City Of Lethbridge

Public Realm & Transportation Study

FINAL REPORT

SUBMITTED TO: CITY OF LETHBRIDGE

MMM GROUP

FEBRUARY 2012

EXECUTIVE SUMMARY

1.0 INTRODUCTION AND OVERVIEW

The Public Realm and Transportation Study (PRATS) builds on the vision, ideas, and concepts for Downtown development that were expressed in the Heart of Our City Master Plan (HOCMP). PRATS utilizing elements of New Urbanism and Sustainable Development Planning, in harmony with interactive community engagement and collaboration, to produce an exciting and lively public urban space.

The study focuses on the Downtown area proposed in the HOCMP and examines the facility requirements for active, public realm improvements, alternative and accessible transportation modes, freight, vehicles, and parking in the Downtown area. An extensive design charrette was undertaken supported by additional stakeholder interviews to integrate stakeholder input into the design.

Key Study objectives were identified as follows:

- Incorporate the direction from the HOCMP as a guiding framework.
- Integrate transportation and urban design recommendations.
- Determine 20-year requirements for pedestrians, cyclists, moving traffic , and parking.
- Undertake a consultation and communication process to effectively engage the key stakeholders.
- Demonstrate the value of Form Base Codes through a relevant planning exercise.
- Produce a public realm designs for the selected streets in the Downtown Area based on ideas generated through the consultation process.
- Define public art opportunities within the study area.

2.0 PRIORITY STREETS AND GENERAL AREA REVIEW

Due to the size of the Downtown area it was agreed, during the project initiation process, that the study would focus on selected priority corridors. The Downtown priority corridors were identified by assessing those streets, or blocks, that offered the greatest short-terms gains in enhancement. In identifying the priority areas a revised three weighted criteria was utilized that included the following criterion:

- The condition of the existing infrastructure,
- The potential for enhancement of the public realm, and
- The opportunity to stimulate future development.

The priority corridors that were approved by the City's Project Advisory Committee (PAC) were:

- 2 Avenue S. – Scenic Drive S. to 5 Street S
- 5 Street S. – 1 Avenue S. to 6 Avenue S
- 3 Avenue S. – 4 Street S. to 8 Street S

In addition to focusing on the priority corridors the study also included a high-level review of other key aspects of the Downtown area. The review noted the following:

Pedestrian Facilities

- Many of the sidewalks are not wide enough for large volumes of pedestrians or for the comfortable passing of wheel chair users.
- Many of the sidewalks are obstructed by fixed and moveable obstacles such as parking meters, street lighting, traffic lights, street signs, trees and vendor signing.

Cyclist Facilities

» 3 Avenue S is signed as a designated bike route but the travel lane width does not allow a vehicle and a cyclist to share the same lane and conflicts with angle parking.

» There's an overall lack of cycle pavement markings, wayfinding signage or prioritisation for cycles.

» There are insufficient cycle storage facilities in the down town area.

Roadway Analysis

» The traffic analysis shows that the existing intersections operate at a satisfactory Level of Service (level of service 'LOS' A) during the peak periods.

Parking Conditions

» The parking analysis showed that there is sufficient on-street and off-street parking availability and that the mean peak demand is about 60% of capacity.

» The overall parking demand rate is between 2.10 and 2.22 spaces per 100 m2, which is consistent with the City's zoning by-law.

Freight Review

» Scenic Drive S is the only roadway, in the Downtown area, that is designated as a truck route.

» Twelve hour traffic counts (7am to 7pm) show that there are few large vehicles trying to access the Downtown area.

» The freight survey results did not identify any major issues regarding the freight operations in the Downtown area.

3.0 FUTURE CONDITIONS

Future projections for the Downtown area were incorporated to determine the conceptual designs for the priority streets. An estimate of the future traffic volume along the priority streets, as well as the estimated parking demand for the Downtown area was analysed. The main elements of the future conditions are as follows:

2030 Traffic Analysis

» Forecast traffic is expected to grow annually by 1.7% and active transportation is expected to increase annually by 3%.

» All observed intersections are expected to operate at a satisfactory Level of Service (LOS C or better) in the 20 year time horizon.

» The future implementation of a pedestrian only phase (scramble intersection) at 5 Street S and 3 Avenue S will increase delays, to a LOS D, but will remain within acceptable limits.

Future Parking Conditions

» Peak parking utilization is expected to increase to about 80%.

» Some blocks may experience a higher level of demand, but this can be met by spare capacity in adjacent blocks.

Future Parking Structure

» Assuming the traffic growth forecasts and development forecasts are correct then a new public parking structure will not be required within the next 20 years.

» Local development would have to exceed the City's own plans, by an additional 115,000m2 of non-residential gross flow area, before a public parking structure would become viable.

» If a four storey parkade were built on the Bompass Lot then the estimated costs would be in the range of $9M to $13M.

Land Use/Form Based Code

» Form based code regulates the physical outcome of structures and has been demonstrated to better implement within mixed use and pedestrian friendly places.

» Can be used to implement the essential elements of the HOCMP, provide guidance for shop front design and interface between the public and private realm.

4.0 CONCEPT DEVELOPMENT

Concepts were developed, for the priority corridors, to help achieve the vision contained within the HOCMP. The concepts adhered to the guidelines for barrier-free design and included recommendations for pavement markings, curb ramps, pedestrian signals, and a future pathway improvements.

The cyclist treatment concepts for the Downtown area are based on the Bikeway and Pathway Master Plan. Connectivity to the Downtown area was improved by the specification of dedicated bike lanes and the use of multi-modal zones. In addition, it is recommended that the City provide additional cycle racks, lockers, changing rooms, and shower facilities.

5.0 PUBLIC AND STAKEHOLDER CONSULTATION

As part of the stakeholder engagement MMM organised and facilitated a four day design charrette with key stakeholders. As well as the design charrette additional face-to-face meetings were held and a written survey was sent to every member of the BRZ.

During the design charrette a clear goal was developed with stakeholders:" To create a balance between the public realm and the traffic realm, without a significant loss of on-street parking, and enhance the overall quality of the Downtown's public realm for long term vitality and promotion of the Downtown as a place to live, work, play, and learn."

Much of the feedback received during the consultation process focused on increased accessibility, safety and facilities for vulnerable road users, specifically for pedestrians and cyclists. There was also a concern about a lack of connectivity, for active transportation, with other parts of the City. Other concerns included a lack of residential property within the Downtown core.

Some of the main themes arising from the stakeholder engagement included a need to slow traffic down, a need to entice families into the Downtown, a need to enhance Galt Gardens as a key destination, and a need to enhance cycling as an alternative mode of transportation

As part of the consultation process MMM produced a "Kits of Parts" toolbox for specific elements that could be adopted along the priority streets or amended for use on other corridors. Elements from the Kit of Parts are shown in figure 5.5.2 and 5.5.3 in the main report. Other key elements arising from the consultation process include:

Public Art

Opportunities for the installation of public art should include the following:

» a primarily sculpture (5 Street S and 4 Avenue S-Northwest Corner)

» vertical marker/gateway (5 Street S and 2 Avenue S-Galt Gardens Plaza Entry)

» figurative representation (stone/bronze) (5 Street S and 6 Avenue S Northwest Corner)

» relocation of the City's historical steam locomotive (northwest corner of Galt Gardens)

Sustainability and High Performance Streetscape Design

In compliance with Lethbridge's Integrated Community Sustainability Plan (ICSP) several 'green initiatives' or examples 'best practice' have been identified. Some of these include:

» increase the quality, density, and diversity of urban trees in the Downtown area

» stormwater management improvements such as landscape improvements, permeable paving, infiltration structures, sub-surface storage, and oil and grit separators

» increase the sustainability of the landscape by using local and regional plant species that are drought tolerant

» minimize urban footprint with the use of sustainable technologies for example, re-use structures, environmental materials, energy conservation, and 'Dark Sky' principles

6.0 PRELIMINARY DESIGN

The preliminary designs, of the priority streets complemented the vision established in the HOMP and incorporated the key elements identified during the consultation process. The main features of the preliminary designs are as follows:

5 Street S

» This would become a major retail and pedestrian corridor.

» The provision of a raised 'scramble' intersection is proposed where 5 Street S meets 3 and 4 Avenue S.

» A multi-modal path is proposed along 5 Street S, to promote alternative modes of travel.

» To create space for the multi-modal path it is recommended that the parking on the west side be parallel parking whilst the parking on the east side could remain as angled parking.

2 Avenue S

» Raised on-street parking to sidewalk level and allow for flexible use of the parking to increase the public realm associated with building use i.e. patio space

» 2 Avenue S is envisioned as a highly pedestrian street that visually and physically connects multi-family buildings and the river trails located west of Scenic Drive S with the Downtown area and Galt Gardens.

» Vehicular movement will remain as two travel lanes with angled parking on both sides.

» A double row of street trees will be planted on each side of 2 Avenue S, extending the 'green' of Galt Gardens to Scenic Drive.

» Intersection of 5 Street S and 2 Avenue S to be treated with a shifted roadway at the intersection to provide flexible space for parking and outdoor gathering.

3 Avenue S

» 3 Avenue S, is a dynamic mix of historic and contemporary architectural styles that should provide the framework for a vibrant streetscape treatment.

» Creation of a pedestrian promenade with a high level of street pageantry in front of major civic spaces and buildings.

» Provide three travel lanes that will allow for angled parking and an enhanced sidewalk width along the north side, which interfaces with Galt Gardens.

» Alternative concept to provide parallel parking configuration between 7 Street S and 5 Street S will allow for the preservation of existing mature street trees and current sidewalk and provide 3.0m for a multi-modal path along the north side of 3 Avenue S.

Public Realm Design Components

Several design strategies are identified in the report with a few of these are listed below:

» Plaza intersections should have raised crosswalks, to reduce traffic speeds and promote pedestrian priority.

» Vary the surface texture, material and colour to identify different zones (e.g. pedestrian, multi-modal, and parking).

» Use a custom colour palette that reflects the natural landscape of Lethbridge.

7.0 IMPLEMENTATION PLAN

The implementation plan helps to identify when the works should be undertaken. Whilst the construction process may be influenced by external factors, such as the availability of funds, and the source of funding, it will also be influenced by the method of construction, the timing of construction, the phasing of the construction, and the economic, social and environmental considerations.

In order to aid the City in identifying the preferred construction method, several evaluation criterion and performance measures have been proposed. The evaluation criterion includes consideration to:

» Social Impacts

» Environmental Impacts

» Economic Impacts

Having evaluated the various options the highest scoring short term priority would appear to be either the treatments identified along 2 Avenue or those identified for 3 Avenue. The actual timing may, of course, be determined by a sudden need to replace one of the failing utilities that already exist within the right of way.

The long term priority should be to reconstruct 5 Street S in two phases; the first phase from 1 Avenue S to 4 Avenue S and the second phase from 4 Avenue S to 6 Avenue S.

8.0 CONCLUSION AND RECOMMENDATIONS

It is important to maintain the momentum generated by the Heart of the City Master Plan and this Public Realm and Transportation Study (PRATS). The transportation component is recommending a change in mindset, from the traditional 'create more space for motor vehicles' , to a more balanced approach in terms of reducing vehicular traffic lanes and reallocating space to the public realm.

The public consultation helped to identify the pertinent issues and the solutions most likely to gain popular support. The conceptual designs synthesized the recommendations to enhance the public realm whilst satisfying the transportation needs.

The Implementation Plan recognizes the complexity surrounding the financial, political and physical resources needed to construct the recommended works. It does set out a strategic approach and makes suggestions for the prioritization of construction of the selected study streets. Ultimately these recommendations will need to be determined by the City. The report's recommendations serve as a starting point and baseline for future discussion and planning – with recommendations that the same level of public consultation continues to future phases.

Future Recommendations

To build upon the ideas in the report the following additional information and investigation should be made prior to or as part of the detailed design:

- Detailed survey and Arborist's report to ensure that existing trees incorporated into the design will remain healthy.
- Further investigation into sustainable green products and initiatives.
- Consider new signage design be coordinated as part of a larger City of Lethbridge wayfinding signage system.
- Standardize site furnishing and lighting within the Downtown, based on the 'Kit of Parts' for common elements that has been developed in the report.
- Public Art Committee to be consulted during the implementation of the Public Art recommendations identified in the report and any potential grant or funding contributions.
- Explore the feasibility of relocating the coal fire steam engine #3651 from behind the Medical Clinic to Galt Gardens.
- Hydro-utility provider to be contacted during or preceding detail design to discuss upgrading of power service and routing for all existing and new services.

ACKNOWLEDGEMENTS

The Public Realm and Transportation Study (PRATS) is an extension of the groundwork completed in the Heart of Our City Master Plan (HOCMP).

The dynamic and exciting designs proposed within the PRATS report, were made possible by the significant contributions provided by local land owners, businesses, local organizations and institutions. We extend our thanks to all the support and assistance that was given by local community groups and stakeholder groups that participated in the design charrette and for their continuous involvement or feedback. Their contributions have helped the consulting team identify a strategy and create a selection of streetscapes that will help promote a strong Downtown community in the heart of Lethbridge.

The study would like to thank the City of Lethbridge and the Heart of Our City Revitalization Committee for their guidance, support, and enthusiasm. Additionally, the study would like to thank the elected officials, business, land owners and residents who participated in the Design Charrette.

The Project Advisory Committee (PAC) played an essential role in the collaboration, identification, development and refinement of the recommended streetscapes. The members of the City of Lethbridge PAC were as follows:

Tatsuyuki Setta, Community Planner and Project Manager
Jeff Greene, Director of Planning and Development
George Kuhl, Downtown Revitalization Manager
Maureen Gaehring, Community Planning Manager
Ahmed Ali, Transportation Planning Manager
Wade Coombs, L.A Transit Strategic Planning Manager
Ryan Carriere, Parks Planning Manager

The study would also like to acknowledge the contributions from Michael Van Hausen, President of MVH Urban Planning & Design, Geoff Dyer lead designer on Form-Based of PlaceMakers, and public artist - Nicholas Wade Associate Professor from the University of Lethbridge.

Canadian Badlands

City of Lethbridge

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CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS AND ACRONYMS

Abbreviation or Acronym	Original Word(s)
AADT	Average Annual Daily Traffic
AB	Alberta
APS	Accessible Ped estrian Signals
BC	British Columbia
BPMP	Bikeways and Pathways Master Plan
BRZ	Business Revitalization Zone
CD	Comprehensive Development
City	City of Lethbridge
CSS	Context Sensitive Solutions
CPR	Canadian Pacific Railway
CPTED	Crime Prevention Through Environmental Design
cu. M	Cubic meter
DARP	Downtown Area Redevelopment Plan
GDGCR	Geometric Design Guide for Canadian Roads
GFA	Gross Floor Area
GIS	Geographic Information System
HCM	Highway Capacity Manual
HOCRC	Heart of Our City Revitalization Committee
HOCMP	Heart of Our City Master Plan
ICC	Irrigation Central Control System
ICSP	Integrated Community Sustainability Plan
ITE	Institute of Transportation Engineers
LCAC	Lethbridge Community Arts Centre
LOS	level of service
LPAC	Lethbridge Performing Arts Centre
m	metre
MMM	MMM Group Limited
MOE	Measures of Effectiveness
NFPA	National Fire Protection Association
MPD	Municipal Development Plan
NW	Northwest
ON	Ontario
PMP	Parks Master Plan
PRATS	Public Realm and Transportation Study
RFP	Request for Proposal
R.O.W.	Right-of-Way
SAAG	Southern Alberta Art Gallery
SW	Southwest
TAC	Transportation Association of Canada
T.E.W.	Treated Effluent Water
TMP	Transportation Master Plan
WB	Westbound

STANDARD LIMITATIONS

This report was prepared by MMM Group Limited (MMM) for the account of the City of Lethbridge (City). The disclosure of any information contained in this report is the sole responsibility of the City. The material in this report reflects MMM's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. MMM accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions based on this report.

INTRODUCTION AND OVERVIEW

1.1 INTRODUCTION

The City of Lethbridge (City) has a population of approximately 87,000 people making it the province's fourth-largest city by population, and third-largest city by area. Founded in 1890 the City's commercial base was predominantly coal mining, cattle ranching and irrigation farming. This has evolved over the years in private sector financial and agribusiness, health care, education, retail, hospitality, and government services sectors. Cultural venues in the city include performing art theatres, museums and a mixture of sports venues. Lethbridge is now the commercial, financial, industrial and transportation hub of the south western Alberta region.

The Public Realm and Transportation Study (PRATS) builds on the vision, ideas, and concepts for Downtown development that were expressed in the Heart of Our City Master Plan (HOCMP). PRATS suggests utilizing elements of New Urbanism and Sustainable Development Planning, in harmony with interactive community engagement and collaboration, to produce an exciting and lively public urban space; PRATS envisions a Downtown that is vibrant yet harmonious with the historical origins.

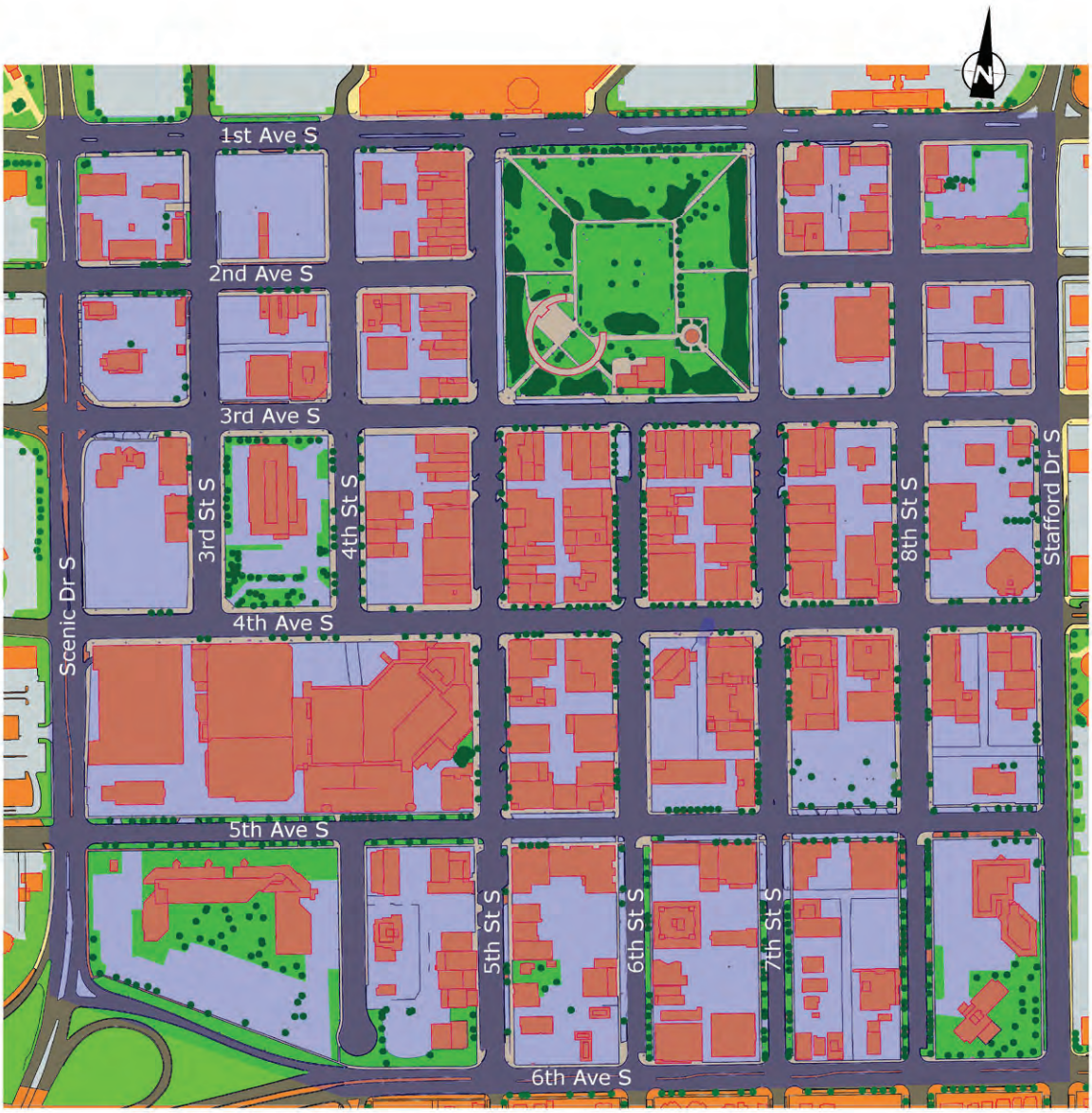
1.2 STUDY OBJECTIVES

PRATS adopts key Downtown corridors identified in the HOCMP and examines the facility requirements for active, alternative and accessible transportation modes, as well as the disposition of freight, vehicles, and parking in the Downtown area (Figure 1.2.1). In accordance with the Consultation and Communication Strategy, an extensive design charrette was undertaken in June 2011 and supported by additional stakeholder interviews to ensure that the main stakeholder groups had the opportunity to provide their input into the thought process.

Key Study objectives were identified as follows:

- Facilitate the direction from the HOCMP as a guiding framework to develop public realm and streetscape concepts
- Integrate transportation and urban design recommendations as part of preliminary designs for selected study streets
- Determine 20-year requirements for pedestrian, transit, cyclist, freight, vehicle movements and parking in the Downtown district
- Conduct a consultation and communication process that will effectively engage the key stakeholders
- Demonstrate the value of Form Base Codes through a relevant planning exercise
- Prepare preliminary public realm designs based on ideas generated though the consultation process
- Define public art opportunities within the study area

Figure 1.2.1 – Study Area



1.3 BACKGROUND INFORMATION

The City of Lethbridge provided the following planning and reporting documents as reference:

In order to align this project with the policy and objectives of the City, various planning, policy and supplementary documents were reviewed and considered throughout PRATS.

PLANNING AND REPORTING DOCUMENTS

» **Heart of Our City Master Plan (September 2007)**

The HOCMP provides the framework for the growth and development for Downtown Lethbridge over the next fifty years. The HOCMP consolidates previous reports while providing additional guidance and direction for the Downtown renewal. With the goal of a revitalized Downtown, The HOCMP includes the development of a Land Use Plan, Urban Design Guidelines, Streetscape Plan, Downtown Transportation Plan, Long Range Parking Plan, Implementation Action Plan, and Governance Model for the Downtown area.

The Heart of Our City Master Plan is the foundation on which PRATS was built. From street furniture aesthetics and street layout to the focus on pedestrians and active transportation, a revitalization of the Downtown has been proposed for select streets to realize the vision of The HOCMP.

» **Integrated Community Sustainability Plan/ Municipal Development Plan (2010)**

The Municipal Development Plan (MDP) was created to guide the adoption of policies to compliment the Plan Your City vision and promote sustainability. The MDP defines a clear path for the City's infrastructure development for the next forty years. Every major planning initiative developed or under development will use this MDP as a basis for achieving the City's long term goals. The plan addresses the coordination of services, transportation, land use, and developments within the city.

As the MDP defines the city's policies and direction, all developments must abide by it; that is to say PRATS should meet the policies outlined in the MDP. The most notable objective is for Lethbridge to have a strong and vibrant Downtown, wherein the policies include revitalizing the Downtown, developing it as a venue for urban design and architecture, and encouraging services that support a Downtown residential community.

» **Transportation Master Plan (June 2004)**

The Transportation Master Plan (TMP) is a high-level assessment of the City's changing transportation needs based on its future size and population. The TMP developed a comprehensive transportation network for the City which reflects the community's needs and objectives. The TMP identifies roadways for future investigation and development as the population grows. The TMP includes a detailed traffic analysis at twenty-five key intersections for population thresholds of 83,200 and 95,000. Most of the intersections appear to have a satisfactory level of service (LOS) of A, B, or C; no LOS's below D were noted.

The LOS of the streets and intersections will have a strong impact on the reclassification of any streets and reduction of lanes. Most notable for PRATS is the designation of 3 Avenue S as an arterial road. The public realm study determined this as a priority street for future enhancement, to increase the prominence of Galt Gardens and the overall vibrancy of Downtown Lethbridge.

» **Parks Master Plan (PMP), (March 2007)**

The City of Lethbridge has a significant parks system that is complemented by the River Valley area. The PMP was developed to influence future park development, protect the city's natural assets, and increase the accessibility to the parks. Specific current and future park areas are acknowledged and concepts for their acquisition, optimization, implementation, and/or rehabilitation are recommended.

PRATS works towards achieving the objectives set forth in the Parks Master Plan. Areas of significance within the study area include Galt Gardens and the access to the Indian Battle Ground Park; both large and significant parks accentuating the Downtown region. The classification of Galt Gardens as a Downtown Core Park highlights its importance as a destination and social focal point for the Downtown area.

» **Bikeways and Pathways Master Plan (BPMP) (March 2007)**

The City of Lethbridge has identified the short and mid-term development priorities for the City's bike and pathway system. Extending ten years, the BPMP intends on guiding the development of a bicycle and pathway system to address the needs of both recreational and commuting users. The proper design and accessibility of the pathways is addressed with a focus on increased facilities for cyclists to provide pathways which are functional for everyone.

The design of the Downtown as a pedestrian and cyclist friendly centre relies heavily on the ideas and classifications established in the BPMP, which identified numerous streets and avenues within the Downtown as locations for potential bicycle and pathway facilities. PRATS expanded on the MPMP and identified future pedestrian promenades and bike facilities, including shared roadways and off-road multi-use path.

POLICY DOCUMENTS

The City provided the following policy document as reference:

» **City of Lethbridge Land Use By-law 5700**

The Lethbridge Land Use Bylaw provides the structure for the development of the city. It defines the different zones and districts and the permitted uses of the land in them including the required parking stalls to be included with the appropriate developments.

The land use bylaw has significant implications on PRATS in regards to the zoning of the areas for the proposed Downtown developments as well as with the required parking for the many developments. The parking requirements will play a significant role in the development of a parking strategy for the City.

» **City of Lethbridge Design Standards (2011)**

The City of Lethbridge developed a set of design standards that directs development within the city. The standards specify the requirements of the main city infrastructure including designs for storm water, sanitary sewer, water distribution, transportation, parks and open space, utilities in lanes, standard line assignments; and fences, entryways and other features. The standards include classifications and design requirements for roadways including typical cross section details.

The City of Lethbridge Design Standards is essential to the PRATS project, most prominently due to the transportation guidelines.

SUPPLEMENTARY DOCUMENTS

Additional background information included:

» **Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR) (1997)**

The GDGCR describes the principles and elements of design for roadways in Canada and is often the principle manual for road design in Canada. GDGCR, amongst other things, classifies roadways, specifies the horizontal and vertical geometry, and provides the warrants for traffic accommodation methods.

For PRATS, the design of the roadways is in compliance with the design guidelines set forth in TAC.

» **Designing Walkable Urban Thoroughfares: Institute of Transportation Engineers (ITE) Context Sensitive Solutions**

The report was developed to ensure users and the community are considered to develop a walkable urban environment. ITE Context Sensitive Solutions (CSS) highlights the main factors Engineers and Planners need to consider to make urban design friendlier to residents as well as visitors. The implications of changing the parking geometry, cross section configuration, and design speeds are expressed, highlighting the importance of the safety of the pedestrians.

The CSS was valuable for PRATS for guidance on roadway elements such as lane widths and curb extensions.

» **Barrier-Free Design Guide: Government of Alberta (July 2008)**

The Barrier-free Design Guide provides the standards for planning and construction to provide accessibility for everyone. The guide contains information on barrier-free travel, parking, circulation, and public facilities taking into account fire safety and people with disabilities. The report contains sections from the Alberta Building Code 2006 and the National Fire Protection Association (NFPA) 72 National Fire Alarm Code Handbook 2007. Clear spaces and signing requirements are also specified.

The report is used as a guide to ensure that there is access to and from shops, parking lots and pathways. It was utilized to provide guidance on preferred pathway clear zones, curb ramp design, and cross slopes.

» **Downtown Area Redevelopment Plan (1988)**

The Downtown Area Redevelopment Plan (DARP) was developed to help direct the development of Downtown Lethbridge into a cultural, commercial, and social centre for the city. Superseded by The Heart of Our City Master Plan (2007), DARP was the primary guide for the development of the Downtown sector. Over time the vision for the Downtown area has evolved and consequently DARP no longer accurately portrays the direction the city is looking. Currently the DARP is under review and will be updated in 2012. The majority of this study's outcomes will be incorporated into the new DARP.

The DARP is the original document outlining the proposed future of the Downtown area. Many public realm improvements in place today can be attributed to this document.

1.4 CONSULTATION WITH COMMUNITY STAKEHOLDERS

A successful study collaborates with stakeholders and integrates the community desires to build momentum and enthusiasm in generating achievable solutions to design issues. Building on the momentum generated by the HOCMP, community consultation was the foundation on which PRATS was built. The City and project team thus continued the practice of engaging key stakeholders at crucial points during this project.

The consultation included an intense four-day design charette that involved local business owners, and representatives from other key groups and organisations. During these meetings the design team engaged stakeholders in developing ideas and solutions to address the existing issues and challenges in the Downtown area. The study team then presented some customized streetscapes and cross-sections, based on the ideas and strategies developed with the stakeholders during the design charrette. (See Technical Reports Appendix D – Public Open House)

Key stakeholders in the Study included:

- Local land/business owners
- City of Lethbridge Staff
- Heart of Our City Revitalization Committee (HOCRC)
- Project Advisory Committee
- Downtown Business Revitalization Zone (BRZ)
- Allied Arts Council
- Chamber of Commerce
- Bike Bridge Cycling Association
- Quad Design and Barrier-Free Consulting
- City Councillors

A complete Communication Strategy and a list of the consulted community stakeholders are available in the Technical Report in Appendix A.

Additionally, a freight survey was distributed to all 274 members of the BRZ in an attempt to identify the heavy truck movement and existing delivery needs for businesses in the Downtown core.

It is hoped that this extensive consultation will result in broad based community support for the principles and recommendations expressed in this document. The recommendations from this report will be presented to the Heart of Our City Revitalization Committee, Canadian badlands and City Council.

PRIORITY STREETS AND GENERAL AREA REVIEW

Although this study concerns the whole of the Downtown area it was necessary to focus on just a few key blocks or streets that could be used to develop streetscapes and typical cross-sections in other areas.

2.1 SELECTION OF DOWNTOWN STUDY STREETS

The priority corridors were identified by assessing those streets, or blocks, that offered the greatest short-term gains in enhancement. In identifying the priority areas MMM with the help of the PAC, reviewed three weighted criteria before agreeing on the priority areas. The weighted criteria included:

» the condition of the existing infrastructure

» the potential for enhancement of the public realm

» the opportunity to stimulate future development

The scores of the weighted-value Street Selection Matrix are included in the Street Selection Recommendation Report in the Technical Report - Appendix B. The priority streets that were recommended and ultimately approved by the City's PAC, and their main reasons for prioritisation are:

2 AVENUE S (FROM SCENIC DRIVE S TO 5 STREET S)

» highest ranking (#1) on the weighted-value Street Selection Matrix

» aligns closely with HOCMP's "parking" and "streetscape priority" recommendations

» is an example of a HOCMP Promenade street which will serve as a demonstration street for similar Downtown streets

» identified by the City's existing infrastructure analysis as having poor quality pavement, older infrastructure, and a high number of water main breaks; indicating a high priority for infrastructure replacement

» is part of Lethbridge's historic Chinatown District containing a number of heritage structures

- it is hoped that improvements to the public realm will assist in attracting future investment to revitalize and reinvigorate this important cultural centre

» will help to enhance the public realm, especially for existing residential lots along the street, and will help to promote better pedestrian connectivity between the river side trails & pathways and River Ridge multi-family complex (west of Scenic Drive S) with Galt Gardens and the Downtown core

5 STREET S (FROM 1 AVENUE S TO 6 AVENUE S)

» high ranking (#3) on the weighted-value Street Selection Matrix

» aligns closely with HOCMP's "streetscape priority" recommendations

» is an example of a HOCMP Main Street which will serve as a demonstration street for similar Downtown streets

» will enhance the public realm on one of the Downtown's most established commercial streets, and could be a prototype for future improvements on similar streets

» can be implemented in multiple phases to minimize impacts to existing businesses

- identified by the City's infrastructure analysis as having poor quality pavement and older infrastructure that is a high priority for replacement
- will help provide a better pedestrian connection linking Park Place Mall, the Lethbridge Centre and Galt Gardens
- is a major shopping street of high heritage value which will support City and local tourism initiatives as well as Galt Museum's historic walking tours
- will directly impact Galt Gardens by improving the quality of the public space around this important Downtown amenity and symbolic "heart of the Downtown"
- the intersection of 5 Street S and 4 Avenue S is considered to be the windiest intersection in the Downtown; streetscape design will be used to mitigate these effects

3 AVENUE S (FROM 8 STREET S TO 4 STREET S)

- high ranking (#4) on the weighted-value Street Selection Matrix
- is an example of a HOCMP Main Street which will serve as a demonstration street for similar Downtown streets
- is a designated commuter bike and transit route,
- will directly impact Galt Gardens and improve the existing quality of this important Downtown amenity and symbolic "heart of the Downtown"
- 3 Avenue S is identified by the City as having moderate to poor quality pavement and infrastructure; indicating possible replacement required in the near future
- allows easy implementation and incorporation of HOCMP recommendations as part of construction of the new Lethbridge Community Arts Centre (LCAC)
- highly trafficked street that is an important through link between Scenic Dr. and Stafford Dr. is of significant civic value owing to the number of cultural amenities such as the Southern Alberta Art Gallery (SAAG), the new LCAC, and proposed Lethbridge Performing Arts Centre (LPAC)

2.2 EXISTING PUBLIC REALM CONDITIONS

A visual inspection was undertaken on the selected priority streets, which focused on an assessment of the existing condition of the public realm elements including the heritage quality of the streets, and the current land use that would need special consideration within the public realm. The record of the reconnaissance is included in the Existing Public Realm Conditions document in Technical Reports - Appendix C.

All the selected study streets fall within the HOCMP's Central District of the Downtown. The Central District is the historic and cultural centre of Lethbridge containing the greatest concentration of heritage buildings as well as major civic and cultural amenities such as Galt Gardens, the Southern Alberta Art Gallery, the Lethbridge Community Arts Center currently under construction, the potential Lethbridge Performing Arts Centre (LPAC), historic Chinatown with its stock of heritage structures, and the new University of Lethbridge Downtown building / the Penny Building.

The Central District is also the retail core of the Downtown, characterized by a number of smaller boutique and specialty shops with retail use at grade and office or residential uses above. Many of these shops are located in historic buildings and have residential accommodation above the retail area. The ongoing renovation of some historic buildings is one factor that has contributed to renewed interest in the Central District.

The Central District also contains Park Place Shopping Mall, to the north, and the Lethbridge Centre office complex, to the south. These are major economic and pedestrian generators (see District Assessment Section 4.3 of the HOCMP) within the Downtown core and the likely source of any increase in pedestrian activity as a consequence of local enhancement of the public realm.

A brief synopsis of the Existing Public Realm Conditions, as it pertains to the selected study streets, is included below:

Historic Core with Narrow Sidewalk

5 STREET S

- 5 Street S is a major retail strip running in a north-south direction, that changes in intensity and character from more historic 2 and 3 storey structures in the north, to a 12 storey structure at Lethbridge Centre, then back to lower density generic building forms in the south.
- South of 6 Avenue S, 5 Street S becomes primarily a residential street within the London Road Neighbourhood.
- The east side of 5 Street S has a higher character level than the west. This is due to a greater number of historic buildings having been renovated and adapted to small boutique retail shops.
- More buildings on the west side appear to be in the process of renovation, such as the Penny Building (newly developed University of Lethbridge's Downtown presence). It is expected that both sides will have a similar level of rejuvenation in the near future.
- There is a vibrancy on either side of the street within the historic core between 1 and 4 Avenue S, with building detailing, shop signage, banner arms attached to buildings, and large display windows.
- Sidewalks in the north are narrow on both sides making it difficult to see individual shop signage mounted on building facades. Sidewalk paving treatment is a combination of concrete and brick, and there are cracked and heaved paving around street trees, causing potential trip hazards.
- Sidewalks in the south are wider and lack any differentiation in paving treatment. There is a notable lack of functional site furnishing such as benches and bike racks.


Transitional Land Uses and Building Character of 5 Street S Moving Southward


Wider Sidewalks with Fewer Street Trees Looking South


5 Street S at 6 Avenue S Transition to Residential Land Use

» Street tree planting is sporadic on both sides of the street with fewer trees toward the south. Many street trees have crooked trunks and asymmetrical pruned crowns, creating an untidy appearance.

» Street trees have a variety of treatments including: pre-cast concrete rings with gravel; open tree wells; and a variety of ground covers, all of which may be converted to tree grates to improve the overall quality and cohesiveness of the Downtown streetscape.

» A higher quality treatment of 5th Street S, North of 6th Avenue, will create a more consistent public realm as it ties into the residential nature of the London Road neighbourhood.

2 Avenue S Lacks Streetscape Amenities

Chinatown is Small and in Moderate to Poor Condition, but Has Redevelopment Potential

2 AVENUE S

» 2 Avenue S is seen as a street with high cultural significance owing to a block of heritage structures between 4 and 3 Street S that make up Chinatown.

» Located on either side of the Chinatown block are large apartment style residential buildings providing short and long term tenancy within the Downtown.

» Two vehicle travel lanes are provided, with angled parking on both sides, and generous sidewalk widths with little in the way of streetscape elements and tree planting.

» Sidewalk conditions are generally in poor condition, as is the existing boulevard planting. Much of the existing boulevard planting is pruned and of inappropriate species (evergreen trees) for street planting.

» For the most part, the existing buildings are in moderate to poor condition with many of the buildings being vacant. Large undeveloped portions of the block are currently being used for off-street parking and there is little or no landscape planting to buffer or screen parked cars.

The SAAG Museum and Additions Creates a Strong Civic Character

3 AVENUE S

» 3 Avenue S is a major connector into the Downtown.

» The SAAG and the new LCAC, currently under construction, connect directly with Galt Gardens and provides a strong civic identity to the street.

» A number of small boutique shops located within renovated historic buildings on the south side of the street strongly interface with Galt Gardens on the north.

- 6 Street S is a highly pedestrianized street between 3 Avenue S and 4 Avenue S, which can be temporarily closed to vehicles on special event days.
- Current configuration is four mixed-use travel lanes and no dedicated cycle lane, even though there is signing in the WB verge to indicate that the route is a designated a bike route. The bike route is not delineated with any pavement markings.
- Much of the perimeter of Galt Gardens exists within the roadway right-of-way (R.O.W) which allows for some flexibility concerning the width and location of the sidewalks.
- Sidewalks are generous in width, are in fair-good condition, and are surfaced in a combination of concrete and decorative brick paving.
- Well established street trees exist between 5 Street S and 7 Street S.

Wide Sidewalk and Continuous Street Tree Planting Provides Successes to Build Upon

2.3 ACTIVE TRANSPORTATION

Active Transportation is defined as modes of human-powered mode of movement (such as cycling, walking, and in-line skating), and is supported as a sustainable means of promoting a more active lifestyle for City residents. Active Transportation can enhance the quality of life for the local community whilst helping to achieve other important environmental and socio-economic goals, such as a reduction of road traffic collisions and a reduction of the roads maintenance budget.

There is rising interest in Lethbridge to encourage the use of active modes for employment commuting, attending school or shopping trips.

As a part of the Public Realm and Transportation Study, active modes were assessed and recommendations for improving the cycling and pedestrian facilities were identified.

2.3.1 EXISTING PEDESTRIAN FACILITIES

Existing pathways situated through Galt Gardens and along the roadway provide great pedestrian connectivity to the Downtown area and local shopping facilities. The safety and accessibility of pedestrians using sidewalks, crosswalks, and mid-block crossings is

important, particularly for seniors, persons with disabilities, families with strollers, and younger children.

Within the Downtown area, existing sidewalks are brick paved pattern or concrete and there has been a concentrated effort to update sidewalks in the Downtown area to make public space more appealing.

Required sidewalk width varies depending on the local conditions and forecast pedestrian volumes. A sidewalk corridor is defined as the total paved area from property line to curb. The sidewalk clear width is defined as the width of sidewalk/pathway for pedestrian use that is free of obstructions.

In general, the typical pedestrian needs a clear width of approximately 0.6m, or 0.9m if there is a “no touch zone” to comfortably walk in an urban environment. As such, the minimum sidewalk width should not be less than 1.5m to allow two pedestrians to pass side by side, and increased to 1.8m with a clear zone. This is the typical width for low volume pedestrian facility such as residential and industrial areas.

Within an urban environment with high pedestrian volumes, building frontage, and street furniture, the minimum desired sidewalk clear width is 1.8m for a pedestrian and wheelchair to comfortable travel side by side. Typically, the sidewalk corridor is further extended to incorporate street lights, utilities, bus stops, and street furniture. Existing sidewalk widths are functional and generally provide only the minimal width for pedestrians to travel. In general, there is insufficient sidewalk clear width to allow for comfortable movement for pedestrians, wheelchairs, or people with disabilities. Obstacles such as the street lighting, utility vaults, trees, building frontage, and parking overhang routinely encroach into the sidewalk clear zone. The existing sidewalk corridor width is inadequate to incorporate amenities, such as street furniture and landscaping. The photos are examples of the sidewalk clear zone that is encroached upon by a building frontage, utility pole or parking meters.

The 2008 Alberta Barrier-Free Design Guide provides the standards for proper and safe access to buildings and facilities. The guide provides guidance for the design for sidewalks and pathways. A visit conducted by MMM provided some typical examples for improvements in the existing sidewalks of the Downtown area:

» Raised curb median across a crosswalk on Scenic Drive S at 2 Avenue S discourages walkability, especially for seniors from the nearby River Ridge Senior complex.

» An uneven surface due to damaged sidewalk can cause pedestrians to trip or cause a wheelchair to come to an abrupt stop.

» Extensive cracking is an example of a sidewalk in poor condition in the Downtown area. As well as degrading the character of the street, it can become a potential trip hazard and will certainly lead to future maintenance issues.

» Facility maintenance is always a concern especially during the winter months. During the snow and ice season, care needs to be taken to ensure that sidewalks are cleared if they are to remain accessible and safe to use. As well as clearing the roadway and sidewalks, diligence is needed to clear the edges of cross walks and at sidewalk ramps where ice and snow tends to build up.

» Incomplete snow removal at curb ramp, these hazards can be difficult for seniors and people with disabilities to navigate. The snow also covers any tactile pavement surfaces that are beneficial to the visually impaired, to help them distinguish the curb from the surrounding surfaces.

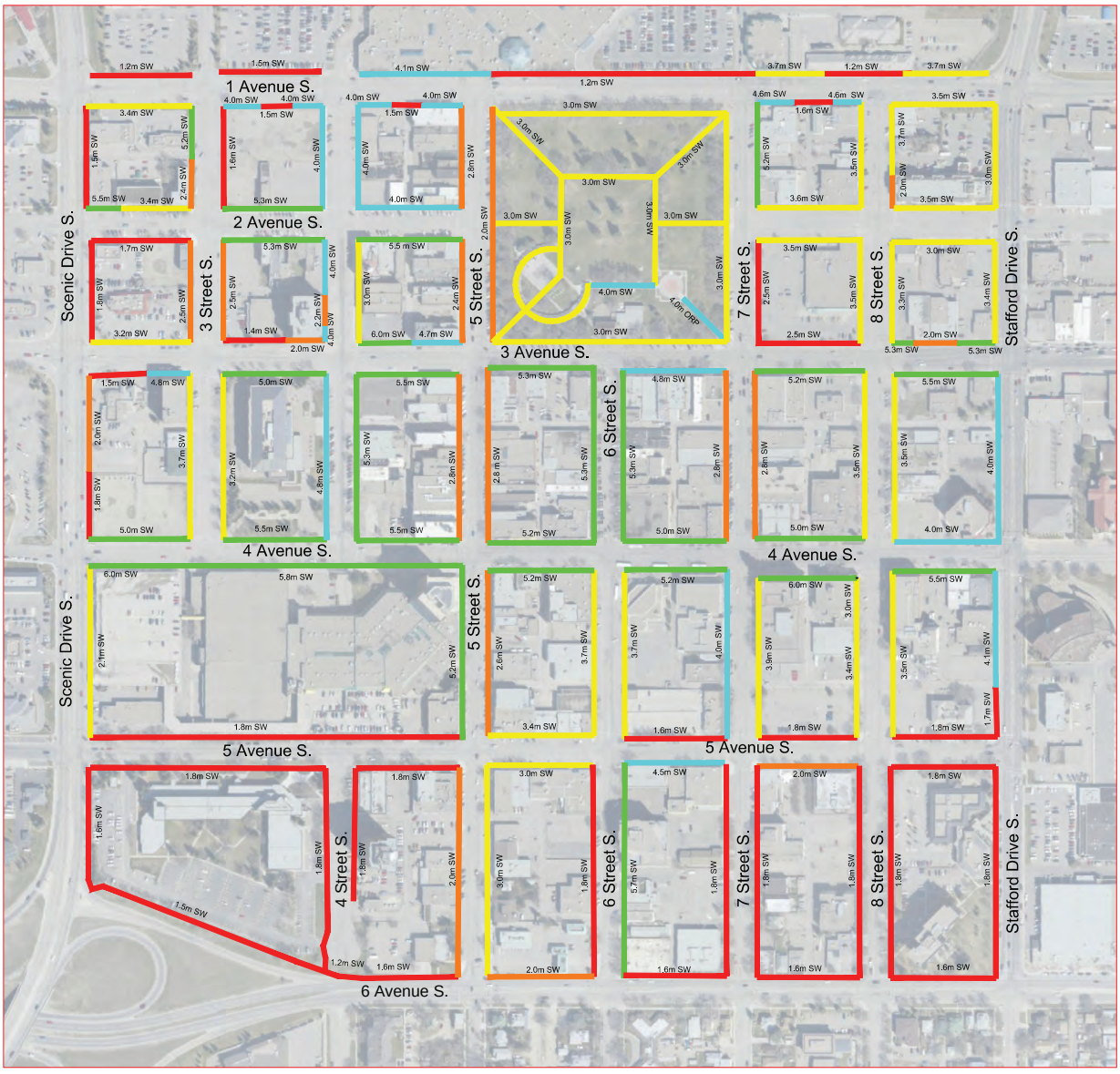
» Parked cars on the sidewalk impedes pedestrian flow and can damage the sidewalk. The sidewalk is also covered in ice and snow, thus creating a slip hazard.

A depiction of the sidewalk corridor and pathway widths within the study area is provided in Figure 2.3.1.

Figure 2.3.1 – Existing Pathway Widths

Legend:

- Existing Sidewalk Between 5.0-6.0m
- Existing Sidewalk Between 4.0-4.9m
- Existing Sidewalk Between 3.0-3.9m
- Existing Sidewalk Between 2.0-2.9m
- Existing Sidewalk Between 1.0-1.9m



Notes:

1. Drawing scale as shown. 50m 0 100m

2.3.2 EXISTING CYCLIST FACILITIES

MMM conducted a review of existing bicycle facility conditions, related utilization, and pedestrian count, at selected intersections, during a period of fine weather in April 2011. The majority of the existing pathways in the City's Downtown core are for pedestrian use only. There is an absence of designated bike lanes and pathways for cyclists to facilitate connectivity within the Downtown district.

Within the study area, 3 Avenue S has been designated as a bike route; however, it does not have a marked bike only lane.

The outside travelling lane width, along 3 Ave S, is just 3.4m; this is insufficient for a motorist to safely pass a cyclist while remaining in the same lane. The existing on-street parking also increases the potential for conflict between then cyclist and the motorist; further discouraging cycling along the corridor.

The remainder of the streets in the study area have various travel lane widths that the cyclist shares with vehicles. There is general absence of any cycle pavement markings, wayfinding signing or prioritisation for cycles.

Although cycling activity tends to increase during fine weather it is unlikely to become a significant proportion of overall traffic volume. This is due, in part, to a lack of cycle infrastructure within the City, but also because of the topography, urban spread, and local climate. Frequent cyclists and commuters will generally cycle on the most direct route, regardless of the lack of cycling infrastructure. Recreational or nervous cyclists do, however, tend to plan their routes according to their level of comfort and the perceived level of risk. Recreational cyclists are therefore those most likely to make use of any new cycle lanes and priority systems.

Despite the presence of bicycle racks within the Downtown area (Figure 2.3.2), it is not unusual to see cycles locked to trees, signposts, railings, and other street furniture. This suggests the number of bike racks provided is insufficient or not located where demand is greatest. Additionally, in locations where bicycle racks are overloaded, a bicycle rack with higher capacity that allows bicycles to be parked upright should be considered.

» Bicycle locked to a parking meter in Downtown Lethbridge.

» Bicycle rack overloaded at 2 Avenue S and 5 Street S.

Figure 2.3.2 – Existing Bicycle Rack Location

Legend:

- Existing Bicycle Rack Location

Notes:

1. Drawing scale as shown.

50m 0 100m

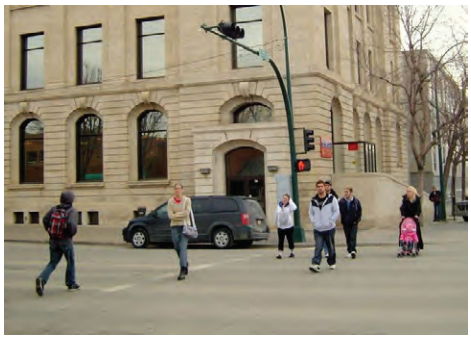
2.3.3 EXISTING PEDESTRIAN AND CYCLIST SURVEY

A count of pedestrians and cyclists was conducted by MMM on a warm sunny day in April 2011. The count locations were conducted within the selected priority streets. The locations of the survey with the peak pedestrian and cyclist volume are shown in Figure 2.3.2 (See Technical Reports Appendix E for pedestrian and cyclists counts).

Figure 2.3.3 – Peak Hour Pedestrian and Cyclist Survey

The result of the survey demonstrates that there is considerable pedestrian activity within the Downtown core and along the priority streets during day. The highest pedestrian movement occurs around mid-day (noon to 1pm) corresponding with the trips for food, shopping, and general errand trips. This also correlates with the existing parking survey information that shows the peak period for parking occurs around lunchtime.

There was an unexpected low level of pedestrian activity along 2 Avenue S at Scenic Drive S. Higher pedestrian activity was expected because of the large housing complex west of Scenic Drive S and its proximity to Galt Gardens and the Downtown core. Improvements could easily be made to the intersection of 2 Avenue & Scenic Drive to increase the attractiveness, and overall sense of safety, at the high volume intersection. The current lack of amenities and services on 2 Avenue S may also contribute to lower than expected pedestrian usage along this corridor. As the block becomes more developed it is hoped that this pedestrian connection will become a stronger corridor.



There is significant pedestrian activity along 5 Street S and 4 Avenue S during the mid-day as employees in the Downtown district head out for lunch to the local restaurants or complete a quick errand at the local shops. Galt Gardens is a major attractor during the mid-day as people eat in park, take a brisk walk, or relax within the attractive surroundings.

Cyclist activity observed was evenly distributed throughout priority streets in the Downtown area. There does not appear to be a distinct preferred bike corridor; a wider count may reveal better trends and travel patterns although the overall level of cycle activity is unlikely to increase significantly unless better bike connections are made in the Downtown area. Improvements to cycle priority systems, and better connectivity with the trails and pathways system, will help increase the number of cyclists although these will probably be recreational users rather than commuters. To increase the proportion of commuters the City may wish to consider sponsoring a training or cycle education session that will increase the confidence level of those considering cycling more.

2.4 ROAD GEOMETRY

2.4.1 EXISTING ROADWAY CLASSIFICATION AND CROSS-SECTIONS

Roadway classifications for the three selected roadways are provided in Table 2.4.1 with existing cross-sections shown in Figure 2.4.1. The roadways are 2 Avenue S from Scenic Drive S to 5 Street S; 3 Avenue S from 4 Street S to 8 Street S; and, 5 Street S from 1 Avenue S to 6 Avenue S. The estimated pavement width was determined using GIS information provided by the City.

Some common design elements of the three roadways are:

- 30.5m R.O.W. width
- 50km/h speed limit – not posted
- 60km/h design speed
- 3.5m lanes on 2-lane roadways
- 3.4-3.2m lanes on 4-lane roadways
- 2.5-2.6m parallel parking lanes
- 5.4m stall length (perpendicular) for 450 angle parking
- 5.8m stall length (perpendicular) for 600 angle parking

Table 2.4.1 – Existing Roadway Conditions

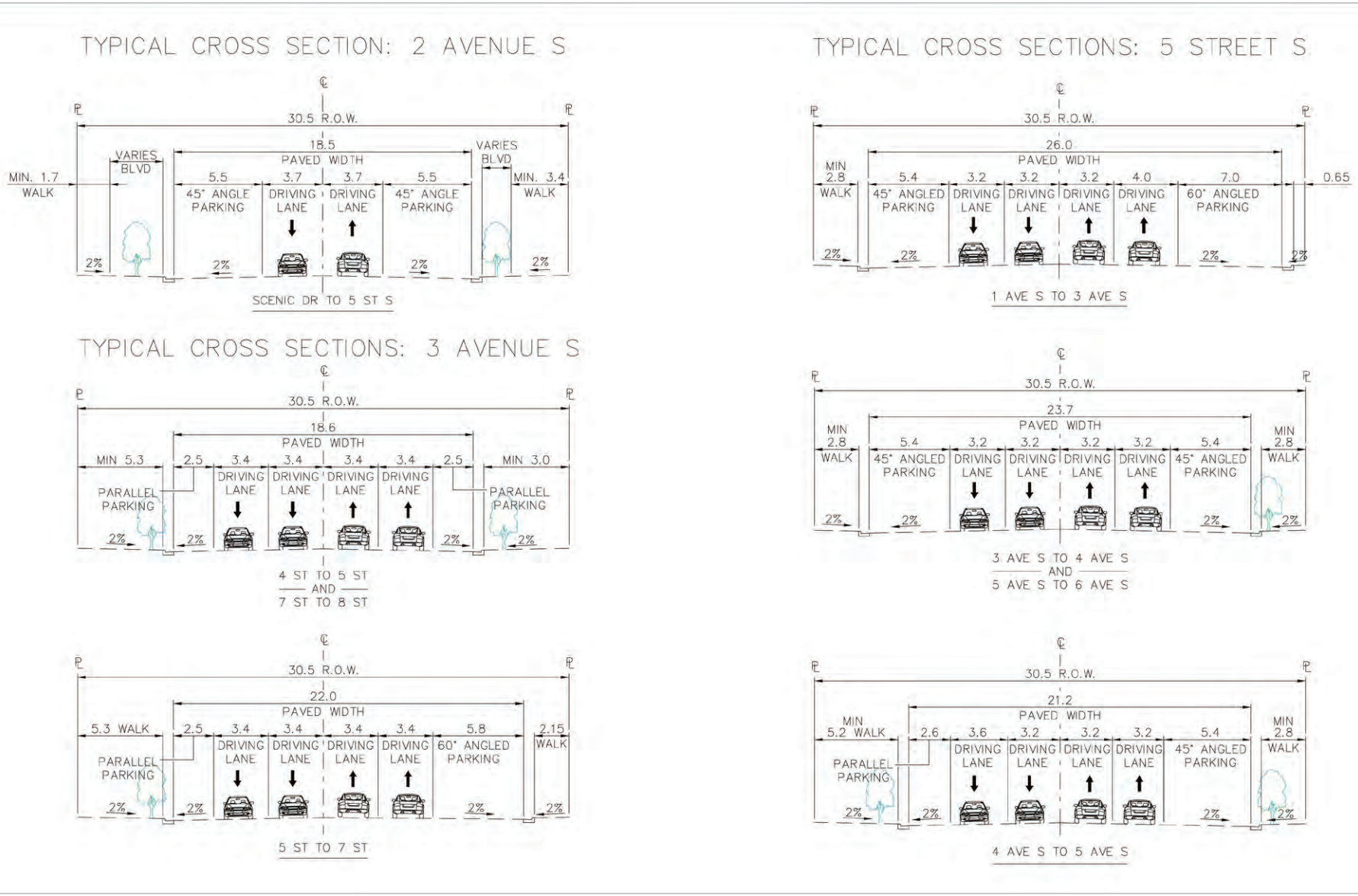
Roadway: Section	Service Classification	Number of Lanes	Finished Pavement Width (m)	Typical Intersection Spacing – Property Lines (m)	Parking
2 Avenue S: Scenic Drive S to 5 Street S	Local Road	2	18.5	84	60° Angle (North/South)
3 Avenue S: 4 Street S to 8 Street S	Arterial Road	4	18.6	84	Parallel (North/South)
5 Street S: 1 Avenue S to 3 Avenue S	Collector Road	4	23.7	137	45°Angle East 60° Angle West
5 Street S: 3 Avenue S to 4 Avenue S	Collector Road	4	23.7	137	45°Angle (East/West)
5 Street S: 4 Avenue S to 6 Avenue S	Collector Road	4	21.2	84-137	45° Angle (East), Parallel (West)

The City's design standard for a typical collector road is 3.5m wide lanes; for lanes adjacent to parallel parking (2.4m) the travel lane width is 3.1m.

The TAC Geometric Design Guide recommends a minimum lane width, on collector roads, of 3.5-3.7m on new construction, and 3.3-3.5m on existing infrastructure. Whilst these lanes are permitted it should be noted that a motorist passing a cyclist will probably have to move into the adjacent travel lane.

The angled parking perpendicular stall length includes a curb overhang and is within accepted parking standards. The parallel parking width is consistent within the City and TAC standards.

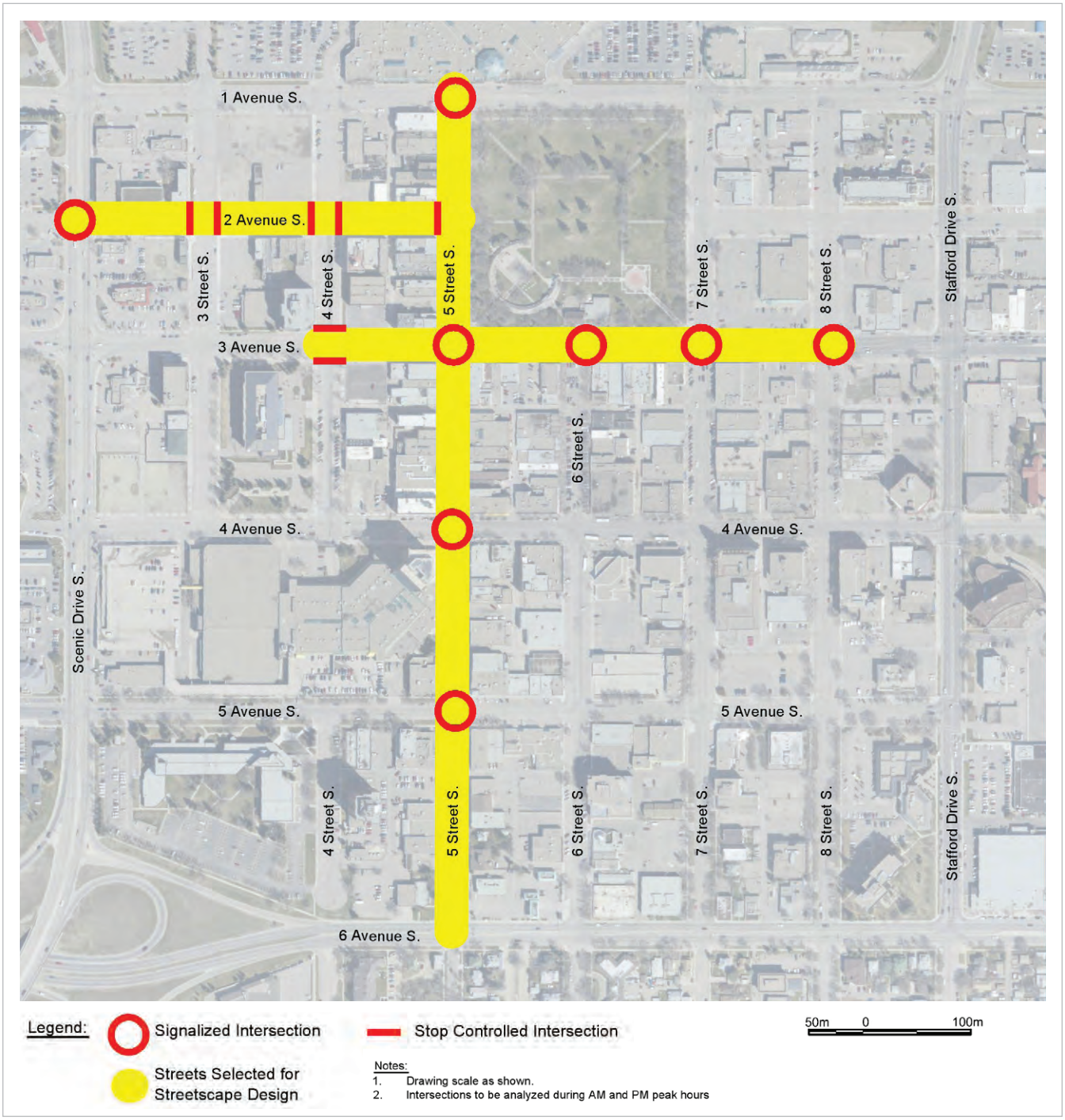
Figure 2.4.1 – Typical Cross Sections



2.4.2 EXISTING INTERSECTIONS

The most common roadway in the Downtown core is a four-lane road with some minor two-lane roads. The majority of the intersections are signalized and, with the exception of those on Scenic Drive and Stafford Drive, do not have separate left-turn or right-turn lanes. However, within the Downtown core, the typical intersection has a shared through-left turn lane and a shared through-right turn lane. There are currently twelve intersections along the selected streets; Figure 2.4.2 illustrates the intersection control type for each.

Figure 2.4.2 – Intersection Types on Selected Streets



A summary of the intersection analysis provided for the intersections provided in Section 2.5.

The existing turning 9.0m radii at the intersections are suitable to accommodate turning movements for emergency and commercial freight vehicles that need to access businesses. There are no existing curb extensions at the intersections and typical pavement markings for crosswalks are parallel lines.

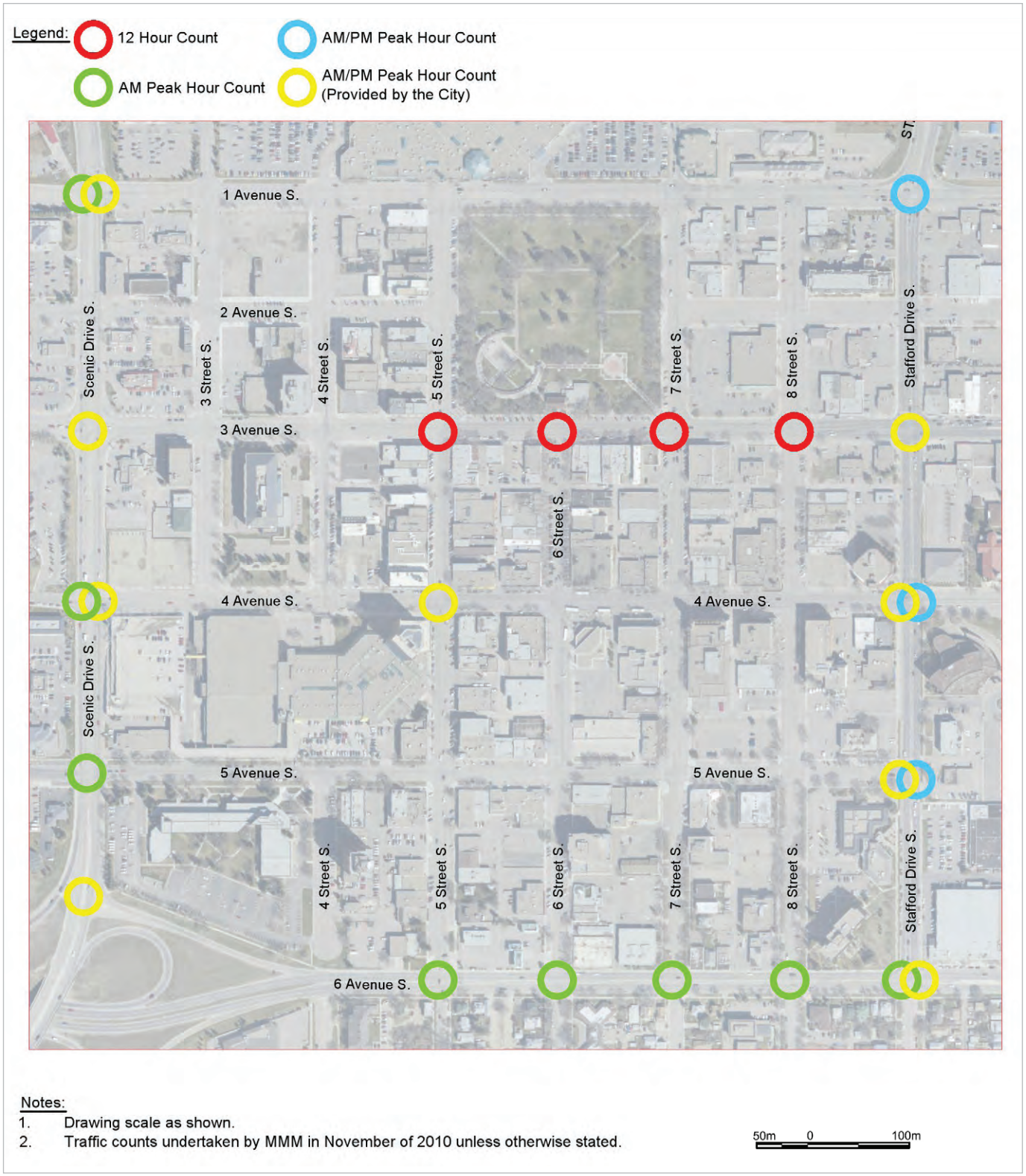
2.4.3 EXISTING TRAFFIC VOLUMES

MMM completed an extensive traffic count program to determine the existing traffic volumes within the study area. MMM used video survey equipment to determine the pedestrian count, vehicle type, and turning movements at the intersections. The traffic program consisted of counts taken at fifteen locations in November 2010 and a further five counts in April 2011. The City also provided some additional traffic at other locations (see Figure 2.4.3.1 for locations and survey count periods).

A detailed capacity analysis was conducted at the eight major intersections as shown in Figure 2.4.3.2. The observed traffic volumes were calibrated and the operational performance of each intersection was analyzed. The determination of the morning peak hour volumes was accomplished by utilizing the observed traffic data. When there was a notable discrepancy between the MMM counts and those collected by the City, then it was agreed that the higher volume would prevail.

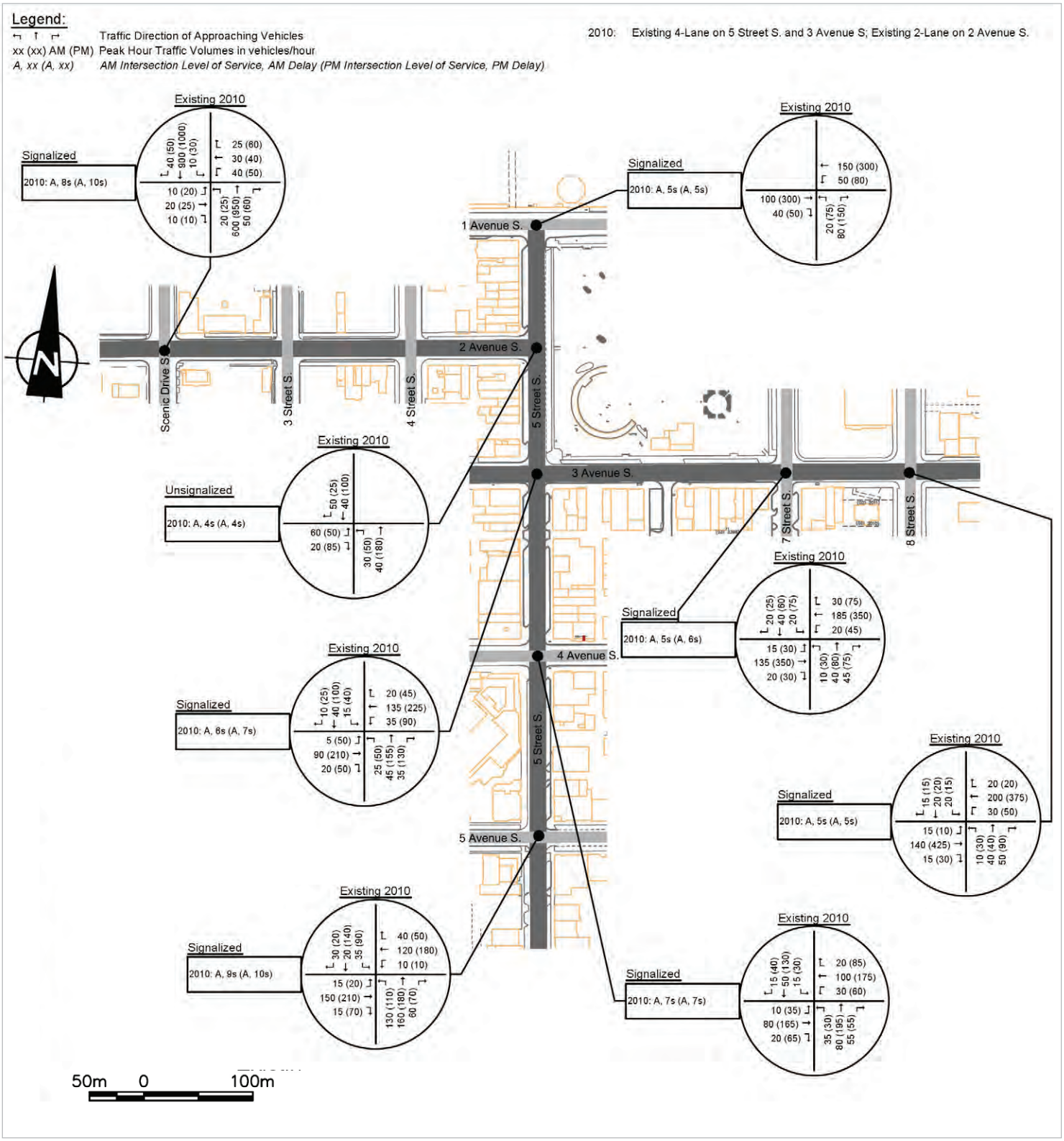
- **Scenic Drive S and 2 Avenue S** – volumes on Scenic Drive S were determined from the traffic counts at Scenic Drive S – 1 Avenue S intersection and Scenic Drive S – 3 Avenue S intersection. The volumes for 2 Avenue S were determined by reviewing the eastbound and westbound intersection volumes at Scenic Drive with 1 Avenue S through 5 Avenue S in combination with a general comparison of the existing land use along 2 Avenue S with the land use along 1 Avenue S through 5 Avenue S.
- **5 Street S and 1 Avenue S** – peak volumes at this intersection were determined using the traffic counts from Scenic Drive S – 1 Avenue S and Stafford Drive S – 1 Avenue S. Consideration was given for Park Place Mall as it is a significant destination and generator of traffic.
- **5 Street S and 2 Avenue S** – volumes were determined using the traffic count volumes for 5 Street S – 3 Avenue S and the estimated volumes at 5 Street S – 1 Avenue S .
- **5 Street S and 5 Avenue S** – volumes at this intersection were determined using the traffic counts from 5 Street S – 6 Avenue S intersection. Consideration was given for the large parking structure at Lethbridge Centre that is a significant destination and generator of traffic. The number of eastbound traffic along 6 Avenue that is destined for the Lethbridge Centre would avoid the exit at Scenic Drive S to avoid the high traffic volumes, this would help account for the high number of left turn movements from 6 Avenue S onto 5 Street S. Review of the morning volumes northbound from 5 Street S – 6 Avenue S intersection is approximately 375 vehicles and is reduced to 170 vehicles by the time the traffic reaches 5 Street S – 5 Avenue S.

Figure 2.4.3.1 – Traffic Count Locations



The Existing Traffic Volume and Analysis Report are provided in Technical Report Appendix E. The following 2.4.3.2 – Existing Traffic Volumes and Operations Diagram summarize the 2010 AM and PM peak traffic volumes:

Figure 2.4.3.2 – Existing Traffic Volumes and Operations Diagram



2.5 2010 INTERSECTION CAPACITY ANALYSIS

The intersection traffic analysis is based on the Highway Capacity Manual (HCM), Measures of Effectives (MOE). The standard MOE are defined as average control delay in seconds, maximum volume to capacity ratio for a traffic movement, and the LOS. The HCM identifies six different levels of service from “A” to “F”, as follows in Table 2.5.1.

The resulting level of service from the traffic analysis for the intersection was included in Figure 2.4.3.2. A summary of the detailed results are in table 2.5 for the 2010 AM and PM peak hours traffic analysis. Measurements are based upon the AM and PM peak traffic numbers determined in Section 2.4.3.

The results of peak hour 2010 traffic is that the flow of traffic at the intersections are practically unaffected by the presence of other vehicles on a road sections operating at a LOS A or B. These results suggest that there is significant additional capacity at these intersections. The detailed Synchro AM and PM peak hour traffic analysis report can be found in the Technical Reports Appendix E.

Table 2.5 – Summary of Existing Intersection Analysis

Traffic Control	Peak Period	Average Delay	LOS	Max V/C	Critical Movement			
					Movement	v/c	LOS (Delay)	Queue (m)
5 Street S & 1 Avenue S								
Signalized Existing Signal Timing	AM	5.2 sec	A	0.21	All movements have a LOS A or B			
	PM	5.6 sec	A	0.37	All movements have a LOS A or B			
5 Street S & 2 Avenue S								
Two-way Stop	AM	3.5 sec	A	0.11	All movements have a LOS A or B			
	PM	3.5 sec	A	0.35	All movements have a LOS A or B			
5 Street S & 3 Avenue S								
Signalized Existing Signal Timing	AM	6.0 sec	A	0.17	All movements have a LOS A or B			
	PM	7.2 sec	A	0.47	All movements have a LOS A or B			
5 Street S & 4 Avenue S								
Signalized Existing Signal Timing	AM	6.5 sec	A	0.27	All movements have a LOS A or B			
	PM	6.0 sec	A	0.41	All movements have a LOS A or B			
5 Street S & 5 Avenue S								
Signalized Existing Signal Timing	AM	6.0 sec	A	0.17	All movements have a LOS A or B			
	PM	9.7 sec	A	0.55	All movements have a LOS A or B			
Scenic Drive & 2 Avenue								
Signalized Existing Signal Timing	AM	7.9 sec	A	0.51	All movements have a LOS A or B			
	PM	10.1 sec	A	0.57	WB T/L	0.32	C (20 s)	20
3 Avenue S & 7 Street S								
Signalized Existing Signal Timing	AM	5.4 sec	A	0.15	All movements have a LOS A or B			
	PM	6.7 sec	A	0.35	All movements have a LOS A or B			
3 Avenue S & 8 Street S								
Signalized Existing Signal Timing	AM	5.5 sec	A	0.15	All movements have a LOS A or B			
	PM	5.8 sec	A	0.32	All movements have a LOS A or B			

Table 2.5.1 – Traffic Analysis Level of Service Description

Level of Service	Description	Signalized Intersection (Average delay per vehicle)	Unsignalized Intersection (Average delay per vehicle)
A – Free Flow Traffic	Primarily free-flow operations at average travel speeds, usually about 90 percent of the Free Flow Speed (FFS) for the given Street class. Vehicles are completely unimpeded in their ability to manoeuvre within the traffic stream.	≤10 sec	≤10 sec
B – Steady Flow	Reasonably unimpeded operations at average travel speeds, usually about 70 percent of the FFS for the street class. The ability to manoeuvre within the traffic stream is only slightly restricted.	10-20 sec	10-15 sec
C – Steady Traffic But Limited	Stable operations; however, ability to manoeuvre and change lanes in midblock locations may be more restricted than at LOS B, and longer queues adverse signal coordination, or both may contribute to lower average travel speeds of about 50 percent of the FFS for the street class	20-35 sec	15-25 sec
D – Steady Traffic at High Density	Borders on a range in which small increases in flow may cause substantial increases in delay and decreases in travel speed. LOS D may be due to adverse signal progression, inappropriate signal timing, high volumes, or a combination of these factors. Average travel speeds are about 40 percent of FFS	35-55 sec	25-35 sec
E – Traffic at Saturation	Characterized by significant delays and average travel speeds of 33 percent or less of the FFS. Such operations are caused by a combination of adverse progression, high signal density, high volumes, extensive delays at critical intersections, and inappropriate signal timing.	55-80 sec	35-50 sec
F – Congestion	Characterized by urban street flow at extremely low speeds, typically one third to one fourth of the FFS. Intersection congestion is likely at critical signalized locations, with high delays, high volumes, and extensive queuing.	≥80 sec	≥50 sec

2.6 EXISTING TRANSIT REVIEW

The Downtown study area is currently served by five transit routes with some variations depending on the served areas out of Downtown. The following routes serve the study area:

a) route 12 to University, Columbia Blvd, and College

b) route 14 to University and North Terminal

c) route 20 north schedule to Winston Churchill

d) route 20 south schedule to Lakeview

e) route 21 north schedule to Nord-Bridge

f) route 21 south schedule to Henderson Lake

g) route 22 north schedule to Park Meadows (Rehabilitation Society)

h) route 22 south schedule to Agnes Davidson

Table 2.6.1 summarizes the typical headways during peak and off-peak periods for the different routes serving the Downtown area.

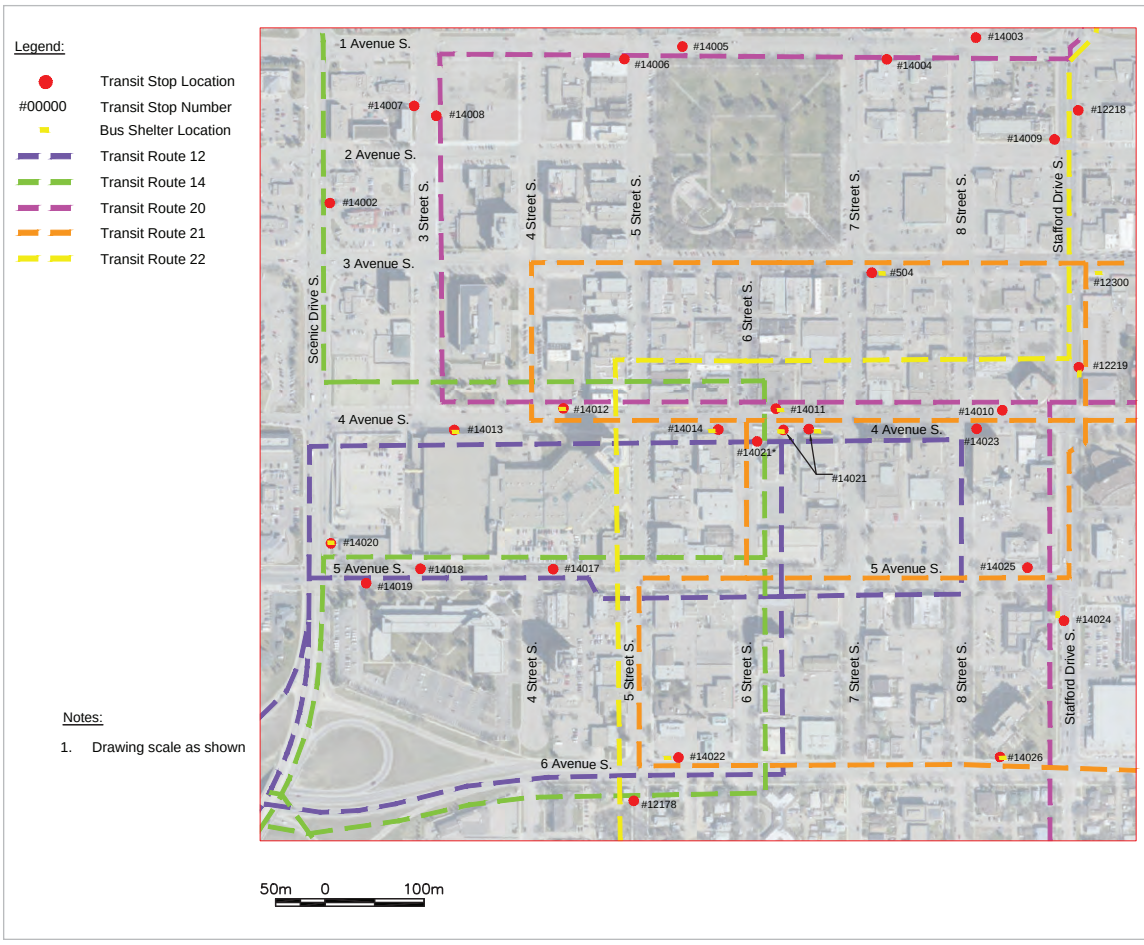
Table 2.6.1 – Transit Headways at City Centre (Source: City Fall Transit Schedule, 2011)

Bus Number	Period	Approx. Headway Weekdays	Approx. Headway Saturdays	Approx. Headway Sundays	Comments
12	Peak Periods	15 min	30 min	60 min	From May to August some buses don't run during peak hours resulting in headways of approximately 30 min
	Off-Peak Periods	30 min 60 min (last bus)	60 min	60 min	
	Operation	6:00 am to 11:58 pm	7:00 am to 11:58 pm	8:58 am to 6:02 pm	
14	Peak Periods	30 min	-	-	Express route
	Off-Peak Periods	30 min	-	-	
	Operation	6:45 am to 6:45 pm	-	-	
20 North and South	Peak Periods	30 min	30 min	60 min	-
	Off-Peak Periods	30 min 60 min (last bus)	30-60 min	60 min	
	Operation	6:00 am to 11:58 pm	7:00 am to 11:58 pm	8:58 am to 6:02 pm	
21 North	Peak Periods	30 min	30 min	60 min	-
	Off-Peak Periods	30 min 60 min (last bus)	30 – 60 min	60 min	
	Operation	6:00 am to 11:30 pm	7:30 am to 11:30 pm	8:32 am to 6:32 pm	
21 South	Peak Periods	30 min	30 min	60 min	-
	Off-Peak Periods	30 min 60 min (last bus)	30 – 60 min	60 min	
	Operation	6:00 am to 11:30 pm	7:00 am to 11:30 pm	8:02 am to 6:02 pm	
22 North	Peak Periods	30 min	30 min	60 min	-
	Off-Peak Periods	30 min 60 min (last bus)	30 – 60 min	60 min	
	Operation	6:00 am to 11:00 pm	7:00 am to 11:00 pm	8:02 am to 6:02 pm	
22 South	Peak Periods	30 min	30 min	60 min	-
	Off-Peak Periods	30 min 60 min (last bus)	30 – 60 min	60 min	
	Operation	6:00 am to 11:54 pm	7:00 am to 11:54 pm	8:02 am to 6:02 pm	

Figure 2.6.1 shows the various transit routes and bus stop locations on an aerial photograph of the Downtown area.

MMM collected passenger boarding and alighting data at four locations identified with City staff. The data was recorded in 12-hour of video surveys between 7am and 7pm at each location on Tuesday, December 7, 2010. Additional data was collected manually during the peak periods at bus stop # 14013 (at 4 Avenue S east of 3 Street S serving the EB direction of traffic). Figure 2.6.2 illustrates the transit survey locations. Table 2.6.2 summarizes the boarding and alighting passenger survey for the 12-hour period by site location.

Figure 2.6.1 – Transit Infrastructure and Routes (Source: City, 2011)



Stop Number	Bus Route Number(s)
504	21
12300	21
12039	20, 21
12178	22
12218	22
12219	22
14002	14
14003	20
14004	20
14005	20
14006	20
14007	20
14008	20
14009	22
14010	20, 22
14011	20, 21
14012	20
14013	12, 14, 20, 22
14014	12, 14
14017	12
14018	12
14019	14
14020	12, 14, 22
14021	14, 20, 21, 22
14021*	14, 21
14022	12, 14, 21
14023	20, 21, 22
14024	20
14025	21
14026	21

Figure 2.6.2 – Transit Survey Site Location

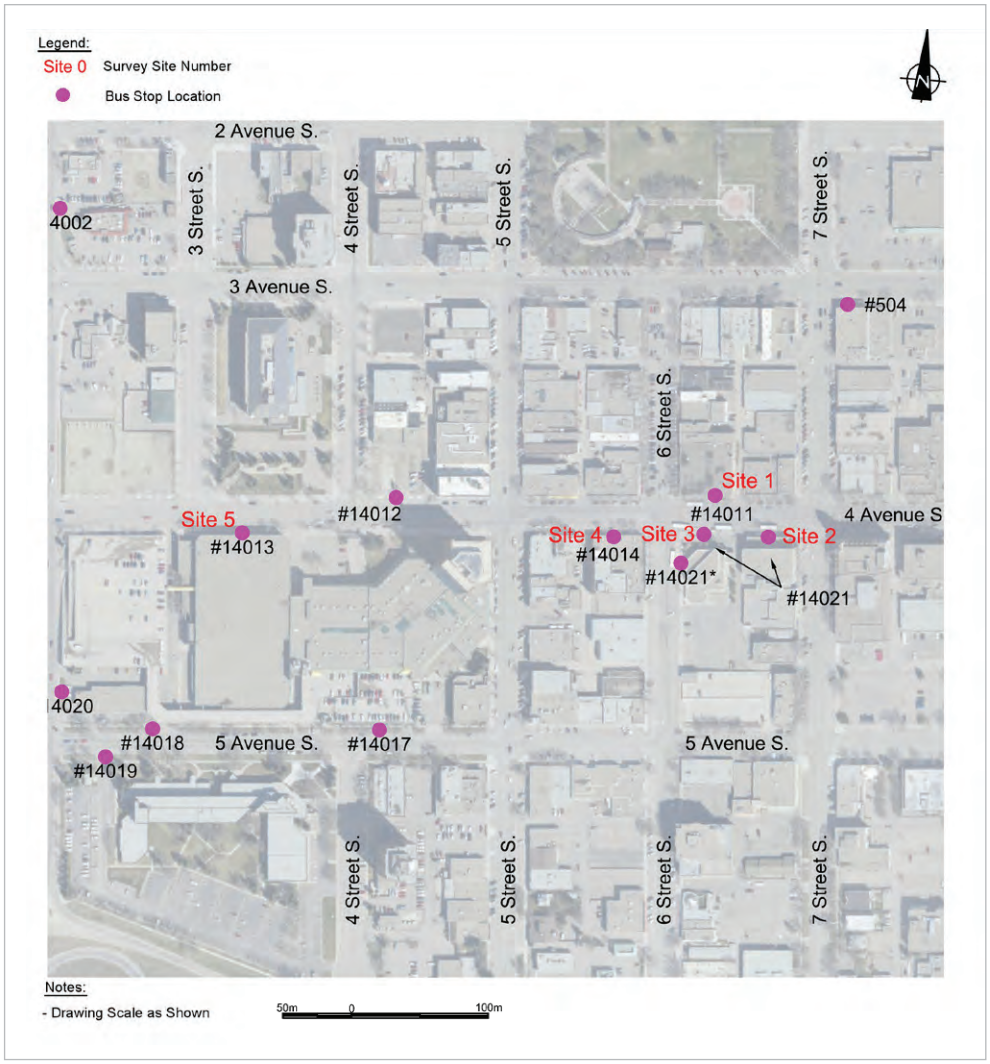


Table 2.6.2 – Boarding and Alighting Passenger Transit Survey Summary

Site	Location	Bus Stop Number	Count Description	Period	Boarding Passenger	Alighting Passenger
Site 1	WB direction at 4 Avenue S between 7 Street S and 6 Street S	#14011 (two spots)	East Spot	9.50 hours	119	173
				2 hour AM peak	13	41
				2 hour PM peak	52	45
Site 2	EB direction at 4 Avenue S between 6 Street S and 7 Street S	#14021 (two of four spots)	East Spot	12 hour	121	295
				2 hour AM peak	28	79
				2 hour PM peak	32	52
Site 2			West Spot	12 hour	123	206
				2 hour AM peak	33	30
				2 hour PM peak	25	62
Site 3	EB direction at 4 Avenue S between 6 Street S and 7 Street S	#14021 (two of four spots)	East Spot	12 hour	187	138
				2 hour AM peak	27	32
				2 hour PM peak	36	22
Site 3			West Spot	12 hour	211	159
				2 hour AM peak	24	28
				2 hour PM peak	50	33
Site 4	EB direction at 4 Avenue S between 5 Street S and 6 Street S	#14014 (two spots)	East Spot	12 hour	419	222
				2 hour AM peak	49	59
				2 hour PM peak	104	55
Site 5	EB direction at 4 Avenue S between 3 Street S and 4 Street S	#14013 (two spots)	Two Spots	6 hour	2	41
				2 hour AM peak	0	10
				2 hour PM peak	1	17

Transit bus stops, sites one through four form part of the existing central bus stop in the heart of Downtown. No further analysis or transit data collection was undertaken by MMM as the City of Lethbridge advised that a detailed transit analysis was not required. Additional transit information, including transit data collection, is provided in the Technical Reports Appendix F.

2.7 EXISTING PARKING CONDITIONS

2.7.1 EXISTING PARKING SUPPLY

Based on detailed parking inventories completed in late 2010 and early 2011, there are approximately 5,418 non-residential parking stalls within the study area. Of these spaces, approximately 1,827 spaces are public on-street, 440 are public off-street, and 3,151 are private off-street parking locations. Most of the on-street parking is available for short-term parking periods, with time limits of less than 3 hours. Long-term parking, of up to 10-hour duration, is available in other meter locations. Typical rates are $0.80 per hour (short term), and $0.35 per hour (10-hour long term parking). Free parking spaces are available, however these are mostly found at the edge of and beyond the Downtown study area.

2.7.2 EXISTING PARKING DEMANDS

MMM conducted a series of comprehensive parking utilization surveys in late 2010 and early 2011. Analysis suggests that that the overall parking demand is relatively stable throughout the day, with peak parking demand occurring just before midday. The peak parking utilization is approximately 59% across the Downtown. This suggests that there is considerable residual parking capacity available in the Downtown as a whole during most times of the day.

Parking utilization was also assessed on the basis of individual blocks and block faces. Off-street parking on the following blocks was found to be highly utilized:

- 4 Street S/1 Avenue S/5 Street S/2 Avenue S
- 5 Street S/4 Avenue S/6 Street S/5 Avenue S
- Scenic Drive/5 Avenue S/4 Street S/6 Avenue S
- 4 Street S/5 Avenue S/5 Street S/6 Avenue S
- 5 Street S/5 Avenue S/6 Street S/6 Avenue S
- 8 Street S/5 Avenue S/Stratford Drive/6 Avenue S

On-street parking is also being highly utilized at many locations throughout the Downtown, including some parts of the priority areas along 2 Avenue S, 3 Avenue S, and 5 Street S.

The overall parking demand rate was measured to be 2.10 to 2.22 spaces per 100 m2 (1 space per 45 m2 to 48 m2). This is consistent with the City of Lethbridge Land Use Bylaw minimum parking requirements for medical and general office use, and lower than those for restaurant and retail uses. This also falls within the range of parking demand rates observed in other Downtown areas.

(See Technical Report Appendix G for the complete *Lethbridge Downtown Parking – Existing and Short Term Future Parking Conditions Report*)

2.8 FREIGHT REVIEW

According to the 2010 City's Dangerous Goods and Truck Route Map, there is no dangerous goods route within the study area; however, Scenic Drive S is designated as a Truck Route. In addition, the truck activity within the Downtown core area and surroundings could be affected by any changes introduced to the transportation system, in terms of the operation, level of service, proper accommodation and safety.

During the 12-hour traffic survey and counts the number of heavy trucks were recorded. MMM then compared their results with those provided by the City of Lethbridge. The following Figure 2.8.1 shows the percentage of heavy vehicles, including the City's transit buses, observed during the AM and PM peak hour period. The results show that there are relatively few large vehicles trying to access the Downtown area during the peak periods. Furthermore, MMM's own 12hr video surveillance suggested that heavy truck movements within the Downtown area are very low during off-peak periods as well.

Where the results show a high proportion of heavy vehicles, eg. 22.6% heavy vehicle movement was observed on the north approach of 6 Street S at 6 Avenue S, it is understood that this is a consequence of having low background traffic – only twenty-three vehicles were observed during the peak period, five of these were heavy vehicles turning right into 6 Ave S. The percentage of heavy vehicles is also greater on 4 Avenue S even though most of the observed heavy vehicles were transit buses.

In addition to the observed counts, MMM conducted a freight survey which was forwarded to all members of the Business Revitalization Zone and the Chamber of Commerce. A sample copy of the freight survey is included in Technical Reports Appendix K.

The purpose of the freight survey was to identify the preferred routes for movement of goods and services through the Downtown area, to quantify the types and number of vehicles that were being used to move goods, the principal time periods for goods movement, and any problem areas experienced by carriers.

From a sample set of 274 stakeholders, only 19 completed surveys were returned. This low response from the study area businesses does not provide a statistically significant outcome; however, it does provide an insight into the freight operations within the study area, providing complementary information to the truck data collected by observation counts.

Of the complete responses, seventeen were from businesses located within the study area. The type of goods delivered to the business varied including food, beverages, household products, furniture, electronics/ appliances, apparel, jewellery, and home decoration.

Figure 2.8.1 – Peak Hour Heavy Vehicle Percentage

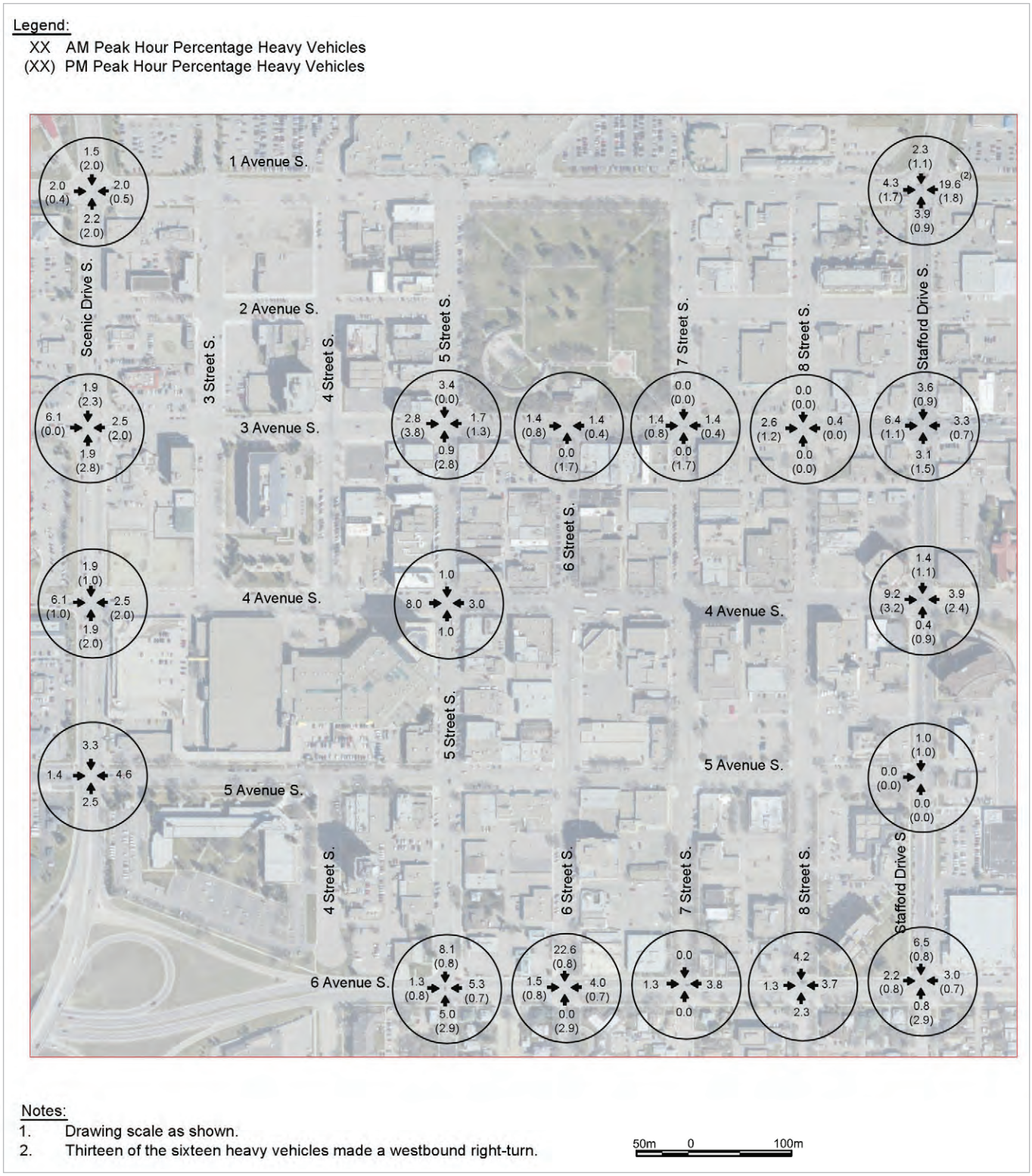


Figure 2.8.2 illustrates that in about 50% of the responses, the delivery of goods is made by medium size trucks (single unit truck), followed by small vehicles (Cars, Mini-vans, SUVs or similar), and in about 15% by single trailer trucks (single articulated trucks).

Video observations suggest that freight movement, by single trailer trucks and other large vehicles, represents about 1% of the total traffic within the Downtown core.

Figures 2.8.3 to 2.8.5 illustrate the delivery temporal distribution. In half of the cases, the surveyed businesses scheduled deliveries between 2 to 4 days per week, about 30% less or one day per week, and close to 20% five or more days per week. Of this, in 80% of the cases the delivery is made by 1 to 2 trucks per day. In addition, most of the deliveries take place during the daytime hours between 5 am to noon (45%) and between noon to 5 pm (55%). No business reported deliveries between the 10 pm to 5 am periods. Notice that trucks includes all the delivery vehicle types identified previously.

Figure 2.8.6 presents the preferred routes reported in the survey responses. Due to the low number of replies, no accurate conclusions can be drawn, thus caution should be used when reviewing the data.

Respondents of the surveys (10 of 17) identified issues regarding the use of back alleys to make deliveries. In general, businesses reported they deliver or receive goods through the back alleys, even though they are often congested or blocked by parked cars or trucks, and are not maintained (snow removal) during winter.

Figure 2.8.2 – Motor Vehicle Type Frequency Distribution

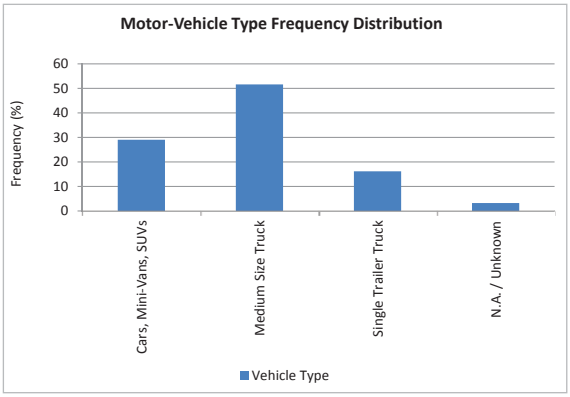


Figure 2.8.3 – Freight Weekly Delivery Distribution

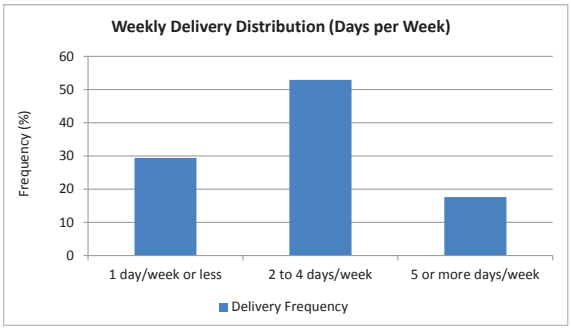


Figure 2.8.4 – Freight Daily Delivery Distribution

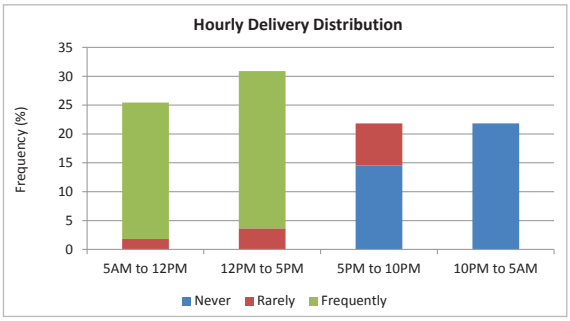


Figure 2.8.5 – Freight Hourly Delivery Distribution

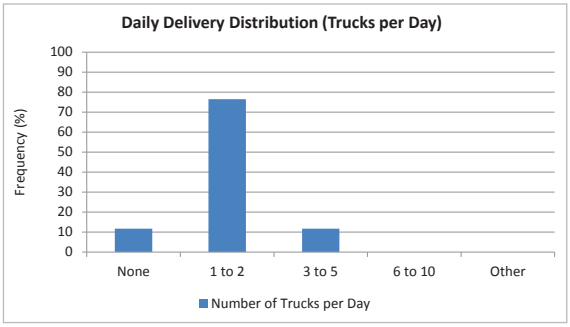
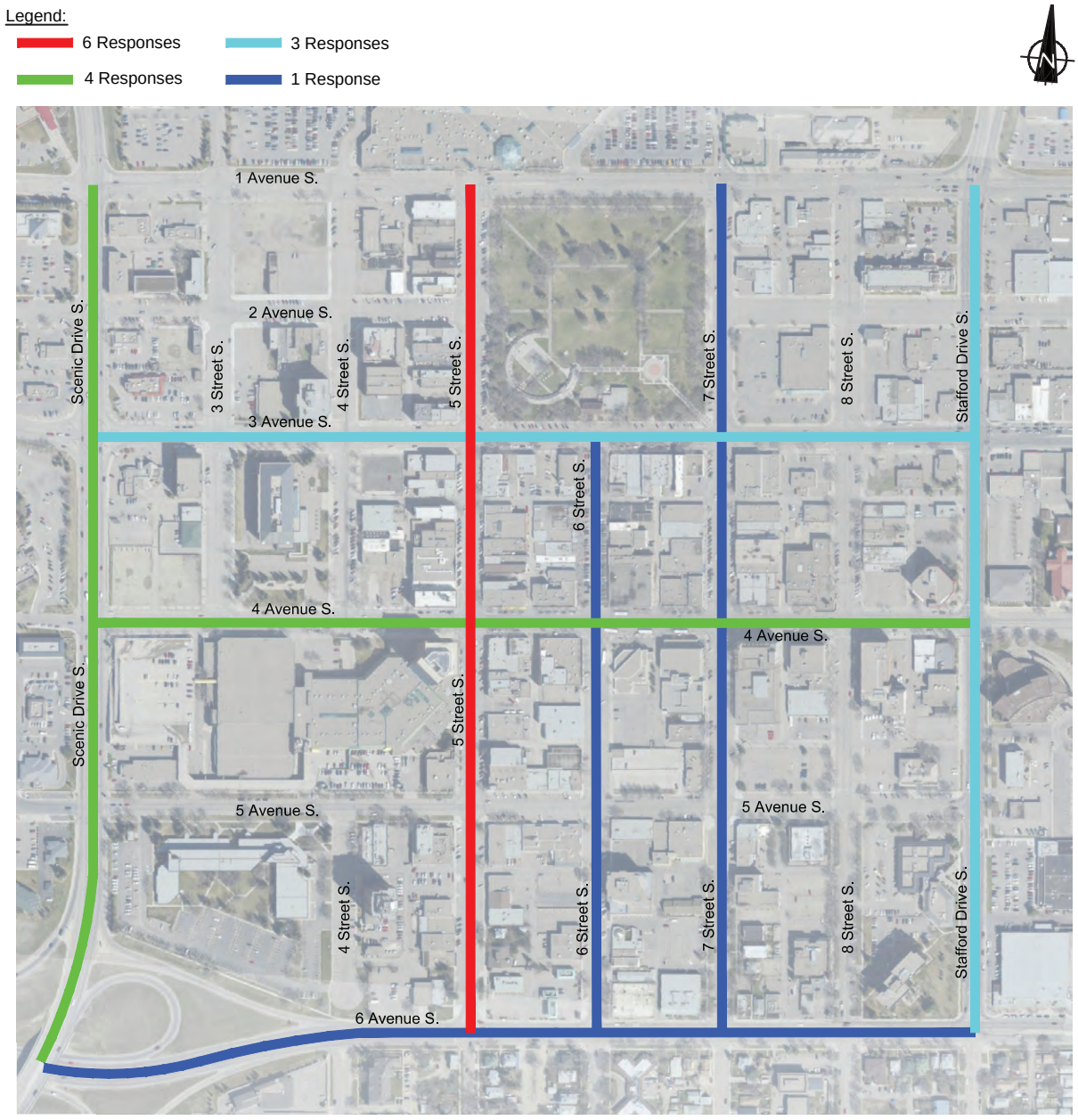


Figure 2.8.6 – Preferred Goods Delivery Routes



No major problems were identified regarding loading and unloading freight operations within the study area. However, the City should establish and provide signage for loading/unloading zones in the alleys for individual business. Providing that non-articulated trucks are used for these purposes and that commercial vehicles are not left unattended. Future development should be designed in a manner that takes adequate loading and unloading zones as well as circulation and access into consideration.

The City should continue to monitor freight traffic along the major routes to ensure the transportation network continues to adequately accommodate freight operations.

FUTURE CONDITIONS

3.1 PROJECTION OF THE FUTURE TRAFFIC VOLUMES

The forecast of the future traffic volumes was determined by applying a growth rate to the existing volumes. City data from its EMME3 model was unavailable thus a review of the historical traffic volumes and population projection was used to identify a low, moderate, and high traffic growth rate. The moderate growth rate was determined to provide the most suitable estimate for future traffic volumes.

3.1.1 HISTORICAL TRAFFIC VOLUMES

Historical traffic counts were also obtained from Alberta Transportation, for the intersection of Highway 3 with Stafford Drive and Scenic Drive, for the periods between 2002 and 2010. Analysis of the traffic data at the intersection of Highway 3 and Scenic Drive showed an average 3-year growth rate of 0.71 %pa, a 5-year growth rate of 1.33 %pa, and a 9-year growth rate of 4.21 % per annum. The intersection of Highway 3 and Stafford Drive showed an average 3-year growth rate of 0.97, a 5-year growth rate of 1.32 %pa, and a 9-year growth rate of 1.76 % per annum.

The average growth rate at these locations is a 3-year 0.84, a 5-year 1.33, and a 9-year of 2.99 percent per annum.

3.1.2 POPULATION PROJECTIONS

Based on information from Census Canada, the City's 2010 population growth is approximately 1.37 %pa for the total population, 1.13 %pa in north Lethbridge, 2.98 %pa in west Lethbridge, and -0.08 %pa in south Lethbridge. Based on the population projections from the City's population forecast study, by Urban Futures (Nov 2001), the population growth rate will reduce by about 0.1 % every 5 years until the forecast year 2030.

3.1.3 RECOMMENDED TRAFFIC GROWTH RATE

Taking the historic traffic volumes on Hwy 3, at Scenic Drive and Stafford Drive, and the population information into consideration, the following three annually compounding growth rates were suggested:

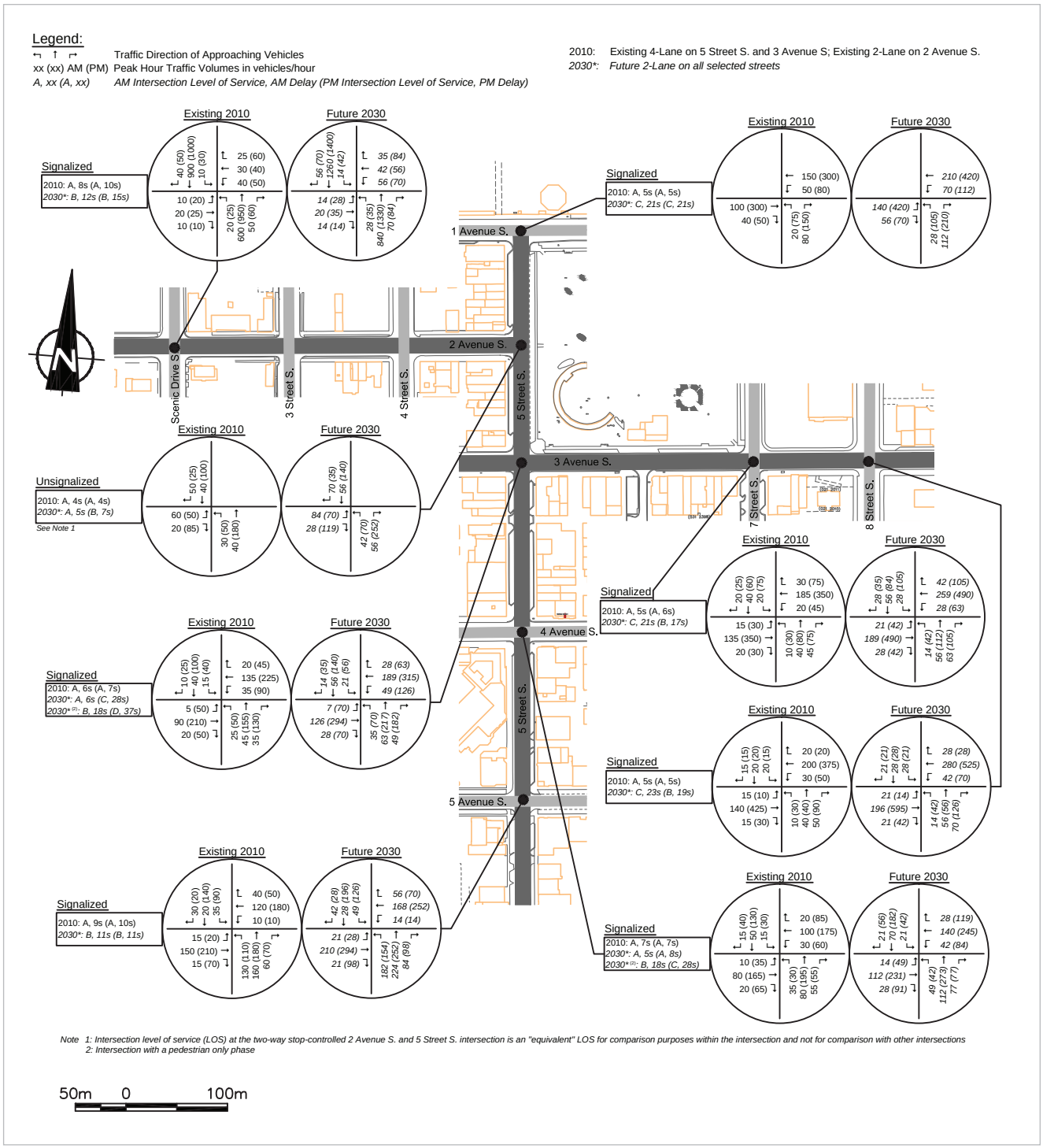
- low Annual Growth rate of: 1.0 percent
- moderate Annual Growth Rate of: 1.7 percent
- high Annual Growth Rate of: 3.0 percent

The City adopted a moderate annual growth rate of 1.7 percent per annum to project the 2030 traffic volume. A growth rate of 3.0 percent per annum was applied to pedestrian and cyclist volumes, as it is anticipated that there will be a greater increase in active transportation.

3.1.4 FUTURE TRAFFIC VOLUMES

Future traffic volumes refers to the total forecast traffic volumes by the year 2030, assuming that an annual growth rate of 1.7% is applied to the existing base volumes (Section 2.4.3). Figure 3.1.4 summarizes the future traffic volumes at eight intersections within the study area, for the weekday morning and afternoon peak hours, respectively.

Figure 3.1.4 – 2030 Traffic Volume and Operation Diagram



Note 1: Intersection level of service (LOS) at the two-way stop-controlled 2 Avenue S. and 5 Street S. intersection is an "equivalent" LOS for comparison purposes within the intersection and not for comparison with other intersections
2: Intersection with a pedestrian only phase

3.2 ANALYSIS OF FUTURE TRAFFIC

MMM prepared conceptual plans of the selected streets, based on the premise that some of existing ROW would have to change from a transportation function to a public realm function; the concepts are discussed in more detail in section 4.0 Concept Development. The concepts were then reviewed by the PAC, changes were made to the plans, and a set of recommended plans was adopted. The main change between the existing roads and the recommended roads is that the through lanes would be reduced from four lanes to two lanes on 5 Street and 3 Avenue (with additional space for short left turning bays). An optional pedestrian-only phase could be introduced at the intersections of 5 Street with 3 Avenue and 5 Street with 4 Avenue.

The recommended changes were then assessed by modelling the forecast 2030 peak hour traffic in Synchro 7. Table 3.2.1 summarizes the capacity analysis: average delay, maximum volume to capacity ratio, LOS, and the results of the critical movements.

Table 3.2.1 – Future Intersections' Capacity Analysis (Year 2030)

Traffic Control	Peak Period	Average Delay Per Vehicle	LOS	Max V/C	Critical Movement			
					Movement	v/c	LOS (Delay)	95th percentile max queue (m)
5 Street S & 1 Avenue S								
Signalized: Act-Coord: 100 sec	AM	21 sec	C	0.33	EB T/R	0.33	C (26 sec)	25
	PM	21 sec	C	0.70	EB T/R	0.70	C (25 sec)	50
5 Street S & 2 Avenue S								
Two-way Stop: E-W Stop Sign	AM	5 sec	-	0.18	All movements have a LOS A or B			
	PM	7 sec	-	0.48	EB L/R	0.48	C (20 sec)	21
5 Street S & 3 Avenue S								
Signalized: Act-Coord: 50 sec (AM) 100 sec (PM)	AM	6 sec	A	0.35	All movements have a LOS A or B			
	PM	28 sec	C	0.86	EB T/R	0.86	D (42 sec)	99
Scramble Signalized Intersection: Act-Coord: 100 sec	AM	18 sec	B	0.67	EB T/R	0.47	D (36 sec)	45
	PM	37 sec	D	0.95	EB T/R	0.95	E (59 sec)	137
5 Street S & 4 Avenue S								
Signalized: Act-Coord: 50 sec	AM	5 sec	A	0.29	All movements have a LOS A or B			
	PM	8 sec	A	0.55	All movements have a LOS A or B			
Scramble Signalized Intersection: Act-Coord: 100 sec	AM	18 sec	B	0.46	WB T/R	0.46	D (36 sec)	33
	PM	28 sec	C	0.92	WB T/R	0.92	D (54 sec)	61

Table 3.2.1 – continued

Traffic Control	Peak Period	Average Delay Per Vehicle	LOS	Max V/C	Critical Movement			
					Movement	v/c	LOS (Delay)	95th percentile max queue (m)
5 Street S & 5 Avenue S								
Signalized: Act-Coord: 50 sec	AM	11 sec	B	0.48	All movements have a LOS A or B			
	PM	11 sec	B	0.56	All movements have a LOS A or B			
Scenic Drive & 2 Avenue								
Signalized: Act-Coord: 100 sec	AM	12 sec	B	0.75	WB L/T/R	0.50	C (30 sec)	**42**
	PM	15 sec	B	0.80	WB L/T/R	0.80	D (53 sec)	**61**
3 Avenue S & 7 Street S								
Signalized: Act-Coord: 100 sec	AM	21 sec	C	0.74	EB T/R	0.53	D (44 sec)	**63**
	PM	17 sec	B	0.77	EB T/R	0.68	C (21 sec)	**75**
3 Avenue S & 8 Street S								
Signalized: Act-Coord: 100 sec	AM	23 sec	C	0.76	WB L/T	0.76	D (41 sec)	**81**
	PM	19 sec	B	0.88	WB L/T	0.88	C (26 sec)	**146**

It should be noted that traffic model uses an algorithm that assumes certain driving behavior. The model results can therefore only provide an indication of the expected queues and delays, assuming certain traffic patterns, and may not necessarily reflect what actually occurs on the street.

The timing plans were optimized for the whole network, rather than for the specific streets being assessed, and a standard cycle time of 100 seconds was used. It was noted that some of the intersections appeared to work better with a much shorter cycle time so, at these intersections, it is suggested that the intersection is coordinated, with adjacent signals, and that the intersection double cycles on a 50 second cycle. The analysis shown in table 3.2.1 includes scramble intersections (all round pedestrian stage) and some double cycling of a 50 second cycle in a 100 second cycle network.

The results of the analysis confirm that, even with the scramble intersections, it is expected that intersections would operate at a LOS D or better during the weekday peak period. Individual vehicular movements are expected to operate at LOS E or better and v/c ratios may be as high as 0.95 on some of the less trafficked movements. Whilst the individual v/c ratios and LOS that are being predicted, on the 20 year forecast, may appear quite high, similar results are common in many existing Towns and Cities. The detailed traffic analysis reports can be found in the Technical Report Appendix I.

The results on the network without the scramble intersections fair a little better. The analysis shows that the study's intersections (excluding the optional scramble intersections), will experience an intersection average LOS C, or better, during weekday peak periods. Individual vehicular movements will operate at LOS D, or better, and v/c ratios up to 0.86, the detailed traffic analysis reports can be found in the Technical Report Appendix J.

3.3 FUTURE PARKING SUPPLY

The future non-residential parking supply within the Downtown study area is estimated at 6,284 stalls, including 1,857 public on-street, 556 public off-street, and 3,871 private off-street parking spaces. This estimate takes into account the development that has already been identified by the City, five future developments, as well as any existing parking spaces that were temporarily out of commission.

3.3.1 FUTURE PARKING DEMAND

The future parking demands for the Downtown study area are estimated to be 4,700 to 4,974 spaces during the overall peak hour, reflecting a parking utilization between 75 and 79 percent. This estimate takes into account full occupancy of the existing non-residential floor space, as well as five additional future developments. Parking on a number of blocks is forecast to be highly utilized in the future, with three blocks operating over capacity. In this case, the parking demands would "overflow" onto the adjacent blocks. This is not expected to be problematic, as a one-block walking distance from the location of parking to the driver's actual destination is considered reasonable in the Downtown context.

3.3.2 PUBLIC PARKING ANALYSIS

In an attempt to create more space for the public realm, and promote a modal shift towards sustainable transportation, MMM are recommending a small reduction of the on-street parking supply. The reduction is less aggressive than that proposed in the HOCMP and should probably be spread between each of the priority streets, rather than at one location. The parking surveys demonstrated that there is residual capacity and that the parking supply could accommodate a small reduction. At times and locations when the parking demand exceeds capacity then the short-fall may be met by the off-street supply or by spare capacity in adjacent streets.

In its present state the on-street parking, in the Downtown area, is critical to the vitality of businesses and commerce in Lethbridge. MMM, and the PAC, therefore considered that the level of parking reduction shown in the HOCMP was too great as a first step and that a gradual reduction in parking, together with improvements in transit and active transportation, was preferable to a sudden and large reduction. To minimize the potential impacts related to the reduction of the existing on-street parking supply, MMM recommend that the City consider adopting some of the following mitigation measures:

- converting all of the on-street parking into short term parking
- determining appropriate fees/rates to ensure that the utilisation level, of the on-street parking, is maintained at about 85-90%.
- encourage long term parkers to use off-street parking
- providing convenient alternative parking locations nearby.
- providing signage to direct parkers to alternative parking opportunities

3.3.3 FUTURE PARKING STRUCTURE

While a new public parking structure is not necessary in the short term, it is prudent to protect opportunities to provide additional parking in the future. Identification and protection of a potential site for a parking structure also provides flexibility for the City to accommodate future changes in the parking supply or demand - including further reductions in on-street parking or unforeseen developments. The existing Bompass Lot, located north of 5 Avenue S between 7 Street S and 8 Street S, is suggested as a preferred site for long-term protection for a possible parking structure, based on the considerations presented in the report, including:

- forecast parking utilization in the area
- proximity to planned developments (i.e., Community Arts Centre and mixed-use, office developments) that are expected to contribute to increased parking demand and future parking supply requirements in the general area
- proximity to existing uses that demonstrate relatively high parking utilization (i.e., public library)
- distance from large existing commercial lots in the area, namely Lethbridge Centre and Park Place Mall, that provide substantial amounts of freely accessible parking and could detract from the financial viability of a large publicly-operated facility
- the property is publicly owned; thus, does not require property acquisition and, therefore, does not involve land acquisition costs
- the size and regular shape of the parcel is potentially adequate to achieve a parking garage footprint that is capable of yielding a reasonably efficient parking garage layout
- the property is an existing surface lot (i.e., there is no existing structure), thus implementation costs are potentially reduced relative to other alternatives
- the parcel is bounded on three sides by roadways, providing a high degree of design flexibility for garage access/egress and circulation
- previous inclusion as a candidate site in the HOCMP

On this site, a 4-storey structure accommodating 376 parking spaces may be considered. As noted in the HOCMP, it would be beneficial to design a parking structure with potential for future expansion.

It is estimated that an additional 115,000 m2 of non-residential gross floor area (GFA), would need to be developed in the Downtown before a potential public parking structure is likely required and potentially sustainable. This development is additional to the existing non-residential development that has already been identified by the City.

If the average cost of a parkade is about $25,000 per stall, for above-grade parking, and $35,000 per stall, for below-grade parking, typical construction costs of a parkade will be in the range of $9M to $13M. The City will therefore need appropriate financial strategies, including a complete review of the public parking tariffs for the Downtown area. Selling off existing surface lots for redevelopment, as well as entering into a public-private partnership may provide funding for construction and operations. The business case for the potential parking structure would therefore need to be assessed before the need for additional public parking is realised.

(See Technical Report Appendix G for the complete *Lethbridge Downtown Parking – Existing and Short Term Future Parking Conditions Report*).

3.4 LAND USE/FORM BASE CODE RECOMMENDATIONS

3.4.1 BACKGROUND

The public realm of a Downtown is defined not only by its public streets, parks, squares, and plazas, but also by the buildings that shape them.

Where public space is constructed and, maintained as a result of a public initiative, the buildings within a Downtown area exist in the private realm and are constructed and maintained by private land owners, as regulated by the Land Use Bylaw. For this reason, the Land Use recommendations of this Study do not focus on specific urban design and streetscape improvements, but rather on the rules and regulations that will guide private development interests in the construction of the buildings that shape the public realm.

At the time when the Lethbridge Downtown was established, design and use of private buildings was not regulated through land use zoning; they were built on a living tradition of architecture and an understanding of creating pedestrian-scaled public space. In the 1940s, the City replaced this tradition with the more modern vision, prevalent at the time, which was to develop on a scale made practical by the increasing use of the personal automobile. To implement this vision, the community enacted a segregated use based land development bylaw to strictly separate daily needs of Downtown residents, workers and shoppers, and then reconnect them through the use of the personal automobile and the functional classification of streets into local, collector, and arterial - all named for their vehicular function.

While these rules were written to guide new development, they were also applied in retrospect to the existing city core, enforcing single use “commercial districts” and “collector streets” in places once understood as mixed use pedestrian focused places. The rules currently in place to guide development patterns not only define the post 1940 vision, but are intrinsically linked to the present day reality.

3.4.2 SAME RULES, DIFFERENT OUTCOME

Municipalities seeking to return to a more traditional mixed use, pedestrianized environment often struggle to realign their bylaws with the preferred style of development and place making. Open land use districts that allow multiple uses and minimal control standards in order to promote greater flexibility, are sometimes created as short term workaround solutions to the complexities of implementing mixed uses within segregated use-based bylaws. This practice sometimes fails to provide adequate guidance and predictability within the bylaw; the discretion afforded to open districts becomes difficult to administer and can result in poorly executed developments and unpredictable approvals processes. To mitigate this, planners create design guidelines which overly control developments– and result in flawed mixed use development patterns. Alternatively, some municipalities seek to substitute a wide palette of land uses, attempting to define multiple mixed use districts for every possible variation. As with open districts and design guidelines, these workarounds generally fail to effectively implement and encourage the vision of mixed use, pedestrian friendly development.

3.4.3 MATCHING THE RULES TO THE VISION: THE FORM BASED CODE

Two decades of experience has demonstrated that a "Form Based Code" is an effective method of regulating development within the current system.

Simply defined, a form based code regulates for a specific physical outcome in the same manner as a segregated use-based code regulates for a specific land use outcome. Where a use-based regulation is ideal for regulating the vision of segregated land use pods and vehicular mobility, a form-based regulation has been demonstrated to better implement mixed use, pedestrian friendly places.

The Form Based Code Institute defines this practice as:

"A method of regulating development to achieve a specific urban form. Form-based codes create a predictable public realm primarily by controlling physical form, with a lesser focus on land use, through city or county regulations."

The City has already achieved much evolution toward a form based code, although this has not yet been implemented through the City's Land Use Bylaw.

3.4.4 IMPLEMENTING THE HEART OF OUR CITY MASTER PLAN

As developed through a comprehensive public consultation process and formally adopted as policy by the City, the Heart of Our City Master Plan offers a clear, comprehensive vision for the Downtown. The current Land Use Bylaw, however, does not implement the Master Plan, but rather attempts to offer flexibility through a broadly defined commercial district with guidance provided by advisory design guidelines transcribed from the older Downtown Lethbridge Area Redevelopment Plan. As a more recent document, the Heart of Our City Master Plan provides a sound basis for developing a form based code suitable for administration through the City's Land Use Bylaw.

3.4.5 OBJECTIVES FOR A DOWNTOWN LETHBRIDGE FORM BASED CODE

The objectives for the Downtown Lethbridge Form Based Code are to incorporate the following:

- Implement the essential elements of the HOCMP, using the "Part 5: Development Design Guidelines" as a basis for the form based code.
- Provide further guidance for shop front design and other building design elements at the interface between the public and private realm.
- Integrate effectively with the current Land Use Bylaw in both consistency of format wherever possible and adherence to the requirements of the Alberta Municipal Government Act.
- Integrate any applicable regulations as set forth within the existing Downtown Commercial (C-D) zones within the Downtown Commercial district, eliminating discretionary term "should" in favour of required regulations.
- Provide a code that will work for all the HOCMP districts while allowing for a phased adoption process focusing on the three streets identified for phase one streetscape improvements.
- Propose a form based code implementation plan to replace existing zoning over time.

(See Technical Report Appendix H for the complete Lethbridge Downtown Form Based Code Study.)

3.4.6 RECOMMENDATIONS FOR A DOWNTOWN LETHBRIDGE FORM BASED CODE

If a Form Based Code is desired the following elements are recommended for inclusion:

» Purpose: Provide a clear purpose for the proposed district establishing legal intent for the form based code.

» Sub-Districts: A list, map and description of sub-districts as derived from the HOCMP. All subsequent regulations will refer to each sub-district through a graphed matrix or by some other means.

» A list of permitted and discretionary uses for each sub-district.

» Density and other constraints to land use intensity.

» Horizontal Building Disposition: Including setbacks, parcel size, build-to lines, and building coverage.

» Vertical Building Configuration: Defining a building envelope that includes building heights and upper story step-backs.

» Building Frontage Standards:

- Shop front Track 1: General standards and a review process for larger projects or those projects designed by a registered architect.
- Shop front Track 2: General standards and pre-approved shop front configurations for smaller projects.
- Common Entry and Planter Frontage: For office, institutional, and multi-family residential uses.
- Stoop Frontage: For direct residential entry from the public realm.

» Landscaping Regulations.

» Parking and Access Standards.

» Environmental Standards.

» Urban Standards: Including new Public Spaces, corner sites, termination sites, and other elements that affect the overall public realm across property lines.

» Supplementary Regulations: Other regulations as needed.

» Definitions: Additional definitions from Form Based Code terms that are not already defined in the bylaw.

CONCEPT DEVELOPMENT

4.1 REVIEW OF MASTER PLANNING CONCEPTS

MMM's proposals for the selected study streets will help the city achieve the vision contained within the HOCMP. The HOCMP was approved by Council and is the long-term strategy for the revitalization of Downtown Lethbridge. The document provides the "framework to guide future public improvements and private development to ensure the emergence of a coherent, vibrant, and economically viable Downtown".

Exhibits are provided in Appendix A for the Master Plan Vision, Framework, and Sections. The following outlines the higher level principles and objectives identified in the HOCMP and their specific application to the selected study streets:

CREATING A BEAUTIFUL DOWNTOWN

» Develop specific Streetscape designs that celebrate the unique qualities of each of these streets.

» Build upon "emerging concentrations of cultural and entertainment businesses" such as Chinatown.

» Build upon the City's unique heritage and how it can contribute to the quality of the public realm through urban design and public art.

» Create Downtown gateways at key intersections as well as incorporating public art and special paving treatments.

» Reinforce Galt Gardens as the main public open space within the Downtown.

CREATE A LIVEABLE AND ACCESSIBLE DOWNTOWN

» Determine the spatial requirements for pedestrian and vehicle circulation, parking, patio seating, lighting and site elements to create a functional and pedestrian friendly environment.

» Encouraging a greater use of the Downtown by enhancing the accessibility, physical and visual quality of the selected study streets by using urban braille, raised intersections, traffic calming etc.

» Emphasis should be placed on maximizing street tree planting to help minimize the effect of the sun or the wind.

» Crime Protection Through Environmental Design (CPTED) principles should be used to create safe and accessible streets.

» Explore the concept of territorial space, in the public realm, by considering planting and streetscape elements, to encourage a sense of ownership.

CREATE A SUSTAINABLE DOWNTOWN

» Align new work with current and future Downtown infrastructure improvements allowing for the most efficient use of Municipal dollars for capital improvements.

» Strengthen 5 Street S as being one of the Downtown's most important shopping streets, with a direct pedestrian connection between Park Place Mall and the Lethbridge Centre.

» The use of permeable paving, bio-infiltration planting, recycled materials, high albedo (reduced heat island effect) paving, dark-sky policies, efficient irrigation, and energy efficient lighting in the design of the streetscape.

CREATE AN EXCITING AND VIBRANT DOWNTOWN

The selected study streets contain a variety of cultural, civic and tourist amenities, as well as historic structures and a Downtown location for the University of Lethbridge. We will:

- Explore the synergy created between the various land uses and Downtown amenities.
- Explore how the public realm can respond to these traffic generators to create a an all-season and all-hours Downtown.
- Explore how public art and urban design can be used to celebrate the city's unique heritage, regional character, and climate.
- Explore material selection and high quality design of site elements will add vibrancy and animate the public environment.

MASTER PLAN STREETSCAPE RECOMMENDATIONS

While the HOCMP is wide-ranging and long-term in scope, it establishes a priority of actions and strategic guidance for implementation. A number of short-term priorities have already been initiated by the City, such as partnering with the University of Lethbridge to construct a Downtown building. The public realm ideas developed here will help support these endeavours and hopefully, encourage similar investment in the Downtown.

Other short-term objectives identified can be directly and indirectly addressed from the work prepared as part of this study. These include the following Master Planning recommendations:

- Undertake streetscape improvements in the Central District Pedestrian Core; especially 5 Street S and 3 Avenue S.
- Convert angled parking to parallel parking to broaden sidewalks on the priority streets.
- Intensify and transform the image of the cultural corridor through the creation of a distinct design vocabulary of landscape elements.
- Identify priority sites for public art, especially at Galt Gardens.
- Develop street furniture guidelines for the central district.
- Expansion of Downtown cycling and bike parking facilities.
- Undertake a comprehensive study of Downtown parking needs.
- Develop a strategy for a Downtown bus shuttle to support Downtown commerce, in possible association with the Downtown BRZ.
- Promote the presence of the University of Lethbridge in the Downtown.
- Encourage partnerships to develop mixed use development, including residential, office and commercial facilities.

HEART OF OUR CITY STREETSCAPE PROTOTYPES

There are five distinct streetscape prototypes identified in the Master Plan's Public Realm Framework: Parkway, Boulevard, Promenade, Main Street, and District Street. Of these five, only the Promenade and Main Street prototypes are applicable to the selected study streets – 5 Street S and 3 Avenue S are "Main Street" prototypes and 2 Avenue S is a "Promenade Street" prototype.

All the prototype streets, however, support the common objective of balancing the needs of vehicular traffic with those of pedestrians, transit, and the public realm. In addition, there are common design objectives for all streets which include:

» Provision of street trees.

» Shortening of crosswalk distances.

» Distinguishing parking from roadway through a change in paving.

» Ensuring adequate sidewalk widths for expected pedestrian traffic.

» Encouraging the use of the of outdoor seating areas.

» Minimizing visual clutter and obstructions on sidewalks.

For this reason, many of the specific public realm recommendations for the selected study streets can be easily translated onto other street prototypes and other streets, within the Downtown area.

MASTER PLAN PROTOTYPES MODIFICATIONS

When the Heart of Our City streetscape prototypes were developed, the work was undertaken without detailed assessment of the traffic and transit operations, freight movement or parking needs. Having undertaken a detailed assessment of these components we now have a better understanding of the future transportation needs of the Downtown area. This understanding has led to two major modifications to the HOCMP's original recommendations:

» Firstly, a reduction in the number of travel lanes on the selected study streets, while still maintaining acceptable levels of vehicle flow without congestion.

» Secondly, maintaining as much angled parking as possible to maximizing the number of parking stalls.

The benefits of a reduction in the number of travel lanes are twofold: firstly, it slows traffic in the commercial and retail areas, increasing visibility of business activity while reducing the potential for vehicle and pedestrian conflicts, and; secondly, the additional width created by the lane reduction allows for more parking and public realm space. Both factors are extremely beneficial in promoting the commercial vitality of Downtown Lethbridge as well as the larger objectives of creating a vibrant, pedestrian oriented Downtown.

4.2 VISION FOR FUTURE ACTIVE TRANSPORTATION

In order to successfully implement a vision for non-motorized modes of transportation (active transportation); it is imperative to ensure that the needs of the non-motorized modes are understood. The assessment of active transportation conditions connectivity to and within the Downtown core. Other important considerations include the ability to use the path/network in all weather conditions and the provision of supporting infrastructure at the end of the trip (eg. showers/restrooms, cycle racks, benches and secure storage lockers).

4.3 PEDESTRIAN ENVIRONMENT DESIGN

TRAVEL PATHS

Wherever pedestrians walk through an area, they should be guided by subtle and complementary cues. These may include wayfinding signing, pavement markings, or coloured or textured pavement surfaces. Additional cues may include landscaping or the careful positioning of street furniture to direct the pedestrian along a preferred pathway. Furthermore, walkways should be barrier-free, to allow seniors and people with mobility or visual disabilities to navigate through the area. Figure 4.3.1 shows typical recommend dimensions for barrier-free design.

To accommodate higher volumes of pedestrians and people with disabilities, the desired minimum for sidewalk or paths is 1800mm. This may be reduced to 1500mm in less trafficked areas.

SLOPE GRADE

For barrier-free path design the maximum recommended gradient is 5.0%. Anything more than 5% and the path would be classified as a ramp. However, ramps should not be more than 8% and there is a requirement to have a level landing every 9m.

CROSS SLOPE

The walking surfaces should be relatively flat with a preferred maximum cross slope of 2.0%.

CROSS SLOPE AT ENTRANCES

A sudden change in cross slope at driveways and entrances can generate excessive cross slope falls and, in essence an accessibility barrier. Figure 4.3.2 illustrates three options to design pathways through entrances and maintain a maximum 2% cross slope along the pathway.

Figure 4.3.1 - Sidewalk Barrier-free Dimension

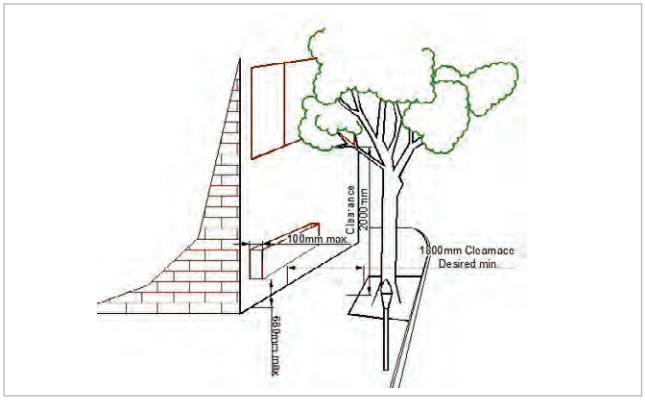
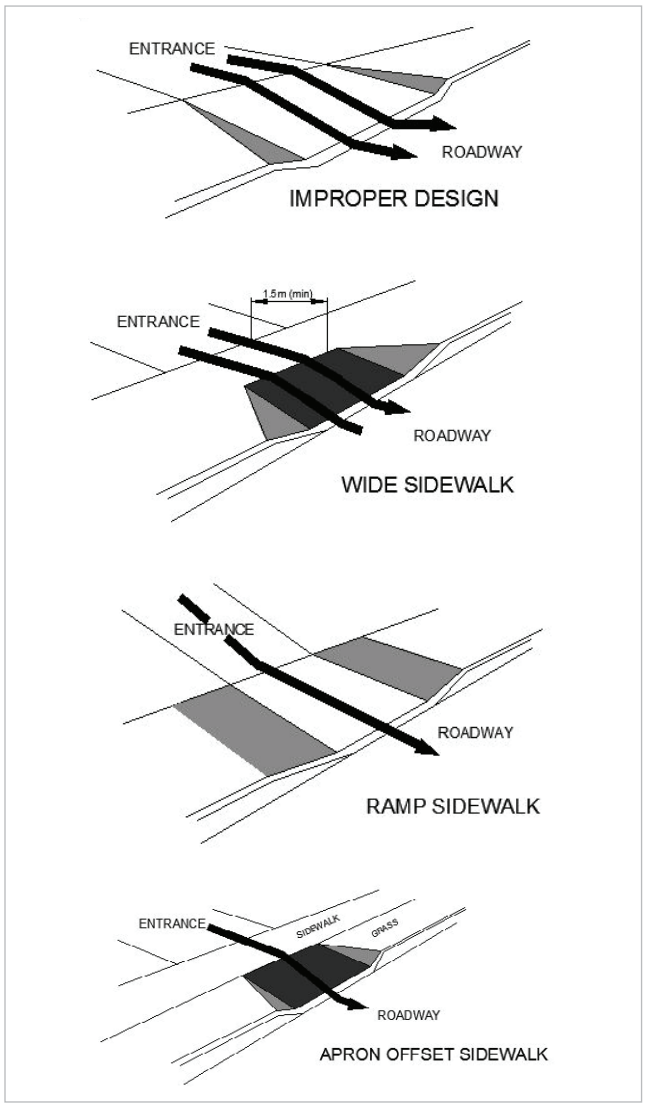


Figure 4.3.2 - Sidewalk Cross Slope at Entrances



EXCESSIVE SLOPE DIFFERENCE

The foot or wheel clearance will be compromised if the rate of change in the grade is greater than 13.0% over a 610mm interval.

CROSSWALK MARKINGS

Marked crosswalks identify pedestrian crossing points and remind motorists to yield to pedestrians. The traditional crosswalk design is based on the guidelines from the Manual of Uniform Traffic Control Devices for Canada and consists of two parallel solid white lines approximately 2.5m apart. There are other variations, including the ladder, zebra, and diagonal as shown in Figure 4.3.3.

At present, there is a selection of cross walk markings in Lethbridge; some cross walks use the parallel lines and others the zebra marking. The recommended pavement marking is the Zebra for the following reasons:

- They are more visible to motorists, At high traffic and pedestrian intersections, zebra markings reduce the rate of vehicle-pedestrian conflicts.
- Zebra markings are preferred by pedestrians, as they help to promote the sense of safety.
- Zebra markings are also easier to spot on account of the increased contrast.

RAISED INTERSECTIONS OR CROSSWALKS

Raised intersections and crosswalks are a traffic calming feature that increase safety and comfort for pedestrians. See Figure 4.3.4 for typical design and pavement markings.

Figure 4.3.3 - Typical Crosswalk Pavement Marking

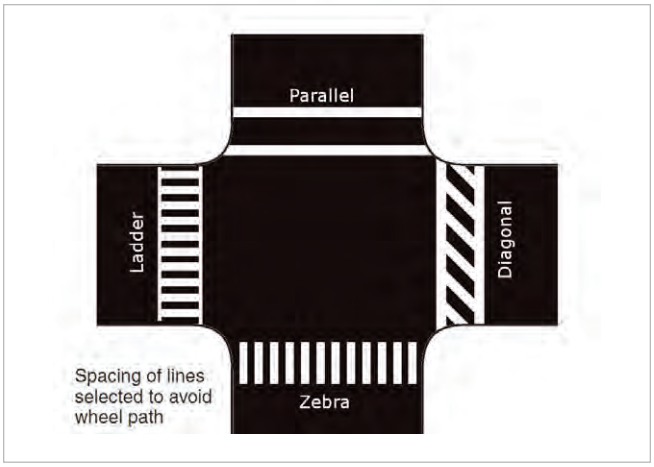
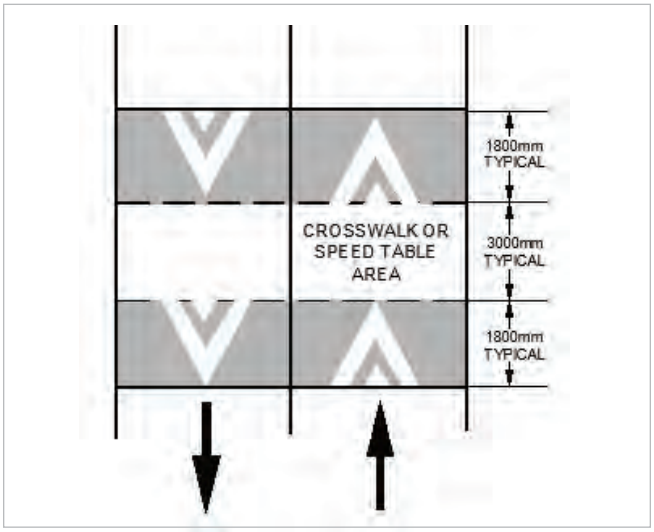


Figure 4.3.4 - Raised Crosswalk Pavement Markings



MID-BLOCK CROSSING

On high traffic volume roads pedestrian crossings should be accommodated at signalized intersections and stop controlled crossings. Grade-separation, by using a bridge or an under pass is an expensive option and would probably be unsuitable for Downtown Lethbridge. Mid-block crossing may be preferable on less busy roads or in residential areas, shopping centres, school zones, and near seniors' homes. When a mid-block crossing is required, it should be designed to provide advanced warning to motorists and cyclists using a combination of lighted signal, vertical signing, and pavement markings. Having clear sight lines is essential when considering any pedestrian crossing facilities.

CURB RAMP

Curb ramps enable wheeled vehicles to pass smoothly between the curb and the street. The slope of the curb ramp should not be steeper than 1:10 (10.0%), at locations where the flared section is not an integrated part traveled path the flared sections can be reduce to 300mm (see Figure 4.3.5). To assist people with visual or cognitive impairment, a distinct colour and texture (yellow truncated pavers) should be used on the curb ramp to distinguish the curb from the surrounding area. Grooves are not recommended as they cannot be reliably detected by people with visual impairments. The surface of the curb ramp should be slip resistant and free-draining.

Pedestrian crosswalks should be perpendicular to the traffic and should align with the curb ramps. (see Figure 4.3.6 for curb ramp layout).

Figure 4.3.5 - Recommend Curb Ramp Design

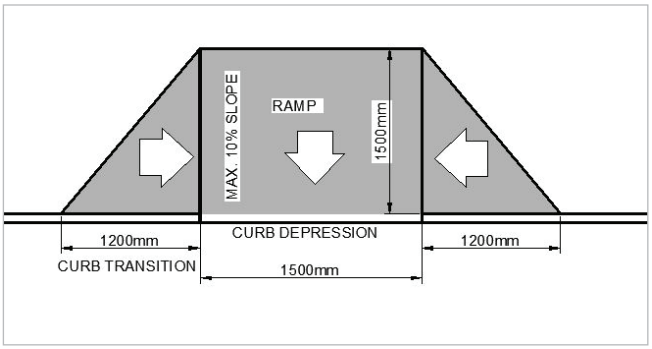
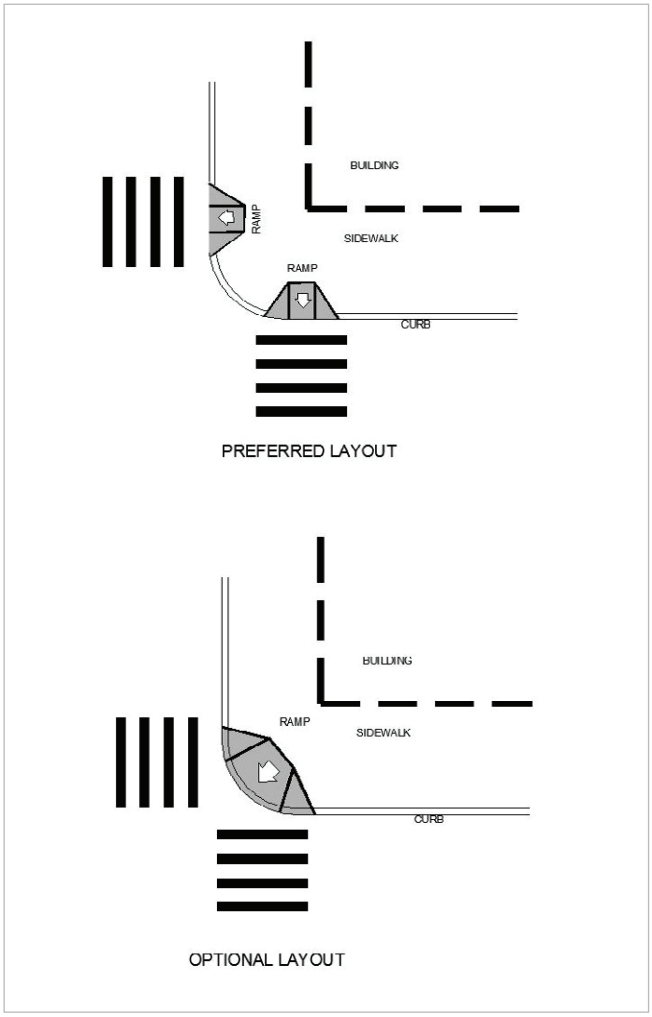


Figure 4.3.6 - Curb Ramp Layout at Intersections



CURB EXTENSIONS

A curb extension, also known as a bulb or a build out, is a horizontal intrusion of the curb into the roadway resulting in a narrower section of roadway and should be extended on both sides of the roadway to create an effective traffic calming device that also reduces the crossing distance for pedestrians. They effectively reduce the number and width of the travel lanes with the sterilised areas often being used for parking or for landscaping.

REFUGE ISLANDS

Pedestrian refuge islands should be installed on wide streets or on highly trafficked streets. Refuge islands should preferably be 2m wide but not less than 1.5 m wide.

PEDESTRIAN SIGNALS

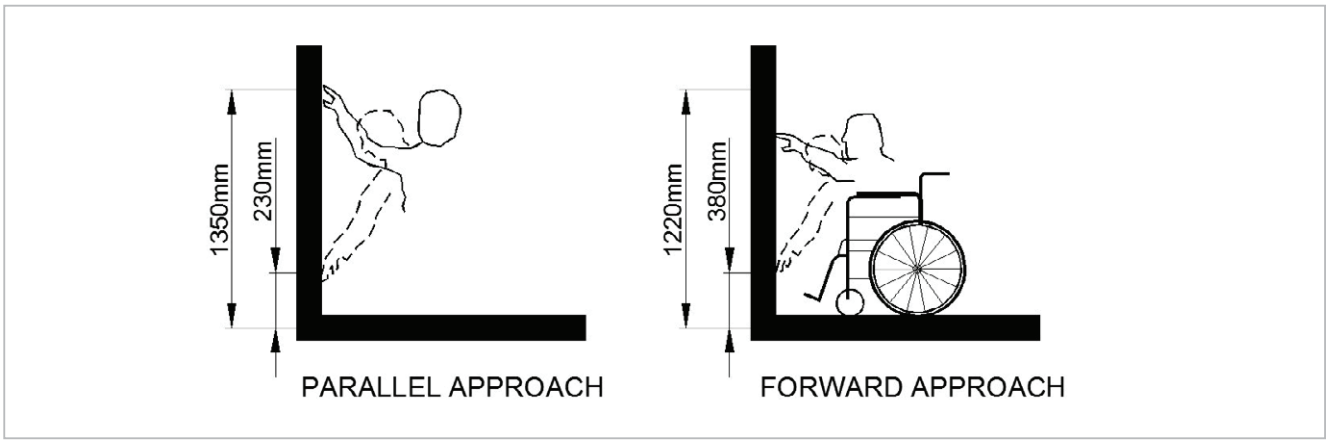
The city does have some countdown signals at particular intersections. As these are preferable to the traditional 'Don't Walk' indicators it is recommended that they be used at all crossing facilities. For barrier-free design the location and height of the push button unit should be consistent. The location of the pedestrian push button should be within 1.5m of the crosswalk, accessible, and surrounded by a flat surface. The vertical reach limitations for a wheelchair on a parallel approach and forward approach as shown in Figure 4.3.7. The city uses several different types of push button unit within the Downtown cores. It is recommended that, for consistency, the city introduce a standard unit.

The height of the push button unit should be accessible to all people, including wheelchair users. The height may depend upon where it is located see Figure 4.3.7 for details.

Consider the use of push buttons on bollards closest to the curb cut based on the flow of traffic (as per Barrier Free Consultation Report).

As well as providing visual indicators, the city should consider audible or tactile indicators. Audible signals sound when the invitation to cross period is illuminated. Audible signals are common throughout the world although the type of signal can vary. Audible signals can be adjusted by time of day, so that they do not unduly disturb local residents at night or during less trafficked periods. However, a common problem with anyone relying on an audible signal is that the signal may refer to another crossing. To overcome

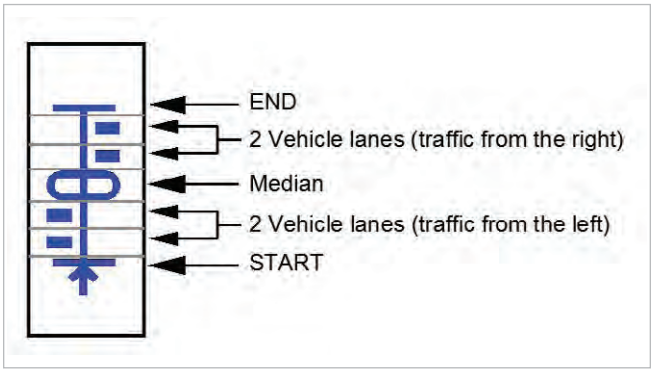
Figure 4.3.7 - Barrier-free High-Low Reach Limit



the obvious safety concerns there has been some development into using different types of audible signal for different crossings. There is also a system that localizes the sound to the immediate vicinity of the push button unit. A safer and more reliable system does not use audible signals but uses tactile units that vibrate or rotate when the crossing invitation signal is illuminated. Tactile devices are attached to the push button units. An alternative device is a tactile map of the pedestrian crossing, (see fig 4.3.8) that is located on the push button unit.

Consider incorporating braille into pedestrian crossing/push button signage (as per Barrier Free Consultation Report).

Figure 4.3.8 – Sample Tactile Map for Pedestrian Crossing Facility



4.3.1 PEDESTRIAN FACILITIES

At present, there are no pedestrian or cycling strategies specifically promoting active transportation. In an attempt to develop a strategy, MMM conducted a site visit, reviewed the Bikeways and Pathways 2007 Master Plan and held with the City to verify the existing and potential interest points for pedestrian facilities. The following summarises the development recommendations as outlined in the 2007 Master Plan:

- 2 Avenue S from Scenic Drive S to Galt Gardens to enhance the pedestrian environment and public character of Downtown
- 2 Avenue S from Galt Gardens to 12B St S to enhance the pedestrian environment and public character of Downtown
- 6 Street S from 6 Avenue S to Galt Gardens to Stafford Drive to enhance the pedestrian environment and public character of Downtown
- Scenic Drive S from 6 Avenue S to 1 Avenue S to create a pedestrian commuter link that will link the north and south Lethbridge commuter pathway networks with the Downtown

Table 4.3.1 summarizes the existing characteristics of the selected road segments to be developed for cycling improvements. The current condition and operation of the sidewalks in these areas are in accordance with TAC and ITE guidelines.

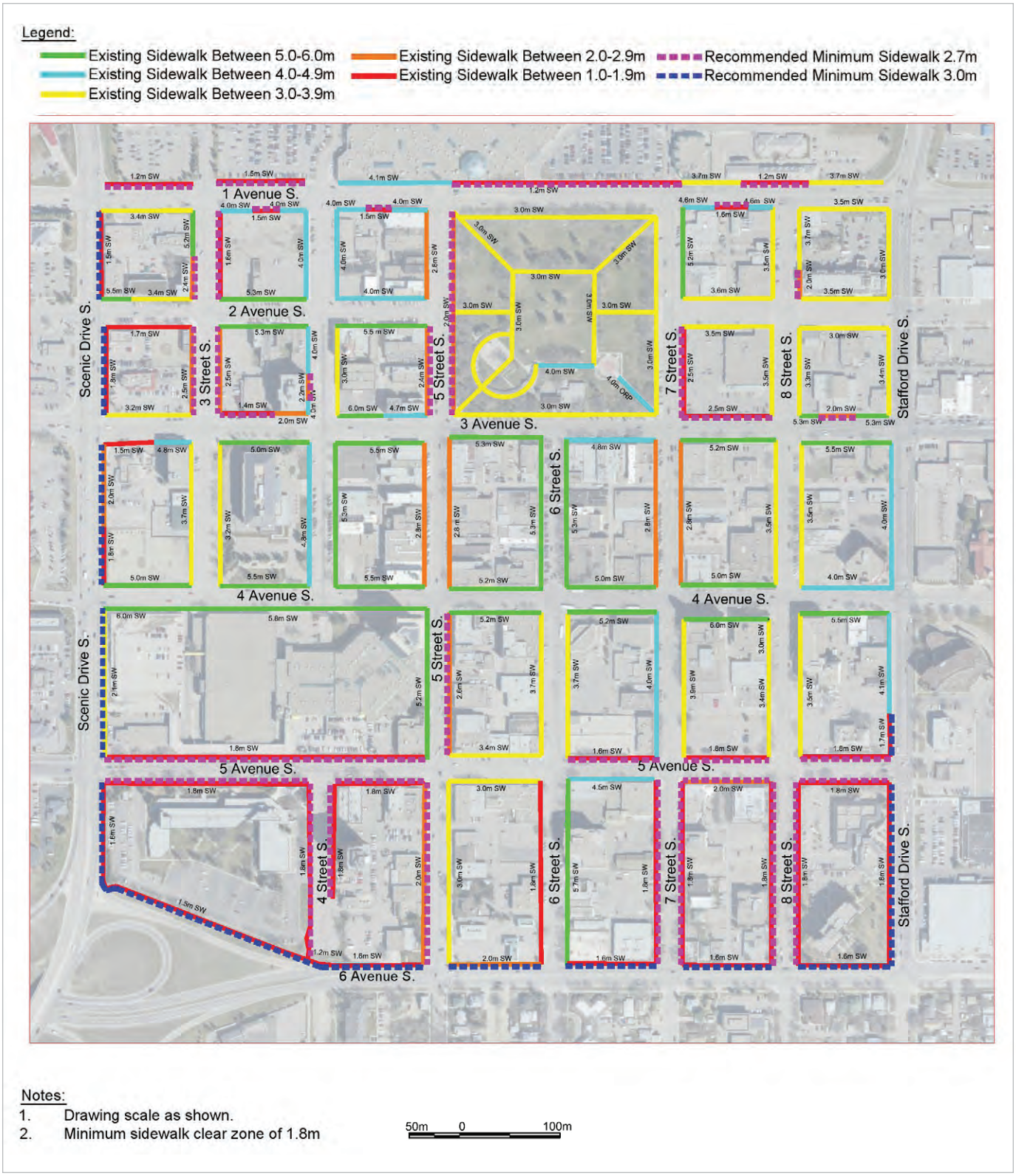
Table 4.3.1 – Pedestrian Sidewalk Recommended Segment Characteristics

Proposed Segments	Community	AADT	Recommended Segments Characteristics					
			No. of Travel Lanes	Recommended Streetside Width	Recommended-Sidewalk Clear Zone Width	Min. Sidewalk Clear Zone Width	Pedestrian Separation from Moving Traffic	*Protected Pedestrian Crossing Frequency
2 Avenue S 3 Street S 4 Street S 6 Street S 8 Street S	Urban center/core commercial	1,000-15,000	2-4	5.0m	2.7 m	1.8 m	Curb Parking	67-200m
1 Avenue S 3 Avenue S 4 Avenue S 5 Avenue S 5 Street S 7 Street S	Urban center/core commercial	1,500-30,000	2-4	6.0m	2.7 m	1.8 m	Curb Parking	67-200m
Scenic Drive 6 Avenue S Stafford Drive	Urban center/core commercial	15,000-40,000	4-6	**6.5m**	3.0 m	1.8 m	Streetside furnishing zone	67-200m

*Pedestrian signals or high-visibility markings at un-signalized intersections

The minimum streetside width is the accumulation of the edge/furnishing zone, clear pedestrian zone, and frontage zone. The recommendation includes a minimum sidewalk clear zone width of 1.8m within the Downtown core. Existing sidewalk widths and the recommended minimum widths are shown in fig 4.3.2.

Figure 4.3.9 – Future Sidewalk Improvements



4.4 CYCLIST TREATMENT

The City completed a Bikeways and Pathways Master Plan (BPMP) in 2007. This comprehensive document includes an inventory of the existing active transportation infrastructure. The BPMP also identifies network improvements, these include the following elements: Improved connectivity from the north and south to the Downtown area by providing:

- a pedestrian overpass at Crowsnest Trail and Scenic Drive S
- a dedicated bike lane on Scenic Drive S or, a high speed regional commuter separated pathway along Scenic Drive S
- a dedicated on-road commuter bike lane on Stafford Drive S, 5 Street S and 7 Street S
- improved connectivity from the east and west to the Downtown area by providing:
  - dedicated on bike lane on 1 Avenue S and 6 Avenue S
  - identifying a location for a top-of-bank crossing that is coordinated with other City transportation initiatives
- establish a regional multi-use pathway north of Park Place Shopping Centre, around the Helen Schuler Nature Reserve and from Scenic Drive S to Indian Battle Park
- complete the natural pathway from the Galt Museum to Indian Battle Park

In addition to the network improvements identified in the BPMP, it is recommended that the city raise public awareness that all city buses are now equipped with bike carrying facilities. Of particular interest is route 12 which crosses the river valley and will provide an integral link between west and south Lethbridge.

4.4.1 CYCLIST DEMANDS BY TYPE

The modal share of cycling to work in Lethbridge is similar to other large cities in Alberta and Saskatchewan being between 1 and 2%.

A summary for the split for cycling trip purposes in comparable cities, geography and size, is provided in Table 4.4.1. Values from other cities, compared to Lethbridge, would be useful but are not readily available. If considering an average of the Edmonton and Kamloops values, then one could assume that approximately 54% of cycling trips may be performed for work purposes, 23.5% for functional trips (shopping, entertainment and errands), and 14.5% for recreational purposes, and 8% for other trips (such as messengers. If Lethbridge has a similar split then it may be seen that the majority of the cycling trips involve commuting. This shows that providing extra facilities for commuting cyclists will benefit most users. However, as mentioned earlier, commuter cyclists are unlikely to increase if most of the cycling infrastructure targets recreational users.

Table 4.4.1 - Bicycle Demands by Type

City	Work (%)	Functional (%)	Recreational (%)	Other (%)
Edmonton 2005/2006 Bicycle User Survey Report	48	29	19	4
Kamloops Bikeway Master Plan	60	18	10	12
Lethbridge Expected Value	54.0	23.5	14.5	8

4.4.2 PATHWAY FUNCTION AND CLASSIFICATION

The existing active transportation infrastructure can be enhanced by increasing the width of the sidewalk promenades on the selected study streets. In addition, cyclists will be accommodated on the selected study streets through the recommended pathway classifications below.

5 STREET S PATHWAY DESIGN

A two-way separated multi-modal zone is recommended on the west side of 5 Street S, as identified in section 5.1.1. The major characteristic and differentiating factor for the multi-modal zone is the physical separation of the pathway from both motorized vehicles and pedestrian sidewalk. Providing a cycle path also addresses for the public's desire to have separate paths for pedestrians and multi-modal users as identified in the community needs assessment of the BPMP. The multi-modal zone provides several benefits for 5 Street S:

» They increase comfort and safety for all users by separating cyclists from vehicle travel lanes and pedestrians.

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» They create a unique context for the street character and links the south end at the London Road residential community to the historic north end at Galt Gardens.

» The multi-modal zone utilizes the benefit of the longer north/south block lengths exhibited in Lethbridge which is a preferred characteristic for cycle paths.

When considering incorporating a multi-modal zone, there are several additional considerations including:

» The safety of vulnerable users at intersections: Providing bollards, width restrictions, or curb edges in the centre of the multi-modal zone at intersections to deter motor vehicles from entering.

» Maintenance: Defining whether the City will assume responsibility of snow removal for the multi-modal zone or if the onus will be on adjacent property owners.

» Driveways: Providing special markings and/or different pavement colour, to delineate priority to other users

» Signal phases: Enforcing right-turn-on-red by vehicles, providing a bike box for left turning bikes, and providing a green wave or special phases for cyclists.

» Transit stops: Provide markings at bus stop locations to delineate crossing priority for aligning and boarding passengers.

Despite the challenges identified it would be possible to accommodate a multi-modal zone on 5 Street S.

2 AVENUE S AND 3 AVENUE S PATHWAY DESIGN

There are two pathway design options to consider for 2 Avenue S and 3 Avenue S. Option one is a multi-modal zone that was described above. Option two is a shared use bike lane, also known as a marked curb lane, and is recommended on both 2 Avenue S and 3 Avenue S, as illustrated in sections 5.1.2 and 5.1.3. The major defining characteristic for marked curb lanes is the shared right of way and shared pavement marking; hence "sharrow" that defines a lane that is shared by both cyclists and also motor vehicles. The sharrow marking is identified with a series of chevrons above a bicycle. A marked curb lane would provide benefits on 2 Avenue S and 3 Avenue S by:

- accommodating the needs of both cyclists and drivers safely within the constrained right-of-way available
- indicating to cyclists their desired position on the roadway thus reducing drift by cyclists.
- providing a cost effective implementation alternative with only road markings signs required and maintenance costs for snow clearing and street cleaning similar to roadways

The marked curb lane has been implemented in various cities including Vancouver, Calgary, and Toronto. When incorporating marked curb lanes in the detailed design phase, additional considerations and constraints include:

- Pavement marking should be place immediately after an intersection, every 75m in midblock, 10m before the end of a block and be complemented with vertical signs.
- In locations of parallel parking, cyclists may conflict with vehicles or pedestrians if insufficient space is provided. To mitigate this issue, the tip of the sharrow chevron should be positioned at least 3.4m from the curb.

Reverse angle parking may reduce some of the conflict between cars and cyclists. Reverse angle parking has been used, with a mixed response, in cities such as Kelowna, Collingwood, and Montreal. Reverse angle parking increases visibility for drivers when exiting their stall and makes it easier and safer for drivers when loading and unloading their vehicle. In Alberta the Basic Licence Driver's Handbook mentions that it is safer to back into a driveway (parking)

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so that you can drive forward when exiting. However, despite the safety benefits of reverse angle parking, it has been received with mixed success especially with drivers who are not confident with reversing. Furthermore, because the vehicles reverse into the stall, the exhaust pipe points towards the sidewalk which is disadvantageous to the public realm. Because of the focus on promoting the public realm in Lethbridge, reverse parking is not considered to be a viable option and is therefore not recommended by MMM Group.

4.4.3 END OF TRIP FACILITIES

The design of end of trip facilities is integral to the skeleton of the entire bike network. End of trip facilities include bike racks, lockers, change rooms and/or showers. In determining the utility experienced by users for end of trip facilities and other elements of the network, the City of Edmonton undertook the 2005/2006 Bicycle User Survey Report. The survey indicated that showers and secure bicycle parking at the destination were important to users but secure bicycle parking was significantly more important than showering facilities. If desired, the City may consider providing public shower facilities in the Downtown, in areas like Galt Gardens, where there are currently public restrooms.

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Shawn Turner

The City encourages developers to provide bicycle racks end-of trip facilities however, the Land Use Bylaw could be changed to provide developers with guidance on the number of stalls for a type of land use. The City of Calgary, for instance, provides bicycle parking stall requirements for Class One and Class Two bicycle parking facilities, based on land use. Class One facilities are for long term bicycle parking with secure or enclosed areas while Class Two facilities are for short term with bicycle racks being used. The two facilities are described below:

CLASS ONE CYCLE PARKING FACILITIES

- Class One facilities are provided for work and other long-term activities.
- Users are allowed to store their bike in an enclosed facility, for a long duration.
- The risk of vandalism and theft is reduced as a consequence of the secure enclosed facility
- Typical Class One facilities include bike lockers and bike cages and may even be extended to providing a room within a building for secure bicycle storage.
- A storage facility is typically on or within 250m of the site.

In the context of Downtown Lethbridge, it would be ideal to have secure bike cages located in enclosed parking areas, such as the one on 7 Street S and 3 Avenue S, which may utilize space not suitable for vehicle parking. Users may be guaranteed parking by renting access keys for a specific locker or bike cage.

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CLASS TWO PARKING FACILITIES

Class Two facilities provide for shorter duration activities, such as shopping, eating and entertainment.

- Preferred Class Two facility is an inversed U-rack that allows users to secure both wheels and the frame of the bicycle.
- Other and less desirable Class Two facilities may only allow for one wheel and the frame to be secured.
- They should be located close to entrances where it may offer convenient access and some security.
- Racks are typically spread out along a block rather than being focused at a point within an area.
- When placing bike racks, consideration should be given to the length of the bicycle and clearance to obstacles including buildings and pedestrians.

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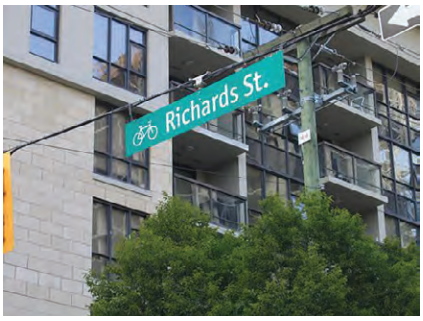
4.4.4 ADDITIONAL DESIGN ELEMENTS

Additional design elements that may be considered for the development of bicycle facilities in Downtown Lethbridge, and may include:

» Developing a more comprehensive bicycle facility design and implementation manual that may address issues such as parking and bicycle friendly design guidelines that shall be considered in future projects. For instance, design elements that may get overlooked include providing bicycle friendly storm sewer grates that could otherwise be hazardous to cyclists.

» Developing a cycling way finding strategy for the city that creates an identity for the City's bicycle network and creates a greater sense of permanence of the facilities. Examples of the strategy include signs to identify a bicycle facility and directional signing to points of interest. The signing could be bespoke to the City but standard signs are also shown in the typical sign requirements from the Transportation Association of Canada.



www.pedbikeimages.org/Carl Sundstrom

www.pedbikeimages.org/Brad Crawford

4.4.5 FUTURE CYCLING FACILITIES

According to the TAC design guidelines, designated bicycle lanes can be justified on safety grounds. The 2007 BPMP recommended the following pathway developments for the Downtown Lethbridge study area to mitigate safety concerns and conflicts between cyclists and vehicles:

» provide an urban collector dedicated on-street bike lane on Stafford Drive S Downtown

» provide an urban collector dedicated multi-modal path at sidewalk level to, additionally, avoid conflicts with parked cars and promote more family (recreational) oriented biking on 5 Street S

» provide an arterial road dedicated on-street bike lane on 6 Avenue S

» provide an urban collector dedicated on-street bike lane on 1 Avenue S

» provide an arterial road dedicated on-street bike lane on Scenic Drive S

Additionally, the HOCMP recommends cycle friendly priority capital improvements including:

» bicycle parking facilities, including racks for short term stays and lockers for employees accommodated at key locations: Galt Gardens, Courthouse, Civic Precinct, Park Place and on 5 Street S.

» the expansion of Downtown bicycle parking facilities including racks for short term stays and lockers for employees at Galt Museum, Provincial Building, 4 Avenue S and 6 Street S, YMCA and Library.

The TAC Geometric Design Guide for Canadian Roads (1999) and the recommended practice by ITE for Designing Walkable Urban Thoroughfares were reviewed as a baseline to define the minimum design criteria required for on-street bikeway classifications.

As per the bikeway design guidelines, bike lanes are intended for the exclusive use of bicycles within a roadway and should be separated from adjacent travel lanes by painted lines delineators or barriers.

Bicycle lanes improve conditions for both cyclists and drivers by assigning separate spaces for bicycles and vehicles. There are several ways of installing a bike lane on a roadway such as reducing the number or width of vehicle traffic lanes, prohibition of on-street parking or widening the roadway.

The speed at which a cyclist can travel depends on several factors. Based on the TAC guidelines, a minimum design speed of 30 km/h is generally used. However, if the downgrade exceeds 4%, a design speed of 50 km/h is advisable. Table 4.3.1 below evaluates the existing roadway system and shows the suggested characteristics for bike lanes in the study area.

There is a need to improve the connectivity of bike pathways leading to the Downtown core and provide bike lanes along the major corridors of 1 Avenue S, Scenic Drive, 6 Avenue S, and Stafford Drive. The bike paths within the Downtown area should be a mix of multi-modal pathways and cyclists sharing the roadway with marked curb lane. The vision is to provide pathways or routes for cyclists on all the existing roadways. Based on this vision, Figure 4.2.2 illustrates the recommended future bike pathway system for the Downtown area.

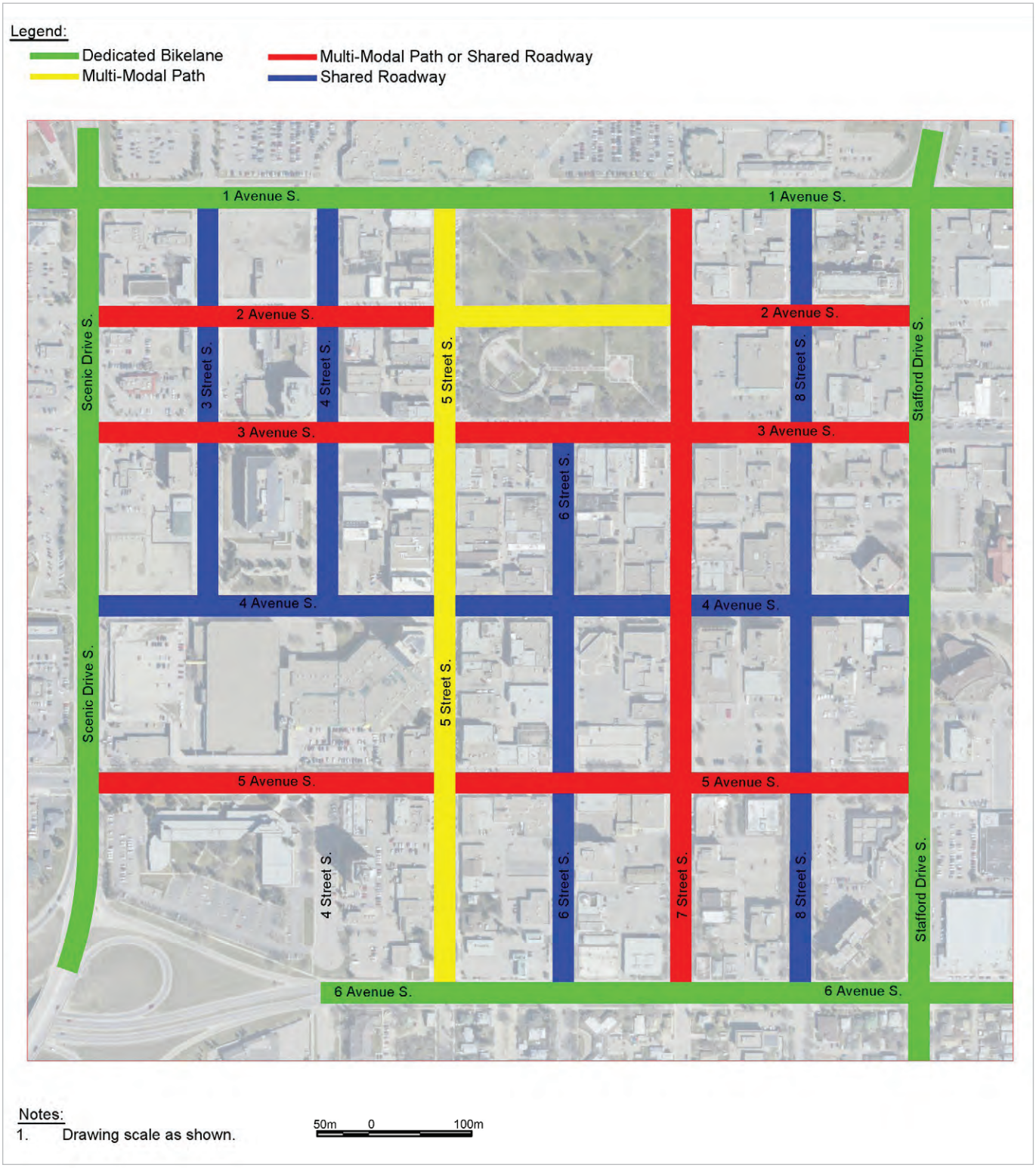
Table 4.4.2 – Recommended Bike Lanes Based on Roadway Characteristics

Segments of Bike Lane Through the Downtown	Bike Lane Type	Segment Characteristics				
		Road Design Speed	Traffic Volumes (daily)	Cyclist Design Speed (km/h)	Bike Lane Width (one way exclusive)	Cyclist Separation from Moving Traffic
1 Avenue S	On-street urban collector	60 km/hr	21500	30	1.5-2.0 m	Painted lines or delineators
Scenic Drive	On-street arterial	70 km/hr	19480	30	1.5-2.0 m	Painted lines or delineators
6 Avenue S	On-street arterial	60 km/hr	17867	30	1.5-2.0 m	Painted lines or delineators
Stafford Drive	On-street arterial	60 km/hr	14300	30	1.5-2.0 m	Painted lines or *delineators

* Delineators are markers fitted with reflective materials. There are various types of delineators identified in TAC design guidelines.

It is also recommended that the City evaluate accommodating bike lanes through intersections and freeway interchanges ramps including Highway 3.

Figure 4.4.1 – Future Bikepath Improvements



4.5 TRANSIT TREATMENT

4.5.1 BUS STOP PLATFORMS

The design of a bus stop is often a function of the location and level of usage. They must be designed and constructed to be accessible, given the limitations of available space. Whilst planning street work accessibility for bus stops should be considered.

Bus stop areas need to provide adequate space for people waiting, entering and exiting. Passengers waiting for a bus must not obstruct the sidewalk or passengers boarding and alighting the bus. The following is a general guideline for bus platform accessibility:

- The platform is to be directly accessible with a hard surface, and not separated by grass, uneven paving, grade-level changes, or other obstruction.
- Remove or relocate non-essential street furniture from the area; eliminate hazards such as support cables from utility poles and low signage protruding into the travel path.
- Provide tactile paving at boarding points to aid the visually impaired.
- If cyclists are anticipated then ensure there is sufficient space for passengers to wait with their bikes and that any locked bicycles will not obstruct the sidewalk.

CURBSIDE STOP

- Curbside stops are typically installed alongside existing sidewalks and within the parking lane.
- The length of the stop`s curb may be coloured to discourage parking.
- A curbside stop is simple in design and inexpensive to construct.
- Drivers may have difficulty in parking flush with the stop`s curb if not enough entering clearance is given by nearby parked vehicles. However, special curbs (Kassel Curbs) can be installed to guide buses to the stop and also aid passengers in wheelchairs to enter/exit the vehicles (if using low floor buses).
- Difficulties for buses re-entering traffic – this issue may be resolved with campaigns encouraging vehicles to yield to transit signaling to re-enter the travel lane.

Bus bays provide an area for buses to leave the main road to pick up or drop off passengers. They allow passengers to board and alight when the bus is out of the travel lane and therefore cause minimum disruption to through traffic. However, buses may have problems re-entering the main travel lanes.

General characteristics of bus bays include:

- allows passengers to board and exit outside of the travel lane
- provides a protected area for the bus away from traffic
- reduces delay to through traffic
- may present problems for buses to re-enter traffic.
- can be difficult and expensive to relocate

SHELTER

A bus shelter provides protection from inclement weather and some protection from noise or spray from passing vehicles. A shelter should have some form of seating and transparent walls, to improve visibility. The shelter should be illuminated and there should be a copy of the bus timetable and route map, located on the back wall. Information in relevant languages and also in braille should be provided. Bus shelters also provide opportunities to go beyond utility into creative design that enriches the public realm.

AMENITIES

- Benches are provided for additional seating outside the bus shelter.
- Bicycle storage facilities provide convenience for cyclists using transit.
- Garbage/recycling receptacles will help reduce litter but will need to be emptied on a regular basis.
- The use of a real-time passenger information (RTPI) display boards will increase public confidence in the reliability of the source as well as provide a real impetus to use transit with such systems implemented in locations like Banff, Alberta.

BUS PLATFORM LAYOUT

The typical bus platform layout needs to provide a large, clear safety zone for passengers that will not obstruct active pedestrian flow along sidewalks. Bus shelter locations and additional amenities are important considerations in providing passengers with a clear zone. Figures 4.5.11 and 4.5.1.2 illustrate typical bus platform layouts in an urban environment.

Figure 4.5.1 – Typical Bus Platform (Bus Shelter at End of Bus Zone)

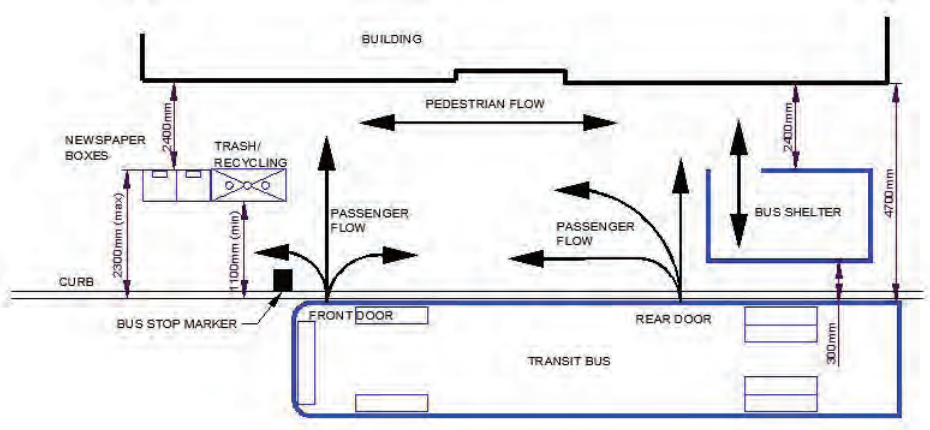
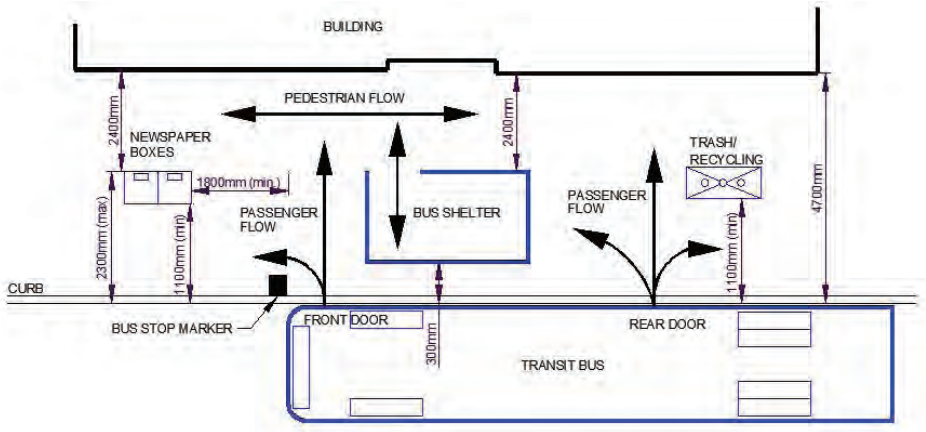


Figure 4.5.2 – Typical Bus Platform (Bus Shelter in Middle of Bus Zone)



4.5.2 MAJOR TRANSIT CORRIDOR TREATMENTS

None of the selected streets are on the City's major transit corridors. However, it may be possible to adapt some of the suggested streetscapes for adoption on the main transit corridor. The parallel parking, for example, shown on the streetscape for 3 Avenue S could easily be changed into a bus stop.

TRANSIT STOP LOCATIONS

When considering transit stop locations it is important to consider the benefits and flaws of locating a stop before (near side) or after (far side) of an intersection. If layby stops are used then, to minimise disruption to the bus and other road users, the stop should be located on the far side of the intersection. Curbside stops cause the most disruption to other traffic located on the far side, but less disruption on the near side of the intersection. Midblock stops are only preferable when located next to a site that generates a lot of pedestrian activity such as outside an educational facility or shopping centre. Consideration must be given when locating midblock stops to discourage pedestrians crossing streets at unsignalized locations. It may be beneficial to implement either a pedestrian crosswalk, near the stop, or a barrier to channel pedestrians to a designated crossing area.

PROVISION FOR QUEUE JUMPS

In areas of significant traffic congestion, provision should be made to allow transit vehicles to gain priority – perhaps by enabling them to move to the front of a queue. In cases where transit vehicles are approaching a major intersection and intend to turn left, for example, there could be a provision of an initial signalized stop line prior to the stop line at the intersection. Priority could be given to the transit vehicle by means of a bus pre-signal, which allows the bus to manoeuvre into the left-hand lane, ahead of other traffic.

The use of queue bypass lanes is another effective technique that allows buses to gain priority over the road users. In most cases these can be implemented with only a slight increase in delay to the road users. It should be recognized that queuing buses could interfere with the operations of right-turning vehicles, and consideration for the potential number of queuing buses must be given. Conversely, the potential queuing of right-turning vehicles could interfere with the ability of the turning lane to function as a transit queue jump lane.

SIGNAL PRIORITY

Signal priority at signalized intersections can provide buses with operational advantages over traffic on a mixed flow lane. Buses should be equipped with transponders (or similar devices) capable of being detected by loops or other detector devices stationed upstream of the intersection. A priority message is then sent to the traffic signal controller and the signal timing is adjusted accordingly.

4.6 PARKING STRATEGY

The City of Lethbridge has requested a "go forward" strategy for public parking development and systems management for its 2011 Public Realm and Transportation Study.

A Strategy is a high level plan outlining general function, direction and goals arising from the observations and recommendations identified within this study, including:

1. Lethbridge has very wide streets, and a large element of its Right of Way allocation has been dedicated to Angle-style public parking. Angle parking requires very generous roadway widths, and parks approximately 50% more vehicles than a parallel parking configuration. As a result, Lethbridge has quite a large supply of On Street parking as compared to most mid-size and larger cities.
2. While some blocks show 100% occupancy at some peak times, utilization of all On Street parking stalls at peak periods show about 60% occupancy. This suggests that there is a very generous supply of On Street parking in the City, quite a lot of long term parking occurring on the street, and that turnover is not being achieved in some high demand areas.
3. The great majority of Off Street parking stalls are in private hands and controlled for specified uses only (reserved parking, customers of individual business, etc.). The use of street parking for long term parking suggests that the existing stock of Off Street stalls is not absorbing longer stay parkers.
4. Although some public Off Street stalls exist, the primary Off street use is private space reserved for individuals or customers of individual businesses. These surface lots generally exhibit 60% occupancy as well.
5. There is currently surplus parking capacity available to accommodate anticipated future growth throughout the Downtown. Should current trends continue and future developments materialize, there will be increased parking pressure on the Northwest and Southwest Quadrants of the Downtown, yet not sufficient pressure to warrant construction of a parking garage.

Understanding this current reality, and following from the results of the Public Realm and Transportation Study, MMM group understands that the City wishes to evolve a program of change in its public parking posture to more closely support its larger strategic development goals. A number of detailed observations and comments are provided below.

4.6.1 CONCEPTS AND CHOICES

From the beginnings of human civilization, individuals and groups have required access to facilities, goods

and services, and have needed to move easily between areas. Efficient transportation is a key ingredient for any successful community. Parking is a key ingredient for any balanced and successful transportation program, and so efficient Parking facilities and services deliver access and mobility to people and communities.

Greatest efficiency in delivery of Parking facilities and services is arrived at by creating harmony between:

a) Efficiency to the individual; representing the most convenient and least resource consumptive solution for each individual.
b) Efficiency to the community; representing the most cost effective and least resource intensive solution for the community.

As the first element of efficiency is subjective and defined individually, and the second element is objective and defined collectively, the elements often interact as opposing forces; consequently the point of harmony between these forces is found in the region of interaction where they are least powerful, and where an optimum, or compromise, or point of efficient sharing is most available. Parking is about people; an optimized parking program delivers the greatest opportunity for people to interact and achieve subjective goals in an objective world.

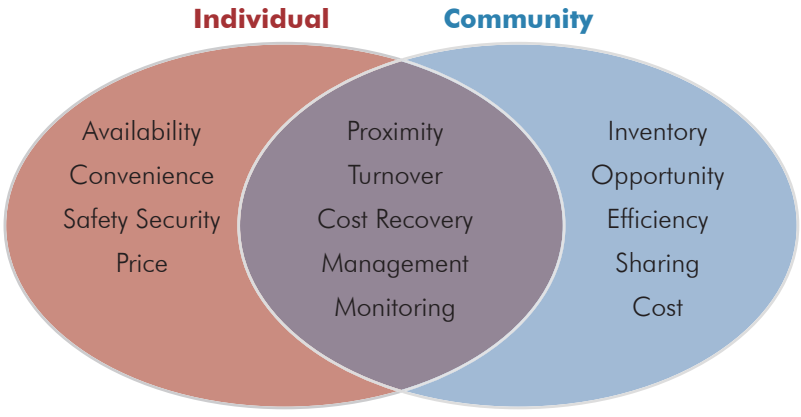
The goal of a Parking Strategy is to create an optimized parking program that continuously adjusts to support evolving community needs and aspirations.

As each community has different needs and aspirations, and as each community is on a different point in its unique and evolving trajectory of growth and development, thematic decisions regarding how policies are to be employed are usually identified as Guiding Principles.

The identified tools for use in addressing Guiding Principles are Best Practices.

Best Practices include:

Figure 4.6.1 – Intersection between the individual and the community



a) **Parking supply and demand recognition –** Parking supply is usually greater than demand in North American cities. In some areas – Downtowns, universities, medical centres, etc. – local demand is greater than local supply. Where demand is greater than supply, sharing of space is required, and this takes the form of regulation of time allowance and pricing.

b) **Regulation of time allowance and pricing –** These are the two management tools commonly used to supress demand; they regulate the length of time vehicles are parked in a space, creating turnover and more availability of space through increases sharing. Both tools require an active compliance program to be effective. Regulation of time allowance is the weaker of the tools and is effective only in low demand areas; it is unpopular with the public and usually does not recover its cost. Pricing for parking is the more effective tool, encouraging users to access their consumer training in thrift and value; it is less unpopular with the public, and usually recovers more than its cost. The correct price to charge for parking is the price point that supresses demand to desired level, which is typically 85% occupancy (or 15% availability) of parking space in given block or in a given locality.

c) **Compliance –** The desired result of a parking "enforcement" or compliance management program. Compliance Management utilizes regulation, reinforced by monitoring and financial or social penalties, to achieve the desired level of demand suppression, resulting in increased turnover and availability of space. Unfortunately, compliance management is usually a form of negative reinforcement – punishment for individuals or groups who do not comply with the regulation and, therefore, overcome its purpose, to the disadvantage of others; unfortunately, effective compliance management is often perceived negatively by the public.

The Compliance Management tool is only effective when:

» the frequency of monitoring is harmonized with the regulation (ie. When a two hour time restriction is reinforced by compliance patrols within the same period – every two hours)

» the value of the financial or social penalty is sufficient to reinforce the regulation, deter non-compliance, and deliver what the offender will consider to be a meaningful punishment and deter a repeat action, relative to the local economy. (ie. A $5 fine for misuse of Disability Parking Stalls is not sufficient to deter repeat misuse)

» the value of the financial or other penalty is seen to match the lost value associated with the offence (ie. Fines for non-payment of parking meters are reasonably related to the value lost by that activity, typically 10X the average fee paid per transaction)

» if the punishment is routinely reinforced on appeal to higher or different authority (ie. The punishment is not overturned by the Courts or local politicians)

While enforcement and compliance management programs are necessary to give "backbone" to the parking and transportation program, they are difficult to operate, naturally attract criticism, and are not located high on the list of civic priorities. Many enforcement programs operate as a matter of

routine, and compliance officers have lost the sense of daily awareness and energy that is regularly required to closely relate the use of the compliance tool to the creation of the desired outcome. As a consequence, over time, many enforcement programs fall into a malaise: they enforce offences by routine, generally lack credibility with the public, become increasingly unreliable and unpopular, and their output is increasingly challenged and overturned by higher authority. Compliance programs that trend in this direction focus on the "letter of the law" and do not support a balanced transportation program.

A compliance program that is working correctly and delivers a positive result is fine tuned to deliver service in scope and scale to the needs expressed by stakeholders and addressed by the regulation effort.

d) **Permissions or permits –** Represent a full or partial exemption from the regulation applied to designated groups or individuals, usually as an encouragement or enticement to utilize available parking in a selected area or for a strategic purpose. Monthly permits for Off Street parking lots are usually significantly discounted over the accumulated daily rate for a month's parking; similarly residents are often exempted from time restrictions or meter fees in areas where residential land use is encouraged.

e) **Customer and Stakeholder Preferences –** or observed industry or local norms - establish a base for customer/und user behaviour. (ie. Usually, transportation consumers prefer personal vehicle use over transit, until such time as parking is more costly that transit, and then they trend in the opposite direction). Customer preferences are not always expressed verbally; parking customers "vote with their feet" and often do things, out of habit, impulse, or urge for convenience, that they would not consider that they would ever do, thinking rationally. In considering customer preferences it is important to note:

» What do customers need? This is an objective observation: it is important to understand the physical and practical needs of individuals in pursuing their personal requirement for efficient access and mobility. (ie. "I require an exemption because I am disabled and unable to climb the stairs").

» What do customers want? This is a subjective observation: it is important to understand the emotional needs of individuals in pursuing access and mobility solutions in their daily lives. Customer desires are often expressed in emotional terms, and are very often disguised as practical needs in order to gain greater expression. (ie. "I need an exemption because I might be late for the concert").

» What are customers accustomed to? This is an intuitive observation: it is important to understand the routine and accepted small processes and activities that individuals repeatedly encounter and work through in their day to day lives. (ie. Red means Stop; Green means Go").

4.6.2 PUBLIC PRIVATE RELATIONSHIPS

For the customer, Parking is a uniform product that is not necessarily related to a particular location or service, except in that it provides convenience to desired services generally. Customers often flow from one parking environment to another. It is important to understand the relationship that exists between On Street Parking (in the Public Realm, which is usually municipally owned and operated) and Off Street properties offering parking services (which are usually privately owned and operated).

1. Value on the streets will build value off the streets; property values are favourably impacted by paid street parking, and adversely impacted by free street parking
2. Value off the streets will build more facilities; increased property values create greater opportunity for private borrowing and an incentive to redevelop to a higher and better use.
3. Restriction in off street spaces + incentives will build parking garages; parkades are typically expensive assets to build and do not start to recover cost in their first 10 years. Restriction of stall supply creates higher pricing, which improves business plans for these facilities.
4. Nobody comes Downtown to park; customers are not attracted to the Downtown by low cost parking, they are drawn by an inviting and unique environment that they wish to be part of – low parking fees have no positive effect on commerce. High or misunderstood pricing, or poor amenities or services, however, have the ability to deter growth and parking fees must be accompanied by positive improvements to the commercial and public environment to have positive effect.
5. Compliance Management is the Backbone; as all parking management is based on compliance, a reasonable, proactive, community minded, and service results driven compliance program benefits both public and private sector operations and builds value in the Downtown.

4.6.3 GUIDING PRINCIPLES

Guiding Principles indicate the theme, interpretation or "flavour" of how the parking program works for the community. They reflect current practices and local realities, but, more importantly, identify larger community standards, goals and aspirations.

It is suggested that important Guiding Principles in the City of Lethbridge should be:

1. As a general rule, On and Off Street Parking assets should pay for themselves and not be subsidized by tax revenue.
2. Where a unique situation requires a taxpayer subsidy, the extent of the cost to the public will be carefully assessed against the value of the benefit to the public, and not to individuals.
3. Where regulations are created and applied on both public and private properties, clear and ample signage will be posted
4. Where parking is offered to the public by the private sector, a physical amenity and maintenance standard and code of ethics will be applied.
5. Where a price is charged for parking, it will be fair and based on the cost of providing the service.
6. Where land is available for use as a parking lot, such use will not be approved unless the need is clearly demonstrated.
7. The primary purpose for public streets and right of way is for movement of people goods and services; parking is an "opportunity only" use.
8. The primary use of parking meters is to generate vehicle turnover
9. There should be a minimum of 15% available stalls at peak use periods at every curbside.
10. Where public land is available for parking use, and where such community need is demonstrated, it will be available for all members of the public based on an appropriate cost recovery program.
11. Where net revenues are earned by the Parking resource, they will be applied back to replace, enhance, or enhance the use of that resource.
12. Compliance management must be consistent and fair to all
13. It is the responsibility of the City to explain, and Stakeholders to understand, the role of compliance in managing parking space availability

The City may wish to apply additional Guiding Principles to its Parking Strategy.

4.6.4 PARKING INVENTORY

Current Condition:

The Current condition of the City parking inventory is closely detailed in the Public Realm and Transportation Study Technical Report; Lethbridge Downtown Parking – Existing and Short Term Future Parking Conditions

Observations and Recommendations:

Based on the prevalence on angle parking and moderate utilization of existing On Street assets, there is significant unused parking capacity throughout most of the Downtown. This capacity could be consumed, either through future growth, or through strategic reassignment of space to other Public Realm uses.

1. Angle parking typically creates up to 50% more parking stalls than parallel parking; as a consequence, under existing conditions, conversion of some of the 1,827 angle spaces to parallel-style parking would reduce overall parking supply by up to that amount (to about 1,350 stalls), suggesting that utilization of the remainder would increase to 85% across the Downtown.
2. Conversion of all or some angle spaces to parallel will enrich other uses of the Right of Way, and more quickly empower development of Off Street facilities and structures.
3. The utilization of "private" lots areas for dedicated customer parking or reserved individual parking creates an apparent wastage of 40% of private Off Street stalls. The observation that "all stalls are sold and allocated, but are unavailable for use" significantly reduces the benefit that these areas can deliver. Increased sharing of these facilities between scramble style parkers and daily hourly public parkers will increase overall efficiency of this space by an estimated 30% (capacity for another 900 vehicles Off Street).

4.6.5 PARKING OPERATIONS, SERVICES AND FACILITIES

Current Condition:

At present, City owned public parking facilities include 1,827 On Street parking meters and 4 surface parking lots (446 stalls). Several other City properties are leased to private entities and operated as reserved parking for single businesses. Municipal parking operations in City owned and operated facilities are managed by a municipal parking manager and a technician. Principal tasks include parking meter and surface maintenance, problem resolution, and management of Monthly assigned parking permits in the surface facilities. Monthly fees are below market rate and there are wait lists for all lots. Revenues from parking operations are used to pay the expenses of operations, and net revenues are assigned to the Parking Reserve Fund. Meter and regulatory compliance in the Public Right of Way is performed by Municipal By-Law Enforcement Officers (current contract to the Corps of Commissionaires), and revenues and expenses resulting from this function accrue to that budget unit. Net Revenues from Enforcement accrue to General Revenue

Observations and Recommendations:

1. Rates for On Street parking are currently determined by means of an informal survey of rates charged in other municipalities of comparable size and composition. This is a flawed approach that results in duplication of other cities' parking problems. As parking meters exist to create turnover of On Street space in support of the merchant and commercial community, rates should be determined by means of annual measurement of On Street supply and demand at peak use, and calculated at the level necessary to create 15% availability of parking space at peak use periods. This principle establishes the "market rate" for the Public Right of Way and creates a condition whereby parking space is continuously available and businesses can grow and Parking can expand into Off Street locations.
2. At present, both short and long term meter parking are permitted on most city blocks. While this utilizes excess On Street space to accommodate long stay customers, when it is applied to high demand areas, it creates a duplicate customer search pattern, excessive circulating traffic, and detracts from value growth in Off Street properties. On Street parking should be organized around High Demand and Low Demand zones; meter prices should reflect the higher

demand level (ie. Price is double the Low Demand rate), and where long term parking is offered On Street, it should be in Low Demand areas only.

3. Rates for Off Street parking are determined by perceived value, or an increase over "last year's fee"; again, these rates should be determined by supply and demand, and the correct price point for assigned stall monthly parking is the fee that results in an absence of a waiting list.
4. Facilities for Off Street parking should offer a combination premium priced Reserved/ Assigned parking, and lower priced unassigned or "scramble" or "roaming" style permits that allow a parker access to any City operated surface lot. Unassigned permits may be oversold by 10-15% to allow for infrequent users. This program optimizes use of space as well as financial return.
5. Facilities for Off Street parking should also allow for long term daily/ hourly use (ie. $ 1 per hours to a $ 6 daily maximum) to allow for interchangeability between On and Off street use, as well as growth in value of Off Street properties (this is essential in building an environment which will create a business case of densification of Off Street parking – a parking structure – in the future). Off Street facilities should be equipped with modern daily rate Pay Station technology consistent with the units customers are used to seeing On Street.
6. The City owns a significant number of surface properties in the Downtown that are currently leased to private interests, and these parking spaces are often reserved for special groups and provided to customers free of charge. This practice restricts growth and mobility in the Downtown. The City should operate these spaces directly, or acquire an operating partner that will manage the lots directly, as daily/ hourly/monthly parking areas, in the manner described above.
7. The City currently uses standard electronic parking meters to support angle parking. These meters are no longer current or supported by the industry. The City should plan to upgrade its meter inventory to a modern solar powered pay station technology configured in an advantageous manner (pay and display, pay by space, pay by plate). These devices accept credit cards and Pay by Cell phone and Pay by GPS technologies are supported. These devices increase service to customers and revenues to the City, and, in some configurations, a more efficient use of the Public Right of Way.

8. Enforcement technology should be upgraded to support hand held computers for wireless individual By-Law Officers; an automated ticket issuance program utilizing Licence Plate Recognition vehicles should be considered.
9. Enforcement ticket rates are currently too low to represent an adequate deterrent to committing a parking offence. Ticket rates should increase to the point where, at a minimum, they represent a credible deterrent to misuse, they refund the direct and indirect costs of ticket issuance and adjudication, and replace any lost revenue associated with the offence. In most cases where revenue is lost, violation fines are calculated at 10 X the normal fee for the space identified (ie. If the fee for 2 hours of parking is $2, the fine for misuse is $ 20).
10. Enforcement Officers for parking offences are often acquired through contract agencies. Different agencies have different policies regarding attendance and productivity. The City should conduct a study to determine if the current contract is optimizing use of these staff. At a minimum, the Enforcement contract should be put out for public bid every 5 years.
11. The position of the Parking Manager is currently responsible for customer service and daily maintenance. The position should be expanded to include proactive daily management of the parking resource, budget, and program, as well as stakeholder relations. In the longer term, the City may consider assigning responsibility to this position for management of the enforcement and compliance function, and for management of the Parking Reserve, and funds accruing from “cash in lieu of parking” payments. Ultimately, the City may wish to establish a Parking Authority to take the lead in funding and developing structured Off Street facilities.
12. The City is currently working with Downtown stakeholders on a variety of committees that deal with planning and parking in the public realm. The City should establish a long term Working Committee or Advisory Group on Parking Programs to consult month to month in public parking management issues.

4.6.6 PARKING STRUCTURES

Current Condition:

At present, the City has very few parking structures, in either the public or private realm, and has identified a desire to work towards and environment that will support the development of structures to locate vehicle parking Off Street as a strategic goal.

The current lack of privately funded structured parking is indicative of a market value for parking space that is generally not sufficient to pay the significant costs of developing a new structure.

There is also a propensity for long term Downtown parkers to seek out and misappropriate existing space that is made available free of charge to private customers in private facilities (Park Place or Lethbridge Centre), and this is indicative of a need for a more proactive, long term construction goal.

The City currently retains a dedicated Reserve Fund for future parking facility development; at present, net revenues from the existing parking operation are contributed to the reserve. While there are significant funds in the Reserve, there is no identified project for the city to save toward, and so the Reserve is occasionally identified as surplus revenue and used to address other expenses.

Observations and Recommendations:

1. Understanding that the City wishes to reconfigure and reduce On Street parking supply as a strategic goal, planning for the development of densified Off Street space should increase.
2. The current preferred configuration for Off Street structured parking is multi-use or shared used (retail, commercial, residential, or entertainment), 250-500 parking stalls, precast construction, footprint and functional design to suit the selected site. Per stall costs for the parking stall elements space are usually $ 30,000; there are additional funds required to acquire the land and construct the building envelope. The typical capital construction cost of such a structure – or of the parking element of a multi-use structure - in 2011 dollars is $ 25 Million. The typical funding model is a combination of cash down payment (25% of total) and annual mortgage over a 25 to 40 year period, as sustained by an approved business case.

3. In addition to their capital construction costs, parking garages typically generate $ 250,000 to $ 500,000 in operating costs each year (staffing, utilities, repairs, snow removal). As parking structures are built to provide future capacity, they are not usually fully occupied in the first several years of operating; consequently the first several years of operations incurs an annual deficit. The typical time to operating profitability is a municipal parking structure is 5-10 years; as net operating revenues are turned to debt repayment, facilities can be paid down earlier than the initial mortgage requires.
4. The best business case for a structured parking facility involves sharing uses of the parking space amongst different types of parkers to maximize capacity, and sharing uses over the course of the business day to stretch the period of the day in which parking stalls are utilized. For instance, a facility may be used by retail and commercial traffic during the day, and by restaurant and special event of concert parkers in the evening and weekend time segments.
5. The business case for a parking structure may be improved though revenue contributions from positive net revenues in other parking modes (ie. Parking meters and permits) as well as by reductions in supply in other key parking areas (ie. Conversion of On Street to parallel parking)
6. The business case for a parking structure can be improved though additional taxation surcharge or subsidy from other revenue generation (ie. A business tax or a parking tax).
7. The business case for a parking structure may be improved through assignment of capital costs to other aspects of the building's use (ie. Assignment of greater cost to the commercial component).
8. The typical time taken to develop a parking garage is: 1 year approvals, site selection and acquisition; 1 year design; 1 year construction; 1 year completion, commissioning and commence operations.
9. The best location for a parking structure is always in a central Downtown location where the facility can achieve its greatest shared use. Pairing of structures with centrally located residential, commercial, event or entertainment centres is very common.
10. In Lethbridge, the best location for a parking structure will be centrally located in a space that supports the proposed entertainment or arts corridors, and future business growth zones, as may be determined in future planning. There are several sites available that may, in the fullness of time, support a business case.

11. The business case in Lethbridge does not yet support construction of a parking garage. To push toward this solution as a strategic goal, the City should consider the following program:
    - » Reduction of surplus On Street space through reassignment of Public Right of Way to non parking uses, and conversion of angle parking to parallel parking.
    - » Correctly price On Street meters and Off Street lots to demonstrate 15% availability, and assignment of net revenues from parking meters and enforcement to the Parking Reserve.
    - » Develop a conceptual plan and self-funding financial pro forma for a garage facility, incorporated into the overall conceptual design and business plan for a larger scale mixed use facility or arts or entertainment district. (Where possible, potential sites should not be discussed until the larger designs are developed and properties are in public hands.)
    - » Establish civic goals for these larger developments at an initial timeline between 5 and 10 years.

4.6.7 ASSEMBLY OF TIMING AND ACTIONS

Near-term (within three years)

- » Begin to reduce angle parking On Street and replace with parallel as new uses for the Public Right of Way reach approval.
- » Begin to increase meter fees toward 15% availability principle.
- » Begin to increase fines to a reasonable deterrent or 10X the fee forgone.
- » Adjust legislation to support principle of 15% availability of space On Street.
- » Create policy and begin to charge City staff for parking on City property (daily/hourly/monthly).
- » Implement daily/hourly parking in City owned lots (select and purchase Pay and Display machines).
- » Implement scramble parking in city owned lots (revise parking regulations and practices).
- » Curtail leasing of city parking properties and operate internally as daily/hourly/monthly lots.
- » Assign increased net revenues from fees and fines to the Parking Reserve.

- Place signage and communications signalling that increased revenues will be dedicated to a parking structure.
- Develop a conceptual plan for 1st parking inclusive project: artist's rendering, rough site plan, financial feasibility study; multi use structure including parking space.
- Create a Downtown Parking Advisory Committee representing stakeholders.
- Assign more proactive and development work to Parking Department; improved training and staffing; customer service and stakeholder support; Plan and execute the Parking Strategy day to day.
- Review Commissionaires contract and performance; convert "Enforcement" to "Compliance Management."
- Select and implement an automated permit and compliance data management program.

Mid-term (3 to 6 years)

- Continue conversion of angle to parallel parking.
- Increase meter fees to create 15% availability (steady state).
- Increase fines to suitable deterrent level (steady state).
- Plan timing of 1st major project based on financial estimates. Continue with formal planning toward approval and construction within this period (if possible).
- Begin replacing On Street parking meters with Pay Station machines.
- Continue developing the "parking facilities and services" department.
- Adjust planning, zoning, and site planning by-laws and practices to be more "parking and development friendly" to encourage redevelopment of surface lots and build more parking garage development in key areas.

Long-term (6 to 15 years)

- Continue to reduce On Street parking as determined by growth in alternative uses of the Public Realm.
- Construct 1st major parking inclusive project and commence conceptual planning for 2nd and 3rd major projects to be developed as the City grows.

PUBLIC AND STAKEHOLDER CONSULTATION

5.1 PUBLIC CONSULTATION PROCESS

The public consultation process began with the MMM Group developing a stakeholder consultation list and a Communication Plan with the City's Project Manager. The objective of this process was to ensure that commonly held values by local citizens representing various interest groups were expressed during the public engagement process.

Core team members included staff from City Departments including Planning, Transportation, Parks, and Transit. Copies of the Communication Plan were distributed to both core and external stakeholder groups including the HOCRC, local special interest groups and organizations, residential and condo associations, external municipal departments, and individual land owners. (See Technical Reports Appendix A for complete list of Core and External Stakeholders). Table 5.1 on the following page is a condensed list of the core participants and key stakeholders groups involved in the charrette.

The Communication Plan gave a brief introduction to the charrette process. This included: key participants, including the consultant team; a summary of key issues of the transportation study such as freight, universal accessibility, and active transportation; background information on how the study streets were selected; and an agenda for the four-day event that outlined each day's activities and timeframes.

The format of the design charrette process involved a series of 'listening' sessions with the various stakeholder groups; development of 'big ideas' through design workshops with the various stakeholder groups; stakeholder drop-in sessions to meet one-on-one with the consultant team to discuss the refinement of those 'big ideas'; and finally a public open house to present the refined ideas and elicit public feedback. Documented public feedback consisted of exit surveys which were distributed out at the public open house.

Table 5.1 - List of Core Participants at Design Charrette

Project Management and Development Team
Robert Evans, MMM Urban Design, Principal in Charge.
Robin Hutchinson, MMM Transportation / Project Manager
Mark Velicevic, MMM Transportation
David James, MMM Landscape Architecture
Michael von Hausen, MVH Urban Planning and Design
Geoff Dyer, Placemakers
Nicholas Wade, Public Art Consultant
City of Lethbridge
Tatsuyuki Setta
George Kuhl
Maureen Gaehring
Jeff Greene
Ahmed Ali
Wade Combs
Ryan Carriere
Heart of Our City Revitalization Committee
Ken Nakagama
Bev Lanz
Mark Bellamy
Grace Duff
Belinda Crowson
Renae Barlow
Alderman Jeff Carlson
Alderman Jeff Coffman

Groups-Organizations-Government
Business Revitalization Zone
Chinook County Tourist Association
BikeBridge Cycling Association
Economic Development Lethbridge
Chamber of Commerce Lethbridge
Allied Arts Council
Lethbridge Historical Society
Park Place Mall
Disabled and Barrier-Free (Individual)
Canadian Badlands
City Departments
Land Development
Lethbridge Regional Police (Downtown)
Fire Department
Planning and Development Services
Public Operations (Road)
Public Operations (Park)
Facility Services
Lethbridge Public Library
Galt Museum (tourism committee)
Helen Schuler Nature Centre
Land – Business Owners
Along the selected streets

5.2 LISTENING SESSION

The first day of the charette consisted of meetings with City Planning and Transportation staff, external stakeholders consisting of community leaders, HOCRC and land owners to briefly describe the goals and objectives of the PRATS Study and allow an opportunity for an open sharing of thoughts and key issues which would need to be addressed in the conceptual work that would follow.


Facilitation of Stakeholder Meetings

The following key issues emerged from the listening session:

- lack of a “pedestrian first” emphasis in the Downtown and to place design priority on pedestrians and bicyclists
- a perception that the Downtown is not safe during parts of the day
- limited connections to the Downtown for cyclists and pedestrians along the outer edges
- a lack of activities, facilities, and programming in the Downtown
- the importance of Galt Gardens as a major destination, gathering place and recreational amenity within the Downtown
- limited parking and associated need for convenient access to businesses
- a need for more housing Downtown to increase activity and vitality
- seasonal (wind and snow) limitations and lack of facilities

5.3 STAKEHOLDER WORKSHOP

Goals of the stakeholder workshop/ design charrette were to directly engage the participants in a creative, hands-on design session, where small teams made up of representatives of each stakeholder group are encouraged to collaborate and sketch ideas about: the public realm potential for the selected study streets; individual issues to build consensus; alternative treatments for the public realm and transportation systems. Strategies for lane reduction and parking space were key focus points. Finally, information generated was collected for further analysis and to prepare conceptual public realm designs.


Presentation of Ideas from Charrette / Workshop

The stakeholder workshop/ design charrette session produced or re-affirmed the following key ideas:

- create a family oriented Downtown
- slow down traffic in the Downtown core
- create 'Attractor Factors' - places that are attractive and invite people to stay awhile
- enhance Galt Gardens as a key destination and Downtown amenity
- provide Safe and Universal Access in the Downtown for pedestrians
- extend cycling throughout the Downtown, and promote other alternate modes of transportation
- design for 'four seasons' and night activities to increase Downtown pedestrian usage
- reduce "Red Tape" for public realm innovations, and streamlining decision process for ease of implementation

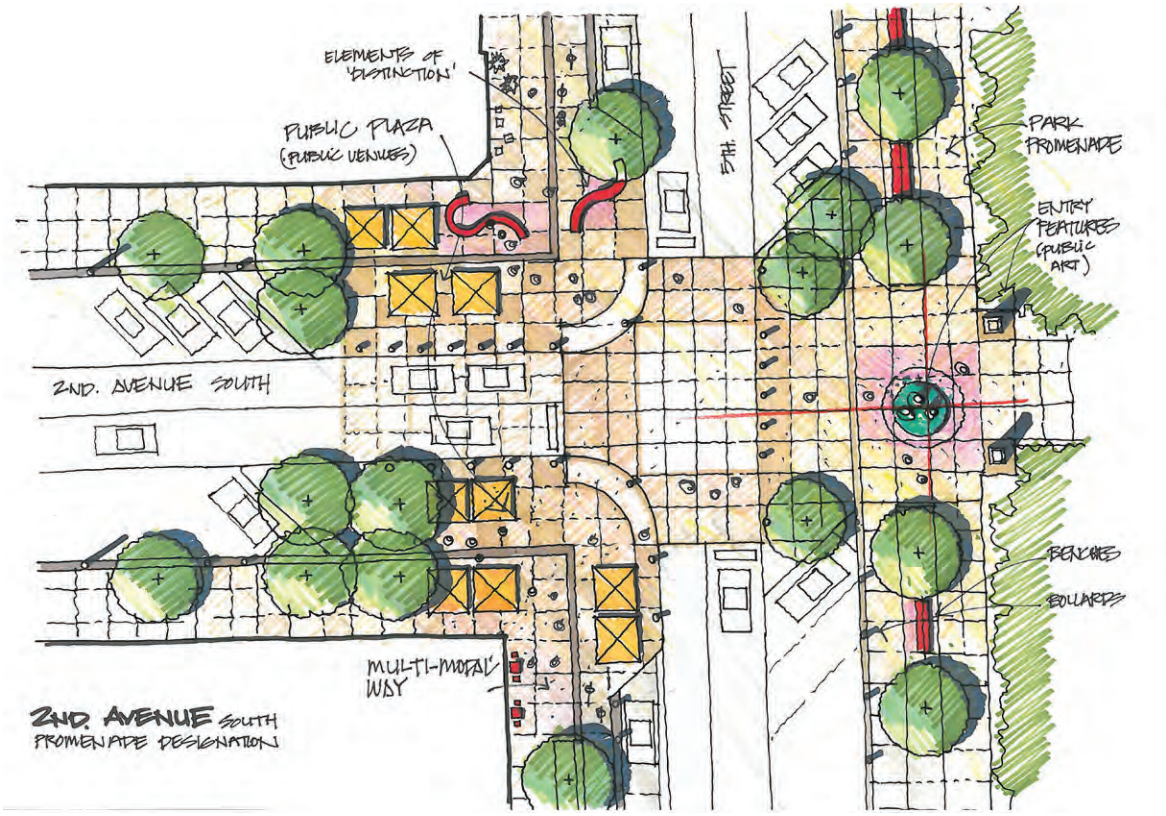
5.4 DESIGN CHARRETTE

The majority of the design charrette involved the consultant team developing the 'big ideas' and responding to the key issues identified by the stakeholders into a series of synthesized plans and sketches (such as that shown in Figure 5.4.1). These drawings visually illustrate potential public realm improvements for the selected study streets.

Stakeholder and working sessions developed a clear goal for the treatment of the public realm:

'To create a balance between the public realm and the traffic realm without a significant loss of on-street parking, and enhance the overall quality of the Downtown's public realm for long term vitality and promotion of the Downtown as a place to live, work, play and learn.'

Figure 5.4.1 – Plan of 5 St S and 2 Ave S Produced at the Charrett



5.4.1 BALANCING THE PUBLIC AND VEHICULAR REALM

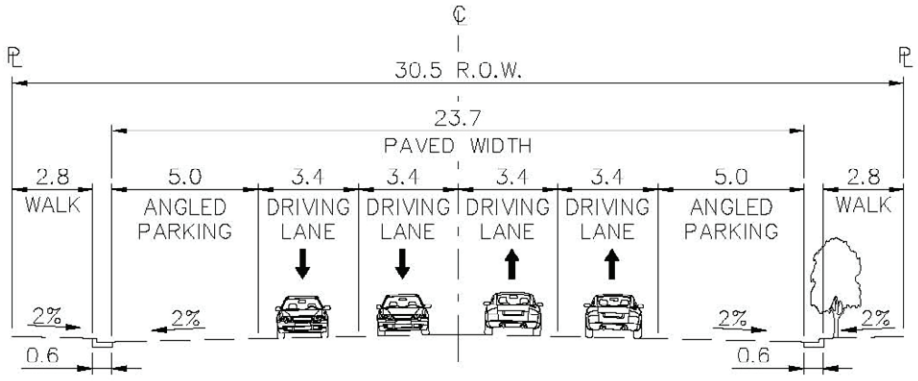
The current public realm conditions, as discussed in Section 2.2, favours motorized vehicles. Based on existing street cross-sections developed by MMM, indicating width of sidewalk in relationship to combined parking and vehicle travel lanes, the following percentage of dedicated space for pedestrian and vehicle movement exists:

» 5 Street S: 19% Public Realm, 81% Vehicular Realm (Figure 5.4.2)

» 2 Avenue S: 39% Public Realm, 61% Vehicular Realm

» 3 Avenue S: 35% Public Realm, 65% Vehicular Realm

Figure 5.4.2 – Existing 5 Street S (19% Public Realm; 81% Vehicular Realm)

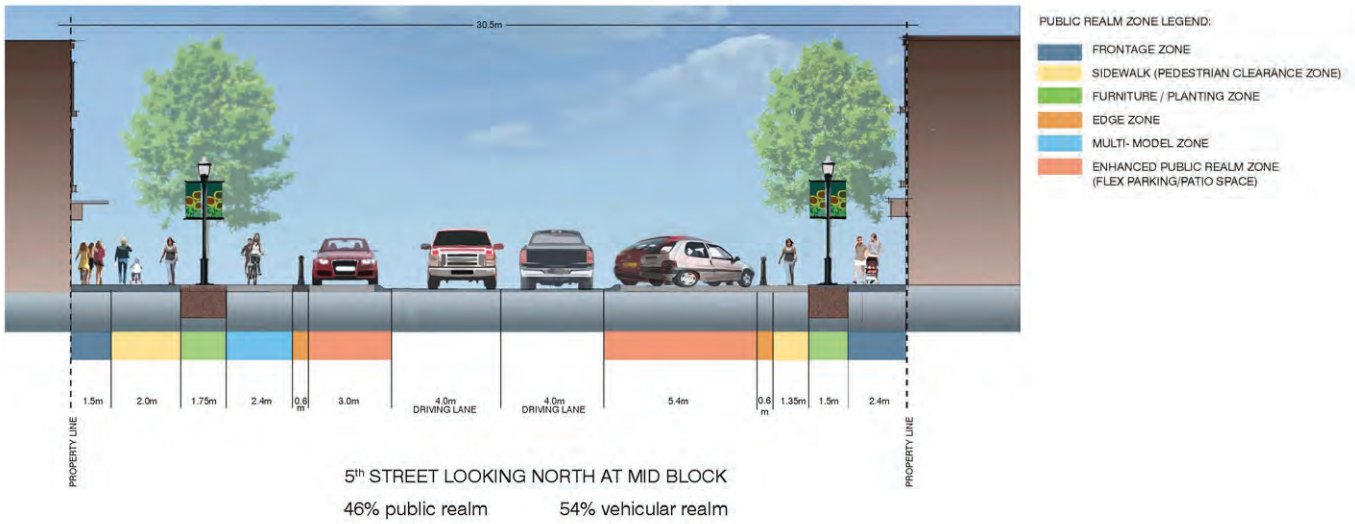


Typical Cross Section

The founders of Lethbridge, when they surveyed the Downtown, showed great foresight in providing 30.5 metres (100 feet) right-of-way widths for the street network. This foresight has allowed for greater flexibility in the treatment of the vehicular and public realm than most cities.

From a preliminary transportation review, it was demonstrated that a reduction in the number of travel lanes on 3 Avenue S and 5 Street S can occur and provide an acceptable LOS (See Section 2.5) at the selected intersections. The traffic analysis is based on a moderate growth rate of 1.7% per year for vehicles and 3.0% for pedestrians-cyclists over a twenty year time period. The reduction in the number of travel lanes allows for an increase in the width of public space within street rights-of-way (the public realm also includes non-street right-of way-space such as publicly owned property with buildings and spaces like Galt Gardens) and provides more of a balance between the two.

Figure 5.4.3 – Proposed 5 Street S (46% Public Realm; 54% Vehicular Realm)



From work developed in the charrette, a redistribution of public and vehicular realm was targeted.

- 5 Street S: 46% Public Realm, 54% Vehicular Realm (Figure 5.4.3)
- 2 Avenue S: 39% Public Realm, 61% Vehicular Realm (remains the same)
- 3 Avenue S: 33% Public Realm, 67% Vehicular Realm (Galt Gardens)
- 3 Avenue S: 41% Public Realm, 59% Vehicular Realm (West of 5 St S)

An increase in space dedicated to non vehicular use will allow for a greater level of articulation in the streetscape treatment, more opportunities to provide comfort elements for pedestrians and dedicated circulation zones for bikes, pedestrians and vehicles. These enhancements to the public realm will improve safety, make streets more attractive and Downtown a more desirable place to visit and spend time.

5.4.2 ENHANCING THE PUBLIC REALM

Specific recommendations and objectives were identified in the HOCMP in terms of celebrating the uniqueness of Lethbridge's Downtown districts. It also identified key objectives for the creation of new public spaces, gateways, public art installations and street prototypes as part of the public realm enhancement.

Correspondingly, the charrette used the HOCMP Guiding Framework as a starting point for further study and testing of those ideas as they pertain to the selected study streets. For the most part, PRATS work closely matches the original framework identified in the HOCMP, but with some modifications and refinement based on the work completed as part of the PRATS. A revised public realm framework concept is provided in Figure 5.4.4.

Figure 5.4.4 – Public Realm Framework Concept

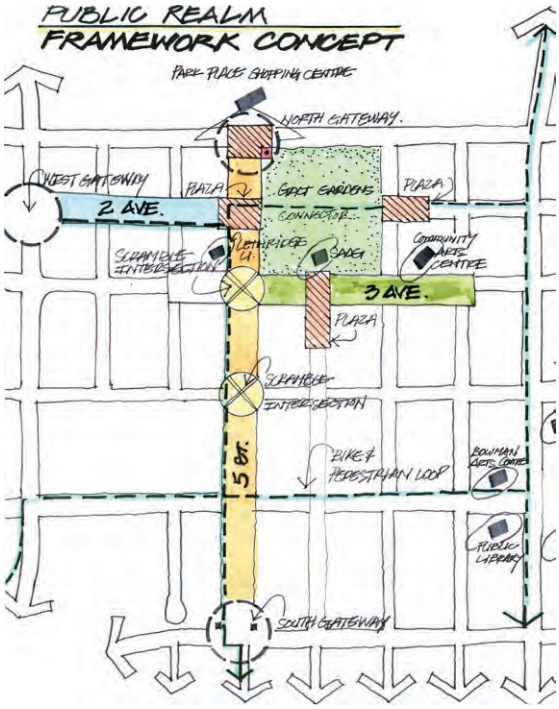
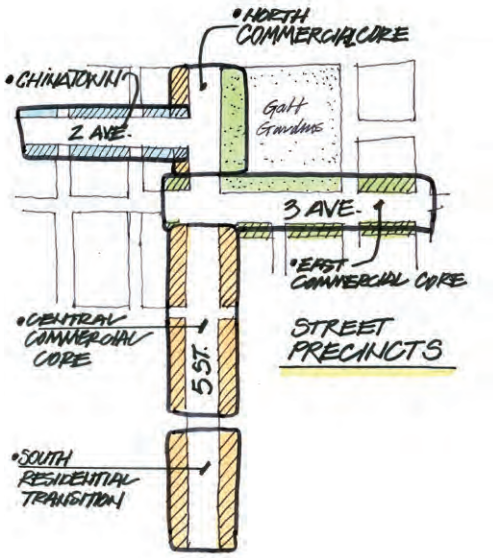


Figure 5.4.5 – Street Precincts



5.4.3 EXPANDING ON THE HEART OF OUR CITY MASTER PLAN PUBLIC REALM FRAMEWORK

The Master Plan originally identified a hierarchy street network comprised of five different street prototypes. In the document, 5 Street S and 3 Avenue S were both identified as Main Street types, with similar treatments; and 2 Avenue S was identified as a Promenade Street type. During the design charrette, the significance of individual study streets within the context of the Downtown Central District became quickly apparent (Figure 5.4.5). The intensity of current use, number of heritage buildings, adjacent land uses and untapped development potential started to inform the design decisions and proposed treatments for individual streets.

This lead to the conceptual development of a variety of 'Street Precincts' that would be unified through a common treatment of elements and materials such as paving, lighting, and site furnishing. The uniqueness of each Street Precinct could in turn be celebrated though the selective use of distinctive elements such as public art opportunities, special paving in featured areas, custom benches, accent lighting and varying street tree planting.

5 Street S is seen as having three distinctive transitional zones and both 2 Avenue S and 3 Avenue S are seen with cultural significance owing to past and current uses. These differences were identified as potential for elaborating on in the treatment of the public realm.

The following expands on the Master Plan street prototypes for the selected study streets:

5 STREET S (FORMERLY ROUND STREET C.1905)

» 5 Street S is a major retail strip running north to south, that changes in intensity and character from more historic 2 and 3 storey structures in the north, to a 12 storey structure at Lethbridge Centre, then back to lower density generic building forms in the south.

» A raised 'scramble' intersection is proposed where 5 Street S meets 3 and 4 Avenues S.

» A new shared pedestrian and multi-modal bikeway is proposed for the 5 Street S corridor from 6 Avenue S to Galt Gardens. This is in response to stakeholder and charrette preferences to promote alternative modes of transportation and the enhancement of Galt Gardens as a family oriented destination place and the 'heart within the heart of our city".

» On the east side to 5 Avenue S, which has more established retail development, angled parking is maintained rather than parallel as identified in the HOCMP. Angled parking is seen as more advantageous for shopping districts for patron convenience and maximizing quantity of parking stalls.

Figure 5.4.6 – 5 Street S and 3 Avenue S Intersection – Commercial Core

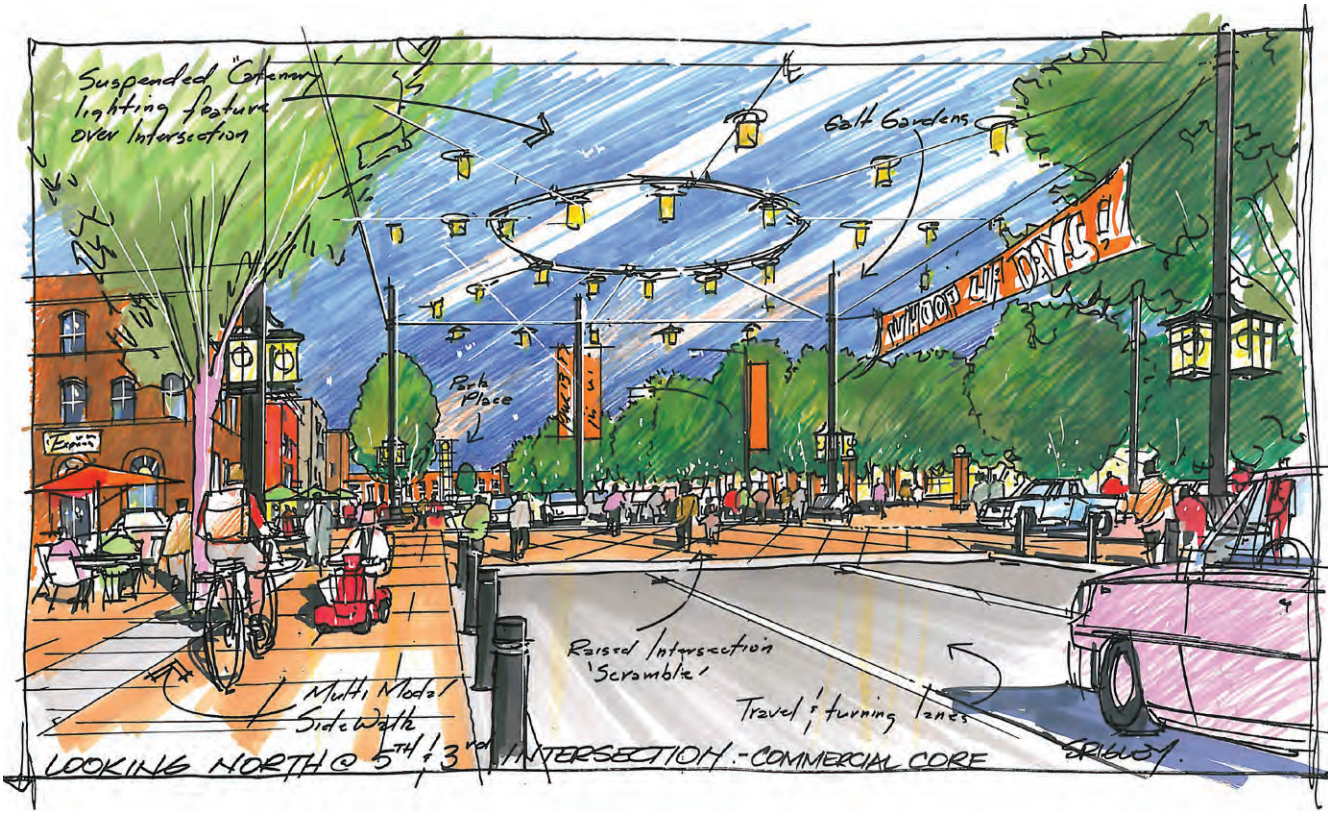
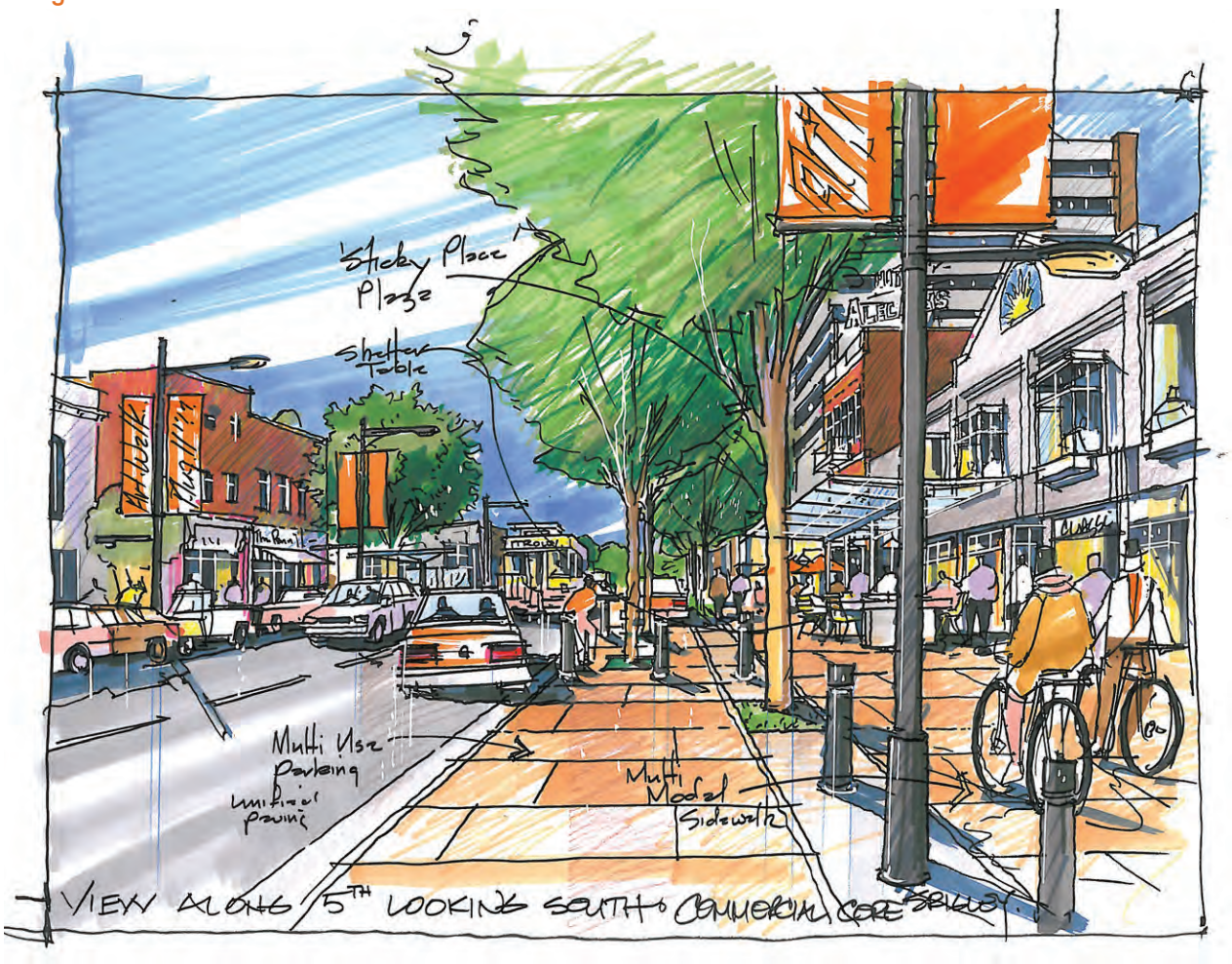


Figure 5.4.7 – 5 Street S – Commercial Core



» Parallel parking is proposed for the west side of 5 Street S. The additional width created by parallel parking allows for a separated bikeway within the public realm zone, free of conflicts with automobiles. This will improve safety and encourage more family oriented biking into the Downtown (See Figure 5.4.7).

» In addition, the bikeway on the western side of 5 Street S directly corresponds to a proposed plaza space in front of the Penny Building (new University of Lethbridge building).

2 AVENUE S

» 2 Avenue S is envisioned as a highly pedestrianized street that visually and physically connects a number of multi-family developments across Scenic Drive S to the Downtown and Galt Gardens.

» Vehicular movement will remain as two travels lanes with angled parking on both sides.

» A double row of street trees is proposed on each side of 2 Avenue S and will extend the 'green' of Galt Gardens to Scenic Drive.

» A more distinctive treatment of public realm elements, such as the use of special street lighting and custom site furnishing is proposed to recognize and reinforce Chinatown's cultural significance in the development of Lethbridge (see Figure 5.4.8).

» The intersection of 5 Street S and 2 Avenue S is proposed to be treated much like 6 Street S including a shifted roadway at the intersection to provide more flexible space for parking and outdoor gathering. On larger event days, an entire section of 2 Avenue S and 5 Street S (in front of Galt Gardens) could be closed off to traffic and used as an event space such as an informal open market (see Figure 5.4.9).

» Future land use recommendations for the proposed redevelopment of vacant lands include mixed-use commercial and residential, with a strong preference for a small (1500m2) grocery store to help support residential use within the Downtown core.

3 AVENUE S (FORMERLY REDPATH STREET C.1905)

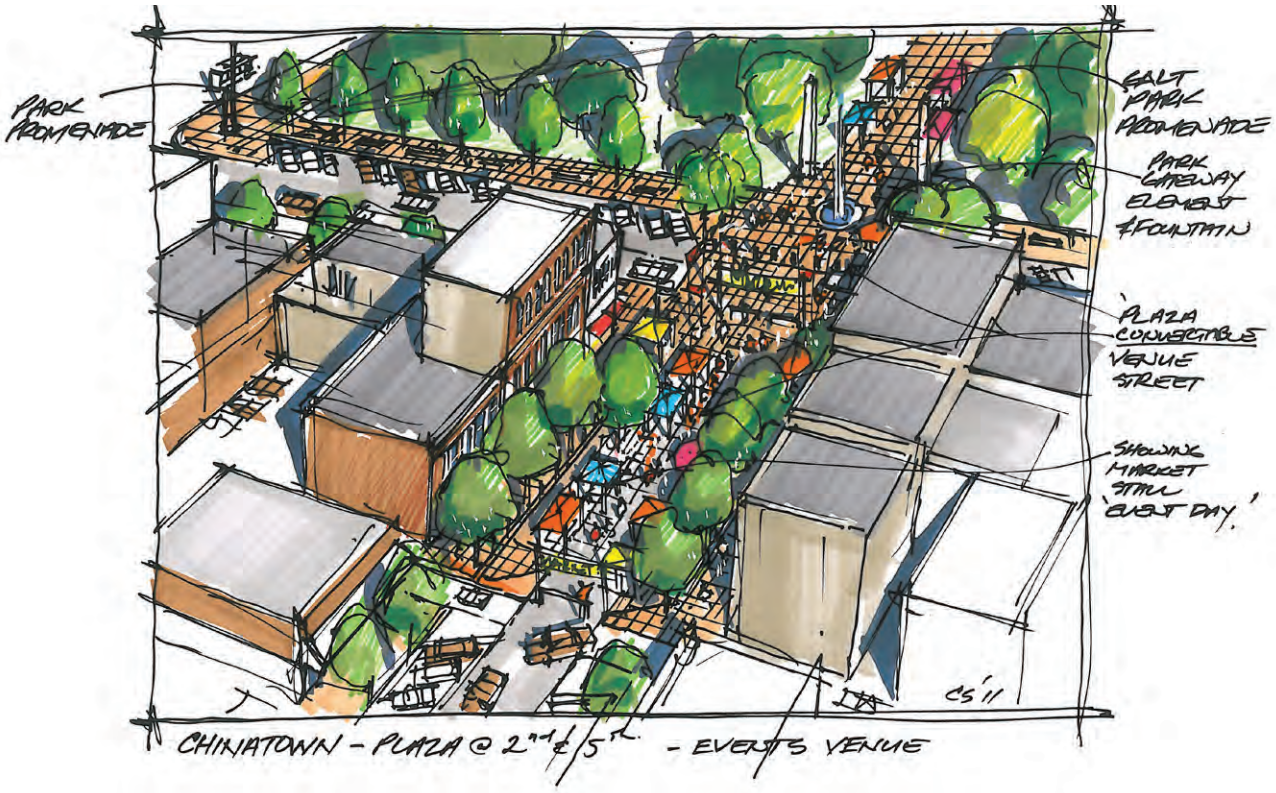
» 3 Avenue S, with its dynamic land use mix, historic and contemporary architectural styling, along with various cultural, civic and retail uses, provides the framework for a vibrant streetscape treatment. Building upon this vibrancy through the addition of distinctive site elements, and promoting greater public utilization of Galt Gardens as a central square and Downtown destination, are key to the public realm improvements.

» Providing three travel lanes (eastbound and westbound lanes with a middle turning lane) will allow for angled parking and an enhanced sidewalk width along the north side which interfaces with Galt Gardens, and parallel parking with a bikeway on the south side.

» The parallel parking configuration between 7 Street S and 5 Street S will allow for the preservation of

Figure 5.4.8 – 2 Avenue S – Chinatown

Figure 5.4.9 – 2 Avenue S – Events Venue



existing mature street trees and current sidewalk width, with approximately 3.0m of additional sidewalk width for a shared bikeway.

» This will provide greater bike safety by eliminating automobile conflicts that currently exist along 3 Avenue S owing to the encroachment of parked vehicles into the commuter bike lane.

5.5 PUBLIC REALM COMPONENTS

Lethbridge's Downtown streets and sidewalks are key components of the public realm and are some of the most important gathering spaces available to the public. As identified earlier, the goal for the treatment of the public realm is to "create a balance between the pedestrian space and the vehicular space without a significant loss of on-street parking, and enhance the overall quality of the Downtown's public realm for long term vitality and promotion of the Downtown as a place to live and work."

From discussions with stakeholders and user groups it became apparent that to achieve this balance in the public realm without a significant reduction in parking, the parking would need to be the buffer between pedestrian and vehicular space. One of the major public realm refinements to the Heart of Our City Master Plan, in terms of the streetscape framework, is to provide angled parking wherever possible, but elevate the parking to the same level as the sidewalk.

When circumstances require additional sidewalk frontage, then the parking can be easily shifted to pedestrian use, transitioning the streetscape zones to accommodate adjacent uses or desired streetscape functions. This flexible parking will also provide opportunities for enhanced treatment of paving surfaces, temporary snow storage and may incorporate passive storm water management systems to minimize infrastructure costs and promote ground water recharge and better urban forestry practices.

5.5.1 STREETSCAPE ZONES

The placement of streetscape elements within in the public realm is important to ensure the urban environment meets the needs of pedestrians. Sensitive placement will promote a more livable and beautiful Downtown that is better organized, thus making for more functional and accessible public space for all users.

Pedestrian movement is critical, but so is providing comfort elements and shelter in order to encourage users to stay and take advantage of all that Downtown Lethbridge has to offer. There are opportunities to enhance outdoor experiences and delight the public through the provision of public art and custom urban design elements. Careful placement of these distinctive elements must also be considered.

In order to provide all the necessary streetscape elements without negatively affecting pedestrian circulation, the public realm is typically divided into a number of Zones: an Edge Zone, Furnishing and Planting Zone, Pedestrian Clearway Zone, Frontage and Marketing Zone (See Figure 5.5.1).

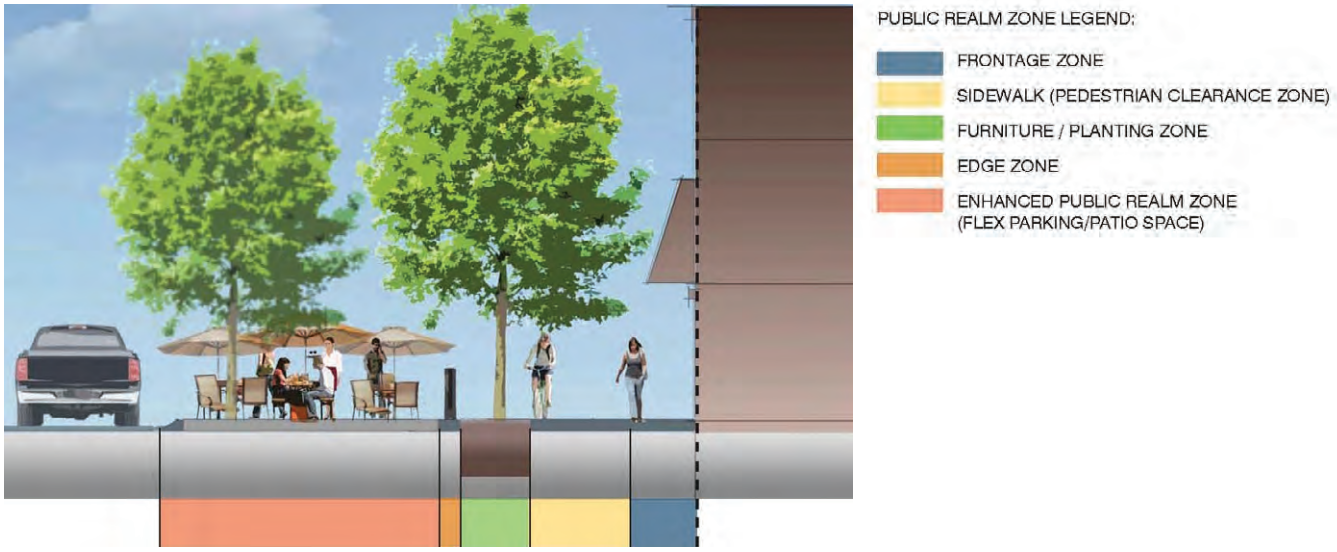
The Edge Zone is immediately adjacent to parking and provides a safety buffer against vehicle encroachment into the adjacent Pedestrian Clearway (shared bikeway zone). At a minimum, this Zone should consist of a 0.6m wide concrete band with metal traffic bollards in locations where the parking is raised to the same vertical elevation as the sidewalk. This zone is also the most desirable for the location of shallow utilities for ease of access and to limit disruption of adjacent building uses.

The Furniture and Planting Zone accommodates street tree planting, lighting, site furniture and other fixed objects. Site furniture and planting must also be placed far enough away from the curb face to limit conflicts with roadway activities.

The Pedestrian Clearway Zone must be kept free of obstructions and provide a continuous linear pathway of an appropriate width to serve anticipated pedestrian flow, yet have easy access to furnishings for safety and ease of amenities.

The Frontage and Marketing Zone is the area directly in front of the building and/or property line. It can be used as flow-out space, patios and outdoor display areas for merchants. It can also be used to separate pedestrians from window and building surfaces that extend out from the face of the building.

Figure 5.5.1 – Streetscape Zones with Flexible Parking/ Patio Space



Depending on the classification of a street, its adjacent land use and its intensity of activity, the type of Zone and spatial requirements can vary. In general it is desirable to maximize the Pedestrian Clearway without adversely affecting or limiting the other zones.

5.5.2 STREETSCAPE ELEMENTS - KIT OF PARTS DESIGN TOOLBOX

A number of opportunities exist to enhance the overall quality and functionality of the public realm through the provision of various basic streetscape amenities, as well as elements of distinction. The greater the width of the public space, the more flexibility there is in the placement of these streetscape amenities.

Basic amenities are required to provide a minimum amount of pedestrian comfort to encourage and support pedestrian use. Examples include: parking meters and ticket dispensers, street and pedestrian lights, benches, bike racks, tree grates, traffic bollards and paving material.

In addition to those basic elements, there are elements of distinction that can be added to provide greater articulation and meaning to a specific place. Examples of these include: bus and transit shelters, way finding and information kiosks, public art installations, gateway features, custom benches, special paving, and special effect lighting.

In a highly articulated public realm, such as an area of cultural significance, even common utility and service features should be treated with greater distinction. Examples include; manhole covers, utility and traffic control boxes, street signage, sidewalk markers and crosswalks.

With such a variety of different site elements there can be a tendency to create visual disorder if care is not taken in their selection. The charrette process developed a strategy for the selection of streetscape elements. This strategy is based on unifying the selected study streets through the identification of “common elements” that are simple and elegant in their character. The unique quality of each individual street or Downtown district is reinforced by provision of distinctive elements which can be custom made urban design elements or installation of public art.

The combination of both lead to the creation of a Kit of Parts Design Toolbox. The following Kit of Parts Toolbox is suggested for the selected study streets. It is based on a selection of common streetscape elements which are Historic, Transitional or Contemporary in character. Recommendations for the use and location of distinctive elements, along with possible urban design themes are also indicated (See Figure 5.5.2 to 5.5.3).

Figure 5.5.2 – Kit of Parts – Common Elements

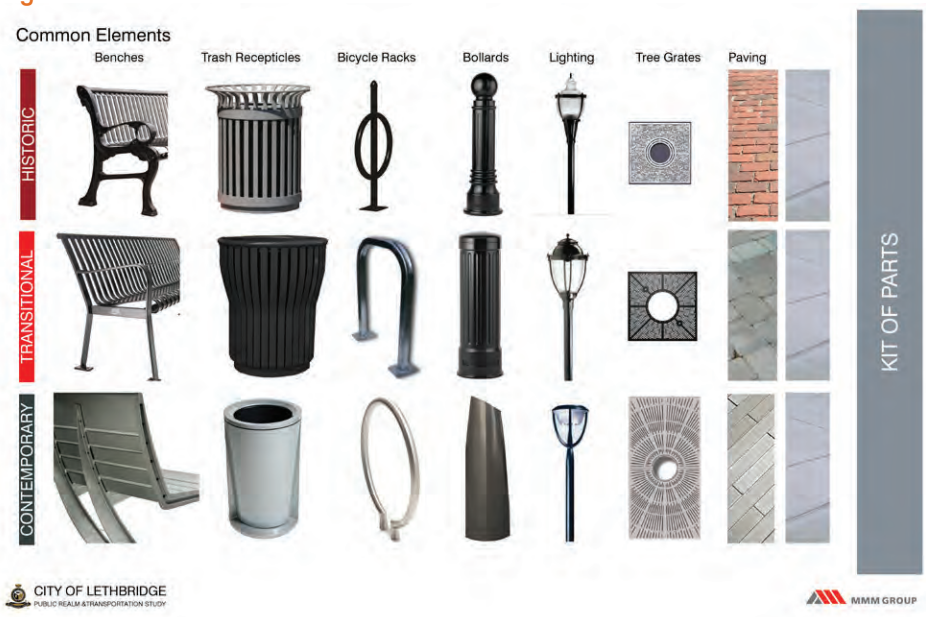
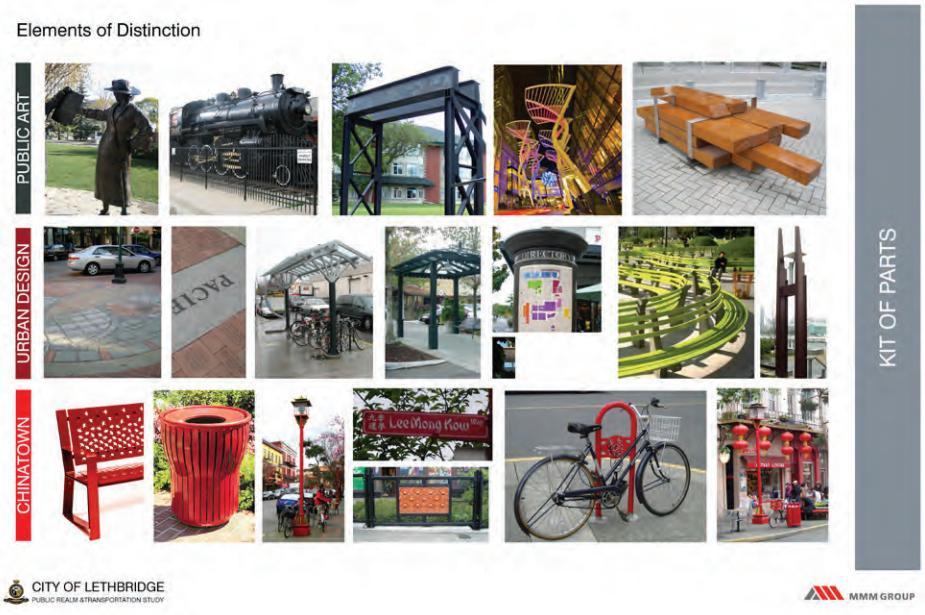


Figure 5.5.3 – Kit of Parts – Elements of Distinction



5.6 PUBLIC ART AND URBAN DESIGN

"Public Art provides an opportunity to celebrate and showcase local arts and culture' establish a unique identity for a District or development; and, can contribute to enhancing the quality of the public realm"

~ excerpt from the Heart of Our City Master Plan's Public Realm Framework

The City of Lethbridge has an active Arts and Cultural community. The celebration of this community is evident in the numerous public art installations throughout the City, especially within the Downtown. From the charrette and integrated design process between stakeholders, the design team, and its public art consultant, a number of potential Public Art opportunities, themes and locations were identified. These include the following:

"The Trees" on Stephen Avenue, Downtown Calgary – Public Art Used to Mitigate Wind Effects

5 STREET S AND 4 AVENUE S (NORTHWEST CORNER)

A Primarily Sculpture might be located at this important intersection emphasising wind as a unique climate condition to the City of Lethbridge. Formal Requests for Proposals (RFP's) might be directed to designers, artists and engineers to propose structures or machines which would have entertainment and teaching value. It may be interactive in a way which would be an attraction to all ages and relate directly to wind conditions at this specific site.

Public art on 6 Street South, Downtown Lethbridge – Used to Celebrate Wind Effects

Currently the City has a number of public art pieces that incorporate wind as a theme. Part of the coordinated approach between the City and Public Art Committee, for a primary sculpture piece such as this, will be to consider structural soundness and regular maintenance as part of the design and fabrication process.

One option is that the public art piece would be kinetic in design; in the way that the mechanism of the structure reveals the physical nature of its operating system and its dependence on wind as the source of its power. There are numerous examples of wind driven public art installations, such as wind driven mechanical instruments (wind harps), Sculptural mobiles, and weather vanes.

"A Departure", Ilan Sandler, 2009 – Public Art Piece at Galt Museum

Another option would be to mitigate the extreme wind conditions evident at this corner and increase pedestrian comfort. This option could take the shape of an aesthetically expressive form, and would require engineering input in response to understanding wind flows and forces, as well as for

the structural design of such an object. The public art installation at Bankers Hall, along Calgary's Stephen Avenue Mall, is one such example of a wind migration structure.

5 STREET S AND 2 AVENUE S (GALT GARDENS PLAZA ENTRY)

This potential public art location, which was also identified in the HOCMP, could take the form of a vertical marker and gateway feature into Galt Gardens. The gateway option could replicate the 3 Avenue S brick colonnade gateway, or could be a new contemporary interpretation taking its cue from the SAAG. It could have a specific urban design function over and above any aesthetic requirement. Its purpose in design would be to help strengthen the physical connection of the park to the Downtown.

Seen as an axial arrangement of vertical elements based on the 2 Avenue S roadway alignment, with a strong visual terminus inside the park, it could offer an outstanding visual landmark identifying Galt Gardens as a key destination along 2 Avenue S and its immediate vicinity.

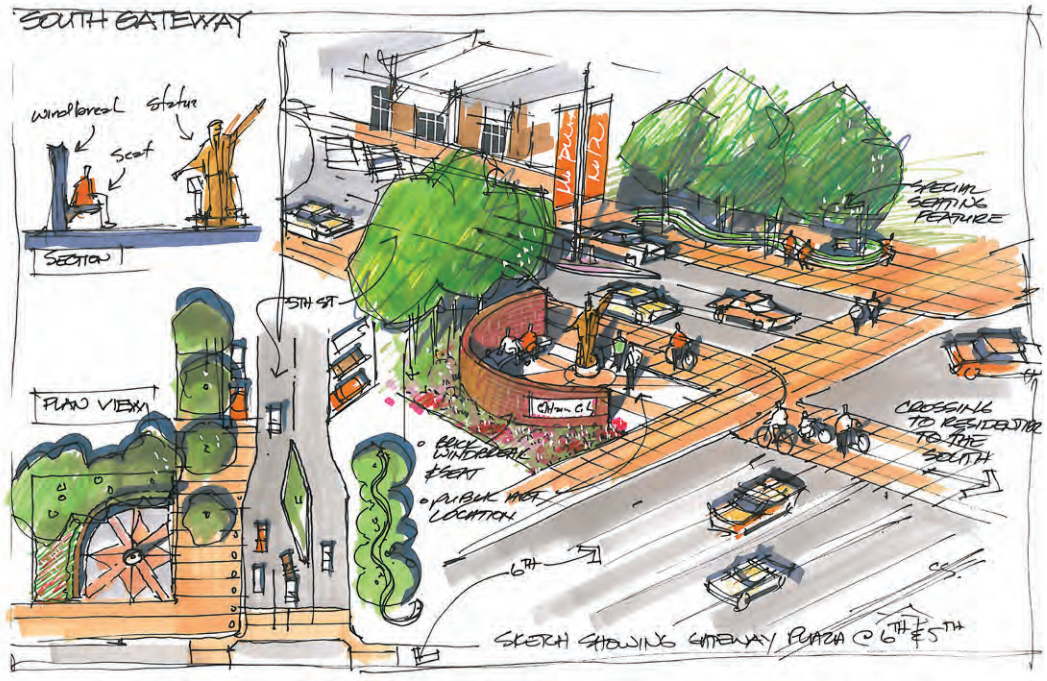
Potential themes for this particular location should avoid the obvious, such as a clock tower which already exists nearby at Park Place Mall. One potential opportunity identified during the charrette is that of an observation tower.

5 STREET S AND 6 AVENUE S (NORTHWEST CORNER)

The corner of 5 Street and 6 Avenue South was the historic location of Lethbridge's first hospital and until most recently it's Downtown Fire Station. Since the completion of a new Downtown Fire Station on the corner of Scenic Drive and 4 Avenue South, the City of Lethbridge, in preparation for selling the land, has parceled off and retained a corner of the property for sidewalk widening and a small pocket park.

Retaining this strategic corner of 5 Street and 6 Avenue South has created the potential to use public art to serve as a gateway into the Downtown and marking 5 Street's transition from commercial and retail into the London Road neighbourhood (See Figure 5.6.1).

Figure 5.6.1 – 5 Street S – South Gateway Pocket Park with Public Art Sculpture



Owing to the close proximity to a residential area, a public art installation is envisioned as a figurative representation in stone or bronze, approximately 150 percent human scale, and set on a raised base within a plaza pocket park. Potential themes for this location include a personage (or a commemorative representation of a specific group) who has contributed to the development of the city and the region. Other potential themes of commemorative representations include mining history and railway history to name but a few. Examples of personages of significance to the City and Region include Sir Alexander Galt, Chief Crowfoot, and Charles Magrath (Lethbridge's first Mayor).

"The Famous Five" – by Barbra Paterson – Example of Figurative Sculpture

These themes are examples upon which the City, in conultation with the Public Art Committee, can refine or further build upon at a detailed design stage.

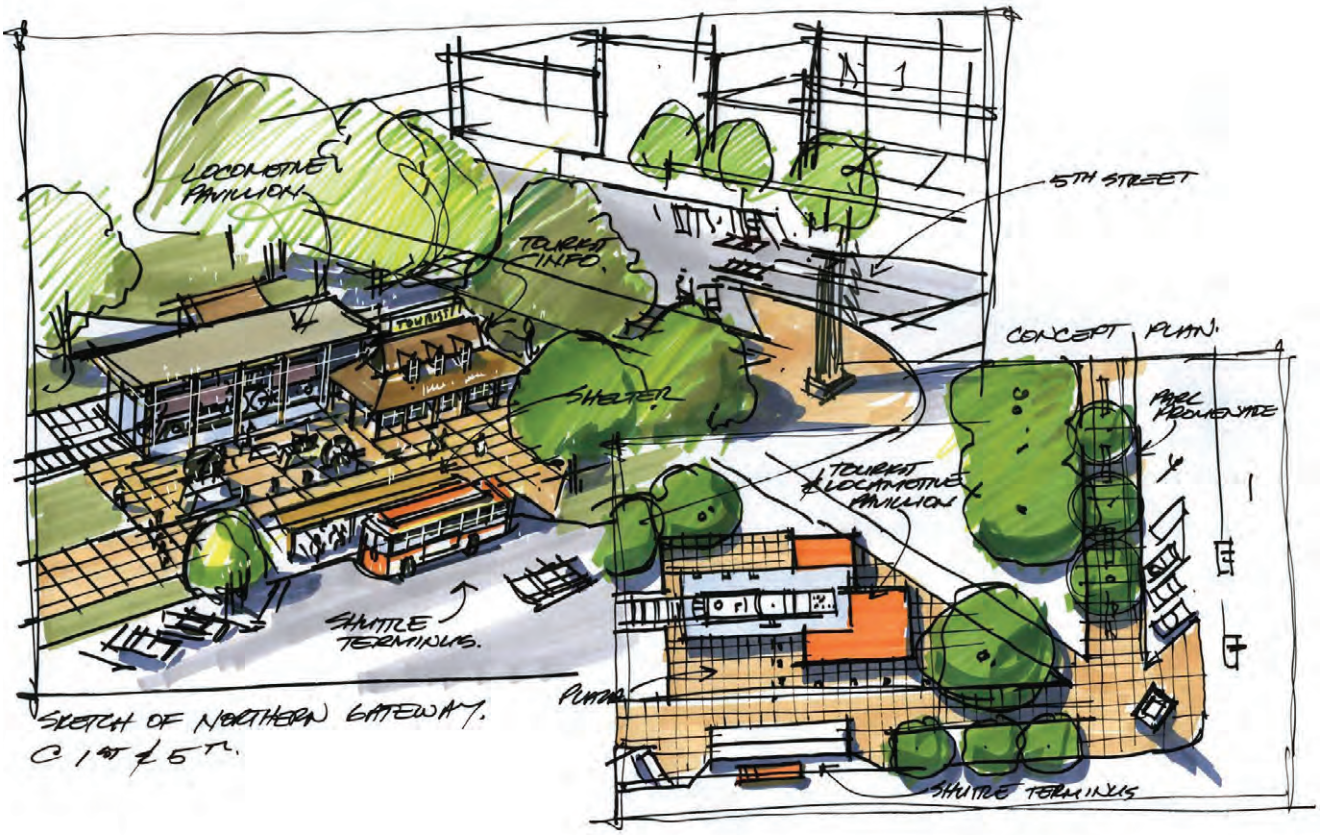
RELOCATION OF STEAM LOCOMOTIVE TO GALT GARDENS

One public art opportunity that was identified during the charrette and garnered much support, is the relocation of the City's historic steam locomotive (#3651) from its present location behind the old train station (City of Lethbridge's Health Unit) on 1 Avenue, to a more prominent location at the northwest corner of Galt Gardens (Figure 5.6.2). This would effectively increase its visibility and create a strong 'attraction factor' for Galt Gardens' north end. The relocation would offer increased tourism incentive and underline the historical and technological changes that have occurred in the Downtown over the past century.

Steam Engine #3651 in Downtown Lethbridge

Ideally, the new location, and pavilion structure required to house the locomotive to protect it from vandalism, would also support a new Downtown shuttle terminal and relocated tourism office. The current tourism office, located on 1 Avenue S west of Scenic Drive S, though scenically situated overlooking the Brewery Hill Gardens, is not highly visible or central to other tourism activities within the Downtown such as the Galt Museum and the SAAG. Relocating the tourism office to Galt Gardens would dramatically increase the tourism office's visibility and accessibility to potential visitors.

Figure 5.6.2 – 5 Street S – North Gateway Downtown Shuttle and Tourism Office



A new Downtown shuttle terminus should be located in one of the most convenient locations, in terms of visibility and accessibility, and would help to promote alternative modes of transportation within the Downtown. An important objective identified in the HOCMP was to strengthen physical connections between Park Place Mall, former location of railway round house, and the Downtown core to increase the economic potential and sustainability of the Downtown.

The shuttle service would provide shoppers with convenient access to potentially free public shuttle service within the Downtown core and would function much like the historic trollies that once looped through the Downtown. There is a historic precedent for re-establishing this shuttle service: 5 Street S was originally named Round Street because of the trollies that rounded 1 Avenue S onto 5 Street S.

As previously mentioned, the City of Lethbridge has an active arts and culture community. It is recommended that the City, in a coordinated effort with the Public Art Committee, establish priorities, budgets and identify funding opportunities to facilitate and implement many of the public art ideas identified.

5.7 PUBLIC OPEN HOUSE AND PUBLIC FEEDBACK

An Open House was held on June 16th, 2011 to present, to the stakeholder groups, ideas that were generated during the charrette exercise as well as the next steps in moving forward. The exit survey provided to all in attendance elicited feedback and comments. Copies of the Open House presentation and exit survey were provided to the City for distribution and are also included in Technical Reports Appendix D.

The following is a summary of what respondents were "highly" satisfied with in the design approach (see Figure 5.7.1):

- Overall the feedback has been positive, with 100% of respondents agreeing that a balance between on-street parking and wider sidewalks was needed.
- 60% satisfied with the design approach as presented; 40% mostly satisfied with the design approach.
- Improved infrastructure to support cycling within the Downtown was positively received.
- 5 Street S was reconfirmed as a priority street.
- The focus of implementing public realm improvements in a concentrated (historic) area of the Downtown.
- Encouraging diversity of treatment in the public realm to celebrate the ethnic diversity of the City (through different cultural street festivals and redevelopment of Chinatown), and encouraging more outdoor uses such as street cafes, etc.

The following is a summary of what respondents were "mostly" satisfied with in the design approach:

- on-street parking raised to the sidewalk level
- provision of wind mitigating site features (wind baffles)
- shared pedestrian and biking lanes, with the focus on recreational biking over commuter cycling
- winter maintenance

Generally there was support for the reduction of travel lanes, with 80% in favour and 20% not in favour (see Figure 5.7.2). From the comments received, the greatest concern was the lane reduction on 3 Avenue, between Stafford Drive and Scenic Drive, as it is a main collector street, and connector through the Downtown, connecting to Mayor Magrath Drive.

A summary of opinions and comments received, as well as a sample of the exit survey is provided in Appendix D.

Figure 5.7.1 – Concept Plan Design Approach Satisfaction

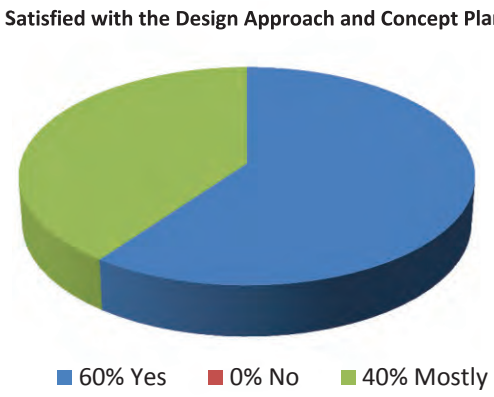
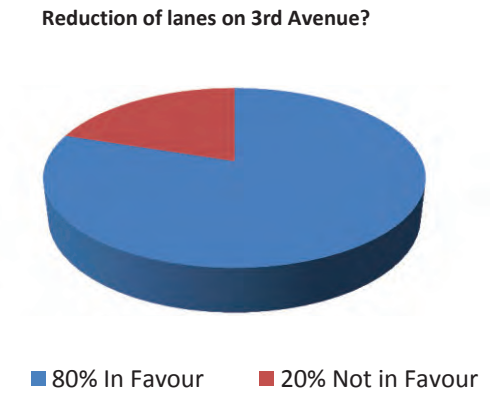


Figure 5.7.2 – Preference of 3 Avenue S Lane Reduction



5.8 SUSTAINABILITY AND HIGH PERFORMANCE STREETSCAPE DESIGN

"Lethbridge balances the cultural, social, economic, built, and natural environment dimensions of sustainability; together we are building a City that is a community – a legacy we are proud to pass on to future generations."

~ City of Lethbridge 'Plan Your City Vision' document (2009)

Completed in 2010, Lethbridge's Integrated Community Sustainability Plan / Municipal Development Plan (ICSP/MDP) will guide future City policy regarding land use, transportation and infrastructure investment decisions. It is meant to encourage and promote long-term sustainability and conservation of resources for future generations. There are 'six dimensions' of sustainability identified and explained in the document:

- Economic
- Social Needs
- Cultural
- Built Environment
- Natural Environment
- Governance

These six dimensions of sustainability are inherently interconnected, and while not all may directly be applicable to the enhancement of Lethbridge's Downtown public realm, some can be directly incorporated through 'best practices' and 'green initiatives', which in turn can support the larger objectives of the ICSP/MDP. For example; an enhanced public realm may lead to increased Downtown populations, in turn creating a more compact and walkable City, and by extension improved social and economic conditions and reduced dependency on natural resources.

The following are examples of potential 'best practices' and 'green initiatives' which could be used to further enhance and support the public realm recommendations already identified:

PUBLIC TRANSIT NETWORK

Lethbridge's Downtown core and the study area in particular, is well-serviced by public transportation, with the following existing transit infrastructure:

- main Downtown 'Transit Hub' located on 4 Avenue S, one block East of 5 Street S
- transit stop and shelter located directly on 3 Avenue S at 7 Street S
- two (2) transit stops located within half a block of 2 Avenue S, on 3 Street S and Scenic Drive S

In addition, the following transit improvements are proposed for the study area:

- Development of a 'Downtown Shuttle' near the proposed relocated tourism centre - adjacent to Galt Gardens at the corner of 5 Street S and 1 Avenue S It is anticipated that the Shuttle would operate on a looping system, allowing users to get on and off at several locations throughout the Downtown.

» Build upon the Galt Museum walking tours, either walking or shuttle based, to develop additional new tours that within the Downtown core. This will help to increase public awareness and education of Lethbridge's historical and cultural importance in Southern Alberta, while increasing employment and outside economic stimulus to the Downtown area.

ACTIVE MODES OF TRANSPORTATION

Active transportation refers to any form of human-powered transportation, such as walking, running, cycling, in-line skating, skateboarding and non-motorized wheelchairs. By incorporating pedestrian-friendly infrastructure Downtown for all ages and abilities, and encouraging active living, there are numerous benefits for Lethbridge's citizens:

» Health: Provides residents and visitors with opportunities to be physically active on a regular basis.

» Social: Increases accessibility to public spaces and provides more opportunities for social interactions.

» Transportation: Reduces road congestion by diverting number of single-occupant vehicle trips.

» Environmental: Contributes to reductions in greenhouse gas emissions and associated pollution.

» Economic: Both direct and indirect benefits of reducing dependence on motorized transportation, for municipalities, businesses and individual citizens.

Encourage Use of Public Transportation and Cycling in the Downtown Core

The following strategies are proposed to accommodate and encourage various forms of active transportation in Lethbridge's Downtown core:

» 2.5m - 3.5 meter wide 'pedestrian clear zones' on both sides of 2 Avenue S and 3 Avenue S.

» 2.0m - 2.5 meter wide 'pedestrian clear zones' on both sides of 5 Street S.

» 2.4m wide 'multi-modal' zone on one side of 5 Street S, dedicated to accommodating recreational cyclists, runners, children in strollers, etc.

» Re-designate 3 Avenue south and make 2 Avenue South the principal bike route into the Downtown from the east. The lower traffic volumes and direct connection into Galt Gardens from 2 Avenue South will greatly reduce cyclist and vehicle conflicts.

- Although not a selected study street, another street towrds the south, such a 5 Avenue S, may be considered as a principal bike route into the Downtown.

» Scrambled and raised intersections at multiple locations would give pedestrians priority in the public realm and contribute to traffic calming initiatives.

» Multiple locations for secure bicycle parking and seating would allow users with limited mobility to rest, increasing stamina and range.

» Bicycle storage and changing rooms with showers could be implemented at Galt Gardens, as this is a destination in the overall City park network and would provide an ideal staging area for commuting cyclists to walk or take the bus/ shuttle to their final destination.

» As changing rooms and showers are seen as key amenities in promoting communter cycling - the City should look for opportunities to parnter with the private sector to provide the kinds of facilities and amenities needed, especially in areas of the Downtown whcih have high concentrations of workers.

» There is potential to connect to the Coal Banks Trail, a 30 kilometer, uninterrupted pathway along the Oldman River Valley, linking facilities and parks throughout the City.

URBAN FOREST

Urban trees can significantly contribute to the beauty of a City and its Downtown core. Increasing the quantity, density, and diversity of urban trees in Lethbridge's Downtown public realm will have multiple and significant benefits, including:

» reducing urban heat-island-effect by increasing shade and minimizing sun in hard surface areas, cooling the pavement on hot summer days and reducing energy required to cool buildings in summer

» contributing to the minimization of wind, noise, and pollution

» increasing habitat for small mammals, birds and insects

» reducing and treating stormwater run-off via water uptake and evapotranspiration.

» incorporating seasonal variety in the short and long term (eg: changing colour of leaves, winter vs. summer appearance, etc.)

» generally contributing to increased property values

Trees living in urban environments face particular urban stresses that are not typically found in their native environments. Urban trees reach maximum potential for environmental benefits after age 30, but the average life-span of a Downtown urban tree is less than 10 years. Compacted and poor soils, city streets, driveways, underground utility services, a shortage of water and nutrients, and increased road salt and other pollutants are all common in urban areas. These impacts can constrain tree roots and negatively influence the growth and overall health of urban trees, or even kill them. In addition, the frequent Chinook winds in Lethbridge during the winter and the associated rapid temperature fluctuations are often detrimental to tree health.

Street Trees Contribute to Beauty and Benefit an Urban Environment

For these reasons, it is essential that urban trees are given every opportunity to not only survive, but thrive in the urban landscape. Fortunately, urban forestry is a rapidly developing field and there are many innovative strategies currently being practiced that can contribute to the long-term probability of successful establishment:

» Specify tree species that are suitable for the proposed climate and growing conditions. Where possible, use plants native to the area or adaptive trees that have been raised in local growing conditions.

» Provide diversity of tree species to protect against the spread of disease and pests that can devastate monoculture plantings (eg: Dutch Elm disease).

» Specific tree species should be coordinated with the City's Urban Forestry Plan.

» Maximize soil volumes and increase the area available for root growth, which improves access to required air, moisture, and nutrients. Design strategies include planting trees in groups rather than isolated pits, and providing trenches or continuous soil zones so that roots from different trees can share soil and nutrients.

» Use structural soil or modular subsurface systems (break-outs), particularly in areas constrained or surrounded by impervious surfaces, to increase the amount of available soil and associated nutrients while maintaining the structural integrity of the base materials required for hardscape surfaces such as roads and sidewalks.

» Provide root barrier adjacent to sidewalks, utilities and other vulnerable infrastructure, which direct roots downward and reduce expensive and complicated future conflicts and potential tree removal.

» Provide supplemental water during establishment period and sustained drought events.

STORMWATER MANAGEMENT

The conventional approach to stormwater management in the past has been to remove rainfall from urban areas as quickly as possible. Today, knowledge about the environmental impact of overloading streams and rivers during storm events has prompted a more proactive, integrated planning approach to urban stormwater management. Strategies such as 'low-impact development' implement small-scale hydrologic controls to replicate the pre-development hydrologic characteristics of watersheds through infiltrating, filtering, storing, evaporating, and detaining surface run-off at its source. This approach has the potential to provide the following benefits for urban areas:

» Minimize damage from pollution to water sources and aquatic ecosystems, particularly 'first-flush' pollutants.

» Reduce flooding incidents and severity due to 'slowing' of stormwater during storm events.

» Reduce impacts and loads on existing stormwater infrastructure, potentially extending the service life through increased capacity and ultimately reducing the life-cycle costs.

» Reduce the use of potable water sources through re-use of rainwater for irrigation purposes.

A good understanding of the overall watershed management strategy and associated stormwater management regulations and/or guidelines of a particular region or municipality is essential when developing a stormwater design. There are several strategies that should be evaluated by the City of Lethbridge based on the Downtown's specific site conditions, constraints, and available budget at the time of construction:

» landscape areas that are capable of high rates of stormwater absorption, infiltration, and treatment, such as vegetated filter and buffer strips, bioretention swales, rain gardens etc.

» permeable paving options such as Aquapave, permeable asphalt, or permeable concrete

» infiltration structures such as perforated pipe, dry wells, and rock pits

» sub-surface storage and retention/ detention infrastructure to temporarily attenuate and store runoff during peak storm events

» water quality inlets such as oil and grit separators, media filters, etc

Bio-infiltration Swales and Rain Gardens Help Retain Stormwater and Reduce Infrastructure Costs

IRRIGATION

Located in a semi-arid climate with low precipitation (only 355mm (14") annually on average) and high occurrence of winds causing evapotranspiration (over 115 days with winds of at least 40km/h), the conservation and efficient use of water sources in Lethbridge is essential in maintaining the long-term sustainability of the region. To that end, there are several strategies that can be employed in the design and construction of irrigation and watering of trees, shrubs, and perennials within the Downtown core:

» Planting native and/or regionally appropriate, adaptive plant species that are drought tolerant (commonly referred to as 'xeriscaping'). Not only will this reduce water consumption, but the plants will require less fertilizer and pesticides, and less maintenance overall.

» Use of an automatic timed irrigation system. The City is currently employing a hand-watering program, and although the initial one-time costs of an irrigation system are more expensive, hand-watering is less efficient, uses significantly more water, and costs far more in the long-term when considering the life-cycle costs of operating water trucks and the associated labour.

» Sub-surface 'drip manifold' irrigation systems are far more efficient than the use of 'spray-style' heads and can dramatically reduce water consumption by directly watering the tree root system; reducing wasted water from over spraying on hard surfaces and evaporation.

» Weather stations connected to automatic irrigation timers that measure rainfall, wind speed, temperature and evapotranspiration rates are designed to water planting areas only when required.

» Non-potable irrigation opportunities, such as the capture and re-use of stormwater from streets, sidewalks, and roofs, the use of grey water from nearby buildings, or the use of treated effluent water (T.E.W.) are becoming increasingly common throughout North America and should be seriously considered as an alternative to the use of potable water for irrigation, particularly for new construction projects.

MINIMIZING URBAN FOOTPRINT

There are a host of ways to minimize the overall urban footprint of a City or a particular project. It is essential that the design and construction team is dedicated to pushing the boundaries of conventional development and construction, and exploring the use of sustainable technologies that represent the 'smart choice' from a long-term sustainability perspective:

» adaptive re-use of existing structures and materials, including re-use and refurbishment

» environmentally preferable materials, such as sustainably harvested / certified woods, recycled materials, locally manufactured or extracted materials, low embodied energy, etc.

» embracing energy conservation and adopting renewable energy technologies (eg: use of LED or Solar light fixtures and other infrastructure where appropriate)

» high-albedo paving (light-coloured and reflective) to reduce heat-island effect of hard surfaces

» waste management / recycling strategy (eg: Big Belly Solar trash compactors and recycling stations)

» efficient and selective use of full cut-off lighting in the public realm to adhere to 'Dark Sky' principles to reduce light pollution

CLOSURE

In common with most cities and regions, the City of Lethbridge has a unique climate, history, and set of circumstances that have guided its current form and character. The proposed streetscape features outlined above are considered to represent current 'best practices' in sustainable infrastructure; however their appropriateness for implementation in particular situations should be evaluated carefully. While it may be tempting to use the outlined features as a 'shopping list' of the most current sustainable technologies, it is the philosophy and principles incorporated throughout the design process that are the most important factor in contributing to the implementation of social, economic, and environmental sustainability in the built environment.

PRELIMINARY DESIGNS

6.1 ROADWAY PRELIMINARY DESIGN

Preliminary roadway designs were developed from the ideas developed through the public consultation process Roadway engineering drawings were prepared by applying the various Transportation Association of Canada (TAC) roadway standards to ensure proposed designs met with the minimum functional and safety standards.

These engineering drawings established the basic roadway structure over which the various public realm enhancements and streetscape elements are applied. Each study street Preliminary Design consists of: a rendered Illustrative Plan, a Street Zone Plan, and a Streetscape Layout plan. Typical roadway cross-sections were also developed for each street.

The following outlines the refined defining characteristics for each of the selected study streets along with related preliminary designs which may be referred to as pilots for similar Downtown streets.

6.1.1 5 STREET S ROADWAY DESIGN

5 Street S is a major retail corridor in the Downtown. This street should be defined by its wide sidewalks to accommodate high levels of pedestrian activity. A wider sidewalk promenade is proposed along the edges of Galt Gardens, featuring a double row of street trees. There are two distinct characteristics defined by the intensity of historic structures along the street: more historic toward the core, transitioning from commercial and office to residential south of 6th Avenue. This change is proposed to be reflected in the character of supportive common site elements such as paving treatment, benches, trash receptacles, bollards, and lighting.

Gathering spaces within the public realm are provided at both ends, along with Public Art opportunities, to create strong gateways into the Downtown and provide opportunities for public interaction and understanding of Lethbridge's rich heritage.

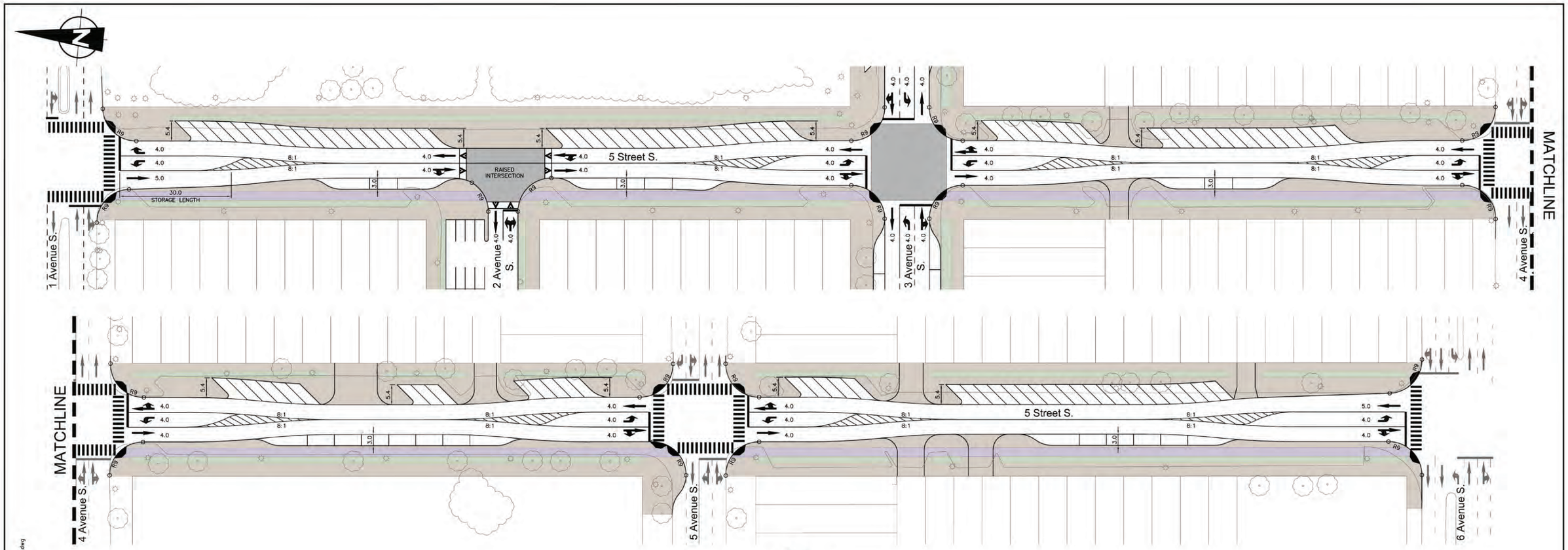
A multi-modal bike lane on the west side of 5 Street S would provide an improved connection for London Road residents to the Galt Gardens. This would also connect to the University of Lethbridge's Downtown building. A Downtown shuttle service hub is proposed at the corner of 1 Avenue S and 5 Street S, as identified in the HOCMP Streetscape Recommendations. Both the shuttle and multi-modal corridor will provide alternative methods for movement within the Downtown.

Characteristic features of 5 Street S include:

- two travel lanes, with a middle turning lane at each intersection
- rolled curb between travel lanes and parking,
- parking raised to sidewalk level, allowing flexibility of use for both pedestrian and vehicle use
- angled parking on the east side
- parallel parking on the west side
- a multi-modal corridor (recreational bike lane) is located on the west side
- street trees on both sides, spaced at +/- 15meters on-centre
- pedestrian lighting spaced at +/- 15meters on-centre
- a wide sidewalk on both sides that will accommodate both a Pedestrian Clearway and Frontage Zones along retail land uses
- a wide Promenade sidewalk on the east, adjacent to Galt Gardens between 1 and 3 Avenues S

(See pullout of 5 Street S Concept - Illustrative Plans and Sections)

Figure 6.1.1 – 5th Street South Concept Plans (A)



Plan
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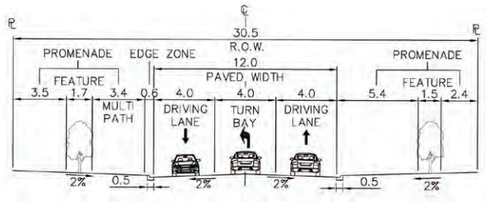
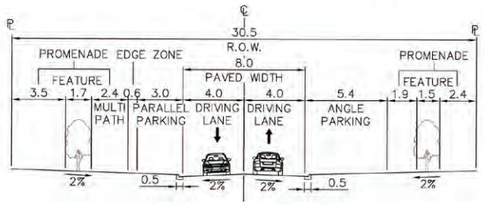
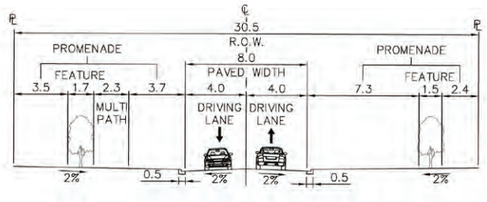


Typical Cross Section
5 Street S At Intersection
N.T.S.



Typical Cross Section
5 Street S With Parking
N.T.S.



Typical Cross Section
5 Street S Without Parking
N.T.S.

Legend:
- Proposed Promenade
- Tree and Feature Allowance
- Multi-Modal Pathway
- Tinted Concrete

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PATH: P:\MMM\5210038000 PROJS Lethbridge\T9200 – Preliminary Design Submissions\Drawings\Sketches\MMM-1050-R0-SSI-Charette-Concept.dwg
LAYOUT: MMM-1050-R0

CITY OF Lethbridge

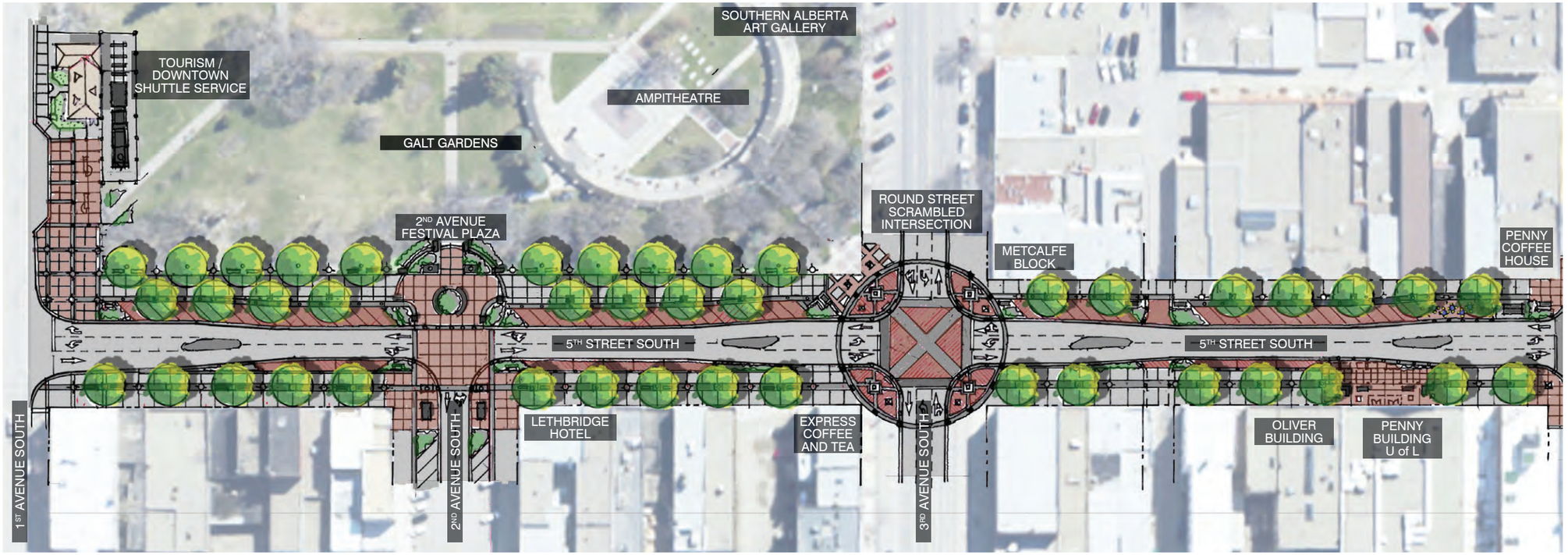
MMM GROUP

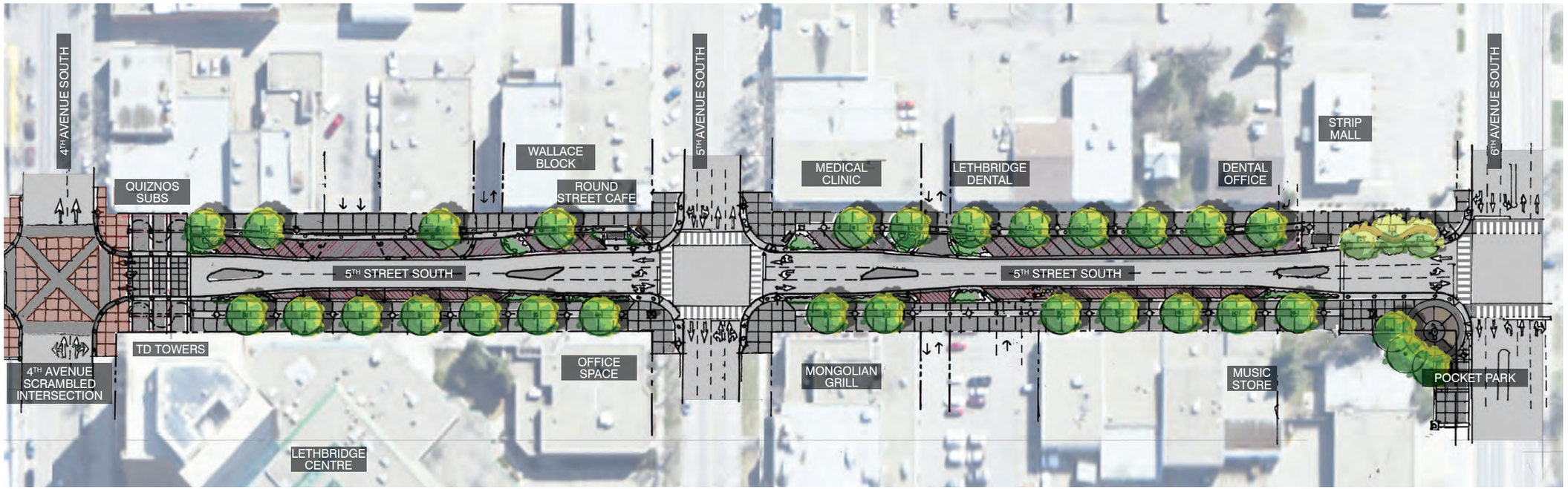
Public Realm & Transportation Study for Downtown Lethbridge

5 Street Concept Plan

MMM Ref. 5210038000
Drawing No. MMM-1050-R0
October 31, 2011

Figure 6.1.1 – 5th Street South Concept Plans (B)





5th STREET ILLUSTRATIVE PLAN

CITY OF LETHBRIDGE
PUBLIC REALM &TRANSPORTATION STUDY

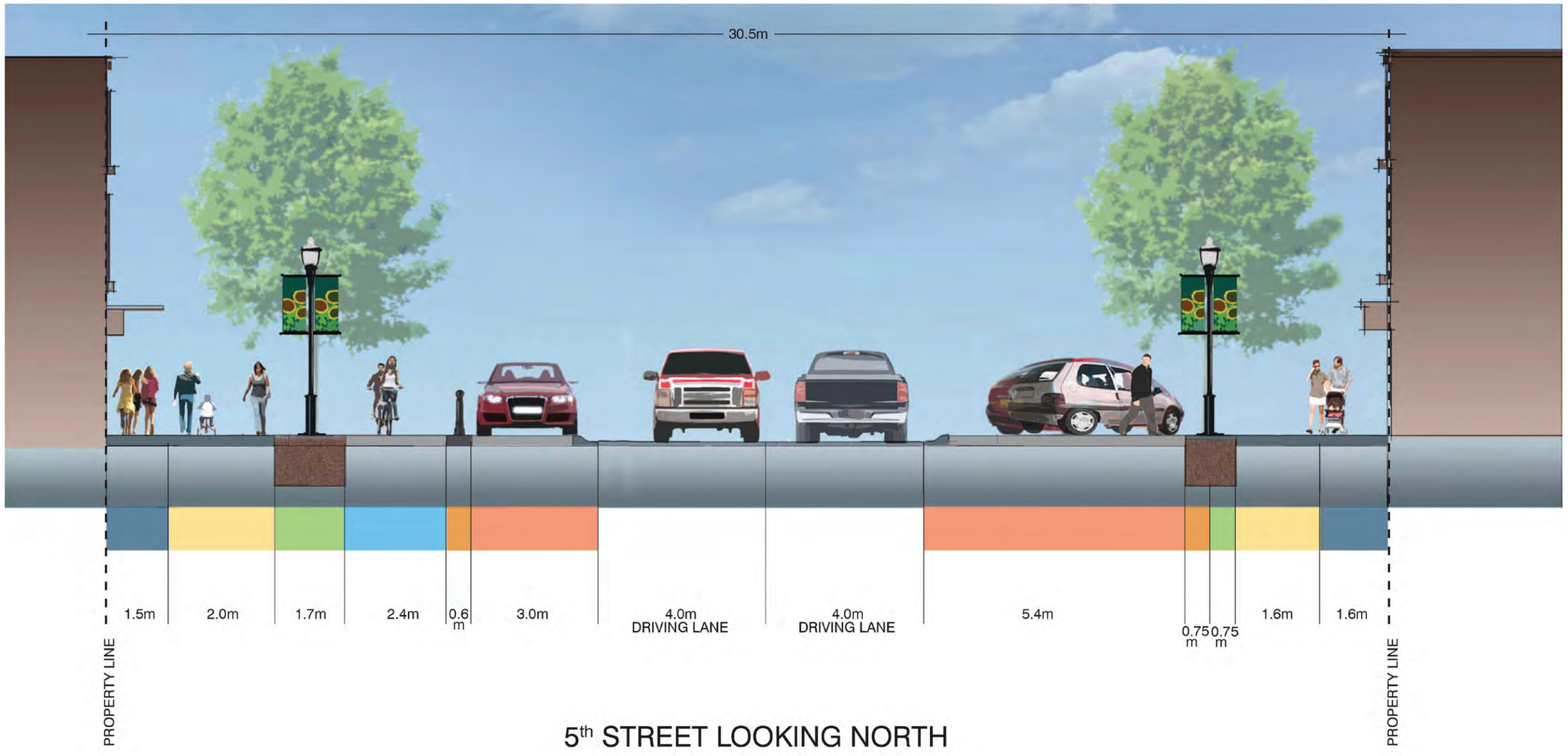
0 10 20 30 40 50

MMM GROUP

Figure 6.1.1 – 5th Street South Concept Plans (C)

PUBLIC REALM ZONE LEGEND:

- FRONTAGE ZONE
- SIDEWALK (PEDESTRIAN CLEARANCE ZONE)
- FURNITURE / PLANTING ZONE
- EDGE ZONE
- MULTI- MODEL ZONE
- ENHANCED PUBLIC REALM ZONE (FLEX PARKING/PATIO SPACE)



5th STREET LOOKING NORTH

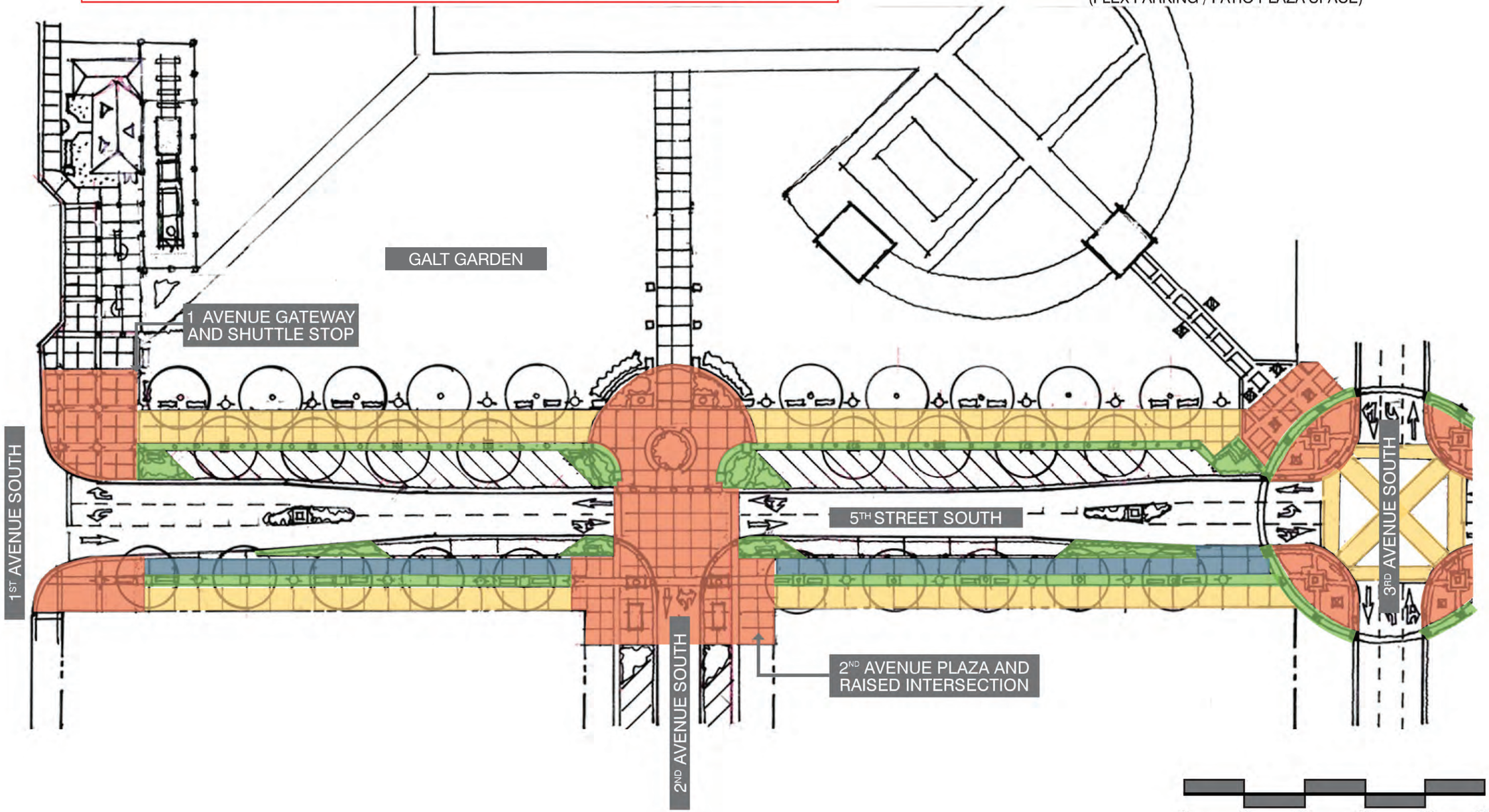
TYPICAL 5th STREET SECTION

Figure 6.1.1 – 5th Street South Concept Plans (D)

PARKING STALL TO BE CONSISTANT
DEPTH OF 5.4m PARALLEL TO CURB

PUBLIC REALM ZONE LEGEND:

- SIDEWALK (PEDESTRIAN CLEARANCE ZONE)
- FURNITURE / PLANTING ZONE
- MULTI-MODAL WAY
- ENHANCED PUBLIC REALM ZONE (FLEX PARKING / PATIO PLAZA SPACE)



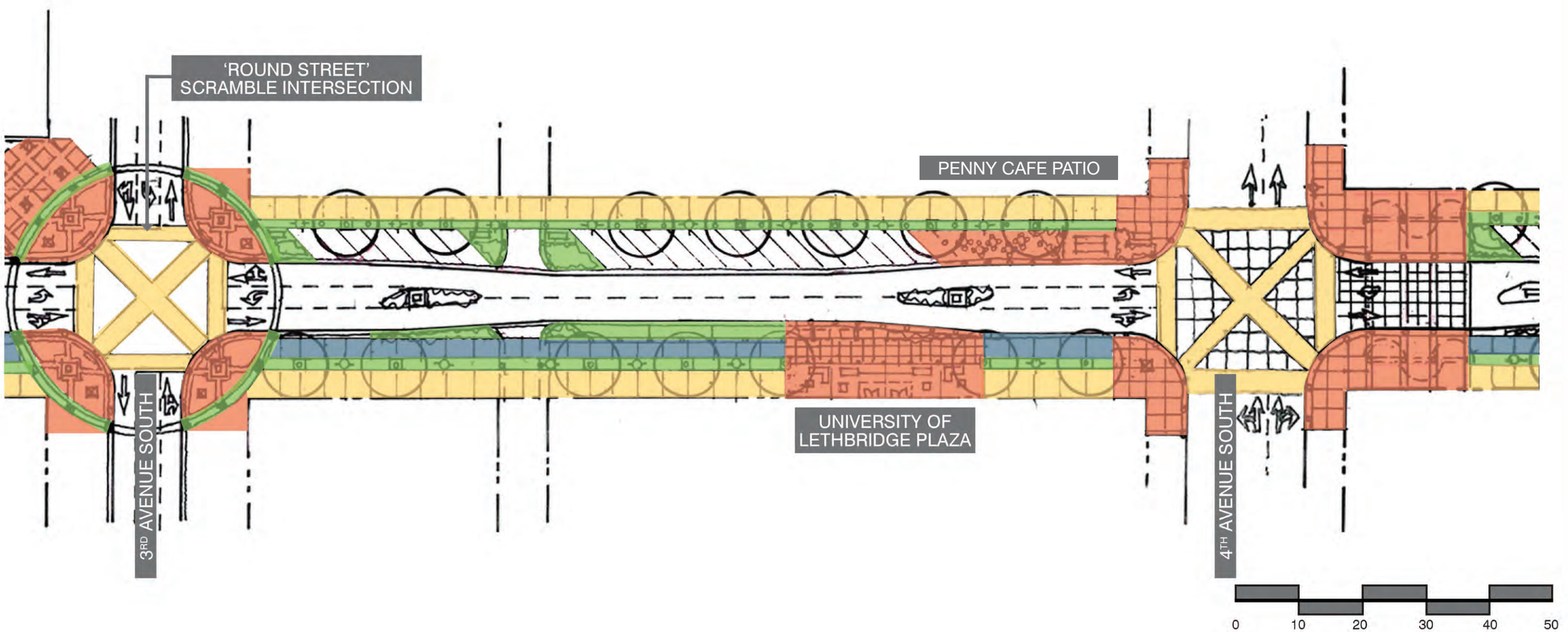
5th STREET HISTORIC PUBLIC REALM ZONE

Figure 6.1.1 – 5th Street South Concept Plans (E)

PARKING STALL TO BE CONSISTANT
DEPTH OF 5.4m PARALLEL TO CURB

PUBLIC REALM ZONE LEGEND:

- SIDEWALK (PEDESTRIAN CLEARANCE ZONE)
- FURNITURE / PLANTING ZONE
- MULTI-MODAL WAY
- ENHANCED PUBLIC REALM ZONE (FLEX PARKING / PATIO PLAZA SPACE)



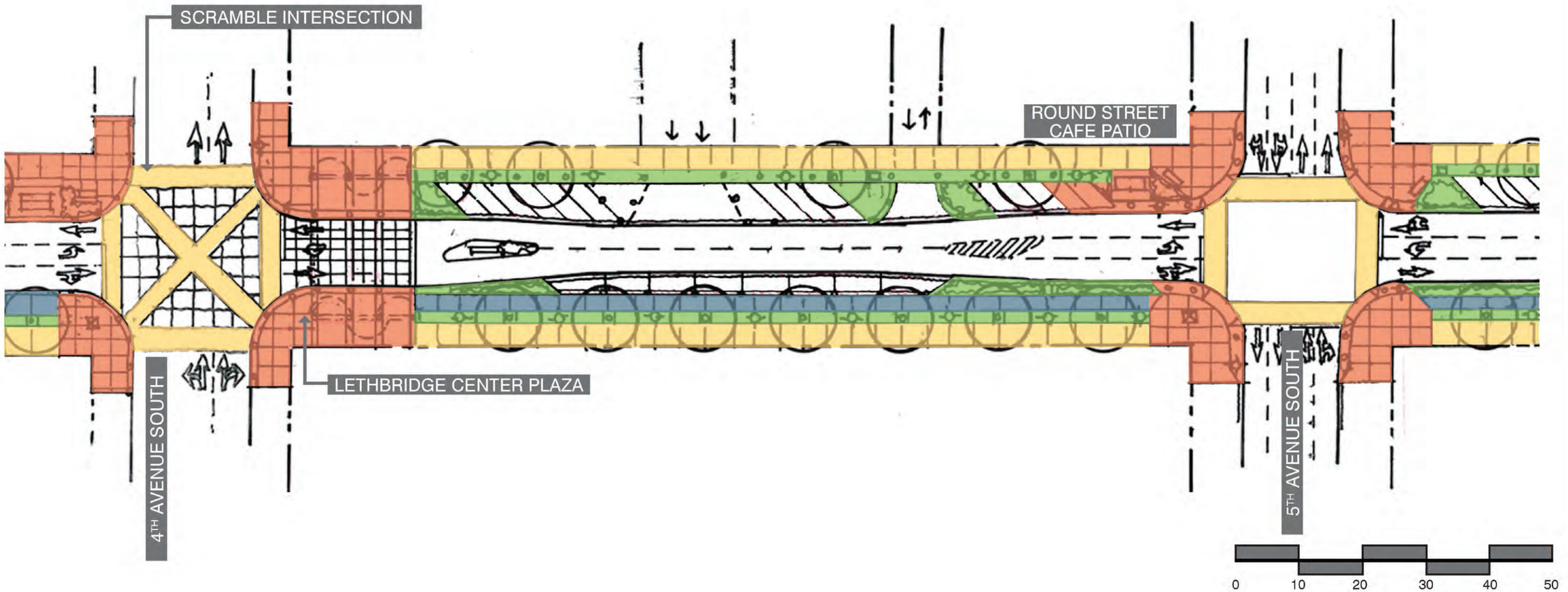
5th STREET HISTORIC PUBLIC REALM ZONE

Figure 6.1.1 – 5th Street South Concept Plans (F)

PARKING STALL TO BE CONSISTANT DEPTH OF 5.4m PARALLEL TO CURB

PUBLIC REALM ZONE LEGEND:

- SIDEWALK (PEDESTRIAN CLEARANCE ZONE)
- FURNITURE / PLANTING ZONE
- MULTI-MODAL WAY
- ENHANCED PUBLIC REALM ZONE (FLEX PARKING / PATIO PLAZA SPACE)



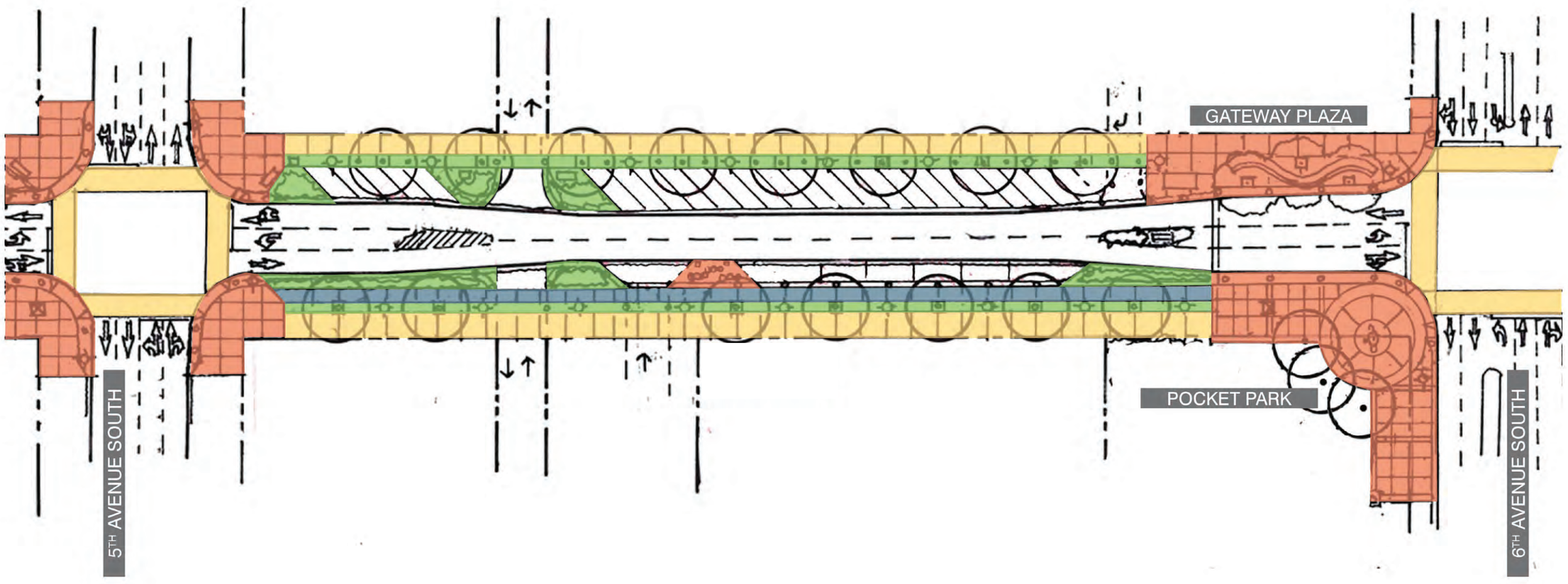
5th STREET CENTRAL COMMERCIAL PUBLIC REALM ZONE

Figure 6.1.1 – 5th Street South Concept Plans (G)

PARKING STALL TO BE CONSISTANT
DEPTH OF 5.4m PARALLEL TO CURB

PUBLIC REALM ZONE LEGEND:

- SIDEWALK (PEDESTRIAN CLEARANCE ZONE)
- FURNITURE / PLANTING ZONE
- MULTI-MODAL WAY
- ENHANCED PUBLIC REALM ZONE (FLEX PARKING / PATIO PLAZA SPACE)



5th STREET CENTRAL COMMERCIAL PUBLIC REALM ZONE

Figure 6.1.1 – 5th Street South Concept Plans (H)

SITE FURNITURE LAYOUT ADJUSTED FOR REVISED PARKING DEPTH

LEGEND:

SITE FURNITURE

- TREE GRATE AND STREET TREES
- LIGHT
- BOLLARD
- TRASH RECEPTACLE
- BENCH
- SHELTER / BIKE STORAGE
- WAYFINDING / TICKET DISPENSER

URBAN DESIGN

- GATEWAY ELEMENT
- PUBLIC ART OPPORTUNITY
- ELEMENT OF DISTINCTION

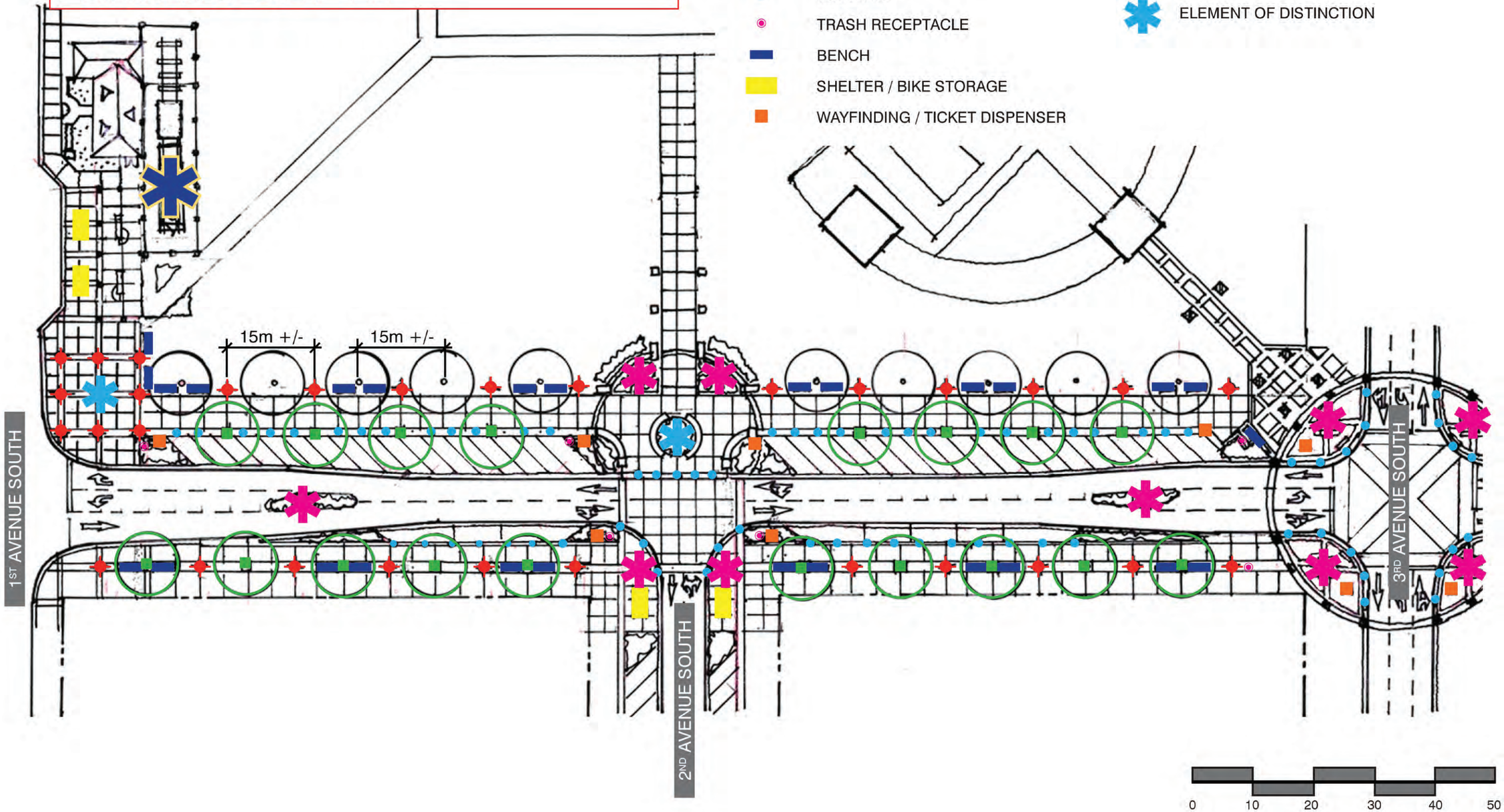


Figure 6.1.1 – 5th Street South Concept Plans (I)

SITE FURNITURE LAYOUT ADJUSTED FOR REVISED PARKING DEPTH

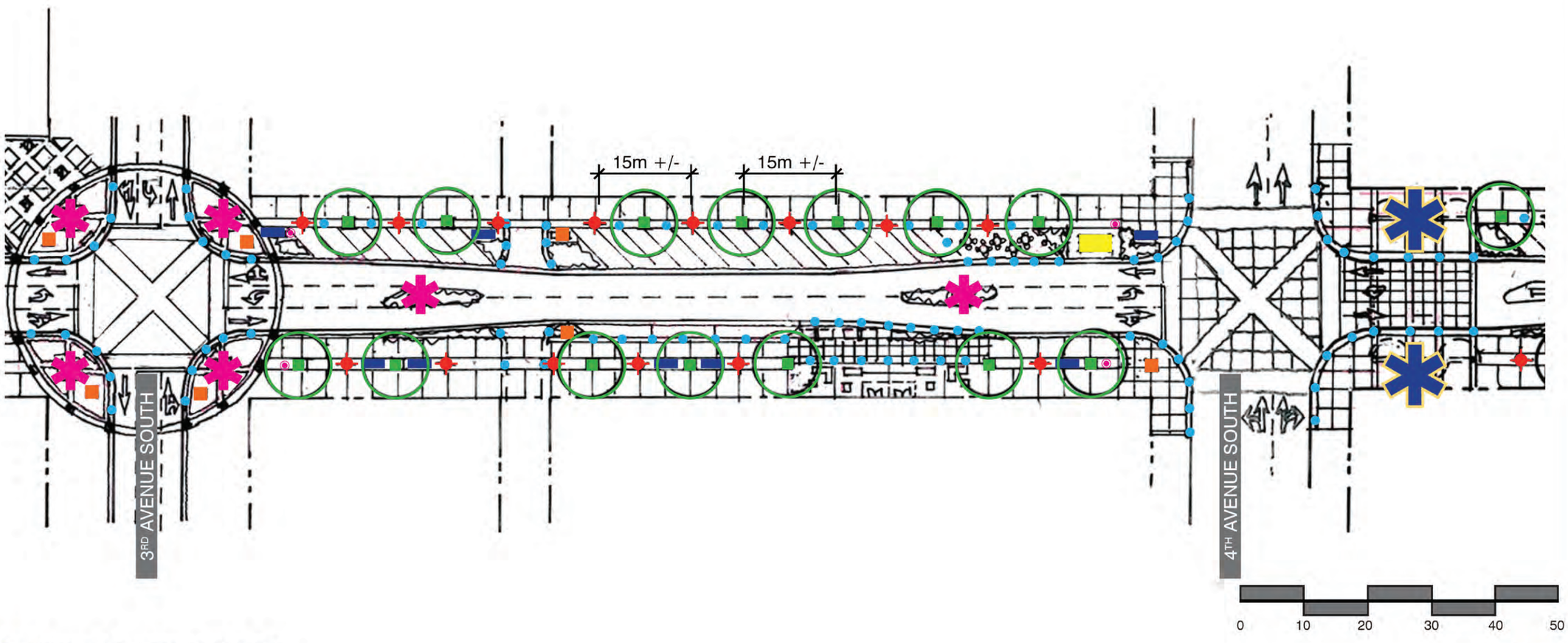
LEGEND:

SITE FURNITURE

- TREE GRATE AND STREET TREES
- LIGHT
- BOLLARD
- TRASH RECEPTACLE
- BENCH
- SHELTER / BIKE STORAGE
- WAYFINDING / TICKET DISPENSER

URBAN DESIGN

- GATEWAY ELEMENT
- PUBLIC ART OPPORTUNITY
- ELEMENT OF DISTINCTION



5th STREET LAYOUT

Figure 6.1.1 – 5th Street South Concept Plans (J)

SITE FURNITURE LAYOUT ADJUSTED FOR REVISED PARKING DEPTH

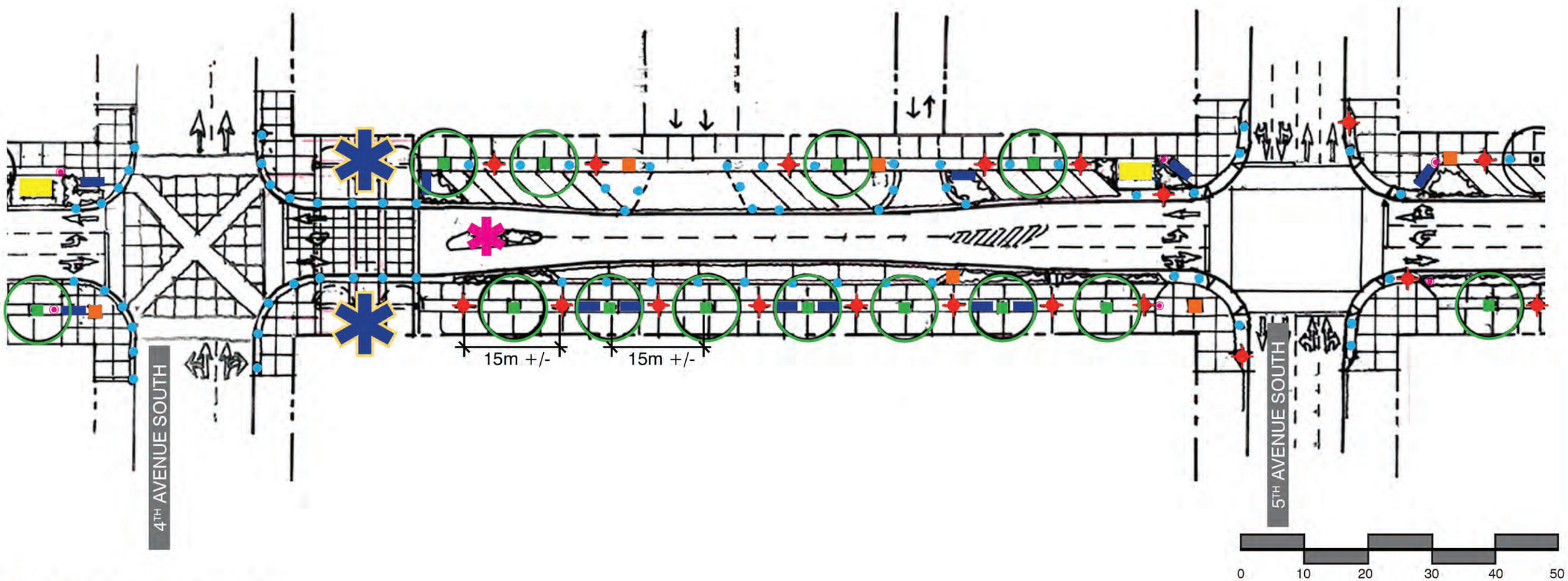
LEGEND:

SITE FURNITURE

- TREE GRATE AND STREET TREES
- LIGHT
- BOLLARD
- TRASH RECEPTACLE
- BENCH
- SHELTER / BIKE STORAGE
- WAYFINDING / TICKET DISPENSER

URBAN DESIGN

- GATEWAY ELEMENT
- PUBLIC ART OPPORTUNITY
- ELEMENT OF DISTINCTION



5th STREET LAYOUT

Figure 6.1.1 – 5th Street South Concept Plans (K)

SITE FURNITURE LAYOUT ADJUSTED FOR REVISED PARKING DEPTH

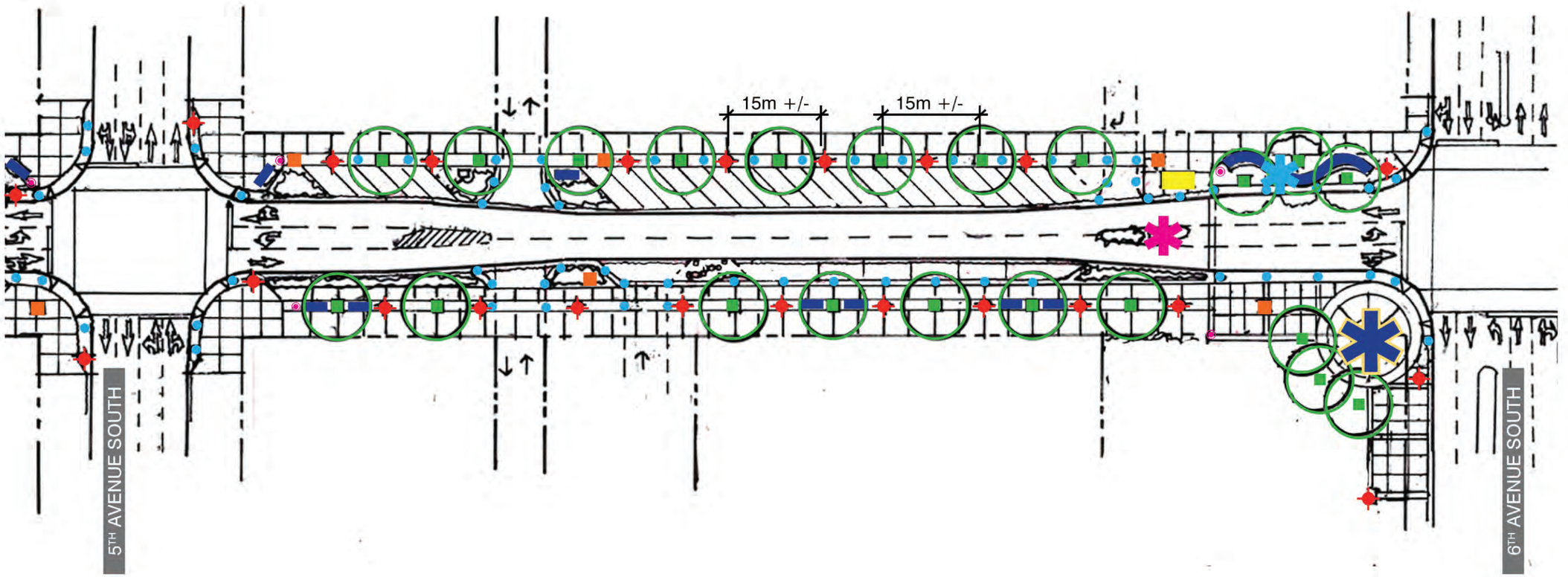
LEGEND:

SITE FURNITURE

- TREE GRATE AND STREET TREES
- LIGHT
- BOLLARD
- TRASH RECEPTACLE
- BENCH
- SHELTER / BIKE STORAGE
- WAYFINDING / TICKET DISPENSER

URBAN DESIGN

- GATEWAY ELEMENT
- PUBLIC ART OPPORTUNITY
- ELEMENT OF DISTINCTION



0 10 20 30 40 50

5th STREET LAYOUT

6.1.2 2 AVENUE S ROADWAY DESIGN

2 Avenue S will be a highly pedestrianized promenade 'green street' which continues the park character of Galt Gardens westward, through the use of a double row of street trees and wide sidewalks. In addition to the generous sidewalks, there will be numerous opportunities to expand adjacent land uses out into the multi-use parking areas for alternative use such as fesival activities.

It is anticipated that future development will include mixed-use residential and commercial development along 2 Avenue S, taking full advantage of the enhanced public realm and expanded sidewalks. Similar to 6 Street S, temporary closure of 2 Avenue S between 4 and 5 Streets S to accommodate a festival street that could be utilized for outdoor public markets and to create a distinct precinct within the Downtown.

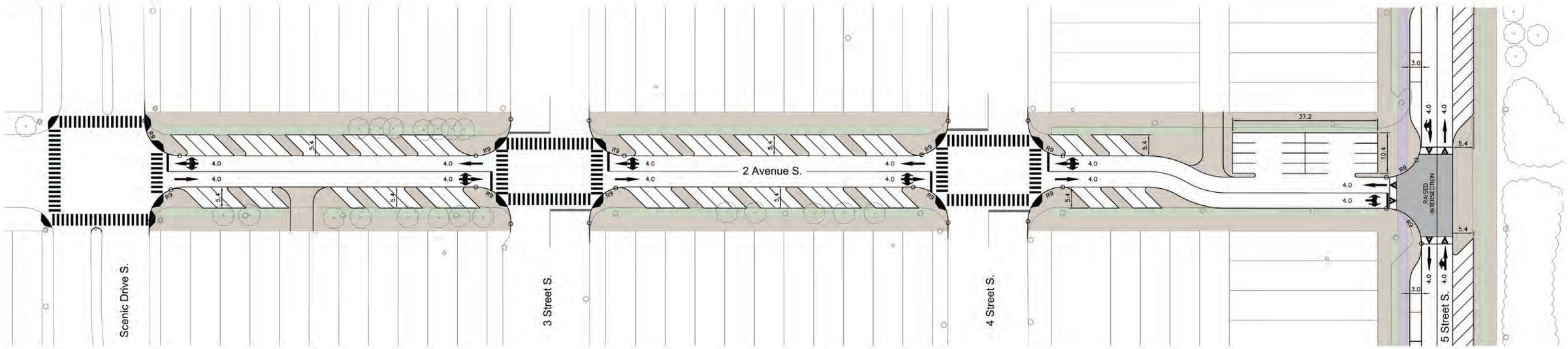
Between the blocks of 3 and 4 Streets S is the cultural Chinatown District. While the extent of Chinatown is relatively small, its significance to the development of Lethbridge is large. Most of the cultural identity of this area is best left to the renovation of existing heritage structures However, a distinction in site furnishing can greatly enhance the uniqueness of the block. It is proposed that all site furnishing (lights, benches, trash receptacles) be finished in a powder-coated red colour (symbolic of prosperity in Chinese culture).

Characteristic features of 2 Avenue S include:

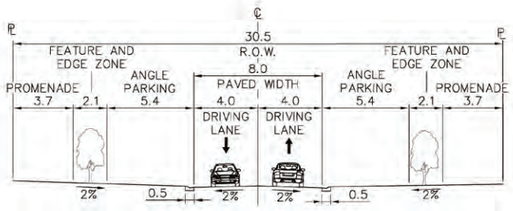
- two travel lanes
- rolled curb between travel lanes and parking
- parking raised to sidewalk level, allowing flexibility of use for both pedestrian and vehicle use
- angled parking on both sides
- a double row of street trees on both sides of the street
- pedestrian lighting spaced at +/- 15meters on-centre
- a flexible parking zone at the intersection of 5 Street S, similar to the one that exists on 6 Street S
- use of red as a site furnishing colour to denote the Chinatown Cultural District

(See pullout of 2 Avenue S Concept - Illustrative Plans and Sections)

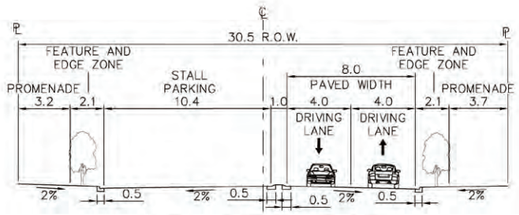
Figure 6.1.2 – 2nd Avenue Concept Plans (A)



Plan
1:500



Typical Cross Section Facing East
N.T.S.



Cross Section With Additional Parking
N.T.S.

Legend:
- Proposed Promenade
- Tree and Feature Allowance
- Multi-Modal Pathway
- Tinted Concrete

CITY OF Lethbridge

MMM GROUP

Public Realm & Transportation Study for Downtown Lethbridge

2 Avenue Concept Plan

MMM Ref. 5210038000
Drawing No. MMM-1053-R0
October 31, 2011

DATE: 2011-11-04 - 11:22am (baldwink)
PATH: P:\BELMK\5210038000 PRATS Lethbridge\19000 - Preliminary Design Submissions\Drawings\Sketches\MMM-1053-R0-2 Ave-Charette-Concept.dwg
LAYOUT: MMM-1053-R0

Figure 6.1.2 – 2nd Avenue Concept Plans (B)

2nd AVENUE ILLUSTRATIVE PLAN

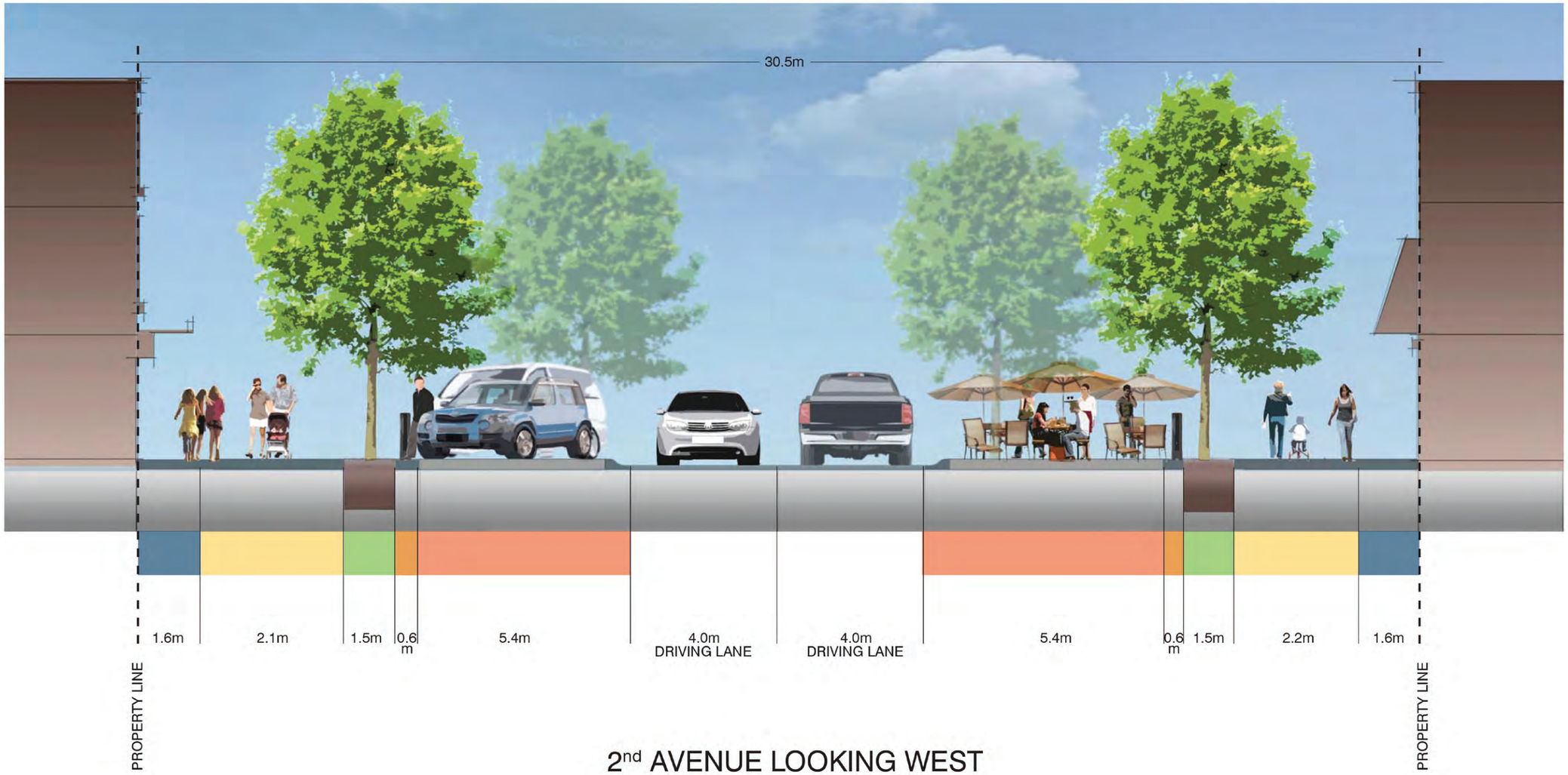
0 10 20 30 40 50

MMM GROUP

Figure 6.1.2 – 2nd Avenue Concept Plans (C)

PUBLIC REALM ZONE LEGEND:

- FRONTAGE ZONE
- SIDEWALK (PEDESTRIAN CLEARANCE ZONE)
- FURNITURE / PLANTING ZONE
- EDGE ZONE
- ENHANCED PUBLIC REALM ZONE (FLEX PARKING/PATIO SPACE)



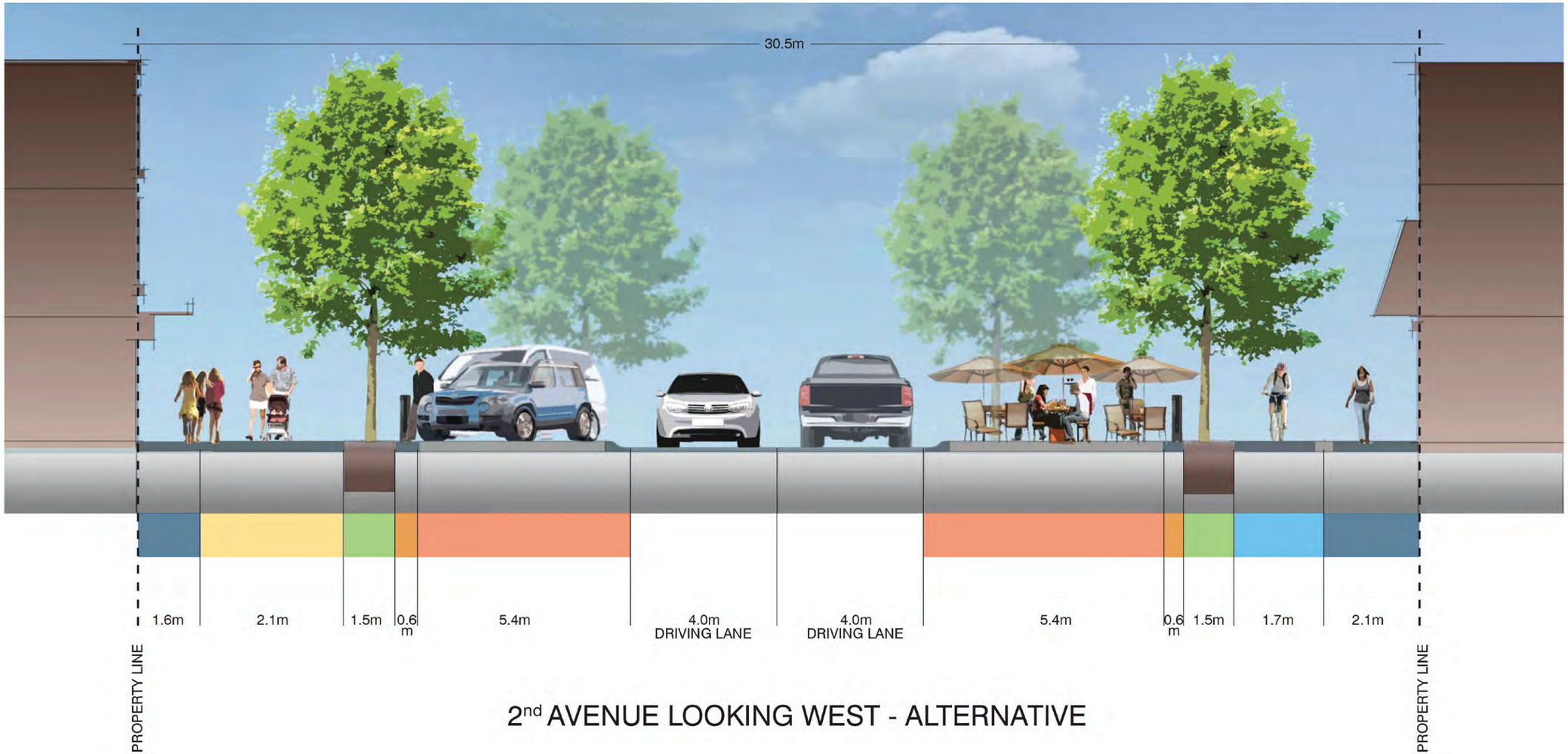
2nd AVENUE LOOKING WEST

TYPICAL 2nd AVENUE SECTION

Figure 6.1.2 – 2nd Avenue Concept Plans (D)

PUBLIC REALM ZONE LEGEND:

- FRONTAGE ZONE
- SIDEWALK (PEDESTRIAN CLEARANCE ZONE)
- FURNITURE / PLANTING ZONE
- EDGE ZONE
- MULTI- MODEL ZONE
- ENHANCED PUBLIC REALM ZONE (FLEX PARKING/PATIO SPACE)



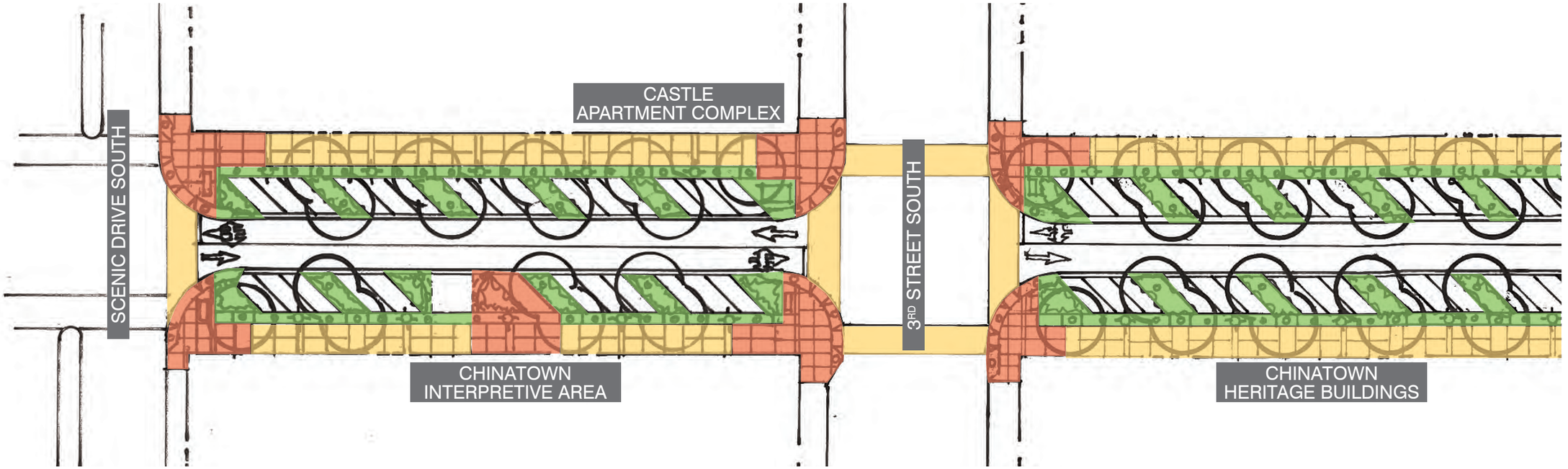
2nd AVENUE LOOKING WEST - ALTERNATIVE

TYPICAL 2nd AVENUE SECTION

Figure 6.1.2 – 2nd Avenue Concept Plans (E)

PUBLIC REALM ZONE LEGEND:

- SIDEWALK (PEDESTRIAN CLEARANCE ZONE)
- FURNITURE / PLANTING ZONE
- ENHANCED PUBLIC REALM ZONE (FLEX PARKING / PATIO PLAZA SPACE)



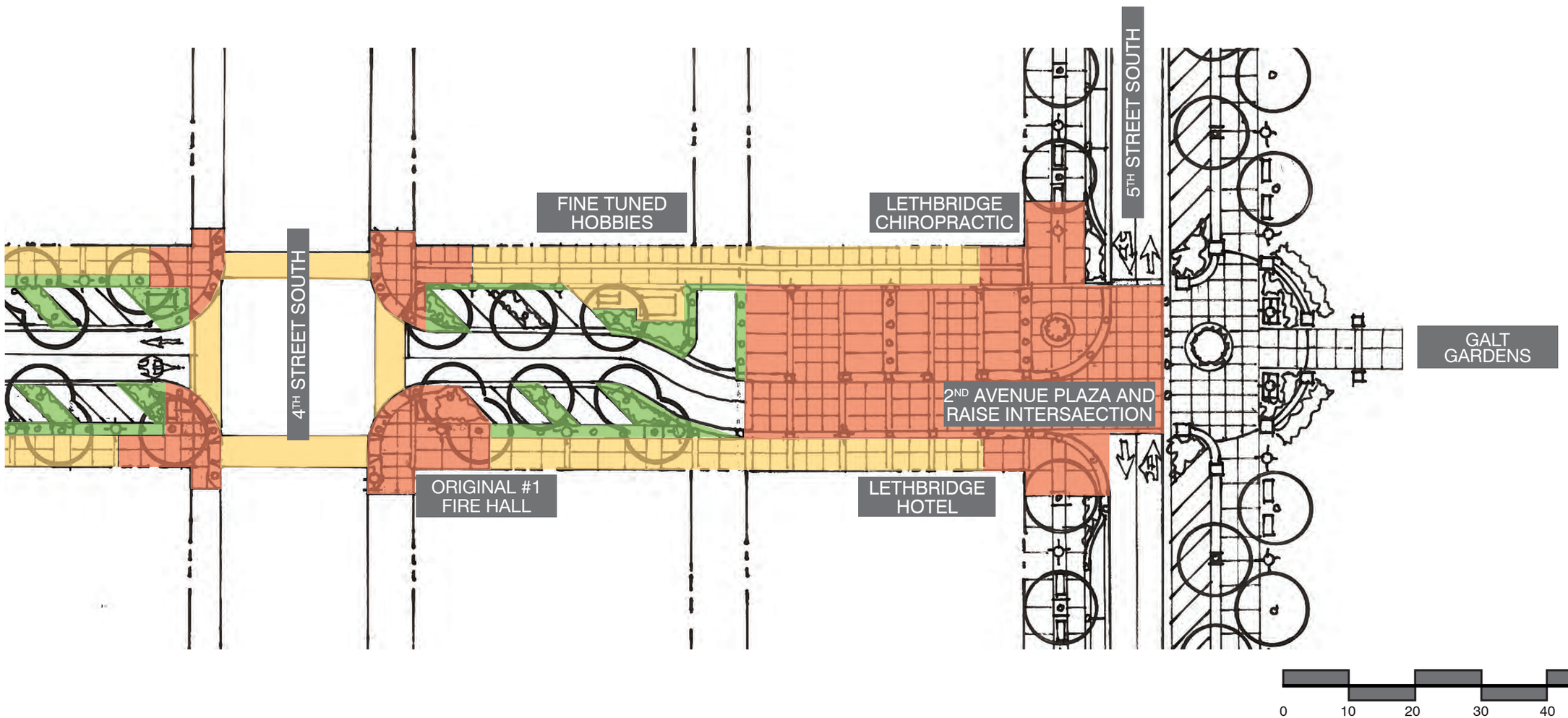
2nd AVENUE TRANSITIONAL + CHINATOWN PUBLIC REALM ZONE

0 10 20 30 40 50

Figure 6.1.2 – 2nd Avenue Concept Plans (F)

PUBLIC REALM ZONE LEGEND:

- SIDEWALK (PEDESTRIAN CLEARANCE ZONE)
- FURNITURE / PLANTING ZONE
- ENHANCED PUBLIC REALM ZONE
  (FLEX PARKING / PATIO PLAZA SPACE)



2nd AVENUE TRANSITIONAL + CHINATOWN PUBLIC REALM ZONE

Figure 6.1.2 – 2nd Avenue Concept Plans (G)

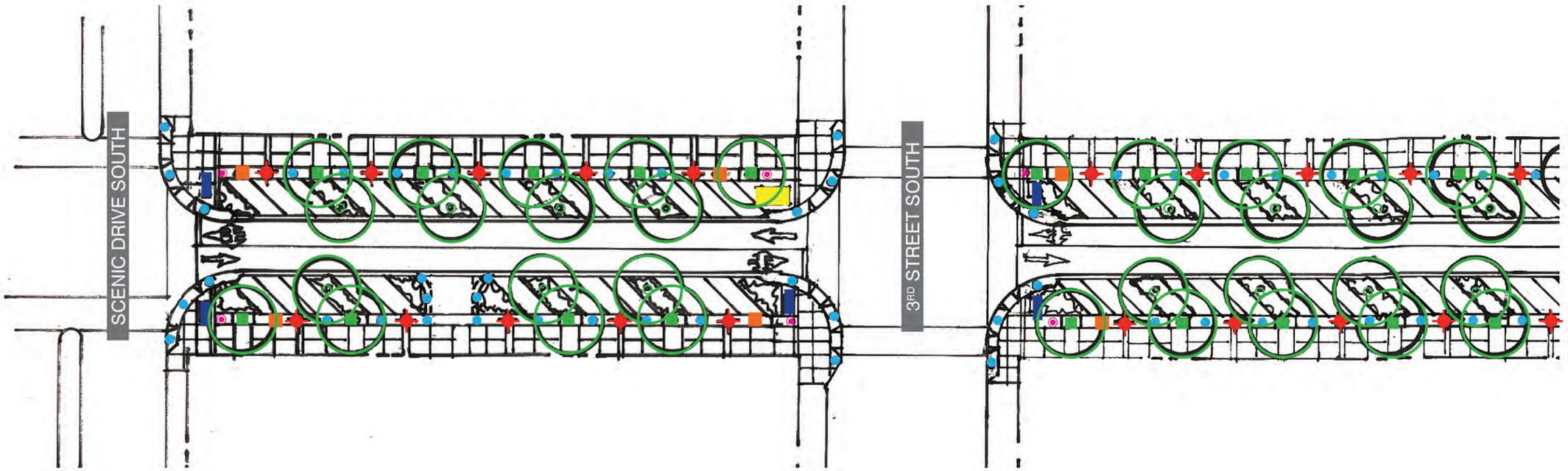
LEGEND:

SITE FURNITURE

- TREE GRATE AND STREET TREES
- STREET TREE
- LIGHT
- BOLLARD
- TRASH RECEPTACLE
- BENCH
- SHELTER / BIKE STORAGE
- WAYFINDING / TICKET DISPENSER

URBAN DESIGN

- PUBLIC ART OPPORTUNITY
- ELEMENT OF DISTINCTION



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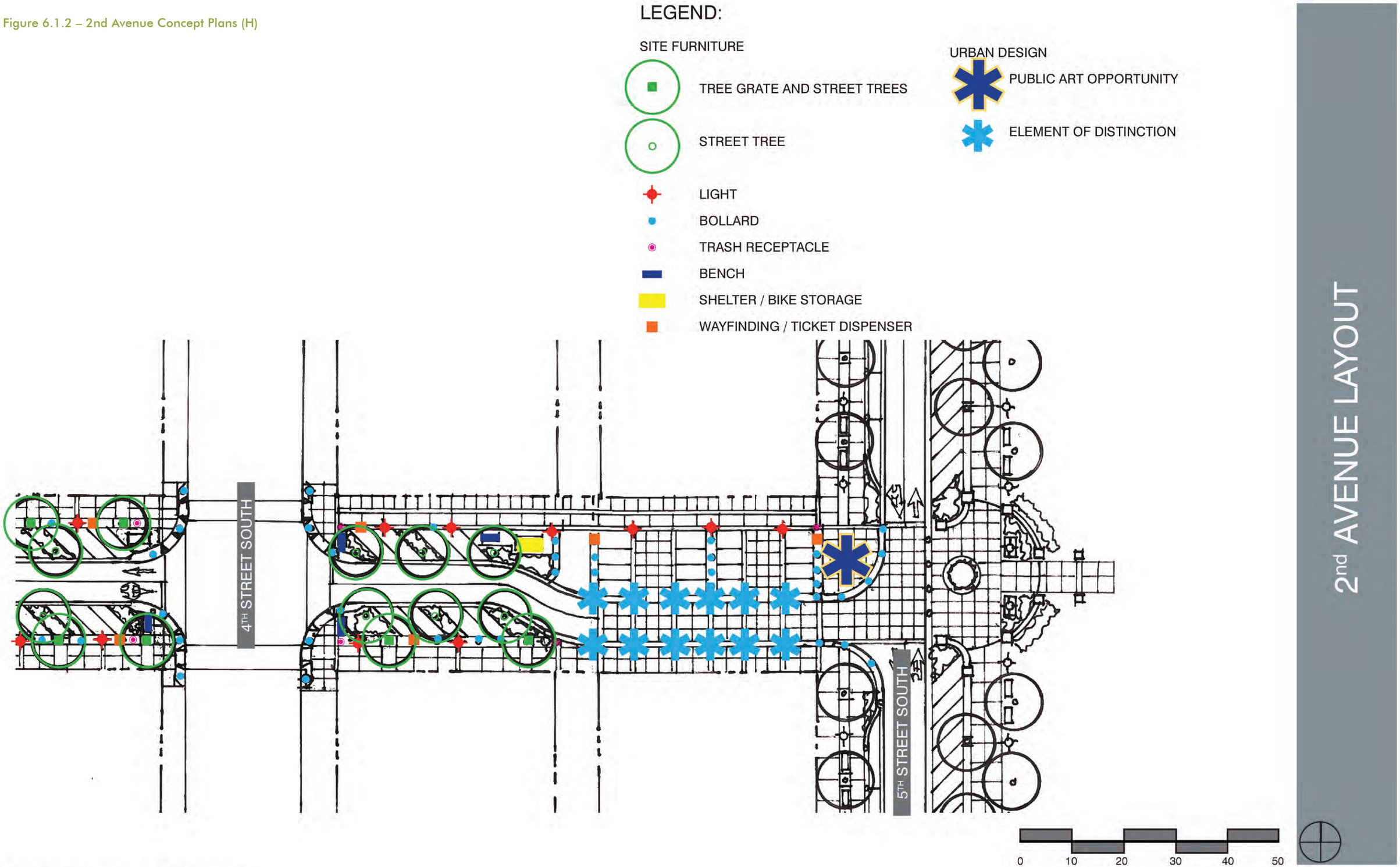
2nd AVENUE LAYOUT

Figure 6.1.2 – 2nd Avenue Concept Plans (H)



2nd AVENUE LAYOUT

CITY OF LETHBRIDGE
PUBLIC REALM &TRANSPORTATION STUDY

MMM GROUP

6.1.3 3 AVENUE S ROADWAY DESIGN

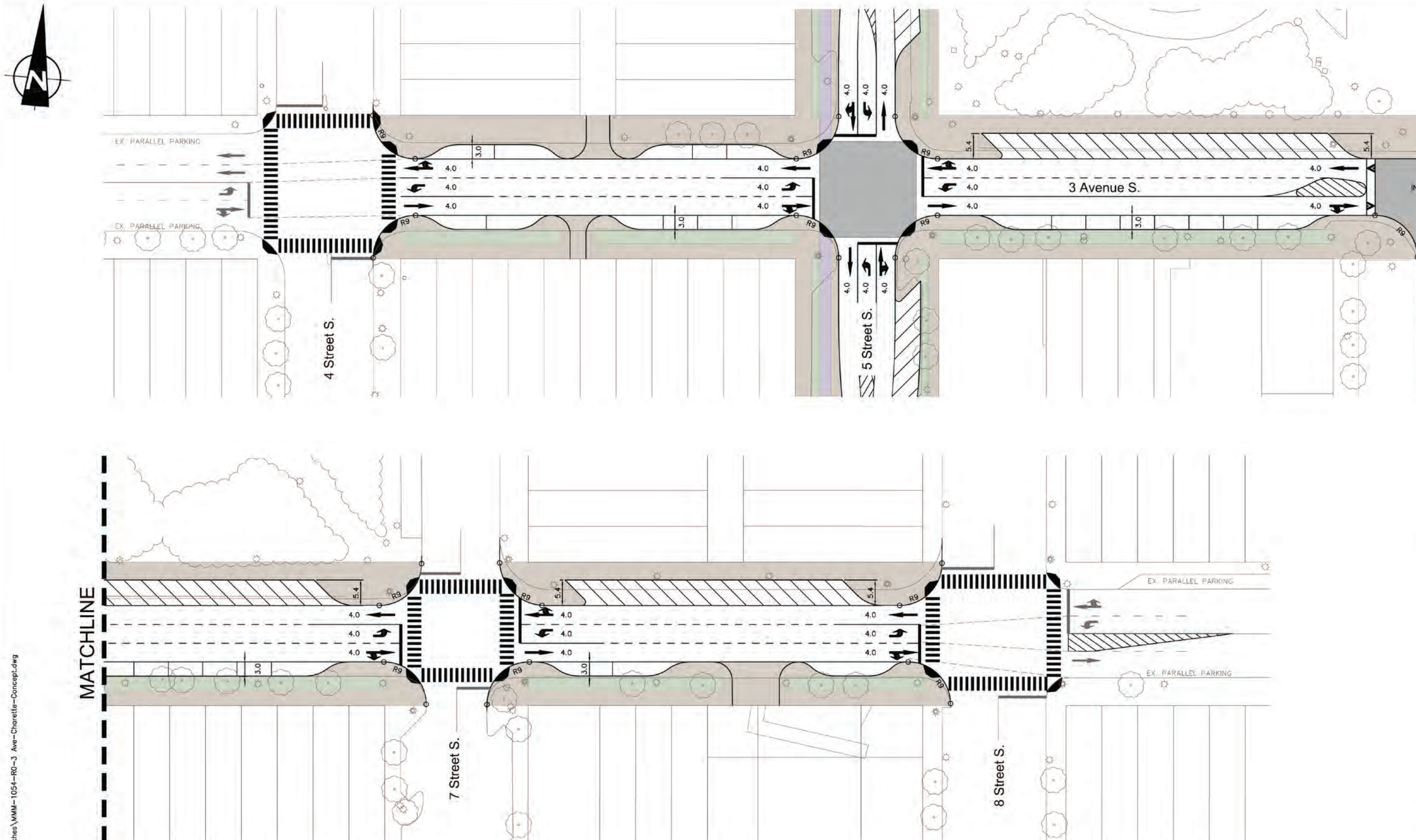
3 Avenue S is a main collector into Downtown, on which both the Southern Alberta Art Gallery (SAAG) and the Lethbridge Community Arts Centre (LCAC) are located. Given its prominence in use and cultural amenities which front onto the street, this street is proposed to have a unique 'Civic' character that reflects the cultural importance of the area. Much like the SAAG, this character is defined by the juxtaposition of historic and contemporary styling. There already exists ample historic styling in the existing buildings and park elements. It is recommended that the treatment of the public realm be contemporary character with wide 'promenade' sidewalks with a high level of pageantry associated with it.

Characteristic features of 3 Avenue S include:

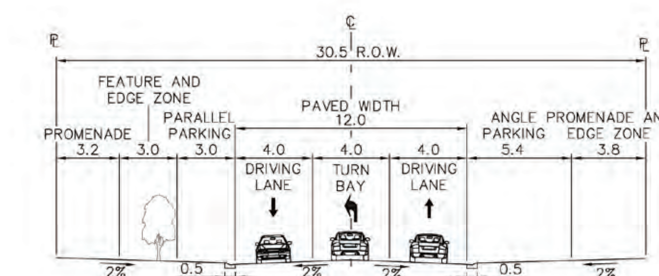
- three travel lanes, with a middle turning bay
- rolled curb between travel lanes and parking
- parking raised to sidewalk level, allowing flexibility of use for both pedestrian and vehicle use
- angled parking on the north side of the street in front of Galt Gardens and the Lethbridge Community Arts Centre
- parallel parking on the south (retail) side between 8 Street S and 5 Street S, and parallel parking on both sides of the street west of 5 Street S
- street trees on both sides, spaced at +/- 15meters on-centre
- pedestrian lighting spaced at +/- 15meters on-centre
- a wide sidewalk on both sides that will accommodate both a Pedestrian Clearway and Frontage Zones along existing retail land uses
- a wide Promenade sidewalk on the north, adjacent to Galt Gardens between 5 and 8 Street S

(See pullout of 3 Avenue S Concept - Illustrative Plans and Sections)

Figure 6.1.3 – 3rd Avenue Concept Plans (A)

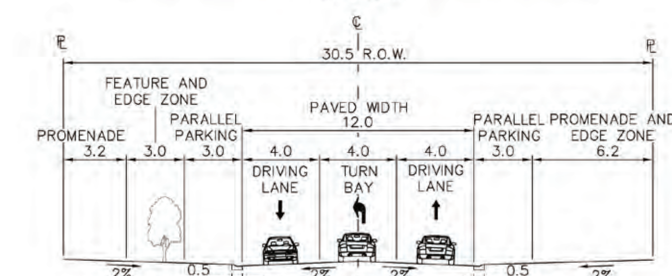


Plan
1:500



Typical Cross Section Facing West
Angle and Parallel Parking

N.T.S.



Typical Cross Section Facing West
Parallel Parking

N.T.S.

City of Lethbridge

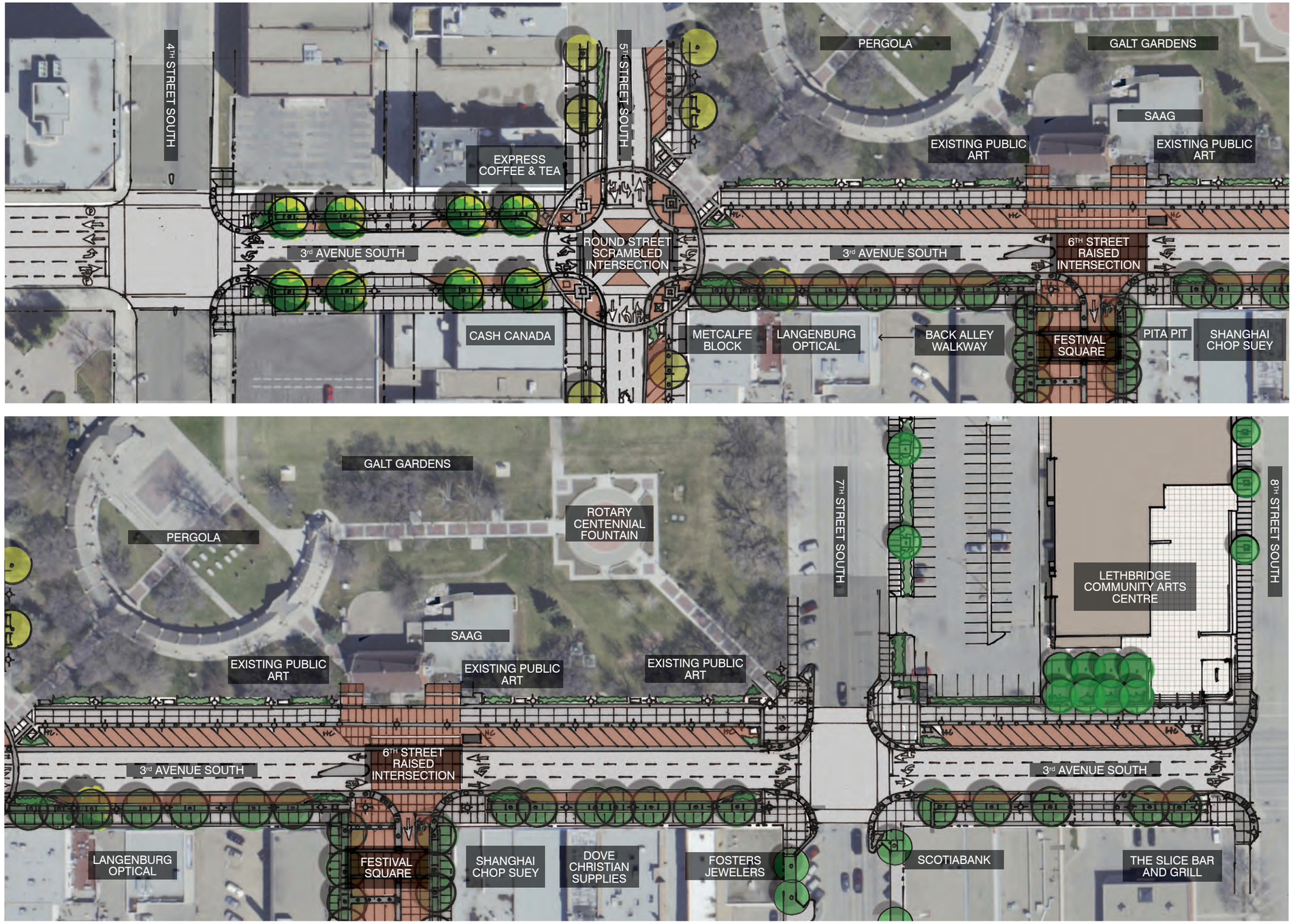
MMM GROUP

Public Realm & Transportation Study for Downtown Lethbridge

3 Avenue Concept Plan

MMM Ref. 5210038000
Drawing No. MMM-1054-R0
October 31, 2011

Figure 6.1.3 – 3rd Avenue Concept Plans (B)



3rd AVENUE ILLUSTRATIVE PLAN

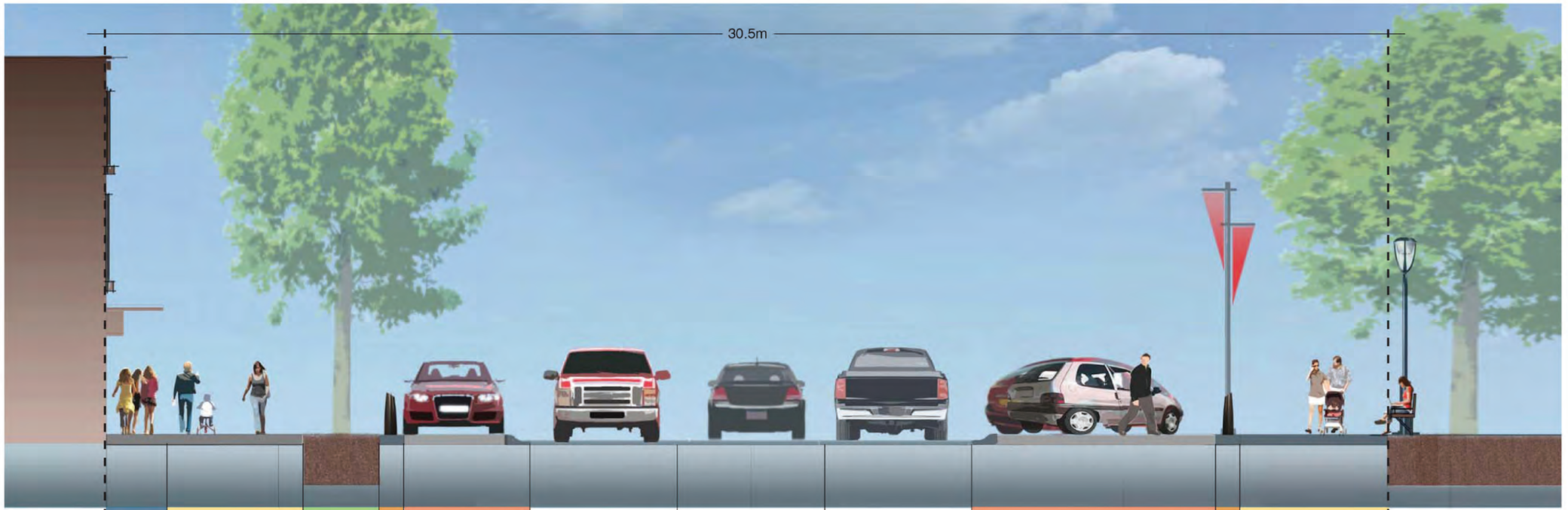
0 10 20 30 40 50

MMM GROUP

Figure 6.1.3 – 3rd Avenue Concept Plans (C)

PUBLIC REALM ZONE LEGEND:

- FRONTAGE ZONE
- SIDEWALK (PEDESTRIAN CLEARANCE ZONE)
- FURNITURE / PLANTING ZONE
- EDGE ZONE
- ENHANCED PUBLIC REALM ZONE (FLEX PARKING/PATIO SPACE)



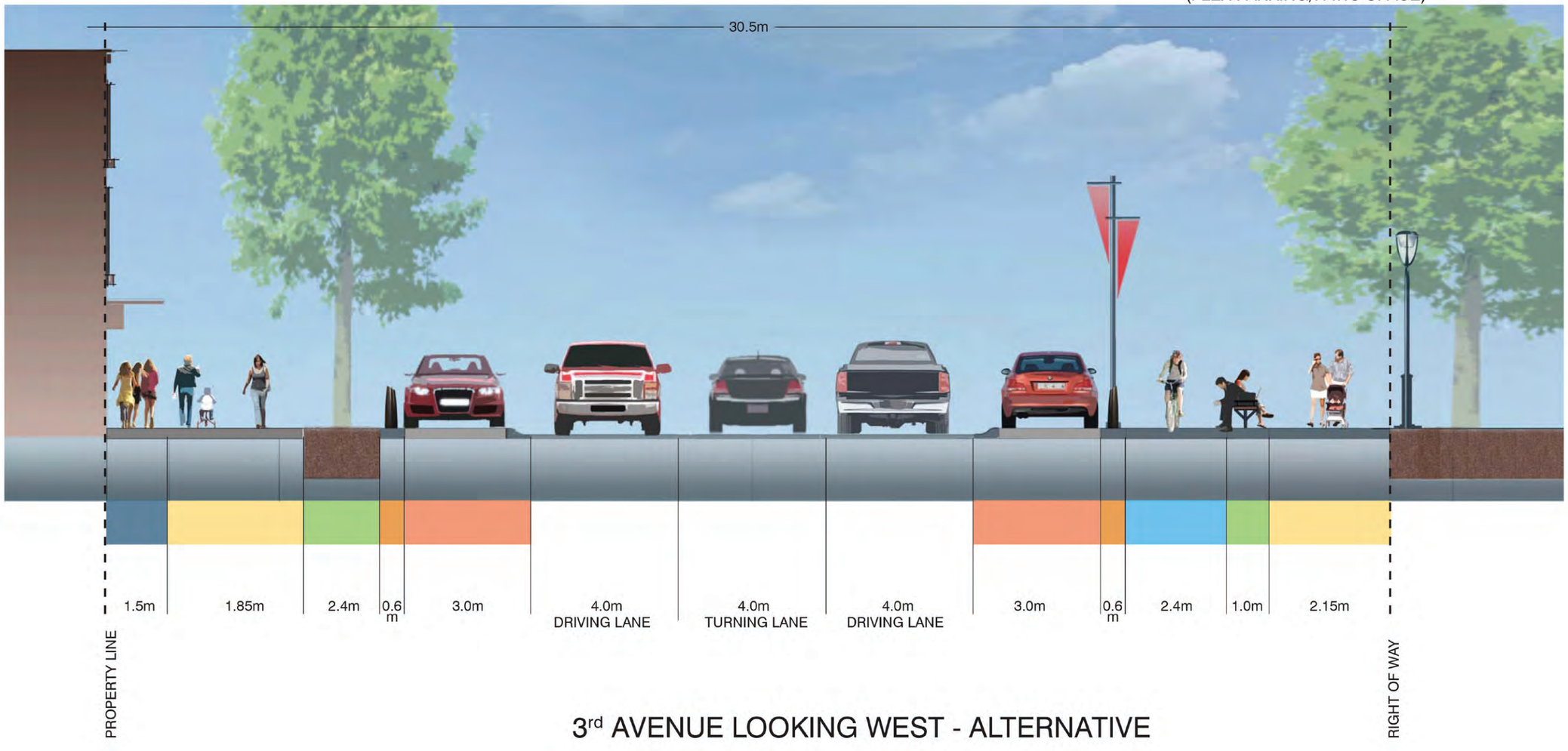
3rd AVENUE LOOKING WEST

TYPICAL 3rd AVENUE SECTION

Figure 6.1.3 – 3rd Avenue Concept Plans (D)

PUBLIC REALM ZONE LEGEND:

- FRONTAGE ZONE
- SIDEWALK (PEDESTRIAN CLEARANCE ZONE)
- FURNITURE / PLANTING ZONE
- EDGE ZONE
- MULTI- MODEL ZONE
- ENHANCED PUBLIC REALM ZONE (FLEX PARKING/PATIO SPACE)



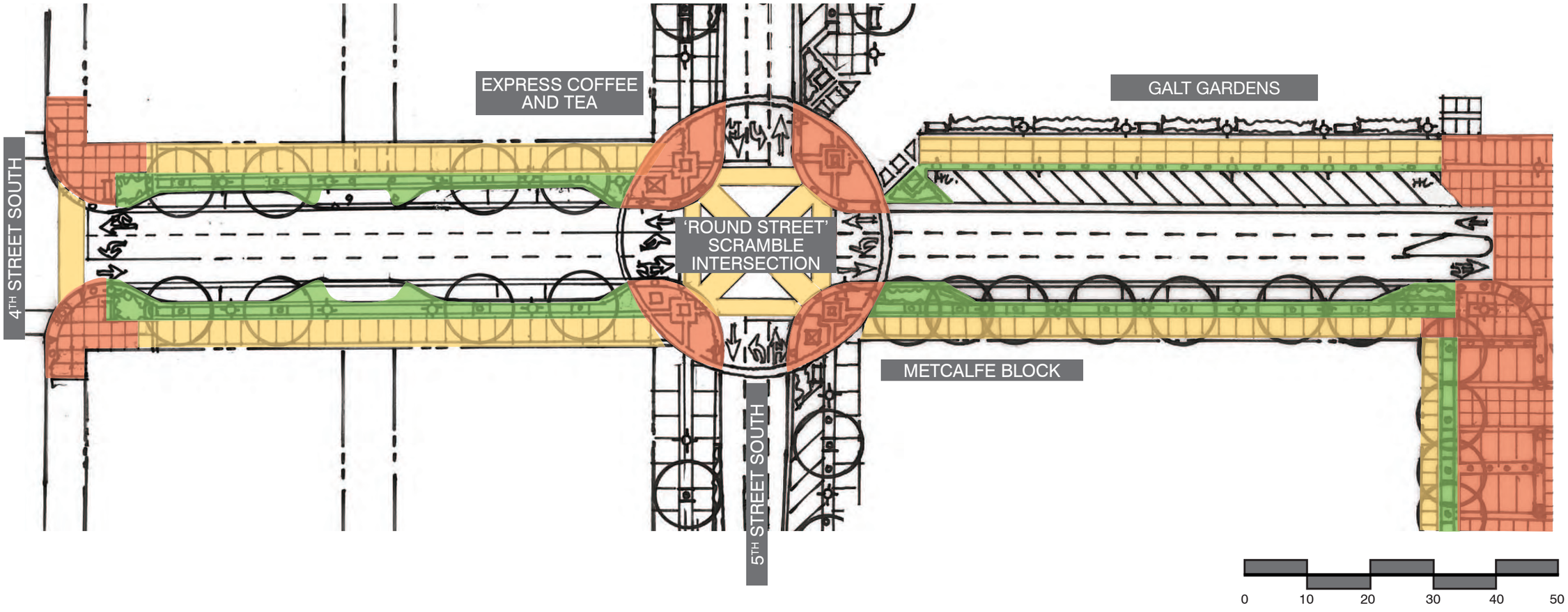
3rd AVENUE LOOKING WEST - ALTERNATIVE

TYPICAL 3rd AVENUE SECTION

Figure 6.1.3 – 3rd Avenue Concept Plans (E)

PUBLIC REALM ZONE LEGEND:

- SIDEWALK (PEDESTRIAN CLEARANCE ZONE)
- FURNITURE / PLANTING ZONE
- ENHANCED PUBLIC REALM ZONE (FLEX PARKING / PATIO PLAZA SPACE)

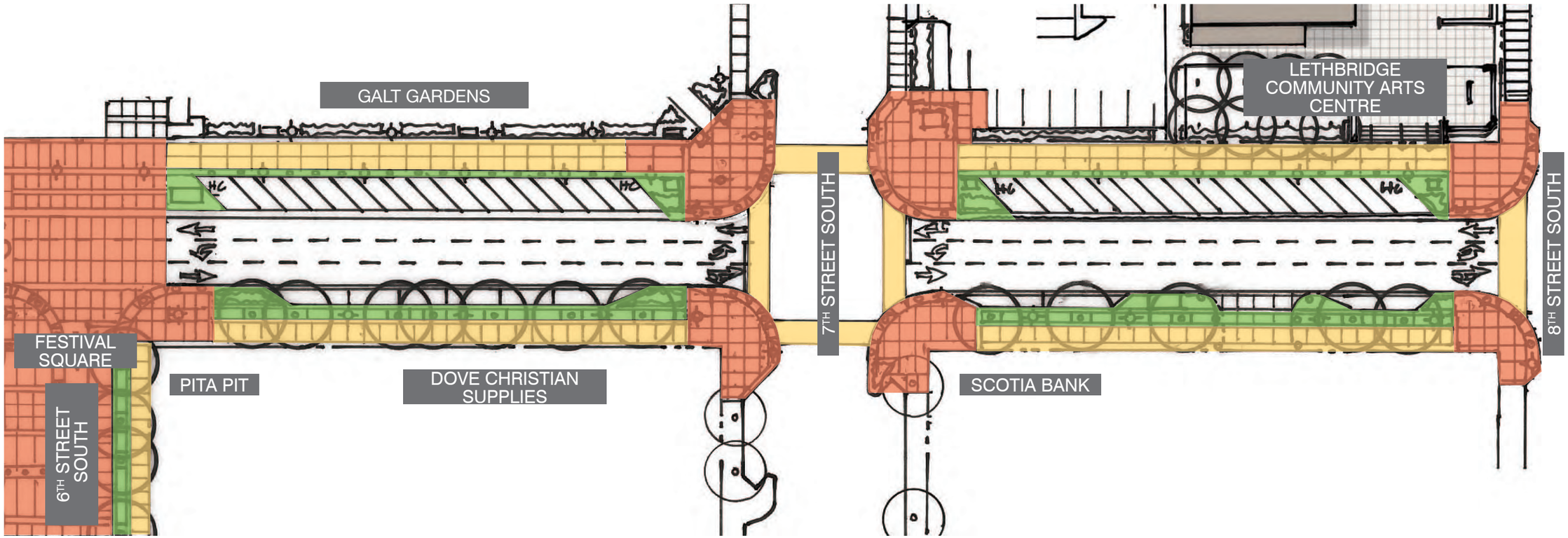


3rd AVENUE TRANSITIONAL + CONTEMPORARY PUBLIC REALM ZONE

Figure 6.1.3 – 3rd Avenue Concept Plans (F)

PUBLIC REALM ZONE LEGEND:

- SIDEWALK (PEDESTRIAN CLEARANCE ZONE)
- FURNITURE / PLANTING ZONE
- ENHANCED PUBLIC REALM ZONE (FLEX PARKING / PATIO PLAZA SPACE)



3rd AVENUE TRANSITIONAL + CONTEMPORARY PUBLIC REALM ZONE

Figure 6.1.3 – 3rd Avenue Concept Plans (G)

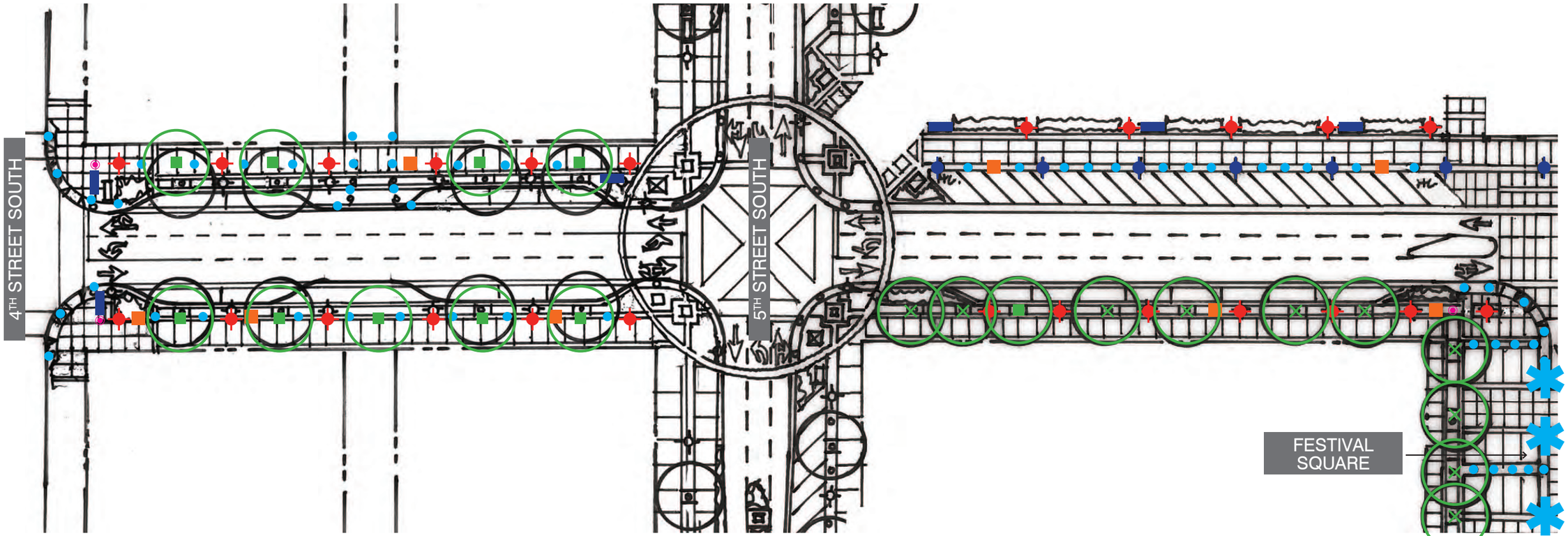
LEGEND:

SITE FURNITURE

- TREE GRATE AND STREET TREES
- EXISTING STREET TREE
- LIGHT
- BANNER POLE
- BOLLARD
- TRASH RECEPTACLE
- BENCH
- SHELTER / BIKE STORAGE
- WAYFINDING / TICKET DISPENSER

URBAN DESIGN

- ELEMENT OF DISTINCTION



3rd AVENUE LAYOUT

Figure 6.1.3 – 3rd Avenue Concept Plans (H)

3rd AVENUE LAYOUT

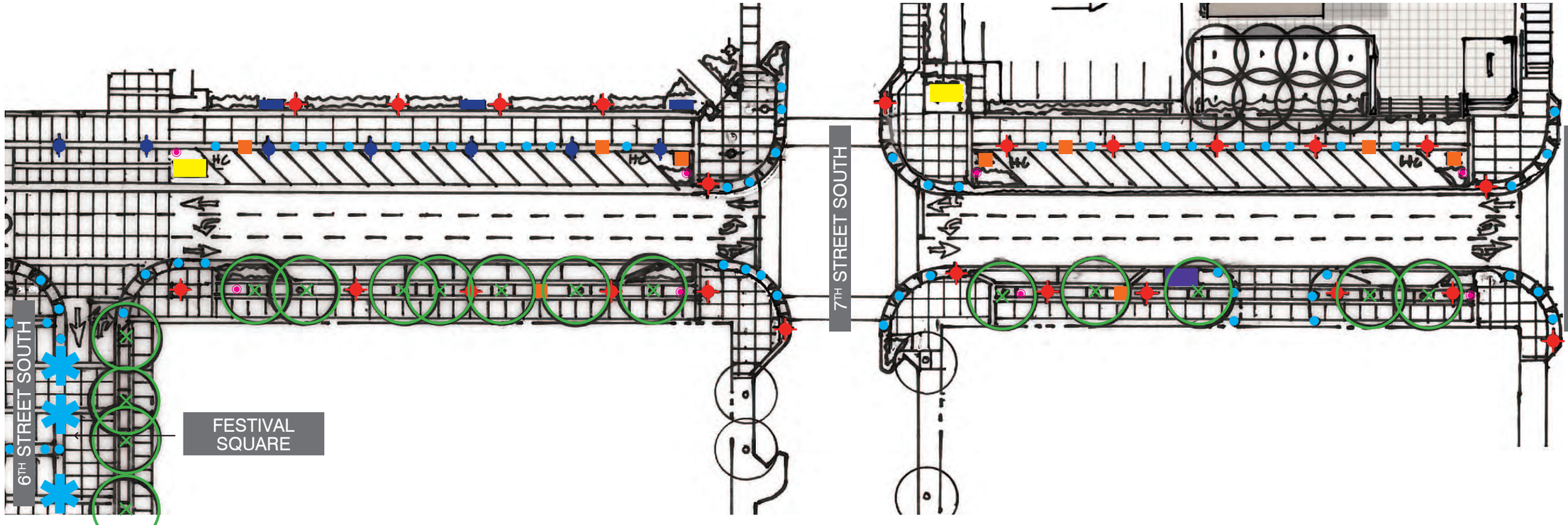
LEGEND:

SITE FURNITURE

- TREE GRATE AND STREET TREES
- EXISTING STREET TREE
- LIGHT
- BANNER POLE
- BOLLARD
- TRASH RECEPTACLE
- BENCH
- SHELTER / BIKE STORAGE
- BUS STOP
- WAYFINDING / TICKET DISPENSER

URBAN DESIGN

- ELEMENT OF DISTINCTION



6.1.4 ROADWAY DESIGN SUMMARY

The proposed roadway designs focus on modifications made to existing curb lines which reduce the number of vehicle travel lanes in order to provide more streetscape opportunity; balancing the proportion of public realm and vehicular realm without significant loss of on-street parking.

Achieving a 'balance' is a key consideration and one in which vehicle movement, vehicle parking, pedestrian movement and active transportation needs to receive equal attention.

Below is a comparison between on-street parking spaces, using current conditions as a baseline, with the number of parking spaces that were proposed in the HOCMP recommendation and the number of parking spaces proposed in the recommended Preliminary Roadway Designs.

Table 6.1.4 – Parking Spaces Comparison

Selected Study Streets	Existing Parking Spaces	HOCMP Parking Spaces	Proposed Parking Spaces
5 Street S			
	265	80	120
2 Avenue S	117	42*	81
3 Avenue S	90	38	80
Total Spaces	472	160	281
Percentage %	100%	33%	60%

* Based on HOCMP Promenade Prototype Option 1 (Angled Parking Configuration) Part 4, page 40

Based on the above summary, there would be a reduction of on-street parking compared to current conditions in order to achieve a higher level of public realm articulation. However, the proposed Preliminary Roadway Designs loss is significantly less (maintain 60% of existing parking) than what the HOCMP recommends (maintain 33% of existing parking) based on all parallel parking on Main Streets and Option 1 Angled Parking on Promenade Streets.

The provision of greater public realm space while providing almost twice as much on-street parking than the HOCMP is consistent with the overall public realm objective as determined through the public consultation process suggests:

"Create a balance between the public realm and the traffic realm without a significant loss of on-street parking, and enhance the overall quality of the Downtown's public realm for long term vitality and promotion of the Downtown as a place to live and work."

6.2 PUBLIC REALM PRELIMINARY DESIGN COMPONENTS

The emphasis of the Public Realm and Transportation Study is meant to be more than an exercise in 'street beautification'. It is meant to create more balance in the public realm between the pedestrian and vehicle; to increase pedestrian comfort through provision of site amenities and increased planting; increased safety by minimizing pedestrian/ vehicle conflicts, improve sightlines and lighting; and to use Lethbridge's culture and heritage to create a unique identify for the Downtown.

The public realm is made up of various components. While the emphasis will be on quality of design and achieving the larger public realm goals, consideration to functionality, ease of implementation, ease of maintenance and operations, as well as costing, will also be important considerations. The following design strategies and related drawings are meant to guide future development of detail drawings and help to coordinate the efforts in implementing the outlined works:

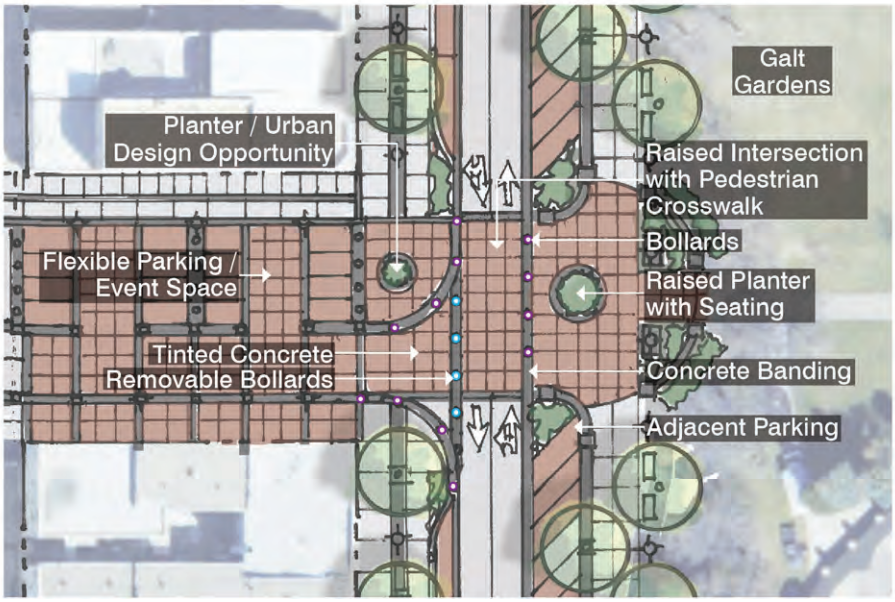
6.2.1 INTERSECTIONS

PLAZA INTERSECTIONS

- Two (2) of the thirteen (13) intersections that comprise the study area have been identified as Plaza Intersections and are typical of a Promenade Streets terminating at Galt Gardens.
- Crosswalks would be raised and encompass the full width of the intersection to reduce traffic speeds and promote pedestrian priority crossing.
- They would be enhanced with special paving treatments (tinted concrete) and pattern that will continue across the road bed to unify both sides of the street and strengthen physical and visual connections into the Park.
- Vehicular traffic lanes would be shifted to provide flexible parking/ festival event space.
- Plaza intersections are intended to be temporarily closed to vehicular traffic on special event days.
- Provisions would be made for removable bollards to facilitate traffic control.
- It is not recommended that unit pavers be used within the road bed due to potential maintenance issues associated with snow clearing.

Innovative Use of Urban Space for Parking

Same Urban Space Used for Festival Events



Illustrative Plan of 2nd Avenue and 5th Street S. Plaza Intersection

SCRAMBLE CROSSWALK (PEDESTRIAN PRIORITY) INTERSECTIONS

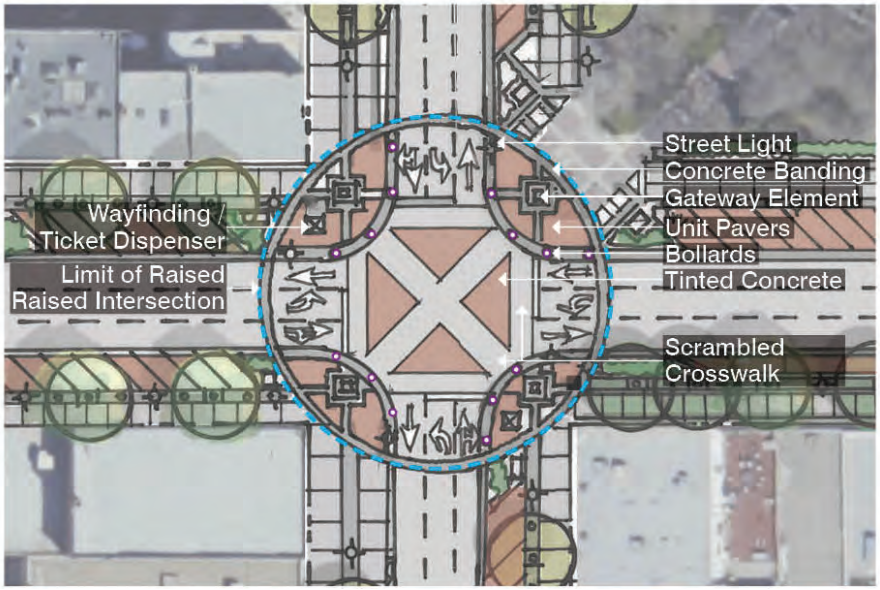
Both the City of Toronto (Yonge/Dundas, Yonge/Bloor, and Bay/Bloor) and the City of Calgary (3 St/ 2 Ave., 3 St/3 Ave. SW) have recently added scrambled intersections at particularly busy streets with high pedestrian and turning vehicle volumes.

Scramble Intersection at Yonge Street and Dundas, Toronto

The benefits of a Scrambled Intersection are to help eliminate conflicts between pedestrians and turning vehicles and improve traffic flow efficiency by reducing two directional pedestrian travel time. Features of Scramble Crosswalk intersections include the following:

- Two (2) of the thirteen (13) intersections that comprise the study area have been identified as potential Scramble Crosswalk Intersections and are typical of 'key pedestrian intersections' within the Downtown.
- Crosswalks should be raised and encompass the full width of the intersection to reduce traffic speeds and promote pedestrian priority crossing.
- Crossings should be parallel to the roadway as well as diagonal with a minimum 4.0m width.
- Enhanced with paving treatments (tinted concrete) and patterns would be embedded into the road bed to unify both sides of the street and provide strong visual cues for pedestrian flow.
- Traffic lights to provide a crossing phase for pedestrians only will be required which will stop vehicular traffic and allow pedestrians to cross in every direction, including diagonally, at the same time.

Enhanced Streetscape and Roadway to Create Unified Public Realm, Penticton, BC



Illustrative Plan of 3rd Avenue and 5th Street S. – Scramble Intersection

» It is not recommended that unit pavers be used within the road bed due to potential maintenance issues associated with snow clearing.

» Informing the public is of key importance in implementing scramble intersections because operational problems can arise, particularly with the blind or visually impaired pedestrians. Many of these problems can be overcome through media and public information sessions, the use of appropriate signage and Accessible Pedestrian Signals (APS), and increasing the cycle length of the timed crossing to accommodate longer diagonal crossing times.

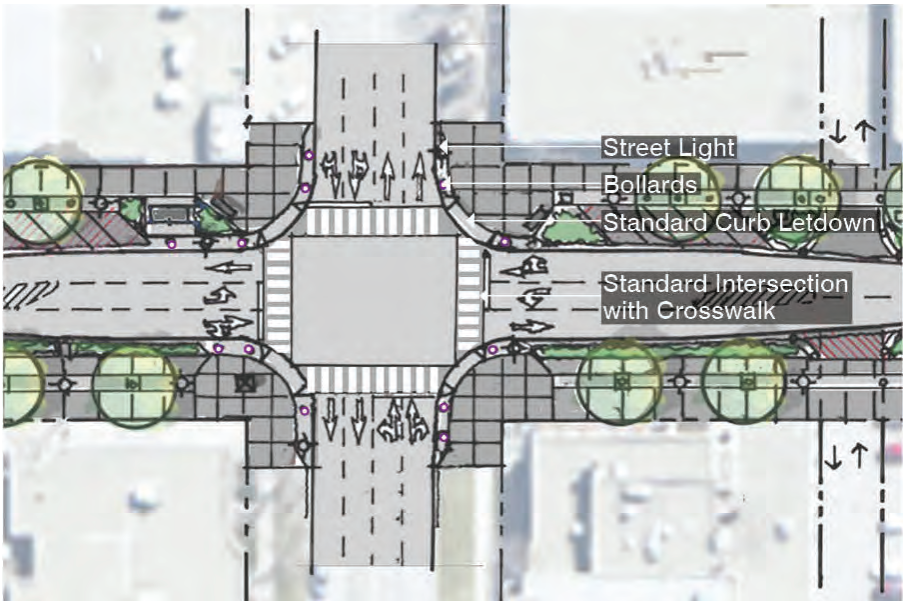
STANDARD INTERSECTION AND CROSSWALK

Standard intersections make up nine (9) of the thirteen (13) intersections that comprise the study area and should have the following characteristics:

» Crossings parallel to a roadway have a crosswalk width of 3.0m to 4.0m.

» They are delineated through either painted lines, colour thermoplastic over asphalt, or tinted stamped concrete embedded into the roadway.

» It is not recommended that unit pavers be used within the road bed due to potential maintenance issues associated with snow clearing.



Illustrative Plan of 5th Avenue and 5th Street S – Standard Intersection

6.2.2 MULTI-USE PARKING

The overall strategy toward on-street public parking is to provide a rolled curb at the edge of the travel lanes and raise the vehicle parking spaces up to the sidewalk level. Raised parking provides greater flexibility in how the critical street frontage area is used, especially in commercial areas. Multi-use parking areas can be used for either vehicle parking or extended public realm space such as outdoor patios. Such parking areas could be of a duration suitable for the uses in the surrounding area.

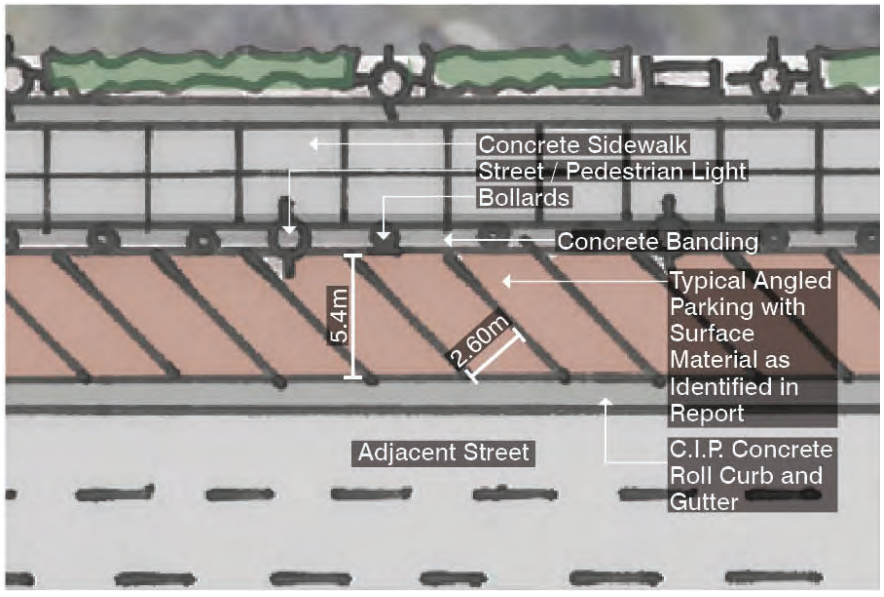
Compensation for lost parking revenue will need to be determined by evaluating current City practices. Options for consideration include: charges based on a short term permit; or as part of annual property tax assessment for long term pedestrian realm use. Based on City evaluations, current policies and practices may need to be updated in order to make this type of parking strategy viable in the long term.

This strategy takes into account the dynamic nature of Downtown, such as how new and infill development, as well as land tenure, can change over time. The strategy also considers expanding the public realm by converting parking spaces into multi-purpose spaces. This strategy will also help to support improvements in urban design.

The following are examples of proposed on-street parking typical dimensions based on City of Lethbridge's Land Use Bylaw 5700 and TAC best practice standards:

» Angle parking is the preferred form of on-street parking as it allows for a greater number of parking spaces per linear meter of street frontage.

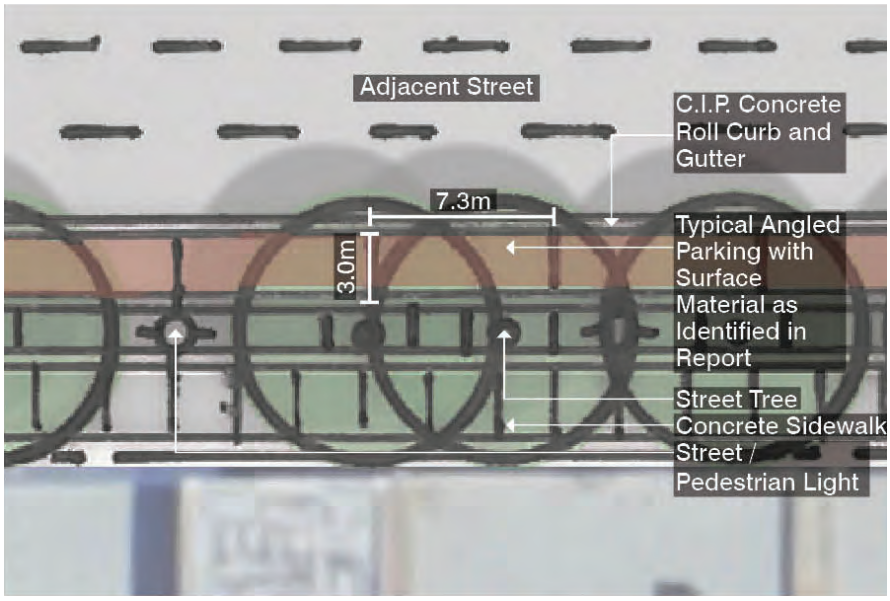
» Angle parking should be either on a 45° or 60° angle, 2.6m stall width, and a minimum stall length of 5.8m.



Typical Example of 45° Angle Parking with 5.8m Stall Length (5.4m Offset From Curb Line)

» Typical parallel parking should be 3.0m wide, with a minimal stall length of 7.3m long.

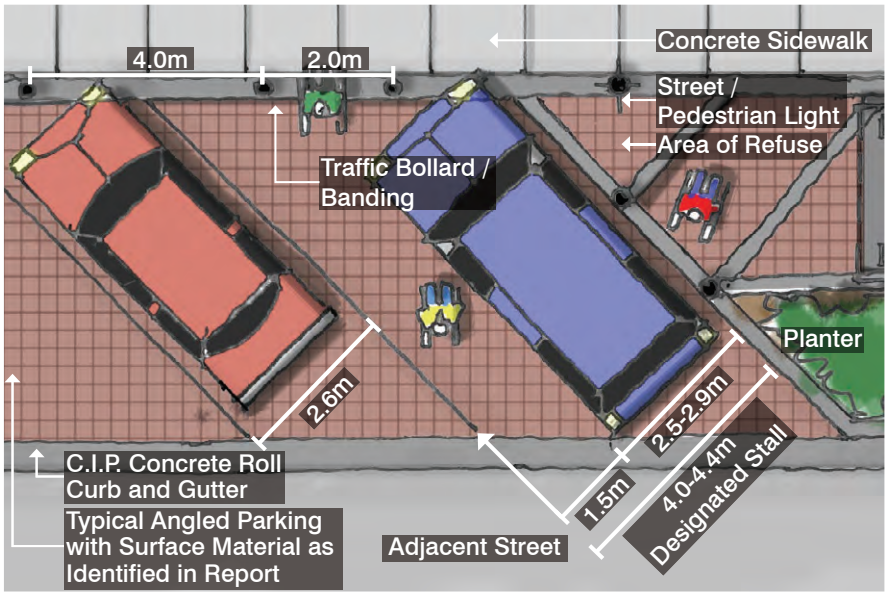
» Raised parking to sidewalk level provides barrier free access for users with limited disability. This eliminates the need for extensive curb drop-downs



Typical Parallel Parking

» Typical designated on-street parking stalls for persons with physical disabilities should be located closest to the intersection, or at ends of on-street parking bays so as to incorporate adjacent public realm/ planting areas as refuge zones.

» Provide universal accessibility at all parking meters and ticket dispensers at a height of 1.0m.



Typical Angle Parking – Designated Stall

6.2.3 MATERIAL SELECTION

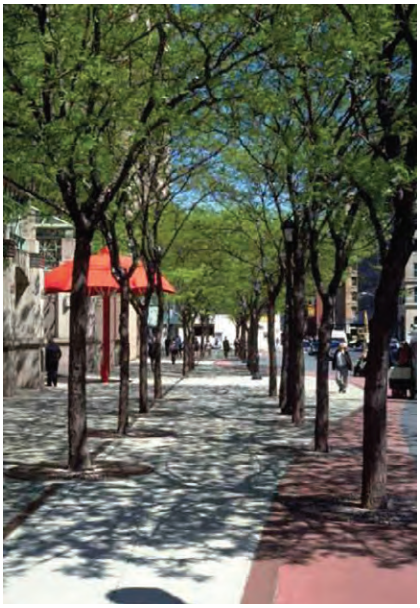
Material selection and surface treatment for sidewalks, crosswalks and roadways will be a major consideration. Materials must be conducive to the type of movement, durable, economical to install and maintain, as well as have some sustainability qualities.

The material selection and final finish of hard surfaces can have a significant impact on the visual quality and character of the public realm. Owing to the extent of paving involved, it is important to vary the selection of hard surface materials to create visual interest and respond to safety and accessibility issues. The following outlines considerations and recommendations for the selection of various hard surface materials:

Concrete Sidwalk With Saw Cut Control Joints – Highly Accesible Pedestrian Movement

PEDESTRIAN MOVEMENT

- Primary material should be broom finish concrete, perpendicular to the flow of traffic, with saw-cut control joints; providing a smoother transition over the control joint gap for people of limited mobility and strollers.
- Ensure all paved surfaces are designed to have a minimum 1.5% - 2% cross-drainage slopes directed to landscape areas and ensure no damming occurs along the edge which can result in icy patches in the winter.
- Saw-cut pattering should vary in spacing to delineate the Frontage and Sidewalk Clearway Zone with larger patterns used in the Clearway Zone.
- Rectilinear sidewalk panel (control joint spacing) should be used in areas of Contemporary character areas.
- Square sidewalk panel (control joint spacing) should be used in Historic and Transitional character areas.
- Use of tinted concrete or pre-cast unit pavers should be used as accent paving in special areas.



Use of Paving and Material to Reinforce Pedestrian Movement and Streetscape Zones

MULTI-MODAL MOVEMENT

- The preferred material is broom finish concrete, perpendicular to the flow of traffic, with saw-cut control joints; providing a smoother transition over the control joint gap for cyclists.
- Should ensure all paved surfaces are designed to have a a minimum 1.5% - 2% cross-drainage slopes directed to curb edge and ensure no damming occurs along the edge which can result in icy patches in the winter.
- A cost effective option is hot-mix asphalt concrete paving (asphalt). If Asphalt is to be used, an Upper Course #2 Mix (max 12.5mm aggregate size) is to be specified. Minimum cross-drainage slope to be 2%.
- Any asphalt paving used in the public realm should be retained by a concrete edge; rolled curb, sidewalk slab, concrete band.

Example of Multi-Modal Way – Separation and Surface Treatment

PARKING

- The preferred material for on-street parking is precast concrete unit pavers. Paver type, size and colour can change to reflect the different public realm character; Historic, Transitional, Contemporary.
- Precast unit Pavers paving should be 80mm thick, rated to accept vehicle loading, and placed on an appropriate base material as determined by a Geotechnical Engineer.
- An interlocking paver pattern, such as Herringbone, should be used in traffic areas where precast unit pavers are used
- A cost effective option is hot-mix asphalt concrete paving (asphalt). If Asphalt is to be used, it is to match the City of Lethbridge Design Standards, latest edition.
- Use of specially design paver units, such as AquaPave®, can be used for permeable on-site stormwater control to reduce excess stormwater runoff quantities and improve stormwater quality (see Sustainable Streetscape Strategies).

Rasied Parking Used Successfully, Downtown Victoria, BC

COLOUR PALETTE

Colour can have a significant impact on the visual quality and character of the public realm. The use of colour can add distinction to the streetscape, can unify a variety of different elements, and help in wayfinding. Design solutions should avoid the use of too many different colours. There is a tendency for to create visual dis-harmony with too many competing colours. The following identifies opportunities to introduce the strategic use of colour into the public realm:

» Standard powder-coated colour for all site furnishing such as benches, trash receptacles, light bases and poles should be black. This will help unify various public realm elements whether existing or proposed.
  - Black is readily available as a standard colour, it is considered a 'classic colour; which is not subject to stylistic changes, therefore is complimentary to large number of other materials

» Custom colours for site furnishing can be used for elements of distinction, but generally have a cost premium attached. A representative palette of custom colours has been developed (see Figure 6.2.3).

» Planting of vegetation can be used to introduce colour, and as a way to celebrate the change of seasons.

» Annual plantings, such as in raised planters and hanging baskets, can provide an opportunity to introduce a colour and vibrancy to the street in a relatively inexpensive way.

» Nylon banner art can be colourful as well help to advertise community festivals and events.

Figure 6.2.3 - Custom Colours Palette Reflects the Natural Landscape

MAINTENANCE

Operations and maintenance can play an important role in the selection of materials. The extent of pedestrian infrastructure that is associated with Downtown Lethbridge represents a considerable investment and commitment of public resources. The following are maintenance considerations when selecting materials:

- Select materials that are durable, easy to maintain and, if necessary, can be replaced without creating a visible difference between the old and new.
- Highly decorative patterns and colour finishes are difficult to match when patching. If such features are to be added, incorporate logical breakout areas into the design, so larger sections can be replaced in order to make repairs less noticeable.
- Coordinate selection of paving material with surface operations ('Clean-Sweep' program), especially for snow removal equipment. Hand sweeping or power brooms are recommended for snow removal on precast concrete unit pavers.
- Minimize material changes that require different base and sub-base preparations which can result in differential settlement; resulting in drainage problems and tripping hazards.
- Owing to Lethbridge's Chinooks and winter freeze-thaw cycles, ensure there are adequate cross-drainage slopes on pavement surfaces, and water is directed to systems that will collect and drain water away quickly to avoid icing. Provide catch basins and area drains in isolated areas, if required.
- Develop a street tree maintenance program in conjunction with the City Arborist, including removal of dead branches, pruning to thin and shape tree canopy, and soil testing and nutrient replenishment.
- Provide a high efficiency underground automatic irrigation system for street planting that is connected to a centralized controller and monitoring station; allowing for greater ease and efficiency in watering.
- Encourage 'civic pride' in the public realm by being proactive in maintenance, especially with regard to surface condition, trash pick-up, and vandalism (including graffiti). Develop partnerships with private sector property and business owners, the Downtown BRZ and 'Hotline' to quickly respond to maintenance, security issues and emergency repairs.
- Together with other City departments, develop an anti-graffiti 'wrap program where utility boxes are wrapped in vinyl photos and images. The vinyl photo wraps can withstand temperatures from –54 to +107 C. The artwork makes it more difficult to see any graffiti and the vinyl surface allows for an easy clean up if the boxes are tagged. This program has been extremely successful in other Canadian cities such as Kelowna.

6.2.4 UNIVERSAL ACCESSIBILITY

The intent is to design and construct a public realm that people, of all ages and physical abilities can use and enjoy equally. Barrier-Free Design is based on established safety codes and design standards (such as those set out by the Alberta Safety Code Council) that promotes proper and safe access - especially for seniors and people with disabilities. Urban Braille is an example of design standards and details which can be incorporated into the public realm that specifically address people with limited vision or are visually impared. Principles of 'Barrier-free Design' and 'Urban Braille' have been incorporated into the preliminary designs, and include the following:

BARRIER-FREE DESIGN

- A consistent sidewalk width (Clearway Zone) that is free of obstructions should be provided in a clear path of travel that will continue through to crosswalks.
- Primary pathway surface should be cast-in-place concrete with saw-cut control joints to provide a smooth walking surface, free of abrupt edges that will create potential tripping hazards and make it difficult for wheel chair and strollers movement.
- Raising crosswalks to sidewalk level at key intersections will give priority to pedestrians.
- Where intersections are not raised, separate curb let-downs should be provided for each parallel crosswalk.
- Traffic bollards to protect pedestrians waiting to cross from turning vehicles should be provided. Maintain incline gradients of pathway between a minimum of 1% to a maximum of 5% (optimal for cycling and walking).
- Manholes and other service features should be minimized or relocated where they won't cause tripping hazards.
- Incorporating high contrasting colours with legible signage and symbols of sufficient size should be part of a wayfinding strategy.

Raised Intersection with Traffic Bollards – Promotes Pedestrian Priority and Accessibility

Urban Braille Treatment with High Contrasting Pavers and Tactile Changes at Intersection

URBAN BRAILLE

Suggestions that incorporate Urban Braille elements include the following:

- Incorporating 'Advanced Warning Strips' prior to intersections, consisting of a double row of soldier course pavers perpendicular to the direction of movement.
- Providing a single row of soldier course 'shoreline pavers' that are of a high-contrasting colour to the paving field in order to delineate the area of potential traffic conflicts at intersections.
- Incorporating tactile guides into paving at 'sidewalk zones' leading to curb letdowns. Guides can be either a series of grooved reveals in concrete or a textured paving band.
- Providing verbal or audible APS at intersections that operate on a 24/7 basis and adjust to ambient sound levels.

CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN PRINCIPLES

CPTED is a holistic approach that balances the objectives of reduction in crime with the elements of good design to create attractive public environments. The full extent of CPTED principles is beyond the scope of this project. However, pertinent urban design and streetscape principles that may be the focus of further study during detail design include:

- creating natural surveillance and sight lines to ensure unobstructed views between 0.6 meter height and 1.5 meter height
- providing pedestrian level lighting at a lux/footcandle level sufficient enough to uniformly light adjacent sidewalk in order to meet 'High Pedestrian Conflict' illumination classification. Levels of 12 lux/1.2 footcandles with an average uniformity of 4:1 are recommended for major pathways
- improving safety through participation and use
- creating a sense of ownership
- encouraging territorial reinforcement in Frontage/Market Streetscape Zone

6.2.5 PLANTING

As one of the HOCMP Pillars, planting in Downtown will bring many social, economic and environmental benefits as well as contribute to the public realm. We respond positively to the presence of street trees because of their beauty and the shade that they provide. They also help in improving air quality, lower building energy needs in the summer, buffer wind, increase property values, and can supplement passive stormwater management system through the up-take of water. Trees are able to provide all these benefits at a relatively low cost. To ensure trees reach their maximum potential and benefits in a harsh urban environment, the following will need to be considered early in the design process, and evaluated with current City practices in order to make any necessary policy changes:

PLANT SPECIES SELECTION

The following should be considered when selecting plant species:

- Select the right tree for the right space. Tree species need to be tolerant of urban conditions that they are placed in. If salt is to be used as part of surface operation and snow removal practices, salt

Tree Species Used to Create Diversity and Seasonal Colour

Ornamental Grasses Add Colour and Distinctiveness While Being Highly Tolerant of Urban Conditions

tolerant species such as Green Ash (Fraxinus pennsylvanica) should be considered.

» Select tree species, as possible, based on a maximum mature growth area of 8.0m width and 15m height.

» Select tree species that are identified in the City of Lethbridge's Construction Specification Section 07020; Small, Medium and Large street tree lists.

» Avoid use of monocultures (single tree species) to promote bio-diversity and avoid catastrophic loss due to disease and pest infestation.

» If a single species is to be used, a strong pest and disease management strategy needs to be developed as part of a maintenance program.

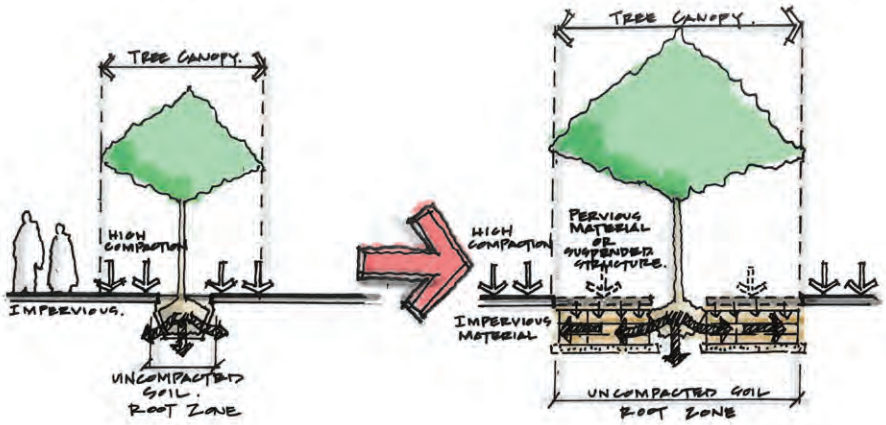
» Use of native and native-adaptive planting that is drought tolerant will reduce water irrigation requirements. It should be noted that during the critical one to two year establishment period increased irrigation times, compared to typical species requirements, are recommended.

» Select low shrub, ornamental grass and perennial plant species (maximum 0.45m height) to preserve visual sightlines, especially at intersections.

» Select hardy drought tolerant shrub, ornamental grass and perennial plant species that are able to tolerate high user conflicts without impacting growth form. Ornamental grasses are ideal planting in urban streetscape environments owing to the variety of species, growth characteristics and ability for damaged vegetation to quickly grow back.

STREET TREE IMPLEMENTATION STRATEGIES

» Maximize available soil volume to maximize tree canopy and tree vigor. Tree growth is restricted by its root growth. If poor soils or low soil volumes are provided, such as in urban environments, tree size and health will be restricted. Best practices suggest a minimum 36 cu.m of soil volume per large tree.



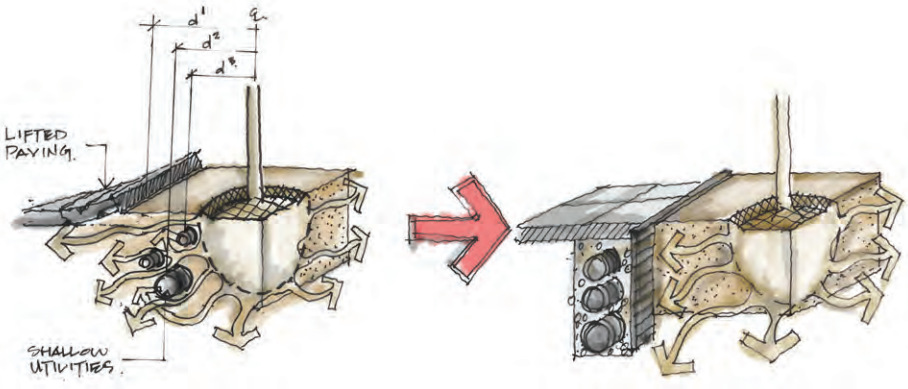
Increased Soil Volume Equals Increased Urban Tree Health, Vigour and Size

» Use of 'suspended paving systems' such as Silva-Cell® technology to support paving while providing necessary soil volumes for trees (see Sustainable Streetscape Strategies).

» Reduce specified compaction rates of sub grade in critical 0.6m – 0.9m root depth to 75% Standard Proctor Density.

» Scarify existing subgrade soils prior to placing new soils to improve drainage.

» Minimize Conflicts with underground infrastructure and provide root-deflecting devices, such as DeepRoot® root barriers, adjacent to paving and utilities.



Strategic Location of Shallow Utilities and Use of Root Barriers Help to Reduce Street Tree Conflicts in UrbanAreas

- Tree grates are beneficial in urban environments where compaction is an issue, they do however have maintenance issues with accumulation of garbage and debris. Over time it should be anticipated that tree grates will be removed once the trunk flare starts to reach maximum tree grate openings.
- Design for future root and trunk growth (removable or break away tree grate system).
- The best option for tree staking is the 'no-staking' option. Staking in an urban environment can create user conflicts due to lack of space around the tree and care needs to be taken that any staking does not penetrate the rootball system. It is also important that any guy wires holding the tree are removed after the root system is established, and before the tree is girdled by the tie-backs.
- Owing to the wind conditions that Lethbridge is noted for, some form of temporary tree staking may be required. This will need to be evaluated at a detail design level and appropriately detailed. One solution is to provide a tree guard that will also be used as an anchor for nylon strapping such as ArborTie® by DeepRoot.

TREE AND PLANTING MAINTENANCE

The following tree and planting maintenance requirements will need to be considered early in the design process, and evaluated with current City practices in order to make any necessary policy changes:

- Develop landscape maintenance guidelines and manuals based on short-term establishment and long-term maintenance programs.
- Establish a regular tree monitoring and pruning program and specifications to identify tree health issues earlier rather than later.
- Establish an annual testing and fertilization program and specifications to replenish soils.
- Establish a pest and disease monitoring and management program.

6.2.6 IRRIGATION

COMPONENT SELECTION CRITERIA AND WATER SOURCE SUPPLY

The following should be considered for the selection of water source supply:

- Irrigation systems should be engineered for high water usage efficiency.
- Components should comply with City of Lethbridge, local and international common standards to guarantee a continued components service, upgrades and renovation as required.
- More than likely the source of irrigation water will be from the Municipal domestic water service due to the proximity of existing infrastructure, ease of connection, and reliability of a constant source of a water at a constant quality. However, this should not preclude investigation, at a detail design level, into alternate sources of water for irrigation such as: groundwater, grey water, stormwater capture from adjacent buildings, and treated effluent water (T.E.W).
- Irrigation components should be selected that are compatible to the water supply source and colour code irrigation components based on this supply (i.e. Use purple colour components for T.E.W).
- Water application rates should be quantified and qualified, flow rates and schedules should be based on landscape material peak demand to ensure adequate availability and water source capacity.

DESIGN CRITERIA

Best practice indicates that the following attributes would create a desired watering system:

- components selected for longest life-cycle durability
- configuration designed for modular installation

» sub-surface installation with a minimal foot print above ground

» consider using solar power supplies as part of Sustainability considerations

» provide irrigation components that allow for supplemental manual watering

OPERATIONS AND MAINTENANCE

Suggestions that would improve operations and maintenance include:

» allowing for Irrigation Central Controls Systems (ICC) and remote monitoring and management

» providing a two-way communication to and from the site to optimize system operation

» employing weather or soil moisture factors to optimize the irrigation operation

» establishing flow monitoring and management capabilities to minimize or eliminate problem

» employing low-power, wireless sensor networks to reduce operating energy costs

6.2.7 SITE FURNISHING

Site furnishings can cover a wide range of site amenities, such as benches, trash receptacles, bike racks, bike shelters, kiosks, wayfinding and banner poles. The goal is to harmonize their selection (design), scale and location to create a pleasant, unified, clutter-free, safe, low maintenance, and pedestrian oriented environment.

A representative selection of common site furniture elements has been developed to correspond with the different streetscape characters of: Historical, Transitional, and Contemporary (see Kit of Parts). In addition to selecting the correct style, the following criteria should also be considered:

BENCHES

» Bench seating should be selected to coordinate with other site furnishings, in terms of character, materials, and colour - preferably selected from a 'family of elements' from the same manufacturer in order to create an aesthetically appealing public realm (see Kit of Parts).

» Bench seating should face the principal pedestrian routes, and locations coordinated with planting areas within the public realm to ensure maximum visual interest and vegetated relief to street traffic.

» Bench selection should be a minimum of 1.8 metres in length and have a center arm to discourage users from lying on the bench. As an alternative individual seating could be considered. Back support should be provided for user comfort.

» Benches should be manufactured using high quality materials and fabrication methods in order to reduce maintenance requirements.

» Benches should be manufactured using environmentally sustainable practices and materials, be vandal resistant and, if possible, locally manufactured for ease of replacement of parts.

» Benches should be surface mounted on concrete sidewalks or pads. In paving areas that use pre-cast concrete pavers, threaded rods should be set into concrete below the paver surface for mounting.

» Adequate leg room in front of the bench to avoid user conflicts should be ensured.

Benches Encourage Pedestrian Use and Comfort

TRASH RECEPTACLES/ RECYCLING

» Waste receptacles should be selected to coordinate with other site furnishings, in terms of character, materials, and colour - preferably selected from a 'family of elements' from the same manufacturer in order to create an aesthetically appealing public realm (see Kit of Parts).

» Waste receptacles should be located in close proximity, but not adjacent to, bench locations to avoid odour nuisances and to be located outside of the primary flow of pedestrian and cycle traffic.

» Final selection of all trash cans must be approved by City of Lethbridge Parks Operations at the detail design level.

Simple Elegant Trash Receptacle by Victor Stanley

At this time, a recycling program has not been identified by the City of Lethbridge as a requirement applicable to the public realm design for the selected study streets. However, given the precedence of the study, length of streetscape involved, and level of public environmental awareness, there is a great opportunity for implementing a recyling program as part of the Clean Sweep Program that already exists.

» Further study into the possible use of recycling containers should be part of the detailed design development, with City input on the feasibility and timing of this program.

BOLLARDS

» Traffic Bollards should be selected to coordinate with other site furnishings, in terms of character, materials, and colour - preferably selected from a 'family of elements' from the same manufacturer in order to create an aesthetically appealing public realm (see Kit of Parts).

» Traffic Bollards should be used at points of conflict between pedestrian and vehicular traffic. Typical locations include at major (4-way) intersections, and in the edge zone between raised on-street parking stalls and pedestrian circulation.

» A cast-in-place concrete base should be provided at traffic bollard locations for reinforced mounting.

Bollards Add to Character of the Public Realm

BIKE RACKS, SHELTERS AND LOCKERS

- In order to promote biking as an alternative mode of transportation, facilities for securing bikes need to be provided. Bike parking can allow for a single bike, multiple bikes, or allow for the storage of both bikes and belonging for longer stays.
- Bike parking does take up space within the public realm owing to the length of a bike (1.80m). Placement of various bike amenities needs to be part of a larger overall Downtown bike facility strategy to avoid wasteful space and costs.
- Individual bike parking takes up less space and should be part of a larger strategy of placing bike racks at regular intervals along public realm for short duration stays.
- Bike racks should be selected to coordinate with other site furnishings, in terms of character, materials, and colour - preferably selected from a 'family of elements' from the same manufacturer in order to create an aesthetically appealing public realm (see Kit of Parts).
- Bike shelters (with bike parking corrals) take up considerably more space than individual racks, therefore their use and placement needs to be more centralized and complementary to major destinations and attractions within the Downtown and should be well lit and signed.
- Owing to the area required for bike shelters, locations should not impede pedestrian circulation and should not interfere with major sightlines. It is recommended that bike shelters are located close to major intersections and within the expanded public realm zones or within vehicle parking stalls claimed by the City for the purpose of bike parking.
- Storage lockers allow for more security for cyclists in leaving their bikes and possessions for longer duration stays. Storage lockers can be either freestanding elements within the public realm, or incorporated into vehicle parkade structures. The latter is the preferred option due to efficiency and economy of means, as well as the physical area involved. Bike lockers could be rented or leased, therefore would require administration.
- Bike shelters provide more protection from the weather owing to the covered roof. The roof structure provides an opportunity to incorporate slight stylistic changes and should be designed or selected to fit with established character zones (see Kit of Parts).

Simple Elegant Bike Rack by Maglin

Covered Bike Storage with Signage and Wayfinding

» Freestanding storage lockers for cyclists should be provided at Galt Gardens, and other major destination points within the Downtown.

» Catalogue specified storage lockers are utilitarian in nature, lacking any visual character. Where possible, such as in Galt Gardens, bike lockers should be incorportated into existing architectural styling or public realm themes through the use of customized structures (i.e. pergola) or anti-graffitti vinyl photos wrap programs (see Section 6.2.3 - Maintenance).

STREETSCAPE PAGEANTRY

The use of banner poles and nylon banners are an easy and effective way to annimate the streetscape. In order to impletment this strategy the Ctiy will need to update their regulatory environment. If implemented the following are potential benefits:

Pageantry Banners Used to Advertise Civic Events

» Two-dimensional art works, in the form of banners attached to pedestrian light poles, provide an effective method of 'place-making'.

» Banners can be dye-printed on transparent nylon, which allows light to pass through and creates an illuminated effect.

» Streetscape pageantry can be an easy and cost effective method to introduce colour and images from the City or Community to advertise upcoming events and create vibrancy for in the Downtown.

» There are a number of festivals and events that are specific to the City of Lethbridge (i.e. Whoop-Up Days) which has great potential for a street banner program.

» Other themes for future exploration include: Art and Culture (in support of the SAAG and Galt Museum); food and shop (in support of area merchants); building heritage (to bring awareness to the Lethbridge's architectural diversity in the Downtown).

» Railway Heritage (the role CPR played in opening the west) is another possible theme.

WAYFINDING

Wayfinding is intended to both enhance the visual quality of the public realm as well as guide users to and from their destinations, through easy-to-understand, attractive signage systems. It principally assists pedestrians to orient themselves and navigate to key destinations within walking distance. This system can be developed in concert with any Streetscape Pageantry proposed.

The selected graphic layout of wayfinding for Downtown should be distinctive for the Downtown area yet maintain a level of consistency and cohessivness with the City-wide wayfinding strategy.

Due to the number of key civic and institutional facilities within Lethbridge's Downtown, it is suggested that a strategic wayfinding program be developed to direct people to the following key destinations:

- Galt Gardens and the Southern Alberta Art Gallery
- The Galt Museum
- Chinatown District
- City Hall
- University of Lethbridge Downtown Building
- Lethbridge Community and Performing Art Centre (when completed)
- Major shopping and eating district such as Park Place Mall and Lethbridge Centre
- Incorporate wayfinding signage with transit shelters and bike parking facilities
- Public washroom in the Galt Gardens

Wayfinding Kiosk Also Used for Herigate Interpretation

URBAN DESIGN

Urban Design is best used in situations where smaller gestures of uniqueness within the public realm are required, which do not warrant a more a formal public art process.

» The use of urban design elements within the public realm provides an opportunity to create features of distinction that attract, engage and can educate the user.

» Urban Design is typically undertaken at the detail design level, where cultural or regionally specific details are incorporated into the design of streetscape elements (i.e. a bridge trestle and girder detail used in the structure of a bike or transit shelter).

» Opportunities for Urban Design explored at a detailed design level include: incorporation of details from iconic landmarks such as the High-Level Bridge; railway details; agricultural details; historic maps embedded into pavement surfaces; special lighting or custom fixtures; custom benches and seating; cultural and historical imagery for anti-graffiti wraps.

Transit Shelters Add to Character of Public Realm

Urban Design and Gateway Element Made From Steel Trusses

Example of Steel Trusses Used for Lethbridge's CPR High Level Bridge

6.2.8 LIGHTING

Lighting is the primary method to ensure pedestrians feel safe and secure at night by increasing visibility. Adequate lighting is essential in the Downtown to encourage pedestrian activity after business hours, and in promoting a more liveable Downtown.

The main objective of pedestrian lighting is to increase the watching opportunities, or 'eyes on the street', and set the tone for beautifying or enhancing the pedestrian environment through appropriate selection of fixtures. Lights also need to be selected to minimize glare and excessive light pollution in order to preserve the evening dark sky.

Currently a variety of different types of light fixtures exist in the Downtown. The Cobra street light is the most common, but lacks the appropriate aesthetic and pedestrian scale. Existing globe lights, while having the appropriate scale, lack the ability to control the illumination pattern; creating excessive glare.

New pedestrian and street lighting is proposed for Lethbridge's public realm. Lighting characteristic that should be considered include:

- Street lights of 10.0m in height or more should be complimentary to pedestrian lights (see Kit of Parts) including pole, base and colour in order to create unified and aesthetically appealing public realm.
- Street lights should accommodate, by means of a davit arm assembly, pedestrian scale fixtures at 6.0m height.
- Preliminary plans identify street lights at a maximum spacing of 30.0 meters on-centre to coincide with street tree planting and pedestrian lights. Adaptation methods, such as the utilization of existing street lights, should be considered with regards to any existing street lights that are within the edge zone.
- Pedestrian lights should be a minimum of 6.0m in height to accommodate banner arms. If hanging baskets are considered, provisions should be made to allow for irrigation lines to be incorporated into the poles to avoid exposing irrigation lines.
- It is recommended that the City of Lethbridge evaluate the use of Light-Emitting Diode (LED) as a lamp option for outdoor street and pedestrian lighting. LED lights are more energy efficient and offer longer service-life, resulting in savings in energy and maintenance. LED is more expensive and performance is largely dependant on the ambient temperature of the operating environment.
- Preliminary plans identify pedestrian lights at a maximum spacing of 15.0 meters on-centre to coincide with street tree planting and street lights.
- Special lighting for the Chinatown District should be considered as part of urban design and elements of distinction.
- Pedestrian lighting should have a lux/ footcandle level sufficient enough to uniformly light adjacent sidewalk in order to meet 'High Pedestrian Conflict' illumination classification levels as recommended to accomplish Crime Prevention Through Environmental Design (CPTED).
- Weather-proof outdoor receptacles allow for easy access to power for special event lighting such as Christmas street lighting. Ideally these receptacles should be located in the street light poles and are optional to most light and pole manufacturers.
- The use of string lighting for street trees is discouraged, as the wiring and electrical supply conduits conflict with the tree root system and will eventually girdle and strangle the tree.

Pedestrian Lighting to Provide Uniformly Lit Pathway, While Preserving Evening Skies

Example of Distinctive Lighitng Used in Chinatown District

6.2.9 SUSTAINABLE STREETSCAPE STRATEGIES

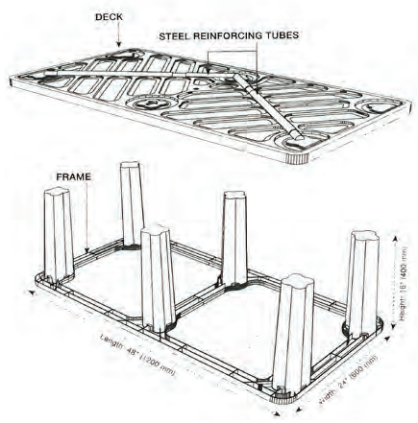
The need for a higher level of sustainability is outlines earlier in Section 5.8, which used the City of Lethbridge's Integrated Community Sustainability Plan/Municipal Development Plan (ICSP/MDP) as its basis. Many of these strategies incorporate new construction methods, technologies and materials. As with any new system, there is a cost premium connected to them. These higher costs are typically associated with material supply and installation costs, and when viewed in the context of long term reduction of natural resources, maintenance and operation costs (life-cycle costing) can become more economically feasible.

Bio-Infiltration Planting Used to Detain Stormwater Run-Off

The following are examples of sustainable streetscape strategies directly applicable to the public realm and should be considered during detail design:

AquaPave System Used to Detain Stormwater Run-Off

- Planted bio-infiltration areas can be used to capture run-off from the sidewalks and parking surfaces, thus minimizing the stormwater impacts and need to upgrade existing infrastructure network.
- In addition to stormwater detention, the plants and soils will help filter suspended solids and contaminants from the water before it eventually returns to groundwater. A geotechnical report and review of soil requirements would be required to determine the retention capabilities of existing soils.
- For LEED projects, it is required that the site use high albedo paving for 50% of hard surface areas with a Solar Reflectance Index (SFI) of 0.30 or greater, to match LEED® requirements for Sustainable Site credit 7.1 Heat Island Effect Non-Roof (SSc 7.1).
- Permeable On-Site Stormwater Source Control Systems, such as AquaPave®, combines the parking, infiltration and detention facilities into one location. Benefits include the reduction of runoff directly entering and taxing the municipal storm system, intercepting and filtering of pollutants such as oil contaminates and asbestos from brake pads, and recharging of the groundwater table.
- AquaPave® has life-cycle cost benefit that can out-way the initial installation cost premiums and semi-annual maintenance and has been successfully used in a number of Canadian cities and is appropriate for Lethbridge. Care must be taken to limit the amount of sand used in winter maintenance, and hydrovac out sediment build-up on a semi-annual basis to ensure maximum infiltration through the paver system.



- The use of suspended pavement systems, such as SilvaCell®, provides the required structural support for at grade pavement systems, while minimizing compaction rates and maximizing the soil conditions necessary for tree roots; maximizing potential tree growth, tree health, and tree vigour in a urban environment.
- Any form of recycling, regardless of how much or its current material state, will help to minimize the demand on future resources and pollution we produce. The specification of high recycled content in materials, provision of recycling trash bin systems to minimize waste directed to landfills, and re-directing of construction waste to recycling depots rather than landfills all will help in preserving our valuable natural resources for future generations.
- At detailed design, consideration should be given to the use of a overflow pipe connection between the bio-infiltration and the existing municipal storm infrastructure system to avoid excessive water build-up during major storm water events, or in poorly drained soils.

6.3 PRELIMINARY COSTING METHODOLOGY

MMM has prepared an Estimate of Probable Cost for the public realm works. The purpose is to provide the City with the most cost effective means of achieving the recommended improvements and form the basis for targeting future Capital Work budgets. To achieve this, MMM has provided a base line cost that covers the minimum items needed for the function of the proposed design; paving, lighting, site furniture and site trees.

In addition, MMM has provided costing for upgrades to base-line items (Preferred Design) including costs for Optional Items that will greatly add to the character and quality of the public realm, as well as contribute to the sustainability objectives of Lethbridge's ICSP/ MDP.

» For budgetary purposes, the amounts identified have been rounded off.

» Base Design works include asphalt for parking and multi-modal pathways, and standard site furnishing.

» Preferred Design works include enhanced paving, decorative site furnishing, and "sustainable design strategies".

» Preferred Design options include both the base design and upgrade items from the Estimate of Probable Costs contained in the appendices.

» Optional items include works that can be added to base design / prepared design or phased in at later dates such as; Public Art, Urban Design items, and additional accent lighting.

» For identification of items included in Base Design, Preferred Design and Optional Items, please reference the Estimate of Probable Cost in Appendix B.

5 Street S has been separated into two phases based on an anticipated construction implementation strategy of :

» 1 Avenue S to 4 Avenue S being completed in the first phase, and

» 4 Avenue S to 6 Avenue S being completed in the second phase.

Phasing of works on 5 Street S is hoped to maintain available on-street parking in a logical sequence to compensate for displaced parking in front of businesses during construction; thereby minimizing the disruption of business activity (see Implementation Plan).

It is hoped as many upgrades and optional items as possible will be incorporated into future construction projects which might also include active partnerships with private stakeholder groups, provincial and federal grant opportunities, and life-cycle costing analysis of 'green' infrastructure approaches versus more conventional approaches.

A more detailed Estimate of Probable Cost is indicated in Appendix B; including a list of cost items, approximate area take-offs and quantities, unit costs rates, and contingency factor.

Table 6.3 - Preliminary Estimate of Probable Costs

Selected Study Streets	Base Design	Preferred Design	Optional Items
5 Street S (Phase 1)	$2,600,000	$3,125,000	$1,000,000
5 Street S (Phase 2)	$2,050,000	$2,500,000	$575,000
2 Avenue S	$2,150,000	$2,500,000	$700,000
3 Avenue S	$2,700,000	$3,250,000	$400,000
Total	$9,500,000	$11,375,000	$2,675,000

IMPLEMENTATION PLAN

The Implementation Plan is meant to establish a strategy for putting into action the recommendations contained in this report. Some of the recommendations re-confirm those previously identified in the Heart of Our City Master Plan, while other recommendations are new and specific to the selected study streets. Some of the actions can be implemented in the immediate term of one to three (1-3) years, while other actions will require considerable coordination of resources and efforts, and therefore have a longer time horizons.

The City of Lethbridge will ultimately determine the priority and timing of these actions through planning of capital projects, identifying sources of funding, available annual Capital Work budgets, coordination of available resources and capacity of other City departments, planned infrastructure improvements, and the establishment of public and private partnerships, where feasible.

Given the number of varying factors that need to be considered in implementing the recommended works, this report focuses on making sure “what is needed” is identified early in the process. This will help mitigate any potential negative effects and streamline the construction process.

The Components of future construction projects include the following:

» methods of construction
» timing of construction
» space (phasing) of construction
» economic, social, and environmental considerations
» public relation strategies

Where appropriate, the report identifies advantages and disadvantages of different methods of construction, based on minimizing disruptions to adjacent property owners, that need to be considered when prioritizing works. The report also provides an example of a weighted value matrix approach to prioritizing works. This will create a strong rationale to support the decision making and implementation planning process.

Ultimately the preferred construction method and sequencing of work will need to be determined during the detailed design and planning phases, with input and feedback from adjacent property and business owners. The implementation of construction should be within a statuatory plan adopted by Council and tied to the Capital Improvement Program.

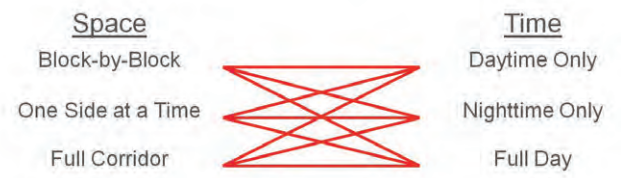
7.1 METHOD OF CONSTRUCTION

Planning for the construction scheduling and construction phasing requires coordination and input between the City of Lethbridge and the property owners who will be affected by the work. For property owners the time of year, duration of construction, and disruption of accessibility are significant issues that need to be taken into consideration when determining the construction scheduling. During the planning phase of construction the Downtown BRZ, property owners, residents and business operators should be invited to attend construction planning meetings. This will allow the planners insight into the owners/ business concerns in order to determine how to minimize the impact of operations.

There are several options to evaluate when determining the most favourable time for the implementation of the proposed works. Different construction methods should be reviewed for each selected street as methods may vary according to the unique characteristics of each roadway.

There are nine potential methods to re-construct the streets in Downtown Lethbridge. These methods include nine combinations involving the amount of construction space and time required for construction. Construction can be undertaken block-by-block, one side at a time, or for the whole corridor. Furthermore, this can be undertaken during regular work hours, off-peak hours, or continuously as seen below.

Figure 7.1.1 – Construction Combinations



7.1.1 TIME OF CONSTRUCTION

The time of construction may be either daytime only, nighttime only or full day construction. Daytime construction will incorporate construction between 7:00 a.m. and 10:00 pm. Nighttime Construction involves work that is intended to minimize impact to businesses; nighttime is defined by the City Noise Bylaw as “the period beginning at 10:00pm and ending the following day at: (i) 7:00 am, if the following day is a weekday; or (ii) 9:00 am if the following day is a weekend”. Operations for nighttime construction tend to begin either after the afternoon traffic peak period (typically 6:00 pm) or later, to reduce impact on local businesses. Full day construction incorporates both daytime and nighttime construction to reduce the total duration of the construction period. A summary of the advantages and disadvantages for the time required for construction that may be considered in the evaluation process is provided in Table 7.1.1.

Table 7.1.1 – Advantages and Disadvantages of Construction Time

Method of Construction	Advantages	Disadvantages
Daytime	• lower worker accident rates • lower construction costs • no light imposing on residents in the Downtown area as lighting is not required for the site • availability of material supplies and of key personnel to make onsite decisions during the day • noise issues lower for residents	• greater impact on surrounding businesses • longer duration impact on businesses • limited pedestrian access and movement during the day • increased noise, dust and air pollution during the day from construction equipment • more air pollution during the day for construction workers due to normal public traffic • less secure work environment – increased public movement in and around the construction zone • higher temperatures during summer construction • vehicle detours required • lower number of on-street parking available during construction
Nighttime	• lower impact on surrounding businesses • high accessibility during the day time – a minimum of one lane open per direction of travel • ease of pedestrian access and movement during the day • reduced noise, dust and air pollution during the day from construction equipment • less air pollution during the night for construction workers due to reduced public traffic • lower temperatures during summer construction • more secure work environment – reduced public movement in and around the construction zone • higher number of on-street parking available during construction	• longer duration impact on businesses • higher construction costs • increased public disturbance – the effect of noise, equipment operation, dust, and air pollution, etc. on the surrounding residential area • to adequately illuminate construction zones, lighting shields would likely be required to minimize light trespassing impacts on residents within, or adjacent to, construction areas • greater visibility issues and higher worker accident rates • equipment breakdown with repair being a problem as parts may not be available until the next day • reduced material supplies at night • key personnel to make onsite decisions may not be readily available

Table 7.1.1 continued

Method of Construction	Advantages	Disadvantages
Full Day	• shorter duration impact on businesses • ability to distribute work that may be best performed during the night or day to reduce impact on businesses and residents	• limited pedestrian access and movement during the day • more air pollution during the day for construction workers due to increased public traffic during the day • vehicle detours required • lower number of on-street parking available during construction • less secure work environment – increased public movement in and around the construction zone during the day • greater visibility issues and higher worker accident rates • increased public disturbance – the effect of noise, equipment operation, dust, and air pollution etc. on the surrounding residential area

7.1.2 SPACE FOR CONSTRUCTION

The space required for construction varies between block-by-block construction, one side of a block construction or full corridor construction. Limiting construction to one or two blocks on selected streets would confine the impactto a smaller area. One side of a block at a time construction would limit the construction to a smaller area than block construction and would, at a minimum, maintain movement of goods and people along the entire corridor. Full corridor construction would provide limited corridor access to the roadway and public realm under construction for the length and duration of the project. A summary of the advantages and disadvantages for the space required for construction that may be considered in the evaluation process is provided in Table 7.1.2.

Table 7.1.2 – Advantages and Disadvantages of Construction Space

Method of Construction	Advantages	Disadvantages
Block Construction	• shorter duration impact on businesses • higher number of on street parking spaces available during construction • shorter distance for pedestrians to access businesses • construction equipment and noise limited to a smaller area	• greater impact on surrounding businesses • limited pedestrian accessibility • vehicle detours required
One Side at a Time	• lower impact on surrounding businesses • construction equipment and noise limitedto a smaller area • minor vehicle detours required with movement maintained along entire corridor	• longer duration impact on businesses • limited pedestrian accessibility • removes on-street parking along a portion of the corridor for the duration of construction • less secure work environment – increased public movement in and around the construction zone • higher construction costs
Full Corridor	• shorter duration impact on businesses • lower worker accident rates • more secure work environment - reduced public movement in and around the construction zone • lower construction costs	• greater impact on surrounding businesses • limited pedestrian accessibility • vehicle detours required • increased noise, dust and air pollution from construction equipment • removes on-street parking along the corridor for the duration of construction • increased distance for pedestrians to access businesses

7.2 DETERMINING CONSTRUCTION METHOD

In order to aid the City in identifying preferred construction methods on selected streets, several evaluation criteria and corresponding performance measures of evaluation criteria have been proposed to determine construction preferences. The evaluation criteria include:

» Social Impacts

» Environmental Impacts

» Economic Impacts

Each of the evaluation criteria consists of performance measures which are summarized for each of the criteria described:

SOCIAL

» Pedestrian access and movement considers the increased distance and reduced access for pedestrians during construction and its reduction in pedestrian mobility.

» Noise pollution from construction equipment considers the noise created by construction and its impact on nearby residents.

» Delays to traffic and other road users.

ENVIRONMENTAL

» Dust and air pollution from construction equipment considers the impact of dust and air pollution to businesses and residents in the immediate vicinity of the construction area.

» Air pollution for construction workers due to public traffic considers the pollution that workers are exposed to from daytime traffic.

» Vehicle detours considers the delays created for drivers because of detours and the resulting increase in greenhouse gases.

ECONOMIC

» Construction duration impact considers the impact that the duration of construction may have on local businesses.

» Availability of on-street parking considers the removal of on-street parking from a construction zone and its potential impact on businesses.

» Construction costs considers the costs of construction and the increased cost for methods such as nighttime construction. Considerations for construction cost include:

- Security of work environment considers public mobility around the construction site and the cost to secure the working area to protect the public.
- Worker accident rates considers worker safety and the cost associated to maintain the same level of safety for all construction methods.
- Availability of material supplies and key personnel considers the decrease in productivity if materials or key personnel are not available during night construction.
- Temperature for construction workers considers the higher summer working temperatures during the daytime and its impact on construction workers.
- Light trespassing to residential areas considers the cost to mitigate light trespassing from the lighting required for nighttime construction.

The performance of each measure may be determined by assigning ratings, or more aggressively a score of one, zero, minus one (depending on whether the impact is beneficial or detrimental), to each of the measures and multiplying by assigned weights for each evaluation criteria and measure. Ratings, or scores, may be assigned for each performance measure for both construction space in Table 7.2.1, and the time of construction in Table 7.2.2. A total score for the performance of each of the nine construction

methods may be obtained by summing the scores in Table 7.2.3 from the corresponding cells in Table 7.2.1 and Table 7.2.2. The process is illustrated below.

Table 7.2.1 - Required Construction Space

Evaluation Criteria	Weight	Block-by-Block	One Side at a Time	Full Corridor
Social	wso	aso1	aso2	aso3
Environmental	wen	aen1	aen2	aen3
Economic	wec	aec1	aec2	aec3
Total		A1= aso1+ aen1+ aec1	A2= aso2+ aen2+ aec2	A3= aso3+ aen3+ aec3

Note: Each of the three evaluation criteria consists of performance measures, each with their own individual weighting.

Table 7.2.2 - Time of Construction

Evaluation Criteria	Weight	Daytime Only	Nighttime Only	Full Day
Social	wso	bso1	bso2	bso3
Environmental	wen	ben1	ben2	ben3
Economic	wec	bec1	bec2	bec3
Total		B1= bso1+ ben1+ bec1	B2= bso2+ ben2+ bec2	B3= bso3+ ben3+ bec3

Note: Each of the three evaluation criteria consists of performance measures, each with their own individual weighting.

Table 7.2.3 - Construction Method Weighting Table

Evaluation Criteria	Daytime Only	Nighttime Only	Full Day
Block-by-Block	A1+B1	A1+B2	A1+B2
One Side at a Time	A2+B1	A2+B2	A2+B2
Full Corridor	A3+B1	A3+B2	A3+B2

At the end of the evaluation process, a desirable construction method may be chosen from the nine methods based on the score that it achieves.

7.3 STREET CONSTRUCTION PRIORITY

In order to aid the city in identifying the priority sequence for implementing construction of Downtown streets, several evaluation criteria and corresponding performance measures of evaluation criteria are proposed. As before, evaluation criteria include the following considerations:

» Social Impacts

» Environmental Impacts

» Economic Impacts

Each of the evaluation criteria consists of performance measures; which may be determined by assigning ratings to each of the measures, then multiplying by assigned weights for each evaluation criteria and measure. A summary of the performance measures for each of the criteria are described:

SOCIAL

» Potential to improve historical/cultural awareness includes the consideration of the number and significance of historical and cultural facilities in the Downtown that may benefit from improvements.

» Making changes on streets that have a high volume of traffic (pedestrian and vehicular) will help raise the public profile of the area and maintain support for further improvements elsewhere.

» Potential to improve streetscape considers the opportunity to improve a streetscape given its existing condition. For instance, a street that currently has a high aesthetic appeal may score lower than another street that has more opportunities to improve the streetscape and add character to the Downtown.

ENVIRONMENTAL

» Potential to stimulate modal shift to walking and cycling includes consideration of the active mode facilities that may be implemented on the street and the potential to encourage a shift to more active modes. For instance, a dedicated cycle path has a greater opportunity to attract new users compared to a marked curb lane.

» Potential to stimulate modal shift to transit considers exposure to transit and the potential to increase the appeal of end of trip facilities for users.

ECONOMIC

» Capital funding includes available City funding that may be devoted to a specific street.

» Other sources of funding may include, but are not limited to, property developers and other levels of government (examples include: Alberta Municipal Infrastructure Program, Federal Gas Tax Fund, Basic Municipal Transportation Grant, Strategic Transportation Infrastructure Grant and the Alberta Historical Resources Foundation).

» Congruent with capital expenditure/development, includes consideration of available resources and the capacity of other other city departments, such as waterworks, as well as the development of significant sites within the Downtown.

» Cost of utilities required over 5 years includes the consideration of expected expenditures on the street over 5 years, accounting for past improvements, and the potential to incorporate those improvements with construction schedules.

» Pavement condition considers the condition of the street and the potential to incorporate rehabilitation within construction scope and scheduling.

» Potential for stimulating business/development considers the potential to increase the vitality of businesses and encourage development in the area.

Table 7.3 - Street Construction Priority Matrix

Evaluation Criteria	Measure	Street
Social	Potential to improve cultural/historical awareness	Ratings to be assigned to each street
	High visual impact	
	Potential to improve on streetscape	
Environmental	Potential to stimulate modal shift to walking and cycling	
	Potential to stimulate modal shift to transit	
Economic	Capital funding	
	Other sources of funding	
	Congruent with capital expenditure/ development	
	Cost of utilities required over 5 years	
	Pavement condition	
	Potential for stimulating business/development	

7.4 PUBLIC RELATIONS DURING CONSTRUCTION

Regardless of the type of construction, public and business awareness of construction activities is a key factor to help alleviate problems associated with construction. A well-organized public relations campaign that keeps everyone informed about the rationale, time, location, and duration of projects, will assist in obtaining public support.

In the preliminary construction planning phase, working closely with the BRZ and the Downtown merchants and residents can assist in identifying potential issues at the outset. A comprehensive parking strategy, an effective traffic maintenance plan and alternative construction staging at an early stage will help mitigate issues. A protocol with the BRZ could also be an effective means to inform local merchants, residents and the pubic as well as promote the projects.

There are several mediums that are currently used to dispense construction information and it is recommended that a combination of the media outlets be utilized to maximize the dissemination of the information to the public:

- project signage
- local newspaper
- local radio
- local television
- internet website
- social media

Notwithstanding the type media that is utilized, information provided should be as concise and current as possible.

7.5 IMMEDIATE CONSTRUCTION PRIORITY

To progress the work completed in the HOCMP, this study identified three streets as priorities for reconstruction. The recommended short-term action (1-5 years) is dependent on the City's objectives, preferences, available funding and condition of utility infrastructure.

Immediate construction priorities may be the reconstruction of either 3 Avenue S or 2 Avenue S. There are many considerations to begin the project on either street and dependant on the need to replace existing utility may push one project ahead of the other.

In determining the short term priority for reconstruction of 3 Avenue S or 2 Avenue S the following factors were considered:

3 AVENUE S

- classification in HOCMP as a Main Street and a District Gateway Street
- high visual impact within the Downtown
- significant civil and heritage buildings
- development underway, specifically the Lethbridge Community Arts Centre
- grander showcase with higher numbers of pedestrians and vehicles to benefit from the functional and aesthetic improvements
- strengthen connection to Galt Gardens, South Alberta Art Gallery, Performing Arts Centers and introduce new public landmarks
- enhancement of a primary shopping and commercial area including the unique commercial and boutique district along 6 Street S
- need to improve tree planting, universal accessibility and street furniture

2 AVENUE S

- » classification in HOCMP as a Promenades and District Gateway Street
- » significant civil and heritage buildings
- » lack of landscaping, decorative paving, pedestrian lighting, universal accessibility and street furniture
- » shorter term development potential
- » City has planned capital works (within 3 years or less)
- » aging infrastructure exhibiting low underground utility quality (including numerous water main breaks)
- » low impacts during construction on vehicular and pedestrian traffic

The City can use the priority selection method in section 7.3 to determine its preferences.

7.6 LONG TERM CONSTRUCTION PRIORITY

The reconstruction of 3 Avenue S or 2 Avenue S will become a showcase to energize the public and build enthusiasm for completing the remaining segments of selected streets. A longer term (5-10 years) construction plan could begin with the reconstruction of 5 Street S since it connects with both 3 Avenue S and 2 Avenue S.

It is recommended that the reconstruction of 5th St S be undertaken in two phases:

- » Phase 1- 1st Avenue S to 4th Avenue S
- » Phase 2 - 4th Avenue S to 6th Avenue S

Consideration for night time construction should be considered for areas that do not abut residential/ hotel properties. During the construction staging every effort should be made to maintain one lane open in both directions for the duration of the work.

The final phase would be the reconstruction of either 2 Avenue S or 3 Avenue S, dependent on prior corridor construction.

CONCLUSION AND FUTURE RECOMMENDATIONS

8.1 CONCLUSION

Implementing as many of the ideas and recommendations contained within the Heart of Our City Master Plan (HCOMP) and the Public Realm and Transportation Study (PRATS) as possible is important so that momentum for Downtown improvements continues.

The transportation component of the study established a strong rational for a number of the 'big moves' in terms of reducing vehicular traffic lanes and reallocating space within the public realm. It also made recommendations for parking strategies to compensate for loss of on-street parking related to a new public realm.

Public consultation helped identify critical concerns of merchants and property owners, stakeholder groups and representatives of the larger community. Through a series of stakeholder meetings and an interactive design workshop/ charrette it was possible to identify the ideas that would gain popular support.

Preliminary designs synthesized the recommendations into illustrative plans that promote the public realm while also satisfying transportation needs.

Comprehensive descriptions of the importance of various streetscape elements and amenities, as well as possible sustainable approaches, have been provided to guide future detailed design efforts. Wherever possible, supporting graphics and images have been provided as representative examples of similar treatments and approaches.

Recognizing that cost and accountability are always key considerations, MMM has provided cost estimates that will help the City of Lethbridge identify immediate, short-term, and long-term budgeting requirements.

It is important that the vision identified in the HOCMP and refined in the PRATS report is implemented. MMM realizes that additional detailed design and planning stages will be required, but have identified key considerations and recommendations as part of the Implementation Plan.

The Implementation Strategy recognizes the complexity surrounding the financial, political and physical resources needed to construct the recommended works. The Implementation Plan sets out a strategic approach and makes suggestions for construction of the selected streets. Ultimately the priorities will need to be determined by City Council. Report recommendations serve as a starting point and baseline for future discussion and planning. It is important to maintain the same level of public consultation during future phases.

8.2 FUTURE RECOMMENDATIONS

As part of the PRATS study, MMM has collected data and tested it against the existing baseline to ensure that the recommendations made can be easily incorporated into future designs.

To build upon the ideas outlined in this report, as well as help facilitate the construction, it is recommended that additional research be undertaken in the following areas prior to or as part of the detailed design:

- A detailed survey and Arborist's report should be prepared to ensure that existing trees incorporated into the design will remain healthy.
- Further investigation into sustainable green products and initiatives should be undertaken during the specification and detailing of proposed site structures (including the use of solar power and Light Emitting Diode (LED) fixtures).
- New signage design should be coordinated as part of a larger City of Lethbridge wayfinding signage system and strategy and possible heritage interpretive program in partnership with the Galt Museum.
- The City of Lethbridge should standardize its site furnishing and lighting within the Downtown, based on the 'Kit of Parts' for common elements that has been developed in the report. It is essential that this selection be done in coordination with City operations and maintenance staff. It is beneficial to select manufacturers which offer a wide variety of style options and features.
- The City of Lethbridge Public Art Committee should be consulted during, or preceding the initial stages of detailed design, on the potential for implementing the Public Art recommendations identified in the report and any potential grant or funding contributions.
- The City of Lethbridge should explore further the feasibility of relocating the steam engine #3651 from behind the Health Unit to Galt Gardens, as part of a larger centralized tourism office initiative.
- A communication plan should be developed with utility providers commencing during the planning stages and maintained throughout construction phases to discuss upgrading of services and routing for all existing and new services.

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APPENDIX A

HOCMP – Vision, Framework, & Sections

Heart of Our City Vision Statement

Heart of Our City Campaign Pillars

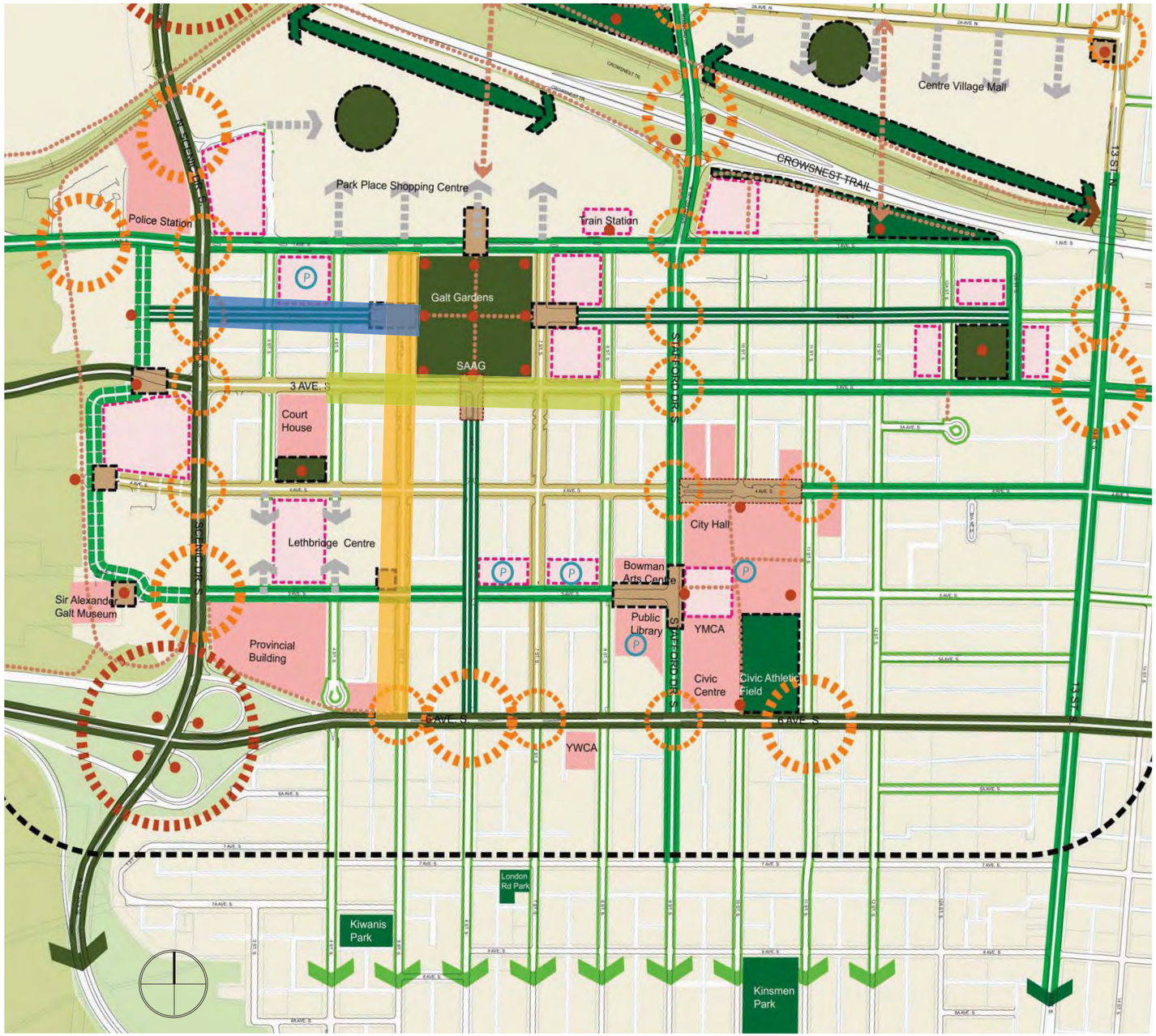
A Beautiful Downtown	A Livable Downtown	A Sustainable Downtown	An Exciting Downtown	An Accessible Downtown	A Vibrant Downtown

Guiding Principles

Strategies

Pillars:	Guiding Principles:	Strategies:
• A Beautiful Downtown • A Livable Downtown • A Sustainable Downtown • An Exciting Downtown • An Accessible Downtown • A Vibrant Downtown	• Movement • Green • Complete Neighbourhoods • Animated and Vibrant • Entrepreneurial and Supportive • A Quality Public Realm • Inclusive • Integrate Heritage, Culture and Local Values • Downtown = Lethbridge = Region • Process Matters	• Reinforce the Retail & Cultural and Civic Corridors • Transition Areas to Buffer Established Neighbourhoods • Reconnect the Downtown to the River Valley • New Complete Mixed-Use Downtown Neighbourhoods • New Open Spaces for Amenity and Foci for Livable Downtown • Promenades and Plazas to Extend from Galt Gardens • Streets Designed to Enhance the Walking Experience • Gateways and Landmarks for Orientation and Visual Delight • Enhanced Pedestrian and Cycling connections • Strategic Sites for Attractions and Civic Destinations

H.O.C.M.P. VISION



OPEN SPACES

- RIVER VALLEY
- PARK
- SQUARE
- PLAZA
- UTILITY CORRIDOR
- POTENTIAL PARK/SQUARE/PLAZA
- EXISTING CIVIC/CULTURAL SITE
- POTENTIAL CIVIC/CULTURAL SITE

STREETSCAPE CHARACTER

- PARKWAY
- BOULEVARD
- PROMENADE
- MAIN STREET
- DISTRICT STREET
- CITY-WIDE GATEWAY
- DOWNTOWN GATEWAY
- DISTRICT GATEWAY
- POTENTIAL PUBLIC ART SITE
- PEDESTRIAN & CYCLING CONNECTION
- (P) POTENTIAL PUBLIC PARKING STRUCTURE

STUDY STREETS

- 2ND AVENUE SOUTH - PROMENADE DESIGNATION
- 5TH STREET - MAIN STREET DESIGNATION
- 3RD AVENUE SOUTH - MAIN STREET DESIGNATION

H.O.C.M.P. GUILDING FRAMEWORK

CITY OF LETHBRIDGE
PUBLIC REALM &TRANSPORTATION STUDY

HOCMP REFERENCE PLAN

MMM GROUP

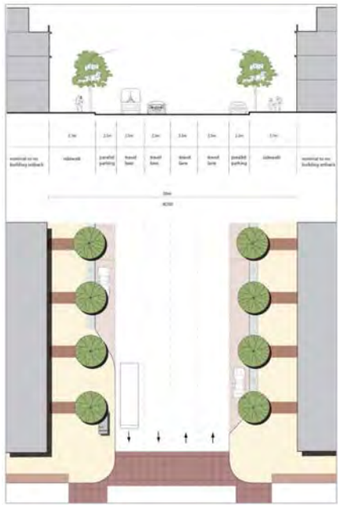
MAIN STREETS

INTENDED DOWNTOWN ROLE AND FUNCTION

- SERVES AS STREET-ORIENTED RETAIL CORRIDORS WITH HIGH PEDESTRIAN TRAFFIC
- TYPICALLY IMPORTANT VEHICULAR CROSS STREETS ACCESSING THE DOWNTOWN CORE WITH EAST-WEST ROUTES ALSO SERVING AS MAJOR THROUGH ROUTES
- IMPORTANT TRANSIT RIDER SOURCE AND DESTINATION
- MIXED USE WITH CONTINUOUS RETAIL AT GRADE AND OFFICE OR RESIDENTIAL ABOVE GRADE

DEFINING DESIGN CHARACTERISTICS

- 4 TRAVEL LANES
- TREE-LINED SIDE BOULEVARDS ENHANCED WITH PLANTING BEDS AND/OR HUNG FLOWER BASKETS TO REINFORCE APPEAL TO PEDESTRIAN TRAFFIC
- MAXIMUM POSSIBLE SIDEWALK WIDTHS FOR HIGH PEDESTRIAN VOLUMES (NO LESS THAN 4.0 METRES IN WIDTH) AND INCLUDES ABUNDANT PEDESTRIAN ORIENTED FURNISHINGS
- PARALLEL ON-STREET PARKING ONLY TO ENSURE ADEQUATE SIDEWALK WIDTHS-OTHERWISE TO BE REDUCED BY ONE OR TWO LANES WHERE ANGLED PARKING REMAINS
- APPROPRIATELY PLACE BUS STOPS FOR OPTIMUM PEDESTRIAN CONVENIENCE AND SAFETY
- BUILDINGS WITH SHOP FRONTS CONSISTENTLY PLACED AT THE STREET EDGE PROVIDING AWNINGS AND OTHER PEDESTRIAN AMENITIES
- SIDEWALKS ACCOMMODATE SPILL-OUT COMMERCIAL ACTIVITY SUCH AS PATIOS



MAIN STREET PROTOTYPE OPTION 1.
TYPICAL CROSS-SECTION.

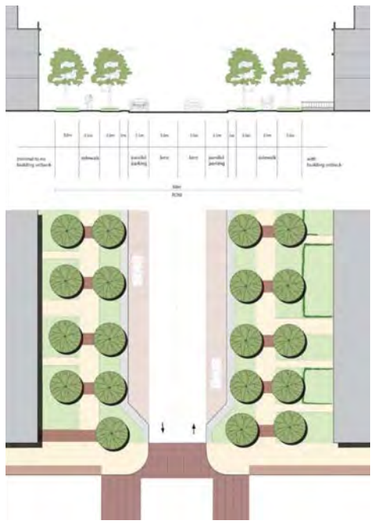
PROMENADES

INTENDED DOWNTOWN ROLE AND FUNCTION

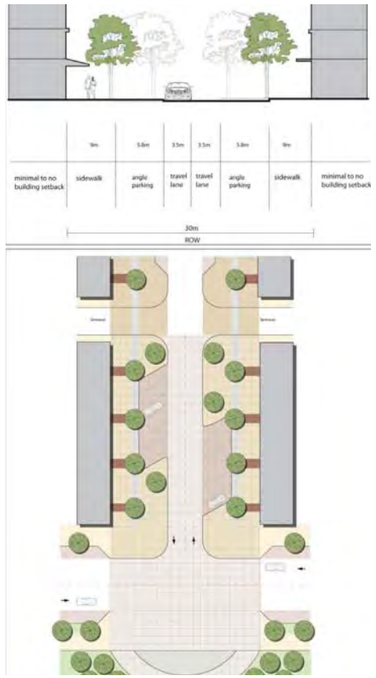
- SERVES AS A GRAND 'GREEN' CORRIDOR THAT VISUALLY AND PHYSICALLY LINKS GALT GARDENS TO THE REST OF DOWNTOWN IN ALL DIRECTIONS
- ANCHORED BY PLAZAS AT GALT GARDENS
- A PRIMARILY PEDESTRIAN-ORIENTED CONNECTION AND DESTINATION FOR PASSIVE AND ACTIVE INTERESTS
- TYPICALLY VEHICULAR TRAFFIC WILL BE LOCAL ORIENTED
- TRANSIT ACCESSED ON ADJACENT STREET OR AT CROSS-STREETS
- USES WILL VARY WITH LOCATION- MIXED WITH RETAIL IN THE CORE AND MORE RESIDENTIAL OR OTHER USES FURTHER AWAY

DEFINING DESIGN CHARACTERISTICS

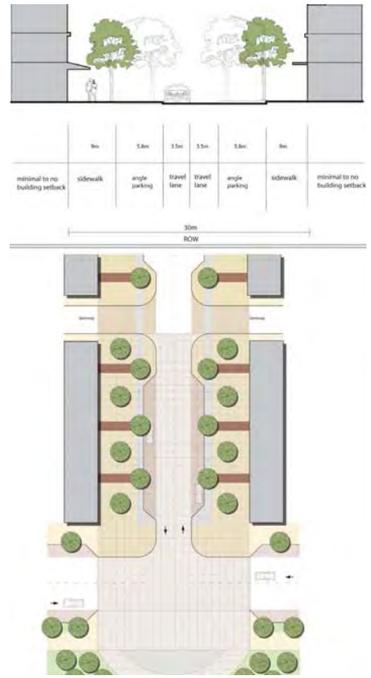
- 2 TRAVEL LANES
- DOUBLE ROW OF TREES ON EITHER SIDE OF THE STREET
- PLAZA DEFINED BY FEATURED PAVING EXTENDING INTO THE ROADWAY WHICH CAN BE PARTIALLY OR ENTIRELY CLOSED OFF FOR EVENTS
- MAXIMUM POSSIBLE SIDEWALK WIDTHS IN THE CORE FOR HIGH PEDESTRIAN VOLUMES (NO LESS THAN 9.0 METRES IN WIDTH) AND ACCOMMODATES AN ABUNDANCE OF PEDESTRIAN ORIENTED AMENITIES AND SPILL-OUT COMMERCIAL ACTIVITIES
- ANGLED ON-STREET PARKING MAY BE ACCOMMODATED IF ALTERNATING TO MAINTAIN THE CONSISTENT DOUBLE TREE LINE
- BUILDINGS CONSISTENTLY PLACED AT THE STREET EDGE WITHIN THE CORE BUT MAY VARY OTHERWISE.



PROMENADE PROTOTYPE OPTION 1.
DEMONSTRATION OF RESIDENTIAL AREA WHERE MULTISTORY BUILDINGS SETBACK TO PERMIT MODEST FRONT YARD AND ACCESS POINTS FOR AT-GRADE ACCESS UNITS THAT FRONT ONTO THE PROMENADE.



PROMENADE PROTOTYPE OPTION 2.
ANGLED PARKING ALTERNATING AND PLAZA TREATMENT.



PROMENADE PROTOTYPE OPTION 3.
PARALLEL PARKING ALTERNATIVE TO OPTION 2.

H.O.C.M.P. PROPOSED SECTIONS

APPENDIX B

Detailed Cost Estimate

MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

Summary

Site Works
Including 15% Contingency

5th Street Phase 1 (1st - 4th Avenue)	$2,579,979.00
5th Street Phase 2 (4th - 6th Avenue)	$2,020,975.50
2nd Avenue (Scenic - 5th Street)	$2,138,223.75
3rd Avenue (4th - 8th Street)	$2,701,528.25

ESTIMATED TOTAL PROJECT BUDGET	**$ 9,440,706.50**

MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

2nd Avenue (Scenic - 5th Street)

	DESCRIPTION OF WORK	Unit	Quantity	Cost		Total
1.0	**HARDSCAPE**					
1.1	**Cast in Place Concrete Surface Materials**					
.1	Concrete for sidewalk c/w sawcuts. 100mm depth (including base aggregates)	sq.m.	3270	$100.00	$	327,000.00
.2	Concrete pads for benches (site furnishings)	ea.	9	$250.00	$	2,250.00
.3	600mm wide concrete band for sidewalk	l.m.	500	$300.00	$	150,000.00
.4	600mm wide concrete band for traffic areas	l.m.	150	$300.00	$	45,000.00
.5	Curb and gutter placement	l.m.	1470	$100.00	$	147,000.00
1.2	**Cast in Place Concrete Surface Materials - Removals**					
.1	Curb and gutter removal	l.m.	660	$32.00	$	21,120.00
.2	Concrete surface removal	sq.m.	2800	$22.00	$	61,600.00
1.3	**Asphalt Surface**					
.1	Asphalt paving for parking stalls (2 lifts including base aggregates)	sq.m.	1500	$35.00	$	52,500.00
.2	Asphalt paving for vehicular lanes	sq.m.	4000	$25.00	$	100,000.00
1.4	**Asphalt Surface - Removals**					
.1	Cold milling asphalt	sq.m.	5500	$3.00	$	16,500.00
.2	Asphalt removal	sq.m.	2000	$30.00	$	60,000.00
	SECTION 1.0 SUBTOTAL				**$**	**982,970.00**

MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

2nd Avenue (Scenic - 5th Street)

	DESCRIPTION OF WORK	Unit	Quantity	Cost		Total
2.0	**SOFTSCAPE**					
2.1	**Grading and Excavation**					
.1	Shrub bed excavation (450mm depth)	sq.m.	520	$15.00	$	7,800.00
.2	Tree pit excavation (900mm depth)	sq.m.	41	$30.00	$	1,230.00
2.2	**Fill, Topsoil and Mulch**					
.1	Imported growing medium for trees (1m depth)	cu.m.	41	$45.00	$	1,845.00
.2	Imported growing medium for shrub beds (450mm depth)	cu.m.	235	$45.00	$	10,575.00
.3	Composted bark mulch (50mm depth)	cu.m.	25	$45.00	$	1,125.00
2.3	**Plant Materials and Sod**					
.1	Shrub / perennial planting	sq.m.	520	$55.00	$	28,600.00
.2	Deciduous Tree (7.5cm Cal.)	ea.	41	$550.00	$	22,550.00
2.4	**Irrigation**					
.1	High efficiency irrigation system materials and labour for shrub beds	sq.m.	520	$25.00	$	13,000.00
.2	High efficiency irrigation system materials and labour for street trees	l.m.	440	$8.00	$	3,520.00
.3	Irrigation meter, backflow preventer and vault	l.s.	1	$30,000.00	$	30,000.00
.4	Pedestal and controller components	l.s.	1	$15,000.00	$	15,000.00
	SECTION 2.0 SUBTOTAL				**$**	**135,245.00**

MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

2nd Avenue (Scenic - 5th Street)

DESCRIPTION OF WORK		Unit	Quantity	Cost		Total
3.0	**SITE AMENITIES AND FEATURES**					
3.1	**Bike Storage and Shelters**					
.1	Covered bike storage	ea.	2	$6,500.00	$	13,000.00
.2	Warming shelter	ea.	1	$8,000.00	$	8,000.00
.3	Wayfinding / Information Kiosk	ea.	8	$3,500.00	$	28,000.00
.4	Parking stub dispenser (solar powered)	ea.	10	$7,500.00	$	75,000.00
3.2	**Site Furnishings**					
.1	Garbage receptacles	ea.	12	$3,000.00	$	36,000.00
.2	Catalogue benches	ea.	9	$2,500.00	$	22,500.00
.3	Pedestrian metal bollards	ea.	89	$1,000.00	$	89,000.00
.4	Rectangular Tree grates	ea.	22	$2,500.00	$	55,000.00
3.3	**Removals**					
.1	Remove trees	ea.	20	$900.00	$	18,000.00
.2	Remove parking meter	ea.	16	$100.00	$	1,600.00
	SECTION 3.0 SUBTOTAL				**$**	**346,100.00**

MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

2nd Avenue (Scenic - 5th Street)

	DESCRIPTION OF WORK	Unit	Quantity	Cost		Total
4.0	**ELECTRICAL/UTILITIES/ANCILLARY SERVICES**					
4.1	**Lighting**					
.1	6.0m Hgt pedestrian pole top lights c/w precast base	ea	15	$6,500.00	$	97,500.00
.2	9.0m Hgt vehicle pole top lights c/w precast base + davit arm	ea	15	$10,000.00	$	150,000.00
4.2	**Ancillary Services**					
.1	Catch basins	ea.	8	$11,500.00	$	92,000.00
.2	Adjust manholes	ea.	7	$705.00	$	4,935.00
.3	Relocate fire hydrants	ea.	2	$1,000.00	$	2,000.00
4.3	**Removals**					
.1	Removal and disposal of existing lamp fixtures	ea.	13	$475.00	$	6,175.00
.2	Remove catch basins	ea.	8	$5,300.00	$	42,400.00
	SECTION 4.0 SUBTOTAL				**$**	**395,010.00**

ON-SITE LANDSCAPE SUBTOTAL	**$ 1,859,325.00**
15% Contingency	**$ 278,898.75**
ESTIMATED TOTAL ON-SITE LANDSCAPE BUDGET	**$ 2,138,223.75**

MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

2nd Avenue (Scenic - 5th Street)

DESCRIPTION OF WORK		Unit	Quantity	Cost		Total
UPGRADE ITEMS						
1.0	**HARDSCAPE**					
1.1	**Cast in Place Concrete Surface Materials**					
.1	**Reference 1.2.2** Traffic unit pavers for parking stalls (including base aggregates).	sq.m.	1500	$120.00	$	180,000.00
.2	**Reference 1.2.2** Aquapave traffic unit pavers for parking stalls (including base aggregates) .	sq.m.	1500	$135.00	$	202,500.00
2.0	**SITE AMENITIES AND FEATURES**					
2.1	**Site Furnishings**					
.1	**Reference 3.2.4** decorative bollards.	ea.	89	$1,750.00	$	155,750.00
.2	**Reference 3.2.4** replace bollards with C.I.P. concrete piers/bollards	ea.	12	$3,000.00	$	36,000.00
OPTIONAL ITEMS						
1.0	**HARDSCAPE ITEMS**					
1.1	**Cast in Place Concrete Surface Materials**					
.1	Concrete for raised intersections (c/w sawcuts). 150mm depth (including base aggregates)	sq.m.	530	$120.00	$	63,600.00
.2	Stamped and coloured concrete for raised intersections). 150mm depth (including base aggregates)	sq.m.	530	$135.00	$	71,550.00
1.2	**Urban Trees**					
.1	Silva cell for urban tree growth	ea.	41	$11,000.00	$	451,000.00
2.0	**SITE AMENITIES AND FEATURES**					
2.1	**Site Furnishings**					
.1	Garbage and recycling station (Big Belly Solar)	ea.	6	$5,000.00	$	30,000.00
.2	Public art / urban design	allow	1	$50,000.00	$	50,000.00
3.0	**ELECTRICAL**					
3.1	**Lighting**					
.1	G.F.I. Receptacles - General	ea.	41	$650.00	$	26,650.00
.2	Junction Boxes - General	ea.	10	$500.00	$	5,000.00

This is an estimate and not a guaranteed amount, and is to be used for budgetary purposes only.

Costing is based on 2011 contractor pricing and is subject to change.

Costing does not include extensive relocation or upgrading of existing services that may be required at time of construction.

MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

3rd Avenue (4th - 8th Street)

	DESCRIPTION OF WORK	Unit	Quantity	Cost		Total
1.0	**HARDSCAPE**					
1.1	**Cast in Place Concrete Surface Materials**					
.1	Concrete for sidewalk c/w sawcuts. 100mm depth (including base aggregates)	sq.m.	4030	$100.00	$	403,000.00
.2	Concrete pads for benches (site furnishings)	ea.	9	$250.00	$	2,250.00
.3	600mm wide concrete band for sidewalk	l.m.	670	$300.00	$	201,000.00
.4	600mm wide concrete band for traffic areas	l.m.	80	$300.00	$	24,000.00
.5	Curb and gutter placement	l.m.	1450	$100.00	$	145,000.00
1.2	**Cast in Place Concrete Surface Materials - Removals**					
.1	Curb and gutter removal	l.m.	1070	$32.00	$	34,240.00
.2	Concrete surface removal	sq.m.	3800	$22.00	$	83,600.00
1.3	**Asphalt Surface**					
.1	Asphalt paving for parking stalls (2 lifts including base aggregates)	sq.m.	2800	$35.00	$	98,000.00
.2	Asphalt paving for vehicular lanes	sq.m.	5200	$25.00	$	130,000.00
1.4	**Asphalt Surface - Removals**					
.1	Cold milling asphalt	sq.m.	8000	$3.00	$	24,000.00
.2	Asphalt removal	sq.m.	800	$30.00	$	24,000.00
	SECTION 1.0 SUBTOTAL				**$**	**1,169,090.00**

MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

3rd Avenue (4th - 8th Street)

DESCRIPTION OF WORK		Unit	Quantity	Cost		Total
2.0	**SOFTSCAPE**					
2.1	**Grading and Excavation**					
.1	Shrub bed excavation (450mm depth)	sq.m.	420	$15.00	$	6,300.00
.2	Tree pit excavation (900mm depth)	sq.m.	10	$30.00	$	300.00
2.2	**Fill, Topsoil and Mulch**					
.1	Imported growing medium for trees (1m depth)	cu.m.	10	$45.00	$	450.00
.2	Imported growing medium for shrub beds (450mm depth)	cu.m.	190	$45.00	$	8,550.00
.3	Composted bark mulch (50mm depth)	cu.m.	20	$45.00	$	900.00
2.3	**Plant Materials and Sod**					
.1	Shrub / perennial planting	sq.m.	420	$55.00	$	23,100.00
.2	Deciduous Tree (7.5cm Cal.)	ea.	10	$550.00	$	5,500.00
2.4	**Irrigation**					
.1	High efficiency irrigation system materials and labour for shrub beds	sq.m.	420	$25.00	$	10,500.00
.2	High efficiency irrigation system materials and labour for street trees	l.m.	400	$8.00	$	3,200.00
.3	Irrigation meter, backflow preventer and vault	l.s.	1	$30,000.00	$	30,000.00
.4	Pedestal and controller components	l.s.	1	$15,000.00	$	15,000.00
	SECTION 2.0 SUBTOTAL				**$**	**103,800.00**

MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

3rd Avenue (4th - 8th Street)

	DESCRIPTION OF WORK	Unit	Quantity	Cost		Total
3.0	**SITE AMENITIES AND FEATURES**					
3.1	**Bike Storage and Shelters**					
.1	Covered bike storage	ea.	2	$6,500.00	$	13,000.00
.2	Bus shelter	ea.	1	$8,000.00	$	8,000.00
.3	Wayfinding / Information Kiosk	ea.	10	$3,500.00	$	35,000.00
.4	Parking stub dispenser (solar powered)	ea.	12	$7,500.00	$	90,000.00
3.2	**Site Furnishings**					
.1	Garbage receptacles	ea.	11	$3,000.00	$	33,000.00
.2	Catalogue benches	ea.	9	$2,500.00	$	22,500.00
.3	Pedestrian metal bollards	ea.	106	$1,000.00	$	106,000.00
.4	Tree grates	ea.	10	$2,200.00	$	22,000.00
.5	Banner poles	ea.	13	$4,500.00	$	58,500.00
.6	Relocate / re-use conc. Peirs	ea.	3	$1,500.00	$	4,500.00
.7	Remove / relocate public art	ea.	2	$1,200.00	$	2,400.00
3.3	**Removals**					
.1	Remove trees	ea.	24	$900.00	$	21,600.00
.2	Remove bike rack	ea.	2	$200.00	$	400.00
.3	Remove parking meter	ea.	49	$100.00	$	4,900.00
	SECTION 3.0 SUBTOTAL				**$**	**421,800.00**

MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

3rd Avenue (4th - 8th Street)

	DESCRIPTION OF WORK	Unit	Quantity	Cost		Total
4.0	**ELECTRICAL/UTILITIES/ANCILLARY SERVICES**					
4.1	**Lighting**					
.1	6.0m Hgt pedestrian pole top lights c/w precast base	ea	24	$6,500.00	$	156,000.00
.2	9.0m Hgt vehicle pole top lights c/w precast base + davit arm	ea	24	$10,000.00	$	240,000.00
4.2	**Ancillary Services**					
.1	Catch basins	ea.	11	$11,500.00	$	126,500.00
.2	Adjust manholes	ea.	13	$705.00	$	9,165.00
.3	Relocate fire hydrants	ea.	5	$1,000.00	$	5,000.00
.4	Scramble Intersections (incl. auditory pedestrian signals and other electrical services)	l.s.	1	$50,000.00	$	50,000.00
4.3	**Removals**					
.1	Removal and disposal of existing lamp fixtures	ea.	20	$475.00	$	9,500.00
.2	Remove catch basins	ea.	11	$5,300.00	$	58,300.00
	SECTION 4.0 SUBTOTAL				**$**	**654,465.00**

ON-SITE LANDSCAPE SUBTOTAL	**$**	**2,349,155.00**
15% Contingency	**$**	**352,373.25**
ESTIMATED TOTAL ON-SITE LANDSCAPE BUDGET	**$**	**2,701,528.25**

MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

3rd Avenue (4th - 8th Street)

DESCRIPTION OF WORK	Unit	Quantity	Cost	Total
UPGRADE ITEMS				
1.0 HARDSCAPE				
1.1 Cast in Place Concrete Surface Materials				
.1 **Reference 1.2.2** Traffic unit pavers for parking stalls (including base aggregates).	sq.m.	2800	$120.00	$ 336,000.00
.2 **Reference 1.2.2** Aquapave traffic unit pavers for parking stalls (including base aggregates) .	sq.m.	2800	$135.00	$ 378,000.00
2.0 SITE AMENITIES AND FEATURES				
2.1 Site Furnishings				
.1 **Reference 3.2.4** Decorative bollards.	ea.	106	$1,750.00	$ 185,500.00
.2 **Reference 3.2.4** replace bollards with C.I.P. concrete piers/bollards	ea.	3	$3,000.00	$ 9,000.00
OPTIONAL ITEMS				
1.0 HARDSCAPE ITEMS				
1.1 Cast in Place Concrete Surface Materials				
.1 Concrete for raised intersections (c/w sawcuts). 150mm depth (including base aggregates)	sq.m.	620	$120.00	$ 74,400.00
.2 Stamped and coloured concrete for raised intersections). 150mm depth (including base aggregates)	sq.m.	620	$135.00	$ 83,700.00
1.2 Urban Trees				
.1 Silva cell for urban tree growth	ea.	10	$11,000.00	$ 110,000.00
2.0 SITE AMENITIES AND FEATURES				
2.1 Site Furnishings				
.1 Garbage and recycling station (Big Belly Solar)	ea.	8	$5,000.00	$ 40,000.00
.2 Public art / urban design	allow	1	$75,000.00	$ 75,000.00
3.0 ELECTRICAL				
3.1 Lighting				
.1 G.F.I. Receptacles - General	ea.	28	$650.00	$ 18,200.00
.2 Junction Boxes - General	ea.	8	$500.00	$ 4,000.00

This is an estimate and not a guaranteed amount, and is to be used for budgetary purposes only.

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MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

5th Street Phase 1 (1st - 4th Avenue)

	DESCRIPTION OF WORK	Unit	Quantity	Cost		Total
1.0	**HARDSCAPE**					
1.1	**Cast in Place Concrete Surface Materials**					
.1	Concrete for sidewalk c/w sawcuts. 100mm depth (including base aggregates)	sq.m.	3700	$100.00	$	370,000.00
.2	Concrete pads for benches (site furnishings)	ea.	22	$250.00	$	5,500.00
.3	600mm wide concrete band for sidewalk	l.m.	900	$300.00	$	270,000.00
.4	600mm wide concrete band for traffic areas	l.m.	60	$300.00	$	18,000.00
.5	Curb and gutter placement	l.m.	900	$100.00	$	90,000.00
.6	Concrete for medians	sq.m.	125	$115.00	$	14,375.00
1.2	**Cast in Place Concrete Surface Materials - Removals**					
.1	Curb and gutter removal	l.m.	800	$32.00	$	25,600.00
.2	Concrete surface removal	sq.m.	2200	$22.00	$	48,400.00
1.3	**Asphalt Surface**					
.1	Asphalt paving for bike lane (1 lift including base aggregates)	sq.m.	660	$20.00	$	13,200.00
.2	Asphalt paving for parking stalls (2 lifts including base aggregates)	sq.m.	1750	$35.00	$	61,250.00
.3	Asphalt paving for vehicular lanes	sq.m.	4000	$25.00	$	100,000.00
1.4	**Asphalt Surface - Removals**					
.1	Cold milling asphalt	sq.m.	5750	$3.00	$	17,250.00
.2	Asphalt removal	sq.m.	3250	$30.00	$	97,500.00
	SECTION 1.0 SUBTOTAL				**$**	**1,131,075.00**

MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

5th Street Phase 1 (1st - 4th Avenue)

	DESCRIPTION OF WORK	Unit	Quantity	Cost		Total
2.0	**SOFTSCAPE**					
2.1	**Grading and Excavation**					
.1	Shrub bed excavation (450mm depth)	sq.m.	500	$15.00	$	7,500.00
.2	Tree pit excavation (900mm depth)	sq.m.	42	$30.00	$	1,260.00
2.2	**Fill, Topsoil and Mulch**					
.1	Imported growing medium for trees (1m depth)	cu.m.	42	$45.00	$	1,890.00
.2	Imported growing medium for shrub beds (450mm depth)	cu.m.	225	$45.00	$	10,125.00
.3	Composted bark mulch (50mm depth)	cu.m.	25	$45.00	$	1,125.00
2.3	**Plant Materials and Sod**					
.1	Shrub / perennial planting	sq.m.	500	$55.00	$	27,500.00
.2	Deciduous Tree (7.5cm Cal.)	ea.	42	$550.00	$	23,100.00
2.4	**Irrigation**					
.1	High efficiency irrigation system materials and labour for shrub beds	sq.m.	500	$25.00	$	12,500.00
.2	High efficiency irrigation system materials and labour for street trees	l.m.	800	$8.00	$	6,400.00
.3	Irrigation meter, backflow preventer and vault	l.s.	1	$30,000.00	$	30,000.00
.4	Pedestal and controller components	l.s.	1	$15,000.00	$	15,000.00
	SECTION 2.0 SUBTOTAL				**$**	**136,400.00**

MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

5th Street Phase 1 (1st - 4th Avenue)

	DESCRIPTION OF WORK	Unit	Quantity	Cost		Total
3.0	**SITE AMENITIES AND FEATURES**					
3.1	**Bike Storage and Shelters**					
.1	Covered bike storage	ea.	2	$6,500.00	$	13,000.00
.2	Warming shelter	ea.	1	$8,000.00	$	8,000.00
.3	Wayfinding / Information Kiosk	ea.	3	$3,500.00	$	10,500.00
.4	Parking stub dispenser (solar powered)	ea.	8	$7,500.00	$	60,000.00
3.2	**Site Furnishings**					
.1	Garbage receptacles	ea.	10	$3,000.00	$	30,000.00
.2	Catalogue benches	ea.	22	$2,500.00	$	55,000.00
.3	Bicycle racks (10 Stall)	ea.	2	$1,500.00	$	3,000.00
.4	Pedestrian metal bollards	ea.	126	$1,000.00	$	126,000.00
.5	Tree grates	ea.	42	$2,200.00	$	92,400.00
3.3	**Removals**					
.1	Remove trees	ea.	4	$900.00	$	3,600.00
.2	Remove bike rack	ea.	3	$200.00	$	600.00
.3	Remove parking meter	ea.	57	$100.00	$	5,700.00
	SECTION 3.0 SUBTOTAL				**$**	**407,800.00**

MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

5th Street Phase 1 (1st - 4th Avenue)

	DESCRIPTION OF WORK	Unit	Quantity	Cost		Total
4.0	**ELECTRICAL/UTILITIES/ANCILLARY SERVICES**					
4.1	**Lighting**					
.1	6.0m Hgt pedestrian pole top lights c/w precast base	ea	18	$6,500.00	$	117,000.00
.2	9.0m Hgt vehicle pole top lights c/w precast base + davit arm	ea	19	$10,000.00	$	190,000.00
4.2	**Ancillary Services**					
.1	Catch basins	ea.	11	$11,500.00	$	126,500.00
.2	Adjust manholes	ea.	17	$705.00	$	11,985.00
.3	Relocate fire hydrants	ea.	3	$1,000.00	$	3,000.00
.4	Scramble Intersections (incl. auditory pedestrian signals and other electrical services)	l.s.	1	$50,000.00	$	50,000.00
4.3	**Removals**					
.1	Removal and disposal of existing lamp fixtures	ea.	24	$475.00	$	11,400.00
.2	Remove catch basins	ea.	11	$5,300.00	$	58,300.00
	SECTION 4.0 SUBTOTAL				**$**	**568,185.00**

ON-SITE LANDSCAPE SUBTOTAL	**$**	**2,243,460.00**
15% Contingency	**$**	**336,519.00**
ESTIMATED TOTAL ON-SITE LANDSCAPE BUDGET	**$**	**2,579,979.00**

MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

5th Street Phase 1 (1st - 4th Avenue)

DESCRIPTION OF WORK		Unit	Quantity	Cost		Total
UPGRADE ITEMS						
1.0	**HARDSCAPE**					
1.1	**Cast in Place Concrete Surface Materials**					
.1	**Reference 1.2.1** Concrete paving for bike lane (including base aggregates).	sq.m.	660	$100.00	$	66,000.00
.2	**Reference 1.2.2** Traffic unit pavers for parking stalls (including base aggregates).	sq.m.	1750	$120.00	$	210,000.00
.3	**Reference 1.2.2** Aquapave traffic unit pavers for parking stalls (including base aggregates) .	sq.m.	1750	$135.00	$	236,250.00
2.0	**SITE AMENITIES AND FEATURES**					
2.1	**Site Furnishings**					
.1	**Reference 3.2.4** decorative bollards.	ea.	126	$1,750.00	$	220,500.00
OPTIONAL ITEMS						
1.0	**HARDSCAPE ITEMS**					
1.1	**Cast in Place Concrete Surface Materials**					
.1	Concrete for raised intersections (c/w sawcuts). 150mm depth (including base aggregates)	sq.m.	550	$120.00	$	66,000.00
.2	Stamped and coloured concrete for raised intersections). 150mm depth (including base aggregates)	sq.m.	150	$135.00	$	20,250.00
1.2	**Concrete Seatwalls and Feature Walls**					
.1	C.I.P concrete seat walls - 450mm height	l.m.	30	$1,000.00	$	30,000.00
.2	C.I.P concrete feature walls with brick veneer - 450mm height	l.m.	15	$1,500.00	$	22,500.00
1.3	**Urban Trees**					
.1	Silva cell for urban tree growth	ea.	42	$11,000.00	$	462,000.00
2.0	**SITE AMENITIES AND FEATURES**					
2.1	**Site Furnishings**					
.1	Catalogue benches	ea.	18	$2,500.00	$	45,000.00
.2	Garbage and recycling station (Big Belly Solar)	ea.	2	$5,000.00	$	10,000.00
.3	Public art	allow	1	$200,000.00	$	200,000.00
.4	Gateway features (Obilisk)	allow	8	$10,000.00	$	80,000.00
3.0	**ELECTRICAL**					
3.1	**Lighting**					
.1	6.0m Hgt pedestrian pole top lights c/w precast base	ea	9	$6,500.00	$	58,500.00
.2	4.8m Hgt pedestrian pole top lights c/w 1.2m Hgt. conc custcom base	ea	4	$12,000.00	$	48,000.00
.3	G.F.I. Receptacles - General	ea.	42	$650.00	$	27,300.00
.4	Junction Boxes - General	ea.	10	$500.00	$	5,000.00

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MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

5th Street Phase 2 (4th - 6th Avenue)

	DESCRIPTION OF WORK	Unit	Quantity	Cost		Total
1.0	**HARDSCAPE**					
1.1	**Cast in Place Concrete Surface Materials**					
.1	Concrete for sidewalk c/w sawcuts. 100mm depth (including base aggregates)	sq.m.	3200	$100.00	$	320,000.00
.2	Concrete pads for benches (site furnishings)	ea.	1	$250.00	$	250.00
.3	600mm wide concrete band for sidewalk	l.m.	700	$300.00	$	210,000.00
.4	600mm wide concrete band for traffic areas	l.m.	50	$300.00	$	15,000.00
.5	Curb and gutter placement	l.m.	800	$100.00	$	80,000.00
.6	Concrete for medians	sq.m.	125	$115.00	$	14,375.00
1.2	**Cast in Place Concrete Surface Materials - Removals**					
.1	Curb and gutter removal	l.m.	700	$32.00	$	22,400.00
.2	Concrete surface removal	sq.m.	2400	$22.00	$	52,800.00
1.3	**Asphalt Surface**					
.1	Asphalt paving for bike lane (1 lift including base aggregates)	sq.m.	625	$20.00	$	12,500.00
.2	Asphalt paving for parking stalls (2 lifts including base aggregates)	sq.m.	1630	$35.00	$	57,050.00
.3	Asphalt paving for vehicular lanes	sq.m.	3800	$25.00	$	95,000.00
1.4	**Asphalt Surface - Removals**					
.1	Cold milling asphalt	sq.m.	5430	$3.00	$	16,290.00
.2	Asphalt removal	sq.m.	2670	$30.00	$	80,100.00
	SECTION 1.0 SUBTOTAL				**$**	**975,765.00**

MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

5th Street Phase 2 (4th - 6th Avenue)

	DESCRIPTION OF WORK	Unit	Quantity	Cost		Total
2.0	**SOFTSCAPE**					
2.1	**Grading and Excavation**					
.1	Shrub bed excavation (450mm depth)	sq.m.	500	$15.00	$	7,500.00
.2	Tree pit excavation (900mm depth)	sq.m.	29	$30.00	$	870.00
2.2	**Fill, Topsoil and Mulch**					
.1	Imported growing medium for trees (1m depth)	cu.m.	29	$45.00	$	1,305.00
.2	Imported growing medium for shrub beds (450mm depth)	cu.m.	225	$45.00	$	10,125.00
.3	Composted bark mulch (50mm depth)	cu.m.	25	$45.00	$	1,125.00
2.3	**Plant Materials and Sod**					
.1	Shrub / perennial planting	sq.m.	500	$55.00	$	27,500.00
.2	Deciduous Tree (7.5cm Cal.)	ea.	23	$550.00	$	12,650.00
2.4	**Irrigation**					
.1	High efficiency irrigation system materials and labour for shrub beds	sq.m.	500	$25.00	$	12,500.00
.2	High efficiency irrigation system materials and labour for street trees	l.m.	560	$8.00	$	4,480.00
.3	Irrigation meter, backflow preventer and vault	l.s.	1	$30,000.00	$	30,000.00
.4	Pedestal and controller components	l.s.	1	$15,000.00	$	15,000.00
	SECTION 2.0 SUBTOTAL				**$**	**123,055.00**

MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

5th Street Phase 2 (4th - 6th Avenue)

	DESCRIPTION OF WORK	Unit	Quantity	Cost		Total
3.0	**SITE AMENITIES AND FEATURES**					
3.1	**Bike Storage and Shelters**					
.1	Covered bike storage	ea.	1	$6,500.00	$	6,500.00
.2	Warming shelter	ea.	1	$8,000.00	$	8,000.00
.3	Wayfinding / Information Kiosk	ea.	3	$3,500.00	$	10,500.00
.4	Parking stub dispenser (solar powered)	ea.	8	$7,500.00	$	60,000.00
3.2	**Site Furnishings**					
.1	Garbage receptacles	ea.	6	$3,000.00	$	18,000.00
.2	Catalogue benches	ea.	3	$2,500.00	$	7,500.00
.3	Bicycle racks (10 Stall)	ea.	2	$1,500.00	$	3,000.00
.4	Pedestrian metal bollards	ea.	105	$1,000.00	$	105,000.00
.5	Tree grates	ea.	29	$2,200.00	$	63,800.00
3.3	**Removals**					
.1	Remove trees	ea.	15	$900.00	$	13,500.00
.2	Remove bike rack	ea.	3	$200.00	$	600.00
.3	Remove parking meter	ea.	21	$100.00	$	2,100.00
	SECTION 3.0 SUBTOTAL				**$**	**298,500.00**

MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

5th Street Phase 2 (4th - 6th Avenue)

	DESCRIPTION OF WORK	Unit	Quantity	Cost		Total
4.0	**ELECTRICAL/UTILITIES/ANCILLARY SERVICES**					
4.1	**Lighting**					
.1	46.0m Hgt pedestrian pole top lights c/w precast base	ea	15	$6,500.00	$	97,500.00
.2	9.0m Hgt vehicle pole top lights c/w precast base + davit arm	ea	16	$10,000.00	$	160,000.00
4.2	**Ancillary Services**					
.1	Catch basins	ea.	5	$11,500.00	$	57,500.00
.2	Adjust manholes	ea.	10	$705.00	$	7,050.00
.3	Relocate fire hydrants	ea.	2	$1,000.00	$	2,000.00
4.3	**Removals**					
.1	Removal and disposal of existing lamp fixtures	ea.	20	$475.00	$	9,500.00
.2	Remove catch basins	ea.	5	$5,300.00	$	26,500.00
	SECTION 4.0 SUBTOTAL				**$**	**360,050.00**

ON-SITE LANDSCAPE SUBTOTAL	**$**	**1,757,370.00**
15% Contingency	**$**	**263,605.50**
ESTIMATED TOTAL ON-SITE LANDSCAPE BUDGET	**$**	**2,020,975.50**

MMM GROUP

5210038 - Lethbridge PRT Study 75% Preliminary Design
Estimate of Probable Costs
November 2011

5th Street Phase 2 (4th - 6th Avenue)

	DESCRIPTION OF WORK	Unit	Quantity	Cost		Total
UPGRADE ITEMS						
1.0	**HARDSCAPE**					
1.1	**Cast in Place Concrete Surface Materials**					
.1	**Reference 1.2.1** Concrete paving for bike lane (including base aggregates).	sq.m.	625	$100.00	$	62,500.00
.2	**Reference 1.2.2** Traffic unit pavers for parking stalls (including base aggregates).	sq.m.	1630	$120.00	$	195,600.00
.3	**Reference 1.2.2** Aquapave traffic unit pavers for parking stalls (including base aggregates) .	sq.m.	1630	$135.00	$	220,050.00
2.0	**SITE AMENITIES AND FEATURES**					
2.1	**Site Furnishings**					
.1	**Reference 3.2.4** Decorative bollards.	ea.	105	$1,750.00	$	183,750.00
OPTIONAL ITEMS						
1.0	**HARDSCAPE ITEMS**					
1.1	**Cast in Place Concrete Surface Materials**					
.1	Concrete for raised intersections (c/w sawcuts). 150mm depth (including base aggregates)	sq.m.	510	$120.00	$	61,200.00
.2	Stamped and coloured concrete for raised intersections). 150mm depth (including base aggregates)	sq.m.	150	$135.00	$	20,250.00
1.2	**Concrete Seatwalls and Feature Walls**					
.1	C.I.P concrete seat walls - 450mm height	l.m.	25	$1,000.00	$	25,000.00
1.3	**Urban Trees**					
.1	Silva cell for urban tree growth	ea.	26	$11,000.00	$	286,000.00
2.0	**SITE AMENITIES AND FEATURES**					
2.1	**Site Furnishings**					
.1	Garbage and recycling station (Big Belly Solar)	ea.	1	$5,000.00	$	5,000.00
.2	Public art	allow	1	$150,000.00	$	150,000.00
.3	Gateway features (Obilisk)	allow	1	$10,000.00	$	10,000.00
3.0	**ELECTRICAL**					
3.1	**Lighting**					
.1	G.F.I. Receptacles - General	ea.	29	$650.00	$	18,850.00
.2	Junction Boxes - General	ea.	7	$500.00	$	3,500.00

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