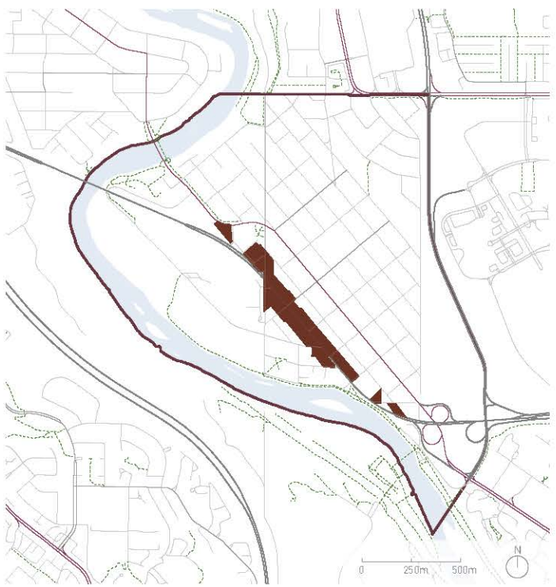
2.4 ZONING, LAND USE AND BUILT FORM

Current Zoning



M-U2

Mixed Use – Active Frontage is intended to:
Be located along commercial streets where active commercial uses are required at grade to promote activity at the street level; promote developments with storefronts along a continuous block face on the commercial street; accommodate a mix of commercial and residential uses in the same building; respond to local area context by establishing maximum building height for individual parcels. The Mixed Use - Active Frontage District should only be located where a local area plan, or other policy, supports land use and development aligned with the purpose statements in subsections.
Bylaw 1P2007



C-COR2

The Commercial – Corridor 2 District is intended to be characterized by:
Commercial development on both sides of streets; buildings located varying distances from streets; limited automotive uses; primary access for motor vehicles to parcels from streets and lanes; parking located on any of the front, side or rear of buildings; pedestrian connections from public sidewalks, to and between buildings; opportunities for residential and office uses to be in the same building; varying building density established though maximum floor area ratios for individual parcels; and varying building height established through maximum building height for individual parcels.
Bylaw 1P2007

C-C1

The Commercial – Community 1 District is intended to be characterized by:
Small to mid-scale commercial developments; developments located within a community or along a commercial street; one or more commercial uses within a building; motor vehicle access to sites; pedestrian connections from the public sidewalk to and between the buildings; building location, setback areas and landscaping that limit the effect of commercial uses on nearby residential districts; and opportunities for residential and office uses to be in the same building as commercial uses.
Bylaw 1P2007

C-O

The Commercial – Office District is intended to be characterized by:
Buildings containing select uses that contribute to locations of high employment; a limited number of other uses that support Offices; locations along or near major roads and transit facilities; pedestrian connections; varying building density established through maximum floor area ratios for individual parcels; and varying building height established through maximum building height for individual parcels.
Bylaw 1P2007

2.4 ZONING, LAND USE AND BUILT FORM

Current Zoning

S-R

The Special Purpose – Recreation District is intended to:

Accommodate a range of indoor and outdoor recreation uses; provide for complementary uses located within buildings occupied by indoor and outdoor recreation uses; and be applied to parcels of various sizes with a greater range of use intensities. The Special Purpose – Recreation District should not be applied to land dedicated as reserve pursuant to the Municipal Government Act or its predecessors.
Bylaw 1P2007

S-FUD

The Special Purpose – Future Urban Development District is intended to:
Be applied to lands that are awaiting urban development and utility servicing; protect lands for future urban forms of development and density by restricting premature subdivision and development of parcels of land; provide for a limited range of temporary uses that can easily be removed when land is redesignated to allow for urban forms of development; and accommodate extensive agricultural uses prior to development to urban uses.
Bylaw 1P2007

S-SRP

The Special Purpose – School, Park and Community Reserve District is intended to:
Provide for schools, parks, open space, and recreation facilities; and have parcels of various sizes and use intensities. The Special Purpose - School, Park and Community Reserve District should only be applied to land dedicated as school reserve, municipal school reserve, community reserve, public reserve, and reserve pursuant to the Municipal Government Act or its predecessors.
Bylaw 1P2007

S-CS

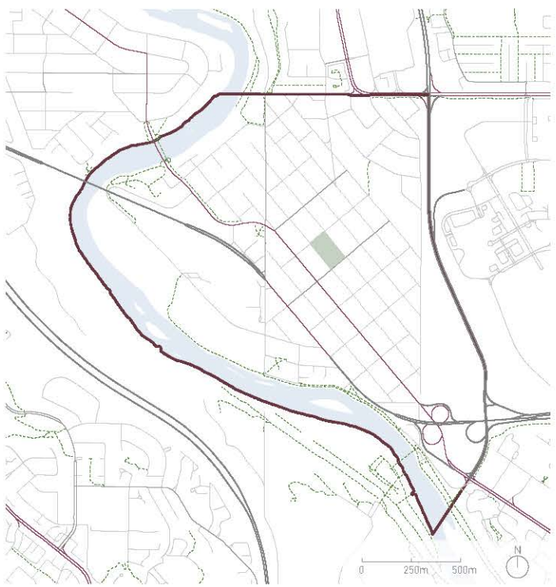
The Special Purpose – Community Service District is intended to:
Accommodate education and community uses located in buildings; accommodate a limited range of small scale, public indoor and outdoor recreation facilities; and have limited application to parcels that are not designated reserve pursuant to the Municipal Government Act or its predecessors.
Bylaw 1P2007

2.4 ZONING, LAND USE AND BUILT FORM

Current Zoning

S-CRI

The Special Purpose – City and Regional Infrastructure District is intended to provide for: Infrastructure and utility facilities; vehicle maintenance, work depots and training centres related to facilities and systems for public transportation; and uses operated by Federal, Provincial and Municipal levels of government.
Bylaw 1P2007



S-CI

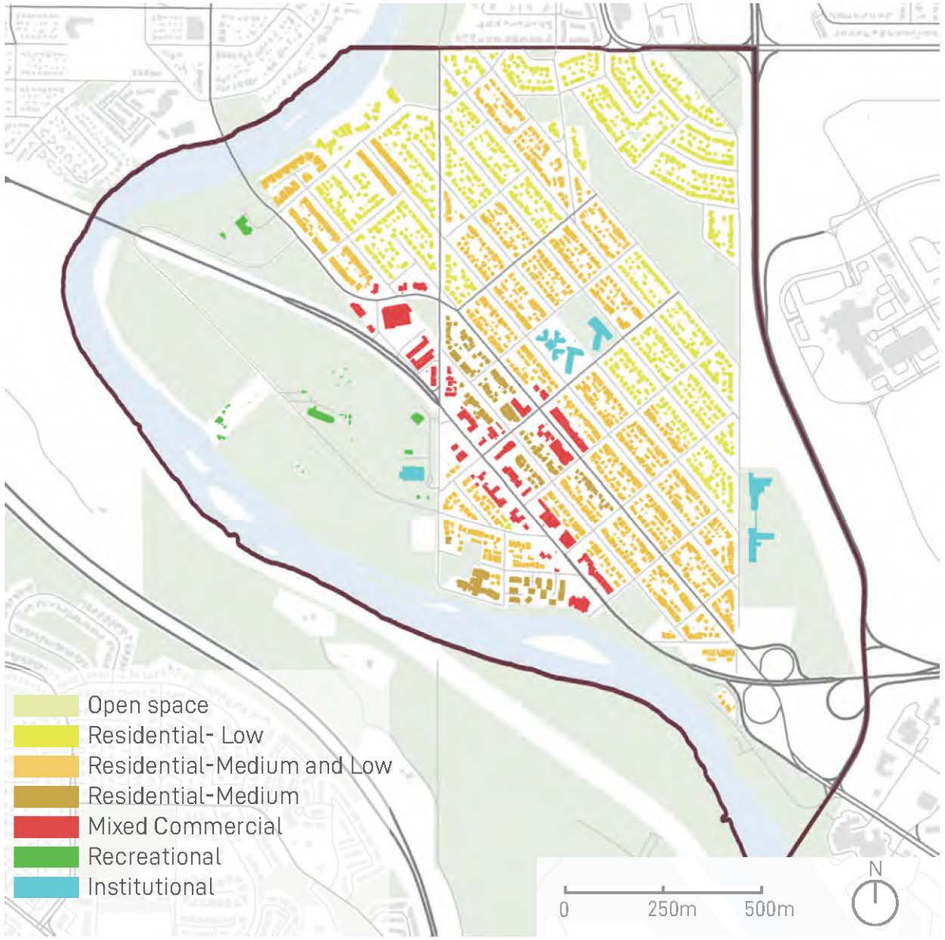
The Special Purpose – Community Institution District is intended to:
Provide for large scale culture, worship, education, health and treatment facilities; provide for a wide variety of building forms located throughout the city; and be sensitive to the context when located within residential areas.
Bylaw 1P2007

S-UN

The Special Purpose – Urban Nature District is intended to:
Be applied to lands that have either been set aside for the purpose of preserving existing characteristics of a natural plant or animal community or which are undergoing naturalization; provide for natural landforms, vegetation, and wetlands; and limit development to improvements that facilitate passive recreational use. The Special Purpose - Urban Nature District should be applied to land dedicated as environmental reserve pursuant to the Municipal Government Act or its predecessors.
Bylaw 1P2007

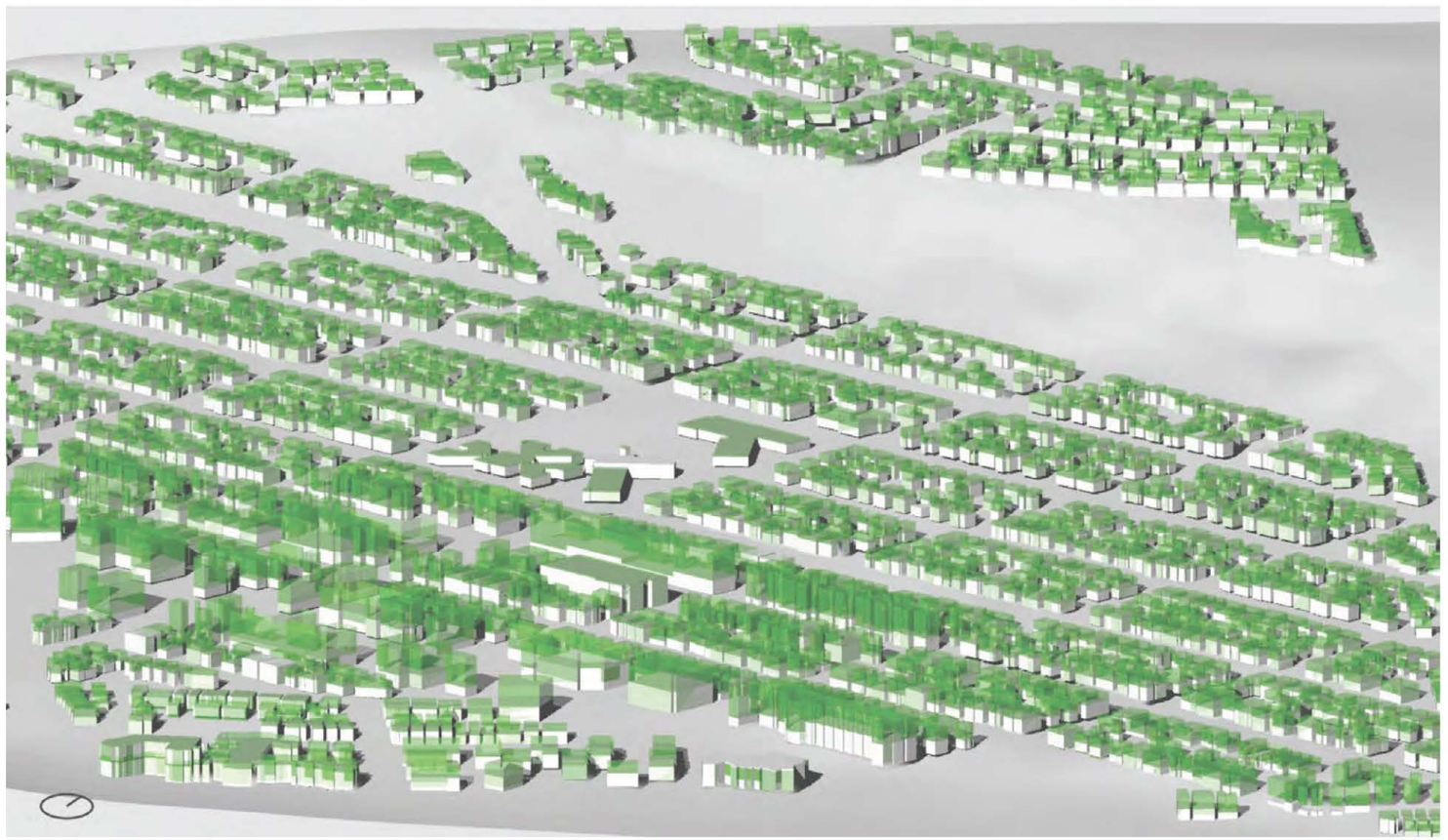
2.4 ZONING, LAND USE AND BUILT FORM

Current Land Use



2.4 ZONING, LAND USE AND BUILT FORM

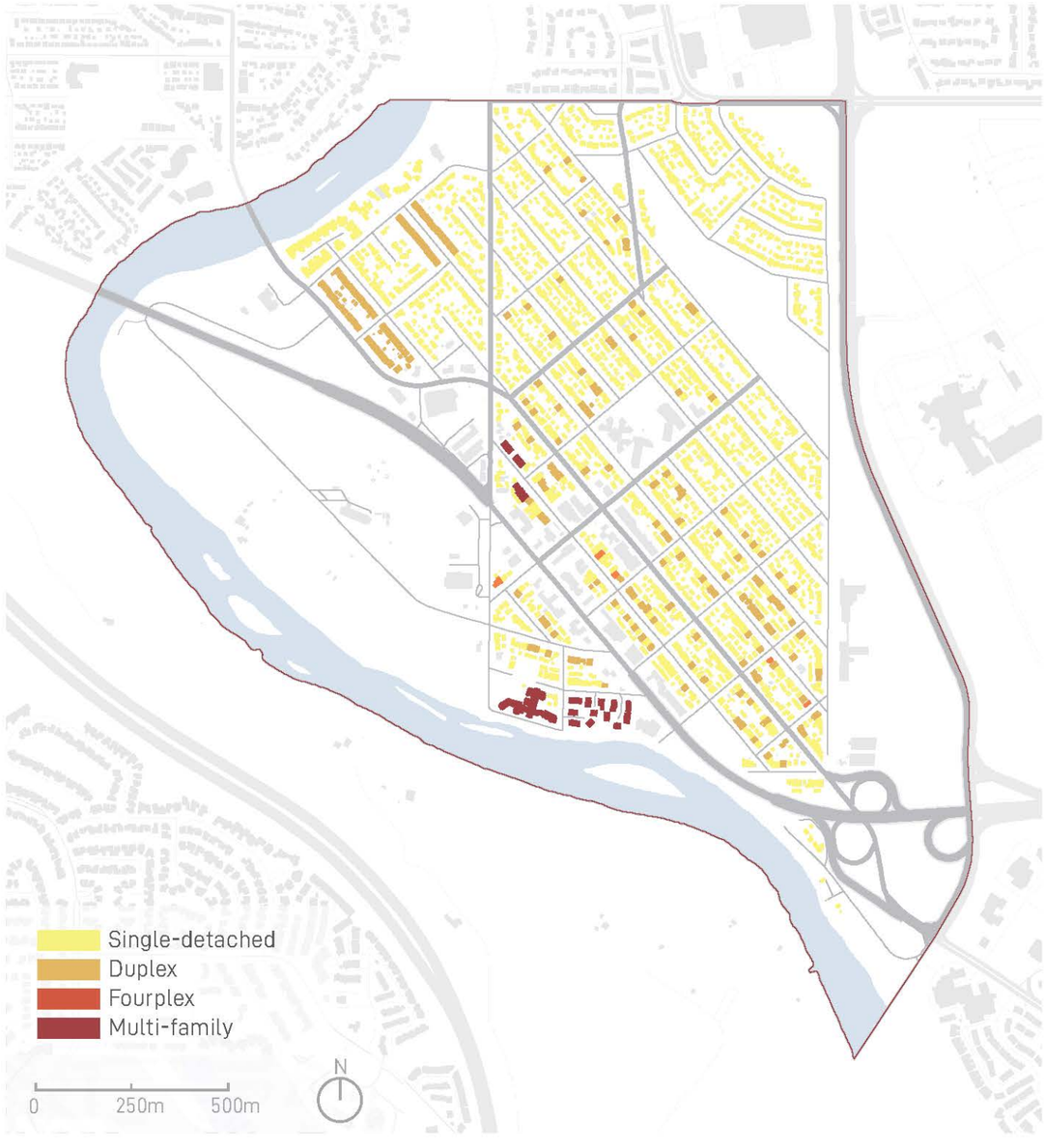
Current Building height



Map revealing allowed building heights based on current zoning in green. White shows the actual building on the ground.

2.4 ZONING, LAND USE AND BUILT FORM

Housing Typology



Single-family House

Duplex

Fourplex

Multi-family House

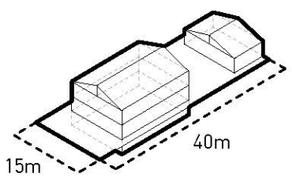
2.4 ZONING, LAND USE AND BUILT FORM

Zoning and Building Typology

C-O	C-COR2	C-C1	M-U2	M-U1	M-X1	M-CG	M-C1	R-CG	R-C2	R-C1N	R-C1s	R-C1
Height 10 – 12m	Height 16 – 22m	Height 10m	Height 16 – 22m		Height 14m	Height 12m	Height 9 – 14 m	Height 8.6 – 11m	Height 8.6 – 10m			
currently no housing	currently no housing	currently no housing	3 4 5		3 4 5	3 4 5	2 3 4	1 2 3	1 2			

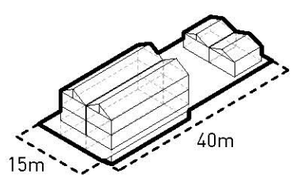
Single family

1



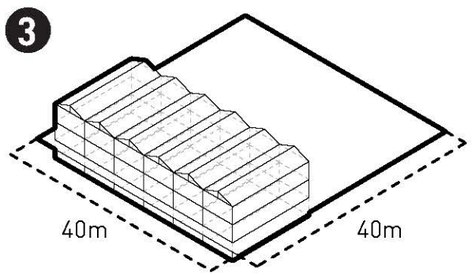
Duplex

2



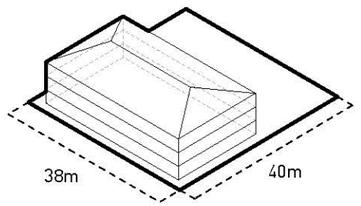
Townhouse
Rowhouse
Fourplex

3



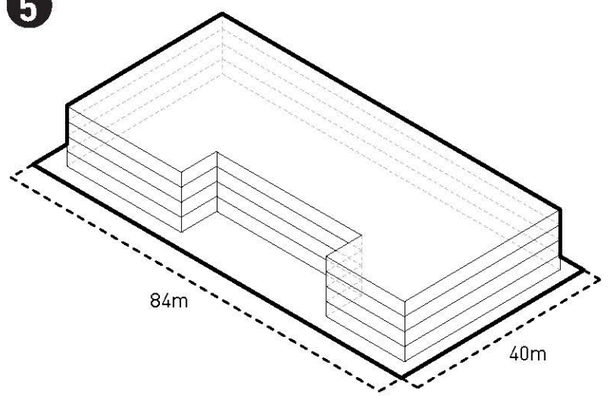
Multi-family low-rise

4



Multi-family medium-rise

5



2.4 ZONING, LAND USE AND BUILT FORM

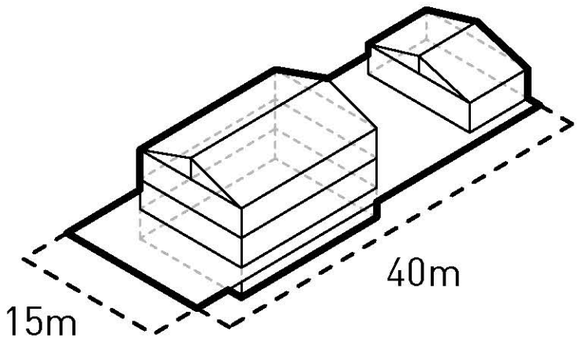
Zoning and Housing Typology

R-CG | R-C2 | R-C1N | R-C1s | R-C1

Single family

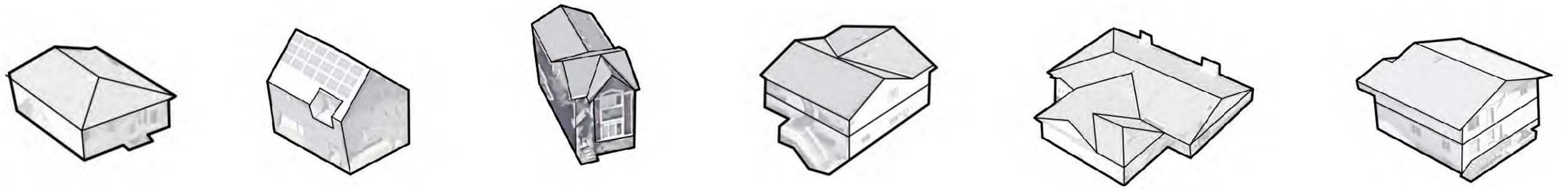
805 units
45% of the total units

❶



Typical built form and parcel size

Existing examples in the community



2.4 ZONING, LAND USE AND BUILT FORM

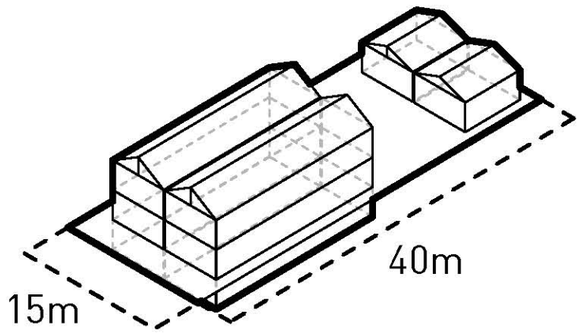
Zoning and Housing Typology

M-C1 | R-CG | R-C2 | R-C1N | R-C1s | R-C1

Duplex
235 units

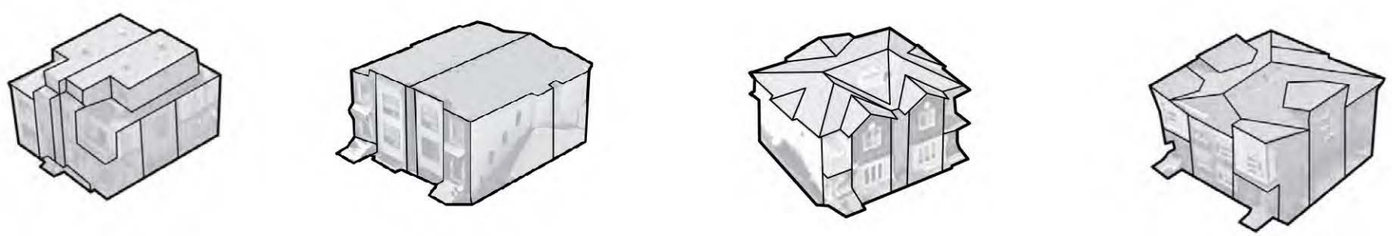
13% of the total units

❷



Typical built form and parcel size

Existing examples in the community



2.4 ZONING, LAND USE AND BUILT FORM

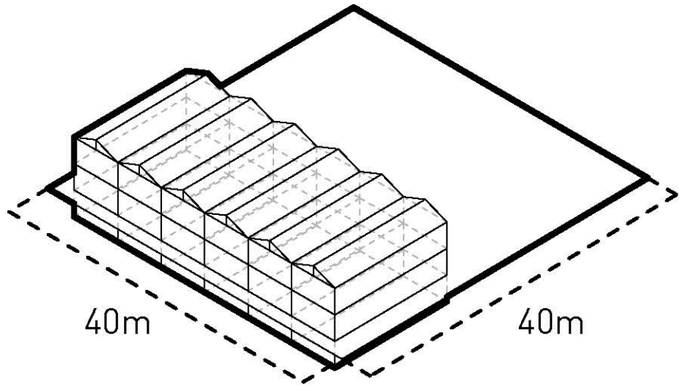
Zoning and Housing Typology

M-U2 | M-U1 | M-X1 | M-CG | M-C1 | R-CG

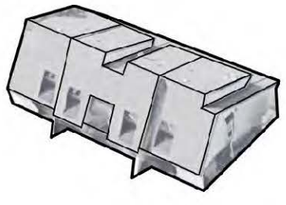
Townhouse
Rowhouse
fourplex
510 units
28% of the total units

3

Typical built form and parcel size



Existing examples in the community



2.4 ZONING, LAND USE AND BUILT FORM

Zoning and Housing Typology

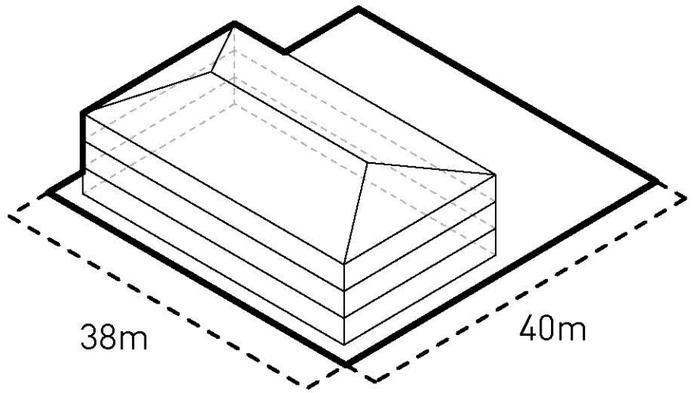
M-U2 | M-U1 | M-X1 | M-CG | M-C1

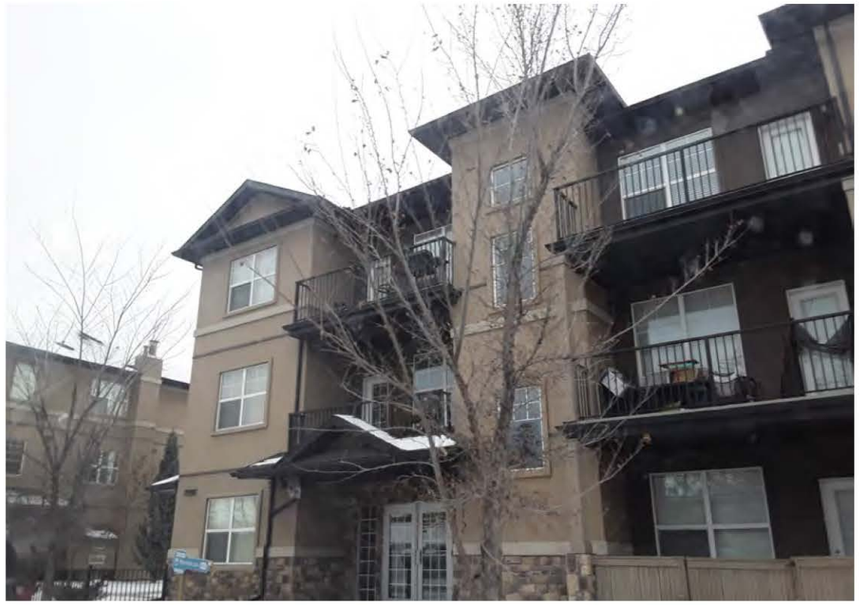
Multi-family low-rise

Combined with next category 245 units
13% of the total units

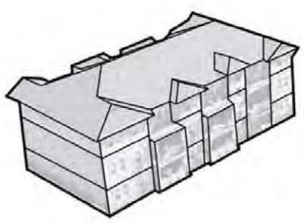
4

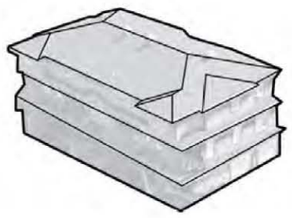
Typical built form and parcel size





Existing examples in the community





2.4 ZONING, LAND USE AND BUILT FORM

Zoning and Housing Typology

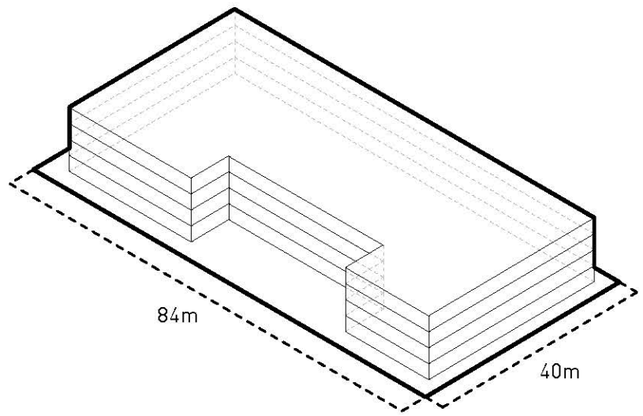
M-U2 | M-U1 | M-X1 | M-CG

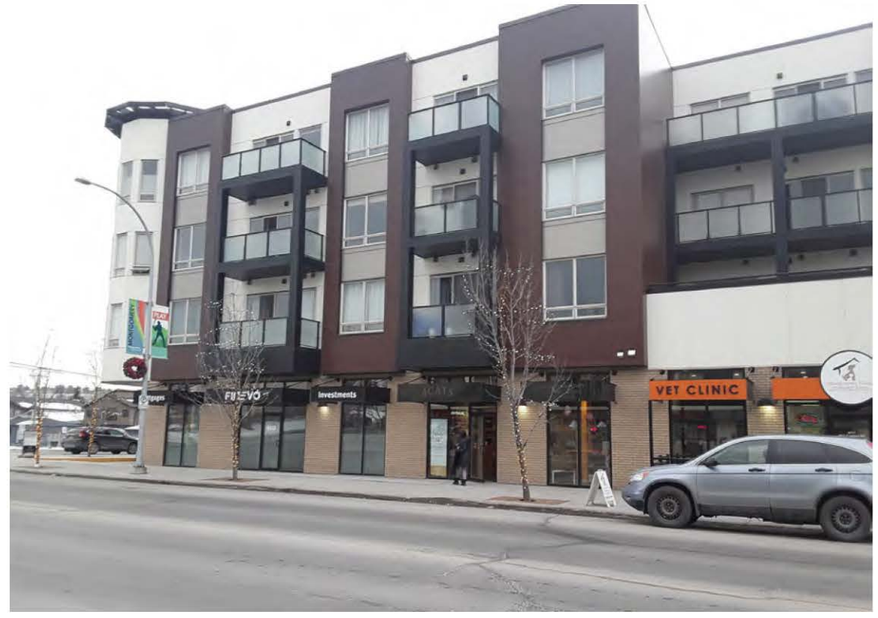
Multi-family medium-rise

Combined with Previous category 245 units
13% of the total units

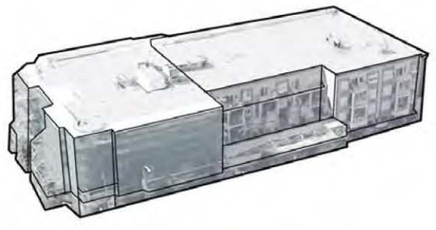
5

Typical built form and parcel size





Existing examples in the community

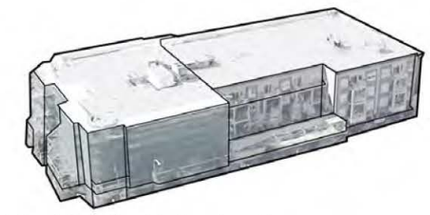


2.4 ZONING, LAND USE AND BUILT FORM

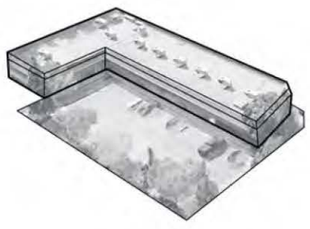
Zoning and Commercial Typology

C-O | C-COR2 | C-C1

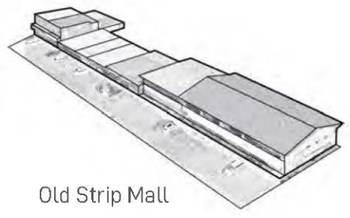
Existing examples in the community



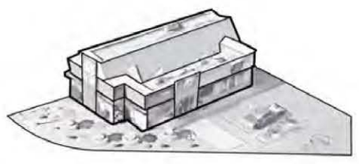
Mixed Retail with Condos Above



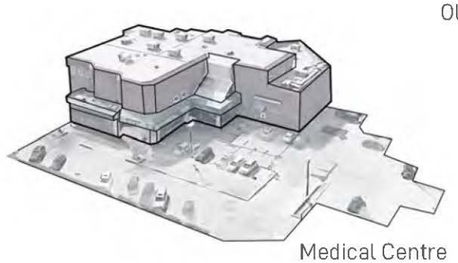
Old commercial complex



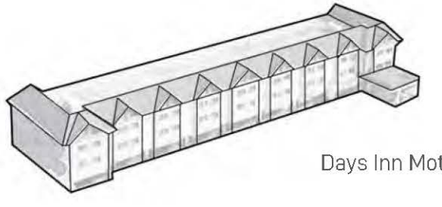
Old Strip Mall



Dairy Queen



Medical Centre



Days Inn Motel

Gas Station

2.4 ZONING, LAND USE AND BUILT FORM

Summary of Zoning, Land Use and Built Form Analysis

We need to balance the need for density to support the livelihood in the community along a commercial street and Main Street, with the communities desire for maintaining a low density residential form, of primarily single family homes.

The current zoning map reveals what is able to be developed with greater density than what is currently on the ground.

The current land use map reveals what is actually built on the ground.

Observations

- Density is concentrated along the commercial corridors of 16th Ave and Bowness Road.
- Density is not being realized to its full potential, currently by only half.
- We see no residential use along 16th Ave.
- The gas stations have low height.

Conclusion

Build form is divided, separated by the Trans Canada Highway. Along the highway we see predominately commercial uses on either side. Some density radiates out from there and gradually steps down into the community.

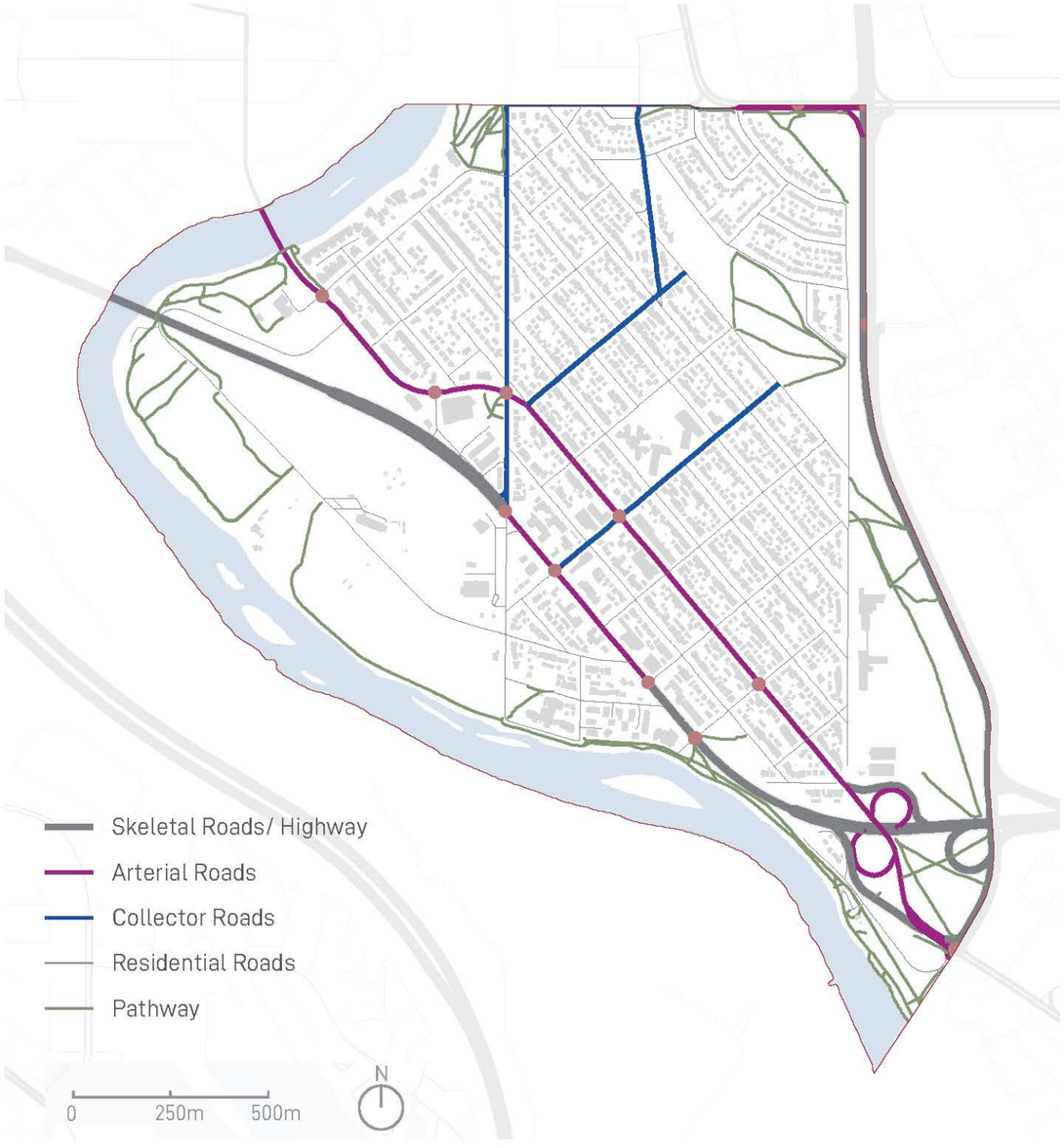
We find a large portion of Montgomery, about half is zoned for single family homes, at R-C1 for which secondary suites are prohibited. This discourages residents from adding secondary suites, which can help with affordability issues.

A few parcels have been re-designated as RC1S and they are accommodating laneway housing or secondary suites.

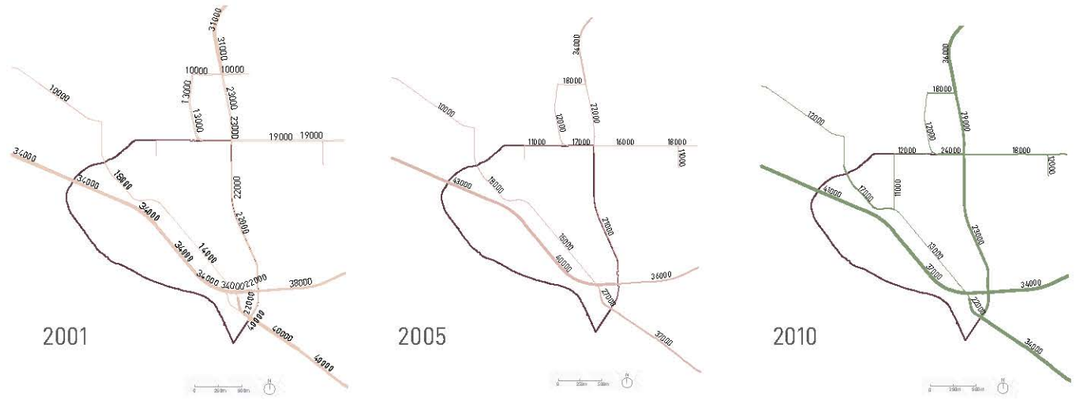
The areas along Bowness Road are great opportunities to add sensitive densification in Montgomery with great amenities.

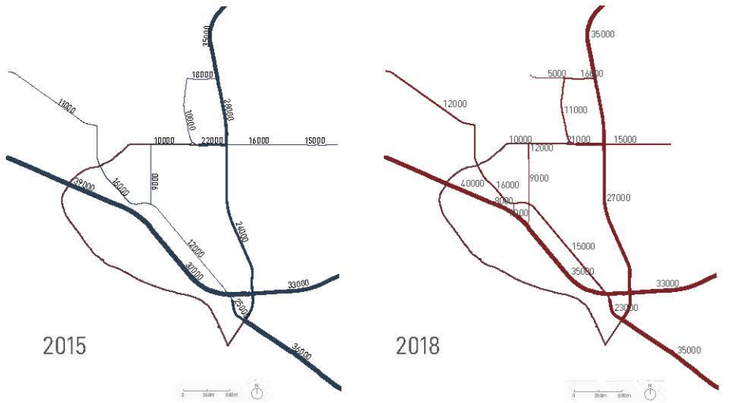
2.5 MOBILITY & CONNECTIVITY

Road and Street Network



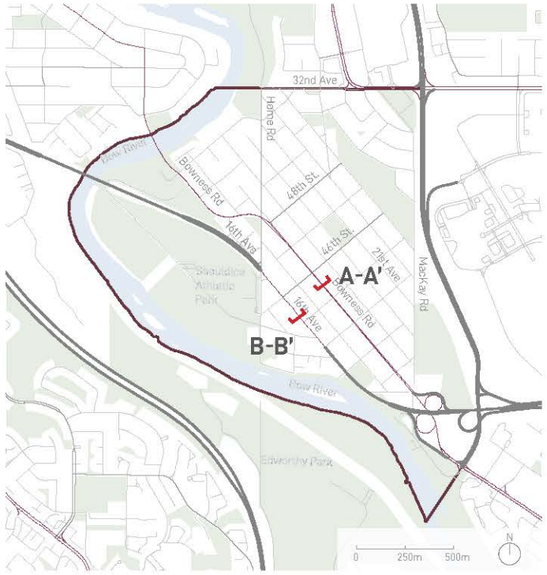
Traffic Volume



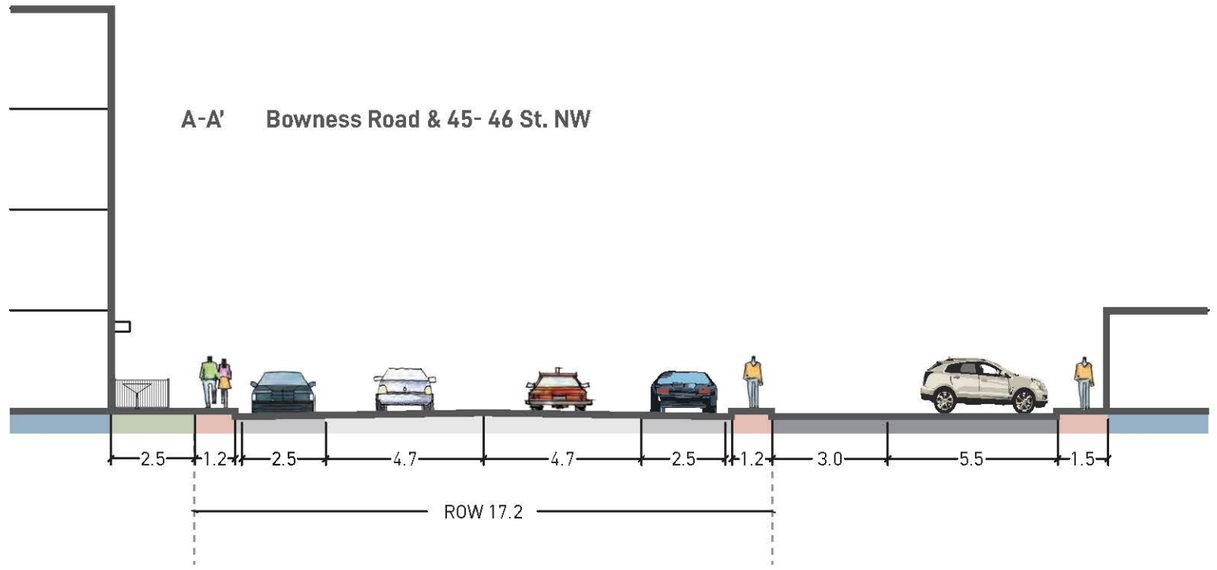


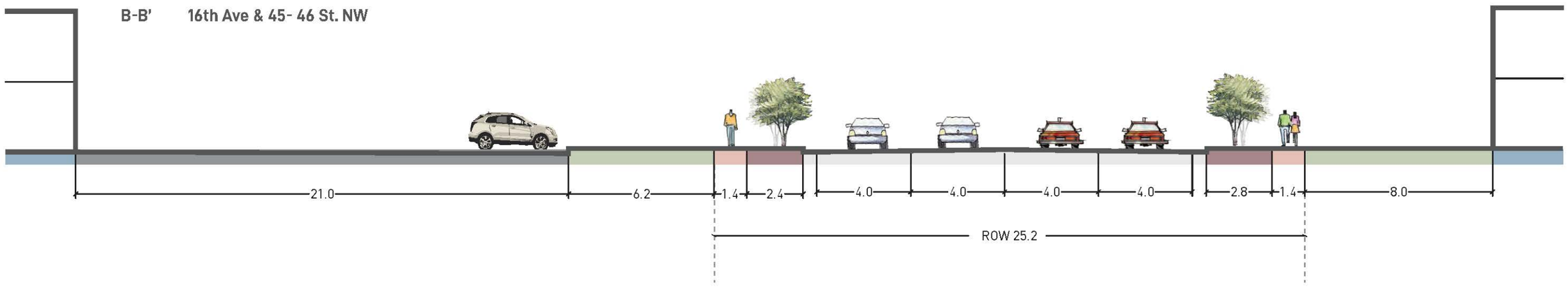
2.5 MOBILITY & CONNECTIVITY

Road Sections



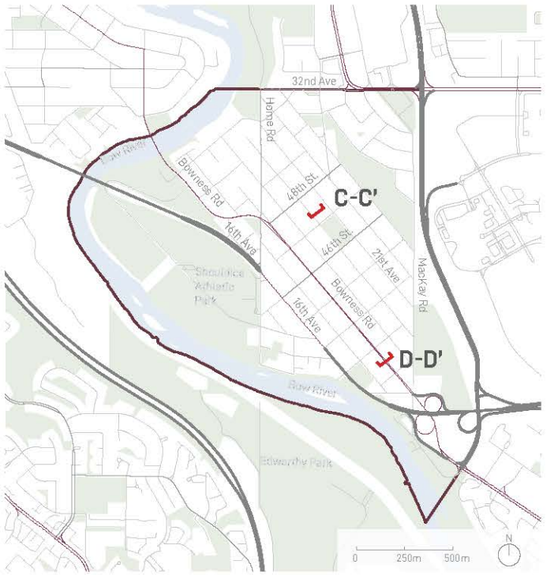
- Building
- Frontage
- Sidewalk
- Street Tree
- Parking Lane
- Travel Lane
- Surface Parking Lot
- Property Line





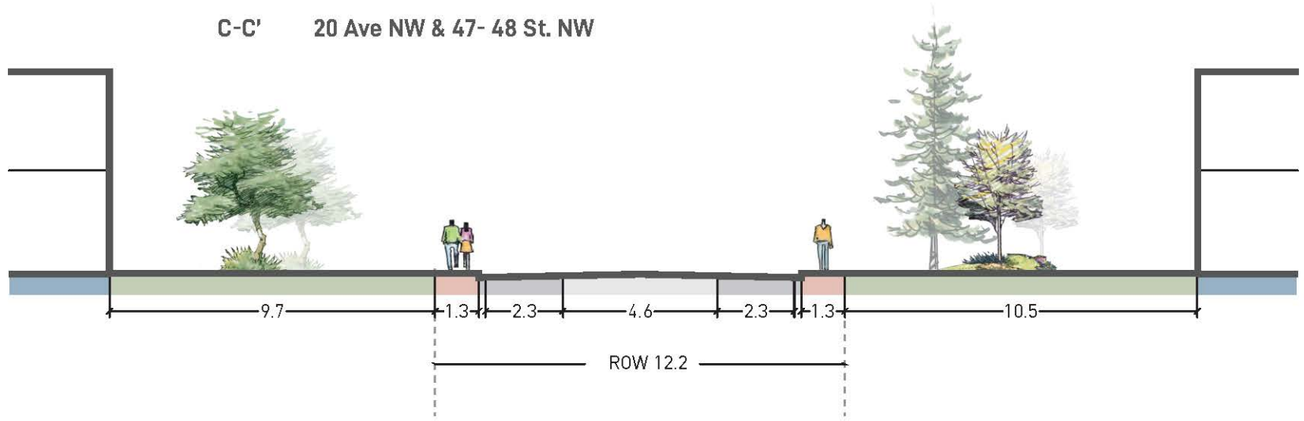
2.5 MOBILITY & CONNECTIVITY

Road Sections

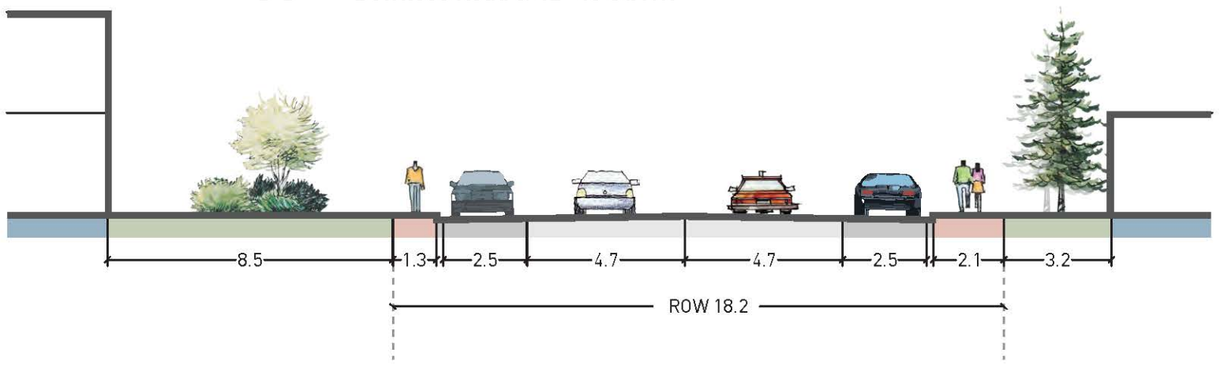


Building
Frontage
Sidewalk
Street Tree
Parking Lane
Travel Lane
Surface Parking Lot
Property Line

C-C' 20 Ave NW & 47- 48 St. NW

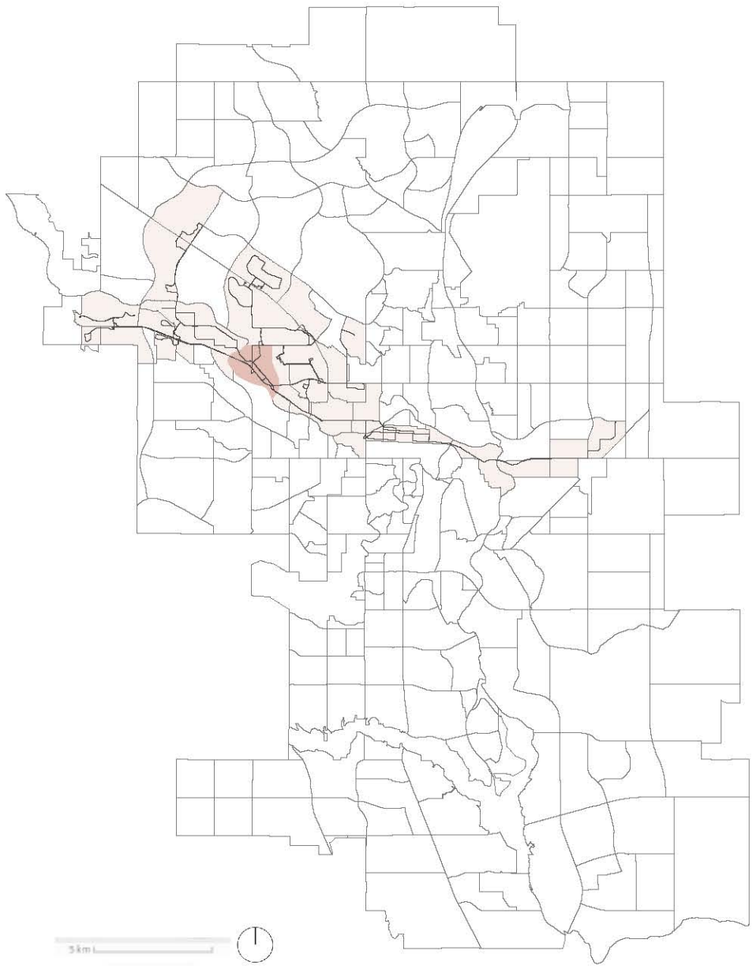


D-D' Bowness Road & 42- 43 St. NW

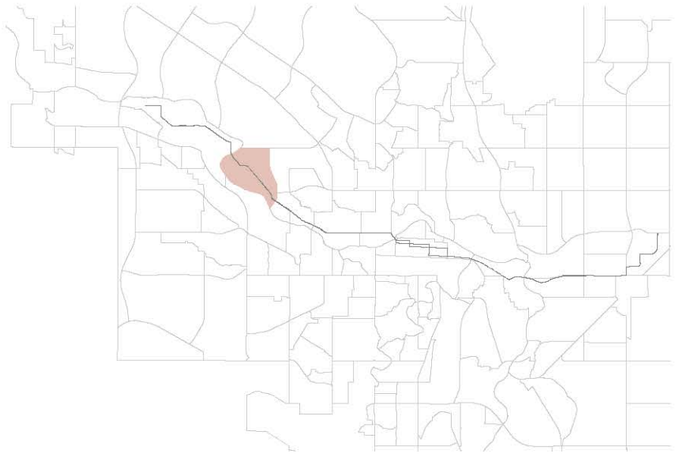


2.5 MOBILITY & CONNECTIVITY

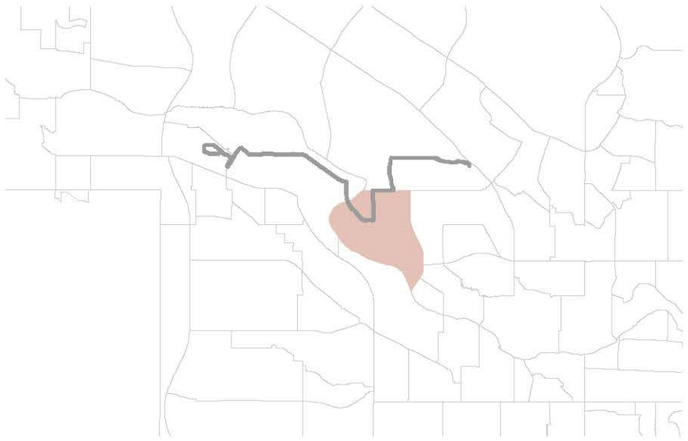
Transit System



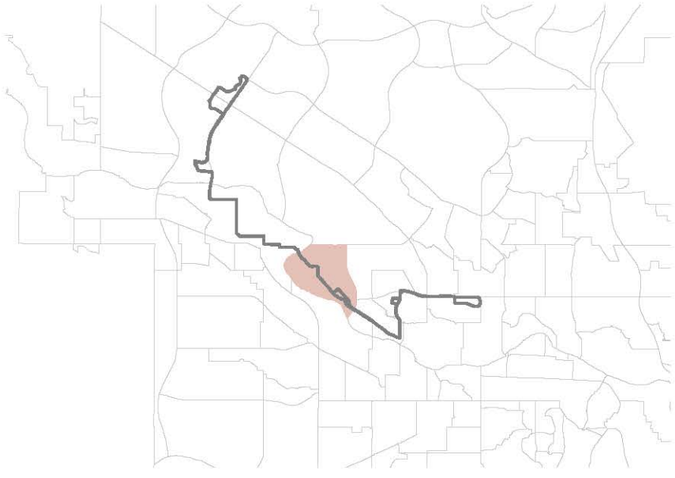
Bus Route #1



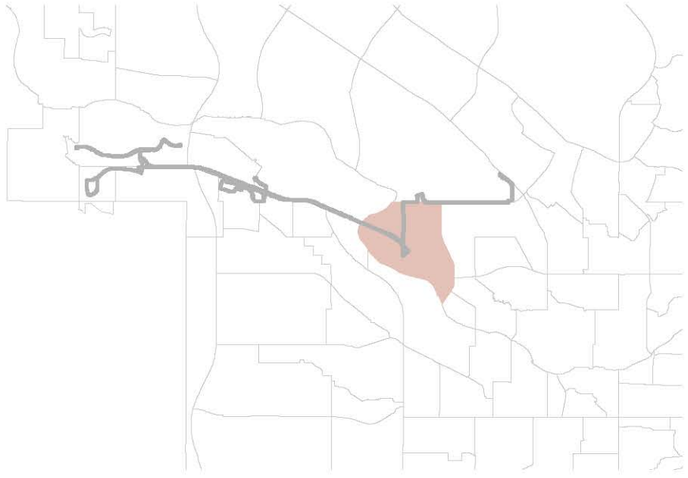
Bus Route #53



Bus Route #40



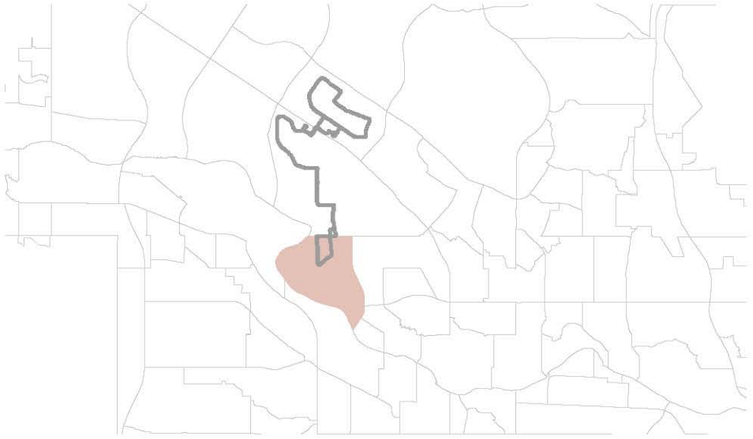
Bus Route #408



The following maps show the bus routes as serviced in Montgomery.

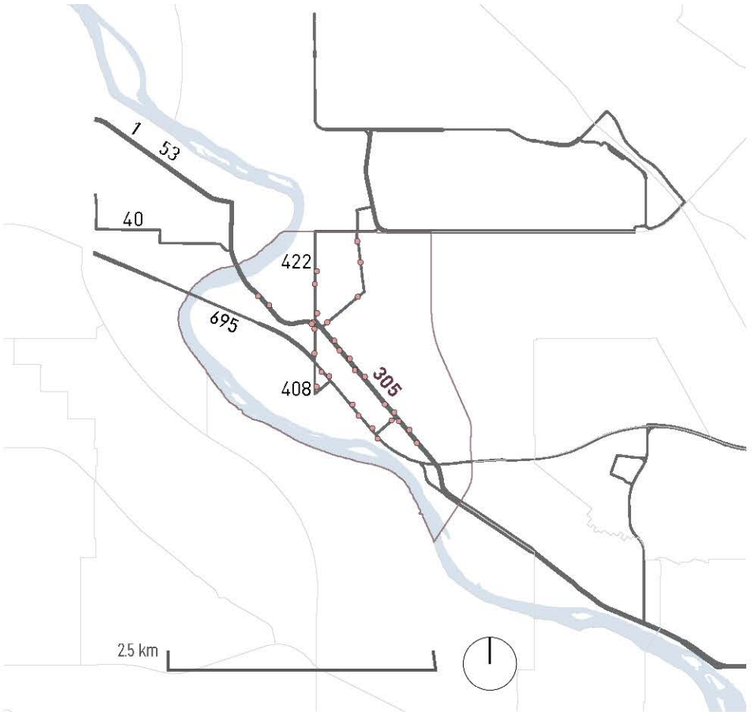
2.5 MOBILITY & CONNECTIVITY

Bus Route #422



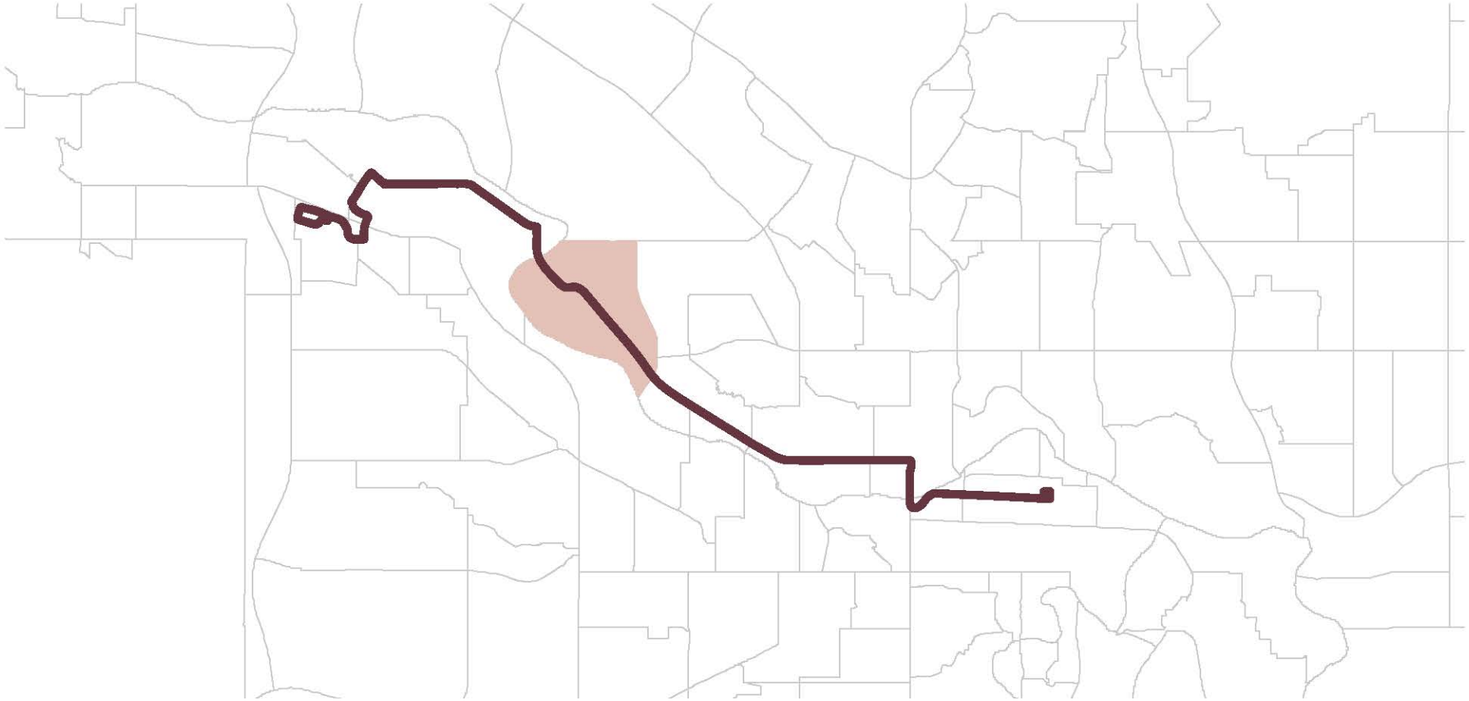
Bus Route #695

Bus Stops



The purple dots show the bus stops in Montgomery.

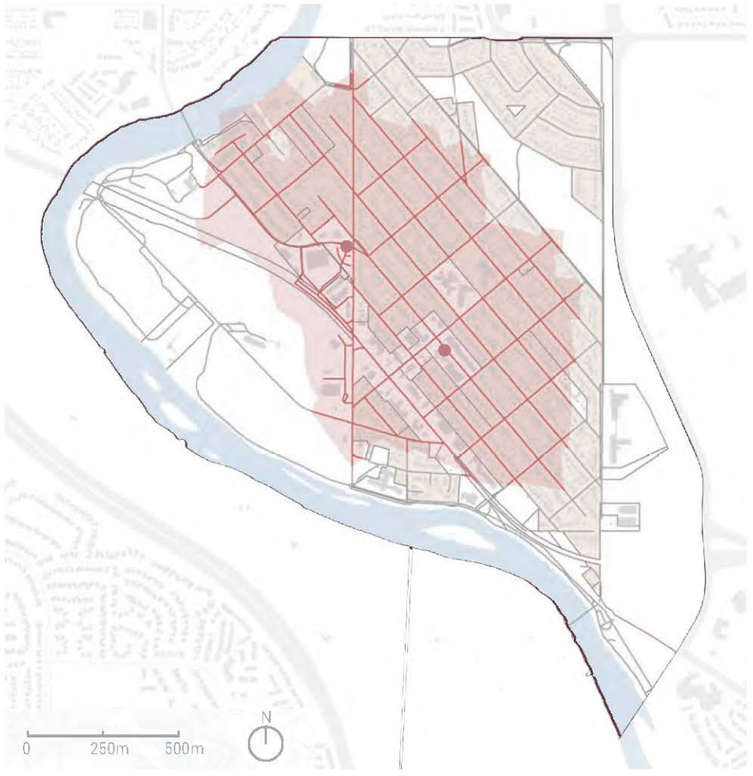
BRT Route #305



2.5 MOBILITY & CONNECTIVITY

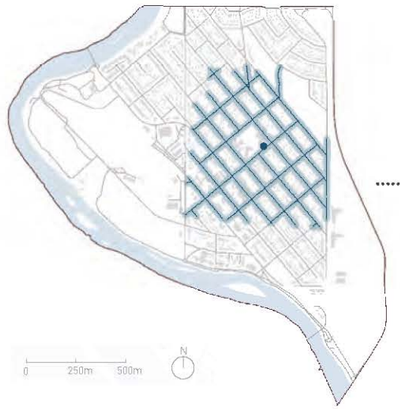
Walking Accessibility

BRT Stations Walkshed

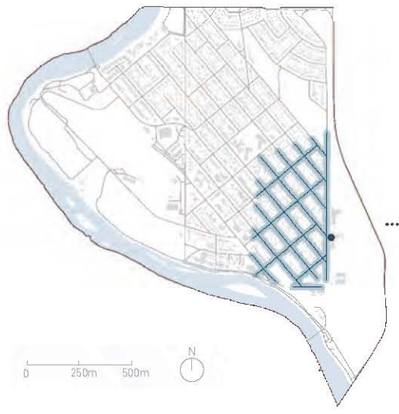


67% of the residential areas are within 600 m walkshed from two BRT stations.

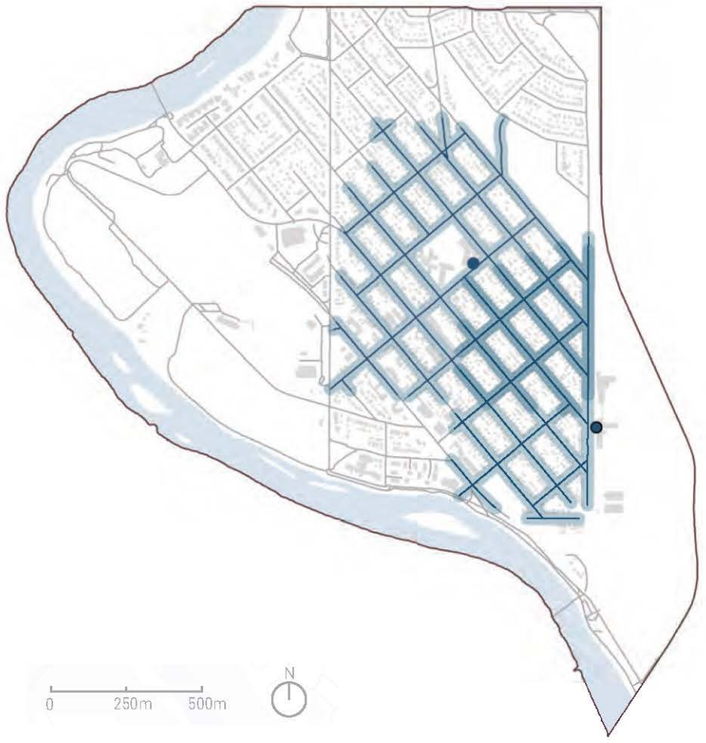
600 m walkshed from Terrace Road School



600 m walkshed from Foundations for the Future Charter Academy, High School Campus



600m Walkshed from Schools in Montgomery

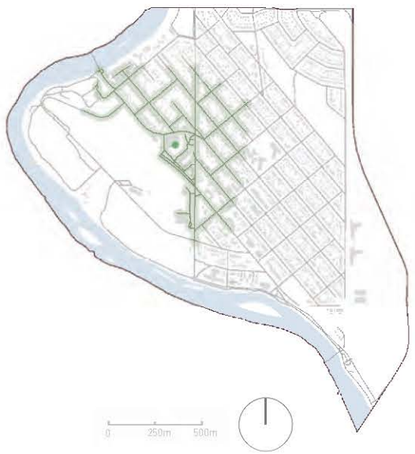


The walkshed analysis using 600 m of the Terrace Road School and Foundations for Future Academy Campus reveal the Terrace Road School is well centred in the community.

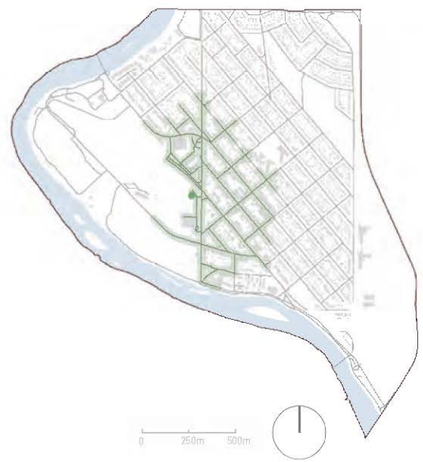
2.5 MOBILITY & CONNECTIVITY

Walking Accessibility

600m Walkshed from Grocery Store (Safeway)

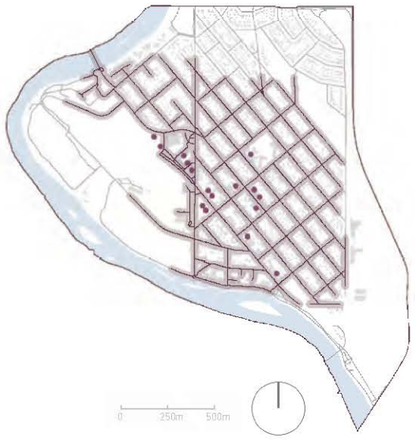


600m Walkshed from Montgomery Community Hall

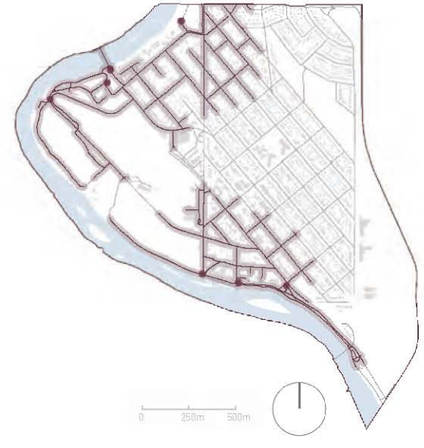


There is mediocre walking access around the grocery store and community association, considering the importance in the community of these two locations.

600m Walkshed from Food Service



600m Walkshed from River Access



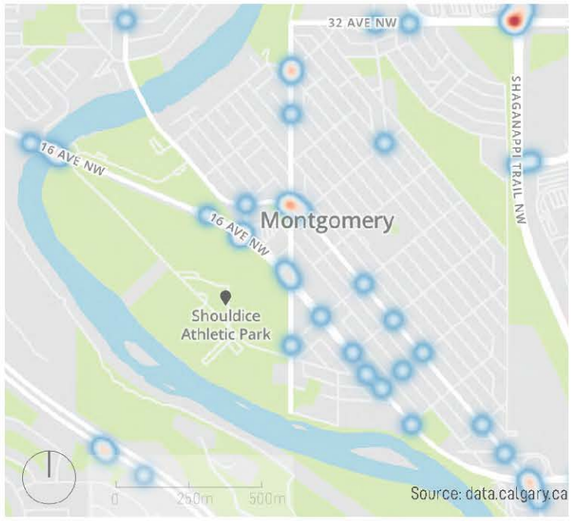
A walkshed analysis reveals the majority of the community have a variety of food service options which are walkable.

More than 60% of Montgomery borders the river, but only a small portion of locals have walkable river access, due in part to the Athletic Park.

2.5 MOBILITY & CONNECTIVITY

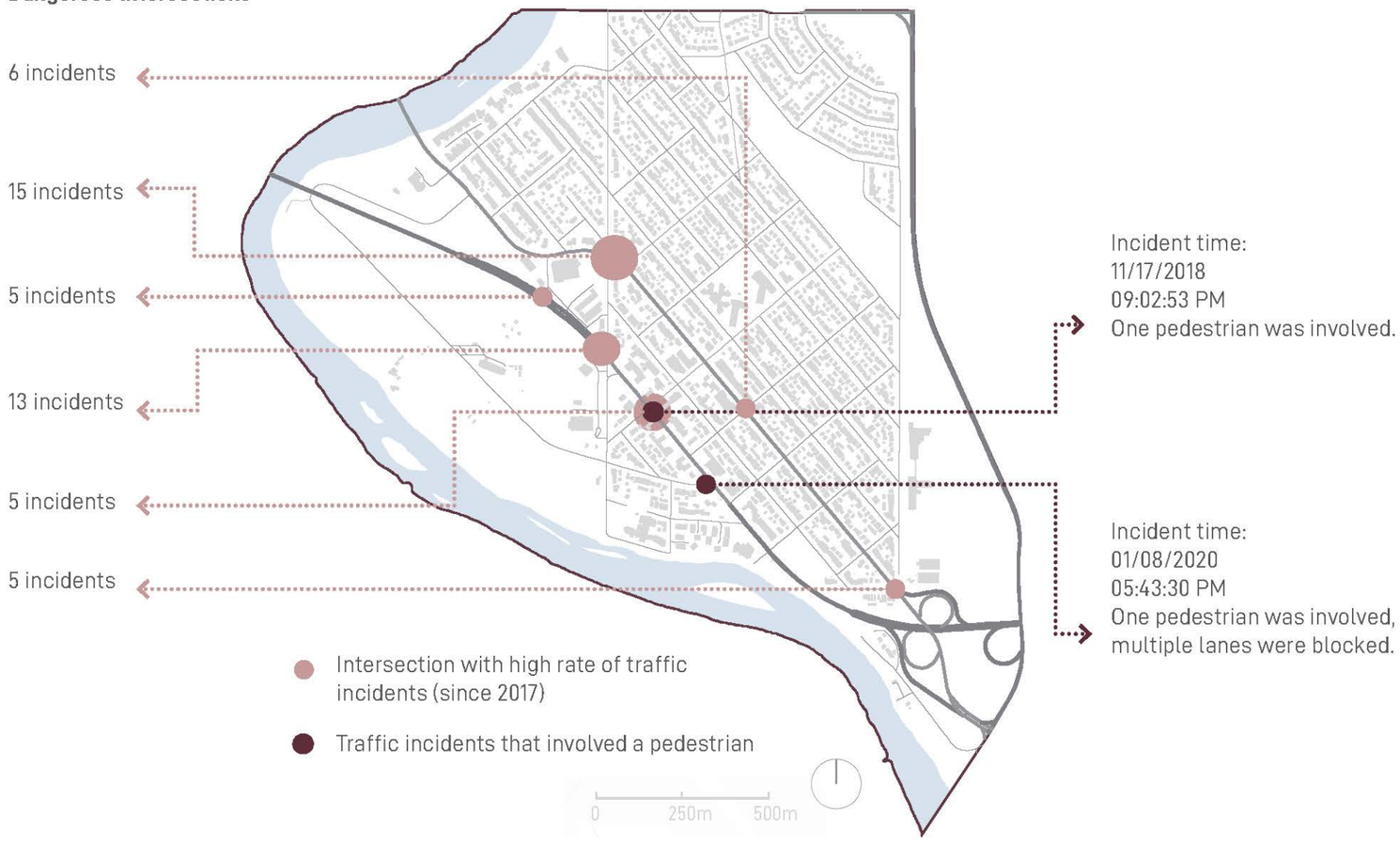
Walking Safety

Traffic Incidents Heat Map



Areas of greater concern shown in red on the heat map

Dangerous Intersections



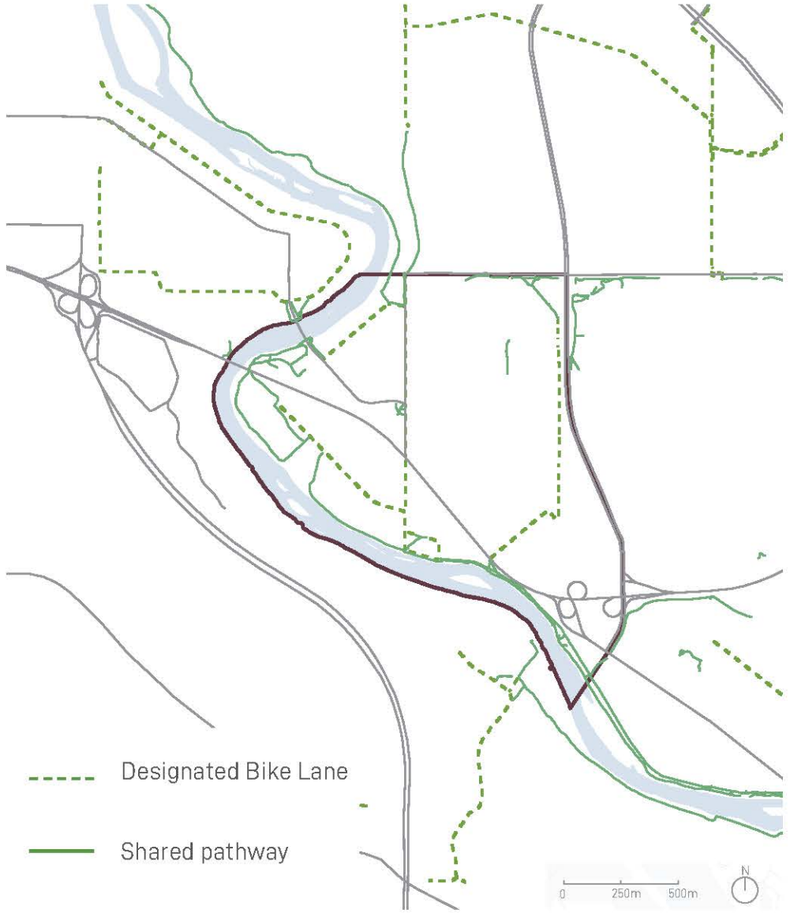
Factors that may cause pedestrian incidents:

- Crosswalk is too wide without middle median rest stops.
- The pedestrian signal phase is too short.
- Obstructed views of the intersection.
- Vehicular speed over limit.
- Poor street lighting.

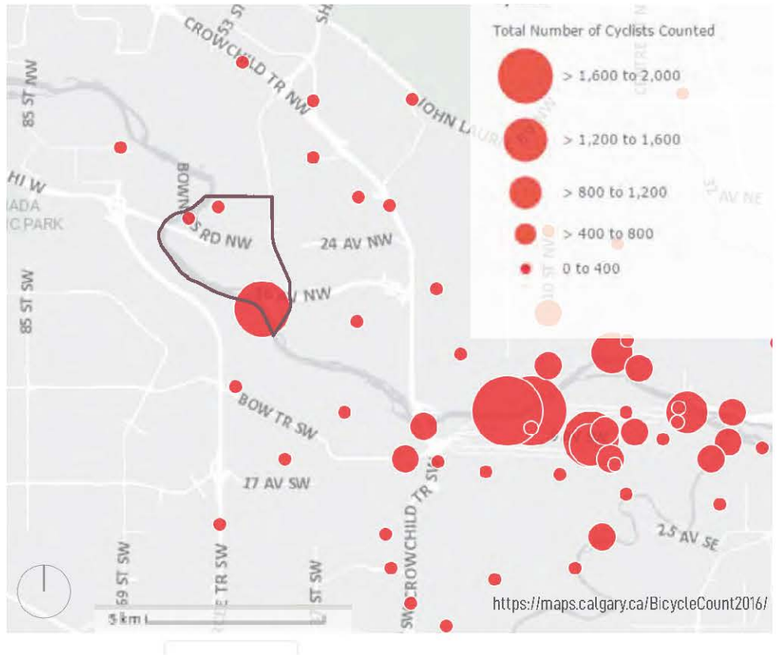
2.5 MOBILITY & CONNECTIVITY

Cycling System

Existing Cycling Network



Bicycle Count



Huge strides have been made in cycle track implementation. As such, Montgomery is fairly connected with its surroundings, via the bicycle network.

Summary of Mobility & Connectivity Analysis

A review of the mobility and connectivity is critical to understand how all road, pathway and sidewalk users can get to their daily needs.

Observations

- The road system is highly prioritized in Montgomery, with Trans Canada highway and Bowness Road cutting through the neighbourhood.
- Pedestrians and cyclists are second class citizens with limited access to numerous services and limited transit.
- Despite the classic grid block pattern, pedestrians feel cut off physically from the north to the south side of the community.

Conclusion

Road sections are revealing wide travel lanes with little enclosure for human scale.

Wide travel lanes can easily adapt to bike lanes and wider sidewalks.

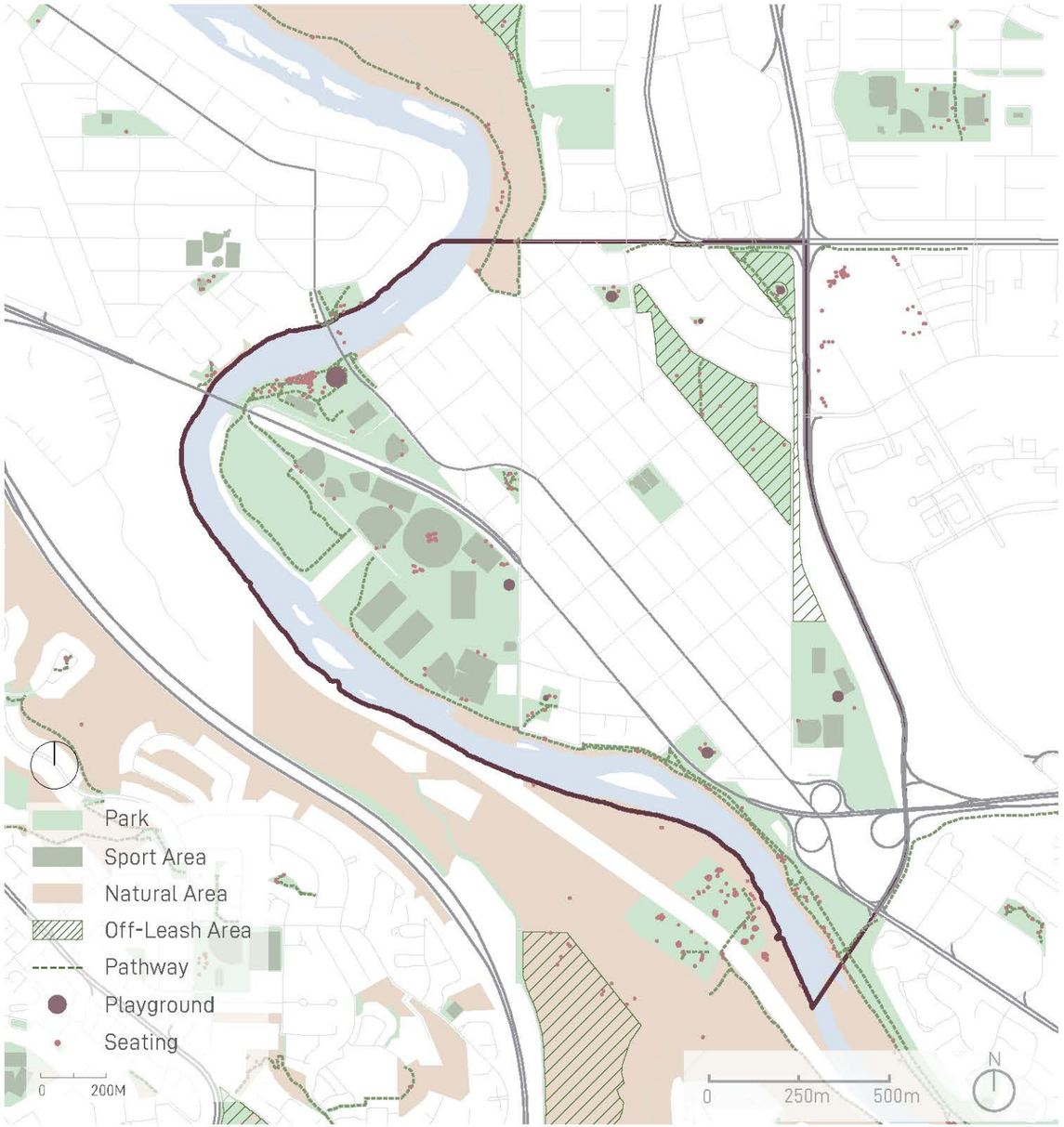
There are numerous points of conflict with traffic incidents along several roads occurring frequently, which should be addressed.

The Main Streets initiative can bring attention to pedestrians and focus on creating a place for gathering.

There is a large opportunity to design and plan improved river access for all residents and regional users.

2.5 PUBLIC REALM

Green Space + Amenities



Sports Area Inventory

13 Ball Diamonds
1 Batting Cage

10 Soccer Fields
(5 in schools)

3 Football Fields

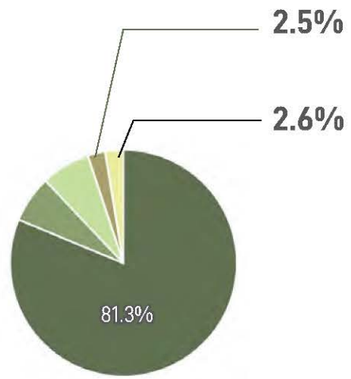
1 Basketball Court

1 Tennis Court

While Montgomery has a large portion of park space, it is largely programmed in sports fields throughout Shouldice Athletic Park. This is not accessible to all residents.

2.5 PUBLIC REALM

Open Space Typology



There is a limited amount of local and neighbourhood parks.

There are few spaces for public gathering and a lack of public realm.

Summary of Public Realm Analysis

Parks, Open Spaces and Public Realm are important systems which add to the social, economic and environmental well-being of a community and its residents.

Observations

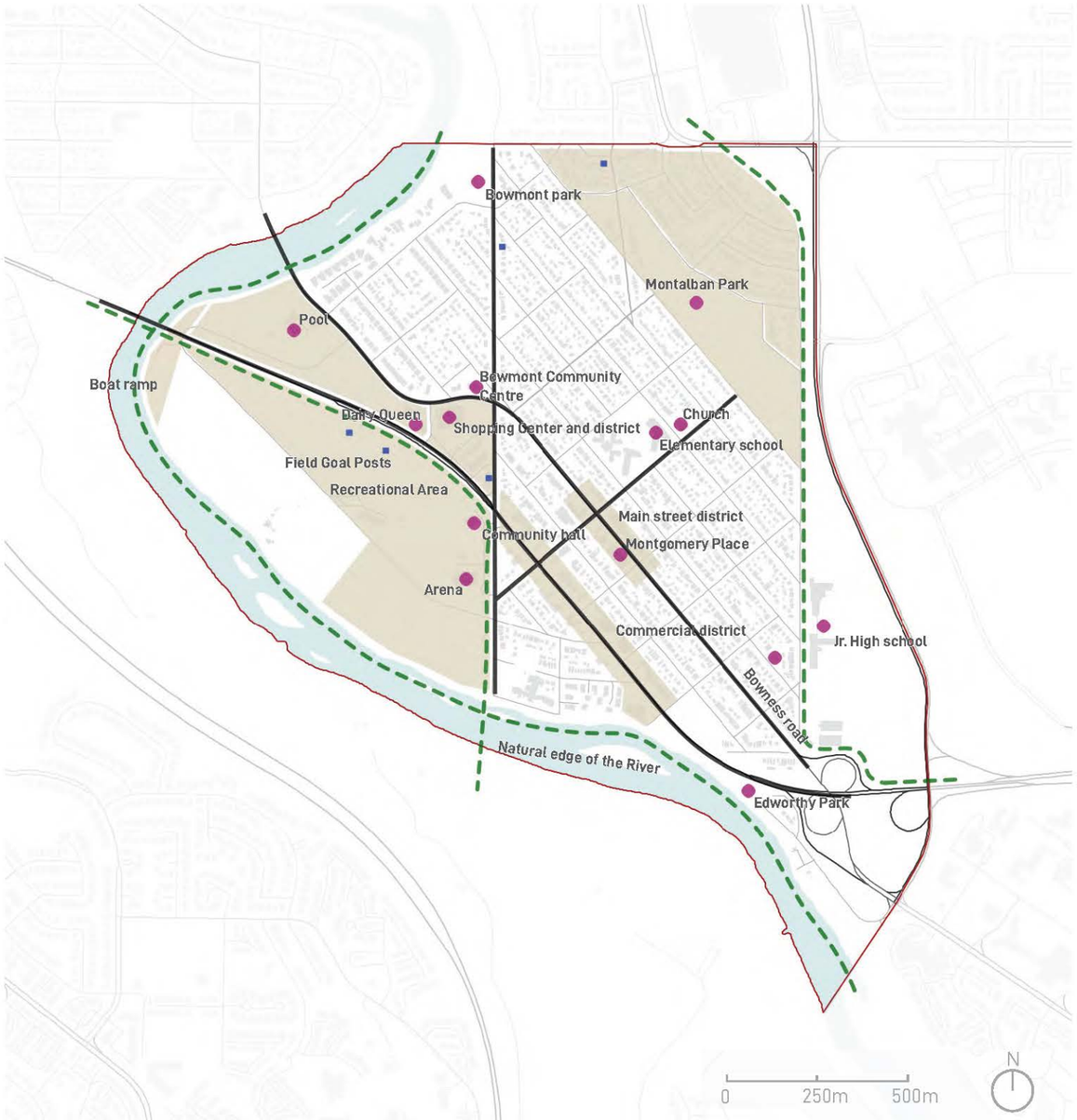
- While the community has ample park space, it is deceiving, as it is concentrated in one type, which is not very diverse or integrated.
- The pathways, trails and cycle systems need improvement for local users to get to open spaces easier and safer.

Conclusion

Green infrastructures can be added to service stations to help combat pollution.

The lack of public gathering spaces offers the chance to retro-fix and breath new life into underutilized spaces.

2.6 FUNCTIONAL ANALYSIS



Kevin Lynch argues that for any given city, a corresponding set of **mental images** exist in the minds of the people who experience that city.
Contributing to those images are **five qualities** which Lynch identifies as **Paths, Edges, Districts, Nodes, and Landmarks**.

Lynch, Kevin (1960). *The Image of the City.* The MIT Press.

Paths
- These are the streets, sidewalks, trails, canals, railroads, and other channels in which people travel
- They arrange space and movement between space

Edges
- Boundaries
- They can be either Real or Perceived
- These are walls, buildings, and shorelines, curbstone, streets, overpasses, etc.

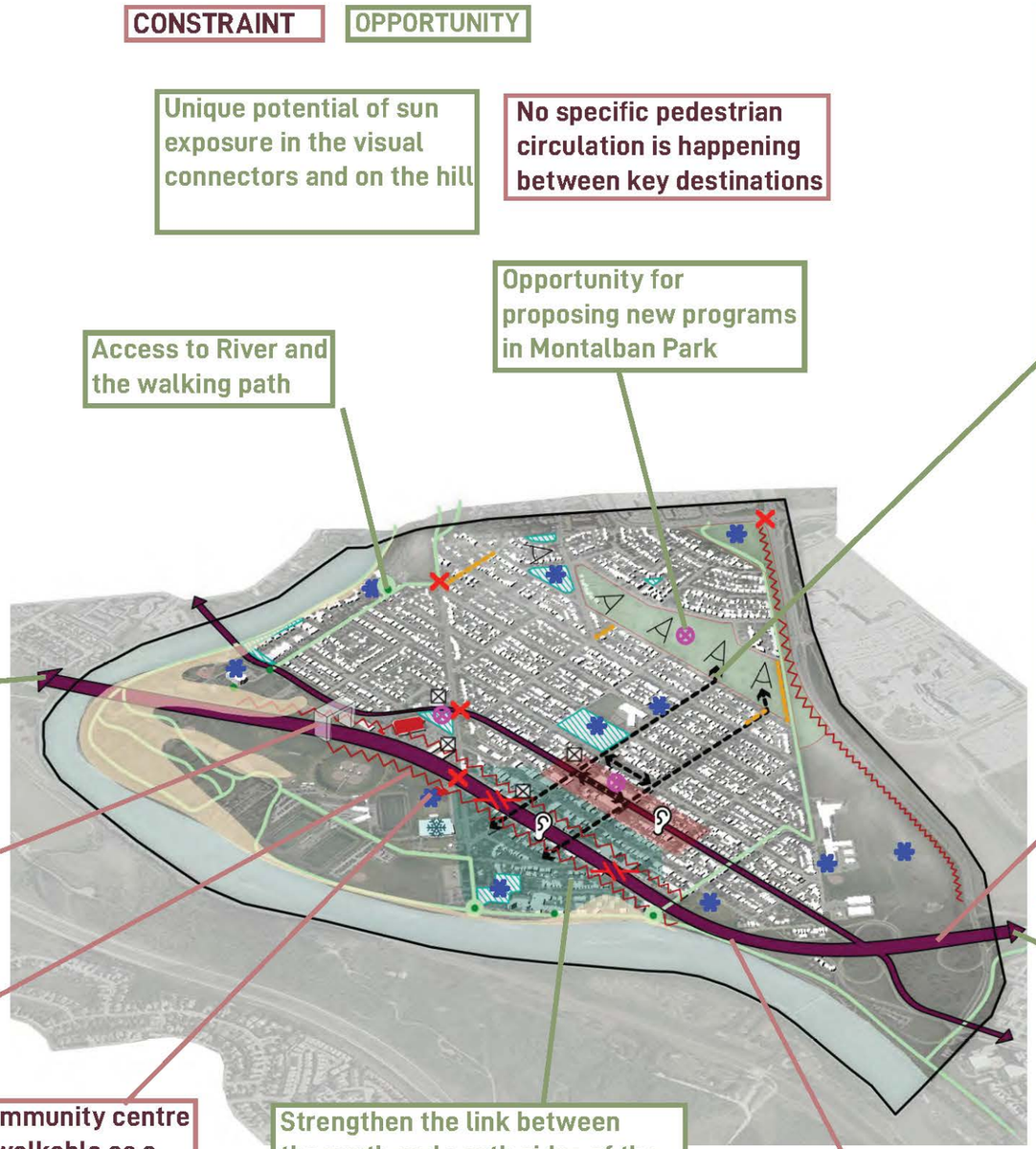
Districts
- Medium to large areas that are two-dimensional
- An individual enters into and out of these areas
- Have common identifying characteristics

Nodes
- Large areas you can enter, neighborhood, district, etc.
- Offers the person in them multiple perspectives of the other core elements
- The most successful node seemed both to be unique in some way and at the same time to intensify some surrounding characteristic

Landmarks
- Points of reference person cannot enter into
- These are buildings, signs, stores, mountains, public art
- At least one aspect of them is unique or memorable in the context they exist

2.7 Summary

- River access
- Bike node
- View opportunity
- Very steep slope
- Major commercial destination
- Bike lane
- Safety concern
- Transit stop (BRT)
- Potential for social gathering
- Social gathering place
- Sub neighbourhood park
- Community disconnection
- Barrier
- 2013 flood
- Winter programing opportunity
- Noise pollution
- Off-leash park



03

PUBLIC ENGAGEMENT

3.1 THE PROCESS

Public engagement is an important part of the planning process. It can include several phases over the span of multiple weeks or a few months. Our timeline began with a site walking tour hosted by a few members of the Montgomery Community Association Planning Committee. The next phase included a Community Workshop. The final phase was to be an Open House, which may still occur, depending on the changing situation surrounding the Covid19 crisis.

The public engagement process is our opportunity to gain local knowledge from those that live there and experience their community daily. Such insights may not be captured in analysis.

On February 29, our class had the opportunity to host a community workshop in the Montgomery Community Hall.

3.2 NEIGHBOURHOOD WALK

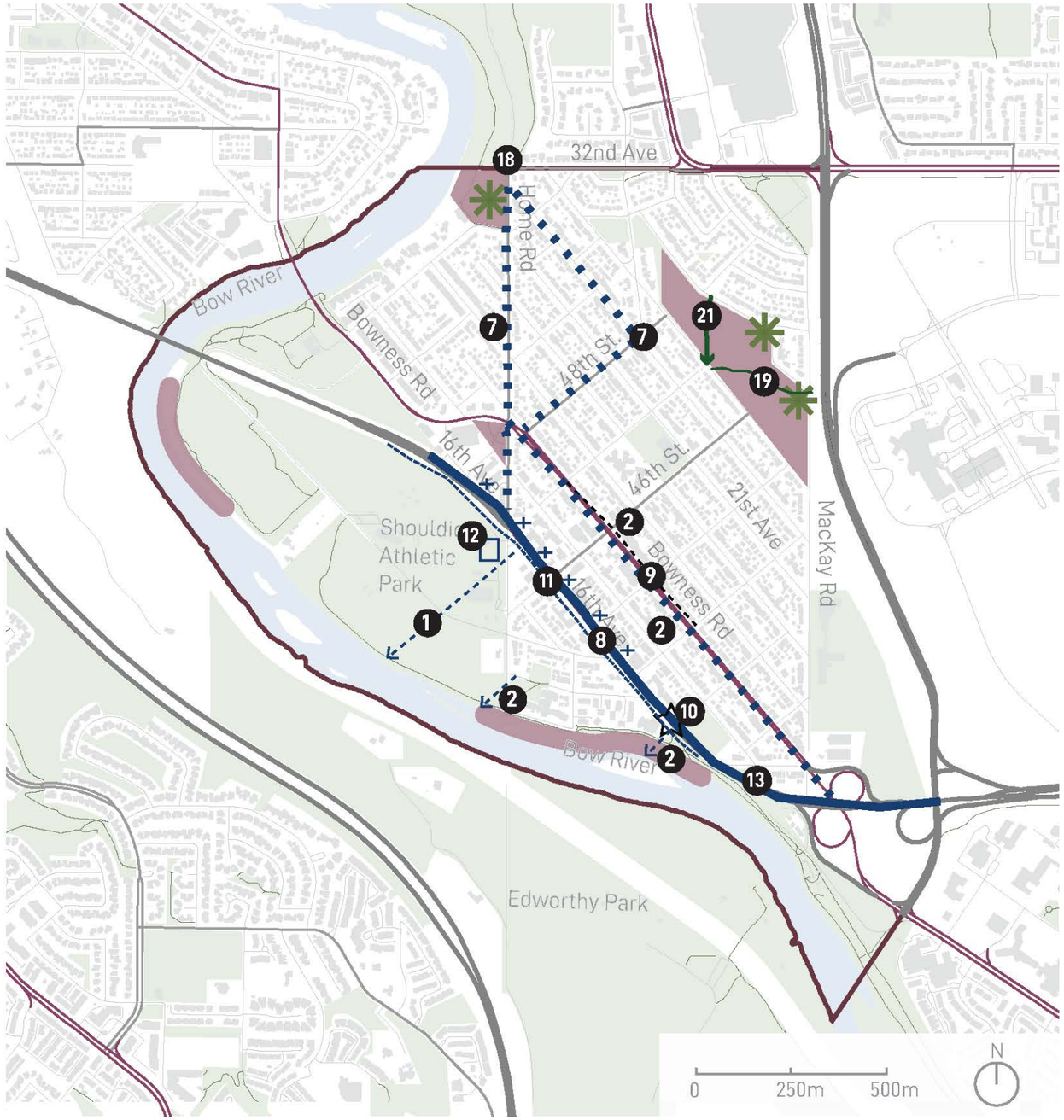
On January 29 we began our public engagement with a meeting of the Montgomery Community Association Planning Committee. Following introductions at the community hall, we toured the neighbourhood, walking the streets and using a boots on the ground approach to see and hear the community issues, dreams and needs for future planning. This gave us an opportunity to learn about the community, from the community. We traveled around numerous sites, moving through residential streets, Main Street, around Montalban Park and up the escarpment to the heritage home site. We came back down to Trans Canada highway felt the challenges of crossing 16th Ave to return back to the community centre. During the tour we took notes and photos to record important sites.

3.3 COMMUNITY WORKSHOP FEEDBACK

On February 29 our class had the opportunity to host a community workshop in the local hall. Planning committee members attended, plus local residents. We broke up into small groups with two students per table to facilitate community member feedback around two - 25 minute discussion points: community opportunities and constraints. We had large site maps printed out at each work table for the residents to mark, draw and write their ideas and concerns. Following this we had a few minutes for community members to look over our initial analysis posters.

1. Disconnected parks/ river access
2. Need for gathering places
3. Underutilized parks/ lack of programming
4. Amazing view
5. More trees around playground are needed
6. Lack of river access
7. Cut-through traffic
8. 16th Ave is a barrier
9. Main Street is not a pleasant walk
10. Unsafe pedestrian crossing
11. 16th Ave is not human-scaled
12. Community Hall is not accessible
13. 16th Ave feels unsafe and too fast
14. Problem with noise and pollution during the development process of the neighbouring parcels
15. More density and lack of parking area
16. The community members prefer to see no added density in the low-density area
17. Adding density along Bowness Road is desired
18. Weak pedestrian connection to Bowmont natural area
19. The desire path towards University District
20. Lack of some public amenities like library and gym
21. Steep and slippery slope for students walking to school

What We Heard Map



04

VISION

Through place-making we will strive to find a balance between density, connectivity and open space.

Our vision for the future of Montgomery is a connected, resilient and dynamic community, a great place for all to live. Our goals are to connect through place-making and find a balance between sensitive and strategic density placement, connectivity and open space. We will create space for a range of housing types, improve connections and mobility for all and enhance the open space to highlight Montgomery's identity.

We envision building a complete community by joining existing residents needs with identified future city plans and developments. The City of Calgary has a Main Streets Plan for Bowness Road and a Commercial Corridor Plan for 16th Ave (Land Use Planning & Policy, 2012). These areas are identified as areas of future significant importance and as vital community assets (Land Use Planning & Policy, 2012). As such these locations need consideration and attention now, to grow with the community.

As an inner city neighbourhood, Montgomery has pressures to densify and support the goals of the MDP. We will endeavour to suggest ways Montgomery can sensibly increase with strategic placement of a variety of housing options to include a diverse population creating a dynamic community. We will suggest and create transportation infrastructure to improve circulation, mobility and create improved connectivity for Montgomery, regionally and locally. Finally, we will offer sustainable and resilient designs regarding public realm, parks and open space to add to the existing green spaces and ensure they carry us into the future.

05

LAND USE, DENSITY & BUILT FORM

5.1 OVERVIEW

Montgomery is predominantly a low density residential community. The current built form and density is not enough to support business along the main streets and create a vibrant public realm. There is a lack of a transition from low density housing all the way to the commercial areas. Coherence and continuity in the built form is not well defined. New infill developments are happening within the community and we need to redirect this added density in a way that it will contribute to the future goals.
In this section, we look forward to achieving a good neighborhood in terms of the built form by pursuing these main policy and goals.

Goals

- Providing more housing and commercial choice to attract a diverse population.
- Create continuity and coherence in the built form
- Providing enclosure and creating active human scale environment on the main street.
- Encourage densification within the existing fabric by adding laneway housing and secondary suits
- Considering the character and scale of the residential areas in the process of commercial development

General Policy

- Distributing density by adding to the missing middle housing typology
- Strategically placing of density along the main street corridors to encourage movement and active life on the street and support local businesses

Built form in Montgomery

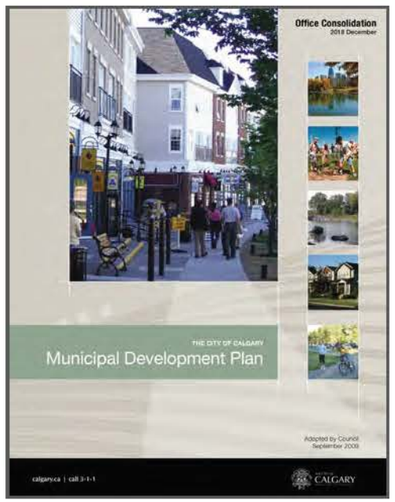






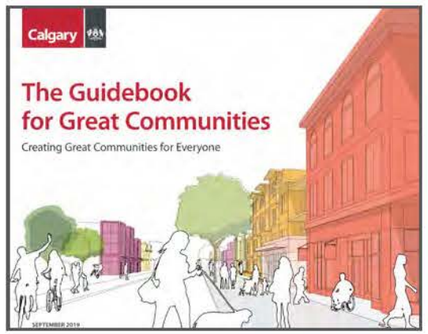
5.1 OVERVIEW

Legal Framework



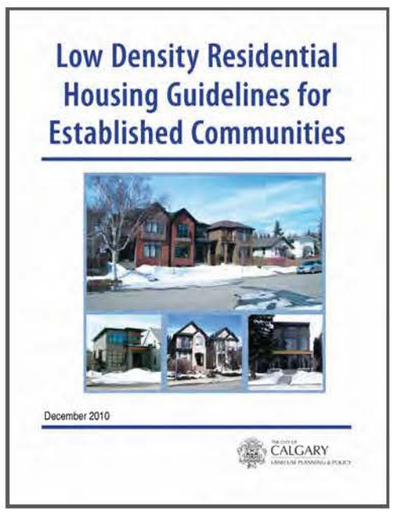
Calgary's Municipal Development Plan

The MDP is a statutory planning document that defines the vision for Calgary's growth and development over the next 30 to 60 years. It aims to build a city with a variety of housing types in unique communities.



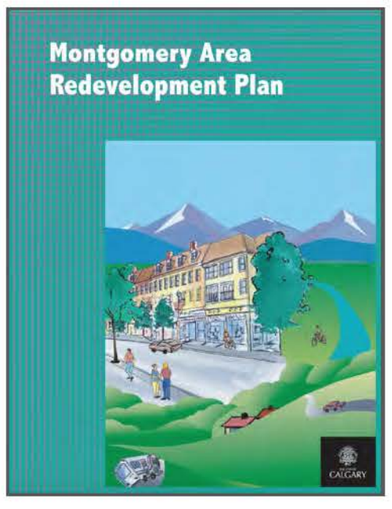
The Guidebook for Great Communities

This document aims to implement the MDP and bridge higher level policies with local area plans and site-specific planning applications. The policies in the Guidebook are based on the following principles: opportunity and choice, health and wellness, social interaction, the natural environment, economic vitality, identity and place.



Low Density Residential Housing Guidelines for Established Communities

This document is to be used as a supplementary guide to the Land Use Bylaw and the Montgomery Area Redevelopment Plan. It places strong emphasis on encouraging quality and character street and community development based on design elements.



Montgomery Area Redevelopment Plan

The Montgomery Area Redevelopment Plan is a statutory document. It is a planning document that sets out comprehensive land use policies to help guide the future of the community and must be considered in conjunction with other applicable statutory plans, bylaws and policy documents.

5.2 RESIDENTIAL AND MIXED USE DEVELOPMENT

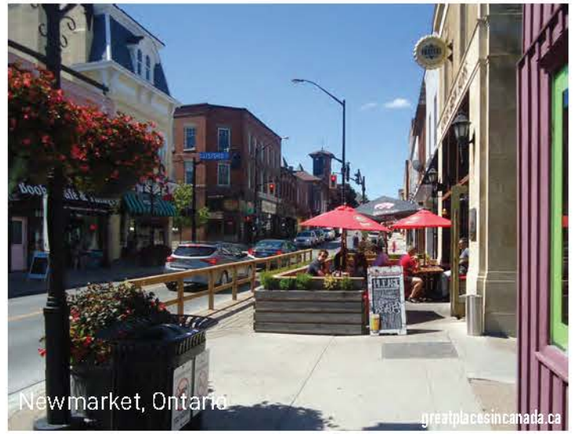
The current population of residents in Montgomery is 3,975 people and there are 1,785 private dwellings occupied. Considering the population growth rate of 54%, by 2042, Montgomery will house 2,150 more residents. According to the census data, the average household size in Montgomery is 2.22 People per household. This means that nearly 970 new residential units should be added to accommodate the population change. We need to make sure that with the new housing policies, this number will be realized.

Policy and Goals

- Providing more housing and commercial choice to attract a diverse population.
- Adding density while maintaining the low density and small-town character of the neighbourhood
- Adding to the missing middle housing typology
- Encouraging a range of housing types for all ages, household sizes, household types and incomes.
- Maintaining the unique view
- At the workshop session the community members mentioned that they are not ready or willing to accept significant density added to the community, therefore we have decided to limit the height of the buildings to six storeys.

Site-Specific Policy for Bowness Road Main Street

- Mixing housing and commercial use on Bowness Road Main Street to support local shops



5.2 RESIDENTIAL AND MIXED USE DEVELOPMENT

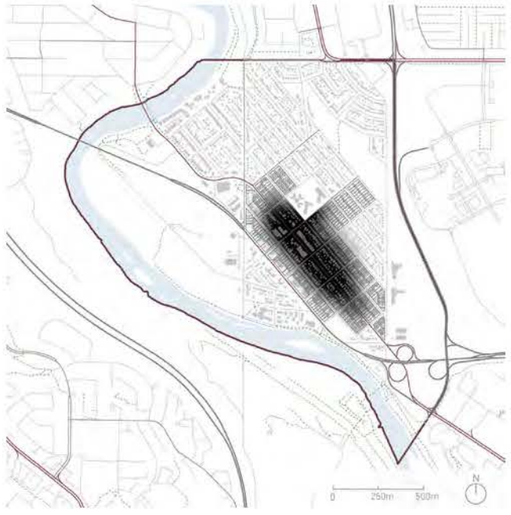
5.2.1 Calculating Building Types and Units

To create a good urban form, the new units should be distributed within the community in a sensitive and strategic way. The single family buildings will be transformed into duplexes, townhouses, rowhouses or multi-family buildings. For those owners who are not willing to destroy the current building on the lot and rebuild a new one, we propose developing laneway houses or secondary suites. This is a gentle way of adding more units to the current low density residential area.

Main Street Bowness will be the intensification corridor as discussed with the members of the community. We propose having commercial use at grade along Bowness Road, but there will be no residential mixed use building along 16th Ave. because of the noise, pollution and safety concerns.

In order to achieve a reasonable proportion of housing typology mix, we need to consider the development trends in the community and balance the outcomes with the density that can create a desired urban form.

We looked at the proportion of building structures between 1991, 2011 and 2016 in Montgomery and we studied the changes in theses proportions. After that, we projected this change on the current proportion of housing mix. The other method we used to calculate the distribution of units between housing types was by considering the growth rate of the number of units in each category from 2011 to 2016. Most reliable results were from the comparison of type proportions from 1991 to 2016. The number of anticipated duplexes was relatively high based on the results from this comparison. We decided to redistribute a portion of duplexes in multi-family units.



Target housing density heat-map

Change in the overall proportion of housing types compare between 2011 and 2016

Structure type Based on federal data	2011	2016	Change in proportion based on federal data
Single-detached house	38%	31%	**-7%**
Duplex	8%	9%	**+1%**
Semi-detached house	11%	16%	**+5%**
Row house	23%	23%	**0%**
Apartment -5 storeys	8%	9%	**+1%**
Apartment +5 storeys	12%	11%	**-1%**

Change in the overall proportion of housing types compare between 1991 and 2016

Structure type Based on federal data	1991	2016	Change in proportion based on federal data
Single-detached house	47%	31%	**-16%**
Duplex	3%	9%	**+6%**
Semi-detached house	7%	16%	**+9%**
Row house	24%	23%	**-1%**
Apartment -5 storeys	5%	9%	**+4%**
Apartment +5 storeys	11%	11%	**0%**

Development Trends

Number of new units based on number growth rate from 2011 to 2016

Structure type	Number of units 2011	Number of units 2016	Number of units changed	Change rate	Number of new units based on the rate	Number of new units modified (970 total)
Single-detached house	925	830	-95	-10.3%	-83	?
Duplex	465	655	+190	+40.8%	+262	?
Row house and threeplex and Fourplex	555	615	+60	+10.8%	+67	?
Multi-family low-rise	190	225	+35	+18.4%	+40	?
Multi-family medium-rise	295	295	0	0%	0	?
					286	

The results from this method of estimation is not close to population projections in 2042

Number of new units based on Percentage growth rate from 2011 to 2016

Structure type	2016 based on City data	Growth rate from 2011 to 2016	Estimation by 2042	Estimated number of units (total=2,755)	Current number of units	Number of new units by 2042	Modified number of new units
Single-detached house	45%	-7%	38%	1,049	805	244	**0**
Duplex	37%	+5%	42%	1,157	655	502	**502**
Rowhouse, threeplex and fourplex	5%	0%	5%	137	90	47	**169**
Apartment	14%	+1%	15%	413	245	168	**299**

Number of new units based on Percentage growth rate from 1991 to 2016

Structure type	2016 Based on City data	Growth rate from 1991 to 2016	Estimation by 2042	Estimated number of units (total=2,755)	Current number of units	Number of new units by 2042	Modified number of new units
Single-detached house	45%	-16%	29%	798	805	-7	**-7**
Duplex	37%	+15%	52%	1432	655	777	**127**
Rowhouse, and threeplex and fourplex	5%	-1%	4%	110	90	20	**270**
Apartment	14%	+4%	18%	495	245	250	**600 (300, 280)**

Balancing the development trends in the community and good built form

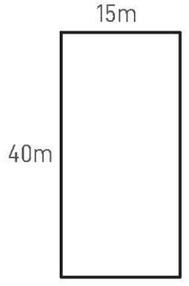
5.2 RESIDENTIAL AND MIXED USE DEVELOPMENT

5.2.1 Calculating Building Types and Units

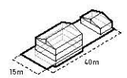
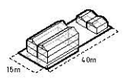
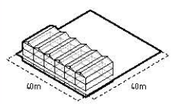
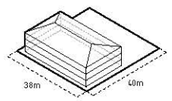
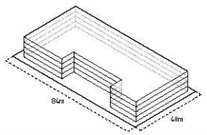
We need to scale the amount of density that we are proposing to where we are locating, this is called density modeling. It's a method of translating built form density to land use density specifically residential land use. A connection should be made between the built form that we are proposing and the numbers of the new units. To calculate the area required for each housing type we can use to methods, one is for the low density residential and the other method is for the multi-family buildings.

Method 1, Low-Density

No Single-family unit will be added. The owners might decide to rebuild a single-family building in their lot and we encourage them to incorporate secondary suites or laneway houses. There is a trend of developing semi-detached and duplexes in the community and we anticipate this trend to continue. The older homes that are not in a good shape are in the priority for semi-detached development. The semidetached will add one unit to the lot and the rowhouse will add approximately three units to the lot. By multiplying the number of available parcels we can calculate the number of added units for these building typologies.



Typical single-family parcel size as a measuring reference: 600m²

	Low density Low height		Low/Medium density Low /Medium height		Medium density Medium height
Building Typology					
Type name	Single family	Duplex	Townhouse Rowhouse fourplex	Multi-family low-rise	Multi-family medium-rise
Average lot size	600m²	600m²	1,600m²	1,520m²	3,360m²
Number of units in each building	1	2	4	15	85
Number of total new units needed	-	127	270	300	280
Number of new buildings needed	-	127	Aprox 67	Aprox 20	Aprox. 4
Available area in the community	-	111,000 m²	50,400 m²	58,200 m²	34,200 m²
Equals to how many single detached parcels?	1	1	1	Aprox 2.5	Aprox 5.6
Coverage area on the parcel for multi-family	*	*	*	583 m²	2,550 m²
Precedent in Montgomery					

Estimated number of units needed		
Method-1	127 unit	**Semi-detached and duplex infill:** how many single detached parcels can change? (not narrow parcel) adding 1 unit per parcel :189 Total units added: 189
	270 unit	**Row-houses infill:** how many single-detached parcels can change? Adding 3 units per parcel (not narrow parcel): 84 Total units added: 262
Method-2	300 unit	**Multi-family low-rise infill (4 storeys):** how many single detached parcels can change? (not narrow parcel): 97 = 38 parcel Available
	280 unit	**Multi-family Med-rise infill (6 storeys):** how many single detached parcels can change? (not narrow parcel) 57 = 10 parcel Available

Area of intensification

Method 2, Medium-Density

We have assumed that the average unit size in the multi-family buildings is 150m2 and we know the building footprint of the multi-family precedents in the community. By dividing the numbers we can calculate the number of units in each storey and by multiplying that number to the number of storeys can calculate the average total number of units in each building. We also know the approximate number of single-family lots that each building covers and using those numbers we can calculate the area needed for the total number of buildings.

5.2 RESIDENTIAL AND MIXED USE DEVELOPMENT

5.2.2 Area allocation

This map demonstrates the available area for each building typology in the intensification corridor. Some of the existing buildings are or single-family or they have been newly redeveloped. These lots are crossed on the map and they are not in the priority for adding density. Some blocks contain several colors and they can accommodate different building types.

Area allocated to each building type in the block

	Duplex	Rowhouse Fourplex	Multi-family low-rise	Multi-family Med-Rise
A1	0	9000m²	0	0
A2	600m²	0	4800m²	0
B1	0	0	5400m²	5400m²
B2	600m²	0	3600m²	0
B3	0	0	0	0
C1	0	9000m²	0	0
C2	600m²	0	3600m²	6000m²
C3	0	600m²	4200m²	0
C4	0	0	2400m²	0
D1	0	10200m²	0	0
D2	1200m²	0	4200m²	3600m²
D3	1200m²	0	3600m²	3600m²
D4	0	1800m²	1200m²	0
E1	0	4200m²	0	0
E2	0	0	4800m²	5400m²
E3	0	600m²	6600m²	0
E4	0	0	5400m²	0
F1	0	7800m²	600m²	0
F2	0	4800m²	3600m²	0
F3	600m²	5400m²	2400m²	0
F4	0	3600m²	0	0

5.2 RESIDENTIAL AND MIXED USE DEVELOPMENT

5.2.3 Distribution Of Buildings Along the Main Street

In this map you can see one alternative way of placing the buildings needed along main street Bowness. As discussed earlier we need a few number of multi-family medium rise and all of them are mixed with commercial at grade to create a active frontage to the street. Other multi-family low-rise, townhouse and rowhouses are distributed in the intensification area are shown.

An example of multi-family medium-rise that occupies a land equal to approximately 5.6 typical single-family lots

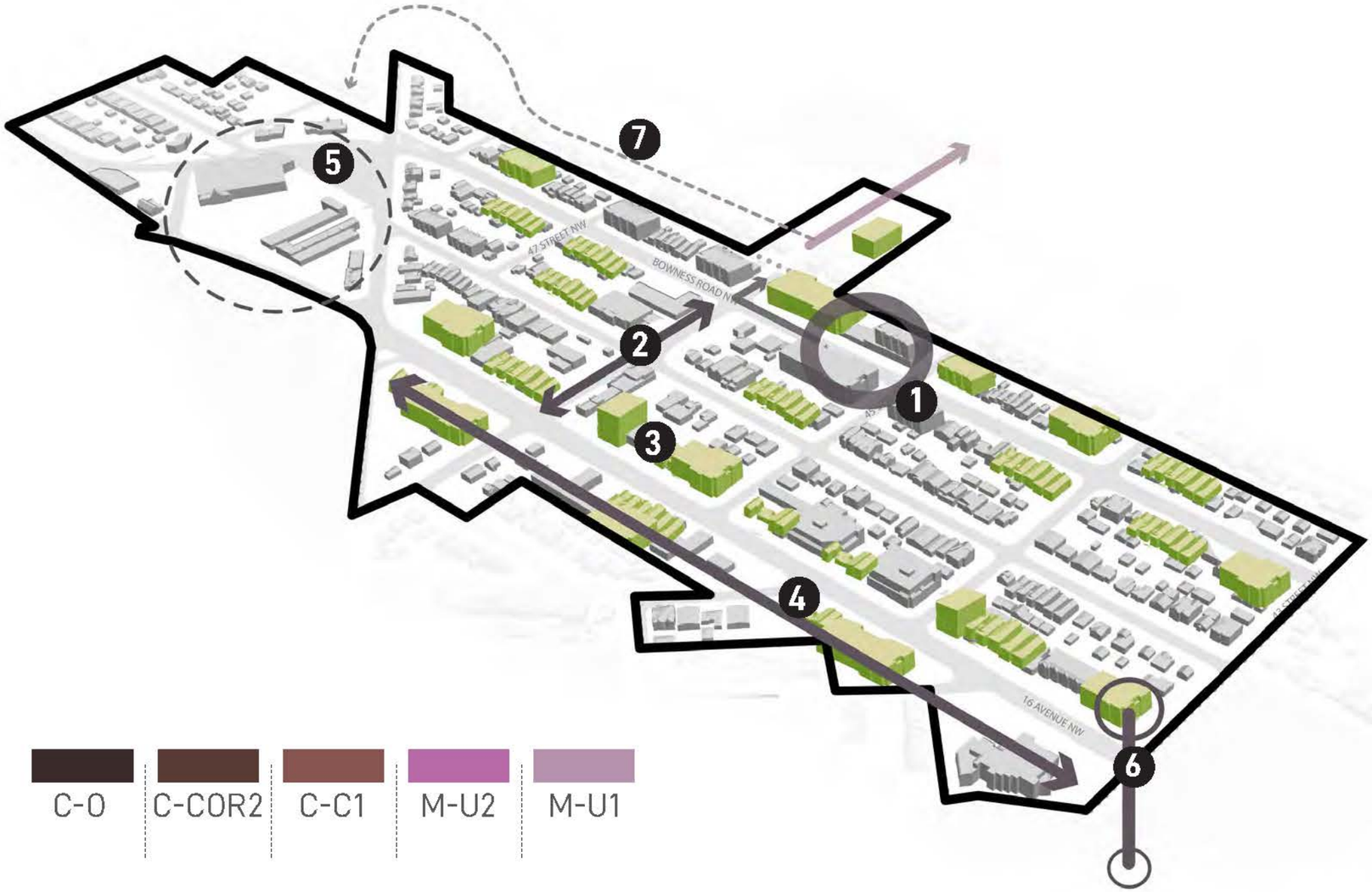
An example of multi-family low-rise that occupies a land equal to approximately 2.5 typical single-family lots

An example of combination of rowhouses that occupies a land equal to approximately 3 typical single-family lots

5.3 COMMERCIAL

Goals

According to the commercial land use, the main goals are:
• Creating a commercial destination in local and city scale along both 16 Ave. and Bowness Road.
• Diversifying the businesses and by doing so, enhancing the resilience of the community. When the community has a diverse commercial combination, businesses can support each other and the community remains active during the day, the week and the year.
• Supporting small local and independent shops.
By doing so we can contribute to the identity of the community. Encouraging local business might be opposed by the regulations of some stores like Safeway if they are located in the close proximity, but we need to consider that small retails are essential for achieving a lively main street.
• Encouraging more cafes, restaurants and food services. At the moment, community members are asking for more places to gather and eat.
• Renew older or vacant businesses. Along both Bowness road and 16th Ave, there are some vacant commercial spaces, revitalizing these areas and rebuilding older shops to provide affordable commercial space, can play a significant role in bringing life to the street.
• Creating active frontages and permeable enclosure along Bowness Road Main Streets.



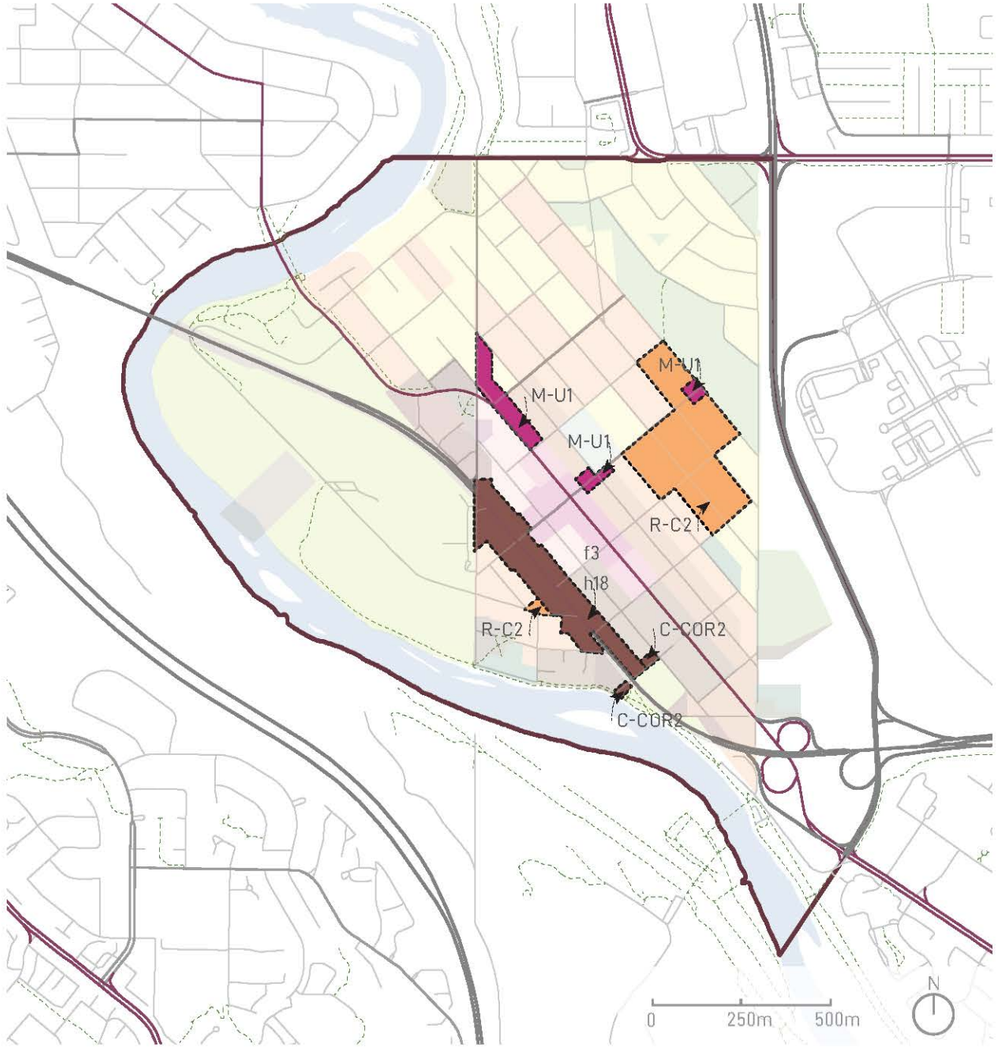


Existing and proposed commercial spaces

In the pictures there are some measures for creating a better commercial and mixed-use environment:
1. Adding the pedestrian friendly mixed use neighbourhood node on Bowness road.
2. Providing a business link between 16 Ave. and Bowness Road via 46 St. This corridor will further continue within the community and towards Montalban park and we are proposing a small parcel of mixed use at the end of 46th St.
3. Reducing the allowable height on 16th Ave. to 18m for more consistency with the overall massing of the community
4. Creating a connected body of commercials along 16th Ave.
5. Revitalizing the Safeway area
6. Adding businesses to the intersection on 16th Ave and 43rd St.
7. Adding mixed use district to 19th St.
The current land use codes of MU1 and MU2 can accommodate all these goals along Bowness Road and we do not need to recommend land use changes there.

5.4 LAND USE DISTRICTS

In order to achieve a better urban environment, we need to apply changes to the current land use policies. These maps summarize the land use changes discussed in previous sections.



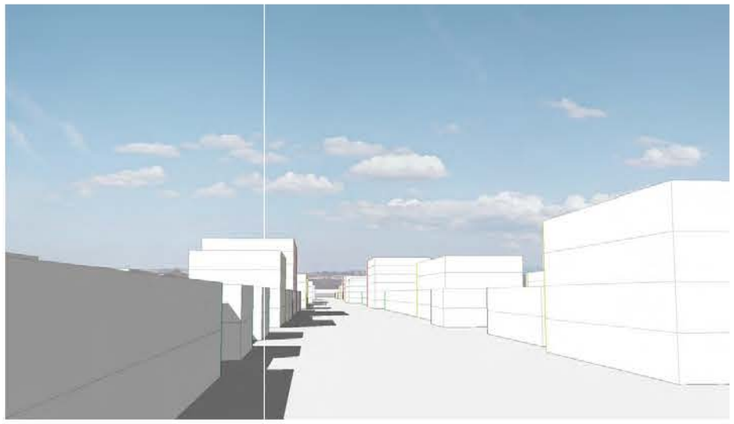
Proposed Land use map

Proposed Land use map

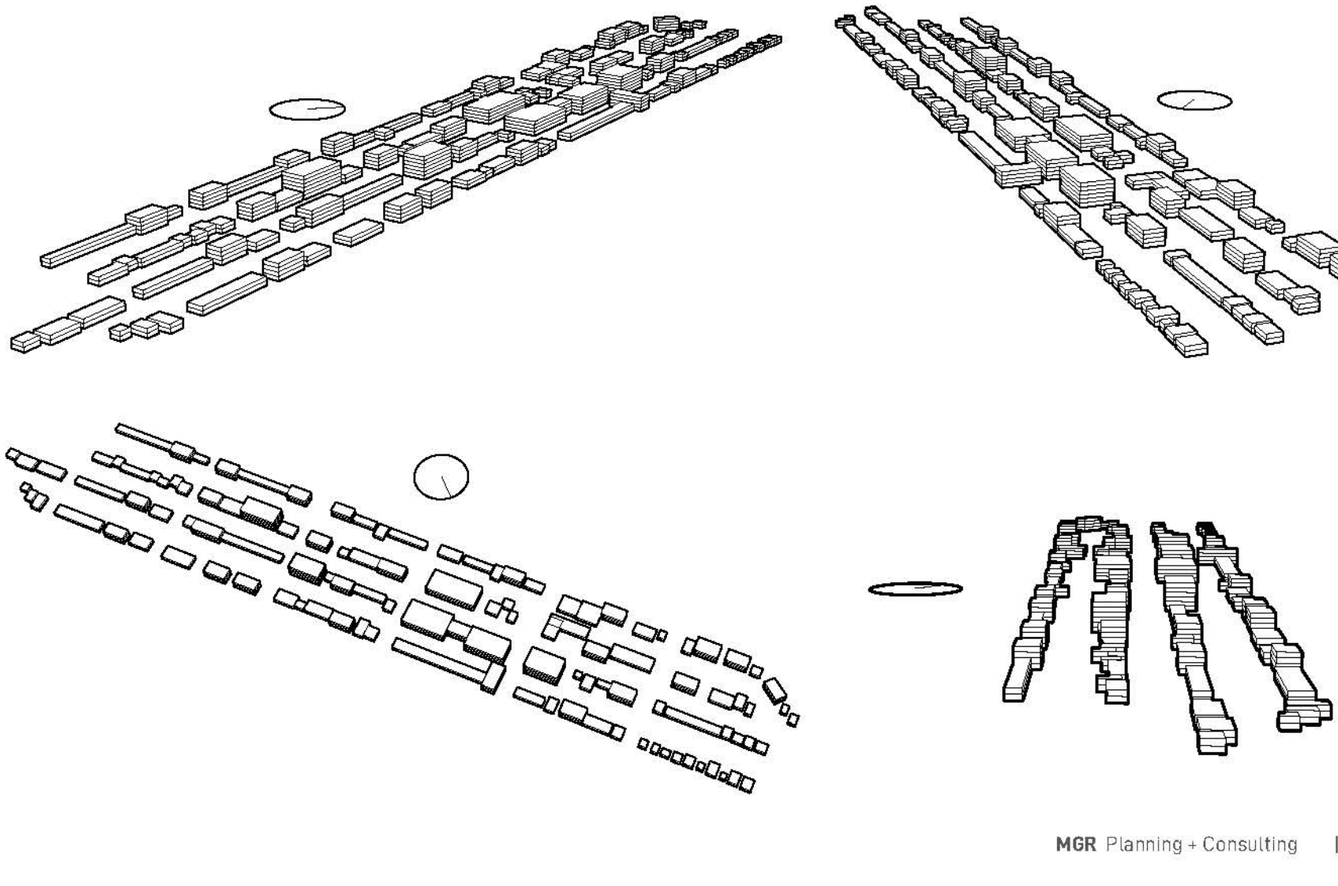
5.5 MASSING

Main Street Bowness Road

The main change in the built form will happen in the intensification area and along Bowness Road. The main goal was to provide enclosure and creating human scale environment on the main street. The diagrams are representing the overall massing of the proposed density. Lack of continuity and coherence is one of the issues with the overall massing along the main streets in Montgomery. One of the purposes for distributing the density instead of concentrating it in towers is creating a better urban fabric. Studying the precedents of massing distribution reveals that both density and shape of the building contribute to the quality of the public realm. Better articulation and arrangement of the buildings creates a more unified whole compared to separated large boxes.



The overall massing on Bowness road

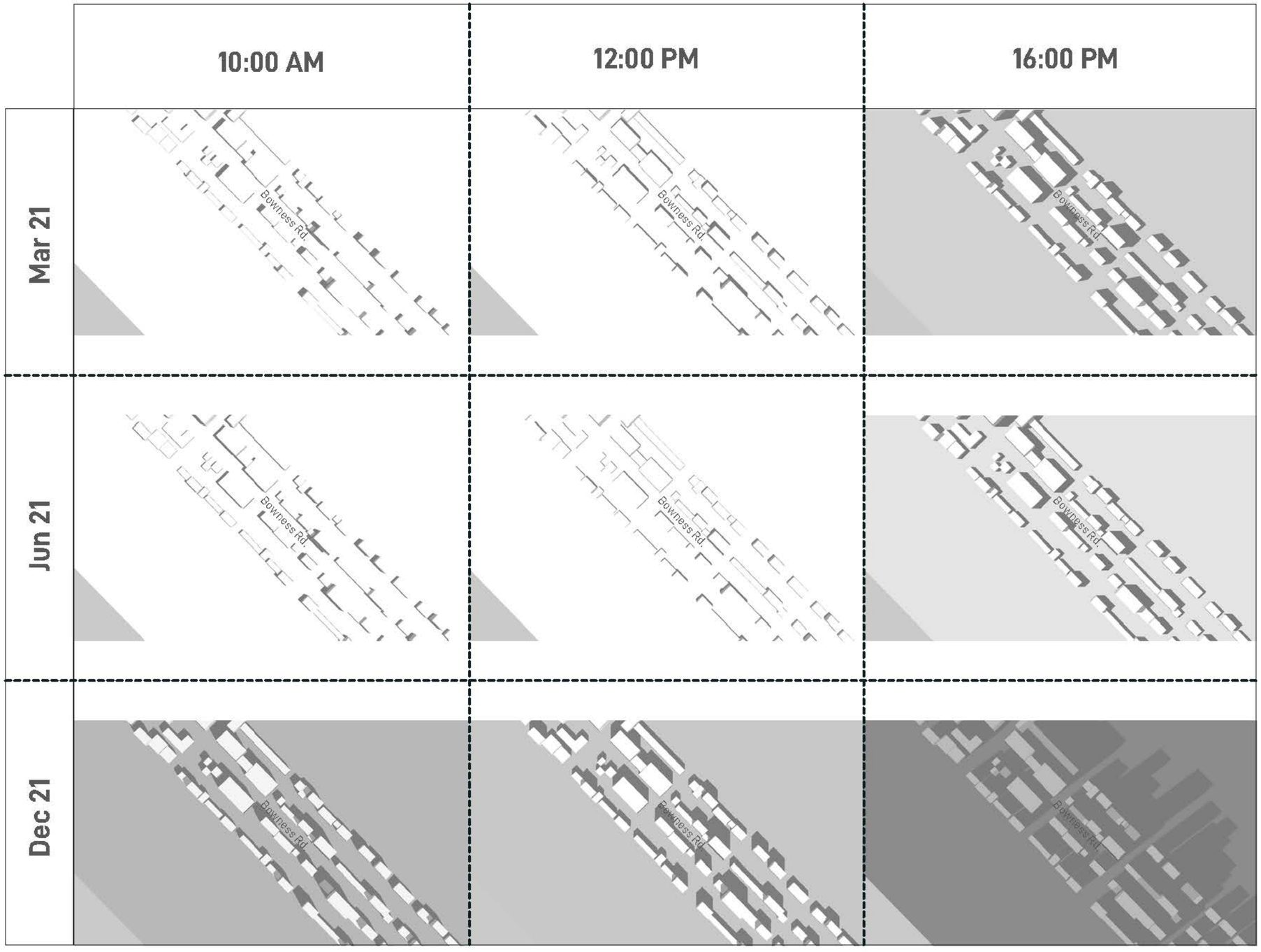


Massing Precedents

5.6 SHADOW ANALYSIS

Main Street Bowness Road

The shadowing impact of the building heights should be studied in the intensification area along Bonewss Road. Assuming the proposed massing, the table shows the shadow casted on Bowness Road on 21st of March, June and December. There are three factors that are contributing to achieving more sun exposure on the public realm: Placing most of the multi-family mixed-use buildings on the north side of the street, the proposed setbacks on the upper floors and limiting the building heights to six storeys. Community member were concerned about building height and shadowing of the future developments. The existing MU1 and MU2 codes on the street allow for maximum of 22 meters height, but regarding the future density requirements, we have decided to not include buildings taller than six storeys.



5.7 GUIDELINES FOR THE BUILT FORM

5.7.1 Parcel Typology in the Intensification Area

Parcel Type	Parcel width	Parcel depth	Area	Shape	Access to street	Access to back lane
Typical parcel	15m	40m	600m²	Rectangle	Yes	Yes
Narrow parcel	7.5m	40m	300m²	Rectangle	Yes	Yes
Consolidated	Varies	40m	Varies	Rectangle	Yes	Yes
Proposed consolidation	Varies	40m	Varies	Rectangle	Yes	Yes
Irregular parcel	Varies	Varies	Varies	Irregular	Yes	Yes

	Duplex	Rowhouse	Multi-family low-rise	Multi-family Med-rise
Zone A				
Zone B				
Zone C				
Zone D				

5.7 GUIDELINES FOR THE BUILT FORM

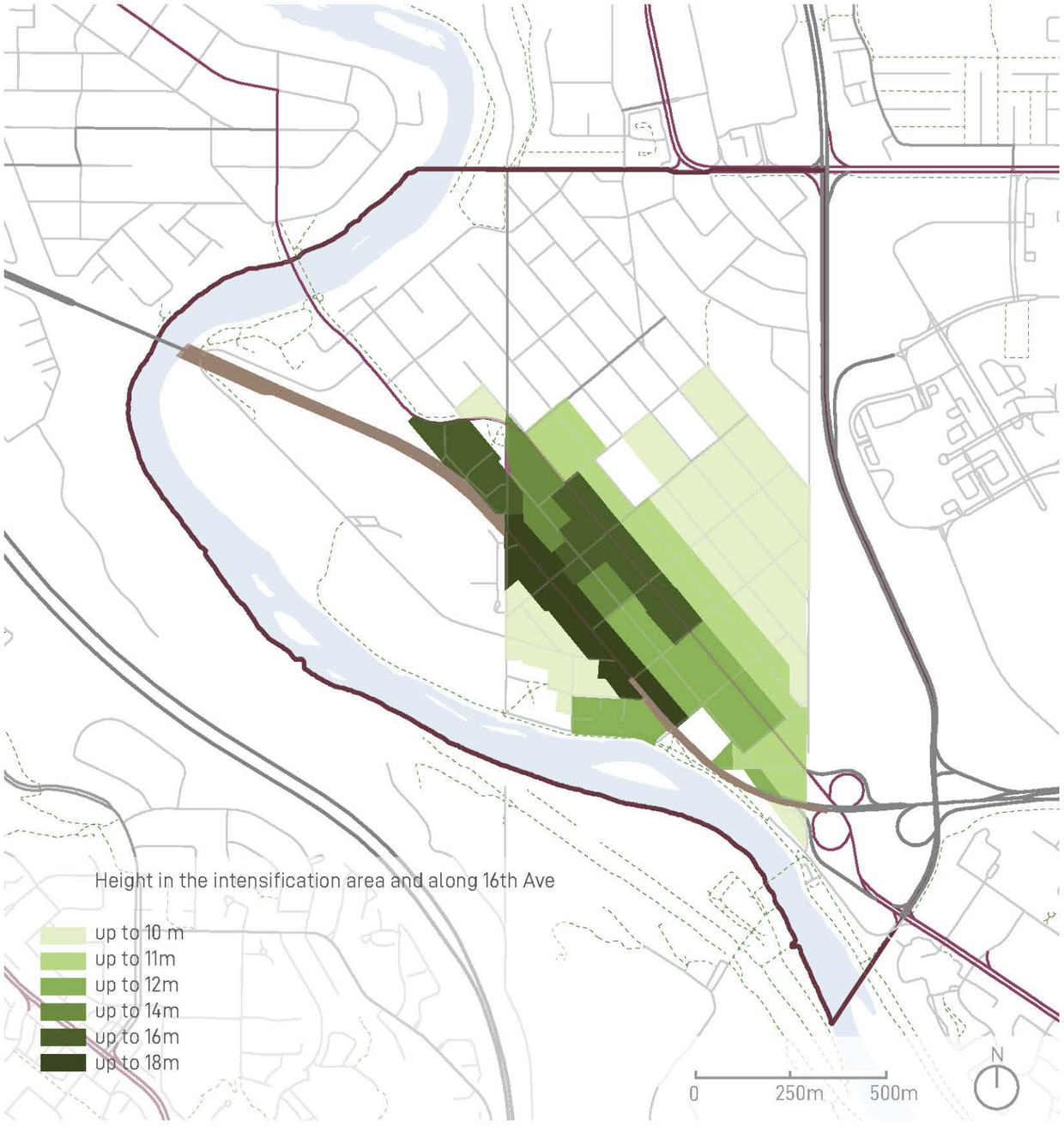
5.7.1 Parcel Typology in the Intensification Area

The intensification area is a mix of different parcel types and each type can accommodate different buildings:

- Typical parcel is a 40m by 15m parcel and it is the DNA of all the parcels in Montgomery.
- Narrow parcel is half of the typical parcel with 7.5m frontage.
- Consolidated parcels are those which have already been consolidated for additional density.
- Proposed consolidation is for the parcels that are located in areas with higher potential for added density.
- Irregular parcel, there are 10 irregular parcels in the whole intensification that are not rectangle shaped
- Corner lots are the parcels located on the four corners of the block. Rowhouses are encouraged for the corner lots. In general and compared to the rest of the parcels on the block, corner lots can accommodate more density. Corner buildings will provide a distinct architectural appearance with a high level of detailing that continues around the corner, with articulated facades oriented towards both streets. Corner buildings should frame intersections well. These sites can help to enhance visual connectivity and orientation within the community.

There are four zones indicated on the map. Based on the density distribution, each zone can include different building types:

- Zone A, the densification happens in the form of duplex infill in this zone.
- Zone B, duplexes and rowhouses will be replaced with single-family detached houses in zone B.
- Zone C, this zone is a mixture of rowhouses and multi-family low rise buildings.
- Zone D, mixed use buildings in the form of rowhouses, multi-family low and medium-rise will intensify this zone.



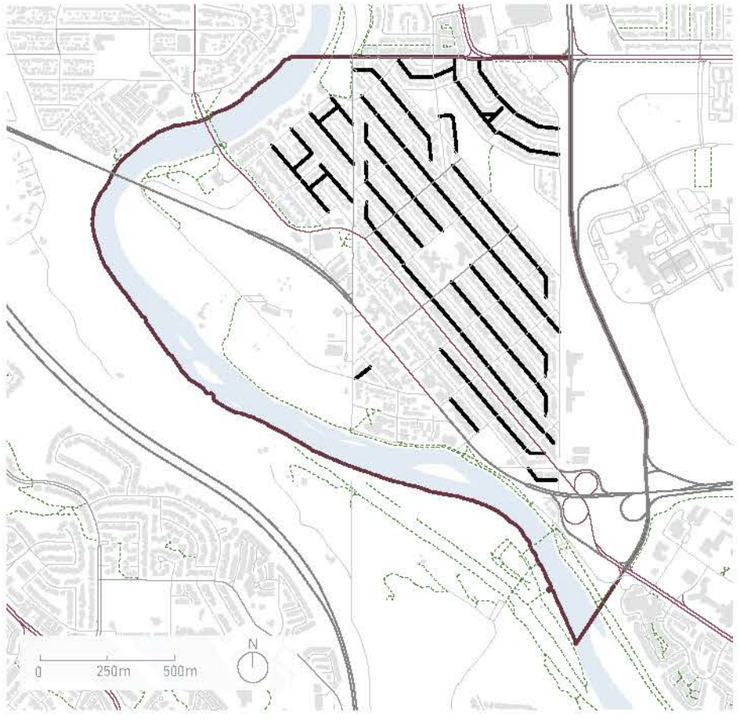
5.7.2 Laneway housing

Laneway housing is encouraged in the single-detached or duplex parcels for adding more density and yet maintaining the low-density character of the neighbourhood. There are a few parcels re-designated as R-C1s and they are accommodating laneway housing. We anticipate this trend to continue in the future, as we did not face any rejection from the community regarding this housing type.

General Guideline for Laneway Housing

- Laneways should be pedestrian oriented with high quality pavement.
- The suite should respect the privacy of the neighbours.
- The design of the laneway housing and the main dwelling on the site should be integrated.
- Laneway house should have direct access to the lane.
- Landscaping should contribute to the quality of the final product.

The location of the laneways in the residential area



Current laneway housing in the neighbourhood

Vancouver

Toronto

Toronto

Guelph

Vancouver

Toronto

5.7 GUIDELINES FOR THE BUILT FORM

5.7.3 Design Guidelines

This section aims to present the rules and regulations in order to:

- Provide design criteria that ensures a consistently high standard of architectural design.
- Provide assurances of a level playing field to Developers and Homebuilders and The City.
- Establish a positive and memorable visual image for built form within new developments and contribute to the quality of life.
- Promote harmonious and attractive developments.
- Establish the appropriate siting of buildings, having regard for dwelling type, size, architectural style and location within the community.
- To ensure compatibility among buildings.
- To assist builders, designers and home buyers in achieving problem free construction.
- To provide a framework for the physical layout, massing and relationships of built form to ensure a quality living environment with an identifiable image.

Vision and Principles:

- Environmental sustainability
- Healthy community (pedestrian and cyclist comfort)
- Crime Prevention Through Environmental Design (CPTED)
- Low-Impact Development
- Sense of Community
- Creating a strong public realm and varied streetscape
- Walkable and pedestrian-oriented development
- Human scaled environment

General Guideline

- New development should be designed in a manner which is responsive to the local context
- Building location and orientation should maintain 5 hours of consecutive sunlight on one side of the street. (Milton III-75 land limited Architectural control Guidelines,2018)
- Materials used for the front facade should be carried around the building or at a minimum to the side building facades. (Sanderling Property ,2012)
- Contrasting materials, patterns, textures, lighting and color should be incorporated to create interest, focus, unity, and compatibility for building entrances and accent areas or features.
- Harmonious variety of massing and architectural expression among publicly exposed building elevations is encouraged (Clarington General Architectural Design Guidelines, 2011)
- Through the use of alternative facade treatments, massing, roof line, materials, colors.
- Buildings adjacent or opposite one another should be compatible in massing and height. Extreme variation in massing should be avoided.
- Effective built form transitions should be applied within single buildings, between buildings on a site, on a block, and across areas of the City.
- Built form transitions are applied to reduce the shadow, view and overlook impacts for adjacent residents, open spaces and future building occupants.
- Materials used for the front facade should be carried around the building or at a minimum to the side building facades.
- Contrasting materials, patterns, textures, lighting and color should be incorporated to create interest, focus, unity, and compatibility for building entrances and accent areas or features.
- Transitions to adjacent properties should also consider existing building open space separation distances.

Texture palette

Source: MGR, Inspired by Aspen lakes Architectural design guidelines

Color palette

Source: MGR, Inspired by Aspen lakes Architectural design guidelines

5.7.3 Design Guidelines

General Guideline

- Building should be designed to suit the site topography conditions.
- Building setbacks should define the street edge and create a visually ordered street scape.
- Garages shall be subordinate to the overall building facade to contribute to a comfortable pedestrian environment. (Town of Aurora architectural control process, 2012)
- Buildings should be sited to define the street edge. This is typically achieved by placing the habitable portion of the dwelling close to the minimum front yard setback to promote a pedestrian-friendly sense of scale and provide enclosure to the public space of the street.
- Controlled variation in front yard setbacks is desirable on long, straight street blocks to provide visual relief, where lot depths permit. Haphazard variation in setbacks should be avoided. (St. James Plantation Design Guidelines, 2018)
- The setbacks of new development should respect the established street pattern.
- Parcel coverage for new development should include all proposed and future accessory buildings.
- One on-site parking spaces should be provided for each new dwelling unit.
- The privacy of adjacent residences should be respected in the placement of windows. (Clarington General Architectural Design Guidelines, 2011)
- New developments in established communities should enhance the street scape, through the retention of healthy mature trees and planting. Any mature trees which cannot be retained should be replaced at a value consistent with what has been removed. (St. James Plantation Design Guidelines, 2018)

Guidelines for Each Typology

General Guideline for Rowhouse

- Contains three or more Dwelling Units, located side by side and separated by common party walls extending from foundation to roof (Bylaw 1P2007)
- One façade of each Dwelling Unit directly faces a public street (Bylaw 1P2007)
- Each Dwelling Unit has a separate direct entry from grade to an adjacent public sidewalk or an adjacent public street (Bylaw 1P2007)
- No Dwelling Unit is located above another Dwelling Unit and may contain a Secondary Suite within a Dwelling Unit in a district where a Secondary Suite is a listed use and conforms to the rules of the district.
- The maximum density is 50 units per hectare (Bylaw 1P2007)
- The minimum parcel area is 160.0 square metres for a parcel containing an individual Dwelling Unit in a Rowhouse Building or Townhouse. (Bylaw 1P2007)
- The maximum parcel coverage is 60.0 per cent of the area of the parcel for each Rowhouse Building or Townhouse. (Bylaw 1P2007)
- The minimum building setback from a front property line is 2.0 metres for a laned parcel (Bylaw 1P2007)
- The minimum building setback from any side property line is 1.2 metres. (Bylaw 1P2007)
- For a corner parcel, the minimum building setback from a side property line shared with a street is 1.2 metres (Bylaw 1P2007)
- There is no requirement for a building setback from the property line on which a party wall is located that separates two or more Dwelling Units. (Bylaw 1P2007)
- The maximum building height is 11.0 metres. (Bylaw 1P2007)

General Guideline for Duplex

- The maximum parcel coverage is 45.0 per cent of the area of a parcel. (Bylaw 1P2007)
- The minimum building setback from a front property line is 3.0 metres. (Bylaw 1P2007)
- For a laned parcel, the minimum building setback from any side property line is 1.2 metres.(Bylaw 1P2007)
- There is no requirement for a building setback from the property line upon which the party wall is located.(Bylaw 1P2007)
- For a corner parcel, the minimum building setback from a side property line shared with a street is 1.2 metres. (Bylaw 1P2007)
- Where a corner parcel shares a side property line with a street, building setback from that side property line is 1.2 metres. (Bylaw 1P2007)
- The maximum building height is 10.0 metres. (Bylaw 1P2007)

Material palette

Source: MGR, Inspired by Aspen lakes Architectural design guidelines

5.7.3 Design Guidelines

Guidelines for Each Typology

Guideline for Multi-Family Residential Low-Rise

- A unit in a Multi-Residential Development that is located on the floor closest to grade must have an individual, separate, direct access to grade and an entrance that is visible from the street that the unit faces. (Bylaw 1P2007)
- The minimum building setback from a property line shared with a lane is 1.2 metres. (Bylaw 1P2007)
- The minimum building setback from a property line shared with another parcel is 1.2 metres. (Bylaw 1P2007)
- The maximum building height is 12.0 metres. (Bylaw 1P2007)

Guideline for Mixed Use Multi-Family Low-Rise

- The maximum floor area ratio is 3.0 (Bylaw 1P2007)
- The minimum density for building is 60 units per hectare and there is no maximum density for parcels (Bylaw 1P2007)
- The minimum building setback from a property line shared with a street for a street-oriented multi-residential building is zero metres. (Bylaw 1P2007)
- The minimum building setback from a property line shared with a lane is 1.2 metres. (Bylaw 1P2007)
- The minimum building setback from a property line shared with another parcel is 1.2 metres. (Bylaw 1P2007)
- The maximum building height is 16.0 metres. (Bylaw 1P2007)
- Parking should be placed away from main street. (Bylaw 1P2007)
- Trees should separate parking lots from residential units (Bylaw 1P2007)
- No garages should face Main Street (Bylaw 1P2007)

Guideline for Mixed Use Multi-Family Medium-Rise

- Residential units are not allowed on the ground floor (Bylaw 1P2007)
- Buildings are typically between four and six storeys in height (Bylaw 1P2007)
- Provide a defined street wall typically two to six storeys in height and proportional to the width of the street (Bylaw 1P2007)
- Have building façades with multiple uses and frequent entries at grade facing the commercial street; (Bylaw 1P2007)
- Have significant proportions of transparent glazing on building façades for street facing uses located at grade (Bylaw 1P2007)
- Designed to be compatible with active, street-oriented commercial uses (Bylaw 1P2007)
- Signs may be located in any setback area (Bylaw 1P2007)
- Where the widest dimension of a balcony faces a property line shared with another parcel, the minimum setback of a balcony from the shared property line is 4.0 metres. (Bylaw 1P2007)
- Each unit must have at least one window or door with a glazed area with a minimum dimension of 1.0 metre. (Bylaw 1P2007)
- The minimum height of the ground floor of a building is 4.0 metres as measured vertically from the floor to the ceiling. (Bylaw 1P2007)
- For a Dwelling Unit, there is no minimum height of the ground floor of a building. (Bylaw 1P2007)
- Units and individual uses located at grade with an exterior wall facing a street must provide individual, separate, direct access to grade, an entrance that is visible from the street; and sidewalks that provide direct exterior access to the unit or the use. (Bylaw 1P2007)
- The length of the building façade that faces the commercial street must be a minimum of 80.0 per cent of the length of the property line it faces. (Bylaw 1P2007)
- Lobbies or entrances for upper floor uses must not occupy more than 20% of the at grade façade facing a street. (Bylaw 1P2007)
- The third story should have a 3 meters setback from the main street. (Bylaw 1P2007)
- The façade of a building located on the floor closest to grade and facing a street must provide windows with glass that occupy a minimum of 65.0 per cent of the façade between a height of 0.6 metres and 2.4 metres. (Bylaw 1P2007)
- A public sidewalk must be located along the entire length of each property line shared with a street. (Bylaw 1P2007)
- Mid-Rise buildings should be no longer than 80 metres in length. Longer buildings must be broken up by building components that are sufficiently set back or of different heights to visually appear as two separate buildings from grade. (Bylaw 1P2007)
- Parking should be underground or at rear yards. (Bylaw 1P2007)

5.8 SUMMARY

To have access to affordable housing is a basic need. Through our analysis we found that prices of homes increased dramatically in the last 25 years in Montgomery. With a growing population and The City of Calgary's Census estimates to expect more than 2000 new residents, the community is looking for solutions to plan ahead for the much needed housing (2016). Montgomery currently has a low density form for residential land use and the community would like to preserve that character and feel of a small town. We put forth solutions to aid in this desire, while strategically and sensitively placing density where it can be supported. We strived to achieve a diverse housing mix to offer a diverse population. We put forth policy to place density along the Main Street corridors and provide for the missing middle. We further strived to increase density via laneway housing and secondary suites. This is a way to effectively add double occupancy within one parcel, while maintaining the low density form the residents are wanting to preserve.

06

MOBILITY & CONNECTIVITY

Source: https://calgary.ctvnews.ca/i-ve-definitely

6.1 OVERVIEW

Improving how a community travels to its' destinations is vital. No one wants to send more time than necessary to travel to the final location. The sooner you arrive, the more time you have to carry on with your day. This chapter will explore how Montgomery moves and connects through roads, transit, cycling and pedestrian possibilities.

Following The City of Calgary's Transportation Sustainability Triangle, we will be placing pedestrians first, by offering solutions for improved safety and reduced dependency on private vehicle use. We will further be promoting cycling and transit use, by offering policy to aid in these three modes of transport.

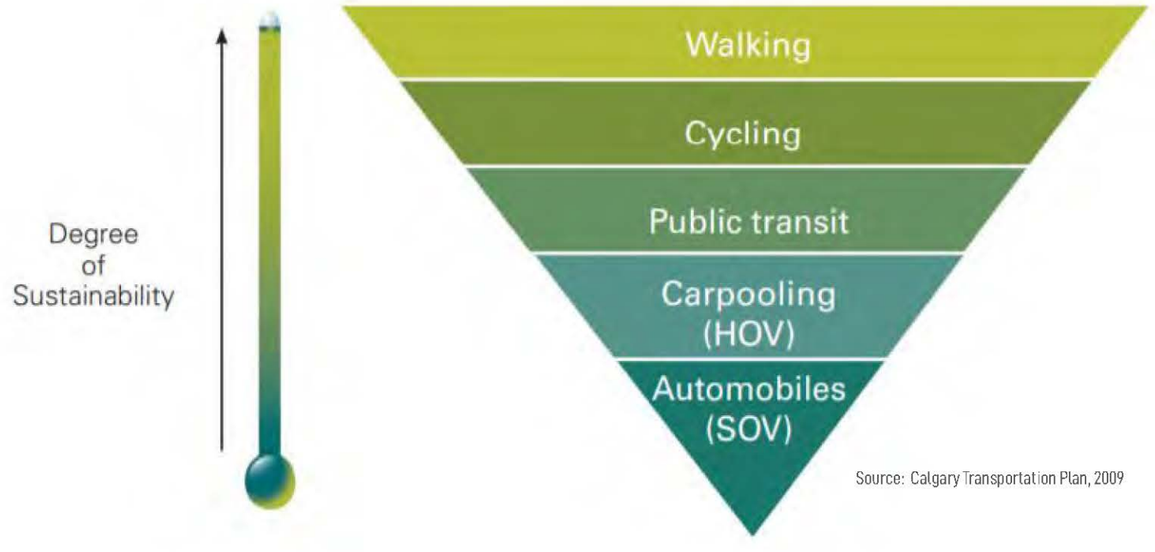
Several policy documents and guidebooks relevant to mobility will be introduced. A review of the findings of the analysis phase is presented in a map. Following the community feedback is summarized with specific mobility concerns. Finally proposed interventions paired with policy and guidelines will recommend the way for future improvements in Montgomery.

Walking


Source: https://www.macleans.ca

Cycling


Source: MGR



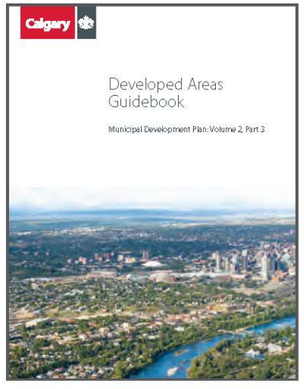
Source: Calgary Transportation Plan, 2009

Transit

Source: https://www.youtube.com/watch?v=8Z33vb7rEok

6.1 OVERVIEW

6.1.1 Legal Framework

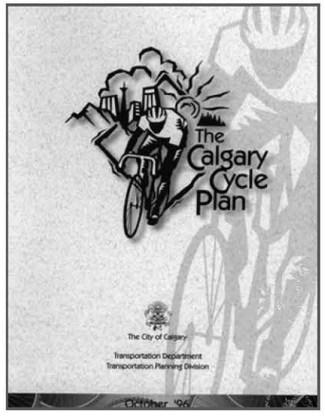


Developed Areas Guidebook

This is an important tool to support municipal development and community building with references to established community mobility policies.

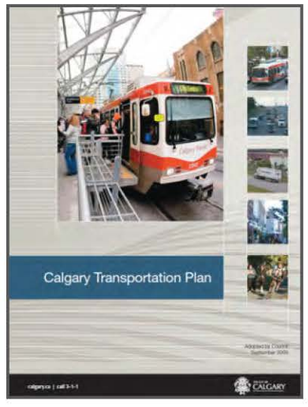
Complete Streets Policy and Guide

With more specific policies around street use for safety of all traffic modes and creating multi-modal streets partnering will with the CTP.



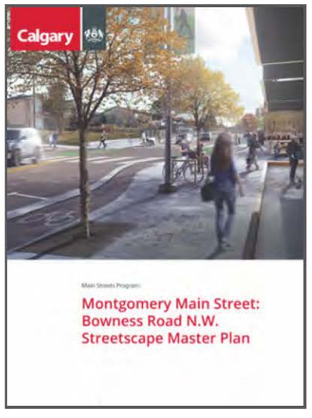
The Calgary Cycle Plan

This document focuses on strategies in Calgary to increase active transport via cycling.



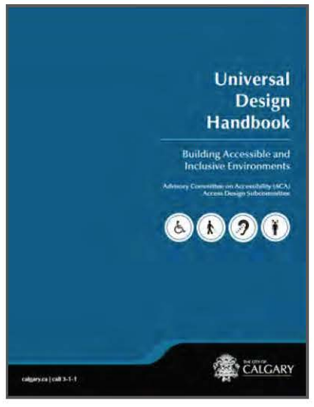
Calgary Transportation Plan

This document offers a long range comprehensive plan and looks to focus on walkable streets, public transit and overall sustainable choices.



Calgary Main Streets Initiative

Focused on improving 24 specific areas around The City to attract local events such as shopping, dining, and socializing through urban design improvements.



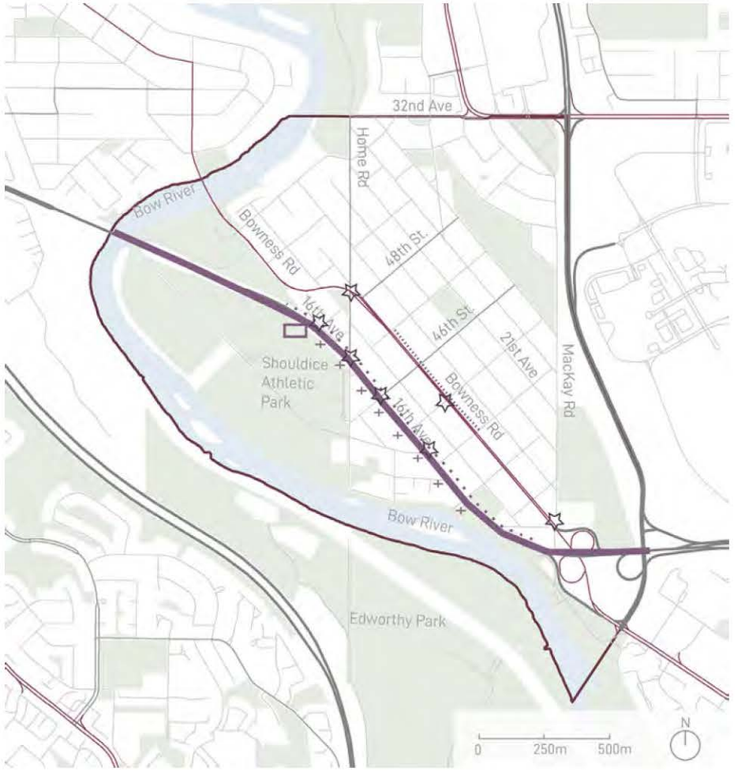
Calgary Universal Design Handbook

This handbook explains and outlines what access for everyone looks like, while also providing policy which supports universal design.

6.1 OVERVIEW

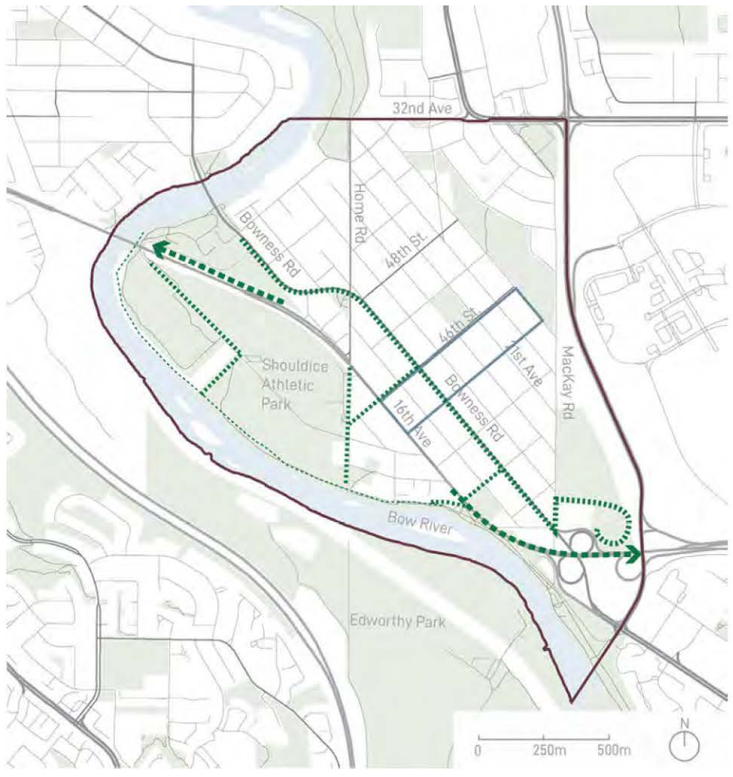
6.1.2 Challenges and Opportunities Maps

Montgomery Challenges Map



Challenges:
- 16th Ave separating N & S
- Poor intersection safety
- Auto focused on 16th Ave
- Lack of gateway entrance
- Lack of pedestrian focus
- Excessive speeds

Montgomery Opportunities Map



Opportunities:
- Gateway to downtown
- Create link 16th Ave & Main Street
- Gateway to mountains
- Create river connections
- Improve cycling & pedestrian links

Our preliminary analysis of Montgomery revealed a few key challenges regarding mobility. These begin with the Trans Canada Highway, or 16th Ave which divides the community in half and creates a significant barrier for pedestrians or cyclists to cross. This highway also has an auto focus and is cause for excessive speeding. Multiple intersections have significant issues regarding safety for pedestrians with numerous traffic accidents. There is a lack of pedestrian focus along Bowness Road Main Street. Finally the community of Montgomery as a gateway into Calgary has a lack of presence when people first drive in along the Trans Canada.

Our same analysis revealed some exciting opportunities for Montgomery around mobility. First, a few opportunities include the regional traffic entering either downtown or heading west to the mountains. Capturing this group of people to stop and stay a short while in Montgomery would greatly benefit the local businesses. Next, we see the opportunity to link 16th Ave, Bowness Road Main Street and Montalban Park creating a connected route for recreating, shopping or visiting in Montgomery. We see a great chance to build a better link to the river for recreational users and at the same time improve existing cycling and pedestrian networks.

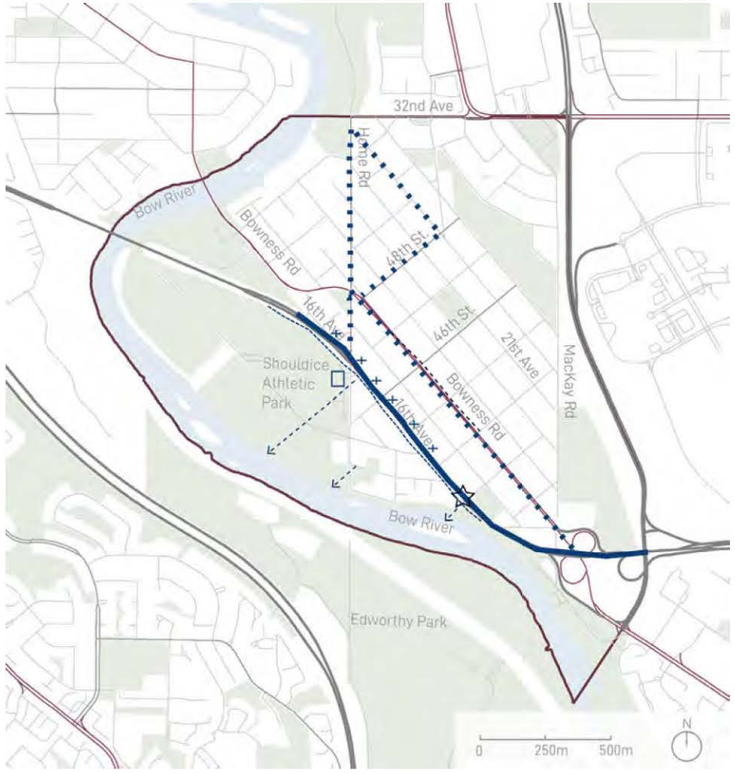
6.1 OVERVIEW

6.1.3 Community Feedback Map

Part of our project process included a community workshop where we listened to the residents and community association members. We heard a variety of concerns, which we have mapped. Some of our analysis findings paired with the community comments, such as the barrier 16th Ave creates in dividing the community. We also heard 16th Ave prevents ease of access to the river and is unsafe for pedestrians. We further heard 16th Ave prevents access to the community hall and the speeds traveled on it are far too fast. The community feels 16th Ave and Main Street are not pleasant to walk along, especially 16th Ave which is not human-scaled. One a last note, the community commented on the large amount of cut-through traffic which travels on Bowness Road, Home Road and 48th St., creating an unpleasant residential experience.

After listening to the community, we have set out some mobility goals necessary to create better connectivity and improve mobility.

What we heard about mobility in Montgomery map



- Lack of river access
- Cut-through traffic
- 16th Ave is a barrier
- Main Street is not a pleasant walk
- Unsafe pedestrian crossing
- 16th Ave is not human-scaled
- Community Hall is not accessible
- 16th Ave feels unsafe and too fast

6.1.4 Key Goals

To ensure the positive flow of vehicles while improving safety through traffic calming for the benefit of all users.

To reduce cut through traffic, while maintaining 16th Ave as a major transportation corridor.

To encourage and support the use of public transit by improving the amenities at bus stops.

To encourage and support cycling and walking through improving links and connections in the community and on to further destinations.

To encourage and support Main Street Montgomery as a destination for local and regional shopping, retail and restaurant options.

6.1 OVERVIEW

6.1.5 Key Interventions

After listening to the community members, we have a great amount of information to pair with our analysis. This helps us to build a better picture of prioritizing issues and laying out strategies for improvements. A map of the key interventions needed can be seen on this page.

We will seek to address the community issues around mobility through a series of interventions. Many of the interventions involve improving pedestrian and cycling safety, plus improving links for better connectivity.

6.1.6 Key Issues

Trans Canada highway also known as 16th Ave NW presents as a significant barrier and separates the north and south sides of the community.

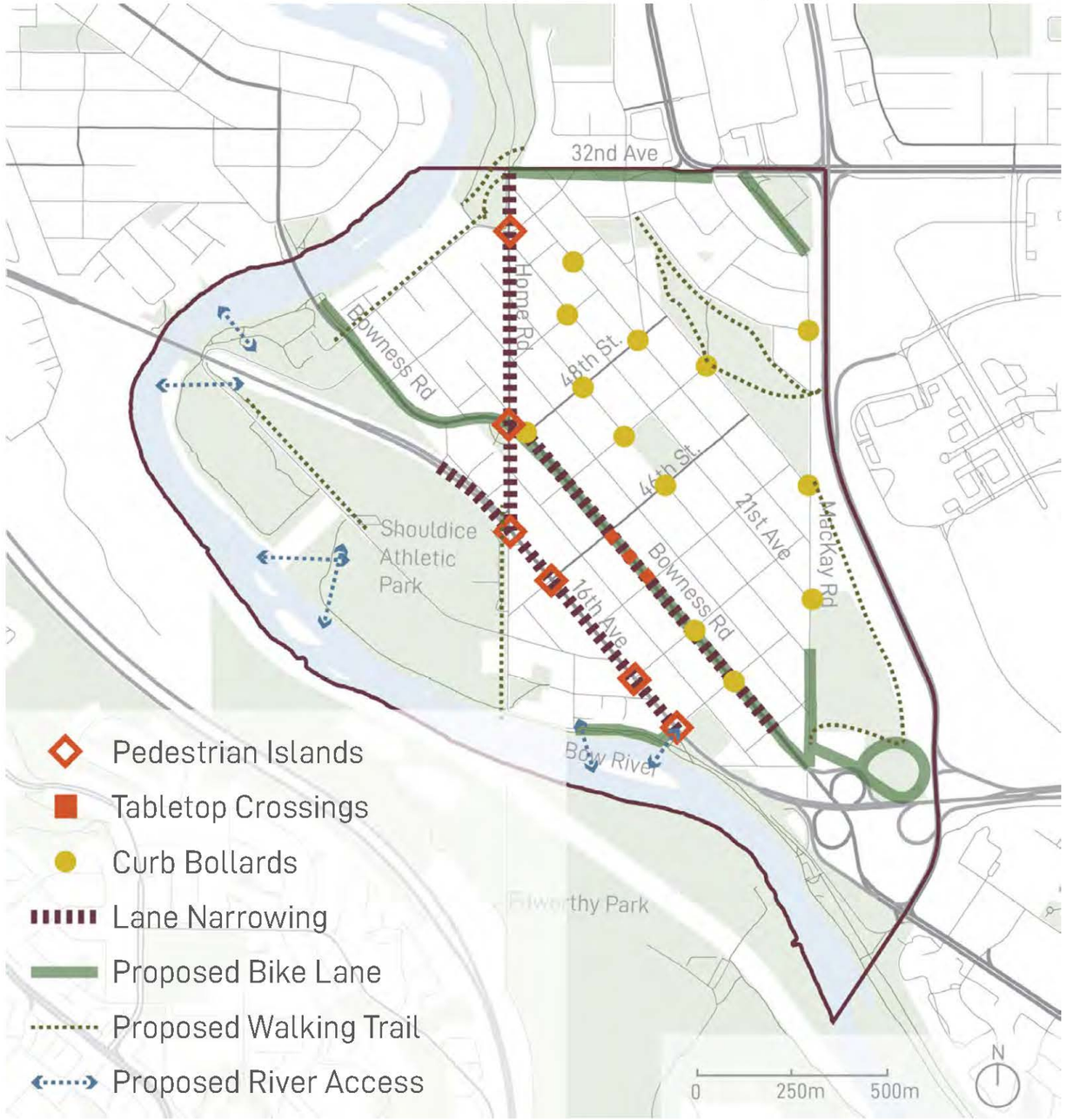
A concern regarding the speed and width of 16th Ave, Trans Canada highway with a focus on auto-oriented uses, rather than an inviting public realm.

A lack of safety for pedestrians and cyclists moving around the community.

Many streets in Montgomery are used as traffic corridors, rather than ensuring the safety and comfort of residential use.

A lack of access and connectivity to the river.

Key interventions in Montgomery map

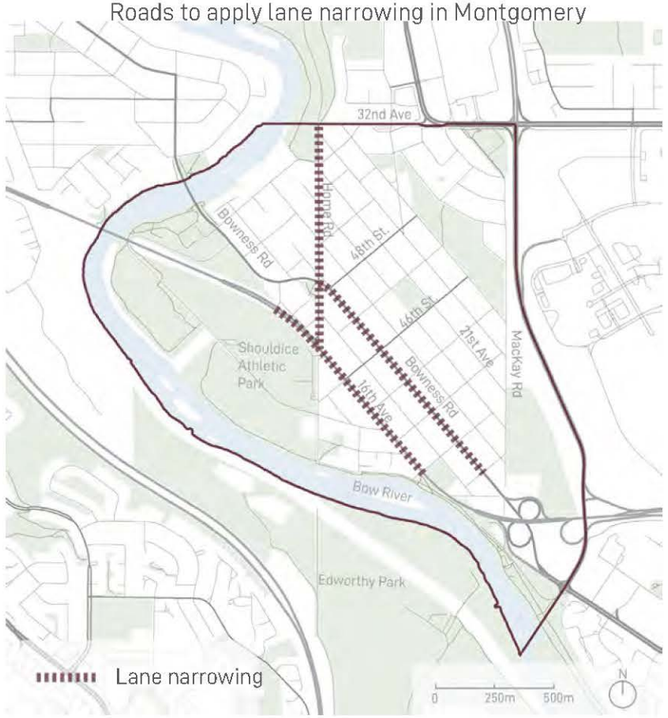


6.2 VEHICLE NETWORK/ ROAD DIETS

6.2.1 Lane Narrowing

A roadway configuration, or a road diet is a transportation planning tool generally described as an adjustment of vehicle lanes to reallocate the extra space to other uses or travel modes (US.... Department of Transportation, 2016). This may result in extra sidewalks, cycle lanes, turn lanes, transit use, medians or pedestrian refuge islands (U.S. Department of Transportation, 2016). Road diets can improve safety, efficiency and quality of life for all users (U.S. Department of Transportation, 2016). The benefit of planning ahead with such interventions is road diets can be relatively low cost, provided they are introduced at the same time as scheduled resurfacing maintenance and reconstruction (U.S. Department of Transportation, 2016).

Roads to apply lane narrowing in Montgomery

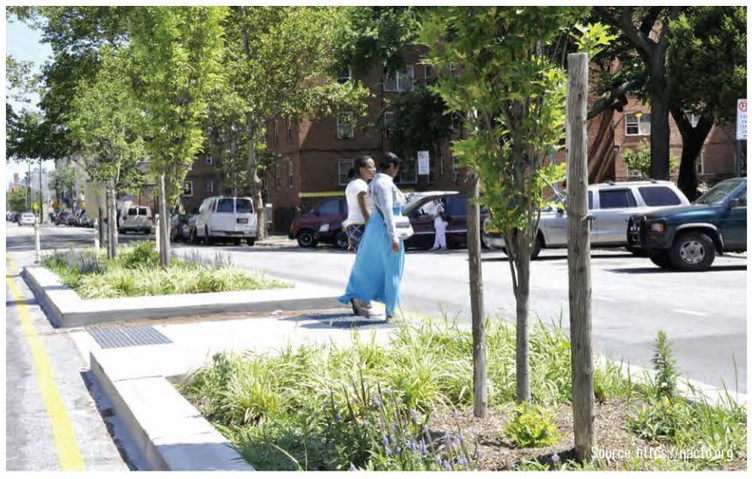


We propose lane narrowing on Home Road, Bowness Road and 16th Ave, NW. Each of the roads have had a number of traffic incidents revealed during our analysis. Narrowing roads gently guides motorists to slow their driving speed, thereby empowering pedestrians and increasing safety. The goal is to change the character of the auto-centric 16th Ave to an urban commercial boulevard and change the feel of Bowness Road to a true Main Street.

Lane narrowing is suggested for the length of 16th Ave, Trans Canada highway, beginning from Home Road moving east through to 43 St. NW. Lane narrowing makes room for pedestrian refuge islands, and planted medians, as shown here in these precedents.

Planted Central Median

Pedestrian Refuge Islands



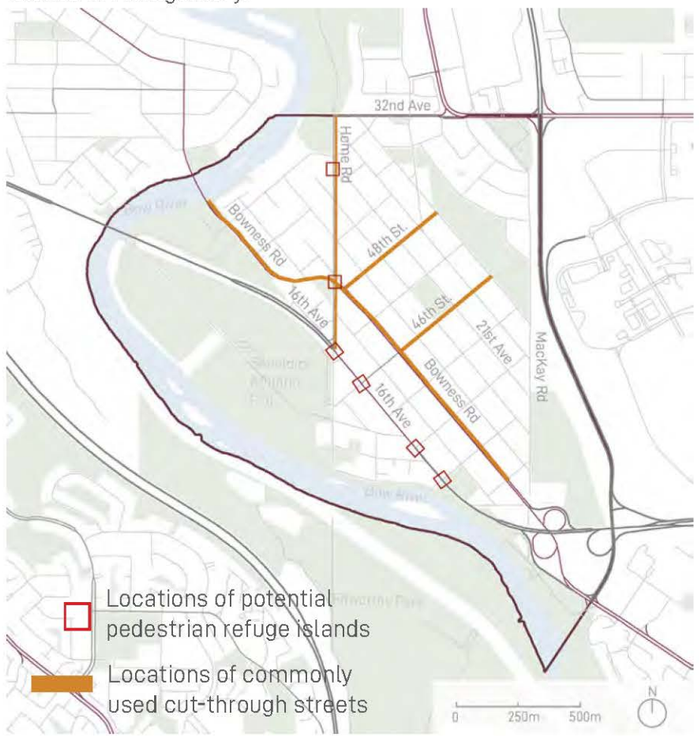
Planted Sidewalk Buffer

6.2 VEHICLE NETWORK/ ROAD DIETS

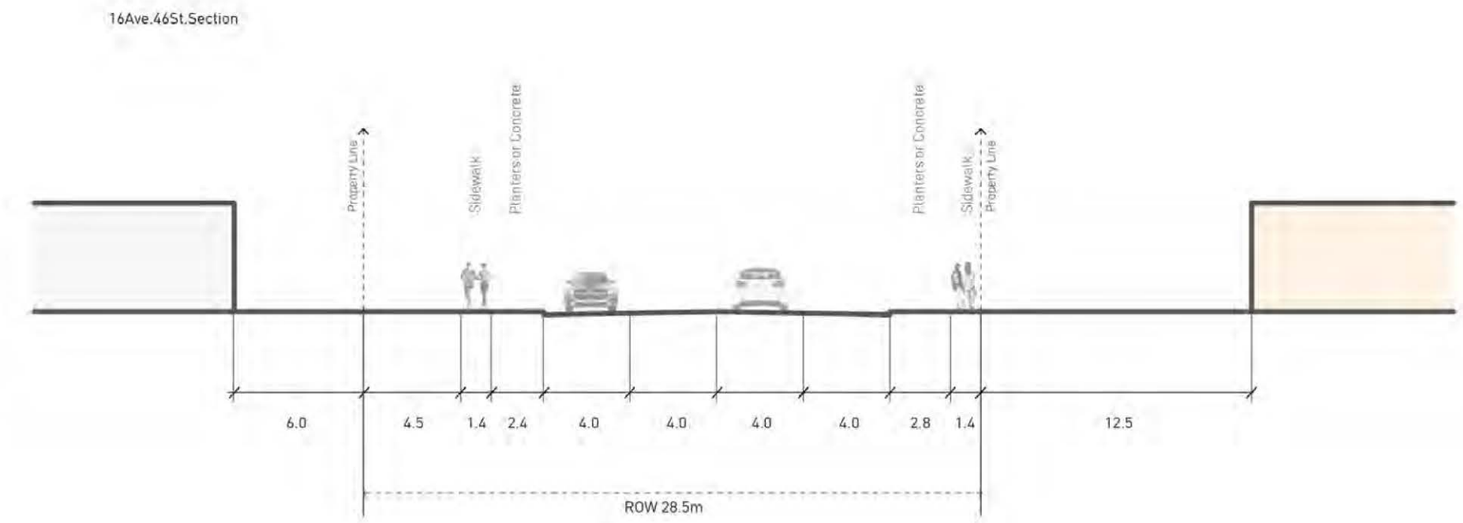
6.2.1 Lane Narrowing

As traffic has increased along the Trans Canada highway, many personal vehicles have chosen to short cut and travel through Montgomery via residential roads. This creates a poor street environment and mediocre public realm within the community. A combination of different road reconfigurations can work together to increase pedestrian and cycling safety, plus enhance the quality of the neighbourhood.

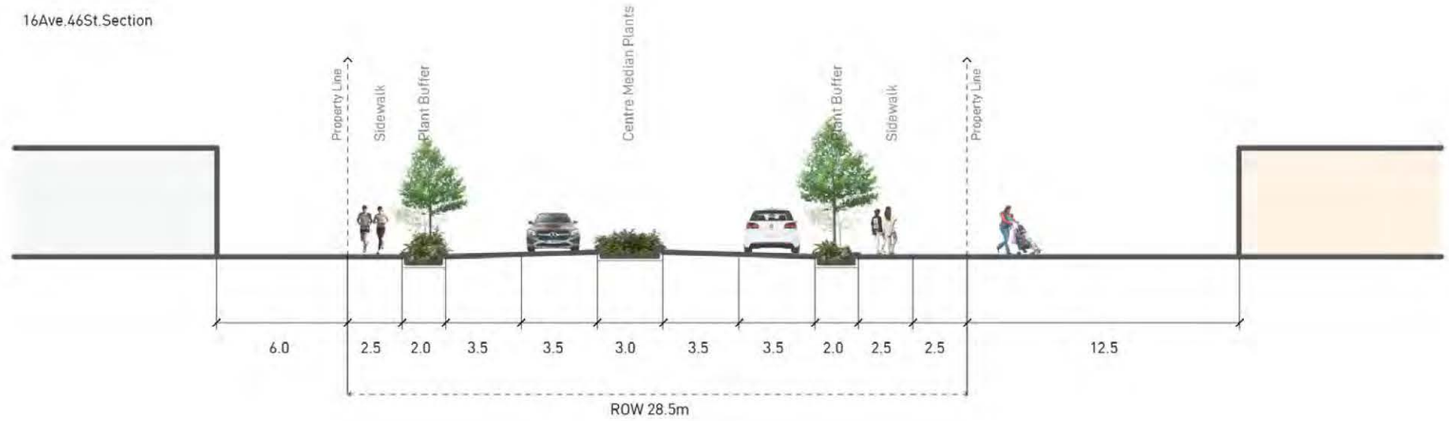
Map revealing main streets used by regional drivers to travel through the neighbourhood and intersections in need of pedestrian refuge islands in Montgomery.



Before - Trans Canada Highway/ 16th Ave NW A-A'



After



6.2 VEHICLE NETWORK/ ROAD DIETS

6.2.1 Lane Narrowing

Trans Canada Highway runs through Montgomery and divides the community in half. The pedestrian realm needs multiple interventions including narrowing the width of the lanes, adding pedestrian refuge islands, adding a centre median, increasing the sidewalk widths and adding a buffer of green space between the traffic lanes and the sidewalks. The result of adding all these measures will change 16th Ave into a pedestrian friendly urban boulevard.

With 13 traffic incidents at the intersection of Home Road and 16th Ave, the need to make significant improvements regarding safety is great. Having narrower lane widths will slow the speed of traffic. Adding pedestrian islands creates a safe place for people, mid-crossing the street and island crossings shorten the distance pedestrians must span.

Before - Trans Canada highway/ 16th Ave NW A-A'

Goals

- Improve local and regional connectivity.
- Slow the speed of traffic in the community.
- Prioritize intersections for and around schools including entrances leading to schools.
- Reduce regional traffic short-cutting through the neighbourhood.
- Improve safety for all users.
- Improve efficiency of vehicle transportation.

General Policy for Vehicle Network

- All streets must be designed and upgraded to ensure safe access or all modes of transport and people. Including: pedestrian and cycling uses with traffic-calming measures or infrastructure.
- Road intersections identified in this document must be addressed and improved through various design interventions.

Site-Specific Policy for 16th Ave NW

- The narrowing of all vehicle lanes to a width of 3.5 metres.
- The addition of pedestrian refuge islands and a centre median 3.0 m wide to be filled with native vegetation.
- The addition of a buffer 2.5 m wide along each side of 16th Ave to be planted with native vegetation.
- The widening of sidewalks on either side of 16th Ave to 2.0 m.

After - Trans Canada highway/ 16th Ave NW A-A'

6.2 VEHICLE NETWORK/ ROAD DIETS

6.2.2 Traffic Calming

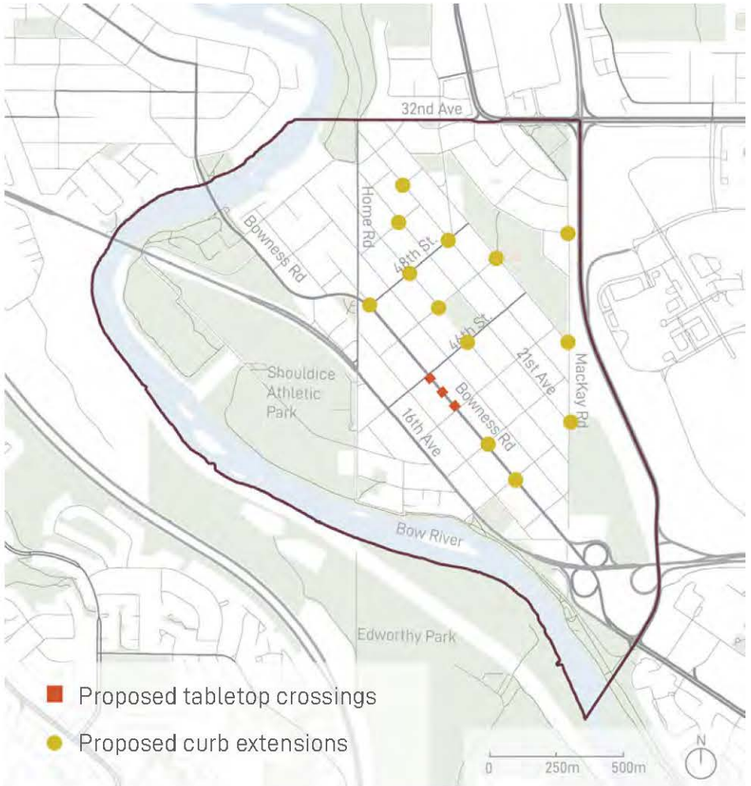
Traffic calming measures such as curb extensions physically and visually narrow the road and help to slow vehicles (National Association of City Transportation Officials, N.D.). They are important for many reasons as curb extensions shorten the crossing distance for pedestrians and expand their visibility (National Association of City Transportation Officials, N.D.). Curb extensions can have multiple applications and can be used in residential streets, downtown or in neighbourhood settings (National Association of City Transportation Officials, N.D.).

Raised crosswalks not only help with traffic calming, they are a great winter friendly design. As they elevate the pedestrian out of snow and wet on the street, tabletop crosswalks prevent wet feet in snowy conditions. Raised crosswalks further the comfort level of pedestrians and can encourage year-round active transportation.

Curb extension can be used for extra neighbourhood space with plantings, seating and other street furnishings. This space can be allocated for socializing and gathering rather than empty streets.

Planted Curb Bollards

Needing Intervention



Map revealing the locations of needed curb extensions and tabletop crossings in Montgomery.

6.2 VEHICLE NETWORK/ ROAD DIETS

6.2.2 Traffic Calming

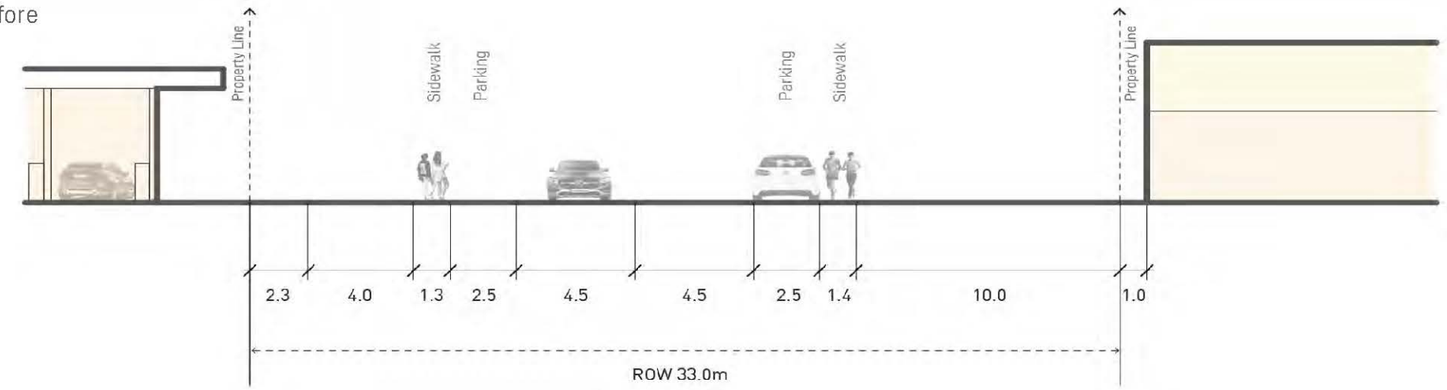
Main Street Bowness Rd

Raised crosswalks, or tabletop crossings slow vehicles down by providing a short, slight elevation in the street. Three tabletops are suggested along the main shopping area of Main Street to improve safety and the public realm. This block measures 166 m, not unreasonable for pedestrians to wait to get to the end of the street to cross at a crosswalk. But the point is for people to take back this street as a place to people, not cars and create a more friendly feel and environment.

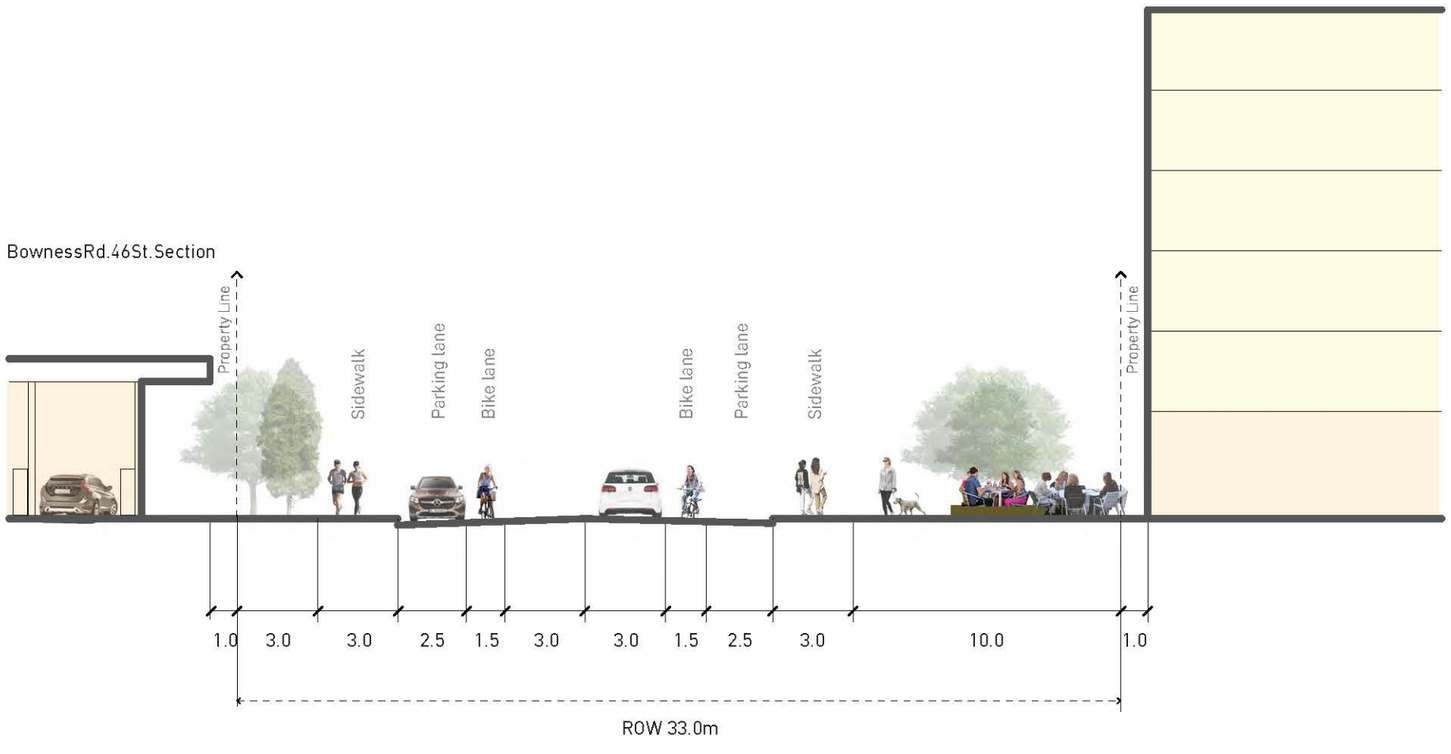
Tabletop Crossing

Bowness Road & 46th St. NW B-B'

Before

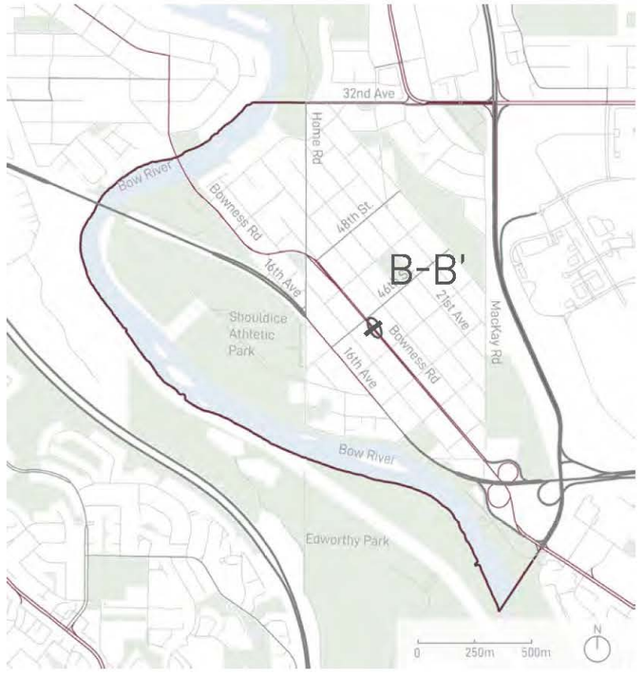


After



6.2 VEHICLE NETWORK

6.2.2 Traffic Calming



Before - Bowness Road & 46th St. NW

Site-Specific Policy for Main Street Bowness Road NW

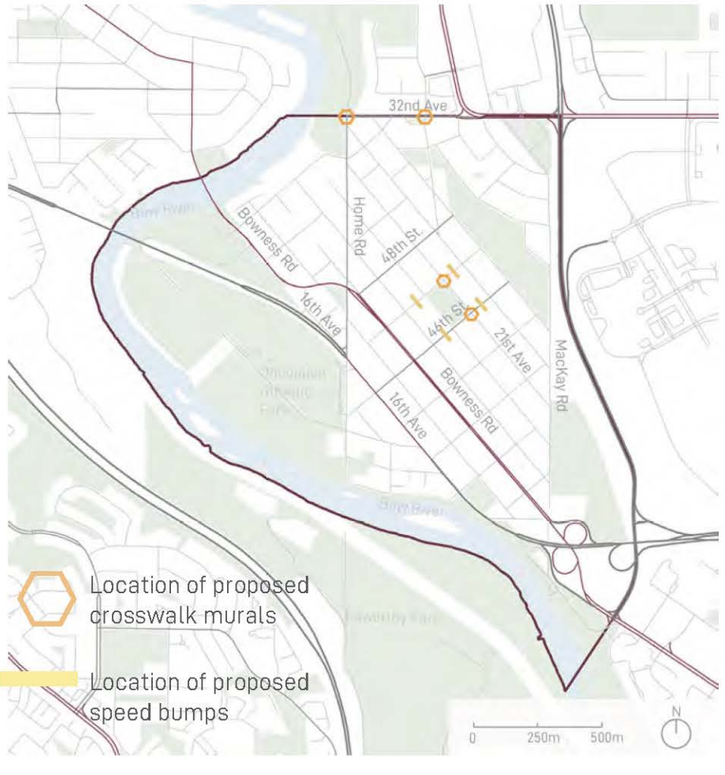
- The travel lanes along Bowness Rd will be narrowed, to 3.0 m.
- A cycle track lane will be added on either side with a width of 1.5 m.
- A width of 2.5 m will be retained for parallel car parking along the Main Street shopping area.
- The sidewalk will be widened to 3.0 m to improve public realm.
- The addition of three raised crossings, beginning at the corner of 46th St. and Bowness Rd and ending at 45th St. and Bowness Rd.
- These crossings will be evenly spaced through the block.
- These crossing must be elevated to the height of the adjacent sidewalk and footpath.

After - Bowness Road & 46th St. NW B-B'

6.2 VEHICLE NETWORK

6.2.2 Traffic Calming

While safety should be a priority all the time, it is especially critical in locations where children frequent. Speed bumps and crosswalk murals can be effective around schools. Speed bumps are a small raised areas in the road, typically placed every 100-200 m. Speed bumps are effective in slowing vehicle speed in residential areas, and reduce frequency and severity of collisions.



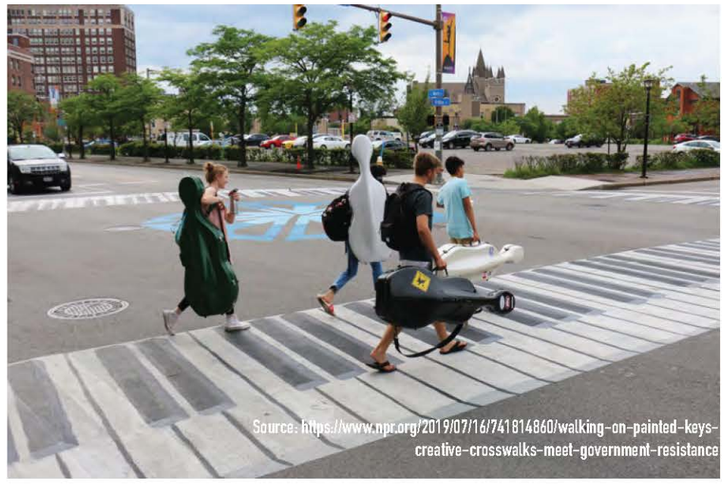
Map revealing areas suggested speed bumps and painted mural crosswalks in Montgomery.

46th St. & 21st Ave
Terrace Road School

Painted crosswalk murals help with visibility and colourful crosswalks lead to safer intersections and neighbourhoods. They can help build community pride and identity if students help paint them in and around their school.

Speed bumps are a small raised areas in the road, typically placed every 100-200 m. Speed bumps are effective in slowing vehicle speed in residential areas, and reduce frequency and severity of collisions. We designed speed bumps are effective in local area roads, and should not be used on major collector roads where primary bus routes or primary emergency response vehicles need to travel.

Crosswalk Mural



Music students in Rochester, N.Y. cross the walk they paint every year prior to a large jazz festival hosted annually.

Speed Bump

Site-Specific Policy for Terrace Rd School, 21st Ave and 46-47th St, NW

- Four speed bumps should be installed at a height of 10 cms and 60 cms long running along 46th and 47th St and 21st Ave NW.
- Two crosswalk murals should be painted at the corners of 21st Ave and 46th St, NW and 21st Ave and 47th St, NW.

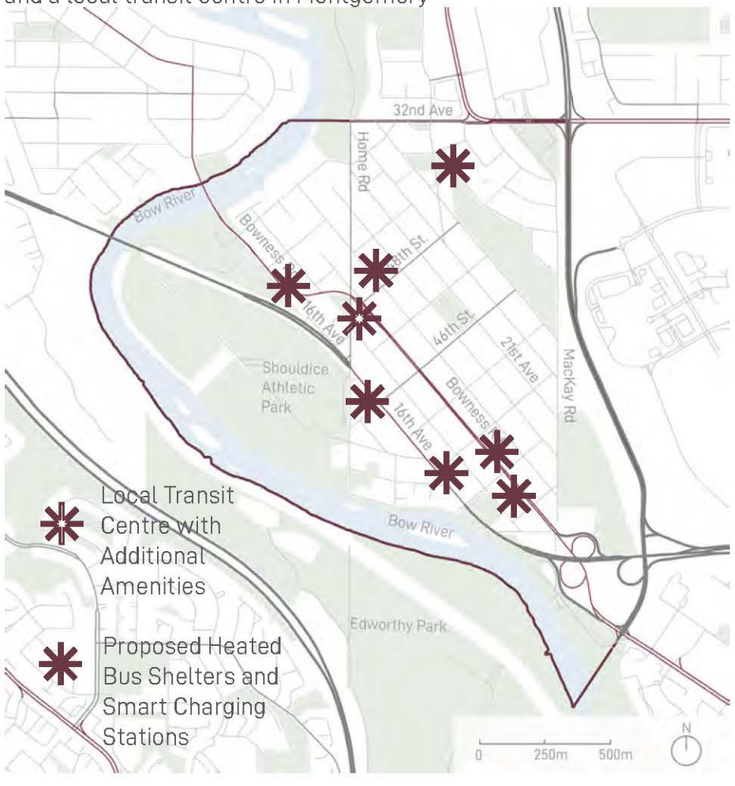
Site-Specific Guideline for Terrace Rd School, 21st Ave and 46-47th St, NW

- The crosswalk murals should be painted annually, as part of a school credit class and program, with students and teachers working together.
- The design and theme of the mural should reflect the school spirit and pride.

6.3 TRANSIT NETWORK

Montgomery is serviced by seven bus routes, including a BRT Route 305. Unfortunately, there is not a LRT line in this area. As such, many destinations require transferring between two buses, or a bus then a train or more combinations to arrive at the last mile. The BRT is quite accessible in most areas of Montgomery, however it offers only limited service at peek hours during weekdays. The overall Transit Score for Montgomery is low with less than 50% of the residents having adequate access to public transit. By offering increased frequency of routes and better more direct connections to necessary amenities, residents will be able to better access the region to complete their daily needs.

Map revealing areas suggested needing additional transit amenities and a local transit centre in Montgomery



Transit Stop Amenities

Covered Bike Storage


Source: https:// bke_transit_storage/ottawa.

Heated Bus Shelter

Source: https://www.thestar.com

Smart Charging

Source: https://www.marketsmiths.com

Goals

Transit Network goals include:

- Promote pubic transit, cycling and walking as a mobility option for people.
- Improve amenities and infrastructure near and surrounding the transit stops.

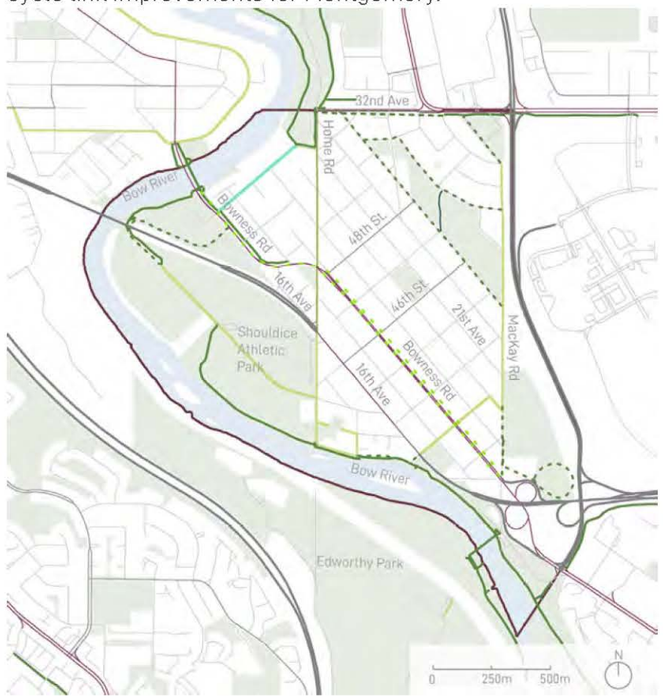
General Policy for Transit Network

- Transit will provide a local transit centre at Montgomery Square.
- Transit must provide stops and infrastructure meeting with pedestrian and cycling routes and needs.
- Transit must provide improved amenities as per the map, to increase customer comfort, especially during the winter months.

6.4 CYCLING NETWORK

While Calgary boasts as having the most extensive urban pathway system in North America, we can always look to improve areas of need (City of Calgary, 2018). Montgomery as several areas which could benefit from the addition of cycling infrastructure and pathway improvement. One popular and major cycling route is the Rotary/Mattamy Greenway. This pathway is a larger system which connects and encircles the outer perimeter of The City of Calgary. The addition of cycling links in Montgomery will connect the system to better serve residents and visitors, allowing them improved access to local amenities, like river access and the future bike and pump track.

Map revealing regional pathway, current cycle track and proposed cycle link improvements for Montgomery.



Shared Lane


Source https:// https://www.calgary.ca/Transportation/TP/

Pump Track


Source https:// https://www.pinterest.ca/pin/543247392297634607/

Snow Clearing


Source https://www.mec.ca/en/explore/get-ready-for-winter-riding:

With the Chinooks in Calgary, it is reasonable to cycle year-round. Support for year-round cycling will include covered, secure bike locking stations along Bowness Road, where the shared cycle lanes will be added, at the transit centre. Bike locking stations will help with first and last mile connections, enabling riders to travel part of their commute on the transit and part on their bike.

In addition to amentities, we will pair these measures with policies, which will speak to city snow removal and clearing on cycle lanes.

6.4 CYCLING NETWORK

Goals

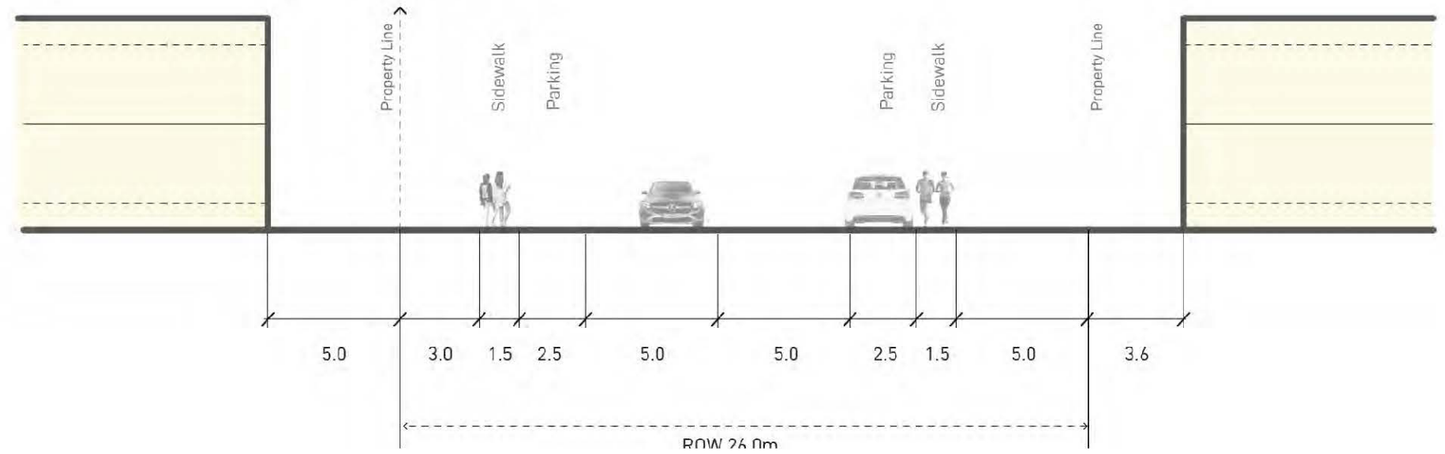
- Improve local and regional connectivity, to amenities, public transit, and parks and open space.
- Provide infrastructure that meets the needs of a range of cyclists.
- Design cycling routes that accommodate a range of cyclists of all abilities.
- To promote and encourage active transport, specifically cycling in Montgomery.
- Improve cycling safety.
- Support year-round cycling.

Site-Specific Policy for Bowness Road, beginning at 42nd St, running west through to 52nd St, NW

- Along this stretch of Bowness Road, a one-way cycling lane must be implemented, running one lane along both sides of the street.
- The cycle lane must be 1.5 m wide.
- The cycle lane must be painted and marked as other cycle lanes in The City of Calgary, including a sign indicating a cycling lane begins here, and white painted line on the pavement denoting the lane width and the diamond shape caution symbol with a bicycle icon on the pavement.

Bowness Road & 43th St. NW C-C'

Before



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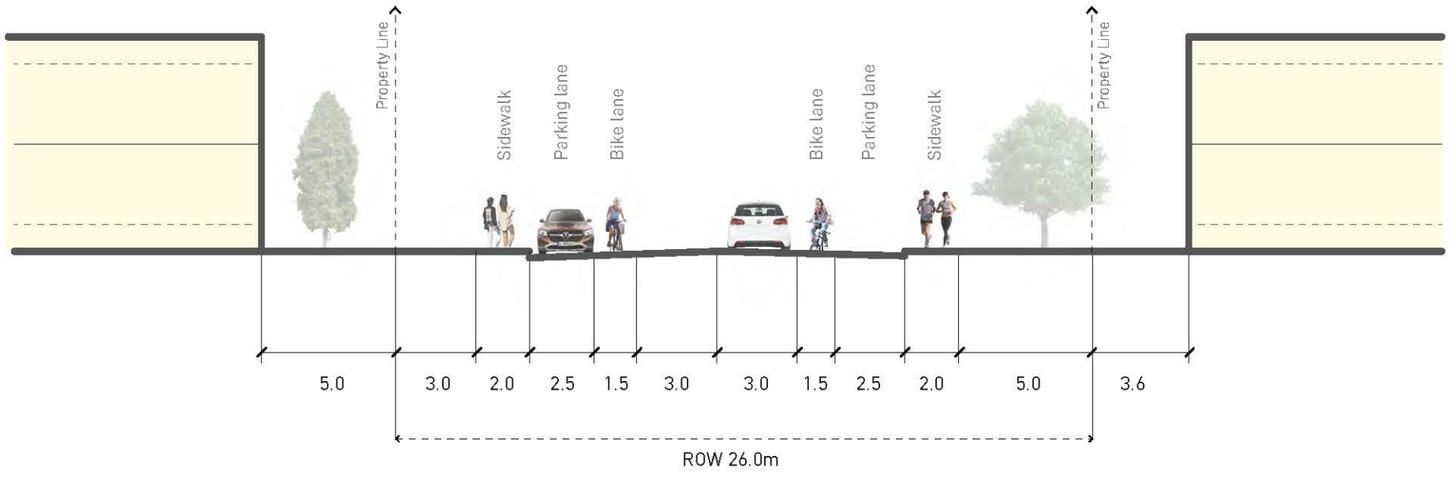


6.4 CYCLING NETWORK

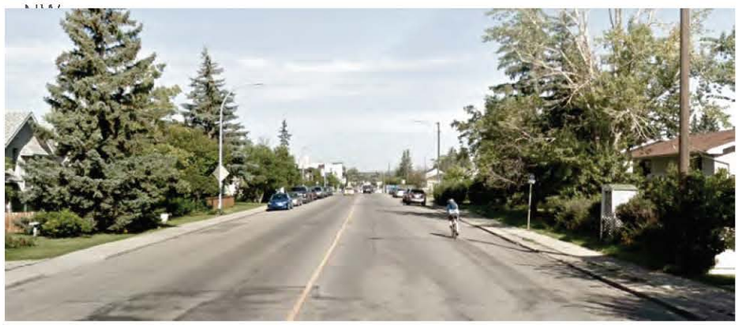
General Policy for Cycle Network

- One-way cycle lanes must be added along Bowness Rd, on each side of the travel lane.
- Cycling routes must be added as noted in the cycle map.
- Cycle routes must provide an uninterrupted path free of obstructions.
- Cycle routes must be well lit.
- Cycle routes must be designed to facilitate year round access. Cycle routes must provide amenities every 3 km to securely park and mend bikes.
- It will be illegal to park in a designated cycle lane.
- Roads with cycle lanes must be plowed within 24 hours of a snow event, following the completion of the snow falling.

General Guideline for Cycle Network

- It is suggested gravel be cleared from cycling lanes at minimum two times per year to improve safety.
- It is suggest bike pathways use permeable building materials to allow moisture to shed.
- It is suggested bike pathways be plowed within 36 hours of a snow event, following the completion of the snow falling.
- It is suggested to institute a local signage and way-finding system to allow Montgomery residents and visitors to navigate better along the cycle routes.
- Secure covered bike parking is suggested to be added in Montgomery square next to the BRT transit stop, across from the Bowmont civic office.
- Public bike parking facilities are suggested to be added along Main Street Bowness and should be covered to facilitate year round cycling.

Before - Bowness Road & 43 St. NW

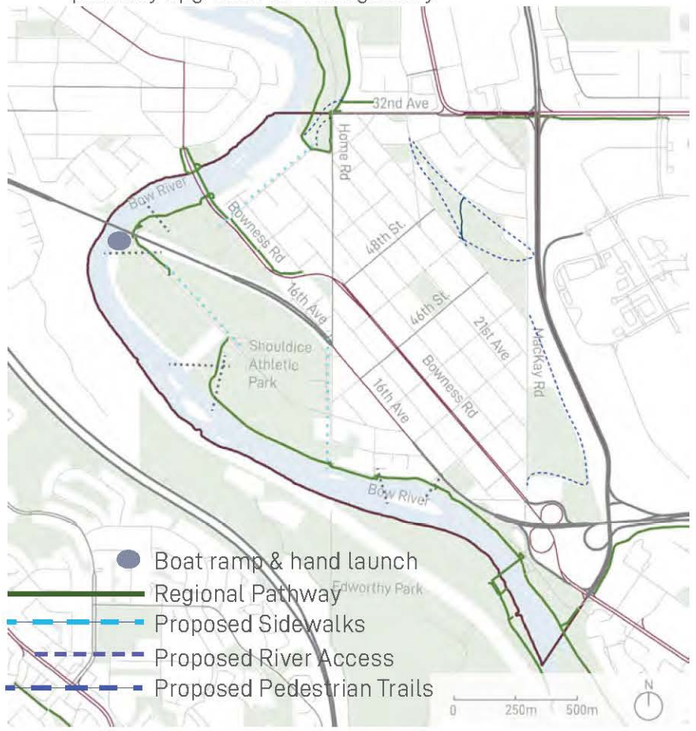


After - Bowness Road & 43 St. NW Section C-C'

6.5 PEDESTRIAN NETWORK

Pedestrians include all sidewalk users. Pedestrian connectivity is largely a product of the grid plan and block pattern of the community. Montgomery has a classic, highly regular grid block pattern which speaks well for basic connectivity. The rectangular block configuration creates many even streets and intersections. The uniform block structure enables travel in any direction between intersections. Yet, there are instances in Montgomery where we find gaps in the sidewalk infrastructure and a lack of barrier free sidewalks. We also find a lack of easily accessible pathways to the river, plus a number of desired trails in Montalban Park or other areas that need improvement.

Map revealing regional pathway, with needed pedestrian pathway upgrades for Montgomery.



In many cases, the sidewalks are narrow, with no buffer between pedestrians and the traffic, or a poor quality buffer like along Trans Canada highway. Some locations actually lack sidewalks. While Montgomery is found within a grid block pattern it has a mediocre walk score of 53 (Walk Score, 2020). Essentially this means only half of the population can successfully navigate around Montgomery.

Goals

Pedestrian Network goals include:

- Improve regional and local connectivity.
- Provide infrastructure that meets the needs of all pedestrians.
- Design pedestrian routes that accommodate the needs of range of pedestrians of all abilities.
- Promote and encourage active transport, specifically walking in Montgomery.
- Improve pedestrian safety.

No Sidewalk

General Policy for Pedestrian Network

- All Pedestrian routes must be barrier free.
- Pedestrian routes must have sidewalks on both sides of the street.
- Pedestrian routes must be added as noted on the pedestrian map:
  - -Sidewalk infrastructure
  - -River access infrastructure
  - -Pedestrian trails infrastructure
- Pedestrian routes must provide an uninterrupted path free of obstructions.
- Pedestrian routes must be well lit.
- Pedestrian routes must be designed to facilitate year round access.
- Pedestrian sidewalks must be no narrower than 1.5 m.
- Where property lines allow, sidewalks must not be narrower than 2.5 m.

General Guideline for Pedestrian Network

- Pedestrian routes are suggested to install a buffer between the road and sidewalk to increase safety.
- It is suggested to institute a local signage and way-finding system to allow Montgomery residents and visitors to navigate better to the six river access routes.

Site-Specific Guideline for Montalban Park

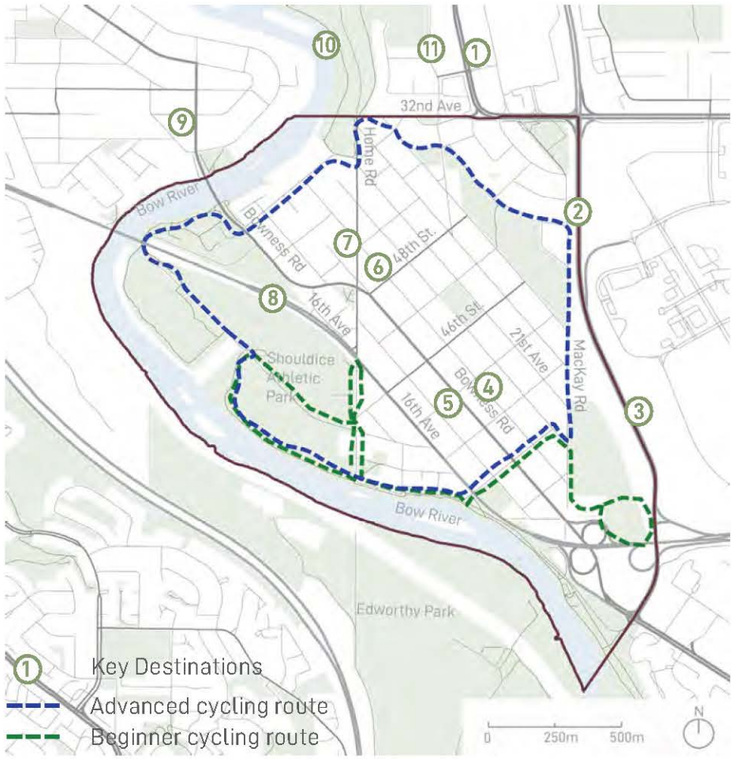
- Pedestrian trails along desire trails as marked on the map must be improved with a hard-packed gravel trail system, linking to the existing pedestrian network.

6.6 LOOPS FOR GROUPS

6.6.1 Cycling Strategy

Loops for groups is a neighbourhood strategy to promote the amazing cycling opportunities and destinations in Montgomery. Combining the new network of cycling links suggested previously with a neighbourhood wayfinding system, residents can easily access and successfully travel one of two routes. Route A is a loop designed for more advanced riders, which includes riding up hills and gaining access to the grand view. Route B is a loop designed for more beginner riders, including seniors and families with children. Each loop has key destinations highlighted and marked.

Map revealing suggested loops for two cycling group users: advanced and beginner, with key destinations.



Loops for groups is a strategy to connect residents to key recreation destinations. It promotes a healthy lifestyle and getting active.

Cycling Travel Distance
Route A / Advanced distance = 5.5 km
Route B / Beginner distance = 3.0 km

Key Montgomery destinations:

1. View of community, city, mountains and off-leash park from Montablan Park.
2. Hill climb.
3. Bike and pump track.
4. Climbing tunnel.
5. River access.
6. Commercial Street, coffee and donut stop.
7. Community Hall, playground and picnic area.
8. River access and off-lease dog park.
9. River access, boat launch, picnic area and rest stop.
10. Hill climb.
11. Community garden.

Goals

Loops for cycling groups goals include:

- Foster and encourage Montgomery residents to recreate and cycle around their community.
- Promote a healthy and active lifestyle for Montgomery residents.
- Increase community pride among local residents.

Grand View

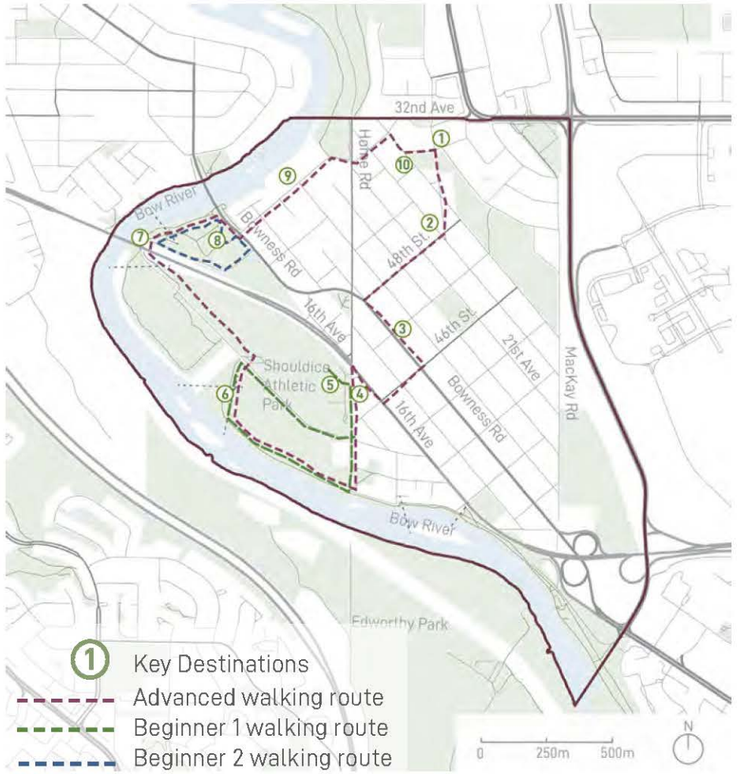
General Guideline for Loops for Cycling Groups

- Cycling routes should be marked using the suggested unified local wayfinding trail sign directional posts with map signage.
- Cycling routes should be marked at Montgomery gateways on a map sign for regional users to locate the community specific loops for groups.
- The Montgomery Community Association should have a link on their website providing the full details of the loops for groups cycling routes for all users to reference.

6.6 Loops for Groups

6.6.2 Walking Strategy

Loops for groups is a neighbourhood strategy to promote the amazing walking opportunities and destinations in Montgomery. Combining the new network of walking links suggested previously with a neighbourhood wayfinding system, residents can easily access and successfully travel one of three routes. Route A is a loop designed for more advanced walkers, which includes traveling up hills and gaining access to the grand view. Route B has two levels and loop designed for more beginner walkers, including seniors and families with children. Each loop has key destinations highlighted and marked on the map.



Map revealing suggested loops for three walking group users: advanced and beginner.

Loops for groups is a strategy to connect residents to key recreation destinations. It promotes a healthy lifestyle and getting active.

Walking Travel Distance
Route A / Advanced distance = 4.5 km
Route B / Beginner 1 distance = 2.0 km
Beginner 2 distance = 1.1 km

Key Montgomery destinations:

1. View of community, city, mountains and off-leash dog park from Montalban Park.
2. Hill climb.
3. Main Street.
4. Commercial Street, coffee and donut stop.
5. Community Hall, playground and picnic area.
6. River access and off leash-dog park.
7. River access and boat launch.
8. Inclusive playground, picnic area and rest stop.
9. Hill climb.
10. Community garden.

Goals

Loops for walking groups goals include:

- Foster and encourage Montgomery residents to recreate and walk around their community.
- Promote a healthy and active lifestyle for Montgomery residents.
- Increase community pride among local residents.

River Walk

General Guideline for Loops for Walking Groups

- Walking routes should be marked using the suggested unified local wayfinding trail sign directional posts with map signage.
- Walking routes should be marked at Montgomery gateways on a map sign for regional users to locate the community specific loops for groups.
- The Montgomery Community Association should have a link on their website providing the full details of the loops for groups walking routes for all users to reference.

6.6 LOOPS FOR GROUPS

6.6.3 Wayfinding Strategy-- Identity Strengthening

The Loops for Groups will feature a unified wayfinding system with matching trail sign posts paced through the various loops. Map signage will also be a part of the system, with a combined built in bench and unique neighbourhood identity. The map signs will be placed at gateways and through the community for regional and local users to access and successfully navigate. Finally, the community association will feature a link on their website to the Loops for Groups Map, with complete trail and loop information.

Main Street - pavers

Desire trails - granular

Main Street Montgomery will be highlighted and the importance of pedestrians will reflect in the unified contrasting paving material covering the site.

The desire trails around Montalban Park and through the Heritage Home Site will become formal pathways with a granular treatment.

Goals

Loops for groups goals include:

- Improve local and regional connectivity.
- Foster and encourage Montgomery residents to recreate and walk around their community.
- Promote a healthy and active lifestyle for Montgomery residents.
- Increase community pride among local residents.

General Guideline for Loops for Groups

- Loops should be marked using the suggested unified local wayfinding trail sign directional posts with map signage.
- Loops should be marked at Montgomery gateways on a map sign for regional users to locate the community specific loops for groups.
- The Montgomery Community Association should have a link on their website providing the full details of the loops for groups for all users to reference.

6.7 SUMMARY

With the expected increase in Montgomery's population, and having reviewed plans for making space for new residents to find accommodation, improvements will be needed to upgrade the mobility and connectivity networks. Our analysis revealed a number of traffic issues, including high traffic speeds, automobile oriented design, highway separating the community and problems with several intersections regarding pedestrian safety. We have suggested several modes to combat these issues, including road diets, with lane narrowing, plus a series of traffic calming measures. These issues were forefront with the community and those concerns are valid. Our suggestions and options vary and are site and intersection specific. The objective is to apply in some cases more than one intervention as needed. These measures are to take back the community from the auto focus and place priority on pedestrians and empower them to feel confident to cross the street safely.

Our next focus included measures to improve transit and cycling. To enable year-round comfort while waiting for the bus or commuting via bike to work, Montgomery residents need more options as there is not an LRT route available. Offering improved amenities, additional bike lanes and addressing snow clearing priorities will begin to further support active transport in Montgomery. Our final focus was to improve pedestrian access with adding missing sidewalks and overall links with pathway systems within Montgomery and on to destinations outside of Montgomery. Our Loops for Groups Strategy focuses on joining people to local community destinations, from the Main Street to the community garden.

07

PUBLIC REALM

7.1 OVERVIEW

7.1.1 Introduction

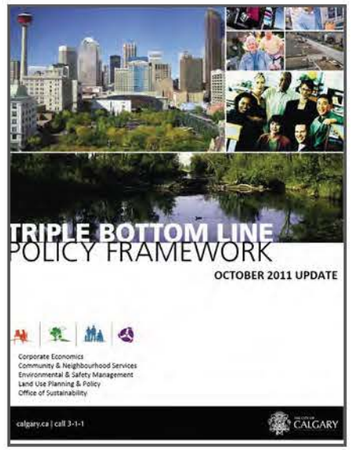
The public realm is defined as the places that are accessible to the public. It embraces a wide range of spaces including parks, open spaces, streets, plazas, and other spaces that allow the public to use freely. The public realm supports pedestrian and multi-modal transportation, encourages social activities and involvement, strengthens the identity of a place, and provides protection to the environment and ecosystem.

This chapter provides policy suggestions and design guidelines for a systematic approach for Montgomery to create a connected, diverse, and resilient public realm network. Public realm resources in Montgomery include Shouldice Park, Shouldice Athletic Park, Montalban Park, George Gell Park, Montgomery Hill, a small portion of Bowmont Park, Tourmaline Outdoor Fitness Park, Montgomery Town Square, streets, semi-private areas in commercial use and other natural, cultural, historic and recreational features or amenities.

While these resources are highly concentrated (most are closed to the riverfront), there is a potential to build interconnected public realm systems with decentralized placemaking anchors linked by green corridors, and trails.

This chapter comprises the following sections: Green Network, Green Infrastructure Strategy, Phytoremediation on Contaminated Land, Re-energizing the Riverfront and New Spaces for Places.

7.1.2 Legal Framework



Triple Bottom Line Policy Framework

A policy which directs municipal administration analyze and ensure the economic, environmental, and social value of their policies and programs.

Open Space Plan

A non-statutory document which frames the policy on open space for The City of Calgary, at a very broad level.

Environmental Policy

Policy guiding The City regarding the promoting and nurturing of an environmentally sustainable city, for citizens and the regional collective community.

Parks Urban Forest Strategic Plan

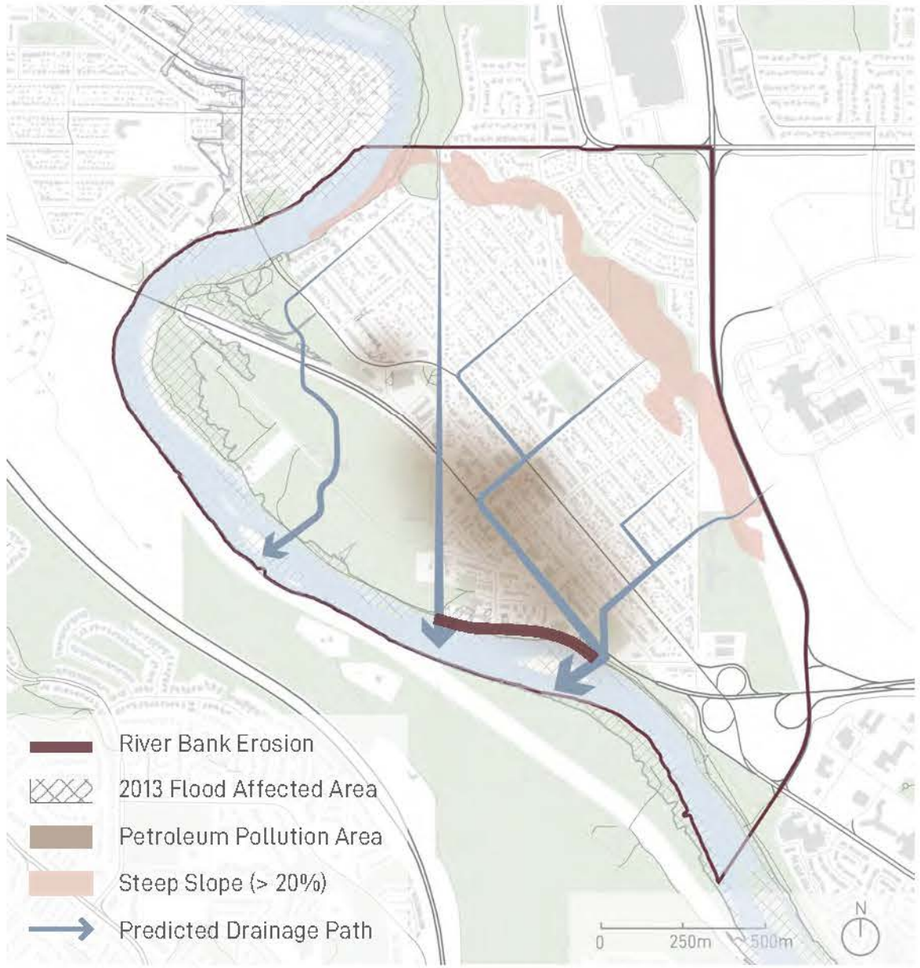
The City provides information on achieving a sustainable urban forest including public and private trees.

Other documents include:

- Sustainable Development Guidelines for Trees, Shrubs, and Groundcovers
- Tree Protection Bylaws
- Corporate Public Art Policy
- Stormwater Source Control Practices Handbook
- Stormwater Management and Design Manual
- Watershed Management Plans
- City-Wide Stormwater Targets
- LID Technical Guidance Manual
- Bird Friendly Urban Design Guidelines
- Biodiversity Policy
- The Riparian Action Program: A blueprint for resilience
- Riparian Strategy: Sustaining Healthy Rivers and Communities

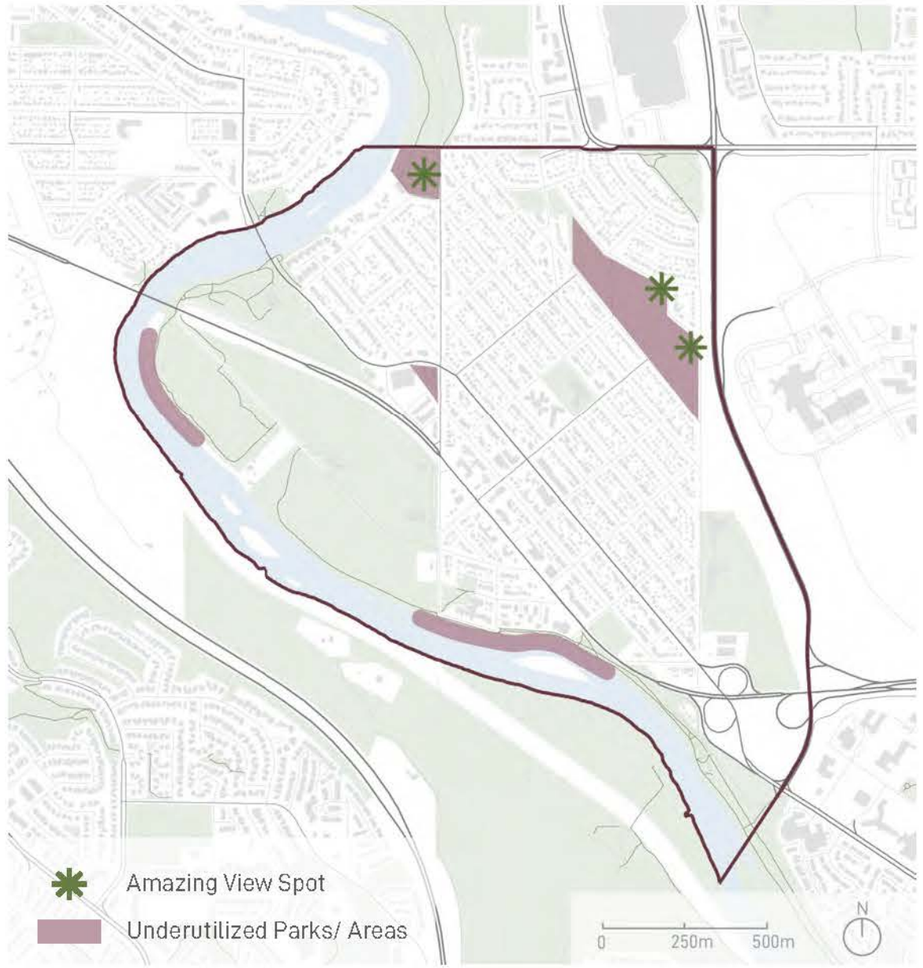
7.1 OVERVIEW

7.1.3 Synthesis of Previous Phase



What We Found

- Scarce local parks (5%). (Most of the open spaces are regional attractions)
- Disconnected open space
- River bank erosion
- Steep slope
- Serious petroleum pollution
- Untreated stormwater



What We Heard

- Disconnected parks/ river access
- Need gathering places
- Underutilized parks/ lack of programming
- Amazing view
- More trees around playground are needed

7.1 OVERVIEW

7.1.4 Key strategies and goals:

Build a green network
To connect various green space including parks, open spaces, plaza, corridors and civic spaces to create a continuous green network within and beyond the community.

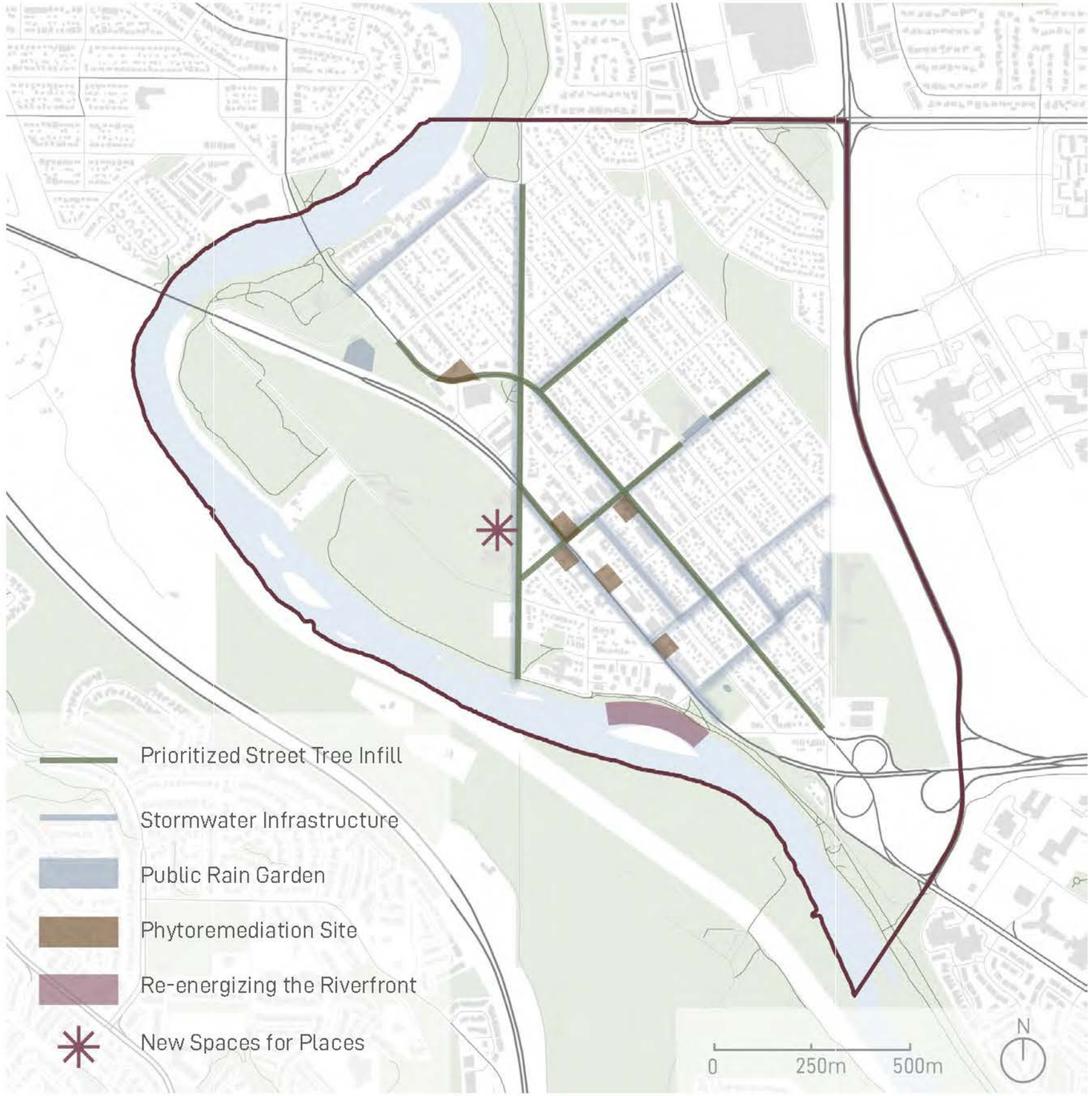
Create decentralized but accessible and connected public realm.
To add to the public realm for more equitable distribution throughout the entire community, and make sure they are easily accessible and within walking distance for all community members.

Reclaim spaces for people
To revitalize underutilized spaces, create opportunities for year-round activities and improve the life quality in Montgomery.

Integrated design
To integrate the public realm with natural corridors, green infrastructure, active transportation and pathway system.

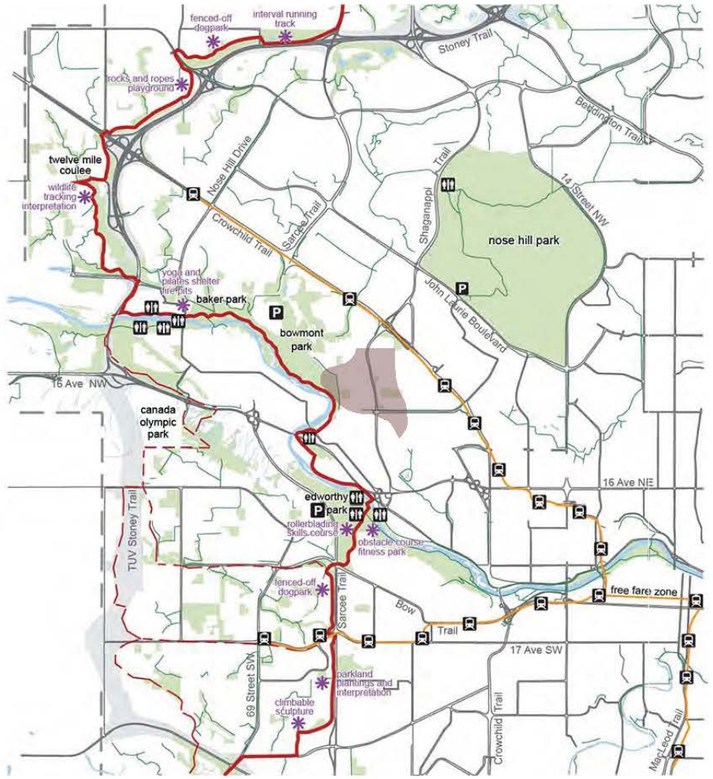
Enhance resilience
To protect the water source, environment and ecosystem and increase Montgomery's resilience to extreme weather.

Promote native species
To promote and nurture native species which usually requires minimum maintenance and saves water resources.



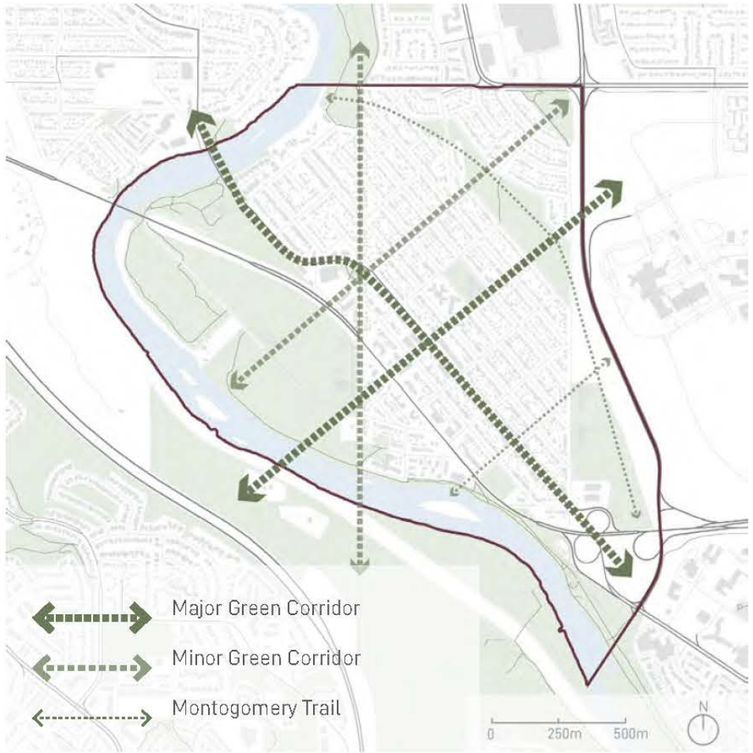
7.2 GREEN NETOWRK

7.2.1 Regional Connectivity



- The Rotary/ Mattamy Greenway

7.2.2 Community Connectivity



- Major Green Corridors (Bowness Rd, 46th St)
- Minor Green Corridors (Home Rd, 48th St, 43th St)
- Montgomery Trail

The Rotary/ Mattamy Greenway is pathway which encircles the entire City of Calgary. It is extensive and links the parks, amenities and services, including river valleys, and natural areas. This connected parkway and pathway is an important part of the interconnected mobility system enabling park users to travel and visit parks and amenities outside of one's own neighbourhood. It can be used by all year round for recreation or for commuting to work.

First, we propose to create two major green corridors along the Bowness Road and 46th Street to build connections between the community and the Rotary/ Mattamy Greenway and link different types of the public realm. Both of the Bowness Road and 46th Street will have a segment to be redeveloped as the main streets of Montgomery which are expected to have high pedestrian movement. It is a great opportunity to incorporate the green space and a range of public realms along these two roads to build physical and visual connections to make the regional green space connected with the community setting. It will also help to provide safe and pleasant walking links between the key destinations within the community at the same time strengthen the main street character and add identity to Montgomery.

Secondly, we propose two minor green corridors along Home Road and 48th Street. The minor green corridors focus on linking important local destinations such as historical home site, Motalban Park, Montgomery Community Hall and Montgomery Town Square with the major green corridors.

Finally, we propose a set of Loops for Groups, a Montgomery trail system in previous chapter to further enhance the local and regional active transport access as a supplement to the public realm network. (please see detail in Chapter 6.6)

7.3 GREEN INFRASTRUCTURE

7.3.1 Background

As Montgomery is redeveloping and growing, plants are gradually removed and the soil is covered with asphalt, concrete, and buildings with rooftops. With many auto-oriented services distributed along 16th Ave, a huge amount of areas in Montgomery have impervious surfaces. These impervious surfaces do not allow water to infiltrate into the ground. When rainfall or melt snow runs off these surfaces, it floods buildings, streets, and waterways, increases riverbank erosion along the Bow River, picks up pollutants like automobile oil, petroleum herbicides and pet waste and collects them in the Bow River.

To mitigate the pollution and negative environmental impact on Montgomery, we propose a series of green infrastructure strategies within the community. Green infrastructure refers to constructed facilities that use natural systems to treat stormwater, reduce runoff quantity, expand wildlife habitat, provide shade, and mitigate urban heat island effects.

7.3.2 Key Goals

Aim to develop networks of green infrastructure and create other benefits at all spatial scales in Montgomery by providing various green infrastructure facilities.

7.3.3 Introduction

A collection of green infrastructure interventions will be recommended and assigned according to the applied location. The scope of interventions varies from community scale (pavement) to individual building scale (residential house).

Green infrastructure interventions for the contaminated sites will be discussed in chapter 7.4.

General Policy for Green Infrastructure

- Propose an appropriate green infrastructure plan considering at the community scale or city scale then tailor it to the specific site.
- Propose appropriate green infrastructure strategies based on the consideration of local topography, predicted drainage paths, available space, street trees, aesthetic demand, and placemaking.
- Incorporate multiple benefits of green infrastructures and have them become assets to Montgomery.
- Landscape architects and planners should work with engineers in the early phase to maximize the potential of green infrastructures.

7.3.4 Limitation

Some of the characteristics of Montgomery may limit the performance of green infrastructure and require slight design modifications. The limitation factor includes:

- The limited water source for Irrigation
- Space Constraints on street and retrofitting project site
- Pollution from the contaminated site (please see detail in chapter 7.4)

General Guideline for Green Infrastructure

Calgary, including Montgomery has limited water resources which may be an obstacle to creating green infrastructure. Therefore, the following principles of xeriscaping may be applied to conserve water sources:

- Plant species according to their water demands.
- Use plant species which require less water; native species and drought-tolerant plants.
- Use efficient irrigation systems: by making seasonal adjustments to rainfall and by plant type.
- Make soil improvements by adding organic materials to preserve moisture, support vegetation and aid in treating stormwater runoff.
- Use mulches, organic materials aid in pollution filtration plus create a weed barrier.

Site-Specific Guideline for Green Infrastructure

Most of the green infrastructure implementation in Montgomery would be retrofitting or redevelopment projects which pose a challenge of fitting green infrastructures in limited spaces. To overcome this challenge:

- It is suggested to use an integrated design approach and choose green infrastructure features that can serve multiple purposes. For example, integrate the rain garden and bioretention planter into curb extension, pedestrian refuge, and other traffic calming facilities.
- It is suggested to choose the appropriate green infrastructure feature strategically according to available space. For example, choose a biofiltration planter instead of a bioretention swale to apply on a narrow road.

7.3 GREEN INFRASTRUCTURE

7.3.5 Stormwater Infrastructure on a Roadway

Walled Bioretention Planter

A walled bioretention planter is a type of stormwater infiltration facility with vertical walls or fences on one side or multiple sides. It usually has a flat bottom and is flexible with size and depth (National Association of City Transportation Officials). Advantages apply to where it has high multi-modal movement. It also provides snow-storage space and acts as a buffer to protect pedestrians from road spray in the winter (The City of Edmonton, 2016).

Considering the characters and demand of the streets and topography conditions, we propose to implement walled bioretention planters on Bowness Road along the commercial segment, 46th Street commercial segment, and 16th Ave (49th Street to 43rd Street). These three segments of roads are on the major drainage path which collects most of the runoff from the community. Walled bioretention planters offer greater capacity within the cross-section for stormwater detention and infiltration than other roadside green infrastructures. In addition, these three segments host frequent pedestrian traffic and wide sidewalks which lead to the needs of the seating, protective buffers, and add space to store shoveled snow in winter. Walled bioretention planters are highly adaptable to this urban context and are able to cater to all demands these three streets have.

Biofiltration Planter

In some situations, where infiltration is not successful, walled planters can be built with impermeable bases with an underdrain pipe to facilitate drainage and filter water runoff. Biofiltration planters treat water quality and decrease runoff volumes and may be used more in limited right of ways(NACTO).

Considering the characters and demand of the streets and topography condition, we propose to implement a series of biofiltration planters along 42nd Street, 43rd Street, Home Road, a segment of Bowness Road, and a segment of 17th Ave (See map).

Bioretention Swale

Bioretention swales are low, planted landscaped hollows with inclined sides. They are designed to capture, treat, and infiltrate stormwater runoff as it moves downstream. Bioretention Swales are more economically wise but need s more space to implement. The large size of the swale can also be a part of a strategy to provide pedestrians a safe buffer along roads and to reclaim spaces for people(NACTO).

Considering the characters and demand of the streets and the topography condition, we propose to implement bioretention swale on 52nd Street, 48th Street, and a segment of Montalban Avenue (See map). These selected segments of roads are part of the walking loops we proposed in the previous chapter (see chapter 6.) where we would like to reclaim spaces from right-of-way for safety, livability, and biodiversity. The bioretention swale implementation will help to build a buffer with a wide range of vegetation and more street trees. This increases the green space, adds wildlife habitat, and provides a more comfortable and safer walking environment to encourage loop walking.

General Guideline for Walled Bioretention Planter

- The planter bottom is suggested to be at least 1.2 meters wide to nurture vegetation health(NACTO).
- Street trees are suggested to be incorporated into the walled bioretention planter to fill the gap of the tree canopy and provide shade in summer.
- Seating is suggested to be incorporated on the wall or fence sides to improve the quality of the public realm.

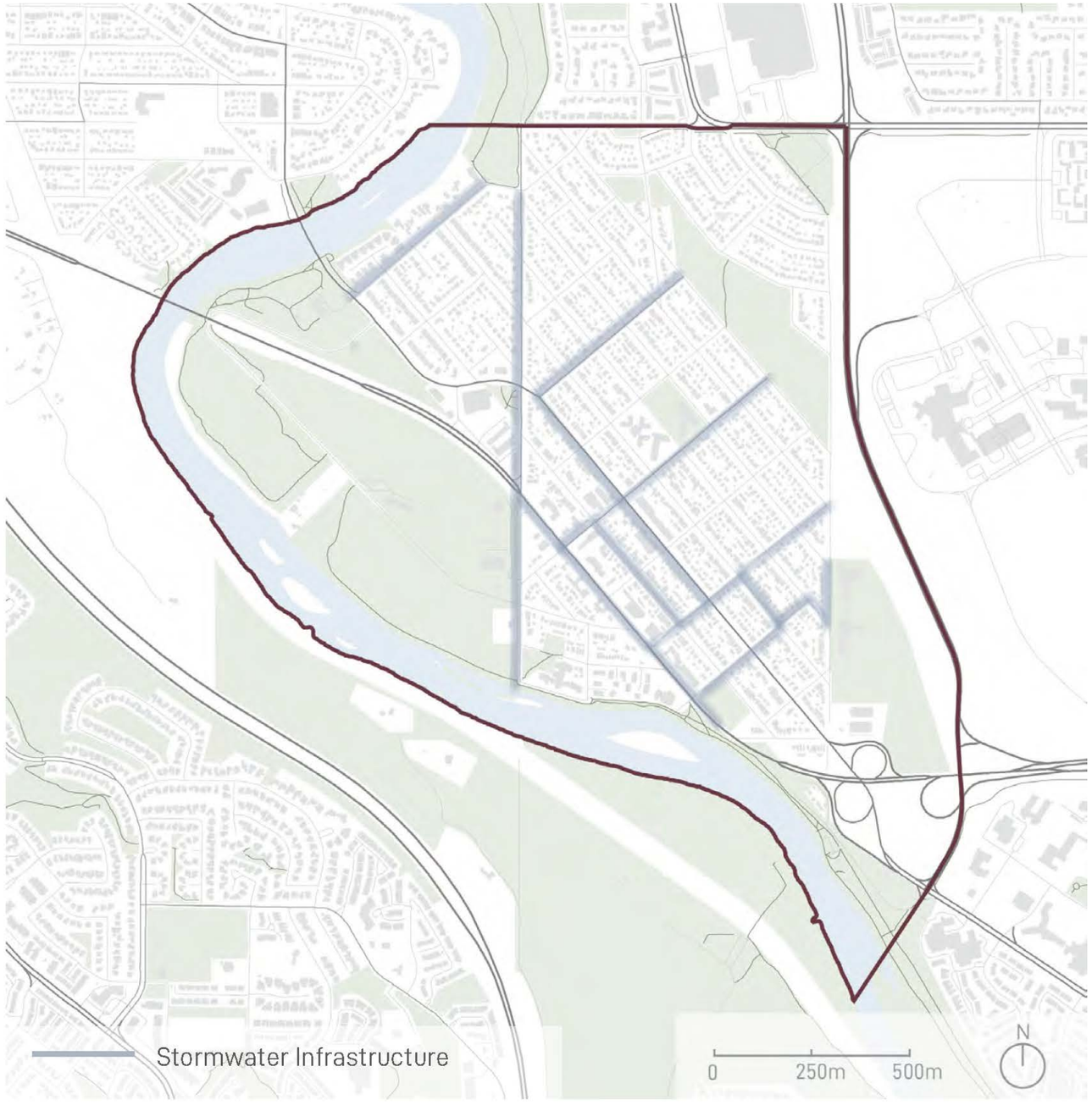
General Guideline for Biofiltration Planter

- It is suggested to implement biofiltration planters on limited rights-of-way or where there is limited space.

General Guideline for Bioretention Swale

- It is suggested to design the slopes of the inclined sides considering the potential for erosion, the ability to establish plants, and if it is easy to have them maintained.
- It is suggested to design the bioretention swale to accommodate street trees.

Stormwater Infrastructure Strategy on Roadways



7.3 GREEN INFRASTRUCTURE

7.3.3 Street Trees

Street trees are the most multifunctional green infrastructure features among the whole green infrastructure system. They mitigate the urban heat island effect through evapotranspiration and shading which contributes enormously to stormwater management. Street trees can also visually narrow the roadway and in that way slow the traffic and improve safety(NACTO). In addition to their immense social and aesthetic value, street trees provide quantifiable economic and ecological value to the community, by having a connected canopy system throughout the community and city (The Trees and Design Action Group, 2016).

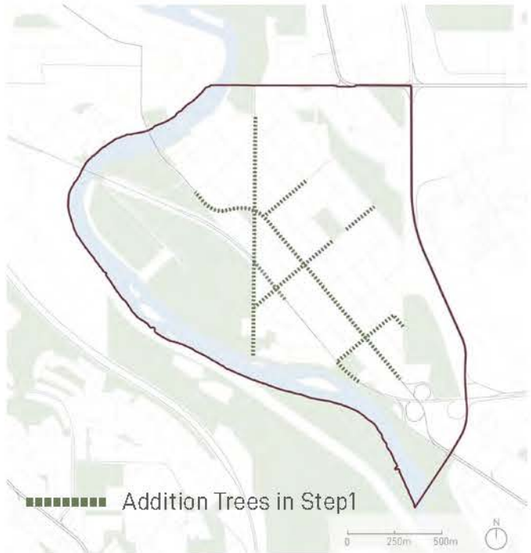
From the previous analysis, we found the street trees in Montgomery are too sparse to benefit the community. There is an urgent request from the feedback we got in the workshop with the community, to help build community identity. While street trees will tremendously improve the quality of place and local distinctiveness as Cullen states in, *The Concise Townscape*, "Of all the natural aids to townscape the tree is surely the most ubiquitous (...) For just as trees have different characteristics, fastigiate or drooping, geometric or fluffy, polished or velvet, so these qualities may be used in dramatic conjunction with buildings, either to extend the conception or to offset it as a foil." (Cullen, 1961).

In response to the need of this integrated and sustainable infrastructure, we proposed a strategic plan for the next ten years to bring more street trees to Montgomery, through a two-step plan.

First, in the first five years, complete the initial implementation of street trees by adding along green corridors as we proposed previously including Bowness Road, 16th Avenue, Home Road, 48th Street, 46th Street, and 43rd Street and MacKay Road. Second, in ten years fill the gaps among the tree canopy and add more trees to the streets that have low tree density.

Current Urban Forest

Addition Street Trees in Step 1 (in 5 Years)



Current Street Tree Coverage

Addition Street Trees in Step 2 (in 10 Years)

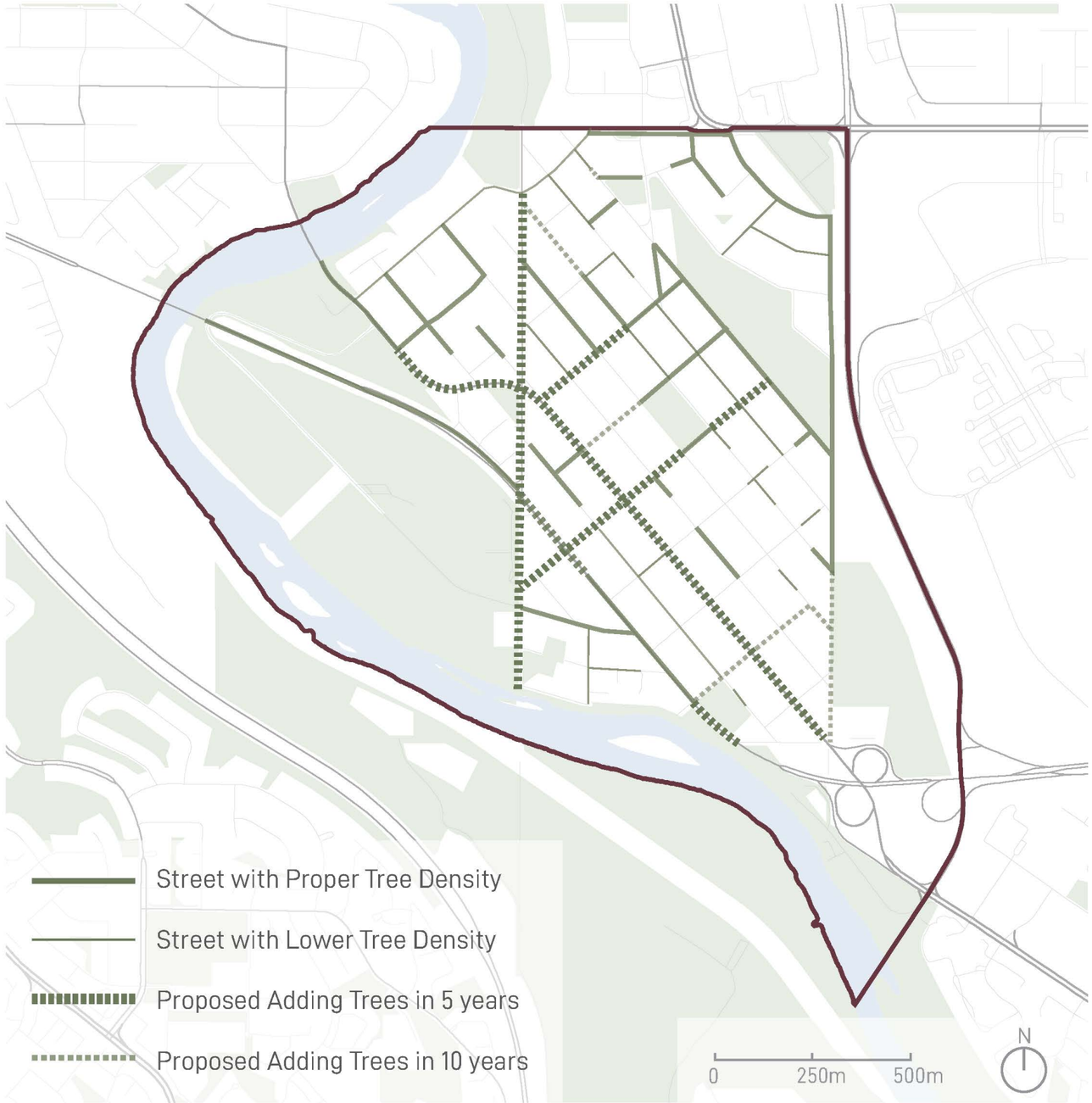
General Policy for Street Tree

- Plant a range of tree species to be more resistant to disease, pests and climate change, plus improve the year-round visual impression(TDAG, 2016).
- Add a tree maintenance program to support the tree canopy system (The City of Calgary)
- Ensure thoughtful attention to large tree species regarding their benefits and long-term influence
- Endorse and plant trees to improve public and private land benefits including social, environmental, aesthetics and economic value
- Use an integrated design plan to include stormwater management infrastructures, lighting, street trees and street fixtures wholly

General Guideline for Street Tree

- It is recommended to include flowering trees and prominent fall coloured trees to enable seasonal tree variety and changes.
- Promote community grasp and understanding of the value of trees through a tree adoption program

Street Tree Strategy



7.3 GREEN INFRASTRUCTURE

7.3.4 Rain Garden

Rain Garden in Residential Front Yard

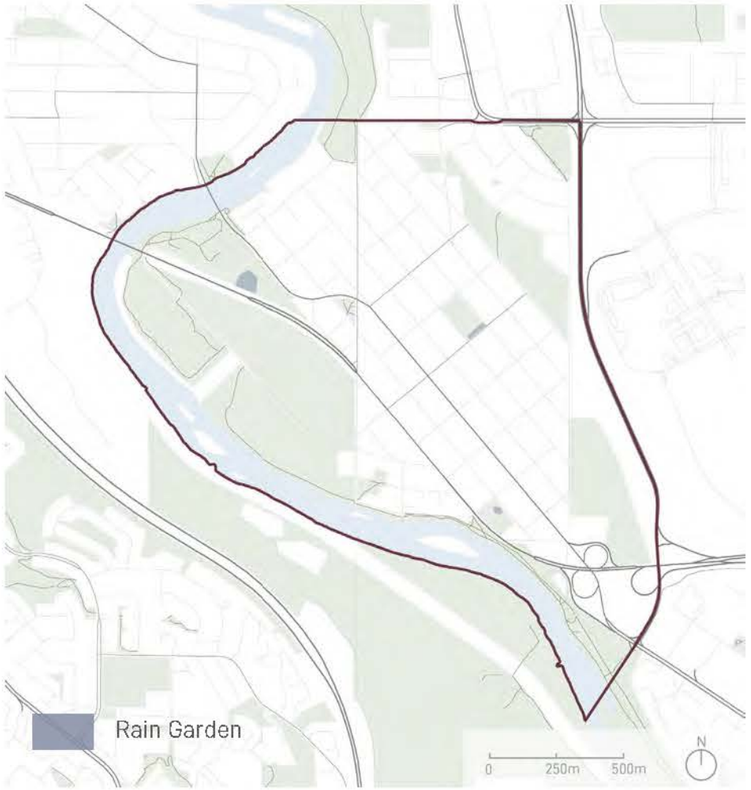
Rain Garden in Bridgeland Park

Rain gardens are designed hollows in the ground planted to capture and permeate stormwater. Rain gardens reduce stormwater runoff through storage, permeation and evapotranspiration. Held solids are eliminated through physical separation by plants and soils. Contaminants, like dense metals or nutrients are alleviated through organic action (the University of Tennessee, Knoxville, Landscape Architecture Program).

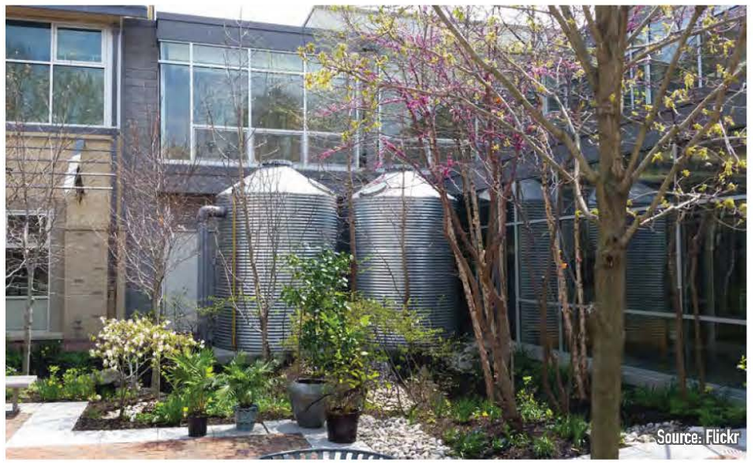
General Guideline for Rain Garden

- It is suggested to apply rain gardens into a property's low areas, however avoid locations which stay consistently damp.
- It is suggested to apply rain gardens in south exposure and full sun to allow drying out between rain events.

Rain Garden Location



7.3.5 Rainwater Harvesting



Commercial Rainwater Harvesting

Residential Rain Barrel

Rainwater harvesting includes gathering and stockpiling rainfall from rooftops for use as a water source at a future time, as needed(UT).

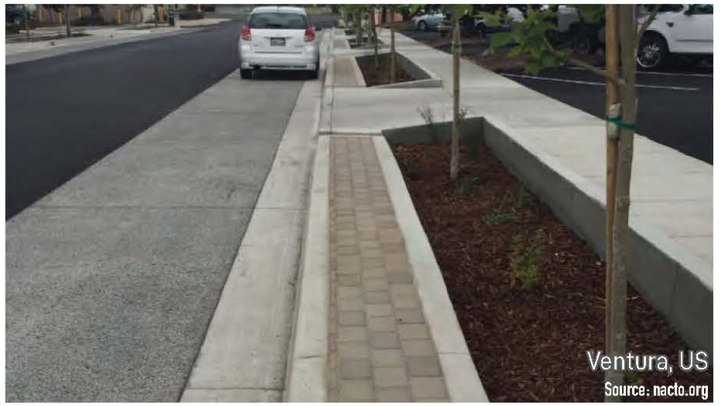
Commercial rainwater storage can have a considerable influence on decreasing runoff by storing stormwater. Commercial rainwater storage cisterns may be located below grade, or at grade level or even inside structures. Some may be designed as garden elements to advertise the collection of rainwater. A variety of uses for the rainwater include non-potable uses like area irrigation or water features like ponds.

Residential rainwater collecting is a saving routine that aids in runoff reduction. This routine is user friendly and cost effective. Rain barrels and other storage tanks have a variety of options in size and shape to match the resident's demands. They can be decorative, or just a storage device. Collecting rainwater can counterbalance irrigation demands.

General Policy for Rainwater Harvesting

- Rainwater collecting systems storage containers should match the volume of estimated rainfall.
- The end use for rainwater collected must be considered along with the roofing substance it was collected off.
- Rainwater collection containers need to be designed with an overflow to a permeable area, like a rain garden.
- One must consult with an expert concerning permitted uses for commercially collected rainwater.

7.3.6 Permeable Pavement



The high volume of impenetrable surface around cities is a large supplier of urban stormwater issues. Reducing the amount of impermeable surfaces with permeable substances reduces runoff and permits water to creep into roads and pathways.

Porous asphalt, pervious concrete, permeable interlocking concrete pavers and grid pavers allow stormwater to seep under the road surface and can be used on any portion of the road considering the surface conditions.

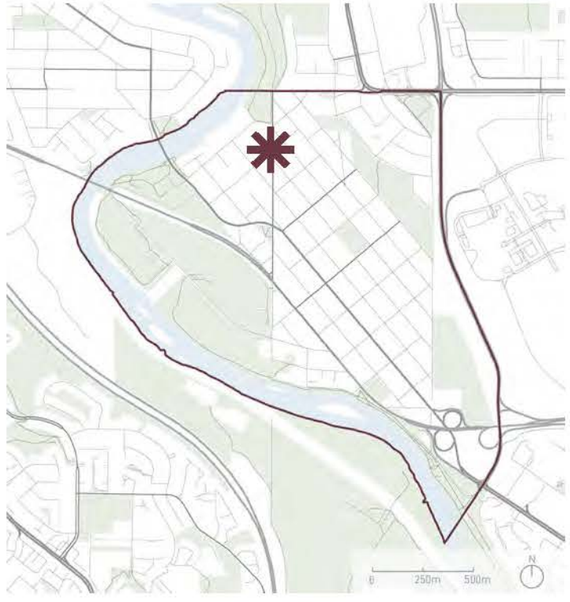
General Guideline for Permeable Pavement

- It is suggested to apply permeable pavement on bikeways, parking lanes, and streets with lower vehicle traffic volumes and limited heavy vehicles.
- It is suggested to apply porous concrete on sidewalks and pathways to increase infiltrative area.
- It is suggested to apply reinforced turf products for overflow parking, fire lanes, and event spaces.

7.3 GREEN INFRASTRUCTURE

7.3.7 Configuration

Home Road, NW



Before

Biofiltration Planter

Street Tree

Biofiltration Planter

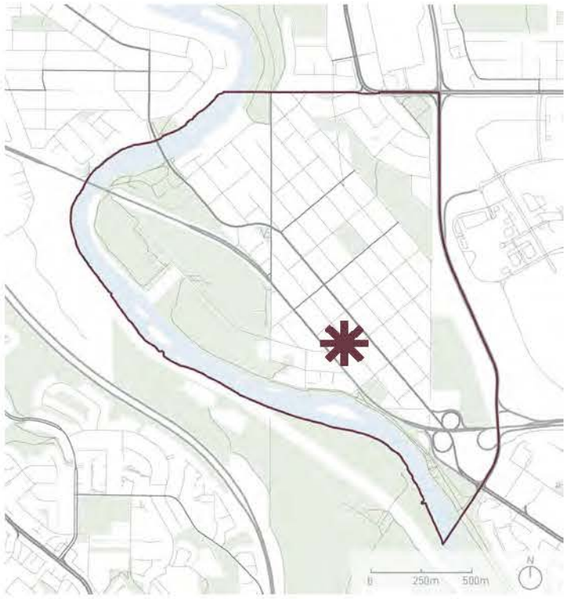
Permeable Pavement

After

7.3 GREEN INFRASTRUCTURE

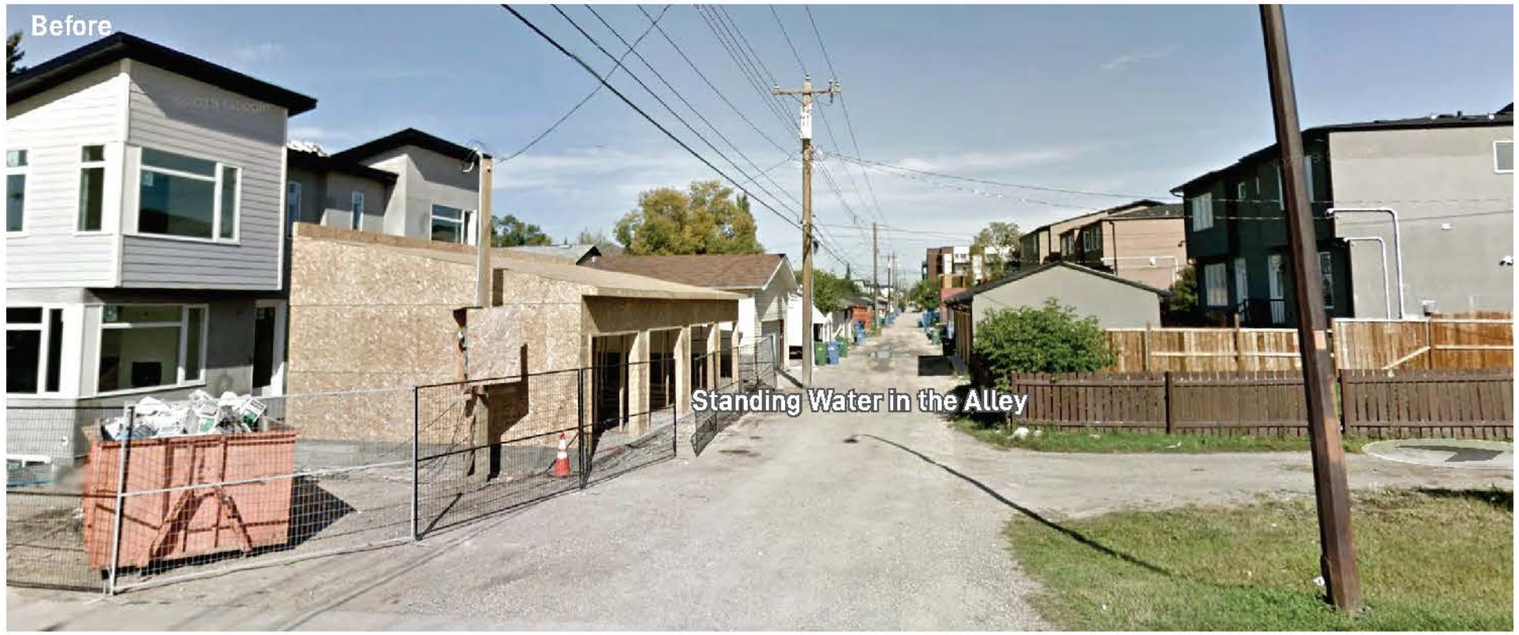
7.3.7 Configuration

Alley



Bioretention Swale

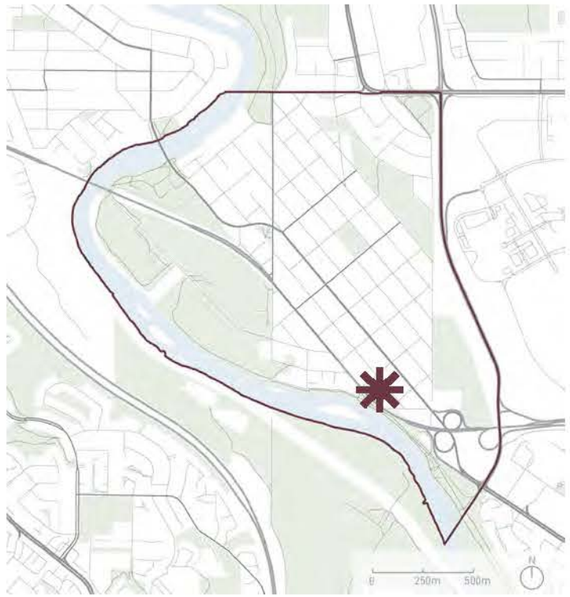
Permeable Pavement



7.3 GREEN INFRASTRUCTURE

7.3.7 Configuration

George Gell Park, NW



Before

Picnic Table

Rain Garden

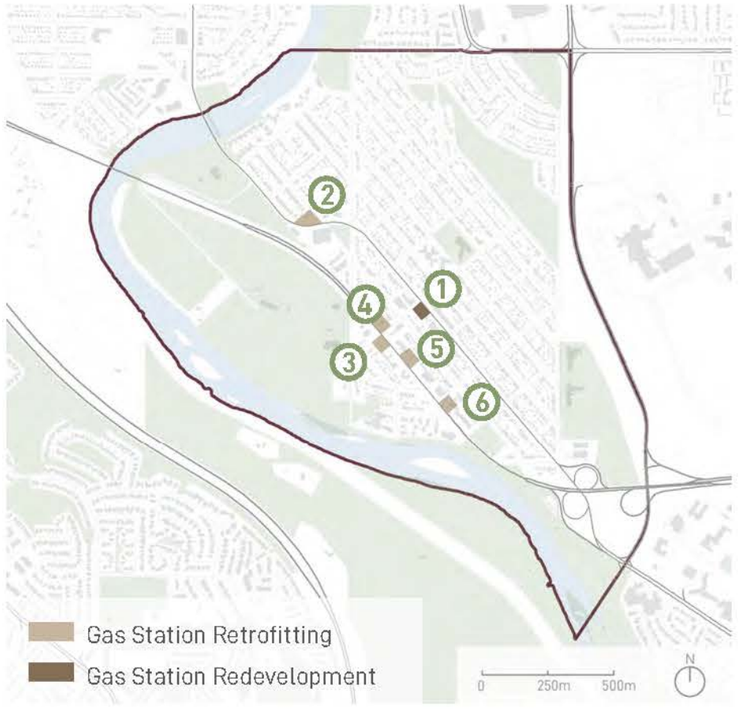
Permeable Pavement

After

7.4 PHYTOREMEDIATION ON CONTAMINATED LAND

7.4.1 Overview

Due to the character of 16th Avenue, Montgomery features a range of typical auto-oriented land use including six gas stations, auto services and heavily used surface parking with potential petroleum contamination. The earliest business license of a gas station that can be tracked was issued in 1994, which means some of these lands have been generating a large amount of contaminants for at least 25 years and are still producing more contaminants daily. The accumulation of contaminants can become a threat to adjacent resident's health and have long-term impacts on water source as it is so close to the Bow River.



③ ESSO Smart Stop 37807

④ SHELL Montgomery Gas Station

⑤ CO-OP Montgomery Gas Station

① HUSKY Montgomery Gas Station

② CENTEX Montgomery Gas Station

⑥ 7-ELEVEN 16 Avenue Northwest Gas Station

7.4 PHYTOREMEDIATION ON CONTAMINATED LAND

To ease the pollution and benefit both the community and overall environmental system, we propose to adopt phytoremediation technologies for the following reasons:

- Phytoremediation is capable in assisting remediating common toxics in urban brownfields including polycyclic aromatic hydrocarbons, oils, greases, and heavy metals (Kennen, 2015).

- Phytoremediation is a cost effective and attractive option for urban brownfield areas to treat multiple contaminants simultaneously (Raskin and Ensley, 2000)

- Phytoremediation can be tailored as site-specific solutions as it has minimal disturbance of the site.

> *"A typical gas station patron might spill 0.01 percent of the fuel he or she buys. A mid-sized gas station sells about 100,000 gallons of fuel in a month, which works out to 10 gallons of fuel dripping onto the ground every month – per gas station.*
>
> *About 10 percent of each drop of gasoline remained in the concrete after 4 hours, the researchers reported at the 2015 American Geophysical Union Fall Meeting in San Francisco. For diesel, however, a much larger proportion of each drop lingered in the concrete: about 70 to 90 percent."*
>
> (Ihwang, 2015)

General Policy for Phytoremediation

- Special study must be carefully completed, so contaminants in the soil will not be mobilized, and in that way expand contamination range and increase the health risk(Kennen, 2015).
- To achieve phytoremediation landscape design, landscape architects should collaboratively engage with other site engineering disciplines and take an integrated design approach at the initial phase rather than carrying out landscape design after the initial civil and environmental engineering design has taken place (Kennen, 2015).

General Guideline for Phytoremediation

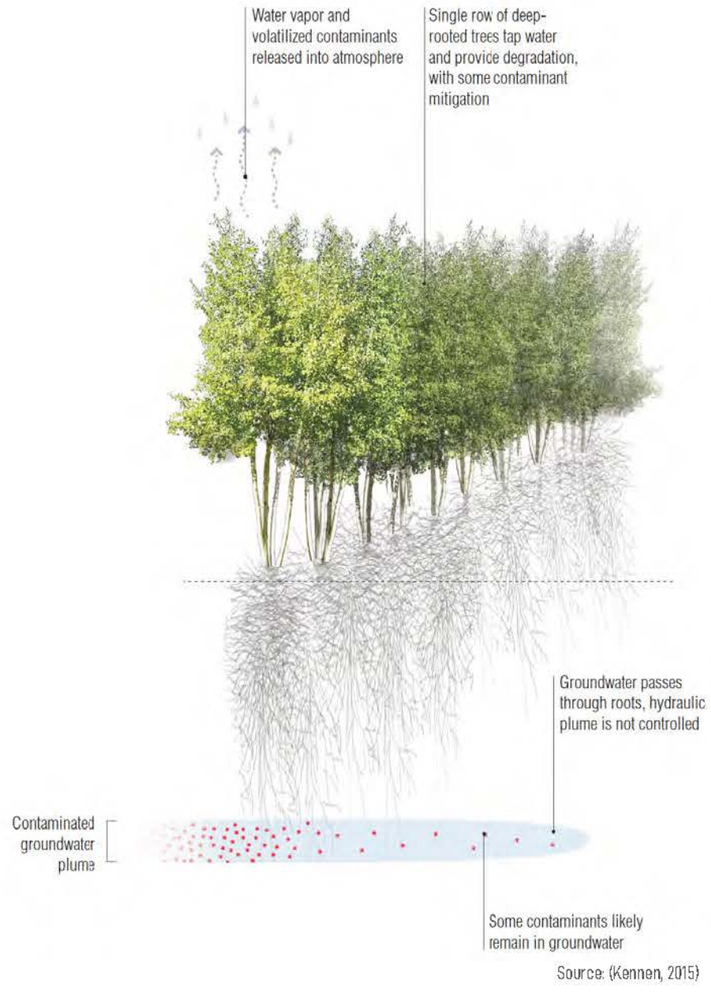
- Mixed species: Habitat corridors for foraging and ecological connectivity become feasible with the introduction of mixed species. A more diversified microbiology promoted by mixed species will also likely stimulate rhizodegradation.

General Guideline for Contaminated Auto-oriented Site Retrofitting

- Provide ample phytoremediation landscaping, in combination with building orientation, to enhance the streetscape and define the street edge.
- The sidewalk along the site should be raised to curb level.
- Provide a minimum 3.0 metre wide phytoremediation landscape area along the edge of a site where parking areas, driveways or stacking lanes are adjacent to a public street. Use trees, shrubs, hedgerows and other phytoremediation landscaping to screen cars from view while allowing eye level visibility into the site.
- Select the plants species considering their tolerance to petroleum pollutant or other sort of pollutants and the urban setting such as road salt in winter.

7.4 PHYTOREMEDIATION ON CONTAMINATED LAND

7.4.2 Phytotechonologies



Source: (Kennen, 2015)

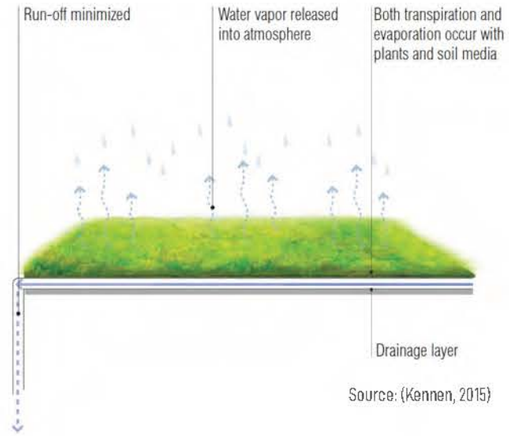
Interception Hedgerow

Description: A single row of trees tap into the water to help degrading contaminated groundwater. The goal is the partial removal of contamination in the small amount of space plated as the groundwater penetrates through the surface. The groundwater plume won't be captured and often there is only partial remedy for contaminants (Kennen, 2015).

Target: Groundwater (up to 6 meters/20 feet deep)

General Guideline

- For gas stations, auto-repair shops, dry cleaners, urban industrial site perimeters, it is suggested to place interception Hedgerow around the property perimeter to degrade organic pollutants within the on-site groundwater. It can be served as aesthetic buffer to mitigate views, define boundaries or inhibit access. Ecological functions such as habitat and wildlife corridors can be achieved through mixed species.
- It is recommended to use mixed species in phytoremediation. Habitat passages for scavenging and ecological linking are possible using a variety of species. Having a variety of species will promote a varied microbiology and activate the process of rhizodegradation, degradation of contaminants around plant roots.



Source: (Kennen, 2015)

Green Roof

Description: Evapotranspiration of water from roofs is maximized. Contaminant removal is rarely provided; the goal is to prevent contaminant mobilization (Kennen, 2015).

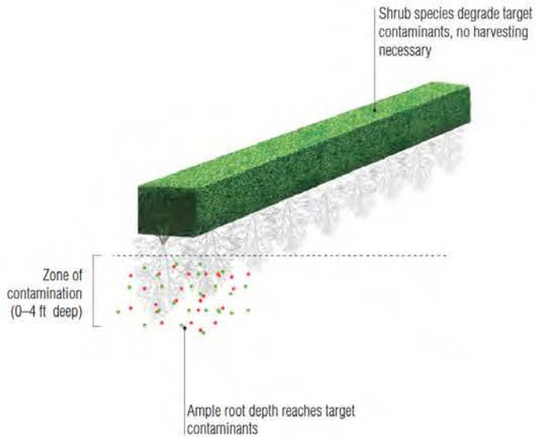
Target: The water vector – rainwater/stormwater

General Guideline

- Green roofs are suggested to only be considered for minimizing stormwater, not contaminant removal (Kennen, 2015).
- A green roof system is recommended for buildings and infrastructure with flat or slightly sloped roofs. An effective way to reduce the possibility for the water to catch and mobilize contaminants during precipitation is to minimize the stormwater run-off from the buildings.

7.4 PHYTOREMEDIATION ON CONTAMINATED LAND

7.4.2 Phytotechonologies

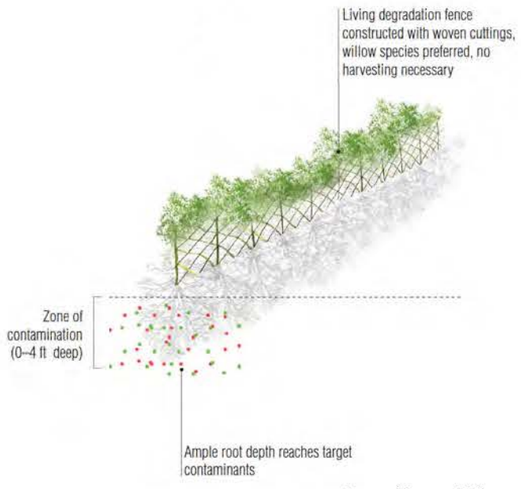


Degradation Hedge and Living Fence

Description: Woody shrub species transplanted to break down contamination in the earth up to 1.2 metres deep. Contaminant break down is achieved without collecting the plant (Kennen, 2015).

Target: Surface soils (0–1.3 meters/0–4 feet deep)

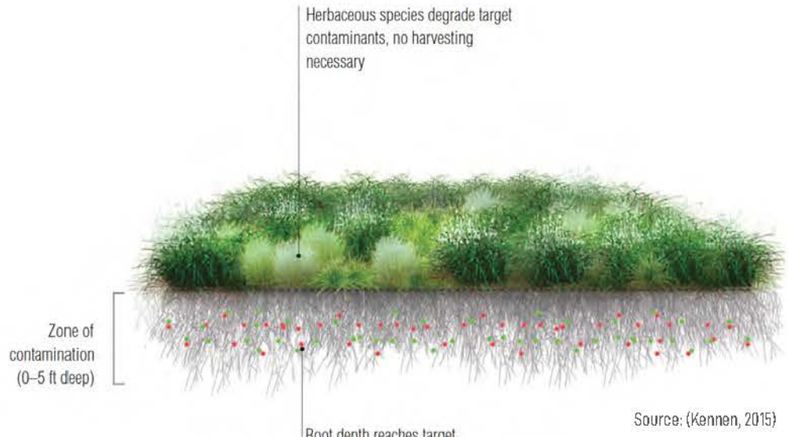
Degradation Hedges utilize shrub species to define areas and degrade contaminants. It has the same degradation functioning as Degradation Bosque typology. The Difference is Degradation Hedges target surface soil while Degradation Bosques tackle deep contamination.



Source: (Kennen, 2015)

General Guideline

- It is suggested to plant degradation bushes around the outer property line of gas stations, auto-repair shops, dry cleaners, urban industrial sites to break down organic pollutants in the area groundwater. The hedge buffer can offer aesthetic values to enhance the views and establish the area perimeter.
- A variety of species should be chosen to offer ecological advantages for wildlife and habitat pathways inside a city.
- Degradation bushes can be partnered with interception hedgerows and other systems around area perimeters, to boost the degradation of contaminants in a localized site.



Source: (Kennen, 2015)

Degradation Cover

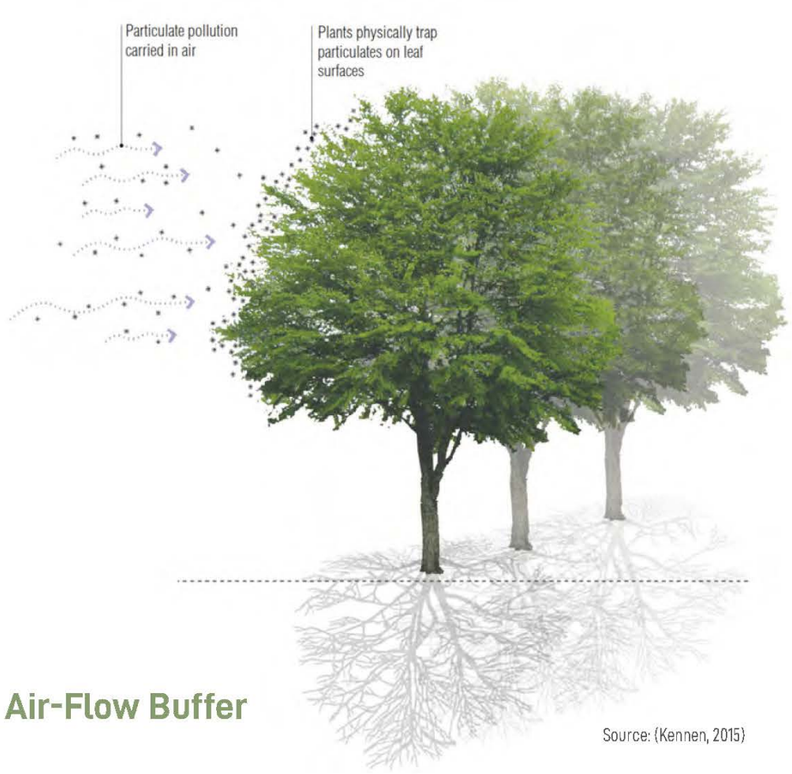
Description: Degradation Cover uses dense, deep-rooted non-woody plants to eliminate contaminants, without collecting the plant, in surface loam up to 1.5 metres deep (Kennen, 2015).

Target: Surface soils (0–1.5 meters/0–5 feet deep)

Deep-rooted, drought-resistant and easy-to-establish/maintain prairie grass species are often used to stimulate rhizosphere activities with their thick, fibrous root zone. Being more effective than monocultures, mixed-species covers encourage a diverse environment and the system benefits from the addition of nitrogen-fixing species like legumes (Kennen, 2015).

7.4 PHYTOREMEDIATION ON CONTAMINATED LAND

7.4.2 Phytotechonologies

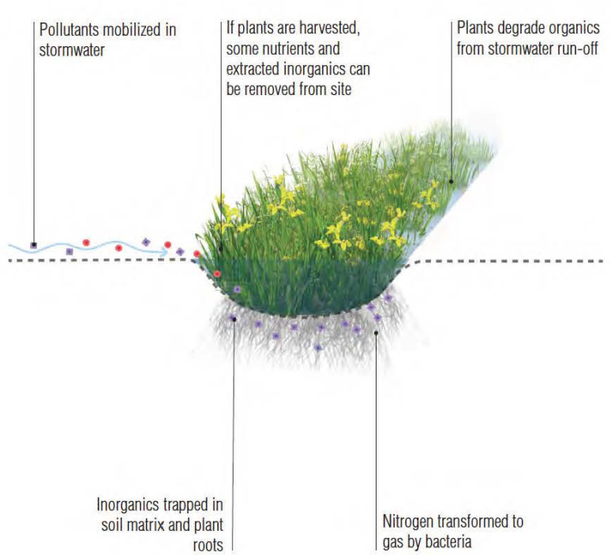


Source: (Kennen, 2015)

Air-Flow Buffer

Description: The leaf surfaces of plants capture airborne particles, correcting the air quality of downwind sites. Without degradation, particles will ultimately invade stormwater as a possible pollutant, for which other phytotypologies can provide remediation (Kennen, 2015).
Target: Air

Particles are part of air pollution that can be removed by vegetation. Automobiles generate particles. Studies have shown that airborne particle content negatively correlate to distance from roadway and vegetation coverage. As particles are physically captured by leaves, they are only isolated, not degraded. The particles could enter the stormwater under certain circumstances (Kennen, 2015).



Source: (Kennen, 2015)

Stormwater Filter

Description: Vegetation and loam eliminate and capture contaminants from stormwater. Organic pollutants may be degraded and nitrogen contamination in water may be turned into a gas and enter the air. Inorganic contaminates may be held and stay onsite in the earth. The goal is to eliminate contaminants from stormwater at the cause, prior to diffusion in groundwater or other water sources (Kennen, 2015).

Target: Stormwater

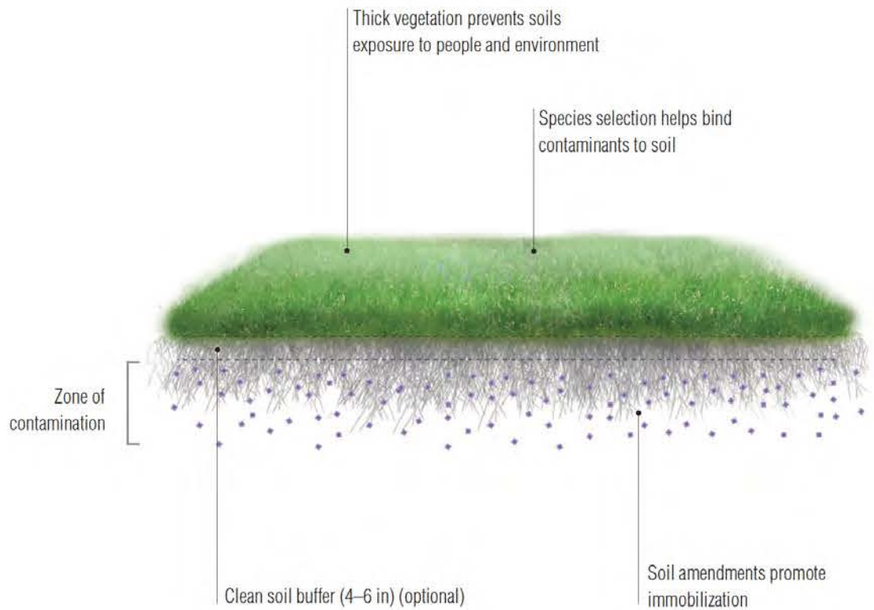
A range of stormwater infrastructure including bioretention swales, vegetated filter strips, rain gardens and detention basins are particular to exact contaminants, climate, stormwater flow volume and speed and location space. As stormwater infrastructure strategies have been discussed in detail previously, they will not be covered here.

General Policy

- Stormwater Filters should be paired with Air-Flow Buffers for prevention of stormwater contamination.
- In order to achieve desired removal performance, careful study of precedents and collaboration with remediation scientists is necessary because the rate and concentration of contamination passing through the system are determinants of contaminant removal.

7.4 PHYTOREMEDIATION ON CONTAMINATED LAND

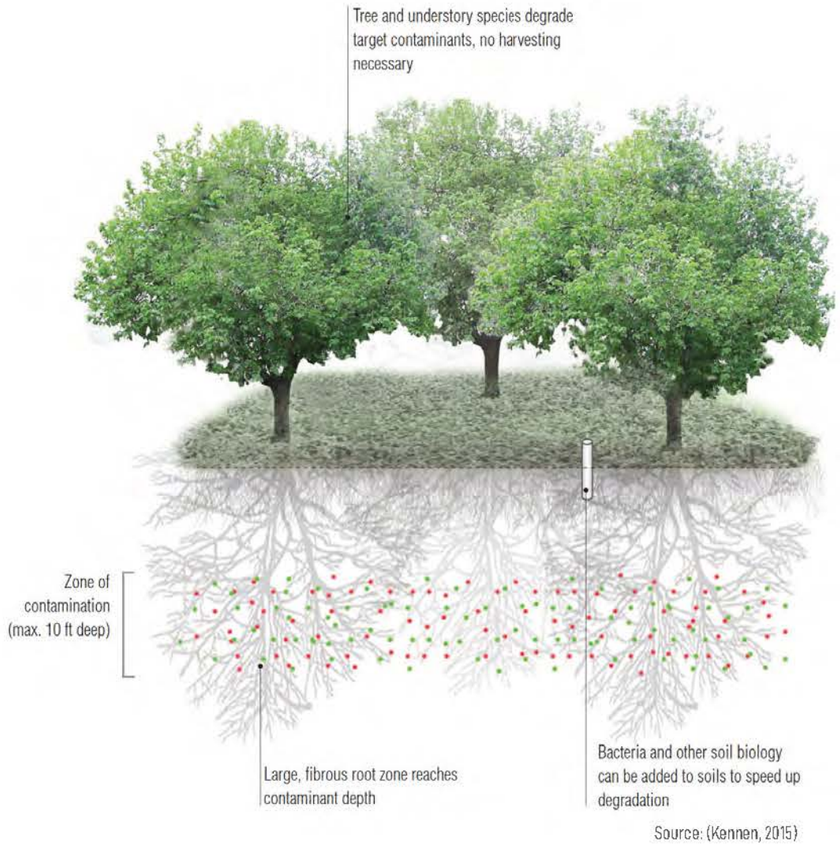
7.4.2 Phytotechonologies



Source: (Kennen, 2015)

General Guideline

- It is suggested that the species for the stabilization mat should be carefully selected to withstand contaminants, with additional amendments to enhance plant growth and toxin-binding.
- Species choice should be decided by contaminants in the area.



Source: (Kennen, 2015)

Stabilizatioin Mat

Description: Chosen plant species store contaminants within, to prevent them from drifting. No removal occurs. The goal is to minimize the potential of contaminant contact to people and the environment (Kennen, 2015).
Target: Soil

Degradation Bosque

Description: Woody plant species with deep roots which break down contamination sites within the soil layers. The plant need not be collected for contaminant elimination (Kennen, 2015).

Target: Deep soils (0–3 meters/0–10 feet deep)

Degradation Bosques target soil contamination up to 3 meters (10 feet) below the surface. Pollutant is broken into smaller, less toxic substances in the root, stems or leaves, or volatilized and released into the air. Degradation Bosques are used to treat recalcitrant organic compounds that are unbreakable by natural attenuation. Species selection can influence degradation rates. Microbial profile varies as each species releases different root exudates. Petroleum, chlorinated solvents and pesticide in the soil, before they reach the groundwater, can be cleaned by Degradation Bosques. They can also stimulate microbiology to volatilize nitrogen deep in the soil. Some nitrogen will be metabolized by the plant into the biomass (Kennen, 2015).

7.4 PHYTOREMEDIATION ON CONTAMINATED LAND

7.4.3 Vegetation Recommendation

Petroleum Degradation Plant Recommendation


Buffalo Grass


Blue Grass


Smooth Brome


Flax


Green Ash


Poplar species and hybrids


Bur Oak


Willow


Cattail

Petroleum-Tolerant Plant Recommendation


Green Ash


Daylily, Happy Returns


Daylily, Scarlet Orbit

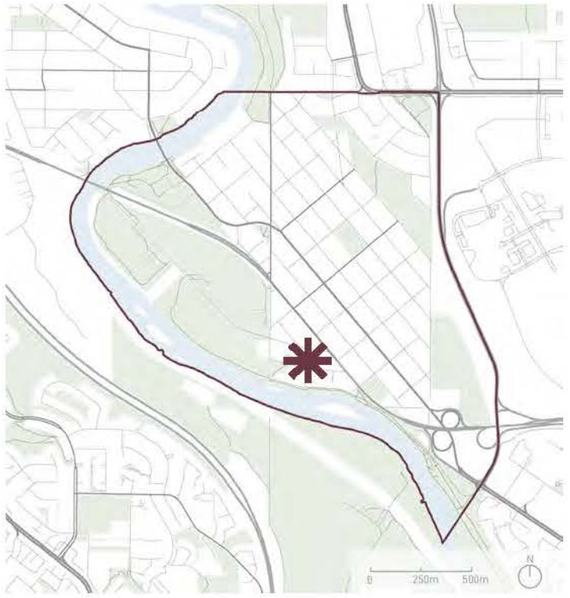

Spiked Speedwell, Sunny Blue Border


Dwarf Globe Blue Spruce


Dwarf Mugo Pine

7.4 PHYTOREMEDIATION ON GAS STATIONS

7.4.4 SHELL Gas Station Retrofitting



Located on 16th Avenue, SHELL gas station has four wide entrance/ exits. It reflects a typical auto-oriented design approach which interrupts the sidewalk and creates many potential conflict points between vehicle and pedestrian in such a short distance.

Site retrofitting is desperately needed to protect the residents who live in proximity, the citizens who reply on the Bow River as the main water source, the pedestrians who passby the gas station in daily life, and children, elderly, and people of all ages who have lung conditions such as asthma.

7.4 PHYTOREMEDIATION ON GAS STATIONS

7.4.4 SHELL Gas Station Retrofitting

We propose to

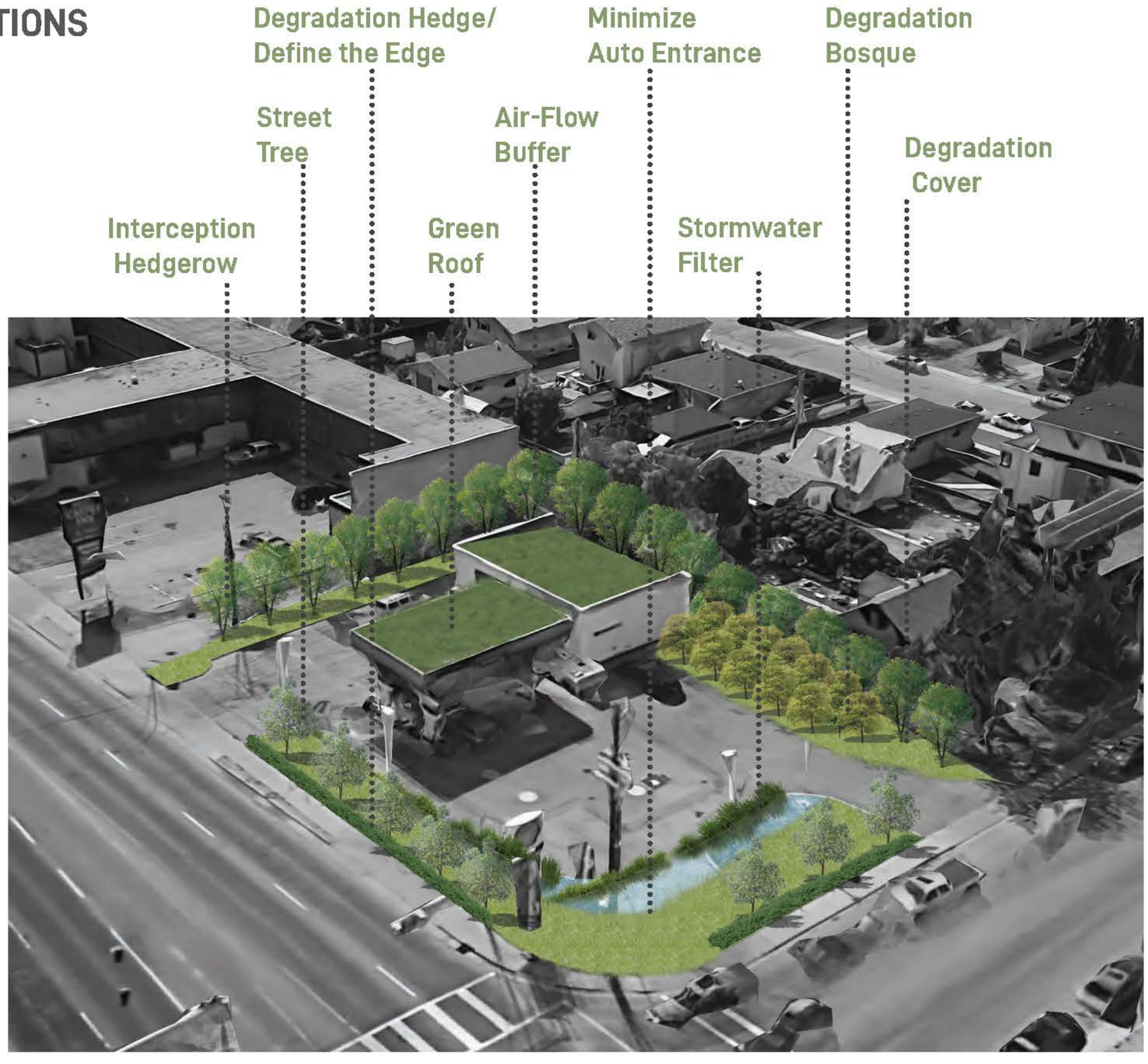
Only keep two entrances/exits to the site for vehicles to decrease disturbing the pedestrians and cyclists. Replace two entrances with a 4-6 metres wide phytoremediation landscape area.

Build a stormwater filter close to the most contaminated area to capture the runoff before the pollutants mobilize into the drainage system located near the intersection to eliminate the source contamination.

Implement continuous degradation hedge between the site and the sidewalks to treat soil, define site boundary and mitigate unpleasant views from the gas station driveway.

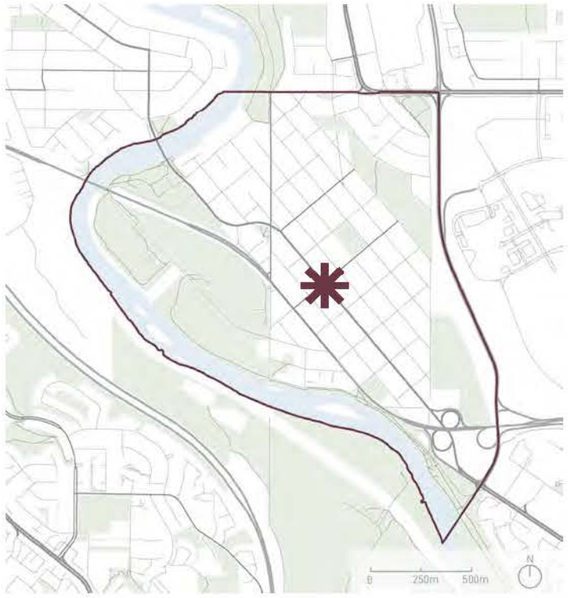
Plant trees around the site working as air-flow buffer to help collecting particulates out of the air.

Apply degradation cover and degradation bosque to stabilize and remove contaminants and create a wide protective buffer between the gas station and residential lands.



7.4 PHYTOREMEDIATION ON GAS STATIONS

7.4.5 HUSKY Gas Station Redevelopment



> *Montgomery ARP - "Automobile Oriented Uses*
>
> *Policy C13. Automobile oriented uses, including automotive sales, automotive rentals, automobile workshops, car washes, gas stations, and drive through services/ restaurants should not be permitted in the Bowness Road/46 Street Commercial Main Street Area. These uses are not conducive to the creation of a pedestrian friendly shopping and service area. Bylaw 17P2017" (City of Calgary, January 2020)*

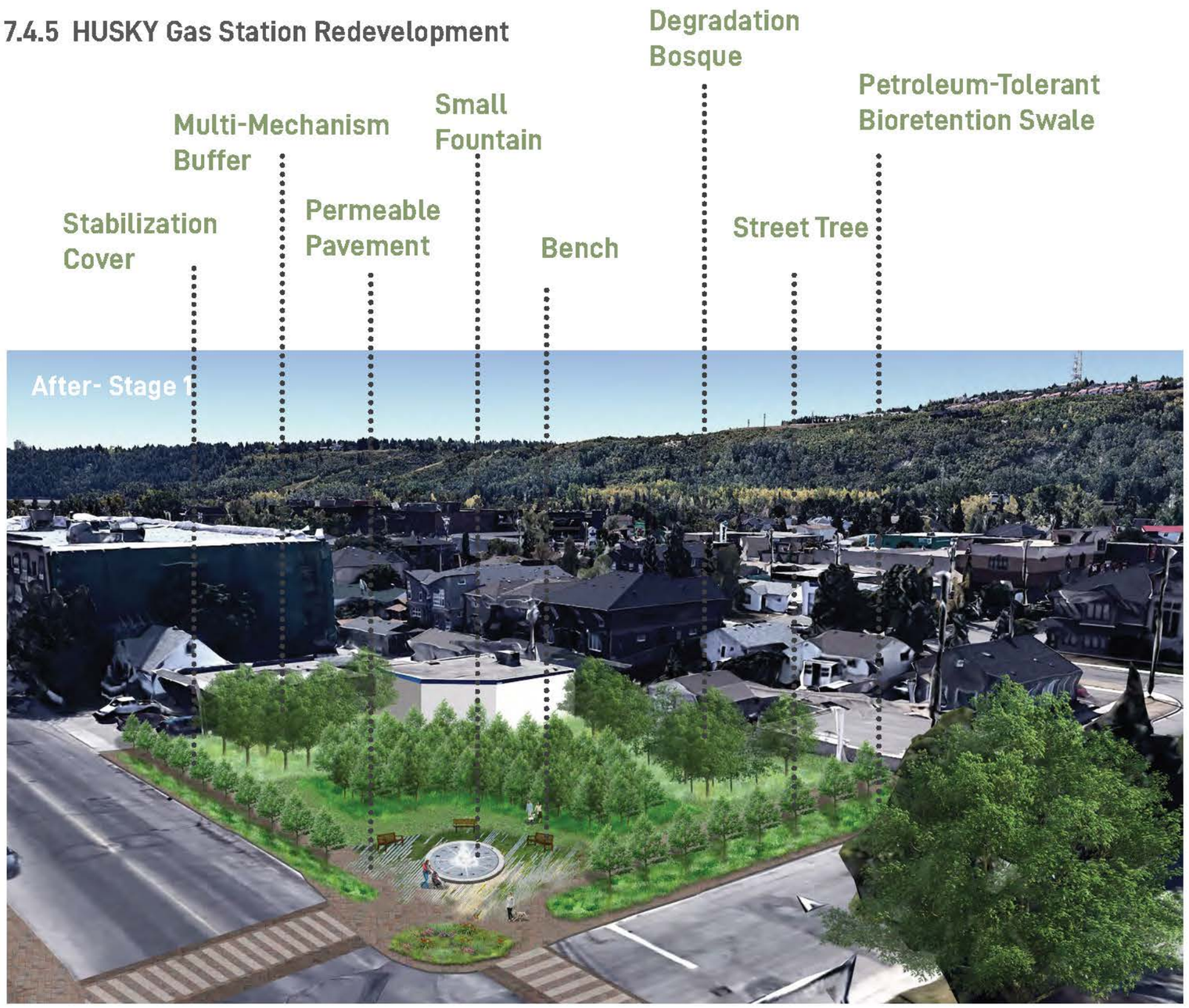
The City of Calgary has a Main Streets initiative along Bowness Road from 43rd Street to 46 Street, NW. The goal is to integrate the street with the community and city. This further aligns with the Complete Streets Policy for a connected and safe walking and cycling network.

The Main Street Plan is for a long term vision of a community hub, a memorable destination for the community. As such we propose the elimination of the Husky Gas Station in two phases. The goal is to realign Montgomery Main Street with the Montgomery ARP and Policy C13, see above. The City wishes to include plazas, parks, streets, and buildings to address public right of way and interface. Our plan will proceed through phase one including phytoremediation of the gas station site. The second phase, some time after the site has been remediated, will include a mixed-use building with special shops on the ground floor and residential living above.

Contamination will bring potential risk to the future land users, so it must be remediated before the transformation. Instead of applying traditional remediation methods which may cost up to 2 million dollars to treat gas station lands, we suggest taking a phytoremediation approach to allow the vegetation to fix the polluted soils during the first stage. During this period, Stage One, the site will be converted into a pocket natural park and bring extra assets to the Main Street while the population will grow naturally. Until such time as the land is completely remediated and the local population has grown to encourage another medium density development, the project will turn to Stage Two and redeveloped as a four- six storey building.

7.4 PHYTOREMEDIATION ON GAS STATIONS

7.4.5 HUSKY Gas Station Redevelopment



In these images we see how the phasing will proceed for the Husky Gas Station Retrofit.

7.5 RE-ENERGIZING THE RIVERFRONT

The riverfront area in Montgomery is an amazing asset but is currently an underutilized and underdeveloped site. It could be a regional and local draw, a jewel in the community with a few improvements. While Montgomery is a gateway to the city, as a current gateway it is not brought into focus. Many people flock to have river front amenities in other Calgary neighbourhoods, thus this should be put forward as a real amenity.

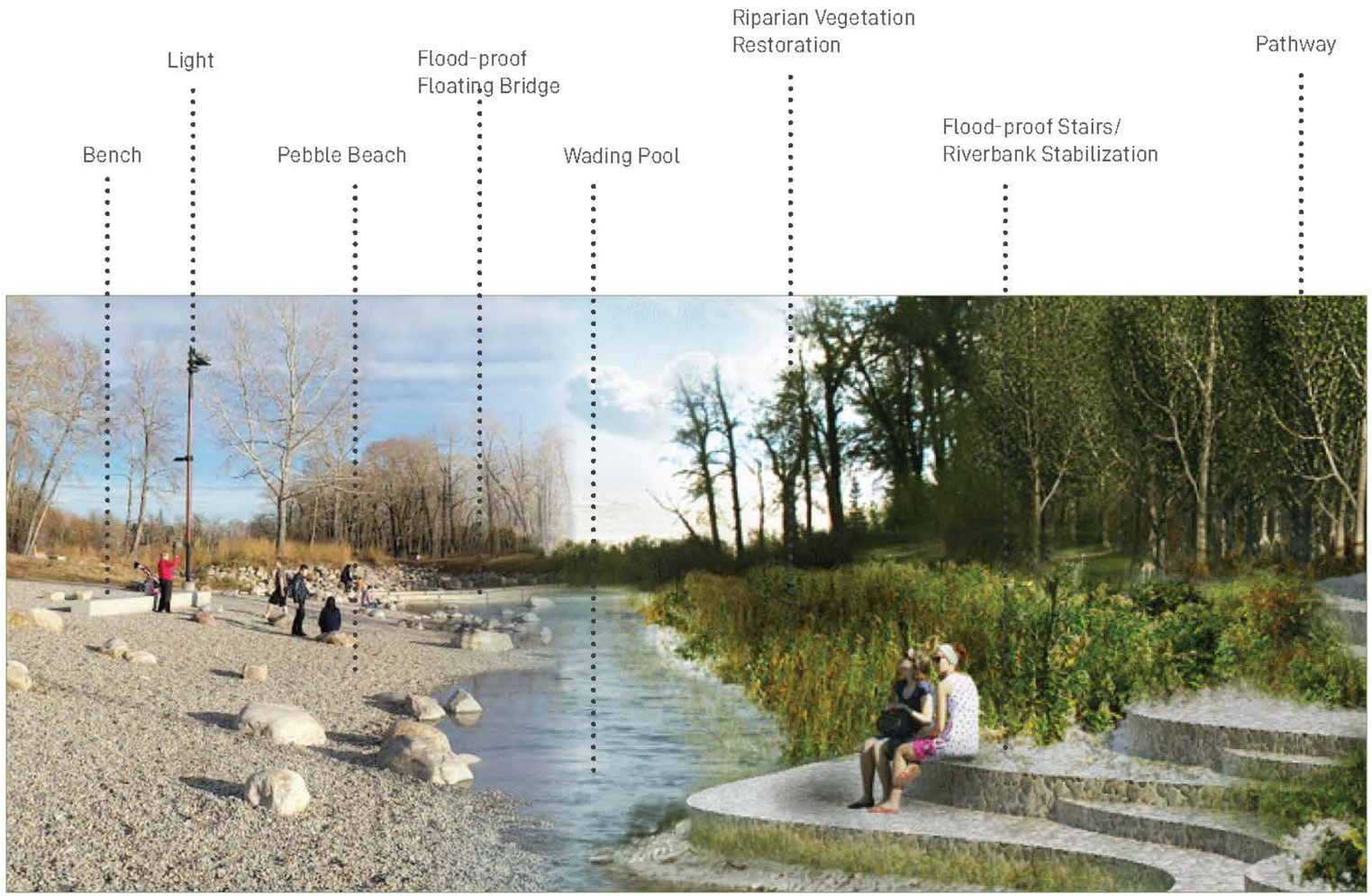
In the image on next page we see how we have designed a riverfront intervention with features for public including flood proof universally accessible stairs.

Storm outflow

1. Pathway crossing/ Important cycling converging point
2. Major river access for Montgomery
3. Steep riverbank & dilapidated, dangerous stairs
4. Serious riverbank erosion (O2 Planning + Design Inc.)
5. Degraded riverbank & poor vegetative cover

Steep riverbank and dangerous stairs

7.5 RE-ENERGIZING THE RIVERFRONT



Our goals are to provide the community with improved riverfront interface and access.

The first phase will include improving the pedestrian and cycling access from George Gell Park. This will be discussed in our Place-Making Anchors Chapter.

The second phase will include stabilizing the riverbank, which is currently subject to erosion and has a steep slope. The area will receive re-enforced bank walls, and two sets of flood proof river access stairs, with an accessible ramp for all users. The current stairs are unacceptable, at best. This area will also have pathway improvements.

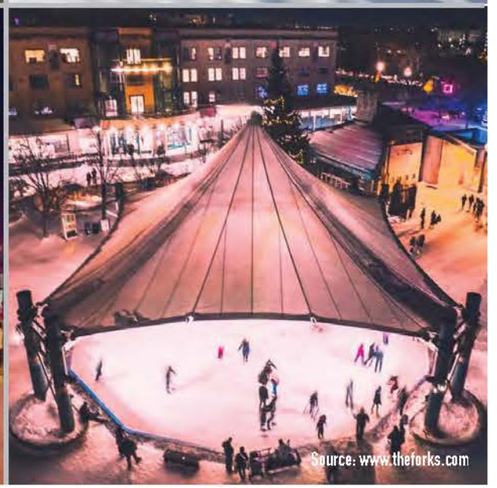
This view shows the pebble beach and one stair access.

7.6 NEW SPACES FOR PLACES

Montgomery Community Hall

The Montgomery Community Association should be an accessible resource for all community members. It offers residents vital programming and a host of services. It is a much needed gathering place for all residents. Due to its location across from Trans Canada Highway, it is not easy to arrive at for all users, especially pedestrians. The limitations of crossing Trans Canada highway will be addressed in the Mobility Chapter, with lane narrowing and pedestrian islands. But once residents have arrived at the community centre, there is a huge potential, with the hall, the local playground, the green space, access to the river and athletic park amenities. The community centre greenspace could benefit by adding some established and programmed site specific areas to add to the services the hall will offer.

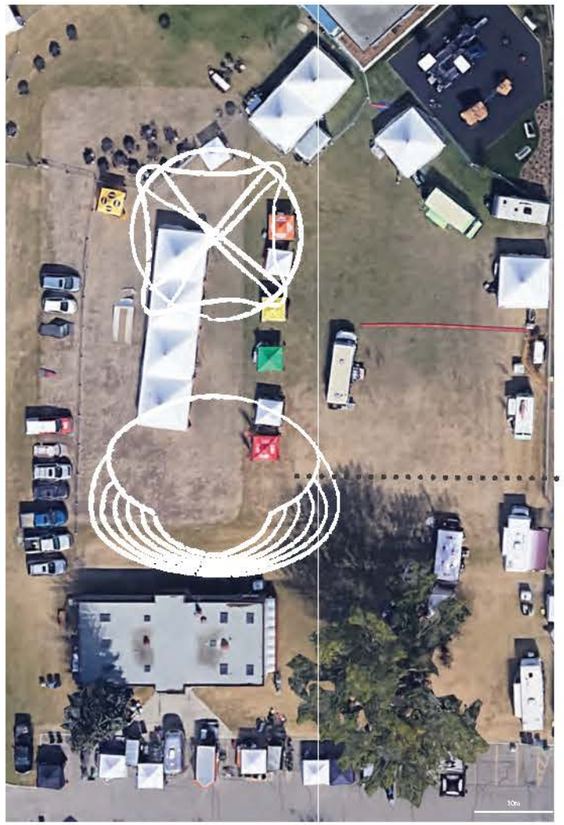
Canopy, Skating Rink

	Summer	Winter
Day	 Source: www.theforks.com	 Source: www.theforks.com
Night	 Source: www.theforks.com	 Source: www.theforks.com

7.6 NEW SPACES FOR PLACES

Montgomery Community Hall

As a gathering place the amenities we will add will make the community centre the Place to be in Montgomery. The addition of seasonal themed activities will include an outdoor ice skating plaza, a gentle toboggan hill, a covered festival tent to host events plus a space for movies in the park.



Gentle Toboggan Hill

7.7 SUMMARY

Having planned and made space for new residents to find accommodation, and upgraded the transportation infrastructure, improvements will be needed to upgrade the public realm, parks and open spaces. Our analysis revealed while Montgomery has community pride and spirit, they do not have places to embody it. The lack of public gathering space and usable park space is misleading as Shouldice Athletic Park is within Montgomery. However, this space is not available to all residents, only those who pay for the field access. Therefore, we have strived to create and design additional spaces for residents and regional visitors alike. One space is a gas station retrofit with removing the Husky station from Main Street to have a plaza and park space. One issue the community members brought up was a challenge with accessing the river. We strived to design a user friendly, flood proof plan for a river interface off 16th Ave and 43rd St. We also wanted to connect the green systems through a green network and with green infrastructure. Using street tree plantings to connect the urban canopy and a range of stormwater interventions, we hope to filter out pollutants before they flow to the river. One other area of concern is the large number of gas stations in Montgomery. We are looking to offer solutions to help with decreasing the pollutants around these areas through phytoremediation to create a better street for users other than the private automobile. Our phytoremediation strategy is key to improving the health of residents, visitors and the environment.

08

PLACE-MAKING ANCHORS

8.1 PLACE-MAKING ON HERITAGE HOME SITE

The site of the former Shouldice Mansion has great views, and historical significance. As such we propose a heritage rock garden, picnic pavilion and walking trail to commemorate this location. The plan will host an open air pavilion with interpretive signs in the building recounting important historical facts on Montgomery. The signage will continue through the rock garden along the trails, informing visitors of the various heritage perennials. Our hope is to add to the identity of Montgomery as a great destination for recreation.

Location of Heritage Garden

Garden Highlights:

1. Picnic Pavilion
2. White Garden
3. Fragrant Garden
4. Melliferous Garden
5. Native Garden
6. Tulip Garden
7. Children's Garden
8. Pollinator Garden
9. Showy Garden

Plan View of Heritage Garden

8.1 PLACE-MAKING ON HERITAGE HOME SITE

The steep hillside can be reinforced and stabilized with a series of terraced rock stairs guiding visitors up the slope. Plants will be chosen that thrive in sunny dry exposure, with hardiness in mind. A select few of the species for the garden can be found in the plant palette on the following page. Plants will also be chosen with flowering season in mind to ensure a range of months have blooms.

This site is the convergence of several paths, including the separated cycle track. The planned trails will link up with existing paths at the entrance to Bowmont Park and flow seamlessly through and around the garden, showcasing the various themed gardens. This garden will honor the early pioneers who challenged Calgary Chinooks' and grew perennials to complement their kitchen gardens. The gardens will be planned around the Heritage Caragana Hedge and bring new life to the area.

Heritage Site Before

Heritage Site After- View of Terraced Rock Garden

8.1 PLACE-MAKING ON HERITAGE HOME SITE

Heritage Garden Plant Palette

SPRING BLOSSOMS

Hepatica, *Hepatica*

Grape Hyacinth, *Muscari*

Wild Ginger, *Asarum canadense*

SUMMER BLOSSOMS

Golden Columbine, *Aquilegia*

Peony, *Paeonia*

Hollyhock, *Alcea rosea Nigra*

FALL BLOSSOMS

Aster, *Aster novi-belgii*

Crocus, *Colchicum autumnale*

Garden Phlox, *Phlox paniculata*

8.1 PLACE-MAKING ON HERITAGE HOME SITE

This site has an amazing view and the picnic pavilion will be placed to capture and frame the view. The pavilion will offer shade, shelter, and seating for seasonal events. The hope is to encourage families to visit and stop for a short rest while recreating in the area. The white garden - #2, is planned to be at the entrance of the pavilion and placed at the best view overlooking the river. This will become the spot to take family and wedding photos.

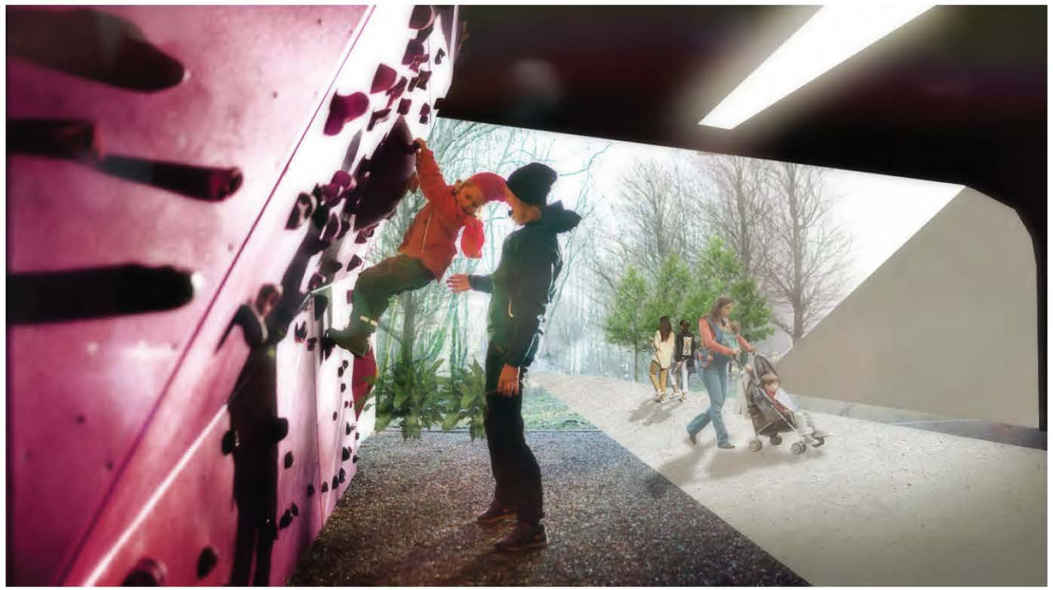
Heritage Site Before

Heritage Site After- View of Picnic Pavilion

8.2 PLACE-MAKING ALONG 16TH AVE.

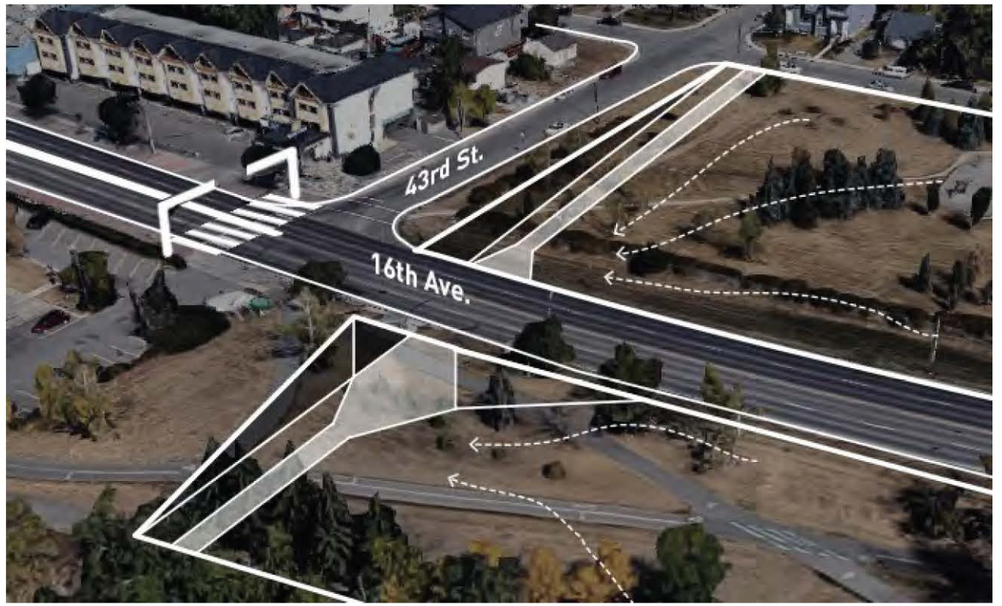
The River is an important destination in the community. A strong connection to the river should be provided to create a "PLACE" to linger and to build community identity, not just providing access to the river. The intersection of 16th Ave. and 43rd street is the location where the residents come out of the community and walk or bike towards the riverfront. We are proposing an underpass with mobile food shops on both sides. Zoning on the adjacent parcels is proposed to be modified to accommodate small retails next to the entrances. Fitness facilities such as a small scale climbing and bouldering wall will be installed in the underpass to support the recreational loop. Public art and interactive lighting is part of the design. To accommodate the at grade crossing on 16th Ave. the pedestrian-activated signal will be replaced with a traffic light and a two meters pedestrian refuge will be added to the intersection as shown in the pictures.

The climbing wall in the underpass



Location of the interventions on the map

Birdseye view of the interventions



Birdseye view of the interventions

8.2 PLACE-MAKING ALONG 16TH AVE.

After

Before

The underpass will be located in the underutilized George Gell park

Light installation in the underpass, Alabama

Climbing wall and fitness facilities in the underpass, Oslo

Climbing wall and fitness facilities in the underpass, Oslo

Landscape architecture at the entrance of the underpass, Arizona

Artistic pavement of the underpass, Arizona

8.3 PLACE-MAKING ON MAIN STREET

Bowness Road Commercial Core

Main Street has strategic importance for the future of the community.

We propose to transform the Main Street into a green Main Street with extensive plantings, and a flexible space for short-term installations.

Seasonal changes will bring changes in the activities on the street, offering year-round and day or night events.

8.3 PLACE-MAKING ON MAIN STREET

Bowness Road Commercial Core

Street and plaza facilitate year-round programmings

Site-Specific Policy for Main Street

- To create an attractive, vibrant street, all elevations facing the street can not have blank facades. Varied roof forms and detailing, with a variety of materials, colors and textures, columns and pattern windows, plus other architectural designs are a must.
- Building fronts must have canopies and awnings to add resilience to climate change.
- No auto-oriented services will be allowed.
- Unified pavements, planters, streetlights, benches, and other street furniture are to be implemented to create an identified character for Main Street Montgomery.
- Extensive upgrades and plantings of vegetation along Main Street will be necessary. This will coincide with the Street Tree Planting Plan.

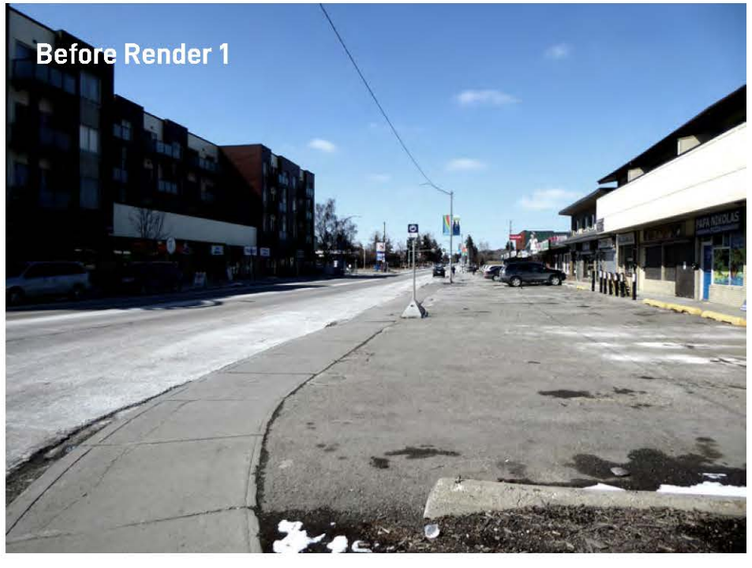
Site-Specific Guideline for Main Street

- Patios are encouraged. Heating facilities- outdoor freestanding patio radiant heaters, fire pits and heated awnings are suggested to encourage outdoor seating and patio use year-round.
- The creation of passive spaces (instead of strictly defined areas like sports fields) along Main Streets to have flexibility to support temporary public space installations and various programmes all year-round are encouraged.

8.3 PLACE-MAKING ON MAIN STREET

Bowness Road Commercial Core

In the images on the left and on next page, we see how Main Street will transform into an active, lively and pedestrian oriented 'Place' and offer year-round activities to draw local and regional visitors.




After Render 2
Market

09 CONCLUSION

Montgomery is a unique inner-city neighbourhood, a gateway community for Calgary full of potential and opportunity. To best manage these opportunities, a collaborative effort should be made to safeguard future development and guide it in the direction which is sensitive to the complexities of designing a complete community, one that is inclusive, connected, dynamic and resilient. Our Community Redevelopment Plan is a blueprint to achieve this desired result. It outlines how land use, mobility and connectivity, public realm and community anchors can be unified in the community to complete community building and model best practices design. With design interventions, Montgomery will be inspired and empowered to redevelop in a sensitive and strategic manner with amenities for all residents to enjoy. These amenities will not only cater to the current residents, but attract future families.

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