APPENDICES

A | 100 Street Charrette Final Presentation

B | Transportation Analysis

a. 2019 100 Street ICBC collision data summary
b. 100 Street Charrette concept transportation performance summary

C | Mapping & Analysis (Charrette Design Brief materials)

a. Figure-ground
b. Zoning
c. Pedestrian network
d. Slopes
e. Precincts & amenities
f. Opportunities
g. Winter walk
h. Placemaking scorecard

D | Street Design Parameters

E | Special Projects

a. North Peace Cultural Centre & Bus Exchange
(Downtown Public Realm and Streetscape Master Plan extract)
b. Plaza Design for Old Fort Hotel Site at 100Street and 100 Avenue (City Centre Plaza)
(Downtown Public Realm and Streetscape Master Plan extract)
c. Festival Plaza Design

F | Additional Studies

a. 100 Street Parking Study (Draft)
b. Future Climate Tree Suitability and Best Management Practices
c. 100 Street Ingrid Cloud Wind Simulation Presentation
d. Retail Vitality and Impact Mitigation Review
e. Downtown Business Mitigation Strategy

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Design Charrette

June 11-15 | North Peace Cultural Centre

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Learn more at letstalk.fortstjohn.ca

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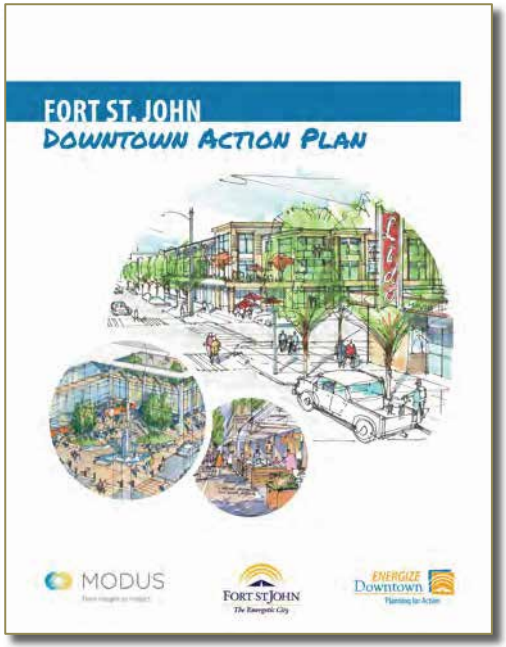
Project Background

Downtown Action Plan – Energize DT



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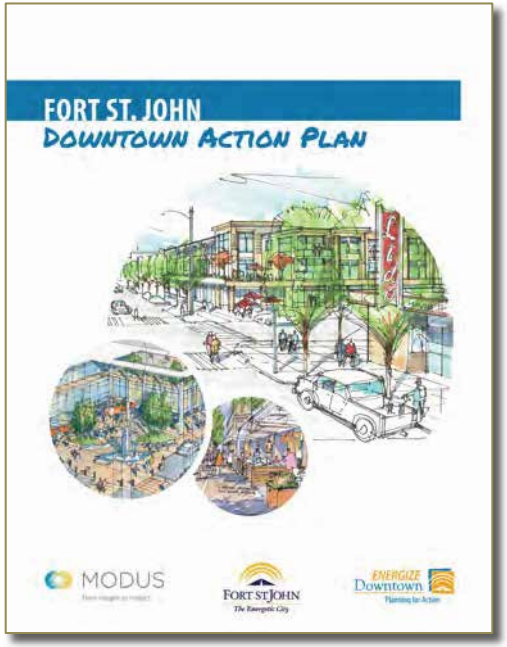
Downtown Action Plan - Vision



"…a compact, mixed use, pedestrian and transit-oriented urban place that is the social, economic and cultural heart of the community and where there are opportunities for downtown living."

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Implementing the Downtown Action Plan

- *Five Fundamentals*
  - Prioritize pedestrians (2); design for the Winter City (3); and “community, culture & the arts” (4).
- *Ten Big Moves*
  - Streets for people (1); “vacant no more” (4); making parking work (5); maintaining the core (6); and the 100 Street Greenway (10)

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Our pipes are aging and need to be upgraded

Last summer's watermain break was a clear indication that the time has come.

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A ‘Generational’ Opportunity

An Urgent Timeline…

…to Replace and Upgrade our Downtown Infrastructure

…and Create a “Street for All.”

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The fundamental tension

All streets serve two fundamental purposes which are in tension with one another - **thoroughfare** and **destination**

'Through'** vs. **'To'

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Vision + Principles

A Street for Everyone... at the Heart of a Thriving Downtown.

DRAFT PRINCIPLES:

A revitalized 100 Street provides:

1. *Access for all ages and abilities, on foot and on wheels*
2. *Comfortable, safe and enjoyable spaces for social connection*
3. *Adequate parking and access to support downtown business*
4. *Movement of goods, services, and emergency vehicles*
5. *Flexibility for special events and/or seasonal celebrations*
6. *Enhanced community identity and civic pride*
7. *Design for climate*
8. *Support Downtown economic revitalization and local businesses*

72% of respondents from the public online survey said they like the draft vision and principles.

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Qualities of a Great Street

- Safety
- Comfort
- Enjoyment

GREAT STREETS create community, facilitate interaction and encourage participation in the life of the City

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Community Engagement

Project Timeline

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Engagement pre-Charrette

150+
people estimated to have attended the Open House *(May 7 @ NPCC)*

371
people completed the online survey *(May 9-21)*

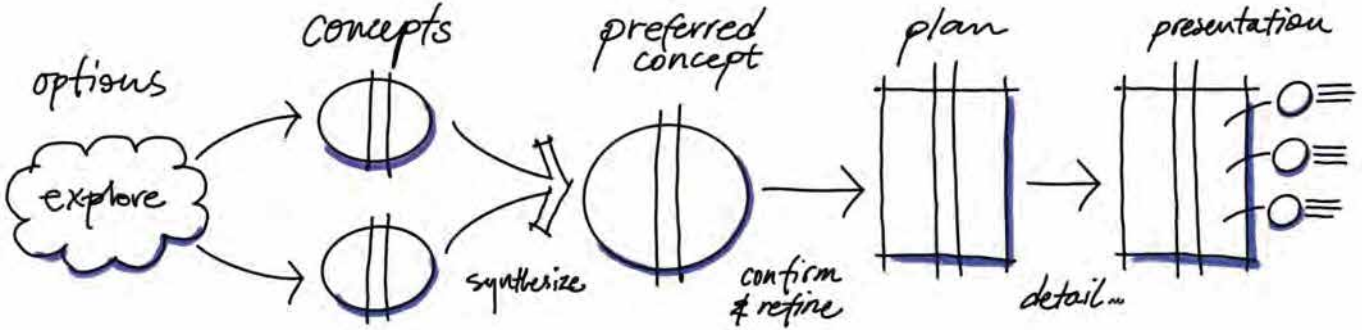
11
stakeholder workshops have been / are being held

- City Staff *(3)*
- Council *(1)*
- 100 Street Action Team *(3)*
- 'Doors on 100 Street' *property and business owners and operators (1)*
- Public Works and Grounds *(1)*
- Youth *(1)*

13
public events and input opportunities have been set up / are being organized

- Open House *(1)*
- Online survey *(1)*
- Pop-ups in businesses *(5)*
- Tents at public events *(6)*

The Design Charrette | Public Events



June 11	June 12	June 13	June 14	June 15
Public Lecture (aspirations) & ***Open House***	Alternative Concepts ***Pin-up***	Preferred Concept ***Pin-up***	*(no public events)*	Final Plan ***Public Presentation***

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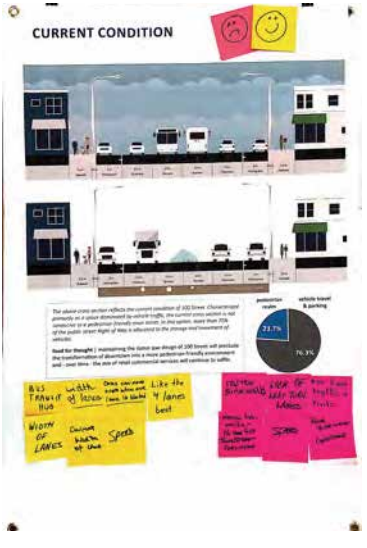
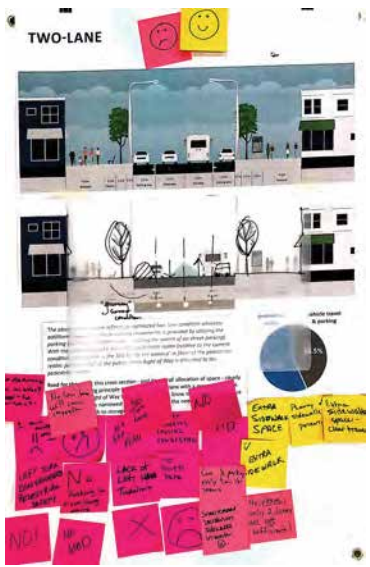
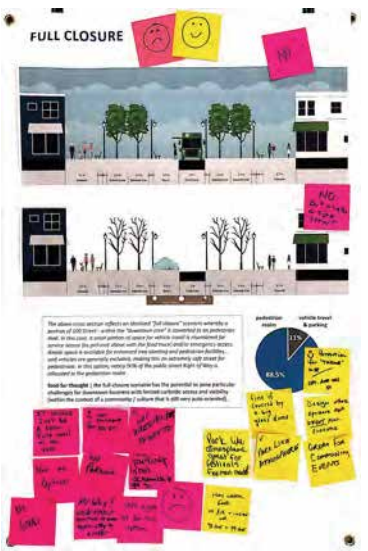
Exploring Options







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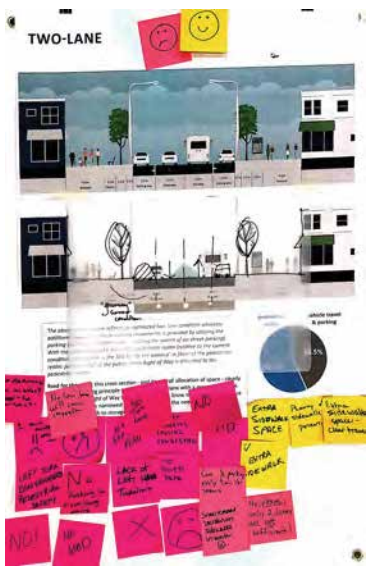
Testing Concepts



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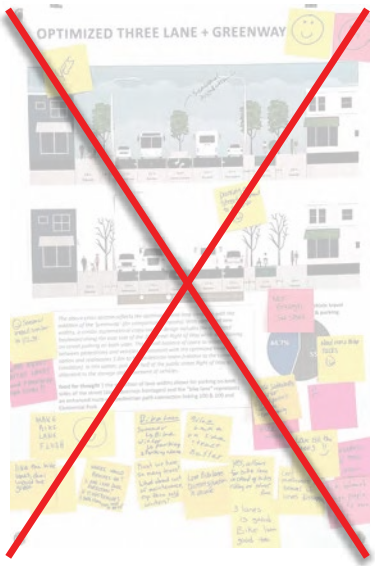
Preferred Concept



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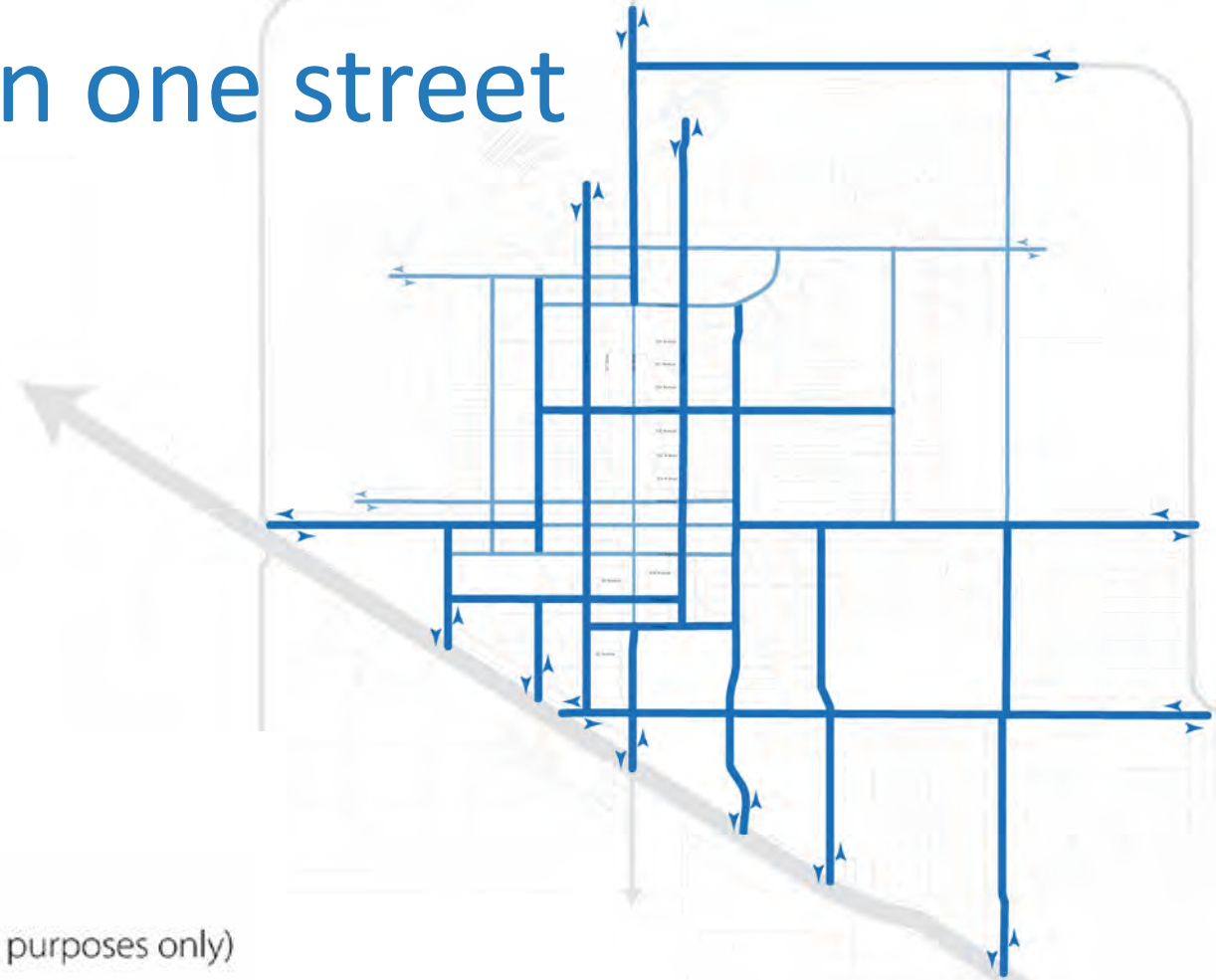
The Proposal

More than one street



Road Network

((for illustrative & discussion purposes only)

More than one street

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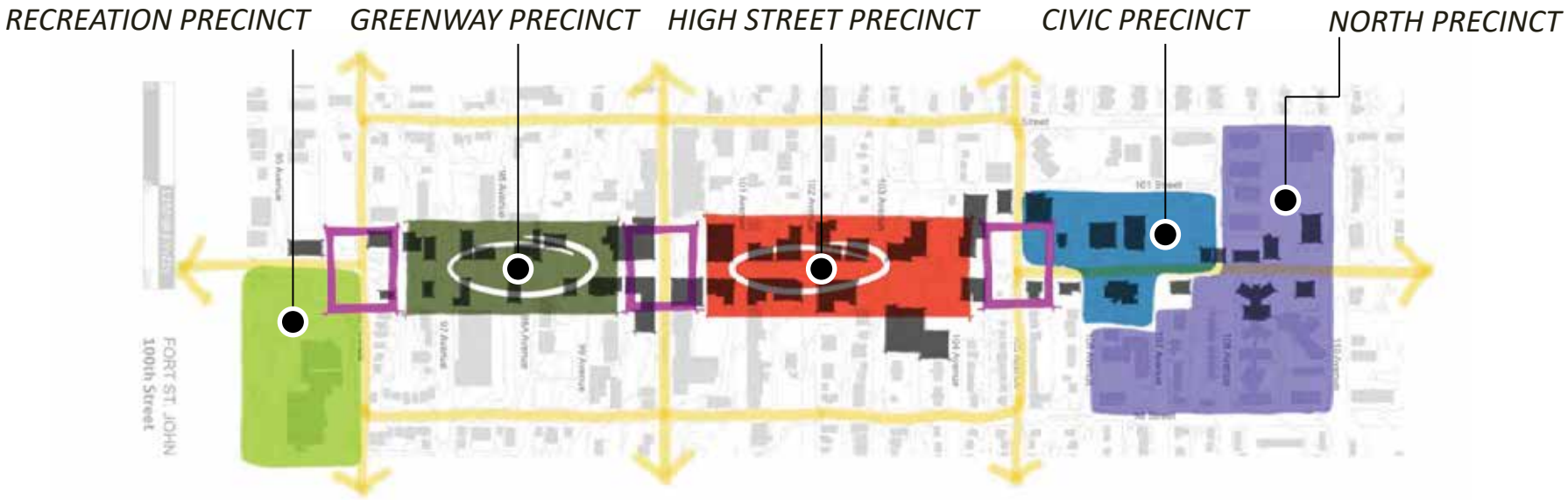
Precincts: A street of many rooms



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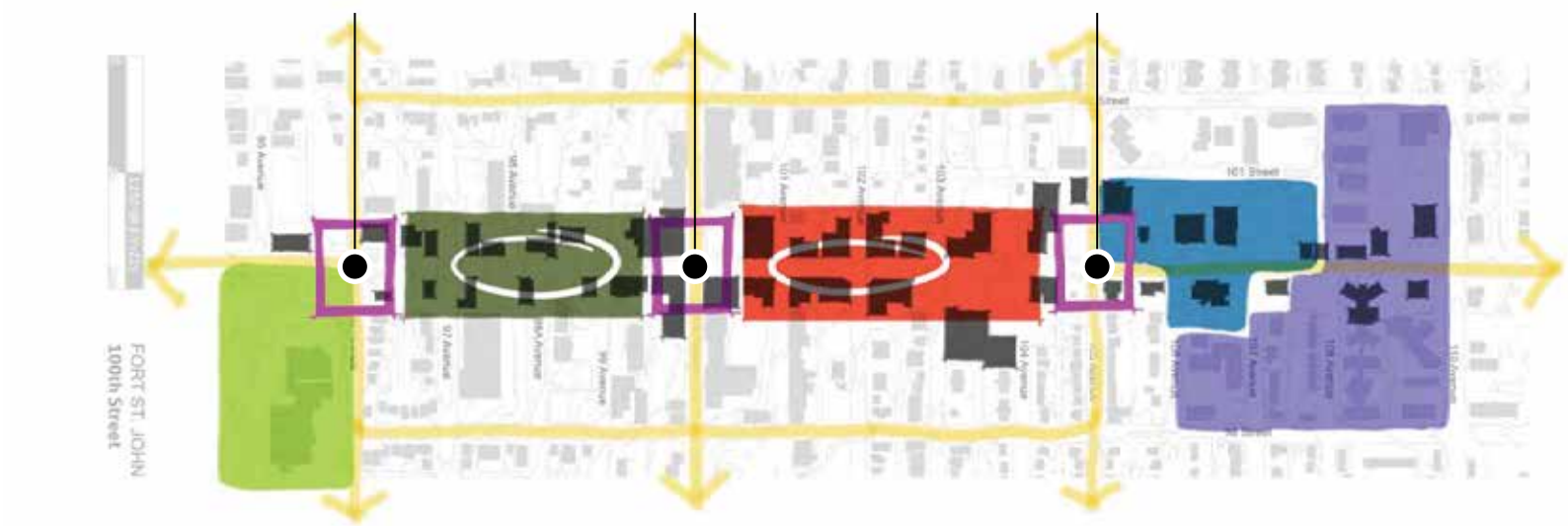
Gateways

SOUTH GATEWAY

THE HEART AT 100 & 100

NORTH GATEWAY



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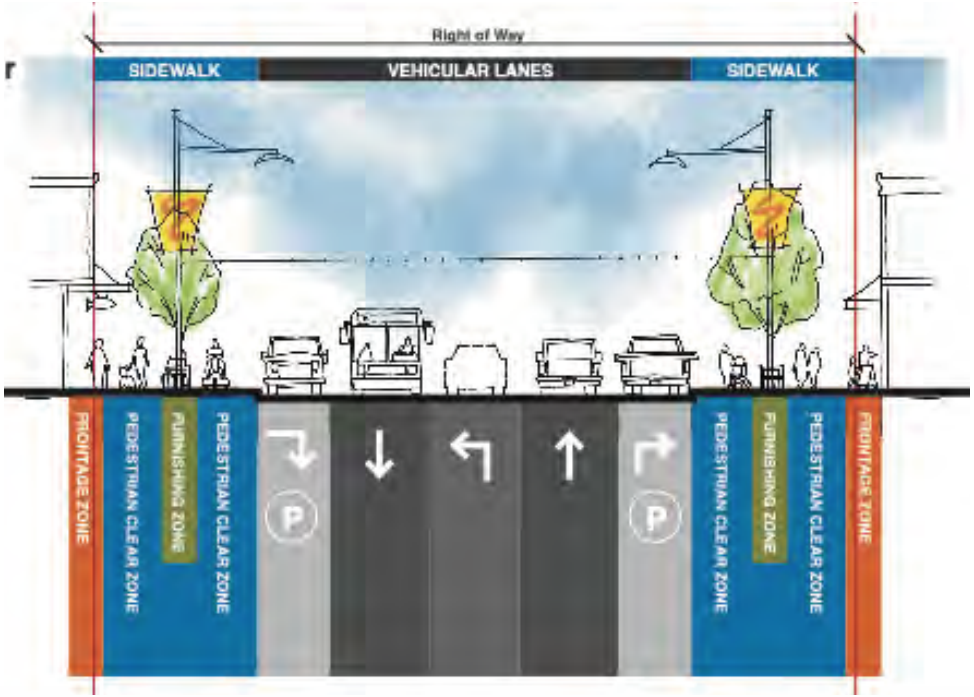
Standard Cross Section - summer



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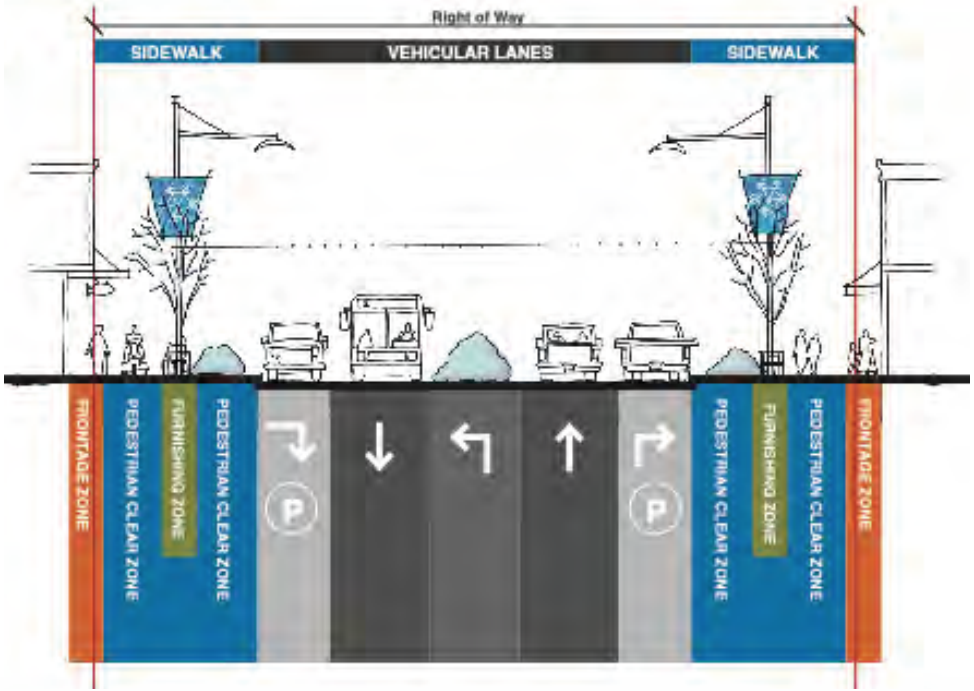
Standard Cross Section - winter



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Existing Street Condition

Proposed 100 Street Design – year 1

Proposed 100 Street Design – year 15

What you don’t see… and why

- Bump-outs and bollards – consideration for high pedestrian traffic areas and summertime installation
- Parking meters – kiosk for zone parking

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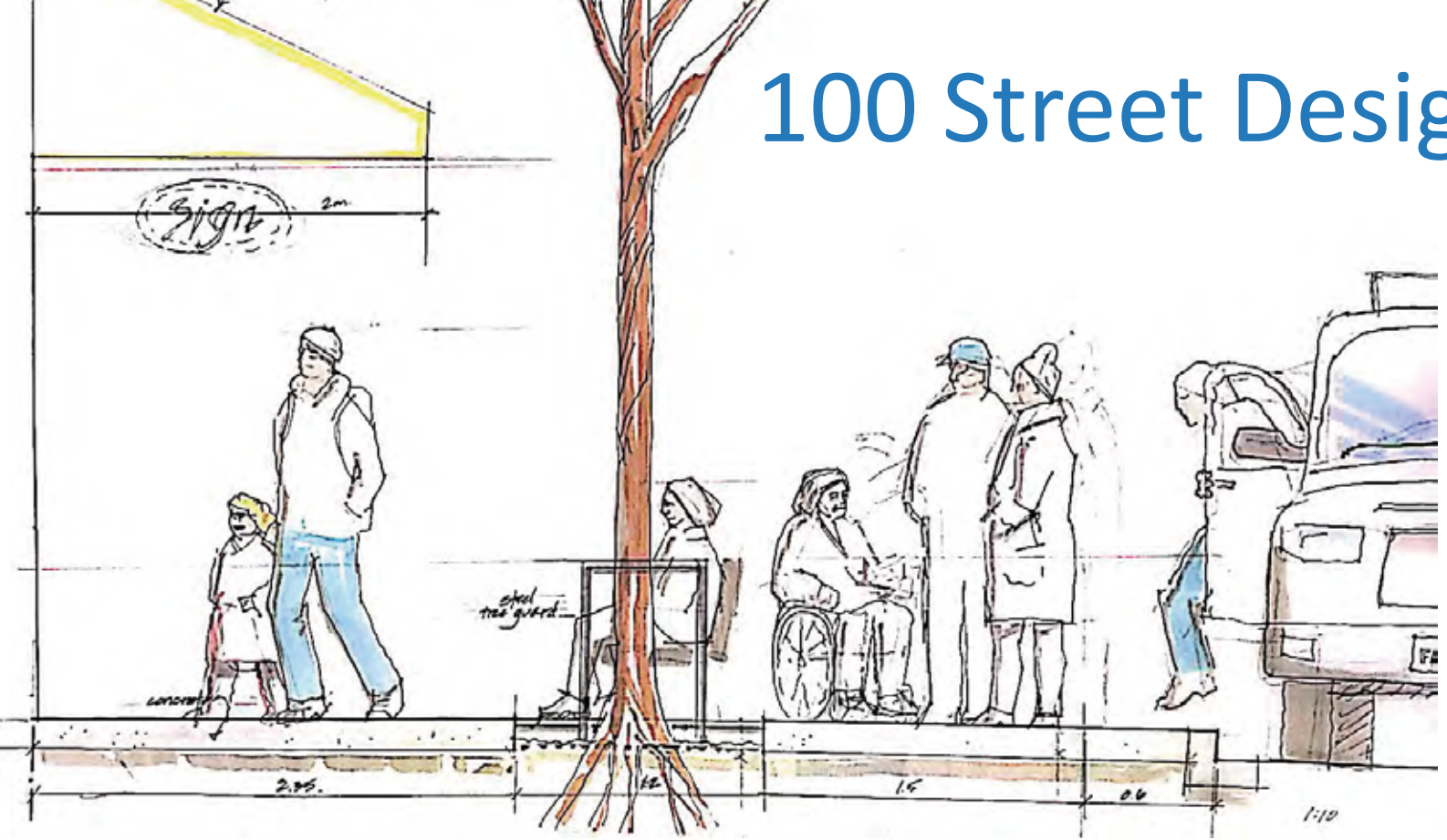
100 Street Design



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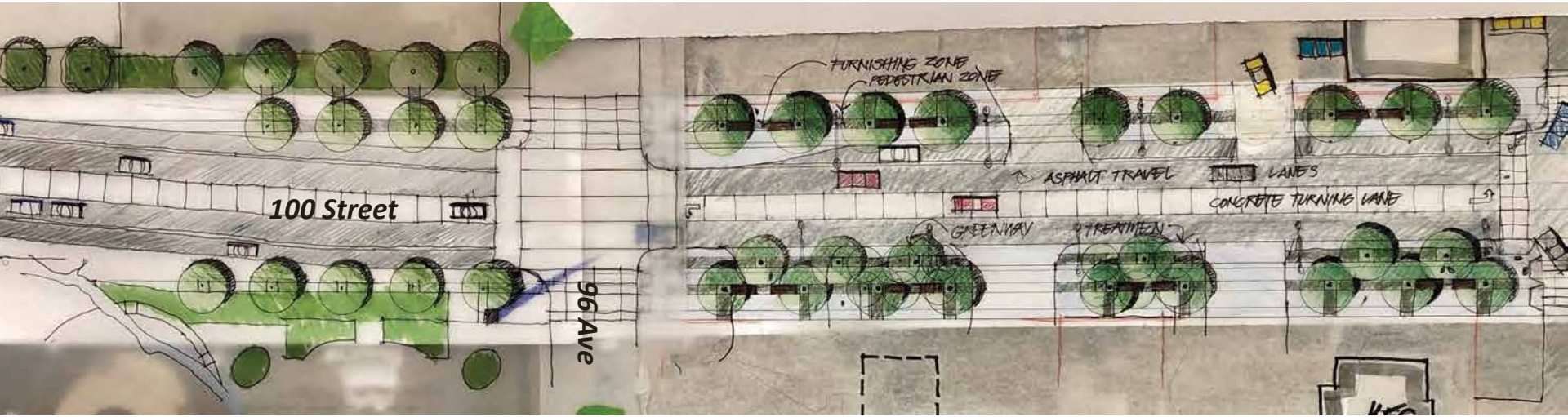
A tour of 100 St

South Gateway



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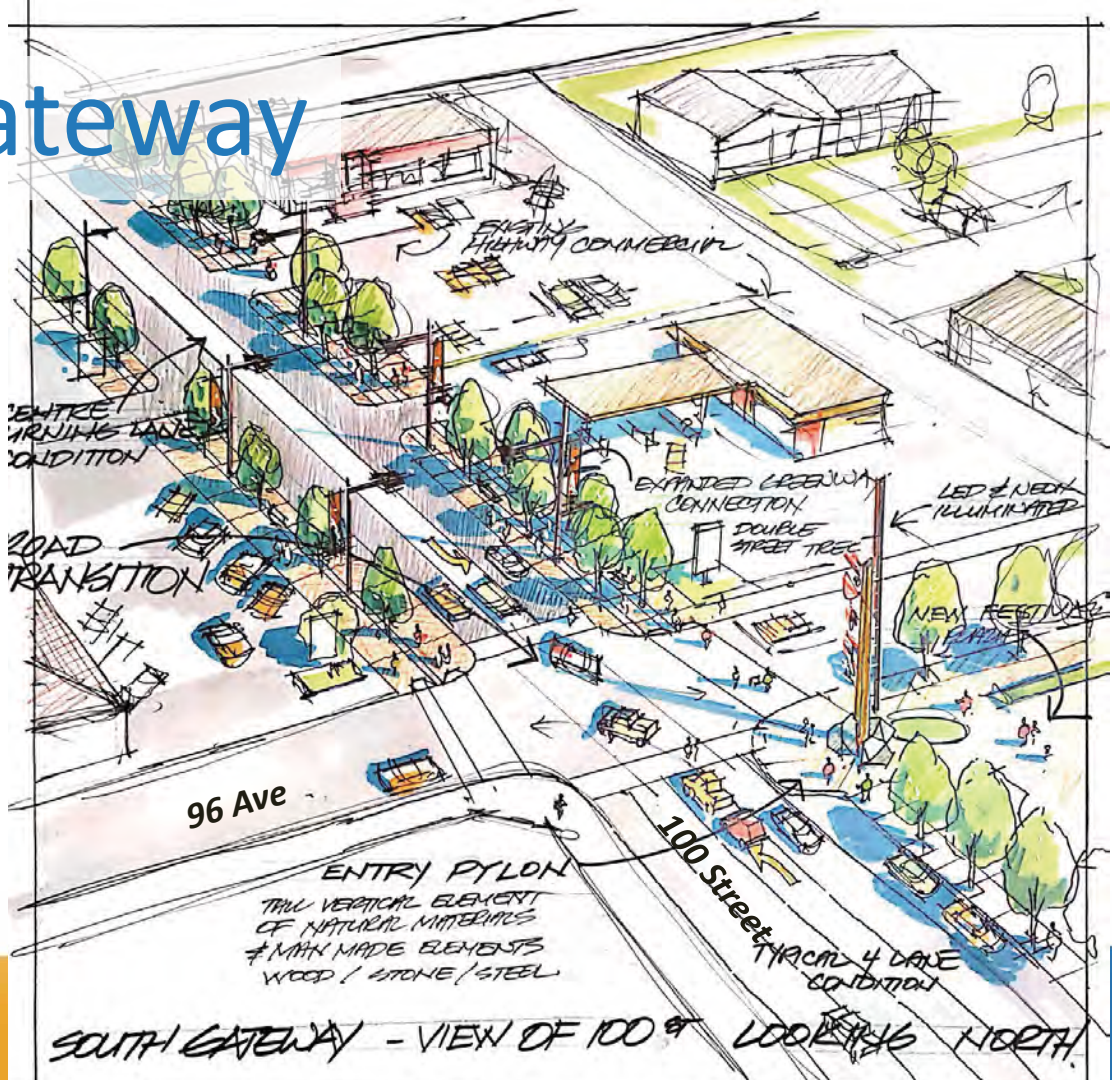
South Gateway



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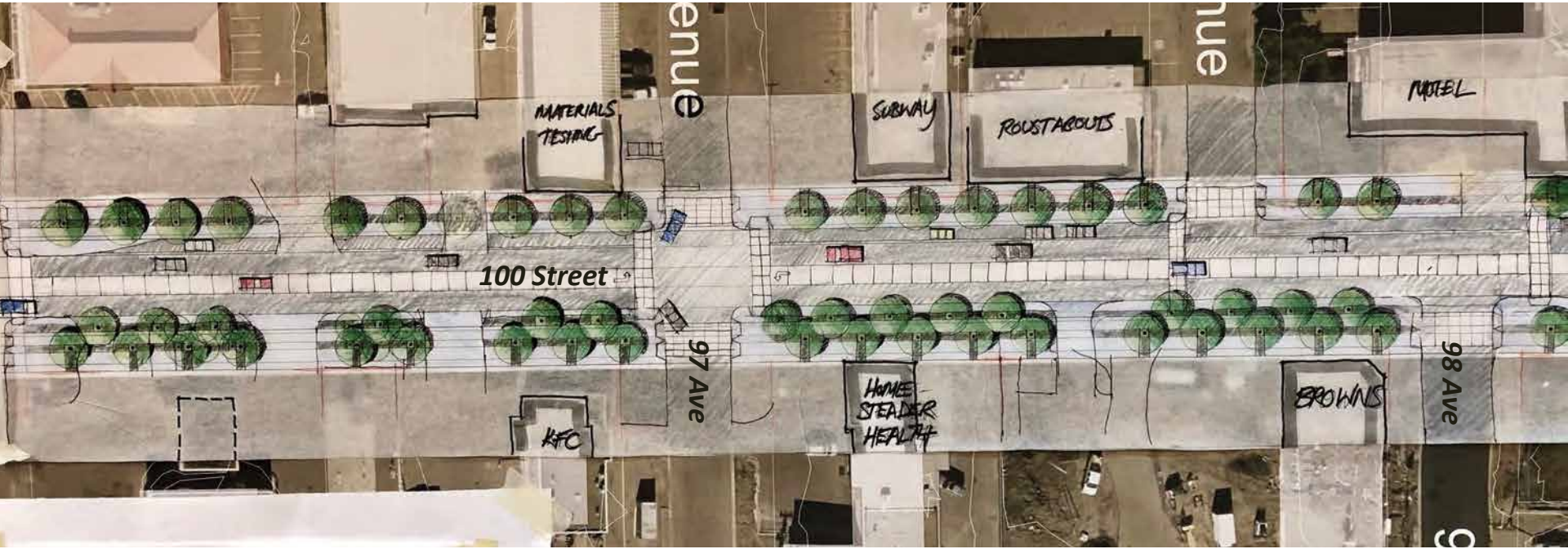
Greenway Precinct



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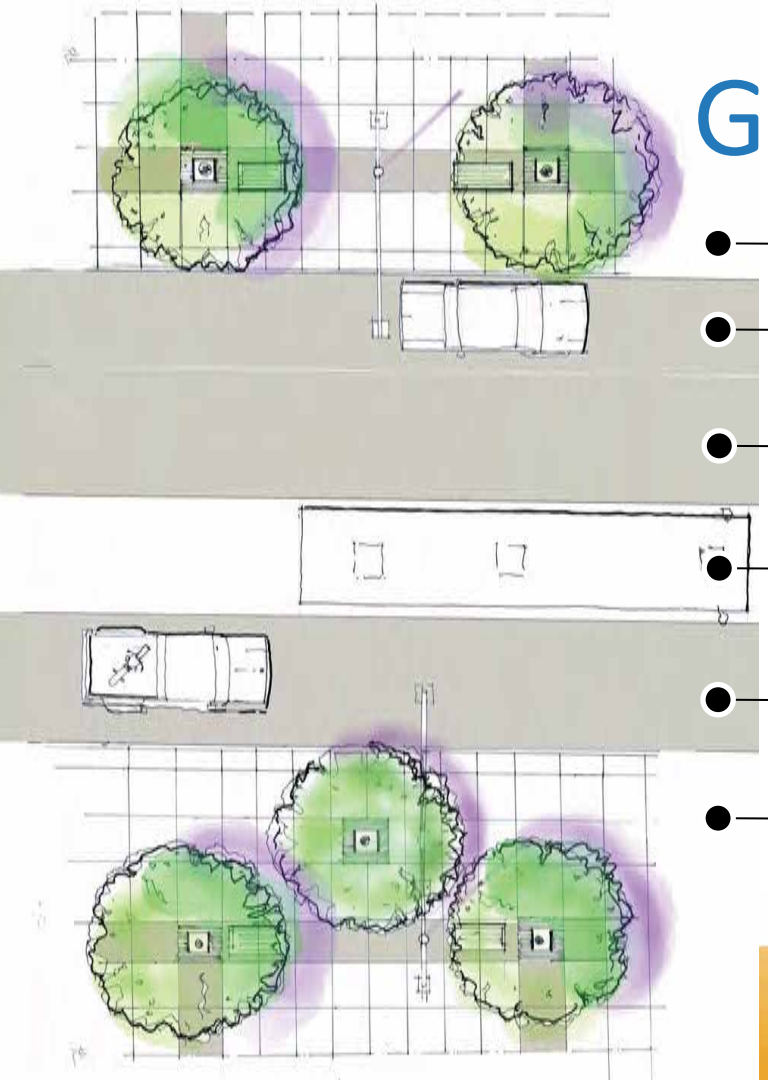

- *Sidewalk*
- *Parking lane*
- *Travel lane*
- *Left turning lane*
- *Travel lane*
- *Sidewalk with double row of trees*

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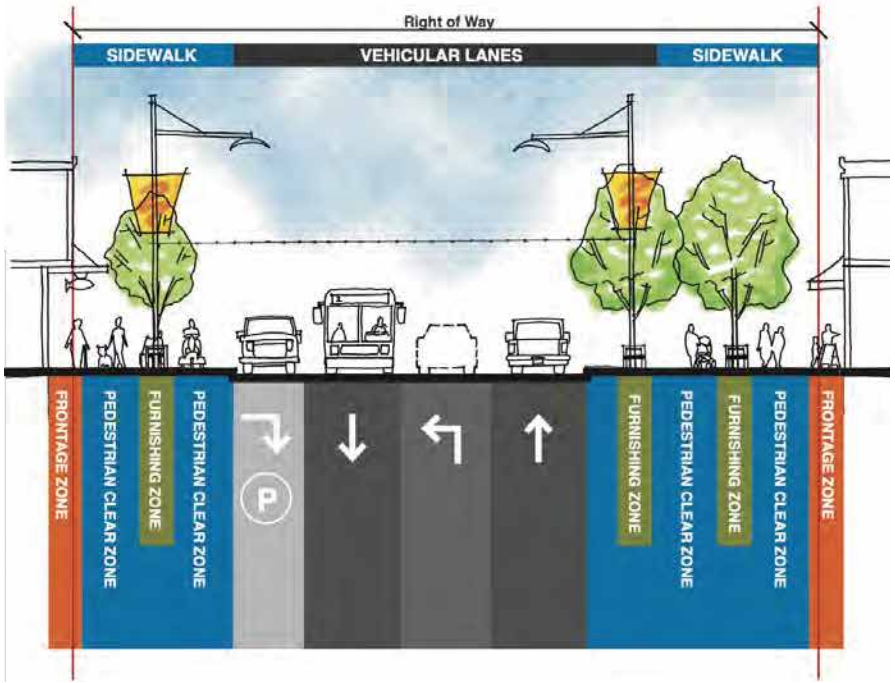
Greenway Precinct - summer



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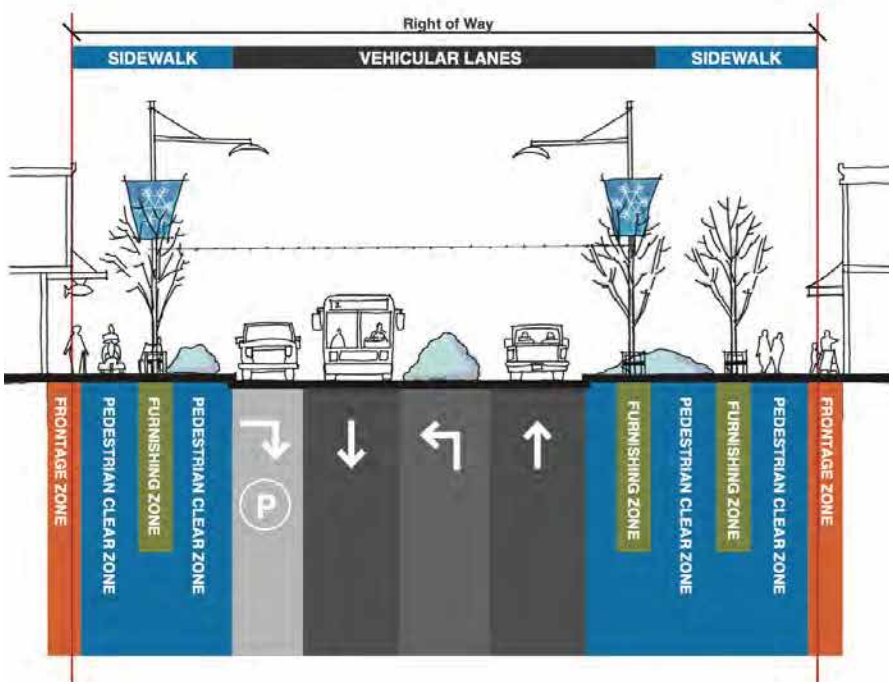
Greenway Precinct - winter



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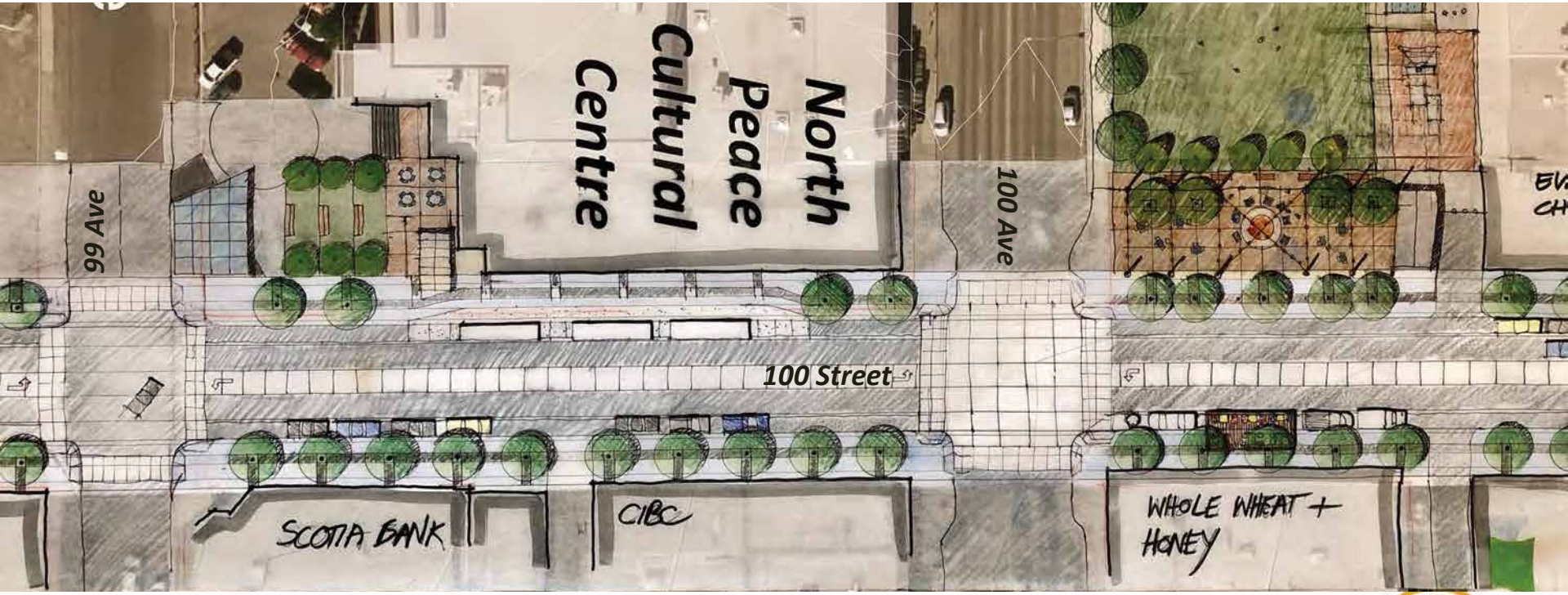
The Heart



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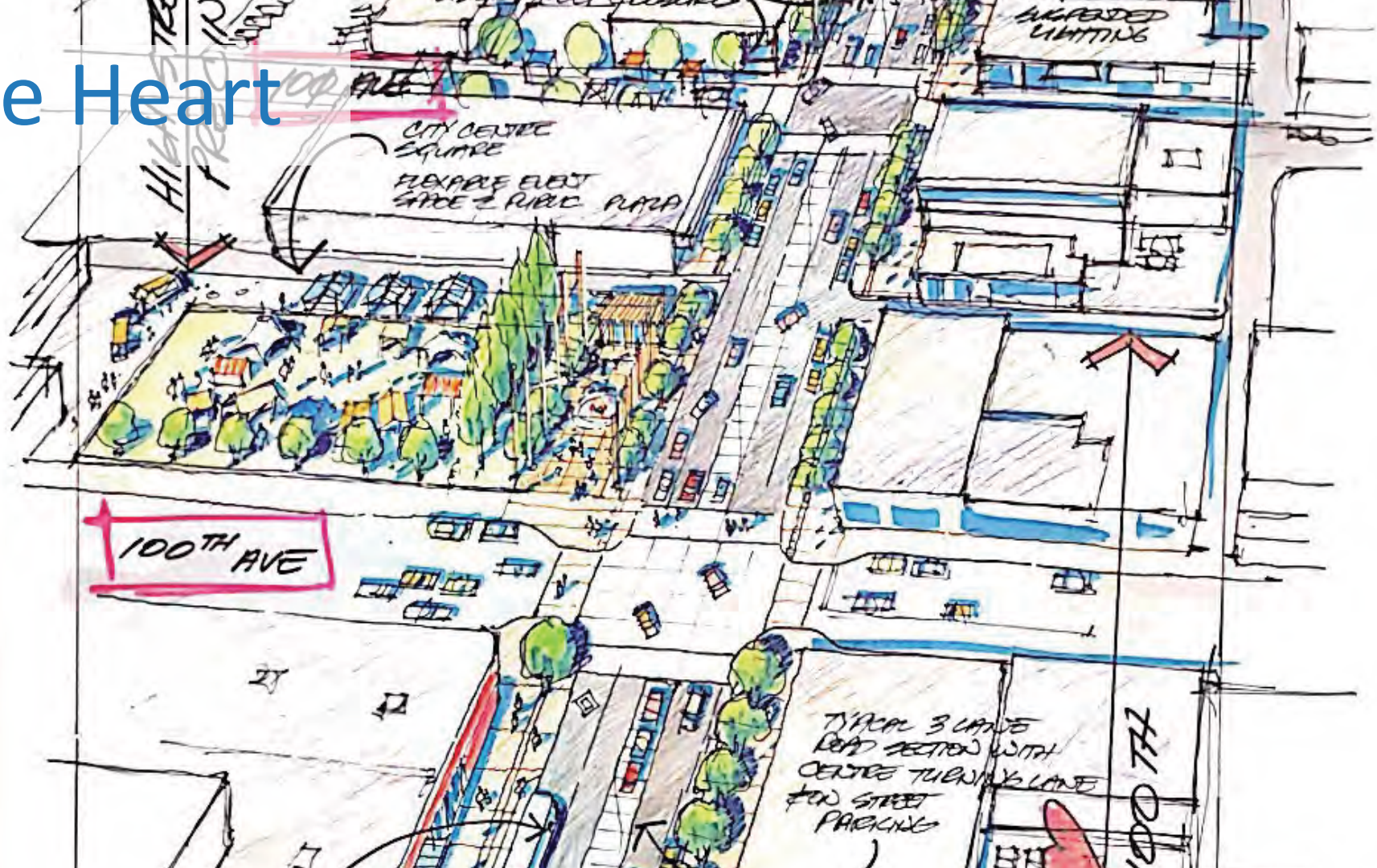
CITY CENTRE SQUARE
FLEXIBLE EVENT SPACE & PUBLIC PLAZA
100TH AVE
TYPICAL 3 LANE ROAD SECTION WITH CENTRE TURNING LANE FOR STREET PARKING

Bus Exchange

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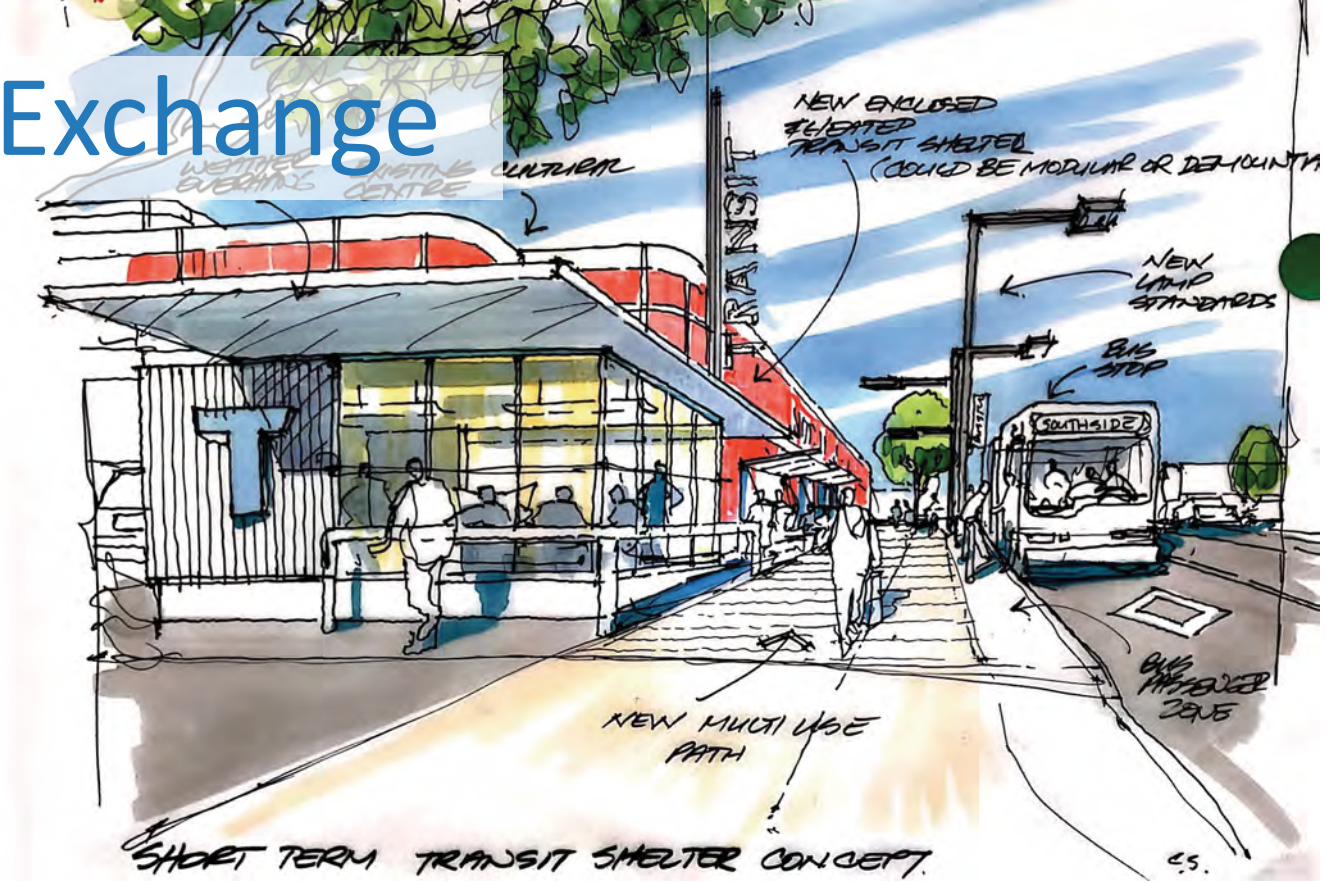
Bus Exchange



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The Heart

at 100 St. and 100 Ave.

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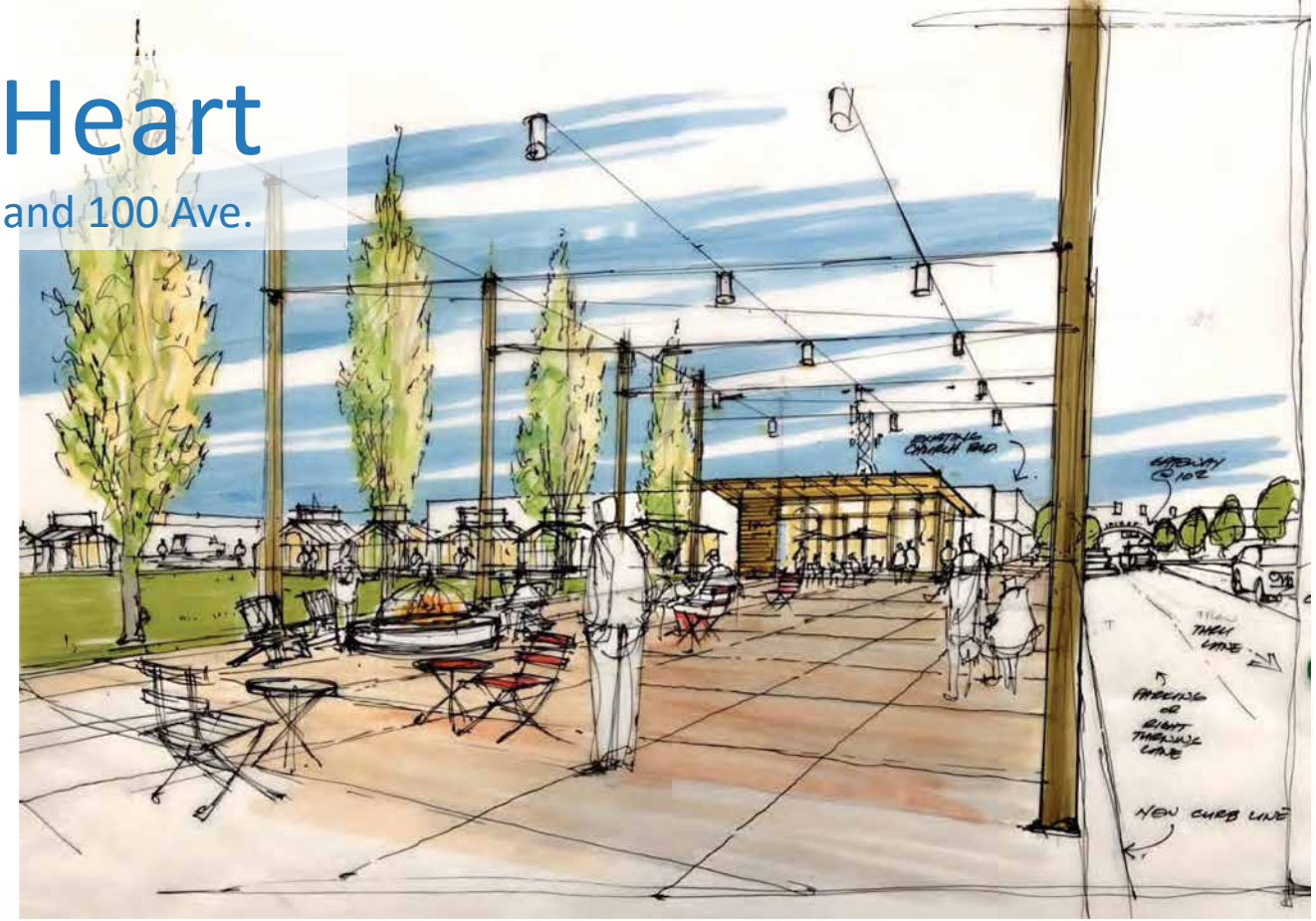
The Heart

at 100 St. and 100 Ave.



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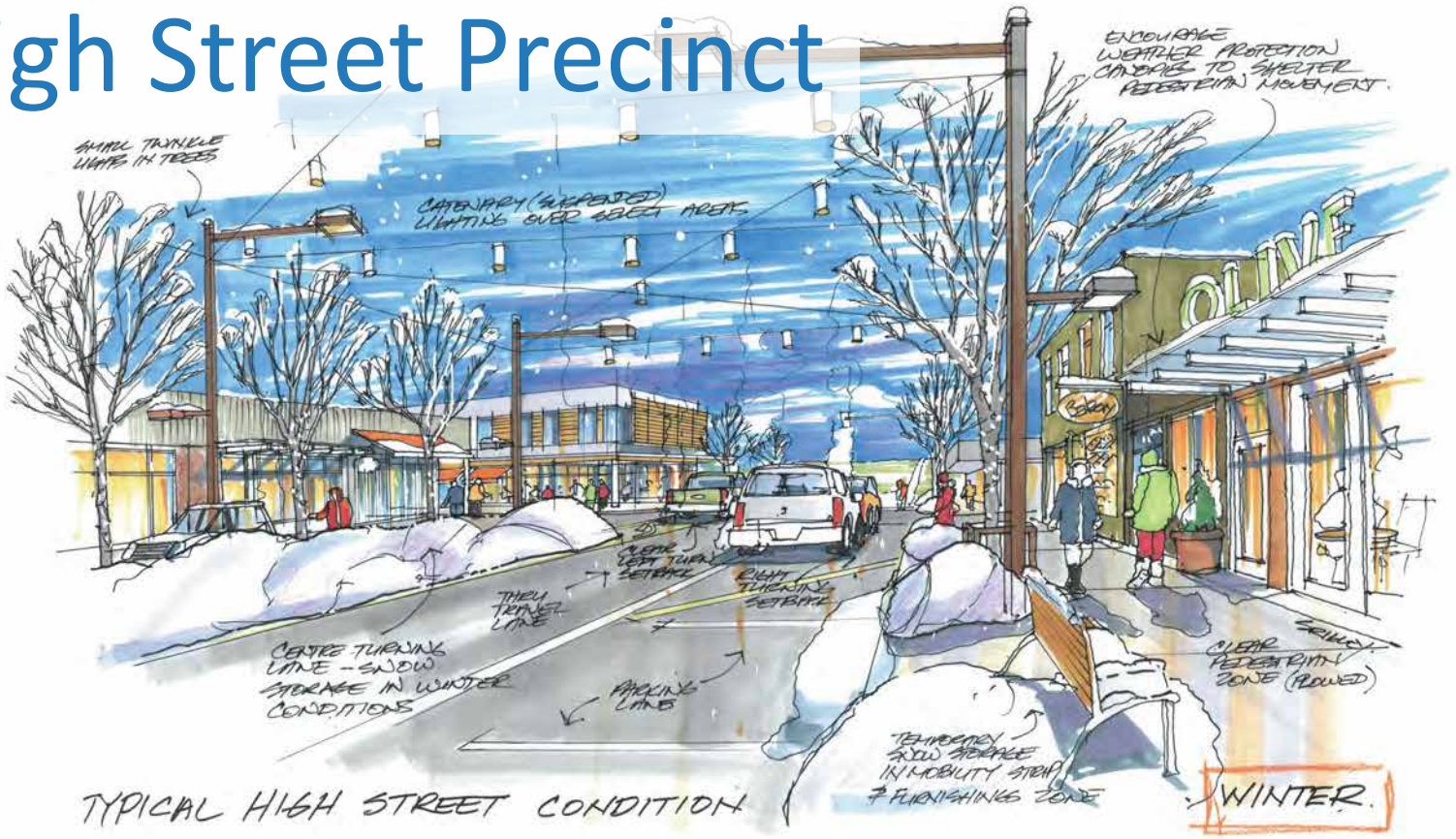
High Street Precinct

High Street Precinct



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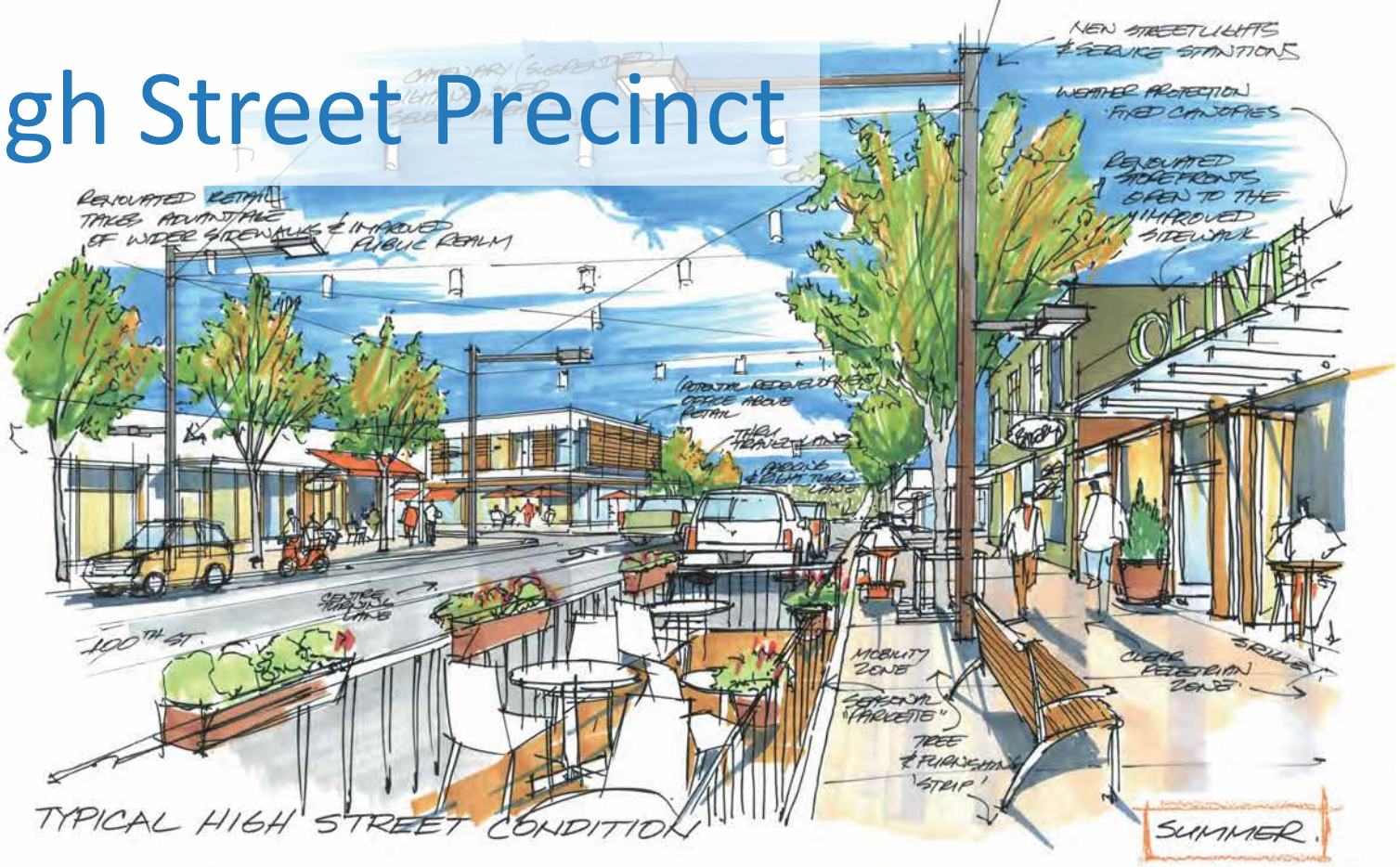

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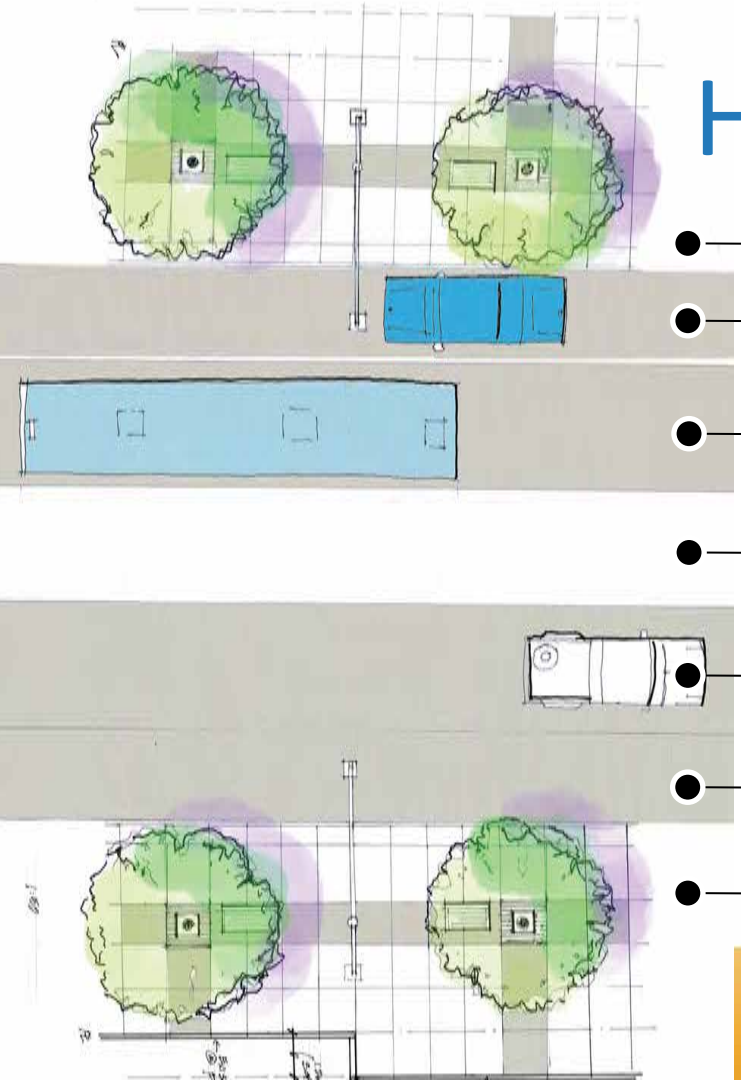

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- *Parking lane*
- *Travel lane*
- *Left turning lane*
- *Travel lane*
- *Parking lane*
- *Sidewalk*

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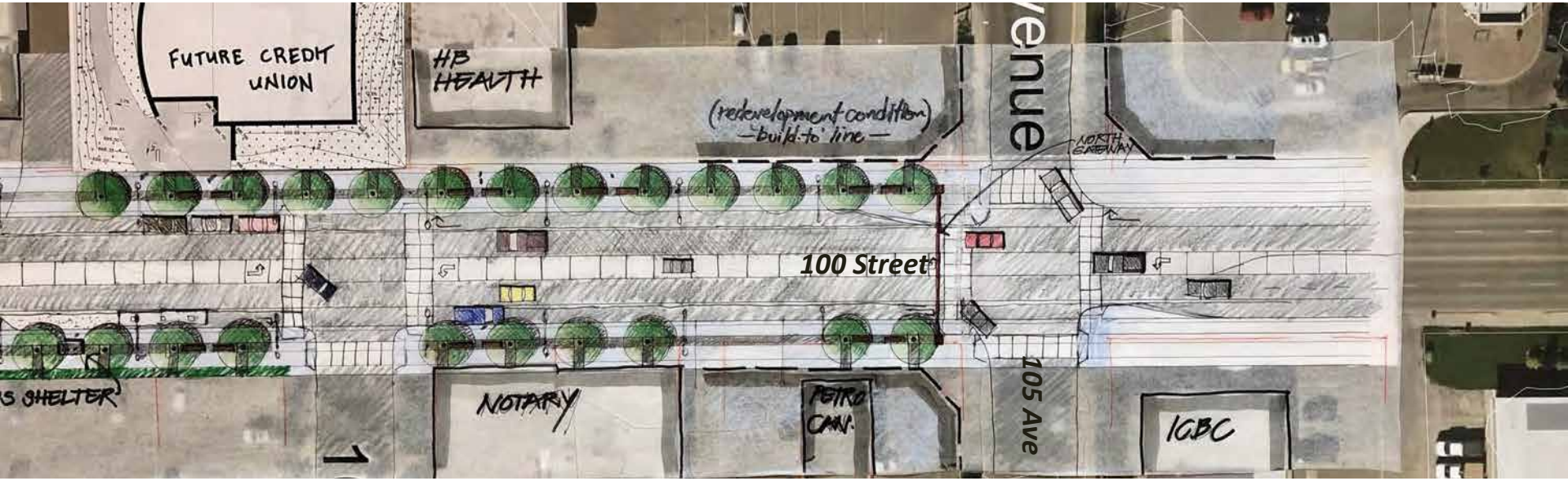
North Gateway



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North Gateway

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A Deep Dive into Functional Considerations

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Infrastructure

Infrastructure

Our Downtown has some of the oldest infrastructure in the City

Alaska Highway News ≡ MENU

Water main break closes 100 Street

Alaska Highway News

MAY 11, 2018 09:34 AM

Like

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Larger water pipes

Allow for greater fire protection and densification

Larger storm pipes

Accommodate increased intensity and frequency of rainfall events due to a changing climate

Larger sanitary pipes

Support Infill and redevelopment

Winter City & Winter Operations

Design Considerations include…

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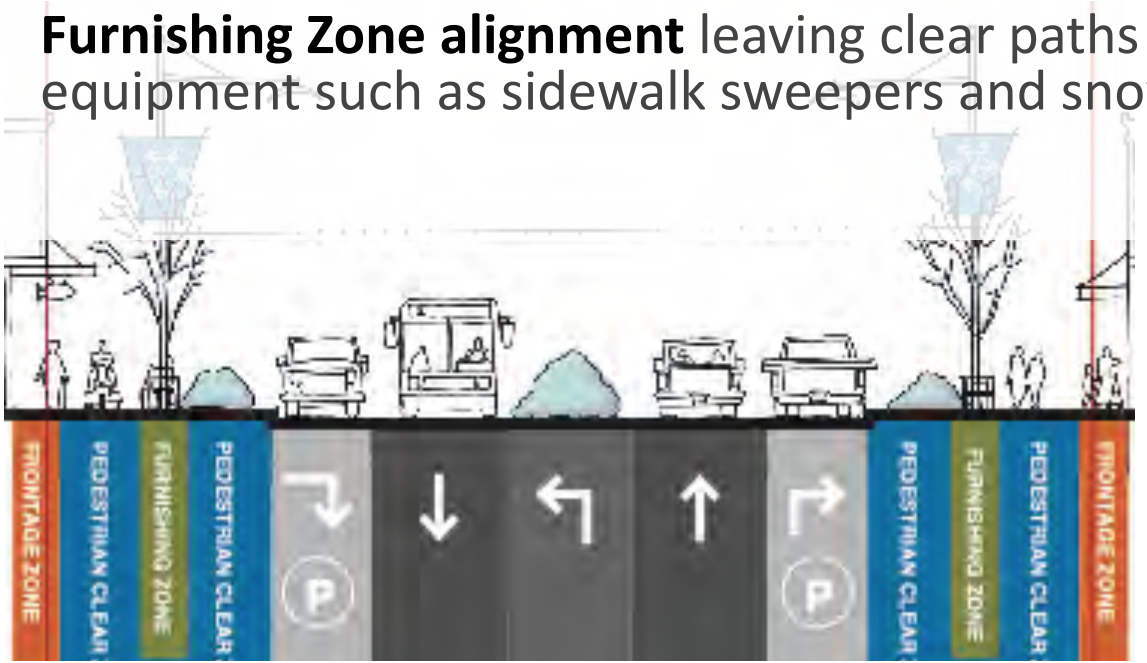
Winter City & Winter Operations

- **Centre turning lane provides storage** – operational methodology doesn't change
- **Furnishing Zone alignment** leaving clear paths for maintenance equipment such as sidewalk sweepers and snow clearing blades



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The use of lighting

To enhance environment during long, dark days of winter

- Catenary lighting used selectively
- Decorative lamp standards with double davit arms for the roadway and pedestrian
- All trees will have electrical source for illumination

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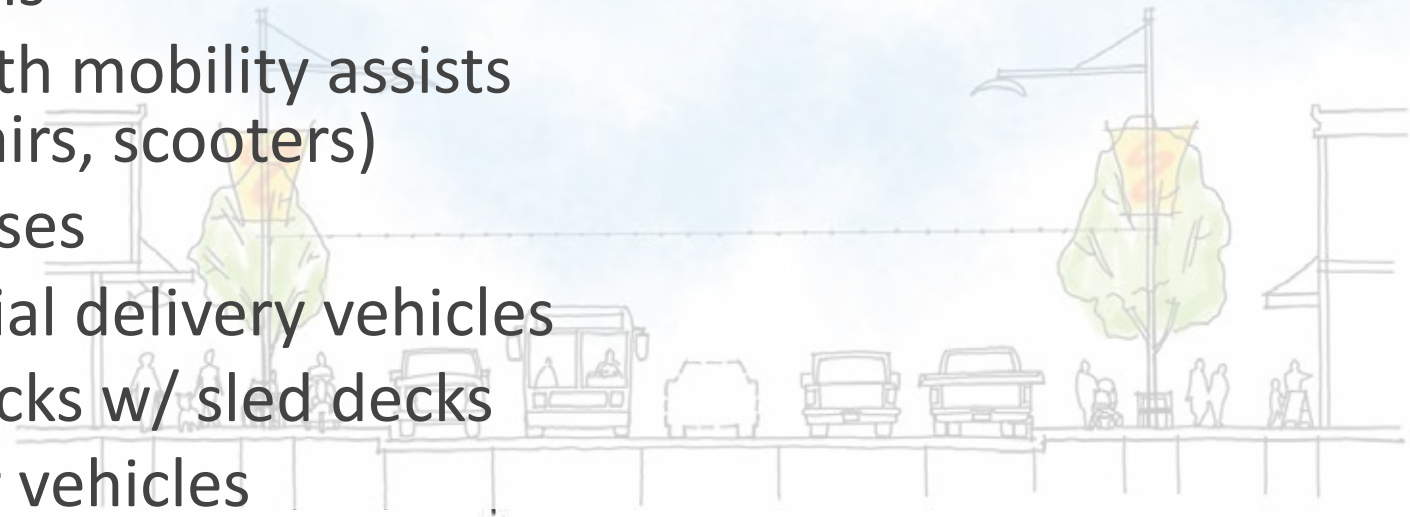
Transportation

Traffic Flow

- Three-lane design supports traffic volume demands
- Separates left and right turning traffic from through traffic at intersections
- Encourages 50 km/h legal speeds
- Improves safety for all road users

Design for Users

- Pedestrians
- People with mobility assists (wheelchairs, scooters)
- Transit buses
- Commercial delivery vehicles
- Dually trucks w/ sled decks
- Passenger vehicles
- Emergency vehicles



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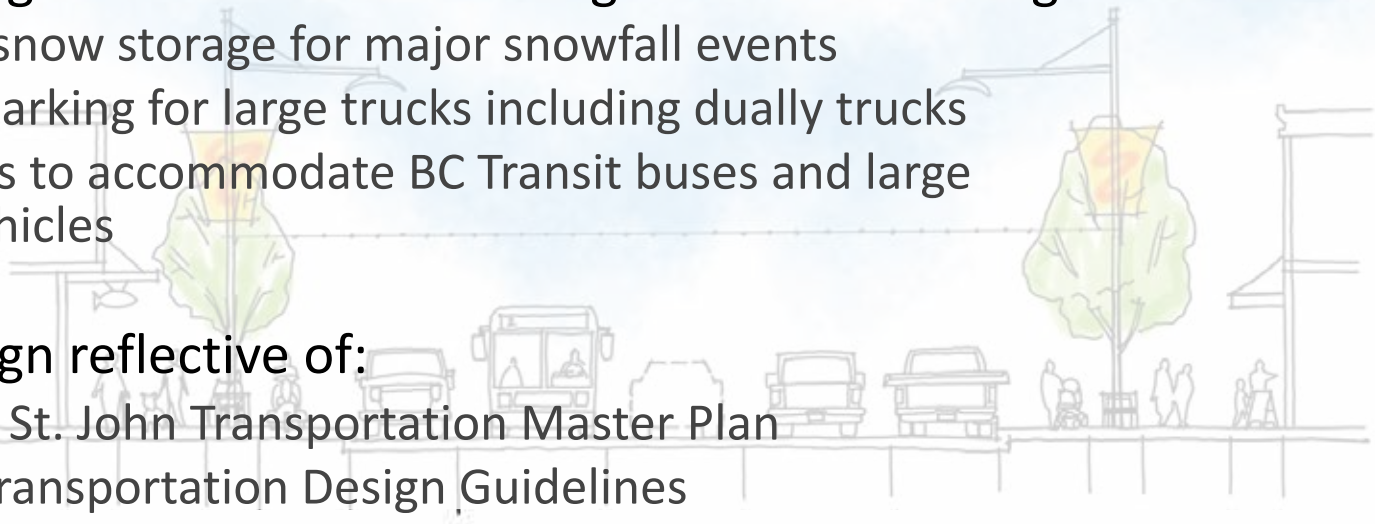
Vehicle Lane Design

Travel and parking lanes meet critical design criteria including:

- Necessary snow storage for major snowfall events
- Sufficient parking for large trucks including dually trucks
- Lane widths to accommodate BC Transit buses and large delivery vehicles

Vehicle lane design reflective of:

- City of Fort St. John Transportation Master Plan
- Canadian Transportation Design Guidelines



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Off-Site Improvements

New traffic signals will be implemented at:

- 98th Street / 100th Avenue
- 100th Street / 103rd Avenue
- 100th Street / 99th Avenue
- 100th Street / 97th Avenue

Additional improvements:

- 100th Street / 102nd Avenue - Upgraded pedestrian crossing
- 102nd Street / 100th Avenue - New laning at intersection approaches

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Supporting Local Businesses

A Foundation for Revitalization

- Compelling public realm a critical foundation for broader business vitality strategy
    - Built a comfortable, clean, safe public realm for all
    - Program the public realm to attract people
        - Lighting
        - Seating
        - Events

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A Foundation for Revitalization

- Other pieces of the puzzle
  - Accessibility and Convenience (e.g. parking strategy)
  - Support for private realm revitalization (e.g. façade incentives)
  - Broader strategy for downtown retail and entertainment (*retention, expansion, attraction*)
    - Roles for the City
    - Roles for other parties

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Impact Mitigation

- Case Studies: Innisfail, Rocky Mountain House, High River, Kelowna, Quesnel
- Key take-aways
  - Communication Strategy
  - Dedicated concierge / liaison
  - Wayfinding
  - Phasing that aligns with business needs
  - Maintaining access

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Impact Mitigation

- Long-Term Benefits:
  - All case study communities have reported uptick in business activity after completion (sales, new businesses)
  - Lit review of investment in ‘complete streets’ show public realm improvements as stimulus for private investment
    - Increased customer counts (vs. control areas)
    - Increased frequency of visits
    - Growth in sales revenues

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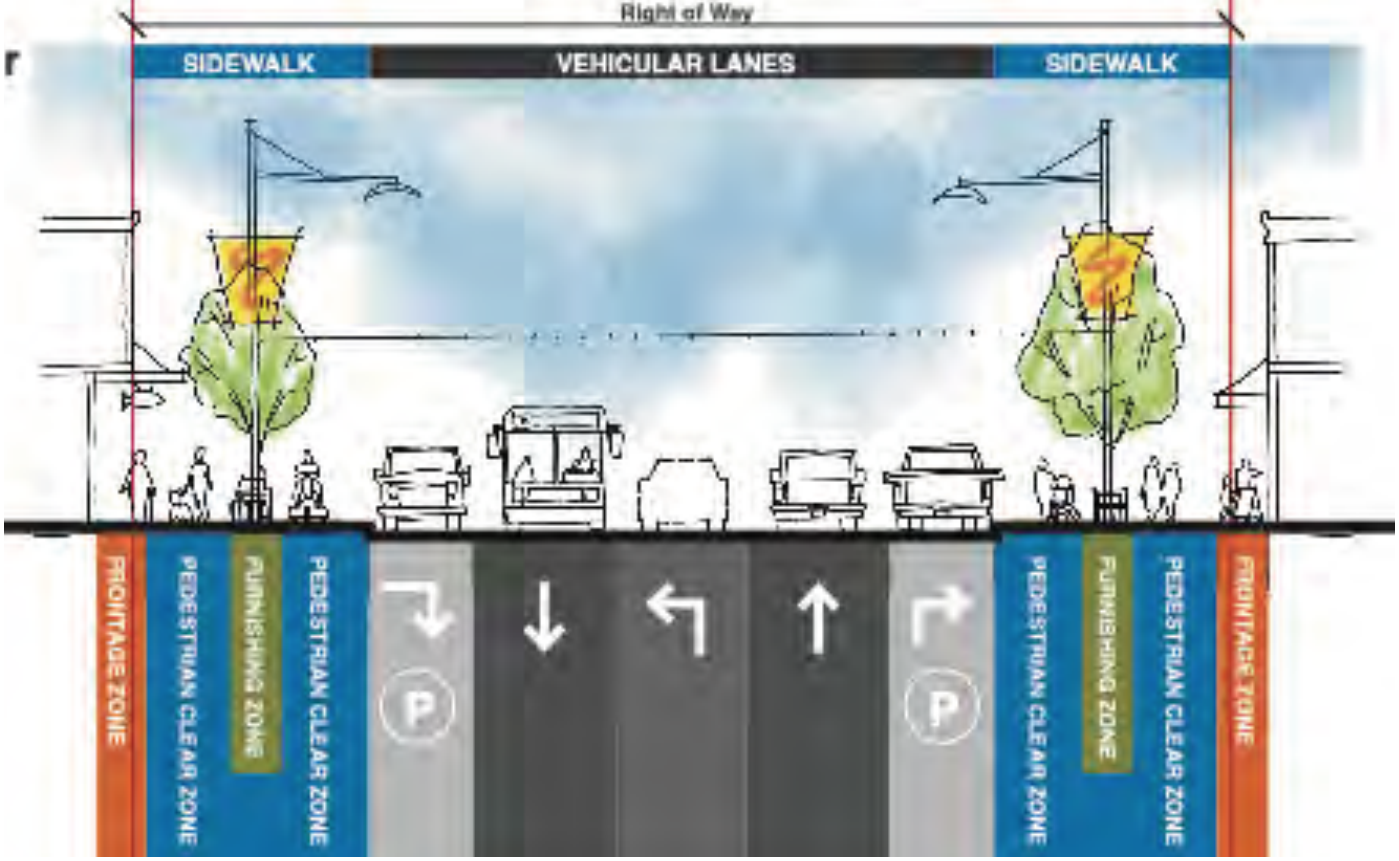
Revisiting the Vision and Principles

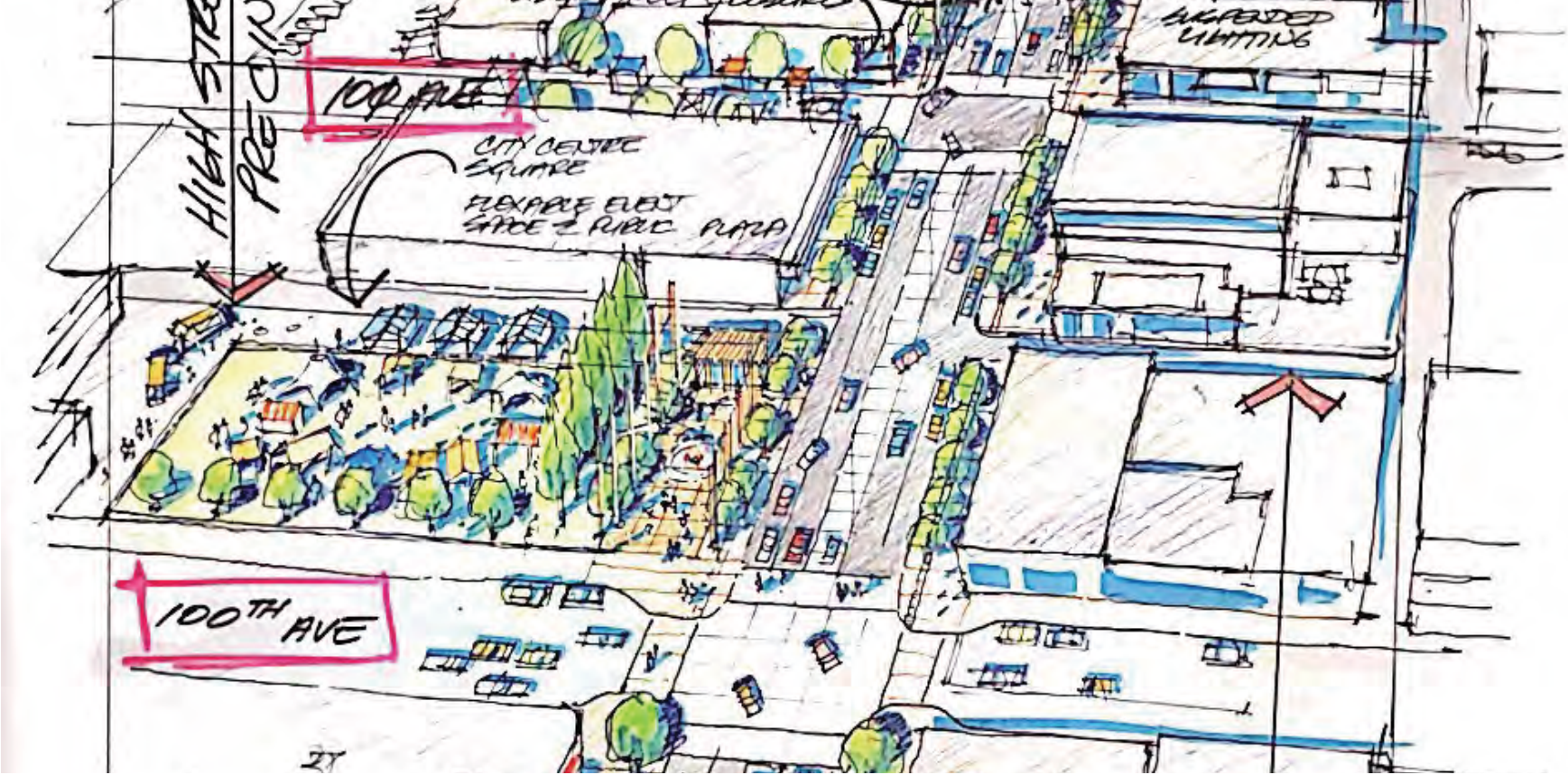
Access for all ages and all abilities, on foot and on wheels

Comfortable, safe and enjoyable spaces for social connection

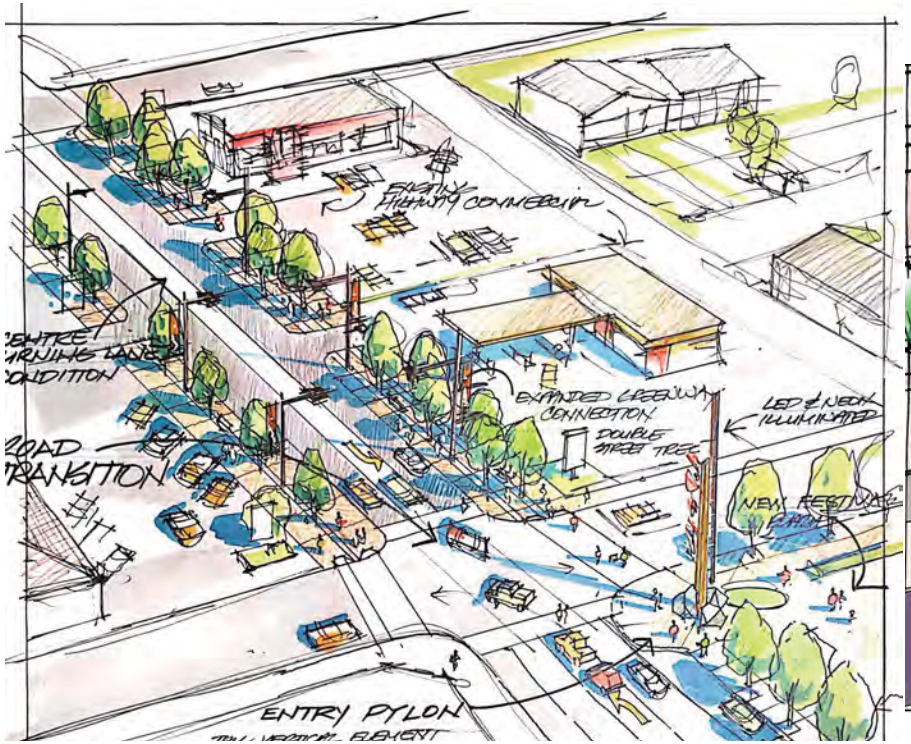


Adequate parking and access to support downtown businesses

Movement of goods, services and emergency vehicles



Flexibility for special events and seasonal celebrations



Enhanced community identity and civic pride

Design adapted to Fort St. John's climate

Support for local businesses and downtown economic revitalization

Thank you!


CATENARY (SUSPENDED) LIGHTING OVER SELECT AREAS
WEATHER PROTECTION FIXED CANOPIES
RENOVATED RETAIL TAKES ADVANTAGE OF WIDER SIDEWALKS & IMPROVED PUBLIC REALM
STOREFRONTS OPEN TO THE IMPROVED SIDEWALK
OLIVE
POTENTIAL REDEVELOPMENT OFFICE ABOVE RETAIL
THRU TRAVEL LANE
CENTRE TURNING LANE
100TH ST.
MOBILITY ZONE
SERVICE ZONE
SEASONAL "PARCETTE"
TREE & FURNISHING "STRIP"

APPENDICES

A | 100 Street Charrette Final Presentation

B | Transportation Analysis

a. 2019 100 Street ICBC collision data summary
b. 100 Street Charrette concept transportation performance summary

C | Mapping & Analysis (Charrette Design Brief materials)

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b. Zoning
c. Pedestrian network
d. Slopes
e. Precincts & amenities
f. Opportunities
g. Winter walk
h. Placemaking scorecard

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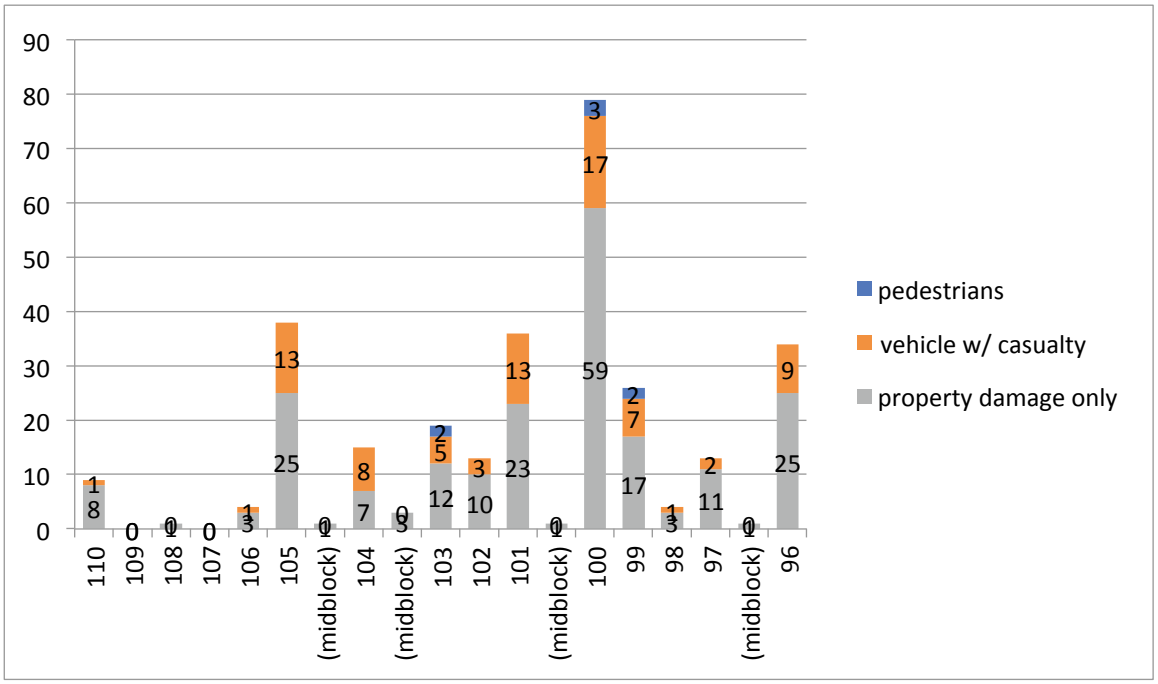
e. Downtown Business Mitigation Strategy

ICBC Crash Data | 100 Street Corridor | 2013 - 2107

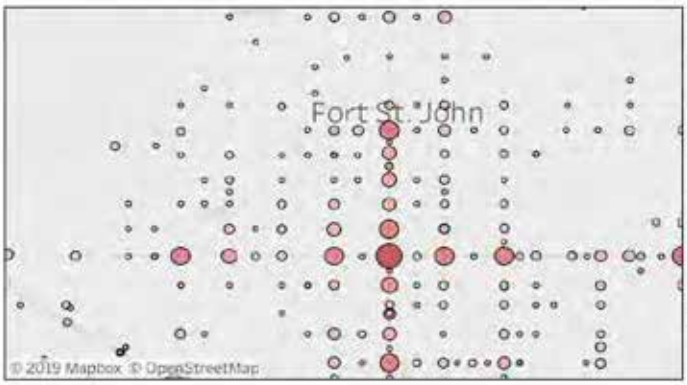
https://public.tableau.com/profile/icbc#!/vizhome/NorthCentralCrashes/NCDashboard

	vehicles			
cross street	vehicle w/ casualty	property damage only	vehicles (total)	pedestrians
110	1	8	9	
109	0	0	0	
108	0	1	1	
107	0	0	0	
106	1	3	4	
105	13	25	38	
(midblock)	0	1	1	
104	8	7	15	
(midblock)	0	3	3	
103	5	12	17	2
102	3	10	13	
101	13	23	36	
(midblock)	0	1	1	
100	17	59	76	3
99	7	17	24	2
98	1	3	4	
97	2	11	13	
(midblock)	0	1	1	
96	9	25	34	
TOTAL	80	210	290	



North Central Crashes - 2013 to 2017

Notes about the data:
ICBC data as of March 31, 2018. Casualty crashes are crashes resulting in injury or fatality. Property damage only crashes are crashes resulting in material damage and no injury or fatality. Crash maps exclude crashes in parking lots and involving parked vehicles. Therefore, **adding figures for any community/region won't provide an accurate total of all crashes in that area.** Crashes between intersections are plotted in the middle of the nearest two intersections. In the "location" field, these crashes are grouped to the nearest 100 block/city block. Note that some 100 blocks extend through multiple intersections and may include more than one point on the map (but don't include crashes that occurred at intersections).
Accurate and verifiable information is not always available. Therefore, maps only include crashes where sufficient location information was available to determine a latitude and longitude. Crashes on boundaries will appear for both cities. When comparing map counts with previous publications, counts may differ due to rounding, late reporting or corrections to the data.



Map Controls
* hover over the upper-left corner of the map to display controls (Zoom-in, Zoom-out, Select-area, Home).
* to pan, left click and hold the mouse button until the mouse pointer changes to 4 arrows then drag the map.
* to display the entire area of the city currently selected, click Home.
* to select an intersection click on the intersection's circle; click it again to deselect.

Please note that to export data to an Excel file, a recent version of Internet Explorer or other browser

City
FORT ST JOHN

Year (All)

Crash Type (All)

Search by street name within city

Use slider to select count range displayed
1 100

Crash Count
1 100

Location	
100 ST & HWY 97 N & TURNIN..	100
100 AVE & HWY 97 N & OLD F..	91
100 AVE & 100 ST	76
93 AVE & 96 ST & 96A ST	67
108 ST & 109 ST & HWY 97 N ..	63
100 ST & 93 AVE	60

BC - Crashes Involving Pedestrians - 2013 to 2017

Notes about the data
ICBC data as of March 31, 2018. Casualty crashes are crashes resulting in injury or fatality. Property damage only crashes are crashes resulting in material damage and no injury or fatality. Crash maps exclude crashes in parking lots and involving parked vehicles. Therefore, **adding figures for any community/region won't provide an accurate total of all crashes in that area.** Crashes between intersections are plotted in the middle of the nearest two intersections. In the "location" field, these crashes are grouped to the nearest 100 block/city block. Note that some 100 blocks extend through multiple intersections and may include more than one point on the map (but don't include crashes that occurred at intersections).
Accurate and verifiable information is not always available. Therefore, maps only include crashes where sufficient location information was available to determine a latitude and longitude. Crashes on boundaries will appear for both cities. When comparing map counts with previous publications, counts may differ due to rounding, late reporting or corrections to the data.

Map Controls
* hover over the upper-left corner of the map to display controls (Zoom-in, Zoom-out, Select-area, Home).
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* to select an intersection click on the intersection's circle; click it again to deselect.

Please note that to export data to an Excel file, a recent version of Internet Explorer or other browser such as Firefox is required.

City/Community/Area
FORT ST JOHN

Region (All) **Year** (All) **Month** (All)

Search by street name within city

Crash Count
1 3

City	Location	
FORT ST JOHN	100 AVE & 100 ST	3
	100 ST & 103 AVE	2
	100 ST & 99 AVE	2
	100 AVE & 102 ST	1
	100 AVE & 98 ST	1
	100 ST & 93 AVE	1
	105 AVE & 98 ST	1
	110 AVE & 98 ST & PEACE ..	1
	83 AVE & 93 ST	1
	86 ST & 89 AVE	1
	86 ST & 93 AVE	1

MEMORANDUM

Date:	September 17, 2019
To:	Edward Porter, Senior Urban Designer, Modus
cc:	Vipul Garg, Urban Systems
From:	Ian Roth, P.Eng., Urban Systems
	Chad Carlstrom, P.Eng., Urban Systems
File:	1958.0430.01
Subject:	**Transportation Design Considerations and Traffic Model Findings for 100 Street**

CONTEXT

Urban Systems acted in partnership with Modus to provide transportation engineering input and review of the conceptual options for the City of Fort St. John's (the City) 100 Street Charrette project that were presented to the public as part of the June 11 – 15, 2019 public engagement process. 100 Street is currently a four-lane road that supports vehicles moving in a north-south direction through the heart of the city and operates as a vehicle-oriented space with nearly 80% of the public right of way allocated to the storage and movement of vehicles. To accommodate the many functions and uses of 100 Street in a more efficient way, and to best serve different user groups using 100 Street, various roadway cross sections were explored during the 100 Street Charrette process.

The following guiding principles were viewed while preparing conceptual designs for 100 Street:

- Access for all ages and abilities on foot and on wheels
- Comfortable, safe and enjoyable spaces for social interaction
- Adequate parking and access to support downtown business
- Movement of goods, services, and emergency vehicles
- Flexibility for special events and/or seasonal celebrations
- Enhanced community identity and civic pride
- Design adapted for Fort St. John's climate
- Support for local businesses and downtown economic revitalization

The outcome of the 100 Street Charrette process identified an optimized three-lane cross-section design for 100 Street as the preferred option. This technical memorandum documents the key transportation design considerations and traffic model findings for the preferred option.

OPTIMIZED THREE-LANE DESIGN

The three-lane conceptual design for 100 Street includes one northbound lane, one southbound lane and a shared centre turning lane which would also act as temporary snow storage. The design also maintains parking lanes on both sides of the street for most of 100 Street and includes wider sidewalks (compared to existing condition).

SimTraffic models were developed for both existing four-lane and preferred three-lane design configurations. **Figure 1** illustrates the traffic flow model for 100 Street/100 Avenue and 100 Street/101 Avenue for existing conditions; **Figure 2** shows the traffic flow for optimized three-lane design configuration. During peak traffic conditions of existing conditions, traffic modelling shows that the centre-northbound and centre-southbound lanes restrict through movements as vehicles begin queuing/stacking while waiting to make a left-hand turn movement; outside lanes maintain through movements. By introducing a dedicated left-hand turn slot in the optimized three-lane configuration, vehicles have a designated area for queuing/stacking while the outside lanes maintain through movements. During peak traffic movements, the

optimized three-lane configuration accommodates similar traffic as the existing four-lane condition but incorporates a more efficient use of space.

Figure 1: Traffic Model for Exiting Four-Lane Design

About the Existing Conditions Model (Figure 1)

- Through vehicles are shown in white, left-turn vehicles are shown in blue, and right-turn vehicles are shown in yellow.
- The existing 4-lane roadway configuration on 100 Street provides significant capacity that is not currently utilized.
- Through vehicles are impeded by right or left turning vehicles in either the outside or inside travel lane, respectively.
- The peak traffic conditions occurring at the 100 Ave / 100 St intersection in the PM peak hour are accommodated.

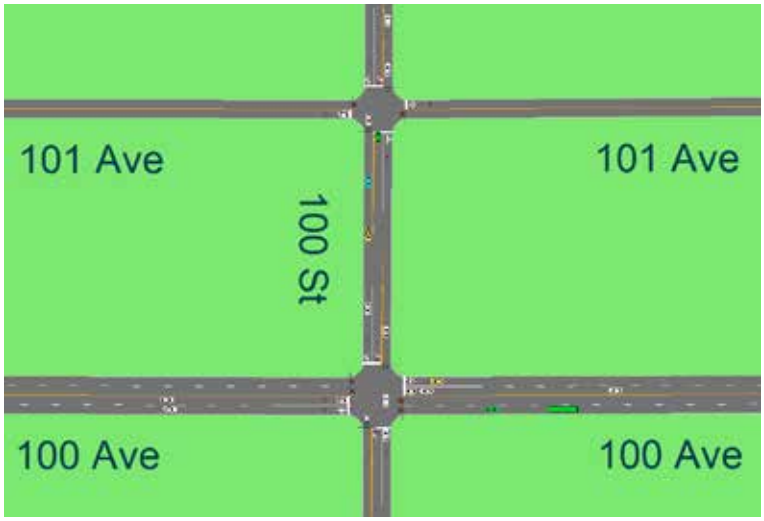

Figure 2: Traffic Model for Optimized Three-Lane

About the Optimized Three-Lane Model (Figure 2)

- Through vehicles are shown in white, left-turn vehicles are shown in blue, and right-turn vehicles are shown in yellow.
- The 3-lane model maintains majority of capacity of the 4-lane design by separating through traffic from turning movements.
- Through traffic is not impeded by turning vehicles at the intersections.
- The peak traffic conditions occurring at the 100 Ave / 100 St intersection in the PM peak hour are accommodated.

Moreover, key transportation findings related to the three-lane design that were presented in the charrette are as follows:

- **Traffic Flow**: Three-lane design supports traffic volume demands, separates left and right turning traffic from through traffic at intersections, encourages maximum 50km/h legal speeds, and improves safety for all road users
- **Design for Users**: Three-lane design supports multiple user groups including pedestrians, people with mobility assists, transit buses, commercial delivery vehicles, dual rear-wheeled trucks with sled decks, passenger vehicles and emergency vehicles
- **Vehicle Lane Design**: Travel and parking lanes meet critical design criteria including parking for trucks including dual rear-wheeled trucks, and lane widths to accommodate BC Transit buses and large delivery trucks. Further, vehicle lane design is reflective of the City of Fort John Transportation Master Plan, Canadian Transportation Design Guidelines, and comparable cities with downtown urban environments. Lane widths were intentionally reduced compared to the existing lane widths to reflect urban environments that moderate traffic speeds closer to the posted speed limit of 50 km/h.
- **Seasonal Design:** the shared centre turning lane is able to accommodate temporary snow storage during the winter seasons while keeping the through-lanes clear. Left-hand turning movements will still be maintained during the winter season as temporary snow storage will not occur near intersections.

OTHER IMPROVEMENTS

Transportation upgrades along 100 Street include adding traffic signals at the intersections of 100 Street and 97 Avenue, 99 Avenue and 103 Avenue to improve east-west movements across the corridor. Given the objectives of creating a safer pedestrianized urban environment, all other intersections without traffic signals are planned to have pedestrian activated cross-walks with flashing amber lights or special lighting features.

In addition, with the future construction along 100 Street, the community will need to rely on alternative routes to get to their destination. Fortunately, the grid layout of Fort St. John allows for opportunities to use other roads such as 96 Street, 98 Street, 102 Street and other streets beyond to accommodate vehicle movements. Several off-site transportation upgrades to support alternate routes include:

- Upgrading the signalized intersection at 100 Ave / 102 Street with left hand turn slots
- Adding a signalized intersection with left hand turn slots at 100 Ave / 98 Street to improve north-south movement to achieve function like 102 Street
- Possibly adding a signalized intersection at 96 Street / 96 Ave to improve east-west movements

In summary, we recommend and support the optimized 3-lane design for 100 Street for further detailed planning, design and implementation.

Sincerely,

URBAN SYSTEMS LTD.

Prepared by:

Ian Roth, P.Eng.
Transportation Engineer
/VG

Reviewed by:

Chad Carlstrom, P.Eng.
Project Engineer

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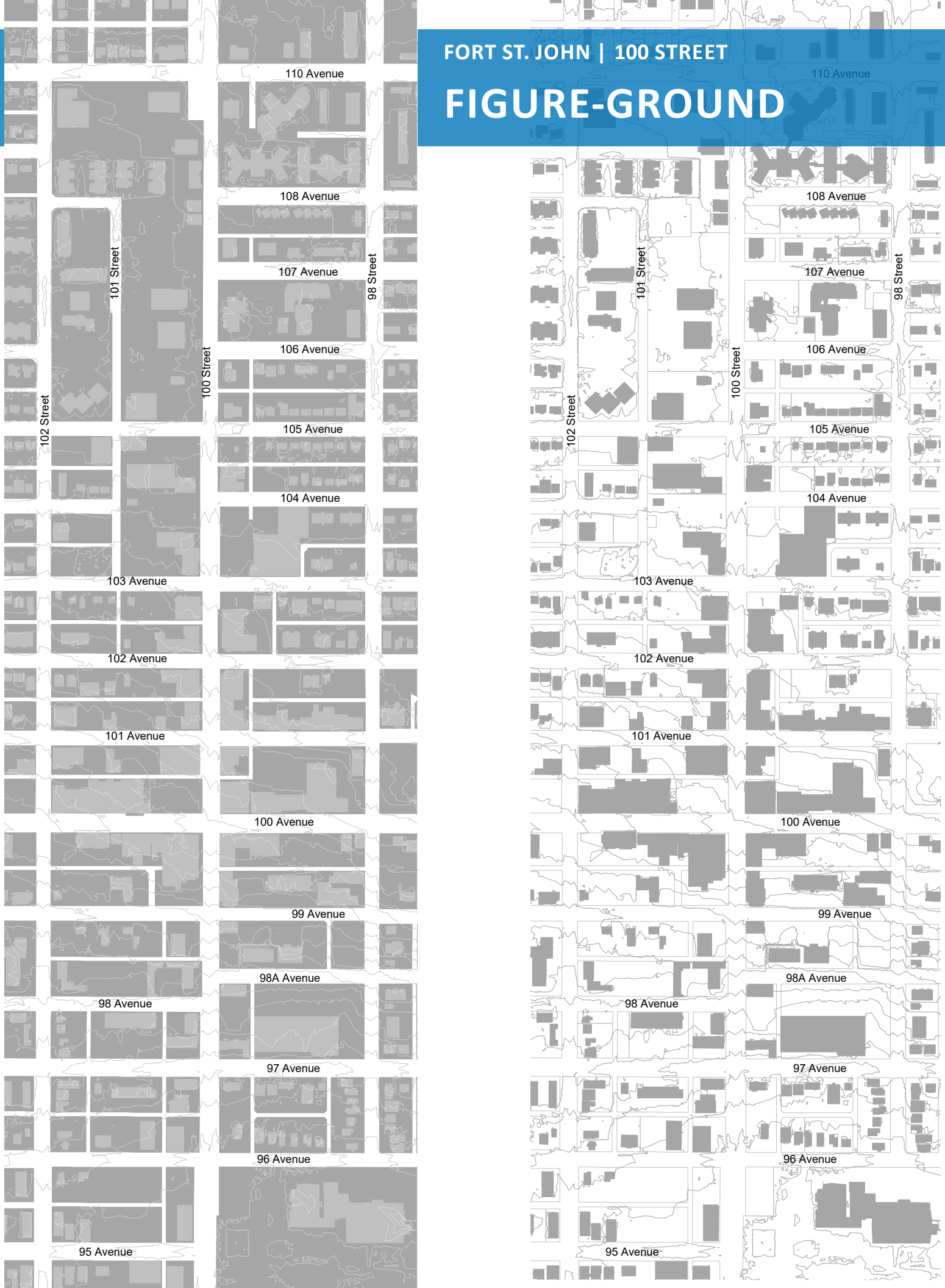
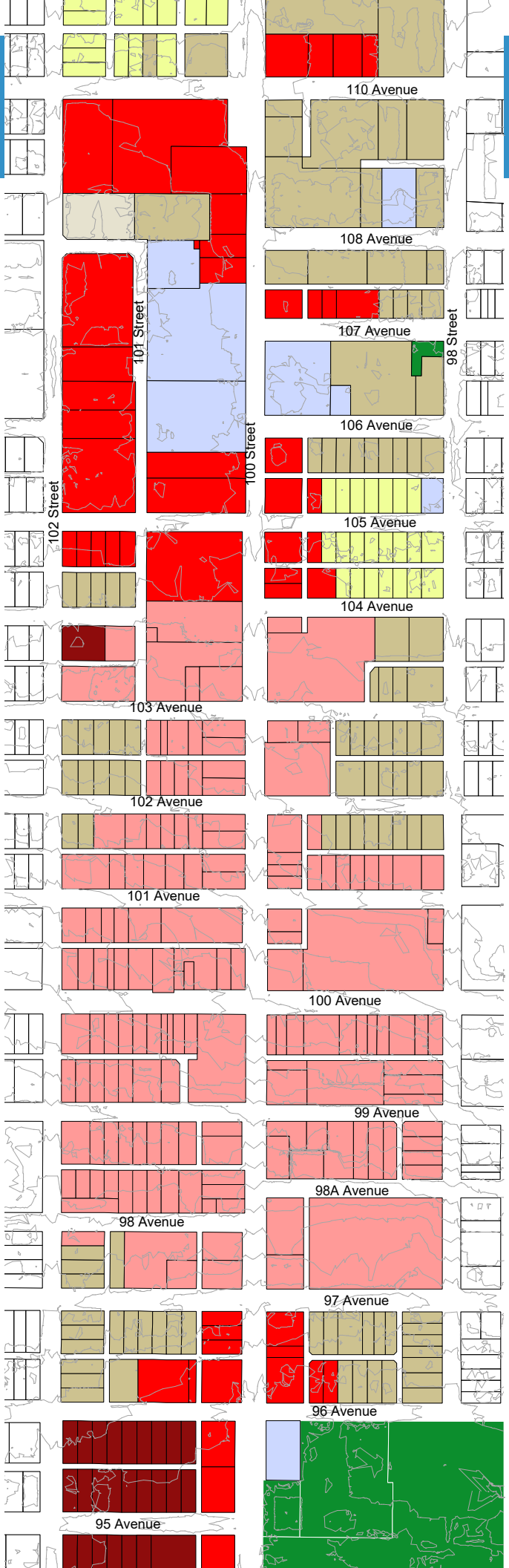
FORT ST. JOHN | 100 STREET

FIGURE-GROUND





FORT ST. JOHN | 100 STREET

ZONING

ZONING LEGEND

C2|Downtown Core Commercial
0m min setbacks; 100% max parcel coverage; 21m max bldg height

C3|General Commercial
1.5m min front setback; 50% max parcel coverage; 21m max bldg height

C4|Service Commercial
1.5m min front setback; 50% max parcel coverage; 21m max bldg height

INST|Public and Institutional
7.5m min front setback; 50% max parcel coverage; 15m max bldg height

P|Parks *7.5m min front setback; 10m max bldg height*

RM2|Multi-family *(High Density)*

RM1|Multi-family *(Medium Density)*

R2|Duplex Housing

R1|Single-detached Housing

C-2 Permitted Uses:

- Institutional uses such as assembly hall, police station, post office, religious facility, library, etc.;
- Art gallery or studio;
- Bus depot;
- Commercial amusement enterprise;
- Commercial school;
- Community care facility;
- Day care centre, major;
- Financial institutions;
- Health services facilities;
- Hotel and motel;
- Liquor establishment;
- Liquor store;
- Multi-family dwelling units above first story as per RM-2 requirements;
- Newspaper printing and publishing;
- Office;
- Personal services establishment;
- Parking lot and parkade;
- Retail store;
- Restaurant;
- Shopping mall; and
- Theatre and cinema

C-2 Downtown Core

Intent of the C-2 zone is to permit and promote the development of a city centre and high density mixed use

Minimum Parcel Area	185 sq m
Minimum Parcel Width	6.0 m
Minimum Setbacks	• Front: 0 m • Interior side: 0 m • Exterior side: 0 m • Rear: 0 m
Maximum Parcel Coverage	100%
Maximum Building Height	21 m
Floor Area Ratio	3
Additional Requirements	• Landscaping Pg. 67 • residential mixed-use developments in the C-2 zone must meet the amenity requirements as listed in the RM-2 zone • Parking Pg 69 • Development Permit Pg 72

C-3 General Commercial

Intent of the C-3 zone is to permit and promote large format retail uses

Minimum Parcel Area	555 sq m
Minimum Parcel width	15 m
Minimum Setbacks	• Front: 1.5 m • Interior side: 0 m or 6 m where abuts a R, Rm or P zone • Exterior side: 3 m or 6 m where abuts a R, Rm or P zone • Rear: 1.5 m or 6 m where abuts a R, Rm or P zone
Maximum Parcel Coverage	40%
Maximum Building Height	21 m
Floor Area Ratio	1.5
Additional Requirements	• Landscaping Pg. 67 • Parking Pg 69 • Development Permit Pg 77

C-3 Permitted Uses:

- Art gallery or studio;
- Automobile sales and repairs where trucks and recreational vehicles do not exceed 4,500 kg gross vehicle weight;
- Large format retail;
- Bus depot;
- Commercial school;
- Contractors offices & associated services
- Community care facility;
- Commercial amusement enterprise;
- Commercial printing;
- Day care centre, major;
- Drive-thru;
- Dry cleaners & laundromat;
- Financial institutions;
- Funeral parlour or undertaking establishment
- Gaming facility;
- Health services facilities;
- Hotel & motel;
- Institutional uses such as assembly hall, police station, post office, religious facility, library, etc.;
- Light passenger vehicle car wash;
- Liquor establishment;
- Liquor store;
- Multi-family dwelling units above first story as per RM-2 requirements;
- Office;
- Parking lot and parkade;
- Personal service establishment;
- Retail store;
- Restaurant;
- Service station;
- Shopping mall;
- Theatre and cinema, and
- Veterinary hospital

C-4 Permitted Uses:

- Art gallery or studio;
- Auction sales and storage (excluding heavy machinery, animals and agriculture)
- Automobile, recreational vehicle sales and repairs
- Building contractors, supply and storage
- Bus depot;
- Caretaker lodging as per suite requirements
- Cartage, delivery, express terminal storage
- Commercial amusement enterprise
- Commercial school;
- Commercial printing;
- Day care centre, major;
- Drive-thru;
- Dry cleaners & laundromat;
- Funeral parlour or undertaking establishment
- Heavy equipment sales and service;
- Hotel , motel and campground;
- Laboratories, scientific and research
- Liquor establishment;
- Liquor store;
- Office;
- Oil field supplies and services;
- Parking lot and parkade;
- Personal service establishment;
- Propane sales;
- Publishing, printers and printing;
- Recycling depot;
- Refrigeration service,
- Retail store;
- Restaurant;
- Service station;
- Taxi dispatch office
- Tire sales
- Veterinary hospital
- Warehousing
- Wholesale establishment

C-4 Service Commercial

Intent of the C-4 zone is to permit a wide range of commercial uses with a focus on highway and service commercial to support the local resource industries

Minimum Parcel Area	555 sq m
Minimum Parcel Width	15 m
Minimum Setbacks	• Front: 1.5 m • Interior side: 0 m or 6 m where abuts a R, RM or P zone • Exterior side: 3 m or 6 m where abuts a R, RM or P zone • Rear: 1.5 m or 6 m where abuts a R, RM or P zone
Maximum Parcel Coverage	50%
Maximum Building Height	21 m
Floor Area Ratio	1.5
Minimum Unobstructed Frontage	50%
Additional Requirements	• Landscaping Pg. 67 • Parking Pg 69 • Development Permit Pg 77

7.2.1 Commercial Landscaping Requirements

	Landscape Requirements
Screening and Fencing	Massed planting is the preferred landscaping screening technique.
	No fence shall exceed a height of 1.2 m in a front yard and 1.8 m in a side or rear yard
	A landscaped screen of not less than 1.5 m in height must be provided and maintained along the boundary of a C parcel which abut R or P zones.
	The landscape screen must be of a form and character compatible with adjacent uses and must be free of advertising.
	Chain link fencing fronting on public space must incorporate vegetative screening, on the side of the fencing visible from outside the parcel, in the form of massed planting as generally illustrated in Figure 20.
Buffering	C uses must be buffered from the public realm by placing, on private property adjacent to the property line, one tree every 10m on centre as per the Subdivision and Servicing Bylaw as amended from time to time.
	In the C zones, the following areas must be screened from the view of highways and adjacent properties with a landscape screen: a) outdoor garbage bins; and b) outdoor storage areas.
	Where a parking lot in excess of 3 spaces is located on a parcel which abuts a R, RM or P zone, a landscape screen of not less than 1.5 m in height must be provided and maintained along the edge of the parking lot facing an R, RM, or P zone.

Figure 20: Chain Link Mass Planting

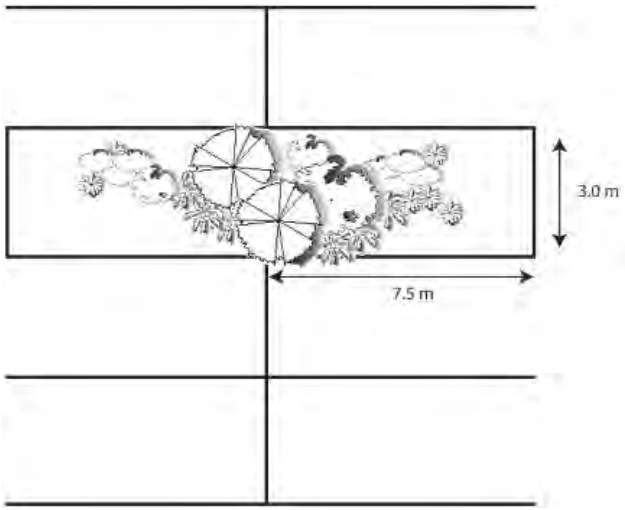


Figure 21: Landscaping in Parking Lot Island

	Where a parking lot in excess of 3 spaces is located on a parcel which abuts a highway or road way, a tree must be place every 10 m on centre along the edge of the parking lot facing the highway as per Subdivision and Servicing Bylaw as amended from time to time.
	Where a parking lot is in excess of 20 spaces, landscaped islands must be located every 10 spaces on a single row of parking (or 20 space on a double row of parking) to break up the hard surface of the parking areas. The landscaped island requirements are: a) minimum 3m x 7.5m for a single row of parking and 3 x 15 m for a double row of parking, as illustrated in Figure 21. b) must include at least two (2) trees per island and may include salt tolerant shrubs and other planting; and, c) hard surfaces, landscaping stone and washed aggregate may not equal more than 30% of the landscaped island.
	Landscaped islands may be used to integrate pedestrian access to and from buildings serviced by the parking area.
Enhanced Landscaping	For proposed mixed-use developments, Green roofs that are accessible and designed for use by tenants may be considered a portion of enhanced landscaping if the green roof is provided at minimum 10 sq. m. per unit.
	For mixed-use developments, amenity space may be provided as streetscape enhancements or a combination of roof top, and streetscaping as approved by the Planning and Engineering Department.
	Enhance landscaping may include a combination of: a) play structures; and/or, b) garden plots for use by tenants; and/or, c) outdoor recreational facilities, such as tennis courts; and/or, d) south facing indoor amenity space at 3 sq. m. per unit and/or, e) green roof.

7.2.2 Service Stations

In the C-3 and C-4 zones, service stations use will require that:

1. Gasoline service pumps or pump islands must be located not closer than 4.5 m to any property line.

2. All servicing and servicing equipment, other than that normally carried out on a pump island, must be entirely enclosed within a building.

3. Canopies over gasoline pumps and pump islands may extend to within not less than 1.5 m from any property line, exclusive of canopy supports which must be located not less than 4.5 m from any property line.

4. The entire service area must be paved with a permanent surface of asphalt or concrete and any unpaved areas of the lot must be landscaped and maintained, and separated from the paved area by a curb or other barrier.

5. All exterior lighting will deflect away from adjacent lots.

6. All tires, automobile accessories and related goods must be located on pump islands or contained within a booth, rack or stand. A maximum of 2 such outdoor merchandise display booths, racks or stands will be permitted on each service station lot and must be located not less than 4.5 m from any street line.

7. All surface water must be contained within the boundaries of the lot.

8. Outdoor storage of machinery, equipment or vehicles in state of disrepair is not be permitted.

7.2.3 Commercial Parking Requirements

In the case where off street parking requirement are not listed for a specific use, the number of off street parking will be calculated based on the requirements for a similar use.

Use	Parking Requirement
Assembly hall/Religous Assembly	1 per 40 sq. m of GFA
Assembly facility	1 per 4 seats

Auction sales and storage	1 per 10 sq. m of auction floor area
Auditoriums, libraries	1 per 3 seats or 1 per 9 sq. m whichever is greater
Automobile sales and service	1 per 75 sq. m of sales area and 1 per service bay
Bakery	1 per 15 sq. m of GFA or 4, whichever is greater
Campground	1 per space
Cartage, delivery, and storage facility	1 per 2 employees, or 1 for 200 sq. m of GFA, whichever is greater
Car and truck wash	4 per bay
Commercial facilities not listed	1 per 20 sq. m of GFA
Bus depot or terminal	1 per 2 sq. m of waiting room plus 2 spaces
Commercialamusemententerprise	1 per 10 person attendance capacity
Convenience store	1 per 25 sq. m of retail floor area or 4, whichever is greater
Daycare centre, major	1 per two employees, plus 3 for drop off/pick up
Financial institutions	1 per 20 sq. m of GFA
Funeral parlour	1 per 4 seats in Chapel
Furniture store	1 per 40 sq. m of GFA
Hotel	1 per 2 guest rooms, plus 1 per 3 seats for a bar or restaurant (restaurant does not include breakfast room catering only to hotel guests)

Fruit and vegetable stand	1 per 15 sq. m of retail area or 4, whichever is greater
Gallery or studio	1 per 40 sq. m of GFA
Outdoor garden shop	1 per 20 sq. m of retail area
Hardware and building supply	1 per 20 sq. m retail floor area and 1 per 200 sq. m of storage
Laboratory	1 per 20 sq. m of GFA
Large-format retail/shopping mall	5 per 100 sq. m of GLA
Laundromat	1 per 3 washing machines
Laundry and dry cleaning	1 per 20 sq. m of GFA
Liquor primary establishment	1 per 4 seats
Motel	1 per room plus 1 per 3 seats for a bar or restaurant (does not include breakfast room catering only to motel guests)
Neighbourhood pub	1 per 3 seats
Office	1 per 30 sq. m of GFA and not less than 1 space for each office or suite of offices occupied by a single tenant
Personal service establishment	1 per 15 sq. m of GFA
Restaurant	1 per 3 seating spaces
Retail store	1 per 20 sq. m of GFA

Sale, rental, service, cleaning and autobody of automobiles, recreation vehicles, boats, manufactured homes, machinery, farm implements and equipment	1 per 70 sq. m of retail floor area plus 1 per service bay plus 1 per 2 employees
Taxi dispatch office	1 per vehicle customarily operating from the office
Theatre and cinema	1 per 4 seats
Trade contractor, oilfield service and supply, drilling contractor	1 per 50 sq. m of GFA contained in building plus 1 per 2 employees
Veterinary clinic	4 per veterinarian
Wholesale establishments	1 per 100 sq. m of GFA
Wholesale store	1 per 30 sq. m of GFA

7.2.4 Off-street Loading

1. No use may be undertaken in any zone unless the off-street loading requirements of this bylaw have been met for that use.

2. The number of commercial off street loading spaces required for any use is calculated according to the following table:

Use	Loading Area Requirement
Commercial Use	1 per 2,790 sq m of gross floor area or fraction thereof
Freight Terminals	1 per 1,860 sq m or gross storage area or fraction thereof

7.3 Commercial Development Permit Area Requirements

7.3.1 Core Commercial Development Permit Area Requirements

The City Core Development Permit Area is designated under Section 919.1 (1) (d) (revitalization of a commercial area and Section 919.1 (1) (f) (form and character of commercial development) of the Local Government Act.	
The City Core Development Permit Area is associated with City Core Commercial Zone.	
Objectives	• Buildings should be designed to enhance the visual character of the downtown. • Create a attractive and vibrant core • Ensure a consistent quality of development in the city core • Promote mixed-use development • Implement the winter city guidelines
Guidelines	Form
	Avoid box-like appearance in building design and large expanses of uninterrupted building surfaces. Uninterrupted surfaces should be achieved using window and door features, building articulation using finishing materials or architectural features. This should occur at minimum every 6m.
	Doorway entrances and window frames should be highlighted through vertical façade articulation. This articulation should including roof line accents, the use of awnings or other architectural features.
	Temporary structures are not permitted.
Guidelines	Materials
	Building materials shall be durable and of high quality. The a minimum of 25% of exterior cladding shall consist of brick, stone, wood, or other durable and aesthetically pleasing materials.

	The following exterior finishes are encouraged: 1) Wood: • Traditional siding such as clap board • Sawn shingles • Wood trim 2) Masonry: • Stone • Clay brick 3) Metal and Synthetics: • Pre-finished metal siding (limited to not more than 50% of exterior)
	The following finishes are discouraged: 1) Wood: • Unfinished plywood or OSB 2) Masonry: • Plain concrete block • Acrylic stucco • Unfinished poured concrete 3) Metal and Synthetics: • Vinyl siding • Asphalt siding • Fibre glass panels
Guidelines	Colour
	Accent colors should be used discreetly to create subtle areas of focus (i.e. doorways, window frames and facia trim)
	An overall color scheme shall unify various elements of the façade.
Guidelines	Universal Design
	An access of no greater than 1:20 should be provided at main entrance to the building.

	Accessible parking should be located in the parking stall (s) directly adjacent to the accessibility ramp.
	Access across the front entrance should be a zero lip entrance.
	Automatic door openers should be provided at main entrance.
	All accessibility requirements should meet the specification within the Building Access Handbook as amended from time to time.
Guidelines	Crime Prevention Through Environmental Design (CPTED)
	The private property should be delineated using both soft and hard landscaping. Landscaping and architectural features should reenforce and identify primary entrances onto the property
	Parking and open space areas will reduced sight lines should be lit to increase surveillance ability
	Any landscaping provided should not impede surveillance of an area. Shrubs should be kept at a max of 1.2m while trees should be pruned to allow for direct sight lines.
	Dark corners and alcoves on building should be lit. This should be done in a way that not only provides for surveillance opportunities but to enhance architectural elements of a building.
	Entrances of building should be lit.
	Landscape design should avoid the creation of "dead spots" that create dark areas on a property
Guidelines	Street Wall

	Glazing, doors and architectural features must be spaced to create a human/ pedestrian scale streetscape Uninterrupted surfaces should be achieved using window and door features, building articulation or architectural features. This should occur at minimum every 6 m.
	Doorway entrances and window frames should be highlighted through vertical façade articulation. This articulation should including roof line accents, the use of awnings or other architectural features.
	The building facade location should match the surrounding buildings to create a consistent street wall and to create a defined public realm.
	Street façade must be up to the build-to-line within 10 m of a street corner. Staff will consider options that may vary this requirement if a mini-plaza/design feature that emphasizes the importance of the corners that are along 100th Ave and 100 st.
	At least 75% of the frontage on 100th Avenue and 100 st. must be façade coverage.
	The build-to-line must be defined by either building or landscaping.
	Ground floor frontage must support a façade that is aligned to the frontage line with entrances at sidewalk grade. The intent of this frontage is retail uses.
	Awnings are permitted and may overlap the sidewalk up to 25% of the Off-site sidewalk widths to support permeable pedestrian retail restaurant space. Awnings are not to be used as signage.
	A maximum setback of 1.5 m from the build-to-line may be permitted to provide adequate space for the development of awning, pedestrian walkway and or sidewalk patio space.
Guidelines	Energy Conservation and Solar Orientation
	Natural ventilation should be used as much as possible and triple glazed windows installed on the northern facing side of the building

	Buildings over 500 sq. m should meet at least 10% of their annual combined lighting and space heating energy demand using renewable and energy efficient technologies.
Guidelines	Storm Water Management
	Utilize roof top rain water capture for detention and utilize for outdoor irrigation purposes
	Storm water should be detained on site with slow release as a means to attenuate storm water run off, particularly from parking lots and roofs
	Use bioswales as retention basins to move run off slowly as possible and provide for detention time for biological degradation of pollutants

7.3.2 Large Format Retail and Highway and Service Commercial Development Permit Area Requirements

The Large Format Retail and the Highway and Service Commercial Development Permit Area are designated under Section 919.1 (1) (f) (form and character of commercial development), (i) (promote water conservation), and (j) (reduce greenhouse gas emissions)of the *Local Government Act*.

The Large Format Retail and Highway and Service Commercial Development Permit Area is visible from the Alaska Highway and often form the first impression of Fort St. John for tourists, as well as a continuing impression for residents who regularly drive along the Alaska Highway. . The intent of this DPA is to maintain a character and feel that is consistent with the community. This DPA will be associated with the General and Service Commercial (C-3 and C-4) zones.

Objectives

- enhance the appearance of developments having public view
- ensure that all new development meets a consistently high standard of visual quality,
- improve the appearance of commercial properties in the city,
- ensure that safe and efficient access is provided.
- improve the appearance of highway and service commercial properties in the city

Guidelines	Landscaping and Water Conservation
	Applicant must appoint a qualified professional to create and submit a landscape plan and supervise installation of all land landscaping elements
	Landscaping must create an aesthetic and functional landscape that: • screens parking and loading areas • buffers areas requiring privacy • provides visual interest to parking and outdoor areas • promote outdoor play and recreation
	Landscaping should utilize low water consumption species and methods such as xeriscaping.
	Integrates storm water management development permit area requirements into landscape design.
	Landscaping should be used to protect the building from direct sunlight during afternoon hours during the summer and permits sunlight penetration in the winter.
	Landscaping should be sited to shield the building from prevailing winter winds.
	Landscaping should minimize mown turf areas by substituting areas of ground cover or unplanted mulch.
	Uses reclaimed or recycled water or rain water capture from roofs or rain barrels for outdoor water use.
	All landscaping installation must meet the standards outlines in the BC Landscape Standard (latest addition).
Guidelines	Energy Conservation and Solar Orientation
	New buildings should be designed (oriented and sited) to take advantage of passive solar energy the building should be within 15 degrees of due south.

	Natural ventilation should be used as much as possible and triple glazed windows installed on the northern facing side of the building.
	Buildings over 500 sq. m should meet at least 10% of their annual combined lighting and space heating energy demand using renewable and energy efficient technologies.
Guidelines	Storm Water Management
	Utilize roof top rain water capture for detention and utilize for outdoor irrigation purposes.
	Storm water should be detained on site with slow release as a means to attenuate storm water run off, particularly from parking lots and roofs.
	Use bioswales as retention basins to move run off slowly as possible and provide for detention time for biological degradation of pollutants.
Guidelines	Materials
	Building materials shall be durable and of high quality. A minimum of 25% of exterior cladding shall consist of brick, stone, stucco, wood, architecturally finished block, or other durable and aesthetically pleasing materials.

	The following exterior finishes are encouraged: 1) Wood: • Traditional siding such as clap board • Sawn shingles • Wood trim 2) Masonry: • Stone • Clay brick • Acrylic stucco • Textured concrete block 3) Metal and Synthetics: • Cultured stones • Pre-finished metal siding • Fibre-cement sidings such as hardi-plank
	The following finishes are discouraged: 1) Wood: • Unfinished plywood or OSB 2) Masonry: • Plain concrete block • Unfinished poured concrete 3) Metal and Synthetics: • Vinyl siding • Asphalt siding • Fibre glass panels
Guidelines	Colour
	Accent colors should be used discreetly to create subtle areas of focus (i.e. doorways, window frames and facia trim).
	An overall color scheme shall unify various elements of the façade.
Guidelines	Signage

	The general character if signs should positively relate to the character of the associated buildings and surrounding development. Where necessary, signs should show the directions to and from a site.
Guidelines	Universal Design
	An access of no greater than 1:20 should be provided at main entrance to the building.
	Accessible parking should be located in the parking stall (s) directly adjacent to the accessibility ramp.
	Access across the front entrance should be a zero lip entrance.
	Automatic door openers should be provided at main entrance.
	All accessibility requirements should meet the specification within the Building Access Handbook as amended from time to time.
Guidelines	Crime Prevention Through Environmental Design (CPTED)
	The private property should be delineated using both soft and hard landscaping. Landscaping and architectural features should reenforce and identify primary entrances onto the property.
	Parking and open space areas will reduced sight lines should be lit to increase surveillance ability.
	Any landscaping provided should not impede surveillance of an area. Shrubs should be kept at a max of 1.2m while trees should be pruned to allow for direct sight lines.
	Dark corners and alcoves on building should be lit. This should be done in a way that not only provides for surveillance opportunities but to enhance architectural elements of a building.

10 Institutional

10.1 Zone Requirements

The following section outlines the requirements for institutional parcels within the City.

10.1.1 Institutional Zone

The Institutional zone is designated as Inst. On a parcel located in an area zoned for institutional uses, no building or structure shall be constructed, located or altered, and no plan of subdivision approved which contravenes the regulations set out in the tables below.

Inst Permitted Uses:

- Ambulance station;
- Accessory use;
- Assembly hall;
- Community care facilities;
- Hospital (including hospital and health care campuses);
- Health services facilities;
- Laboratories, scientific and research establishments;
- Library;
- University, college, technical and vocational schools.
- Park, recreation and open space;
- Fire hall;
- Government offices;
- Police station;
- Public, private and separate schools;
- Religious assembly facility;

Uses deemed secondary to the primary use:

- RM-1 uses accessory to other principle uses and located on the same parcel
- Commercial fitness centre;
- Financial institution;
- personal service establishment;
- Post office;
- Restaurant, limited;
- Assembly hall;
- Day care centre, major;
- Health and wellness retail store;
- Commercial pharmacy;
- Helipad;

Inst - Institutional	
Intent	
Minimum Parcel Area	1,110 sq. m.
Minimum Parcel Width	30 m
Minimum Setbacks	• Front: 7.5 m • Interior side: 4.5 m • Exterior side: 4.5 m • Rear: 7.5 m
Maximum Parcel Coverage	50%
Maximum Building Height	15 m
	in the inst zone any parcel may contain one or more principle buildings

10.2 Institutional General Provisions

	Landscape Requirement
Screening and Fencing	Massed planting is the preferred landscaping screening technique.
	No fence shall exceed a height of 1.2 m in a front yard and 1.8 m in a side or rear yard
	A landscaped screen of not less than 1.5 m in height must be provided and maintained along the boundary of a Inst parcel which abut R or P zones.
	The landscape screen must be of a form and character compatible with adjacent uses and must be free of advertising.
	Chain link fencing fronting on public space must incorporate vegetative screening, on the side of the fencing visible from outside the parcel, in the form of massed planting as generally illustrated in Figure 24.
Buffering	Inst uses shall be buffered from the public realm by placing, on private property adjacent to the property line, one tree every 10m on centre as per the Subdivision and Servicing Bylaw as amended from time to time.
	In the Inst zone, the following areas must be screened from the view of highways and adjacent properties with a landscape screen: a) outdoor garbage bins; and b) outdoor storage areas.
	Where a parking lot in excess of 3 spaces is located on a parcel which abuts an C, R, RM or P zone, a landscape screen of not less than 1.5 m in height must be provided and maintained along the edge of the parking lot facing an C, R, RM, or P zone.
	Where a parking lot in excess of 3 spaces is located on a parcel which abuts an highway or road way, a tree must be place every 10 m on centre along the edge of the parking lot facing the highway as per the Subdivision and Servicing Bylaw as amended from time to time.

Figure 24: Chain Link Mass Planting

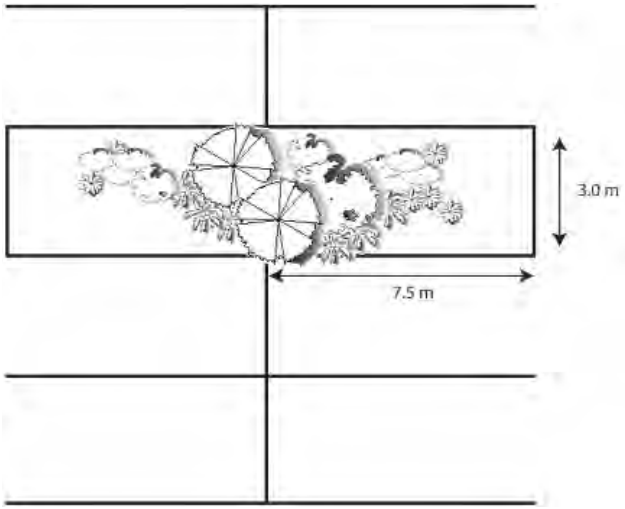


Figure 25: Landscaping in Parking Lot Island

Where a parking lot is in excess of 20 spaces, landscaped islands must be located every 10 spaces on a single row of parking (or 20 space on a double row of parking) to break up the hard surface of the parking areas. The landscaped island requirements are:

a) minimum 3m x 7.5m for a single row of parking and 3 x 15 m for a double row of parking, as illustrated in Figure 25.

b) must include at least two (2) trees per island and may include salt tolerant shrubs and other planting; and,

c) hard surfaces, landscaping stone and washed aggregate may not equal more than 30% of the landscaped island.

10.2.1 Parking Requirements

Use	Parking Requirement
Health Service facility	• 1 per 30 sq m of GFA
Hospital • acute care • extended care • intermediate care	• 1 per 3 beds plus 1 per staff doctor • 1 per 3 beds plus 1 per staff doctor • 1 per 3 beds
Institutional uses not listed	• 1 per 20 sq m of GFA
Police Station, Fire hall, Ambulance Station	• 1 per 25 sq m of GFA excluding bays for emergency vehicles
post office	• 1 per 20 sq m of GFA
recreational facilities	• 1 per 10 sq m of skating area plus 1 per 4 sq m of pool surface plus one per 4 player capacity for other sports

School • college • high school • elementary school	• 10 per classroom • 1 per staff member plus 1 per 10 students • 1 per classroom plus 1 per 10 students

10.2.2 Loading Requirements

1. No use may be undertaken in any zone unless the off-street loading requirements of this bylaw have been met for that use.

2. The number of commercial off street loading spaces required for any use is calculated according to the following table:

Use	Loading Area Requirement
Institutional and Public Uses	1 per 2,790 sq m of gross floor area or fraction thereof

11 Parks and Natural Areas

11.1 Zone Requirements

The following section outlines the requirements for park and natural area parcels within the City.

11.1.1 Parks and Natural Areas Zone

The park and natural areas zone is designated as P. On a parcel located in an area zoned for park uses, no building or structure shall be constructed, located or altered, and no plan of subdivision approved which contravenes the regulations set out in the tables below.

Parks and Natural Areas Permitted Uses:

- Botanical gardens
- Cemeteries
- Concession booths related to assemblies;
- Conservation areas;
- Cultural and recreational facilities;
- Parks;
- Passive recreation areas;
- Playfields and playgrounds;
- Refreshment booths; and
- Tourist vehicle parking and facilities.

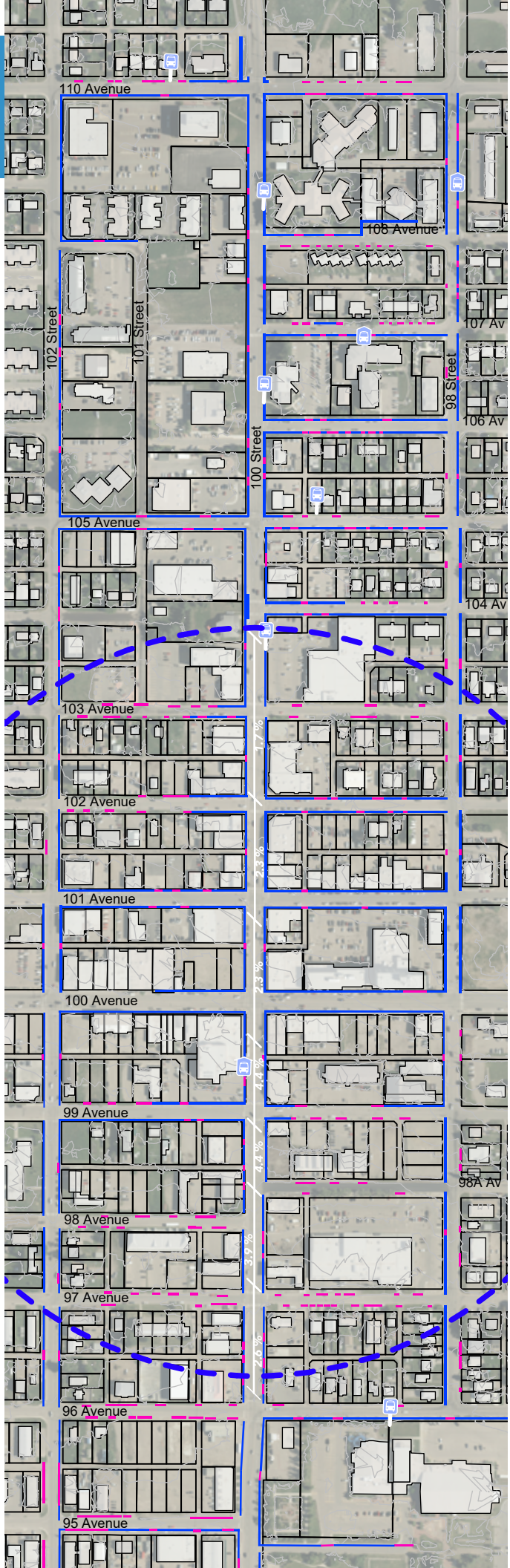
P- Park and Natural Areas	
Intent	• delineate and provide outdoor amenity space for residents • for the protection of natural areas
Minimum Setbacks	• Front: 7.5 m • Side: 4.5 m • Rear: 9.0 m
Maximum Building Height	10 m

Parking Requirements

Use	Parking Requirement
Athletic fields	Twenty (20) spaces for every diamond or athletic field, or one (1) space for every four (4) seats, whichever is greater. (One (1) seat is equal to two (2) feet of bench length).
Parks, Playgrounds, Picnic Grounds	Parking space equivalent to one (1) percent of the total land area. Parking area available along park roads or private drives may be used to fulfill this requirement.

FORT ST. JOHN | 100 STREET

PEDESTRIAN NETWORK



LEGEND

- Existing Sidewalks
- Existing Curb Cuts
- Bus Stop - with shelter
- Bus Stop - no shelter
- 5 min walking distance (400m)

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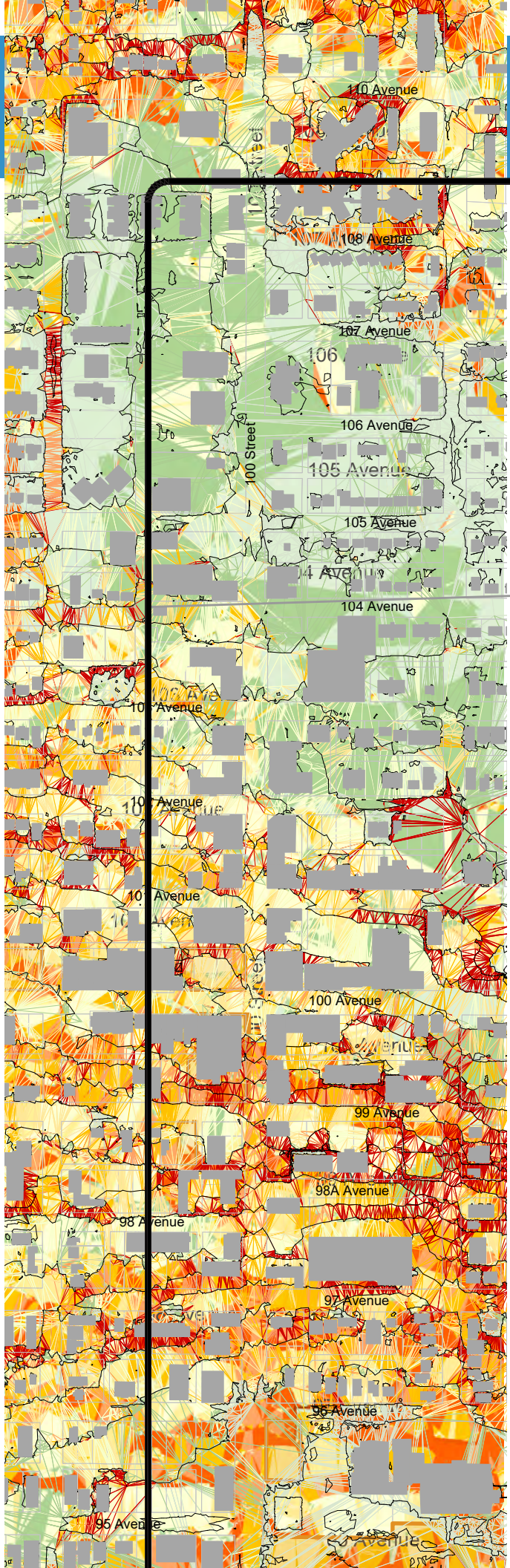
SLOPES



SLOPE LEGEND

- 0-1%
- 1-2%
- 2-3%
- 3-4%
- 4-5%
- 5-6%
- 6%+

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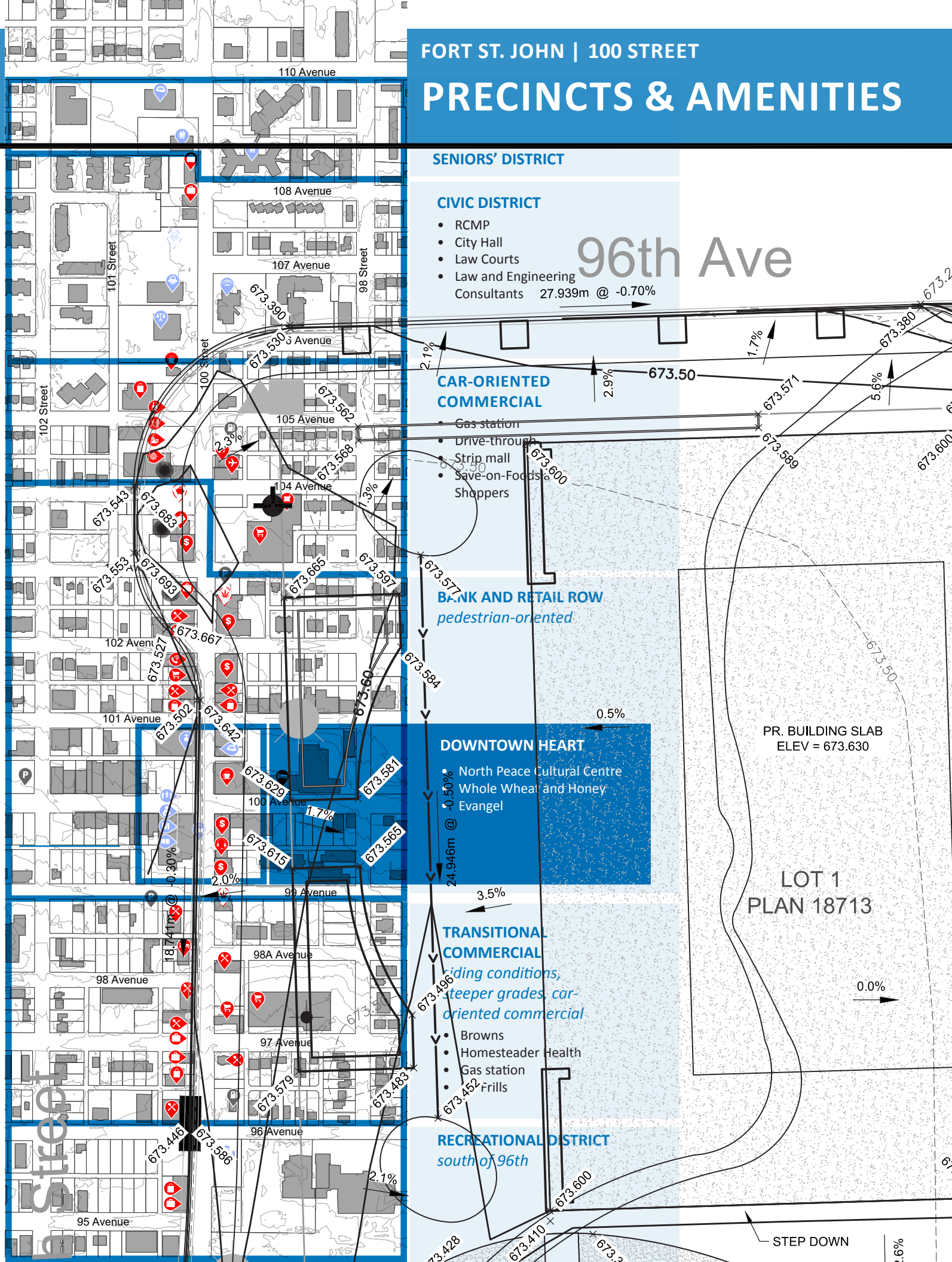
PRECINCTS & AMENITIES



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OPPORTUNITIES

KEY SITES AND OPPORTUNITIES LEGEND

City-Owned Parcel

Opportunity Parcel

1 RCMP

- The plans for a new RCMP building are in development

2 NORTH PEACE SAVINGS RENOVATIONS

- The plans have been submitted to the City

3 OLD FORT HOTEL SITE AT 100 ST & 100 AVE

- One of 100 Street's most comfortable outdoor places
- Could associate with North Peace Cultural Centre
- Downtown Action Plan identifies this site for a civic/institutional or mixed commercial / civic use in the long-term

4 NPCC & BUS LOOP

- Enhance or expand North Peace Cultural Centre and its many community services
- Reconsider and redesign bus loop and bus shelter

5 VACANT LOT @ 98A AVE OFFSET INTERSECTION

- Potential for pedestrianization at due to lower traffic flow at offset intersection

6 VACANT LOTS IN RECREATIONAL PRECINCT FOR SALE

- Potential for expansion of existing recreational program to enhance this area as a destination for recreational programs.

7 FESTIVAL PLAZA & FARMER'S MARKET

- The plans have been finalized

8 LEISURE POOL

- the City is in preliminary consultation to develop plans for a new pool - the program list is still to be determined and a few different sites are being considered as well.

9 CENTENNIAL PARK

WINTER WALK

Bearisto & Associates
ENGINEERING LTD
10940 - 92 Avenue,
Grande Prairie, AB T8V 6B5
780 532 4919 **F:** 780 532 4739

FORT ST. JOHN
The Energetic City

REVISIONS

4	-	-
3	ISSUED FOR TENDER	17-04-19
2	60% DESIGN	04-03-19
1	ISSUED FOR REVIEW	14-01-19

LEGEND

EX. ASPHALT

PR. ASPHALT

108 Avenue
107 Avenue
106 Avenue
105 Avenue
104 Avenue
103 Avenue
102 Avenue
101 Avenue
100 Avenue
99 Avenue
98A Avenue
98 Avenue
97 Avenue
100 Street
101 Street
102 Street
103 Street
104 Street
N


22


21


20


19

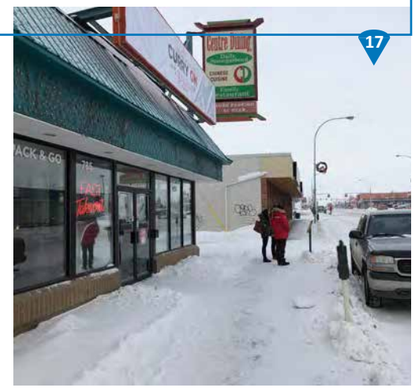

18


13
THE CURRENT


14


15
TD Canada Trust


16

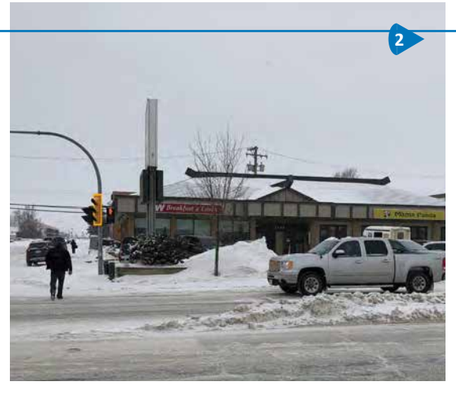

17


10


9


8
BROWNSSOCIALHOUSE


7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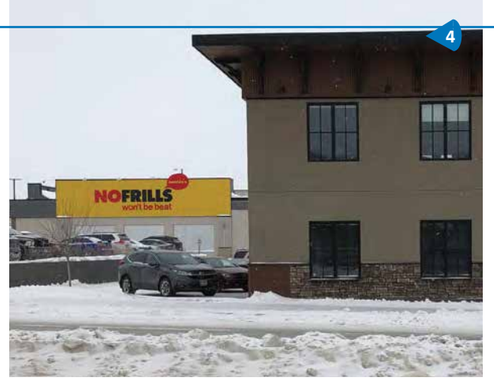
3


4
NOFRILLS
won't be beat


5
HOMESTEADER HEALTH
Feel good... for life!


6

PLACEMAKING SCORECARD

Evaluating 100 Street Today

The City has invited a group of key community stakeholders to act as a "100 Street Action Team" to both represent the full range of Fort St. John community members and residents and from whom to solicit thoughtful input throughout the planning process.

SURVEYING 100 STREET

Action Team members were invited to one of two workshops held April 16th and 17th. Following a warm-up visioning exercise (see "A Day in the Life"), participants surveyed 100 Street in its current condition, using a "Placemaking Scorecard" (as shown below).

Specifically, individuals considered their experience of 100 Street as related to:

PROTECTION. Without basic protection from cars, noise, rain, and wind, people will generally avoid spending time in a space. Protection from these things is critical for success.

COMFORT. Without elements that make walking, standing, sitting, seeing, and conversing comfortable, a place generally won't invite anyone to spend time there. Options for play and exercise also make spaces more inviting to people of all ages.

ENJOYMENT. Great Streets offer positive aesthetic and sensory experiences, take advantage of local climate conditions (e.g. sunny exposure or a windbreak in colder climates), and provide human-scale elements so visitors feel more connected in their surroundings.

100 STREET | PLACEMAKING SCORECARD

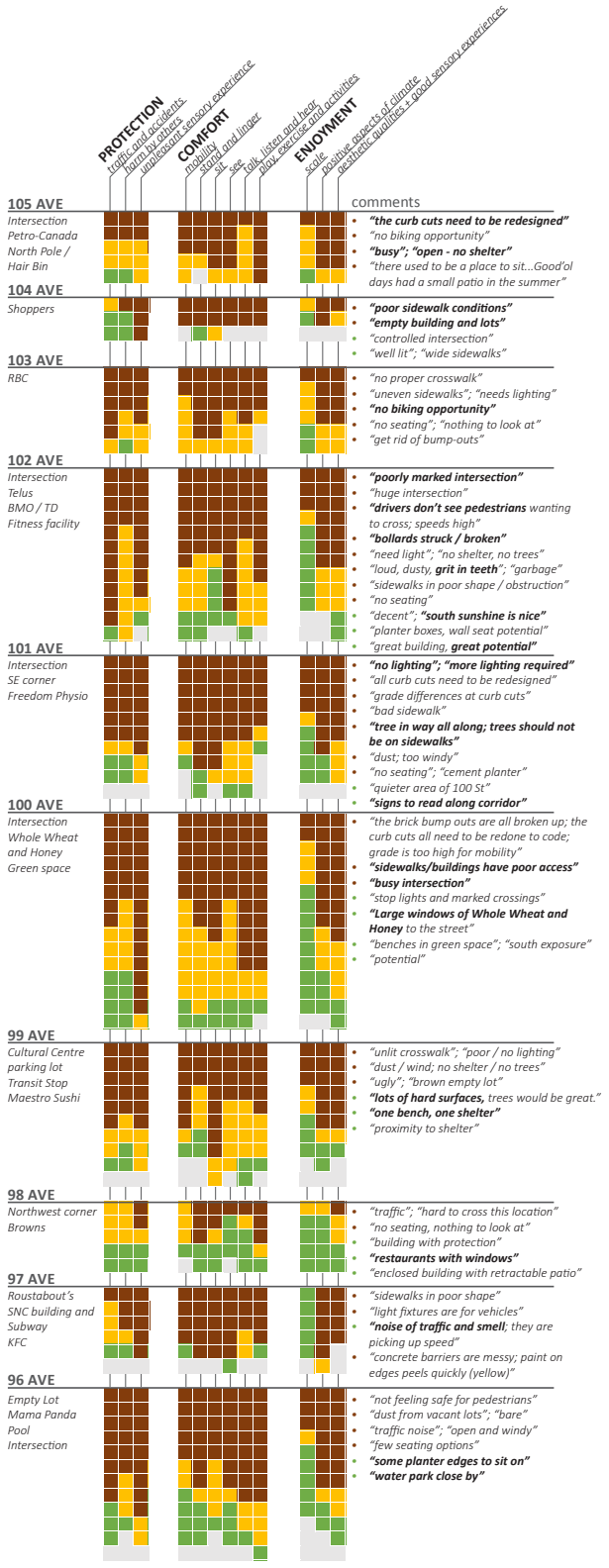
adapted from the "Twelve Urban Quality Criteria" (Gehl Institue)

LOCATION _____

ASSET / CHALLENGE *(circle one)*

= YES
= IN BETWEEN
= NO

Protection	**and accidents.** Do groups across age and ability space? Can one safely bike and walk without fear of being hit by a driver?	**Protection against harm by others.** Is the space perceived to be safe both day and night? Are there people and activities at all hours of the day (e.g. residents provide safety at night as well as a good atmosphere?	**Protection against unpleasant sensory experience.** Are there noises, dust, smells, or other pollution? Does the space function well when it's windy? Is there shelter from strong sun, rain, or snow/cold?
Comfort	**Options for mobility.** Is this space accessible? Are there physical elements that might limit or enhance personal mobility in the forms of walking, using a wheelchair, or pushing a stroller? Is it evident how to move through the space without having to take an illogical detour?	**Options to stand and linger.** Does the place have features you can stay and lean on, like a façade that invites one to spend time next to it, a bus stop, a bench, a tree, or a small ledge or niche?	**Options for sitting.** Are there good primary seating options such as benches or chairs? Or is there only secondary seating such as a stair, seat wall, or the edge of a fountain? Are there adequate non-commercial seating options so that sitting does not require spending money?
	Options for seeing. Are seating options placed so there are interesting things to look at?	**Options for talking and listening/hearing.** Is it possible to have a conversation here? Is it evident that you have the option to sit together and have a conversation?	**Options for play, exercise, and activities.** Are there options to be active at multiple times of the day and year?
Enjoyment	**Scale.** Is the space and the building that surrounds it at a human scale? If people are at the edges of the space, can we still relate to them as people or are they lost in their surroundings?	**Opportunities to enjoy the positive aspects of climate.** Is local climate - wind, cold and sun - taken into account? Are there varied conditions for spending time in the spaces at different times of year? With this in mind, where are the seating options placed? Are they located entirely in the shadows or the sun? And how are they oriented/ placed in relation to wind? Are they protected?	**Experience of aesthetic qualities and positive sensory experiences.** Is the space beautiful? Is it evident that there is good design both in terms of how things are shaped, as well as their durability?



APPENDICES

A | 100 Street Charrette Final Presentation

B | Transportation Analysis

a. 2019 100 Street ICBC collision data summary
b. 100 Street Charrette concept transportation performance summary

C | Mapping & Analysis (Charrette Design Brief materials)

a. Figure-ground
b. Zoning
c. Pedestrian network
d. Slopes
e. Precincts & amenities
f. Opportunities
g. Winter walk
h. Placemaking scorecard

D | Street Design Parameters

E | Special Projects

a. North Peace Cultural Centre & Bus Exchange
(Downtown Public Realm and Streetscape Master Plan extract)
b. Plaza Design for Old Fort Hotel Site at 100Street and 100 Avenue (City Centre Plaza)
(Downtown Public Realm and Streetscape Master Plan extract)
c. Festival Plaza Design

F | Additional Studies

a. 100 Street Parking Study (Draft)
b. Future Climate Tree Suitability and Best Management Practices
c. 100 Street Ingrid Cloud Wind Simulation Presentation
d. Retail Vitality and Impact Mitigation Review
e. Downtown Business Mitigation Strategy

FORT ST. JOHN 100 STREET

STREET DESIGN PARAMETERS

The Subdivision and Development Servicing Bylaw and the Transportation Master Plan that provide guidance for the design of city roadway elements.

CFSJ Subdivision and Development Servicing Bylaw		CFSJ Transportation Master Plan	
Road Type / Classification	**Lane Width (m)**	**Road Type / Classification**	**Lane Width (m)**
Downtown Commercial	3.5	Downtown Roadway	3.5
Arterial	3.6	Arterial	3.6
4 or 2 Lane Collector	3.6	Collector Road	3.5
Industrial	3.6	-	-
Local	3.6[2]	Local Roadway	4.5-5.5
Parking		Downtown Parking Recommended	2.5 < 3

For vehicle travel lanes, there is significant flexibility in the width of the lanes that may be used for roadways, which is primarily dependent on vehicle speed and vehicle size. While road classification (i.e. arterial, collector, local) may be a consideration in the selection of lane width, in practice, community vision, objectives and design constraints have a greater influence on the selection of lane width than attempting to meet prescriptive road cross-sections set forth in municipal bylaws.

TABLE 4: Transportation Association of Canada - National Design Guidelines for Roadway Lane Widths

Design Speed (km/h)	Practical lower limit	Recommended Lower Limit[3]	Recommended Upper limit	Practical upper limit
60 and less	**2.7 m**	**3.0 m**	**3.7 m**	**4.0 m**
70 to 100	3.0 m	3.3 m	3.7 m	4.0 m
110 and higher	3.5 m	3.7 m	3.7 m	4.0 m

[2] The TMP states that the function of local classification roadways is proposed to accommodate on-street parking, bike travel and motorist travel within a single shared lane.

[3] Where buses and larger trucks are expected to regularly use a lane, a minimum lane width of 3.3m is recommended, regardless of the design speed or traffic volume.

RIGHT TURN LANES

Their widths are generally the same as the adjacent lane width. In some instances, the width of the right turn lane may not be reduced from the through lane dimension by 0.2 to 0.25m. Although widths below 3.25 are not ideal, some transportation agencies in Canada use land widths as low as 3.0 m in urban environments.

LEFT TURN LANES

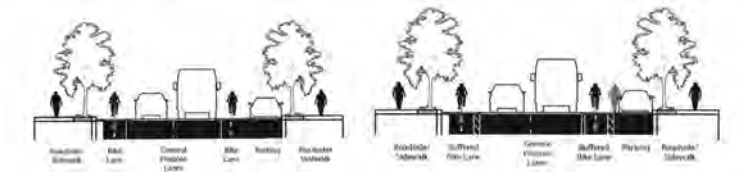
The widths of left-turn lanes not adjacent to a median are generally the same as the adjacent lane width or 0.2 to 0.25 m less. However, lane widths below 3.25m are not ideal and some road agencies in Canada use lane widths as low as 3.0m in urban environments.

BIKE LANES

Similar to the design of roadway vehicle lane widths, the Transportation Association of Canada also provides design guidance for the widths of bicycle lanes. The recommended range in design widths for standard one-way bicycle lanes is summarized in Table 5.

TABLE 5: Transportation Association of Canada - National Design Guidelines for the Width of Bike Lanes

Parameter	Practical Lower limit	Recommended Lower Limit	Recommended Upper Limit	Practical upper limit
Width (m), buffered bike lane including buffer	**1.8 m**	**2.1 m**	**3.0 m**	**3.5 m**
Width (m), bike lane component (unbuffered)	**1.5 m**	**1.8 m**	**2.1 m**	**2.1 m**



Also refer to:

- *Appendix 7 - Edmonton Main Street Design Guidelines Extracts*
- *Appendix 8 - Future Climate Tree Suitability and BMPs*

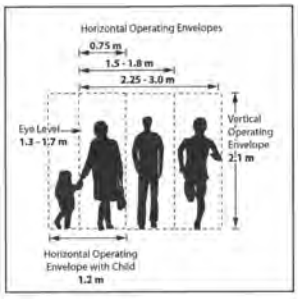
SIDEWALKS AND MULTI-USE PATHWAYS

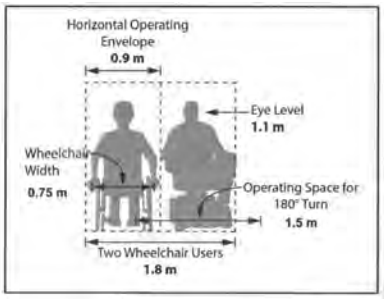
- To make walking more comfortable for all, particularly in high activity areas, a minimum sidewalk width of 2.0m has been adopted along all roadways, from local to major arterial roadways; multi-use trails are proposed with a 3.0m width.
- The downtown core, school zones and recreational are areas that have been identified in the TMP with the highest pedestrian demands and the focus for increased sidewalk coverage.
- A path with multiple users of different types (e.g., pedestrians, bicycles, and similar user types); a MUP may be shared (all users share the same pathway space, with or without a marked centre line) or may be separated (i.e., the pathway is separated into parallel traveled ways.

TABLE 8: Transportation Association Canada: Width of Multi-Use/Bike Path

Parameter	Practical Lower limit	Recommended Lower Limit	Recommended Upper Limit	Practical upper limit
Width (m), bike path, unidirectional	1.5 m	1.8 m	2.5 m	3.0 m
Width (m), bike path, bidirectional	2.4 m	3.0 m	3.6 m	4.0 m
Width (m)	2.7 m	3.0 m	6.0 m	6.0 m

TABLE 6: Transportation Association Canada - Horizontal Operating Envelope Dimensions for Pedestrians/Wheelchairs





ZONES

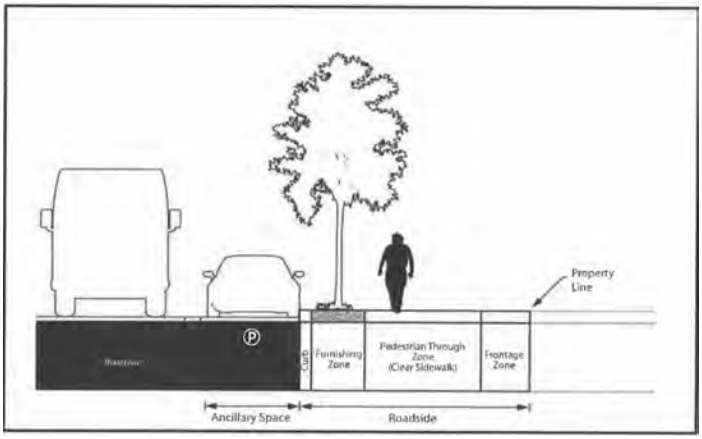


TABLE 8: Transportation Association Canada: Width of Multi-Use/Bike Path

Parameter	Practical Lower Limit	Recommended Lower Limit	Recommended Upper Limit	Practical Upper Limit
Width (m), pedestrian through zone, peak pedestrian Flow rate < 400 ped/15min	1.5	1.8	2.0	Roadside Width
Width (m), pedestrian through zone, peak pedestrian Flow rate > 400 ped/15min	2.0	2.25 - 3.0 or based on crowd capacity/ maneuvering space		Roadside Width

APPENDICES

A | 100 Street Charrette Final Presentation

B | Transportation Analysis

a. 2019 100 Street ICBC collision data summary
b. 100 Street Charrette concept transportation performance summary

C | Mapping & Analysis (Charrette Design Brief materials)

a. Figure-ground
b. Zoning
c. Pedestrian network
d. Slopes
e. Precincts & amenities
f. Opportunities
g. Winter walk
h. Placemaking scorecard

D | Street Design Parameters

E | Special Projects

a. North Peace Cultural Centre & Bus Exchange
(Downtown Public Realm and Streetscape Master Plan extract)
b. Plaza Design for Old Fort Hotel Site at 100Street and 100 Avenue (City Centre Plaza)
(Downtown Public Realm and Streetscape Master Plan extract)
c. Festival Plaza Design

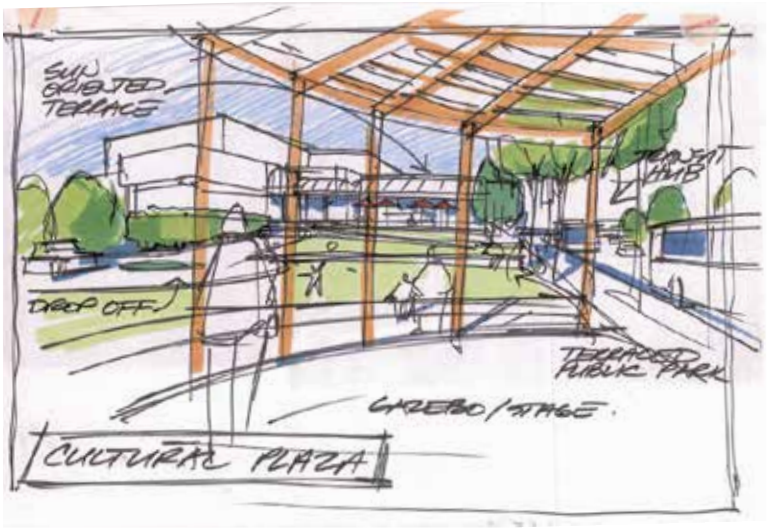
F | Additional Studies

a. 100 Street Parking Study (Draft)
b. Future Climate Tree Suitability and Best Management Practices
c. 100 Street Ingrid Cloud Wind Simulation Presentation
d. Retail Vitality and Impact Mitigation Review
e. Downtown Business Mitigation Strategy

North Peace Cultural Centre South Plaza and Bus Exchange

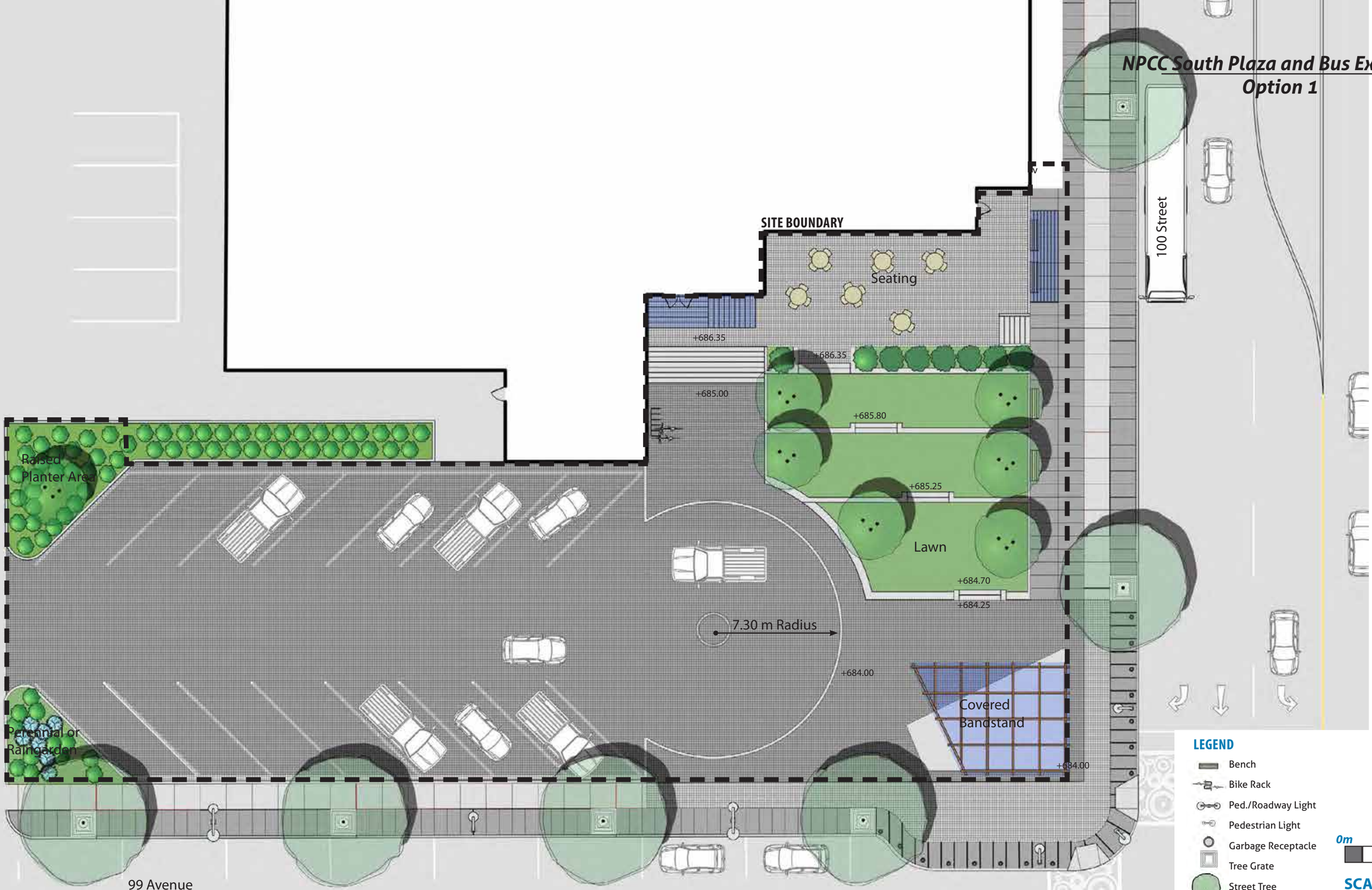
The North Peace Cultural Centre is a wonderful community asset located right in the heart of downtown. However, its blank walls and lack of outdoor gathering spaces detract from its full potential in this key location. Practical and inexpensive retrofits could be undertaken to improve the Centre.

A terraced plaza facing south (and away from 100th St and 100th Ave) that utilizes the unique sloping geography, would create an attractive public gathering place in the heart of downtown. An enhanced entryway and plaza would generate activity and "eyes" on the adjacent downtown bus exchange. The new plaza is designed to cater for increased pedestrian use at the bus exchange and other NPCC facilities.
The two design options presented in the following pages differ mainly in the choice of paving material. A special concrete paver throughout the plaza is foreseen in Option 1; scored concrete and concrete pavers (for the raised seating area only) in Option 2. Both options will reduce parking by approximately 8 to 10 spots.



The retaining walls of the terraces double as opportunities for seating. They reach a maximum height of approximately 45cm. Cast in place concrete walls with attached wooden benches offer comfortable areas for seating along the walls. Smaller multi-stemmed tree species and shrubs offer shade and seasonal interest at a human scale. The proposed design makes full use of the sloping site and offers a space for live music and other performances.

NPCC South Plaza and Bus Exchange
Option 1



LEGEND

- Bench
- Bike Rack
- Ped./Roadway Light
- Pedestrian Light
- Garbage Receptacle
- Tree Grate
- Street Tree
- Bollard

0m 5m

N

SCALE 1:200

When printed on 11”x17” pap

NPCC South Plaza and Bus Exchange
Option 2

SITE BOUNDARY

Seating

+686.35

+686.35

+685.00

+685.80

+684.25

Lawn

+684.70

+684.25

7.30 m Radius

+684.00

Covered
Bandstand

+684.00

+684.00

Raised
Planter Area

Perennial or
Rain garden

99 Avenue

100 Street

LEGEND

- Bench
- Bike Rack
- Ped./Roadway Light
- Pedestrian Light
- Garbage Receptacle
- Tree Grate
- Street Tree
- Bollard

0m 5m

N

SCALE 1:200

When printed on 11”x17” pap

NPCC South Plaza and Bus Exchange
Aerial View Perspective Rendering
Option 1

Precedent Images

Covered Performance Space

Grassed terraces, attached benches

Multi-stem trees for people scale

Old Fort Market Plaza

CONCEPT

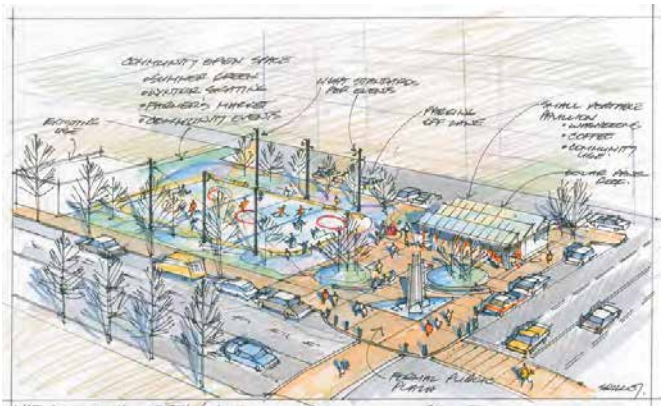
The market plaza would be located in a prominent location as ***a gateway feature and as a unique identifier for the downtown and the City as a whole***. The preferred location for the Market Plaza is the Old Fort Hotel site at 100th and 100th.

A Market Plaza could act as interim use to ***activate the site until a more permanent development is feasible***.

A market plaza could include facilities and programming to support a range of community events and celebrations year-round such as ***markets, festivals and concerts***.

- The plaza could incorporate a large but simple structure for markets and other events in the spring, summer, and fall.
- In the winter a sheet of ice could be thrown down for skating and hockey, which could include a downtown venue for the celebrated High On Ice festival.
- A portable/temporary structure with a small cafe/restaurant, space for portable food trucks, public washrooms, or a community use such as a day care, could also be incorporated, along with surface parking off the lane.
- Incorporating active uses such as housing or a restaurant and/or pub within or adjacent to the plaza would enhance and help activate the space.
- A corner plaza incorporating landscaping, seating and possibly a 'dynamic' or functional public art piece like a fountain or solar flower could be built as a permanent feature and incorporated with future development when it occurs.

Short term summer use



Short term winter use

Old Fort Market Plaza

RECOMMENDED OPTIONS

Two options for the market plaza have been developed. Both incorporate a permanent corner plaza solution. Option 1 presents a larger festival barn structure and more programmed public park space with play area and perennial garden. Option 2 shows a more temporary vending kiosk and street vendor configuration and a simplified public park space.

A corner plaza is desired in this location and could be built in advance of future development. It would incorporate landscaping, an at grade water fountain and sitting areas. A large surface made of "gravel turf" (refer to appendix for details) could accommodate both a farmer's market during fair weather months and an ice rink in the winter. A barn structure for festivals, concerts and markets will anchor the community and provide a "built" edge to the corner plaza. Alternatively, mobile vendors or a portable kiosk structure with a small cafe/restaurant could activate the space north of the corner plaza. Large deciduous trees, like ashes and maples, cast shade and provide a cool green space during hot summers.

Old Fort Market Plaza
Option 1

SITE BOUNDARY

Utilities, W/C & Storage Area

Gravel Turf Temporary Events: Potential Tent Layout

Wood Deck

Large Tent

Mobile Vendor

Cafe Tables

Communal Tables

Mobile Vendor

Mobile Vendor

100 STREET

Coniferous Tree (typ)

Multi-stemmed Deciduous Tree (typ)

Grass

Deciduous Tree (typ)

Planted Berms w/Seat Edge

Fountain

100 AVENUE

LEGEND

- Bench
- Bike Rack
- Ped./Roadway Light
- Pedestrian Light
- Garbage Receptacle
- Tree Grate
- Street Tree
- Bollard

0m 5m

N

SCALE 1:250

When printed on 11"x 17" paper.

Old Fort Market Plaza
Option 2

Precedent Images

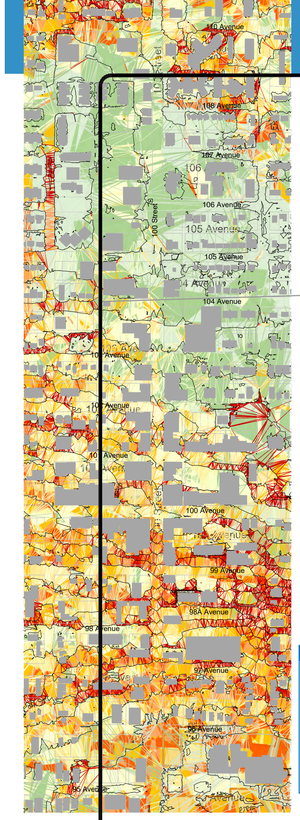
Festival Barn and Market

Kiosks and Mobile Vendors

Fountain, Seating edge, Gravel Turf with Wood Deck

FORT ST. JOHN | 100 STREET

SLOPES

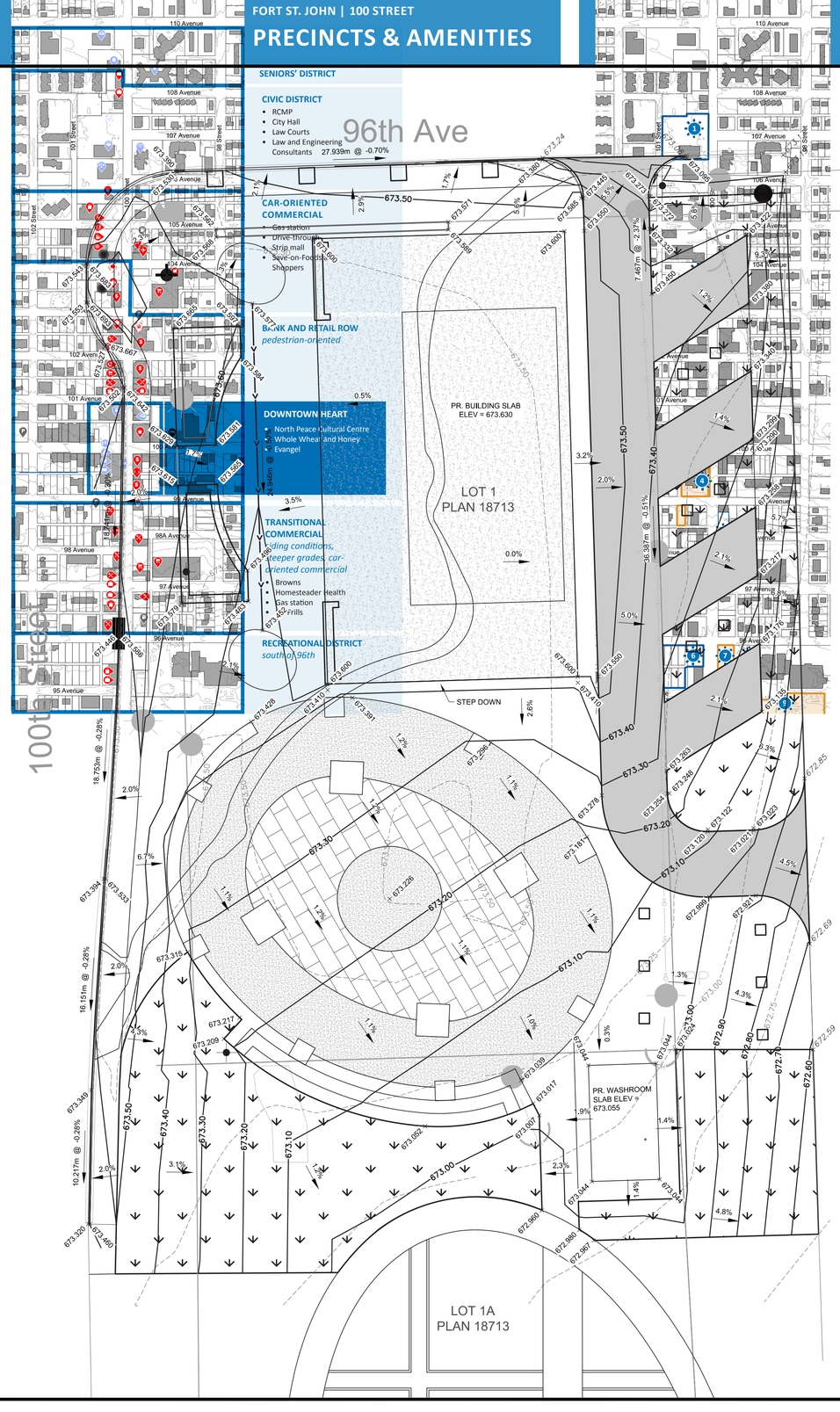


SLOPE LEGEND

- 0-1%
- 1-2%
- 2-3%
- 3-4%
- 4-5%
- 5-6%
- 6%+

FORT ST. JOHN | 100 STREET

PRECINCTS & AMENITIES



FORT ST. JOHN | 100 STREET

OPPORTUNITIES

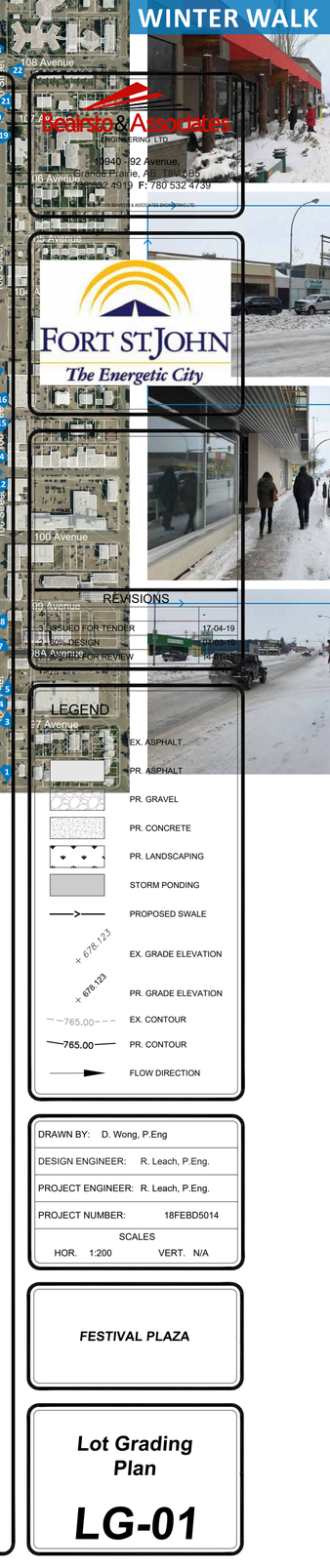
KEY SITES AND OPPORTUNITIES LEGEND

- City-Owned Parcel
- Opportunity Parcel

1. **RCMP**
   - The plans for a new RCMP building are in development
2. **NORTH PEACE SAVINGS RENOVATIONS**
   - The plans have been submitted to the City
3. **OLD FORT HOTEL SITE AT 100 ST & 100 AVE**
   - One of 100 Street's most comfortable outdoor places
   - Could associate with North Peace Cultural Centre
   - Downtown Action Plan identifies this site for a civic/institutional or mixed commercial / civic use in the long-term
4. **NPCC & BUS LOOP**
   - Enhance or expand North Peace Cultural Centre and its many community services
   - Reconsider and redesign bus loop and bus shelter
5. **VACANT LOT @ 98A AVE OFFSET INTERSECTION**
   - Potential for pedestrianization at due to lower traffic flow at offset intersection
6. **RECREATIONAL LOTS IN RECREATIONAL PRECINCT FOR SALE**
   - Lots for expansion of existing recreational program to enhance this area as a destination for recreational programs.
7. **FESTIVAL PLAZA & FARMER'S MARKET**
   - The plans have been finalized
8. **LEISURE POOL**
   - the City is in preliminary consultation to develop plans for a new pool - the program list is still to be determined and a few different sites are being considered as well.
9. **CENTENNIAL PARK**

REM LOT 1
PLAN 18713

WINTER WALK



Bearisto & Associates
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FORT ST.JOHN
The Energetic City

REVISIONS

1	ISSUED FOR TENDER	17-04-19
2	WORK DESIGN	
3	ISSUED FOR REVIEW	

LEGEND

- EX. ASPHALT
- PR. ASPHALT
- PR. GRAVEL
- PR. CONCRETE
- PR. LANDSCAPING
- STORM PONDING
- PROPOSED SWALE
- + 678.123 EX. GRADE ELEVATION
- + 678.123 PR. GRADE ELEVATION
- 765.00 EX. CONTOUR
- 765.00 PR. CONTOUR
- FLOW DIRECTION

UTILITY LEGEND

	EXISTING	PROPOSED
SANITARY		
WATER		
STORM		
POWER	P	P
OVERHEAD POWER	OH	OH
GAS	G	G
TELEPHONE	TEL	TEL
CABLE	C	C
SWALE		
FENCE - BOLLARD		
FENCE - CHAINLINK		
FENCE - WOOD		
MANHOLE		
HYDRANT		
MAIN WATER VALVE		
SERVICE WATER VALVE		
BLOW-OFF VALVE		
VIDEO INSPECTION RISER/CLEANOUT	CO	CO
STREET LIGHT		
POWER PEDESTAL		
POWER TRANSFORMER		
POWER POLE	PP	PP
STREET SIGN		
TREE		

VOLUMES AND STRUCTURES

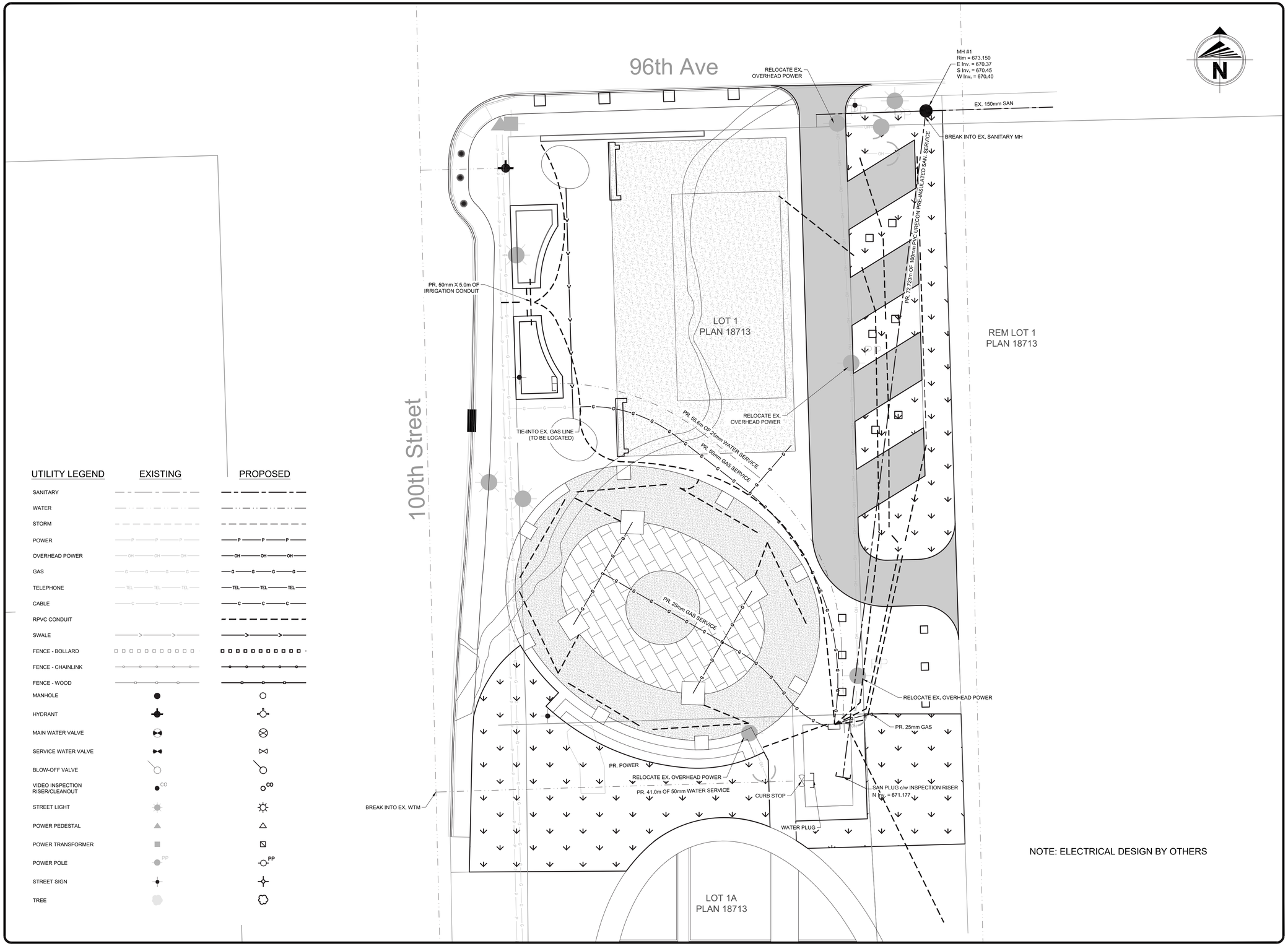
DESCRIPTION	VALUE
PARKING LOT AREA - 50mm ASPHALT, 150mm GRAVEL BASE, 300mm GRAVEL SUB-BASE	489 m²
CONCRETE (AREA INCLUDING BUILDING PADS) - 150mm CONCRETE, 150mm GRAVEL BASE	1293 m²
LANDSCAPE AREA - 100mm TOPSOIL	941 m²
EARTHWORKS (1265 m³ CUT - 12 m³ FILL = 1253 m³ NET CUT)	1253 m³
140mm X 300mm VERTICAL FACE CONCRETE CURB & GUTTER	118 m

DRAWN BY:	D. Wong, P.Eng
DESIGN ENGINEER:	R. Leach, P.Eng.
PROJECT ENGINEER:	R. Leach, P.Eng.
PROJECT NUMBER:	18FEBD5014
SCALES	
HOR. 1:200	VERT. N/A

FESTIVAL PLAZA

Lot Grading Plan

LG-01



UTILITY LEGEND	EXISTING	PROPOSED
SANITARY		
WATER		
STORM		
POWER	P	P
OVERHEAD POWER	OH	OH
GAS	G	G
TELEPHONE	TEL	TEL
CABLE	C	C
RPVC CONDUIT		
SWALE		
FENCE - BOLLARD		
FENCE - CHAINLINK		
FENCE - WOOD		
MANHOLE		
HYDRANT		
MAIN WATER VALVE		
SERVICE WATER VALVE		
BLOW-OFF VALVE		
VIDEO INSPECTION RISER/CLEANOUT	CO	CO
STREET LIGHT		
POWER PEDESTAL		
POWER TRANSFORMER		
POWER POLE	PP	PP
STREET SIGN		
TREE		

NOTE: ELECTRICAL DESIGN BY OTHERS

Bearisto & Associates
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10940 - 92 Avenue,
Grande Prairie, AB T8V 6B5
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FORT ST JOHN
The Energetic City

REVISIONS

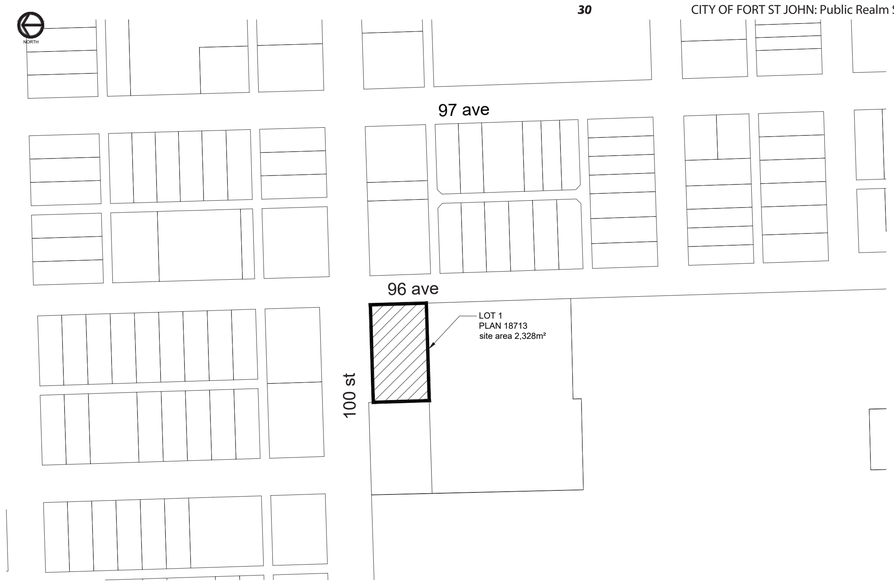
4	-	-
3	ISSUED FOR TENDER	17-04-19
2	60% DESIGN	04-03-19
1	ISSUED FOR REVIEW	14-01-19

DRAWN BY:	D. Wong, P.Eng
DESIGN ENGINEER:	R. Leach, P.Eng.
PROJECT ENGINEER:	R. Leach, P.Eng.
PROJECT NUMBER:	18FEBD5014
SCALES	
HOR. 1:200	VERT. N/A

FESTIVAL PLAZA

Site Servicing Plan

SP-01



1 L01 LOT LOCATION PLAN
nts

GENERAL NOTES:

SITE WORK

1. THE CONTRACTOR IS TO CALL BC ONE CALL AT 1-800-474-6886 TO HAVE EXISTING UTILITIES LOCATED PRIOR TO START OF ANY CONSTRUCTION.
2. THE CONTRACTOR IS RESPONSIBLE FOR THE HOARDING OF ALL TREES AND THE PROTECTION OF ANY EXISTING PAVED SURFACES AND CURBS WITHIN OR ADJACENT TO CONSTRUCTION AREAS.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE ADJUSTMENT OF ALL EXISTING CATCHBASINS, CATCHBASIN MANHOLES, MANHOLES, WATER VALVES, HYDRANTS, ETC. TO MATCH PROPOSED GRADES.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE HAULING OF ALL EXCESS MATERIALS OFF THE SITE TO A LOCATION DESIGNATED BY THE CONSULTANT.
5. THE CONTRACTOR IS RESPONSIBLE FOR GENERAL SITE CLEAN UP.
6. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO LANDSCAPED AREAS AND MUST MAKE ALL NECESSARY RESTORATIONS AND REPAIRS.

PERMITS AND STANDARDS

1. CONTRACTOR IS RESPONSIBLE FOR ALL PERMITS ASSOCIATED WITH CONSTRUCTION.
2. THE CONTRACTOR IS TO ENSURE THAT ALL NECESSARY ARRANGEMENTS ARE MADE WITH THE PIPELINE COMPANIES CONCERNING THE MOVEMENT OF MATERIALS AND EQUIPMENT NEAR ANY PIPELINE RIGHTS OF WAY.
3. VERTICAL STRUCTURES MAY REQUIRE APPROVAL FROM TRANSPORT CANADA AND NAV CANADA DUE TO PROXIMITY TO THE PEACE RIVER REGIONAL AIRPORT.

MATERIALS

1. THE CONTRACTOR IS TO SUPPLY AND INSTALL A 12MM FIBRE MASTIC JOINT WHENEVER MATCHING TO, OR ABUTTING TO, ANY CONCRETE SURFACE OR BUILDING EDGE.
2. ALL PLANT MATERIAL IS TO BE NURSERY GROWN STOCK AND SHALL MEET OR EXCEED THE SPECIFICATIONS OF THE CANADIAN NURSERY TRADES ASSOCIATION FOR SIZE, HEIGHT, SPREAD, GRADING, QUALITY, AND METHOD OF CULTIVATION.
3. ALL SOD AREAS TO HAVE A TOPSOIL DEPTH OF 200MM.
4. ALL PLANT BEDS TO HAVE DEVRINOL OR APPROVED ALTERNATE COLOUR-COATED PRE-EMERGENT HERBICIDE APPLIED PRIOR TO PLANTING.
5. ALL PRODUCTS AND WORKMANSHIP IS TO CONFORM TO THE MUNICIPAL STANDARDS IN ITS LATEST EDITION.
6. ALL MATERIALS TESTING IS THE RESPONSIBILITY OF THE CONTRACTOR. TESTS TO BE PROVIDED TO THE CONSULTANT PRIOR TO ANY WORK.
7. MATERIAL STORAGE AND STAGING AREAS TO BE PROPERLY SECURED AND ONLY PERMITTED WITH PRIOR APPROVAL FROM THE CITY.

GENERAL

2. THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE CONSULTANT FOR FURTHER DIRECTION.
3. LAYOUT IS TO BE APPROVED BY THE CONSULTANT PRIOR TO THE START OF CONSTRUCTION.
4. ALL MEASUREMENTS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
5. PLANT MATERIALS TO BE INSTALLED AND ESTABLISHED BY A QUALIFIED LANDSCAPE CONTRACTOR ONLY.

TREE PLANTING SETBACKS:

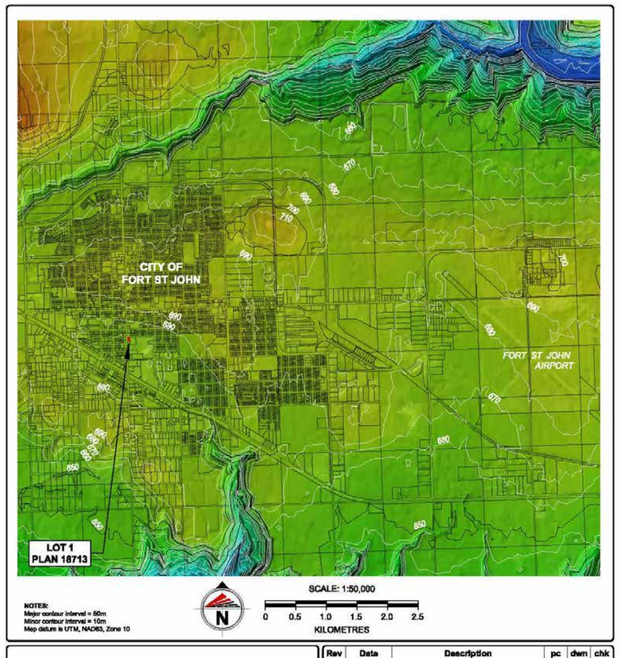
CONTRACTOR TO LOCATE ALL SITE UTILITIES PRIOR TO CONSTRUCTION AND PLANT NO CLOSER THAN THE FOLLOWING DIMENSIONS FROM THE SERVICES:

1. 1.0M FROM POWER LINES .
2. 3.5M FROM ALL POWER HARDWARE
3. 1.8M FROM WATER MAINS, WATER SERVICES, AND WATER VALVES.
4. 2.0M FROM SEWER MAINS, MANHOLES, AND SERVICES.
5. 1.5M FROM GAS AND ALL OTHER SERVICES.
6. 7.5M FROM STREET CORNERS.
7. 3.5M FROM FIRE HYDRANTS.
8. 2.0M FROM DRIVEWAYS.
9. 3.5M FROM YIELD AND STOP SIGNS.
10. 3.5M FROM BUS STOP SIGNS.
11. 2.0M FROM ALL OTHER SIGNS.
12. 1.0M FROM OTHER UNDERGROUND UTILITIES.

THE CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGES AND LIABILITIES INCURRED BY DAMAGES TO SITE UTILITIES.

EROSION & SEDIMENT CONTROL:

1. ALL SOIL PILES TO BE PROTECTED FROM WATER AND WIND EROSION. PILES LEFT FOR MORE THAN 48 HOURS TO BE COVERED.
2. CONTRACTOR TO PREVENT ANY DELETERIOUS SUBSTANCE FROM ENTERING NEARBY CATCH BASINS
3. CONTRACTOR IS RESPONSIBLE FOR ENSURING ESC MEASURES ARE PROPERLY INSTALLED, MAINTAINED AND REMOVED.



TOPOGRAPHICAL MAP
FOR
LOT 1, SEC 31, TP 83, R 18, W6M
PEACE RIVER DISTRICT PLAN 18713
CITY OF FORT ST. JOHN

Rev	Date	Description	pc	dwn	chk
00	Jan 17/19	Original issue	–	jl	kg

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NAVCAN | CAD/MAPPING/18FEBD5014-NAVCAN

2 L01 CONTEXT PLAN
nts

3 L01 EXISTING CONDITIONS
nts

EDS
ENVIRONMENTAL DESIGN SOLUTIONS
EDS Group Inc.
15 - 51109 RR 271
Spruce Grove, Alberta T7Y 1G7
Bus: (780) 271 - 1689

Legend

PROPOSED SITE

Drawings not valid for construction without authorized "Approved for Construction" seal.

Approval
City of Fort St. John — Day.Month.Year

Submission

1.	60% Draft Review	AM	JB	06/03/2019
2.	Development Permit Review	AM	JB	29/04/2019

Submitted By | Approved By | Day.Month.Year

PRELIMINARY/
FOR DISCUSSION
NOT FOR CONSTRUCTION

DRAFT

Seal

BRITISH COLUMBIA SOCIETY OF LANDSCAPE ARCHITECTS
REGISTERED MEMBER
JOHN BUCHKO
519

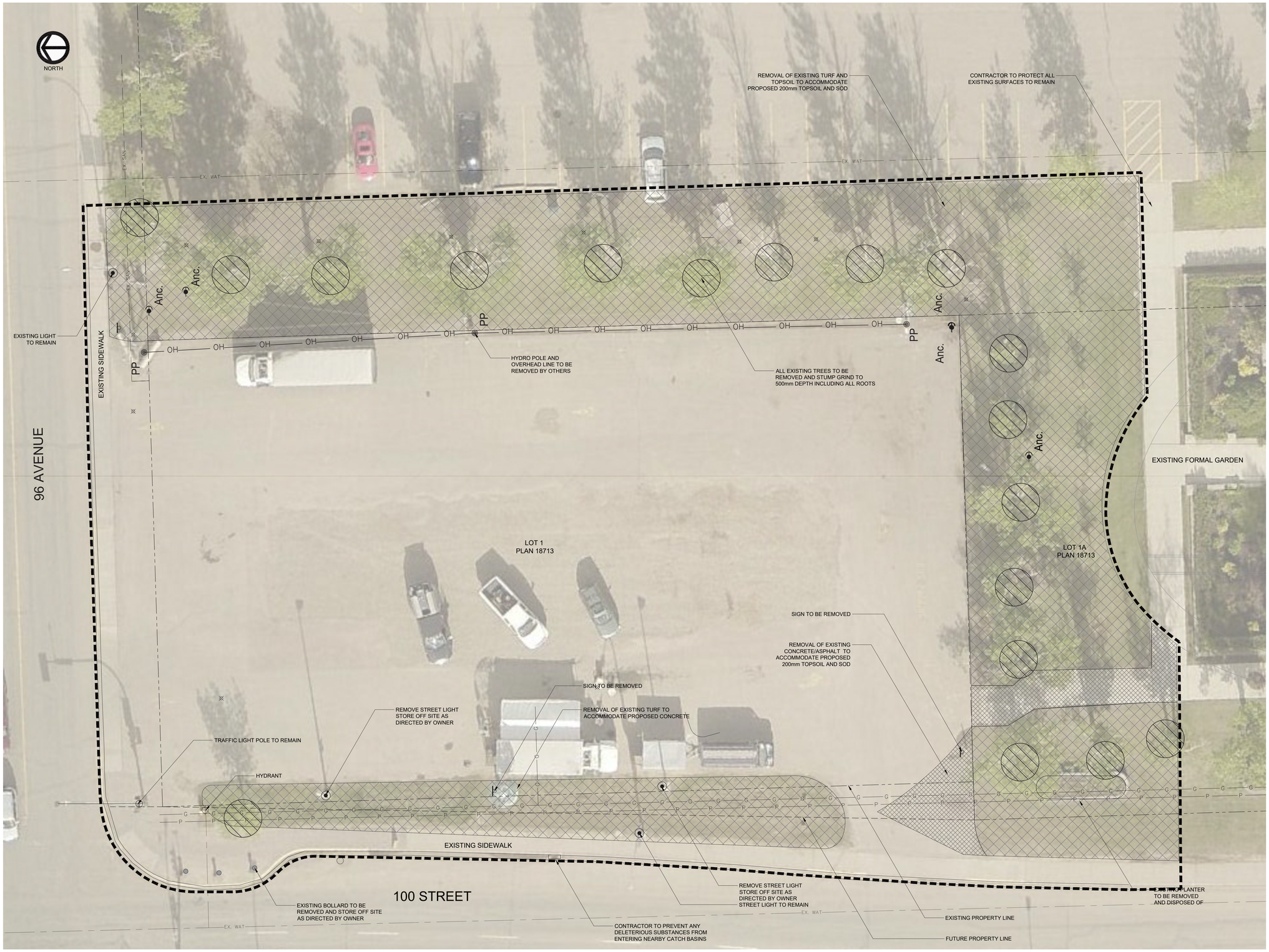
File Name:
LA_FJS_FEST_PLAZA.DWG — Created By: AM — Approved By: JB — Day.Month.Year: 01.01.2019

Project No.: 32113
Scale: as noted

CONTEXT EXISTING CONDITIONS PLAN
FESTIVAL PLAZA

CITY OF FORT ST. JOHN

SHEET
L01



1 L02 EXISTING CONDITIONS AND REMOVAL PLAN
1:150

EDS Group Inc.
15 - 51109 RR 271
Spruce Grove, Alberta T7Y 1G7
Bus: (780) 271 - 1689

ENVIRONMENTAL DESIGN SOLUTIONS

Legend

- CONSTRUCTION LIMITS
- PROPERTY LINE
- FUTURE PROPERTY LINE
- P — EXISTING U/GROUND POWER
- G — EXISTING U/GROUND GAS
- EX. SAN — EXISTING U/GROUND SANITARY
- EX. WAT — EXISTING U/GROUND WATER
- EXISTING POWER POLE
- LIGHT STANDARD
- MANHOLE
- CATCHBASIN
- FIRE HYDRANT
- SIGN
- BOLLARD
- TRAFFIC LIGHT POLE
- EXISTING TREE TO BE REMOVED
- CONCRETE/ASPHALT REMOVAL AND DISPOSAL
- TURF REMOVAL AND DISPOSAL

Drawings not valid for construction without authorized "Approved for Construction" seal.

Approval
City of Fort St. John — Day.Month.Year

Submission

			Submitted By	Approved By	Day.Month.Year
1.	60% Draft Review		AM	JB	06/03/2019
2.	Development Permit Review		AM	JB	29/04/2019

PRELIMINARY/ FOR DISCUSSION NOT FOR CONSTRUCTION

DRAFT

Seal

BRITISH COLUMBIA SOCIETY OF LANDSCAPE ARCHITECTS — REGISTERED MEMBER — JOHN BUCHKO — 519

File Name:

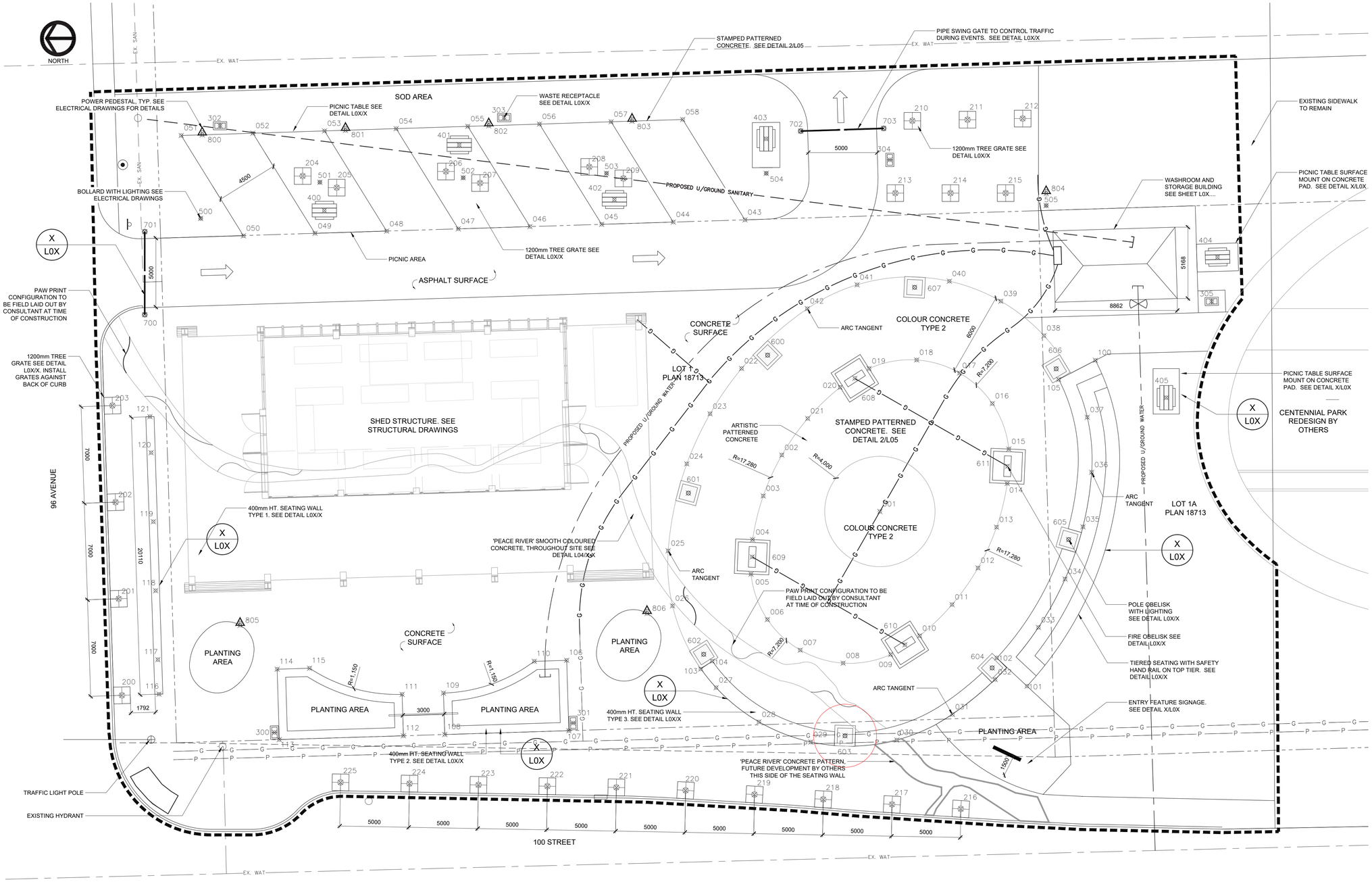
Created By — Approved By — Day.Month.Year: 01.01.2019

Project No.: 32113
Scale: as noted

EXISTING CONDITIONS AND REMOVAL PLAN
FESTIVAL PLAZA

CITY OF FORT ST. JOHN

SHEET
L02



1 L03 LAYOUT PLAN
1:150

PROPOSED CONCRETE DESIGN

COORD. POINT	NORTHING	EASTING
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002	633427.91	6235104.18
003	633424.95	6235105.53
004	633421.78	6235106.30
005	633419.28	6235106.42
006	633415.99	6235105.22
007	633413.78	6235102.85
008	633412.83	6235099.74
009	633413.46	6235096.29
010	633414.81	6235094.19
011	633417.08	6235091.84
012	633419.73	6235089.96
013	633422.68	6235088.61
014	633425.85	6235087.84
015	633428.35	6235087.72
016	633431.64	6235088.92
017	633433.85	6235091.30
018	633434.80	6235094.41
019	633434.17	6235097.85
020	633432.82	6235099.95
021	633430.56	6235102.30

PROPOSED CONCRETE DESIGN

COORD. POINT	NORTHING	EASTING
022	633434.18	6235107.10
023	633430.90	6235109.38
024	633427.27	6235111.07
025	633420.97	6235112.42
026	633416.99	6235112.10
027	633411.06	6235108.94
028	633408.58	6235105.84
029	633407.12	6235102.08
030	633407.27	6235095.84
031	633409.12	6235091.81
032	633411.65	6235088.71
033	633415.42	6235085.58
034	633418.93	6235083.65
035	633422.71	6235082.35
036	633426.66	6235081.72
037	633430.65	6235082.04
038	633436.56	6235085.18
039	633439.06	6235088.31
040	633440.50	6235092.03
041	633440.24	6235098.72
042	633438.51	6235102.33

PROPOSED CONCRETE DESIGN

COORD. POINT	NORTHING	EASTING
043	633444.95	6235106.85
044	633444.79	6235112.05
045	633444.62	6235117.24
046	633444.46	6235122.44
047	633444.30	6235127.63
048	633444.14	6235132.83
049	633443.97	6235138.01
050	633443.79	6235143.21
051	633451.06	6235147.72
052	633451.22	6235142.52
053	633451.39	6235137.33
054	633451.56	6235132.14
055	633451.72	6235126.94
056	633451.89	6235121.75
057	633452.05	6235116.56
058	633452.22	6235111.36

PROPOSED SEATING WALL AND PLANTER

COORD. POINT	NORTHING	EASTING
100	633434.77	6235081.45
101	633406.67	6235091.98
102	633408.39	6235093.01
103	633412.41	6235110.06
104	633412.98	6235109.22
105	633433.38	6235084.11
106	633413.04	6235119.78
107	633407.94	6235119.62
108	633407.66	6235128.62
109	633410.66	6235128.71
110	633412.97	6235122.13
111	633410.57	6235131.71
112	633407.57	6235131.61
113	633407.30	6235140.61
114	633412.39	6235140.77
115	633412.47	6235138.42
116	633410.59	6235149.33
117	633413.09	6235149.41
118	633418.09	6235149.58
119	633423.08	6235149.74
120	633428.08	6235149.90
121	633430.69	6235149.99

PROPOSED TREE GRATES

COORD. POINT	NORTHING	EASTING
200	633410.50	6235152.02
201	633417.50	6235152.25
202	633424.50	6235152.48
203	633431.49	6235152.71
204	633448.68	6235138.72
205	633446.20	6235137.11
206	633449.00	6235128.33
207	633446.53	6235126.72
208	633449.33	6235117.94
209	633446.85	6235116.33
210	633452.12	6235094.72
211	633452.20	6235090.72
212	633452.29	6235086.72
213	633443.25	6235095.95
214	633443.25	6235091.95
215	633443.25	6235087.95
216		
217		
218		
219		
220		
221		
222		
223		
224		
225		

PROPOSED WASTE RECEPTACLES

COORD. POINT	NORTHING	EASTING
300	633411.87	6235141.11
301	633412.54	6235119.39
302	633451.77	6235144.90
303	633452.35	6235124.31
304	633449.29	6235096.35
305	633438.78	6235073.21

PROPOSED PICNIC TABLE

COORD. POINT	NORTHING	EASTING
400	633450.64	6235139.60
401	633445.59	6235135.20
402	633450.96	6235129.29
403	633445.98	6235124.87
404	633450.86	6235119.27
405	633446.07	6235114.61

PROPOSED LIGHT BOLLARD

COORD. POINT	NORTHING	EASTING
500	633445.06	6235146.31
501	633447.67	6235137.67
502	633448.00	6235127.28
503	633448.32	6235116.89
504	633448.32	6235105.31
505	633445.98	6235085.01

PROPOSED OBELISK POLE/FIRE

COORD. POINT	NORTHING	EASTING
600	633435.14	6235105.21
601	633425.15	6235110.96
602	633413.47	6235109.85
603	633407.57	6235099.60
604	633412.49	6235088.93
605	633421.78	6235083.39
606	633434.16	6235084.29
607	633440.06	6235094.56
608	633433.47	6235098.88
609	633420.53	6235106.33
610	633414.16	6235095.26
611	633427.10	6235087.82

PROPOSED GATE PILES

COORD. POINT	NORTHING	EASTING
700	633438.08	6235150.36
701	633444.09	6235150.36
702	633451.38	6235102.81
703	633451.57	6235096.80

PROPOSED POWER PEDESTAL

COORD. POINT	NORTHING	EASTING
800	633451.10	6235146.20
801	633451.43	6235135.81
802	633451.76	6235125.42
803	633452.09	6235115.04
804	633446.85	6235085.01
805	633415.57	6235143.45
806	633416.44	6235113.95

EDS Group Inc.
15 - 51109 RR 271
Spruce Grove, Alberta T7Y 1G7
Bus: (780) 271 - 1689
ENVIRONMENTAL DESIGN SOLUTIONS

Legend

- CONSTRUCTION LIMITS
- PROPERTY LINE
- FUTURE PROPERTY LINE
- P — EXISTING U/GROUND POWER
- G — EXISTING U/GROUND GAS
- EX. SAN — EXISTING U/GROUND SANITARY
- EXISTING U/GROUND WATER
- P — PROPOSED U/GROUND POWER
- G — PROPOSED U/GROUND GAS
- PROPOSED U/GROUND SANITARY
- PROPOSED U/GROUND WATER
- LIGHT STANDARD
- MANHOLE
- CATCHBASIN
- FIRE HYDRANT
- SIGN
- EXISTING BOLLARD
- TRAFFIC LIGHT POLE
- BOLLARD WITH LIGHTING
- POWER PEDESTAL
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- FIRE OBELISK

Drawings not valid for construction without authorized "Approved for Construction" seal.

Approval
City of Fort St. John
Day.Month.Year

Submission

1.	60% Draft Review	AM	JB	06/03/2019

Submitted By | Approved By | Day.Month.Year

PRELIMINARY/ FOR DISCUSSION
NOT FOR CONSTRUCTION
DRAFT

Seal

BRITISH COLUMBIA SOCIETY OF LANDSCAPE ARCHITECTS — REGISTERED MEMBER — JOHN BUCHKO — 519

File Name:
Created By | Approved By | 01.01.2019 Day.Month.Year

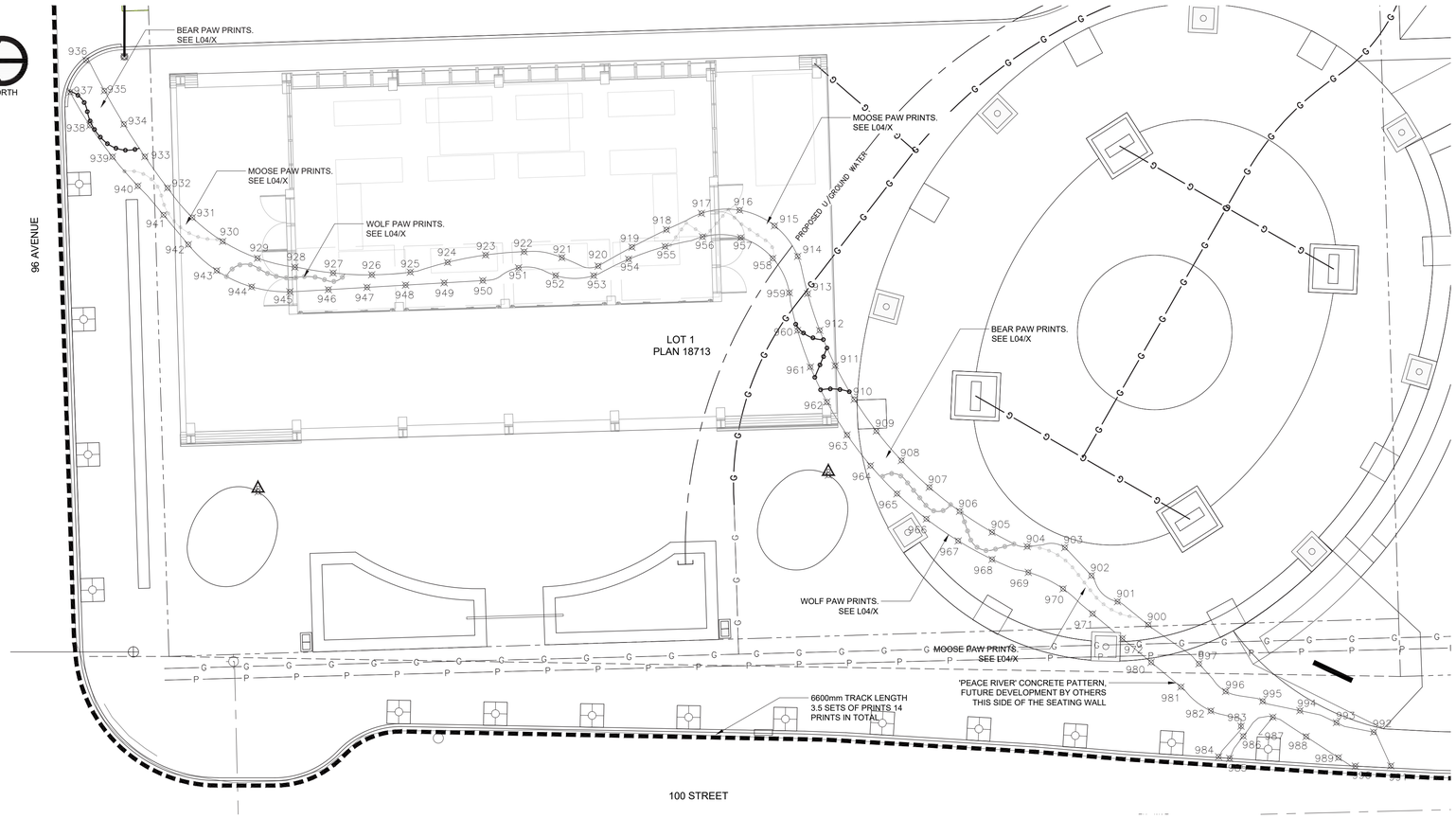
Project No. 32113
Scale as noted

LAYOUT PLAN

FESTIVAL PLAZA

CITY OF FORT ST. JOHN

SHEET
L03



1 L04 LAYOUT PLAN - CONCRETE RIVER DESIGN
1:150

PROPOSED CONCRETE RIVER DESIGN

COORD. POINT	NORTHING	EASTING
900	633408.70	6235097.40
901	633409.90	6235098.99
902	633411.25	6235100.34
903	633412.69	6235101.72
904	633412.75	6235103.66
905	633413.49	6235105.48
906	633414.57	6235107.16
907	633415.81	6235108.73
908	633417.20	6235110.17
909	633418.72	6235111.47
910	633420.36	6235112.61
911	633422.10	6235113.59
912	633423.93	6235114.40
913	633425.83	6235115.02
914	633427.76	6235115.54
915	633429.33	6235116.74
916	633430.14	6235118.54
917	633429.98	6235120.52
918	633429.13	6235122.33
919	633428.23	6235124.11
920	633427.26	6235125.86
921	633427.69	6235127.74
922	633427.99	6235129.69
923	633427.82	6235131.68
924	633427.44	6235133.64
925	633426.93	6235135.57
926	633426.80	6235137.57
927	633426.89	6235139.57
928	633427.19	6235141.54
929	633427.66	6235143.48
930	633428.53	6235145.28
931	633429.76	6235146.85
932	633431.29	6235148.13
933	633432.91	6235149.31
934	633434.59	6235150.39
935	633436.32	6235151.40
936	633437.89	6235152.36
937	633436.24	6235153.17
938	633434.52	6235152.15
939	633432.90	6235150.98
940	633431.39	6235149.67
941	633429.90	6235148.34
942	633428.36	6235147.06
943	633427.02	6235145.59
944	633426.18	6235143.79
945	633425.92	6235141.81
946	633426.03	6235139.81
947	633426.15	6235137.82
948	633426.27	6235135.82
949	633426.38	6235133.82
950	633426.50	6235131.83

PROPOSED CONCRETE RIVER DESIGN

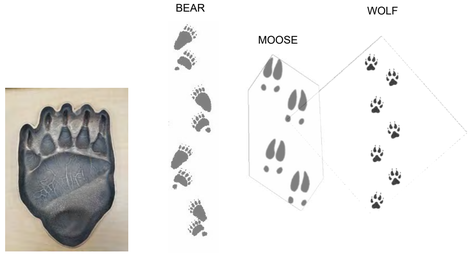
COORD. POINT	NORTHING	EASTING
951	633427.16	6235129.98
952	633426.76	6235128.06
953	633426.75	6235126.09
954	633427.61	6235124.28
955	633428.26	6235122.39
956	633428.76	6235120.46
957	633428.72	6235118.49
958	633427.65	6235116.83
959	633425.87	6235115.97
960	633423.92	6235115.54
961	633422.03	6235114.88
962	633420.23	6235114.03
963	633418.52	6235112.99
964	633416.93	6235111.77
965	633415.48	6235110.40
966	633414.18	6235108.88
967	633413.04	6235107.24
968	633412.08	6235105.48
969	633411.41	6235103.61
970	633410.56	6235101.81
971	633409.27	6235100.28
972	633408.00	6235098.74

FUTURE DEVELOPMENT BY OTHERS
PROPOSED CONCRETE RIVER DESIGN

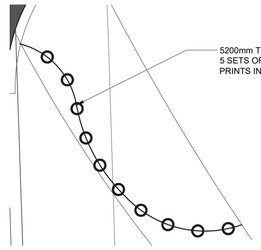
COORD. POINT	NORTHING	EASTING
980	633406.76	6235097.25
981	633405.49	6235095.71
982	633404.25	6235094.16
983	633403.46	6235092.60
984	633401.88	6235093.76
985	633401.80	6235093.19
986	633402.94	6235092.49
987	633403.92	6235090.96
988	633402.92	6235089.24
989	633401.83	6235087.56
990	633401.40	6235086.69
991	633401.41	6235084.86
992	633403.15	6235085.74
993	633403.64	6235087.67
994	633404.26	6235089.56
995	633404.75	6235091.48
996	633405.25	6235093.40
997	633406.69	6235094.78

NOTE:

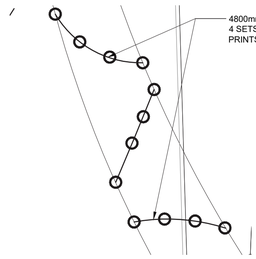
- CONTRACTOR TO BE PROVIDED RUBBER MOULDS FOR EACH PAW PRINT TO IMPRESS INTO WET CONCRETE WET CONCRETE
- BRONZE PRINTS TO BE INLAID INTO DEPRESSIONS AND EPOXIED INTO PLACE ONCE CONCRETE HAS SUFFICIENTLY CURED.
- ALL EDGES OF BRONZE PRINTS TO BE PRECISELY FLUSH WITH SURROUNDING CONCRETE.
- CONSULTANT TO LAYOUT EXACT PAW PRINTS



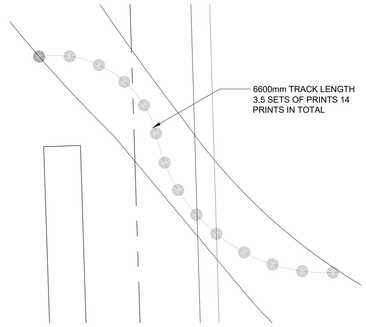
8 L04 EXAMPLE OF BRONZE PRINT
1:50



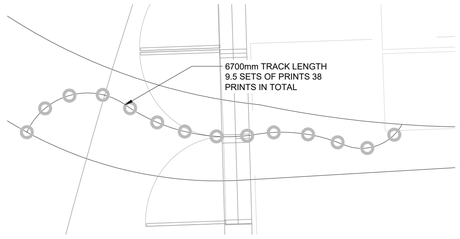
2 L04 BEAR PRINTS
1:50



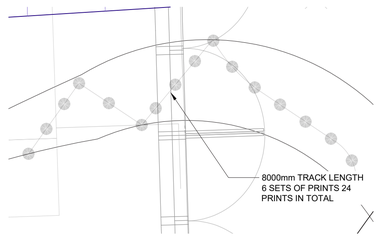
6 L04 BEAR PRINTS
1:50



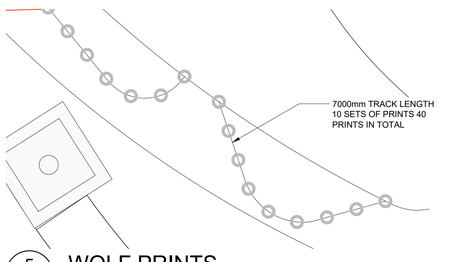
3 L04 MOOSE PRINTS
1:50



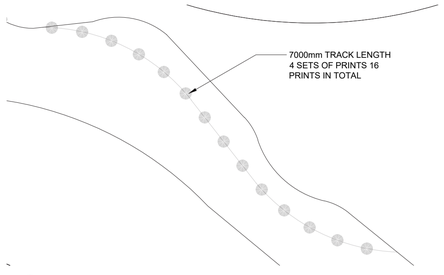
4 L04 WOLF PRINTS
1:50



2 L04 MOOSE PRINTS
1:50



5 L04 WOLF PRINTS
1:50



7 L04 MOOSE PRINTS
1:50

EDS Group Inc.
15 - 51109 RR 271
Spruce Grove, Alberta T7Y 1G7
Bus: (780) 271 - 1689
ENVIRONMENTAL DESIGN SOLUTIONS

Legend

- CONSTRUCTION LIMITS
- PROPERTY LINE
- FUTURE PROPERTY LINE
- P EXISTING U/GROUND POWER
- G EXISTING U/GROUND GAS
- EX. SAN EXISTING U/GROUND SANITARY
- P PROPOSED U/GROUND POWER
- G PROPOSED U/GROUND GAS
- PROPOSED U/GROUND SANITARY
- PROPOSED U/GROUND WATER
- LIGHT STANDARD
- MANHOLE
- CATCHBASIN
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- SIGN
- EXISTING BOLLARD
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- BOLLARD WITH LIGHTING
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- WASTE RECEPTACLE
- PICNIC TABLE
- TREE GRATE
- POLE OBELISK
- FIRE OBELISK

1 L01 DETAIL NUMBER / SHEET NUMBER

Drawings not valid for construction without authorized "Approved for Construction" seal.

Approval
City of Fort St. John — Day.Month.Year

Submission

1.	60% Draft Review	AM	JB	06/03/2019
2.	Development Permit Review	AM	JB	29/04/2019

Submitted By | Approved By | Day.Month.Year

PRELIMINARY/ FOR DISCUSSION NOT FOR CONSTRUCTION

DRAFT

Seal

BRITISH COLUMBIA SOCIETY OF LANDSCAPE ARCHITECTS — REGISTERED MEMBER — JOHN BUCHKO — 519

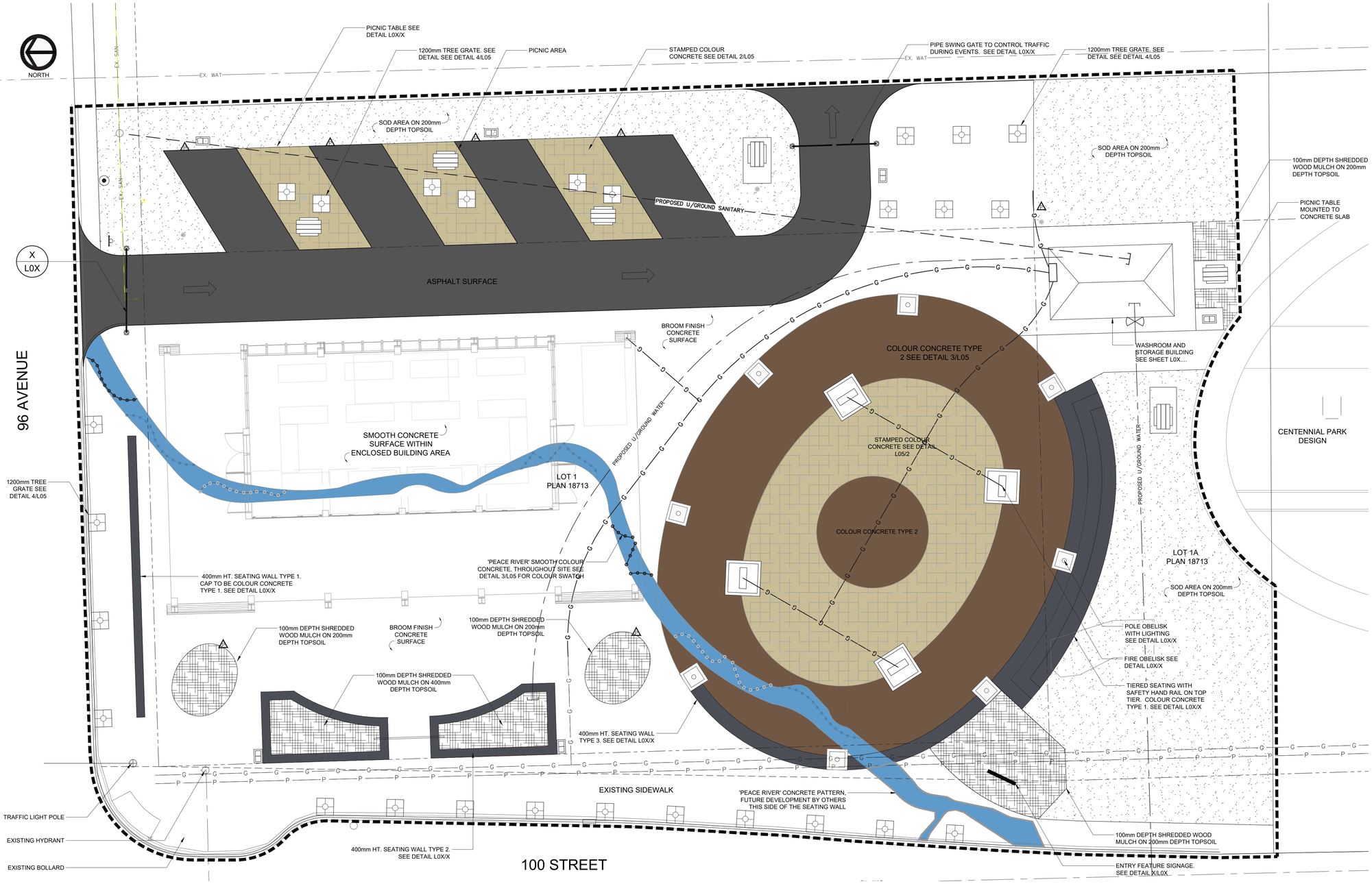
File Name:
Created By | Approved By | Day.Month.Year — 01.01.2019

Project No. 32113
Scale as noted

LAYOUT PLAN - RIVER DESIGN & BRONZE FEATURES
FESTIVAL PLAZA

CITY OF FORT ST. JOHN

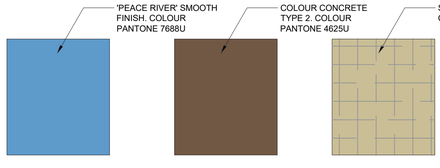
SHEET
L04



1 L05 **SURFACE TREATMENT**
1:150

COBBLE STONE FINISH. BIG ROLLER RR120 COBBLE STONE 33 ½". ROLLER INFORMATION AVAILABLE AT WWW.MARSHALLTOWN.COM EQUIVALENT STAMP WILL BE CONSIDERED FOR APPROVAL

2 L05 **STAMPED CONCRETE**
nts



NOTE:

- CONTRACTOR TO PROVIDE A SAMPLE POUR OF EACH PROPOSED COLOUR FOR REVIEW AND APPROVAL BY CONSULTANT.

3 L05 **COLOUR CONCRETE SWATCHES**
nts

EDS
ENVIRONMENTAL DESIGN SOLUTIONS

EDS Group Inc.
15 - 51109 RR 271
Spruce Grove, Alberta T7Y 1G7
Bus: (780) 271 - 1689

Legend

- PROPERTY LINE
- FUTURE PROPERTY LINE
- LIGHT STANDARD
- MANHOLE
- CATCHBASIN
- FIRE HYDRANT
- SIGN
- EXISTING BOLLARD
- TRAFFIC LIGHT POLE
- BOLLARD WITH LIGHTING
- WASTE RECEPTACLE
- PICNIC TABLE
- TREE GRATE
- POLE OBELISK
- FIRE OBELISK
- CONSTRUCTION LIMITS
- SEED ON 200mm DEPTH TOPSOIL
- 100mm DEPTH SHREDDED WOOD MULCH
- ASPHALT SURFACE
- STANDARD BROOM FINISH CONCRETE
- COLOUR CONCRETE TYPE 2
- PEACE RIVER SMOOTH COLOUR CONCRETE
- STAMPED COLOUR CONCRETE

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Approval
City of Fort St. John — Day.Month.Year

Submission

1.	60% Draft Review	AM	JB	06/03/2019
2.	Development Permit Review	AM	JB	29/04/2019

Submitted By | Approved By | Day.Month.Year

PRELIMINARY/ FOR DISCUSSION NOT FOR CONSTRUCTION

DRAFT

Seal

BRITISH COLUMBIA SOCIETY OF LANDSCAPE ARCHITECTS — REGISTERED MEMBER — JOHN BUCHKO — 519

File Name:
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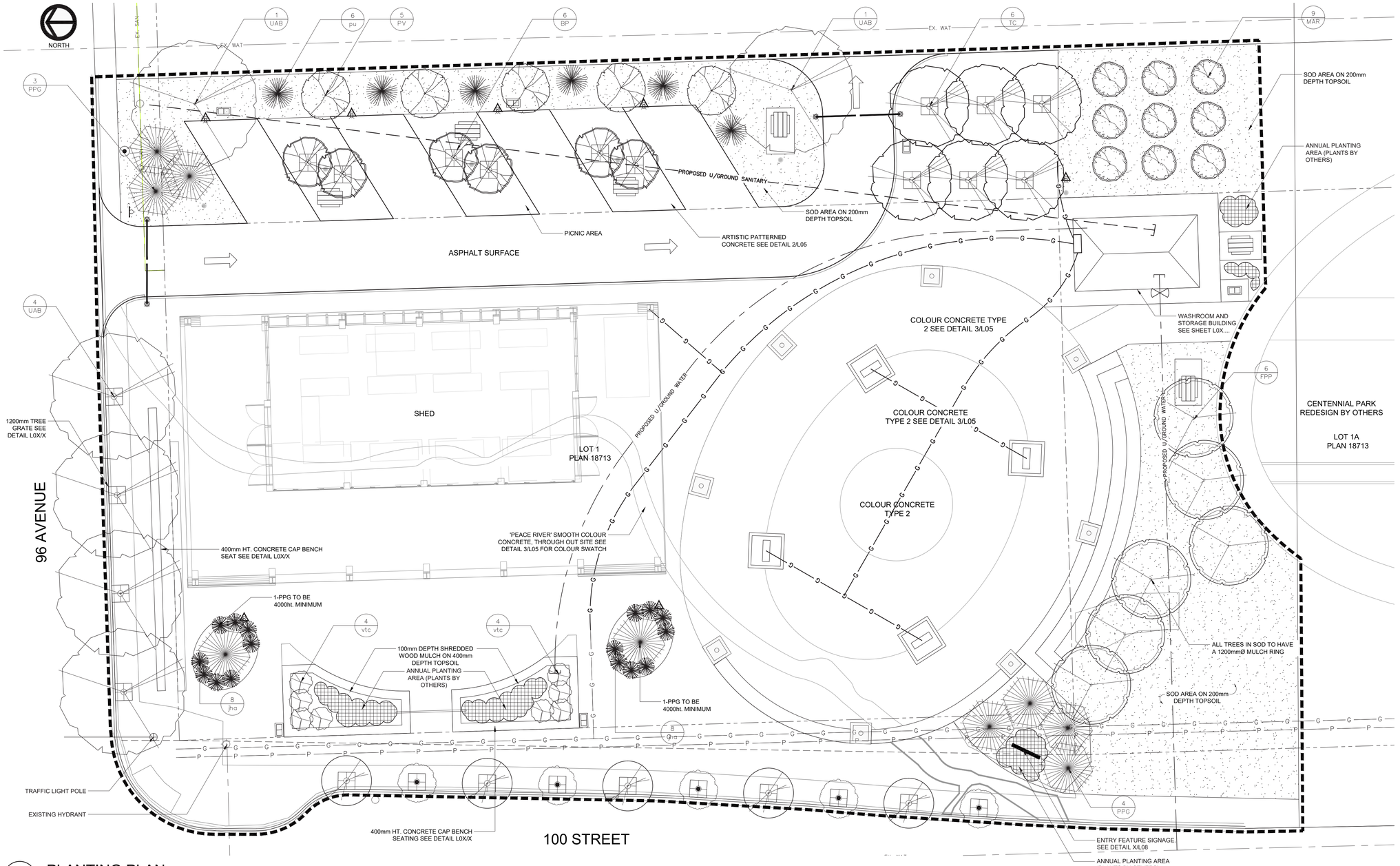
Project No. 32113
Scale as noted

SURFACE TREATMENT PLAN

FESTIVAL PLAZA

CITY OF FORT ST. JOHN

SHEET
L05



1 L06 PLANTING PLAN
1:150

DECIDUOUS TREES

QTY./KEY	BOTANICAL NAME	SIZE	CONDITION
x AM	Acer Ginnala AMUR MAPLE	65mm Cal.	OVERALL BRANCHING HEIGHT TO BE 1800-3000mm LOWEST BRANCHING HEIGHT TO BE 1000mm MINIMUM 12 (TWELVE) BRANCHES PER TREE TREE TO BE BALLED & BURLAPPED WITH WIRE BASKET ROOT BALL TO HAVE A MIN. 750mmØ
X BP	Betula papyrifera PAPER BIRCH	65mm Cal.	OVERALL BRANCHING HEIGHT TO BE 1800-3000mm LOWEST BRANCHING HEIGHT TO BE 1000mm MINIMUM 12 (TWELVE) BRANCHES PER TREE TREE TO BE BALLED & BURLAPPED WITH WIRE BASKET ROOT BALL TO HAVE A MIN. 750mmØ. TREE TO BE SINGLE STEM
x FPP	Fraxinus pensylvanica 'Patmore' PATMORE GREEN ASH	65mm Cal.	OVERALL BRANCHING HEIGHT TO BE 1800-3000mm LOWEST BRANCHING HEIGHT TO BE 1000mm MINIMUM 12 (TWELVE) BRANCHES PER TREE TREE TO BE BALLED & BURLAPPED WITH WIRE BASKET ROOT BALL TO HAVE A MIN. 750mmØ
X PV	Prunus virginiana 'Schubert' SCHUBERT CHOKECHERRY	75mm Cal.	OVERALL BRANCHING HEIGHT TO BE 1800-3000mm LOWEST BRANCHING HEIGHT TO BE 1000mm MINIMUM 12 (TWELVE) BRANCHES PER TREE TREE TO BE BALLED & BURLAPPED WITH WIRE BASKET ROOT BALL TO HAVE A MIN. 750mmØ
X MAR	Malus x adstringens 'Red Splendor' RED SPLENDOR	65mm Cal.	OVERALL BRANCHING HEIGHT TO BE 1800-3000mm LOWEST BRANCHING HEIGHT TO BE 1000mm MINIMUM 12 (TWELVE) BRANCHES PER TREE TREE TO BE BALLED & BURLAPPED WITH WIRE BASKET ROOT BALL TO HAVE A MIN. 750mmØ

DECIDUOUS TREES

QTY./KEY	BOTANICAL NAME	SIZE	CONDITION
x TC	Sorbus americana American Mountain Ash	65mm Cal.	OVERALL BRANCHING HEIGHT TO BE 1800-3000mm LOWEST BRANCHING HEIGHT TO BE 1200mm MINIMUM 12 (TWELVE) BRANCHES PER TREE TREE TO BE BALLED & BURLAPPED WITH WIRE BASKET ROOT BALL TO HAVE A MIN. 750mmØ
x TC	Tilia cordata LITTLE LEAF LINDEN	65mm Cal.	OVERALL BRANCHING HEIGHT TO BE 1800-3000mm LOWEST BRANCHING HEIGHT TO BE 1200mm MINIMUM 12 (TWELVE) BRANCHES PER TREE TREE TO BE BALLED & BURLAPPED WITH WIRE BASKET ROOT BALL TO HAVE A MIN. 750mmØ
x UAB	Ulmus americana 'brandon' BRANDON ELM	75mm Cal.	OVERALL BRANCHING HEIGHT TO BE 1200-2000mm LOWEST BRANCHING HEIGHT TO BE 1800mm MINIMUM 12 (TWELVE) BRANCHES PER TREE TREE TO BE BALLED & BURLAPPED WITH WIRE BASKET ROOT BALL TO HAVE A MIN. 750mmØ

NOTE:

- ALL TREES TO BE HIGH-HEADED AND EXHIBIT A FULL AND UNIFORM CROWN WITH A SINGLE WELL-DEVELOPED LEADER.
- TREES WITH BROKEN OR DAMAGED LEADERS WILL NOT BE ACCEPTED.

CONIFEROUS TREES

QTY./KEY	BOTANICAL NAME	SIZE	CONDITION
X PU	Picea cembra SWISS STONE PINE	1500mm Ht.	LOWEST BRANCHING HEIGHT NO HIGHER THAN 300mm TREE TO BE BALLED AND BURLAPPED WITH WIRE BASKET ROOT BALL TO HAVE A MIN. 900mmØ
X PPG	Picea Pungens 'Glauca' BLUE COLORADO SPRUCE	1500mm Ht. 4000mm Ht. (QTY 2)	LOWEST BRANCHING HEIGHT NO HIGHER THAN 300mm TREE TO BE BALLED AND BURLAPPED WITH WIRE BASKET ROOT BALL TO HAVE A MIN. 900mmØ

CONIFEROUS/DECIDUOUS SHRUBS

QTY./KEY	BOTANICAL NAME	SIZE	CONDITION
X jha	Juniperus horizontalis 'Andorra' Andorra Juniper	400mm Ht.	MINIMUM 4 (FOUR) CANES PER SHRUB SHRUB SHALL BE CONTAINER GROWN MINIMUM ROOT SPREAD TO BE 300mm
X vtcc	Viburnum trilobum 'Compactum' COMPACT HIGHBUSH CRANBERRY	400mm Ht.	MINIMUM 4 (FOUR) CANES PER SHRUB SHRUB SHALL BE CONTAINER GROWN MINIMUM ROOT SPREAD TO BE 300mm

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Legend

- PROPERTY LINE
- FUTURE PROPERTY LINE
- LIGHT STANDARD
- MANHOLE
- CATCHBASIN
- FIRE HYDRANT
- SIGN
- EXISTING BOLLARD
- TRAFFIC LIGHT POLE
- BOLLARD WITH LIGHTING
- WASTE RECEPTACLE
- PICNIC TABLE
- TREE GRATE
- POLE OBELISK
- FIRE OBELISK
- CONSTRUCTION LIMITS
- SEED ON 200mm DEPTH TOPSOIL
- ANNUAL PLANTING AREA

Drawings not valid for construction without authorized "Approved for Construction" seal.

Approval
City of Fort St. John — Day.Month.Year

Submission

1.	60% Draft Review	AM	JB	06/03/2019
2.	Development Permit Review	AM	JB	29/04/2019

Submitted By | Approved By | Day.Month.Year

PRELIMINARY/ FOR DISCUSSION
NOT FOR CONSTRUCTION

DRAFT

Seal

BRITISH COLUMBIA SOCIETY OF LANDSCAPE ARCHITECTS — REGISTERED MEMBER — JOHN BUCHKO — 519

File Name:

Created By | Approved By | Day.Month.Year
01.01.2019

Project No. 32113
Scale as noted

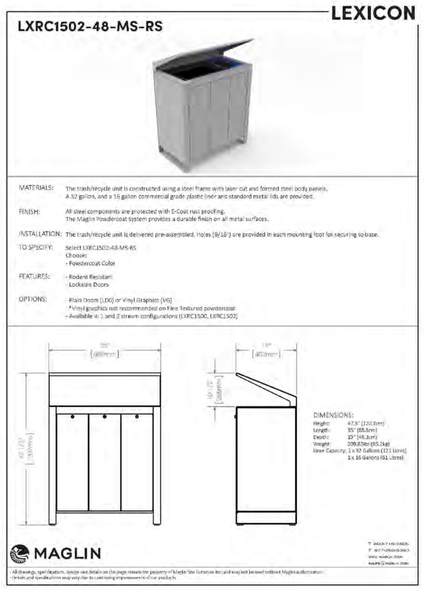
PLANTING PLAN

FESTIVAL PLAZA

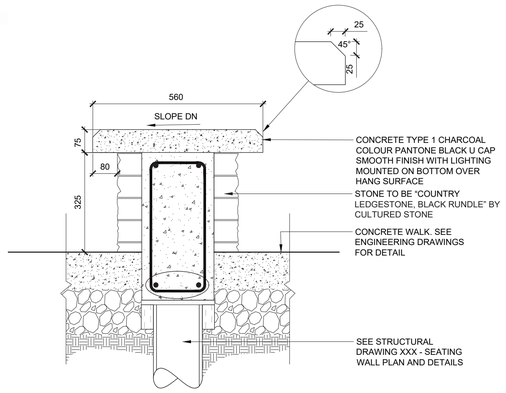
CITY OF FORT ST. JOHN

SHEET L06

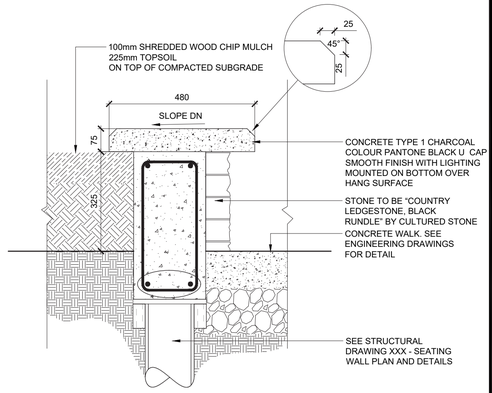
X L07 PICNIC TABLE
nts



X L07 WASTE RECEPTACLE
nts



X L07 SEATING WALL TYPE 1
1:100



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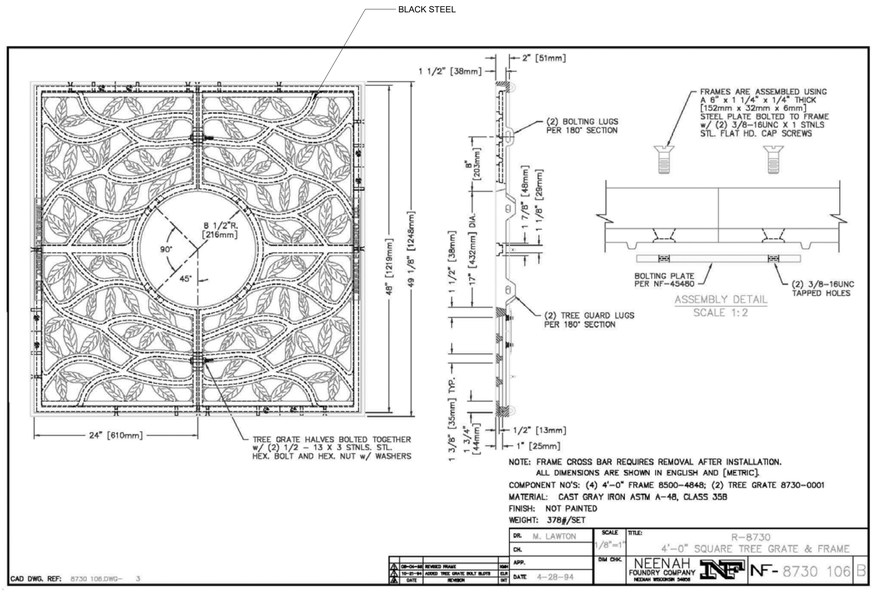
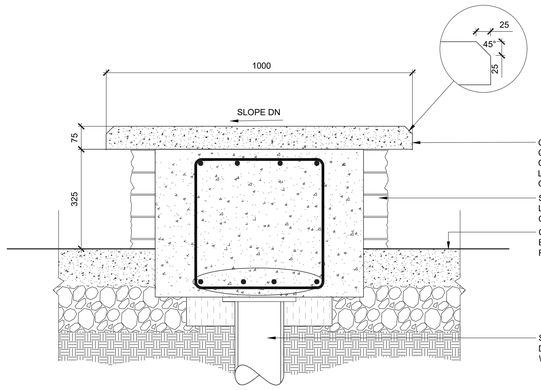
1:10



X L07 TREE GRATE
nts



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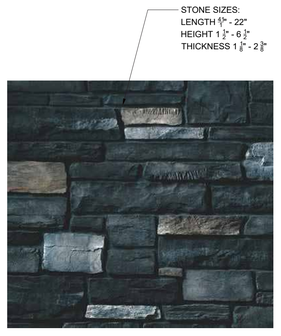
1:10



X L07 COUNTRY LEDGESTONE
nts

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Legend

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REGISTERED MEMBER
JOHN BUCHKO
519

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01.01.2019

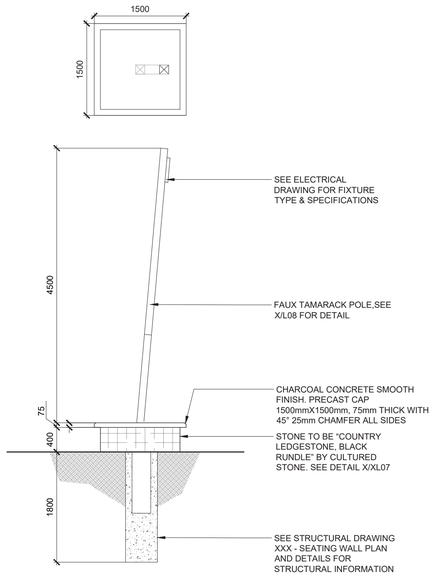
Project No. 32113
Scale as noted

DETAILS

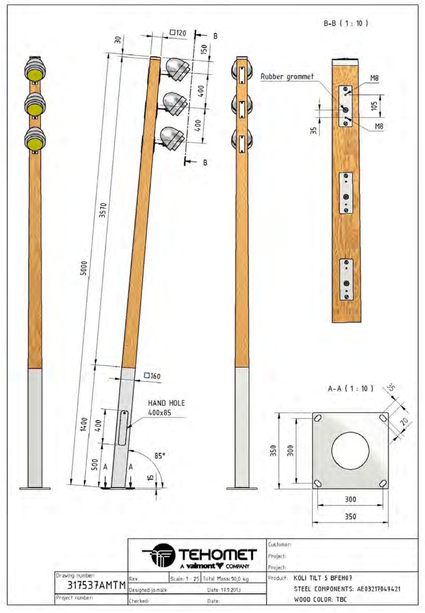
FESTIVAL PLAZA

CITY OF FORT ST. JOHN

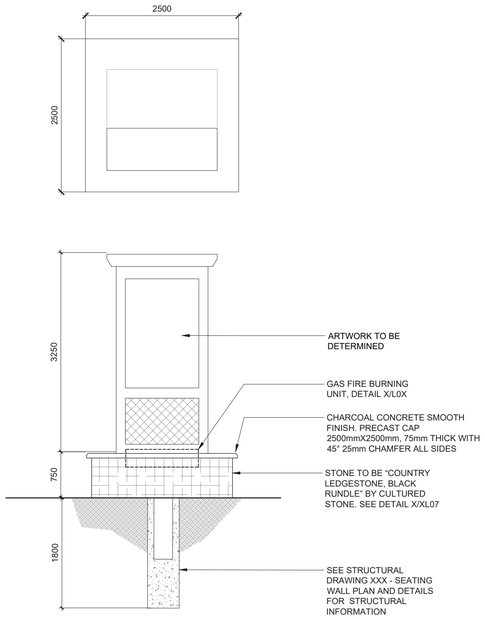
SHEET
L07



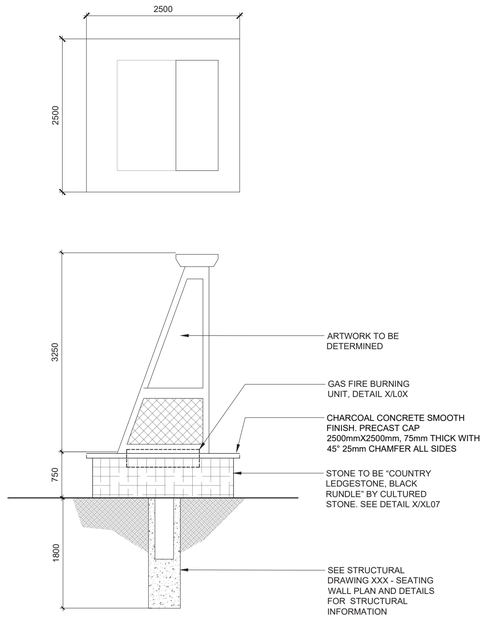
X L08 TAMARACK POLE OBELISK
1:50



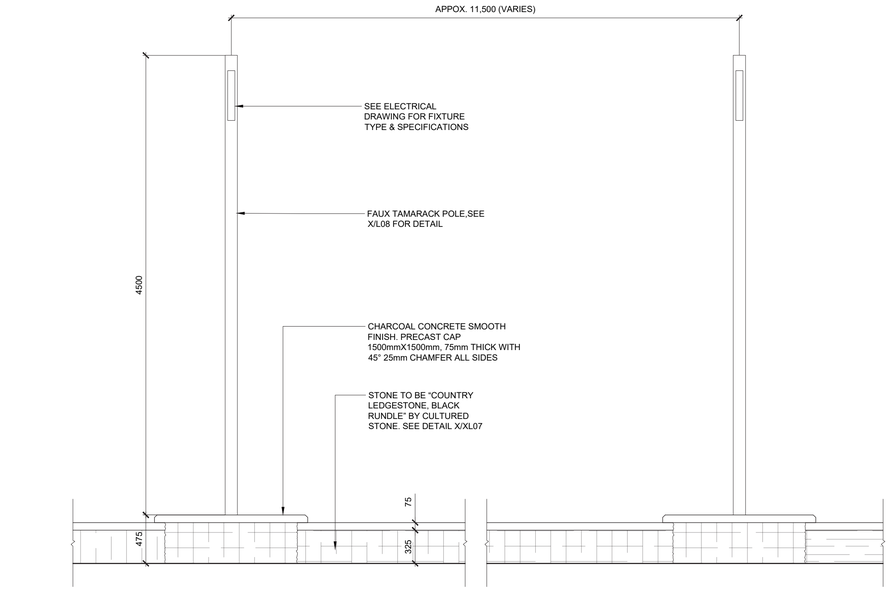
X L08 TAMARACK POLE MATERIAL
nts



X L08 FRONT ELEVATION FIRE OBELISK
1:50

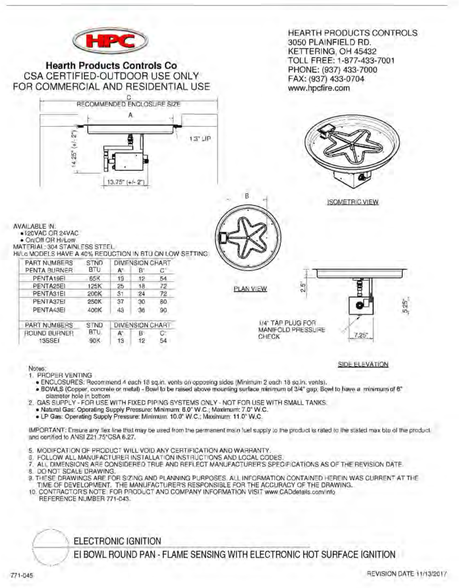


X L08 SIDE ELEVATION FIRE OBELISK
1:50

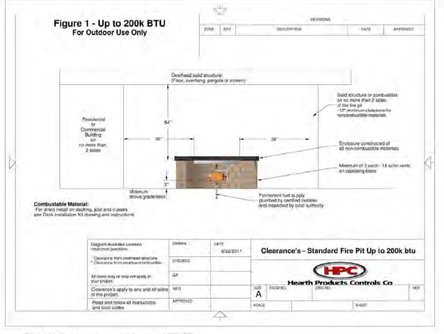


X L08 SEATING WALL/OBELISK ELEVATION
1:30

X L08 REMOTE CONTROL FIRE PLUG
nts



X L08 GAS FIRE BURNING UNIT
nts



X L08 BURNING UNIT PLACEMENT SECTION
nts

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Legend

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Approval
City of Fort St. John — Day.Month.Year

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2.	Development Permit Review	AM	JB	29/04/2019

PRELIMINARY/ FOR DISCUSSION
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File Name:

Created By — Approved By — 01.01.2019 Day.Month.Year

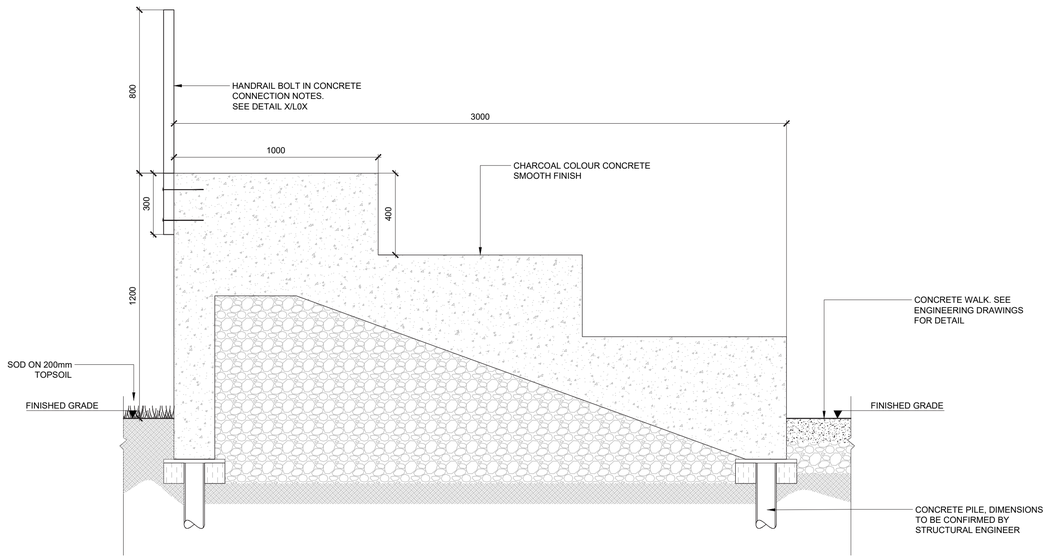
Project No. 32113
Scale as noted

DETAILS

FESTIVAL PLAZA

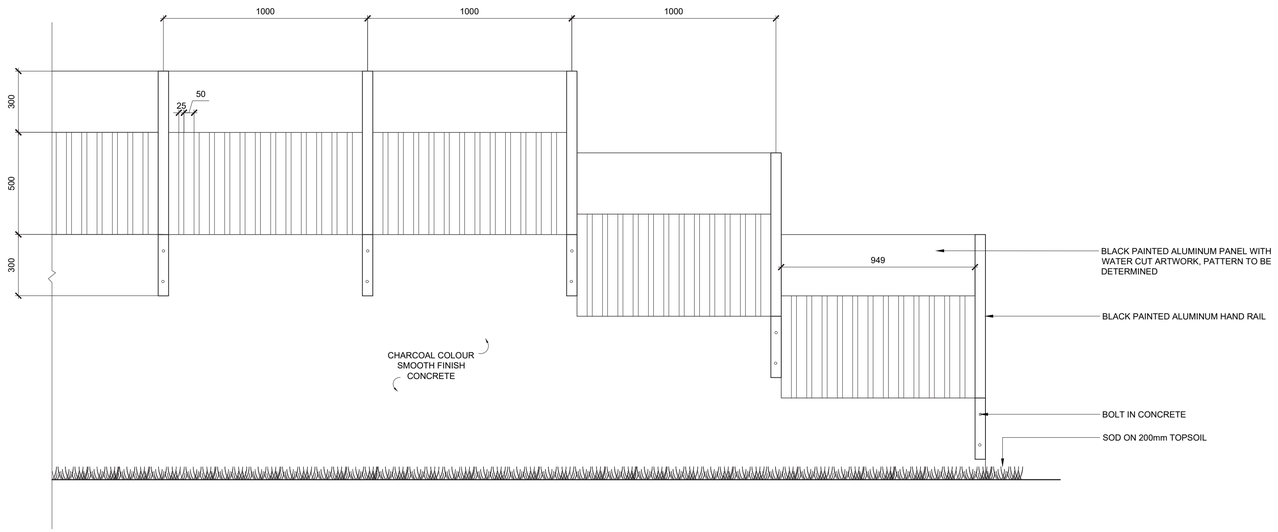
CITY OF FORT ST. JOHN

SHEET
L08



X L09 CONCRETE TIERED BLEACHER
1:15

X L09 ENTRY FEATURE SIGN
1:20



X L09 CONCRETE TIERED BLEACHER END ELEVATION
1:15

EDS Group Inc.
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Spruce Grove, Alberta T7Y 1G7
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ENVIRONMENTAL DESIGN SOLUTIONS

Legend

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City of Fort St. John — Day.Month.Year

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01.01.2019

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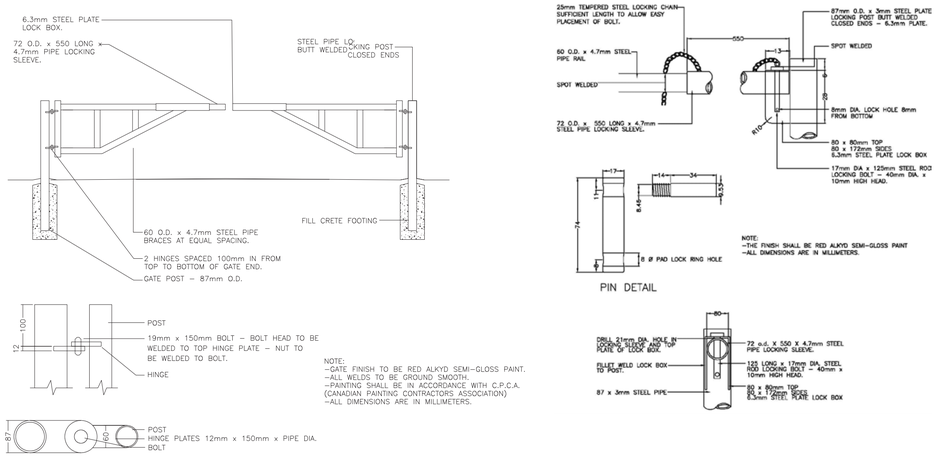
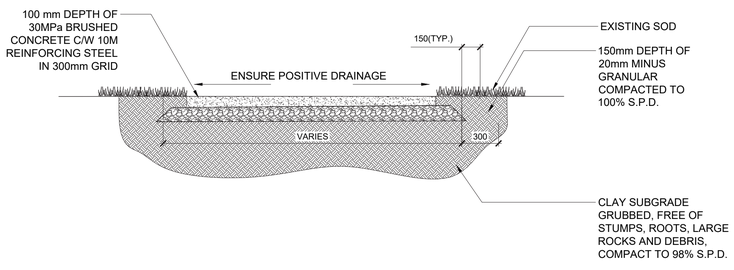
CITY OF FORT ST. JOHN

SHEET
L09



X L10 SWING GATE & GATE LOCKING SLEEVE
nts



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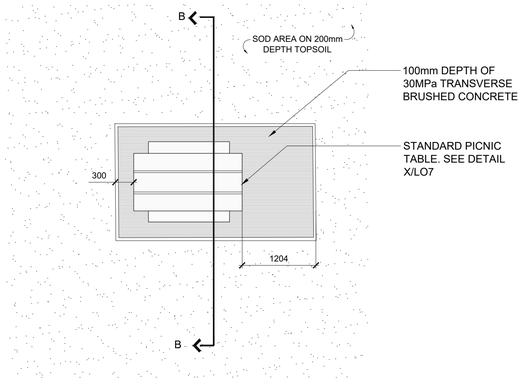
1:30



X L10 CONCRETE PAD - PICNIC TABLE
1:50

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DETAILS

FESTIVAL PLAZA

CITY OF FORT ST. JOHN

SHEET
L10

MATERIALS GUIDE

FESTIVAL PLACE Site Materials

April 2019

CONCRETE STYLES - COLOUR AND FINISH

CLIENT COMMENT | APPROVAL


CONCRETE BROOM FINISH
COLOUR STANDARD GREY


CONCRETE TYPE 1 SMOOTH FINISH
COLOUR PANTONE BLACK 6 U


'PEACE RIVER' SMOOTH FINISH
COLOUR PANTONE 7688 U


CONCRETE TYPE 2 SMOOTH FINISH
COLOUR PANTONE 4625 U


COBBLE STONE STAMPED CONCRETE
COLOUR PANTONE 4535 U

BRONZE ANIMAL TRACKS

CLIENT COMMENT | APPROVAL

BLACK BEAR	SIZE 175mm X 206mm
WOLF	SIZE 94mm X 117mm
MOOSE	SIZE 150mm X 177mm

EXAMPLE PRINT

SEATING WALL, PLANTER AND OBELISK PEDESTALS

CLIENT COMMENT | APPROVAL


CONCRETE TYPE 1 SMOOTH FINISH
COLOUR PANTONE BLACK 6 U

VERTICAL WALL FINISH
COUNTRY LEDGESTONE:

SIZE STONE SIZES:
LENGTH $\frac{41}{1}$" - 22"
HEIGHT 1 $\frac{1}{2}$" - 6 $\frac{1}{2}$"
tHICKNESS 1 $\frac{1}{8}$" - 2 $\frac{3}{8}$"

5. PORTLAND CEMENT SHALL CONFORM TO CAN/CSA A23.1, 23.2 AND 23.3.

6. NO MORE THAN 90 MINUTES SHALL ELAPSE BETWEEN CONCRETE BATCHING AND CONCRETE PLACEMENT, UNLESS APPROVED BY THE ENGINEER OR AUTHORIZED TESTING AGENCY.

7. CONCRETE BATCHING, MIXING, TRANSPORTATION AND PLACEMENT SHALL BE PER CAN/CSA A23.1 OR A23.4 AS APPLICABLE.

8. CONCRETE CONSOLIDATION SHALL BE PER CAN/CSA A23.1 OR A23.4.

9. FORM WORK SHALL BE PER CAN/CSA A23.1 OR A23.4 AS APPLICABLE.

10. REMOVE ALL DEBRIS FROM FORMS, REINFORCING STEEL AND OTHER EMBEDDED ITEMS PRIOR TO PLACING CONCRETE. CONCRETE SHALL NOT BE DROPPED THROUGH REINFORCING STEEL (WALLS OR COLUMNS) SO AS TO CAUSE A SEGREGATION OF AGGREGATES. UNCONFINED FALL OF CONCRETE SHALL NOT EXCEED 5 FEET. CARE SHALL BE TAKEN IN PLACING SLABS ON GRADE SO FILL MATERIAL IS NOT DISTURBED.

11. ALL ITEMS TO BE CAST IN CONCRETE SUCH AS REINFORCING, DOWELS, BOLTS, ANCHORS, PIPES, SLEEVES, ETC., SHALL BE SECURELY POSITIONED IN THE FORMS PRIOR TO PLACING OF CONCRETE.

12. CONCRETE SLAB ON GRADE CONTROL JOINTS SHALL BE SAW-CUT CONTROL JOINTS SUCH THAT THE ENCLOSED AREA DOES NOT EXCEED THAT INDICATED IN TYPICAL DETAIL.

13. EMBEDDED ITEMS SHALL BE PLACED PER CAN/CSA A23.1 OR A23.4 AS APPLICABLE.

14. PIPE OTHER THAN ELECTRICAL CONDUITS SHALL NOT BE EMBEDDED IN STRUCTURAL CONCRETE EXCEPT WHERE SPECIFICALLY APPROVED BY THE ENGINEER. MAX PIPE SIZE SHALL BE ⅓ OF THE SLAB THICKNESS AND LOCATED AT THE MID-DEPTH. MIN SPACING SHALL BE 3 TIMES THE PIPE DIAMETER. PIPES SHALL NOT IMPAIR THE STRENGTH OF THE MEMBER.

15. PROTECT CONCRETE FROM DAMAGE OR REDUCED STRENGTH DUE TO COLD OR HOT WEATHER.

16. CONTRACTOR SHALL SUBMIT CONCRETE MIX REPORT WITH COMPRESSION TEST RESULTS TO THE STRUCTURAL ENGINEER FOR REVIEW PRIOR TO START OF FOUNDATION CONSTRUCTION. REPRESENTATIVE TEST CYLINDERS SHALL BE TAKEN FROM THE CONCRETE IN ACCORDANCE WITH CONCRETE CSA SPECIFICATIONS. TESTING SHALL BE PERFORMED AT 7 AND 28 DAYS.

No.	Description	Date
2	REVISION TO SITE PLAN	2019-04-05
1	ISSUED FOR REVIEW	2019-02-15

NOTES:
1. THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNTIL SIGNED AND SEALED OR ADVISED IN WRITING BY THE ENGINEER.
2. DO NOT SCALE THIS DRAWING.
3. VERIFY ALL DIMENSIONS, DATUMS, AND LEVELS PRIOR TO COMMENCEMENT OF WORK. REPORT ANY DISCREPANCIES OR OMISSIONS TO THE DESIGNER IMMEDIATELY.
4. ALL WORK MUST COMPLY WITH THE MOST RECENT EDITION OF THE APPLICABLE BUILDING CODE, AND ANY OTHER GOVERNING AUTHORITY.

DRAWN BY:	JCM
CHECKED BY:	-
ENGINEER:	-
PROJECT No:	18FEBD5014
DATE:	APRIL 2019
SCALE:	AS INDICATED

DESCRIPTION

Foundation Plan and Details

DRAWING NO.

S1.0

SHEET 1/2

2019-04-05 12:31:19 PM

NOT EXPOSED TO WEATHER OR IN CONTACT WITH EARTH		
STRUCTURAL WALLS, SLABS, AND JOISTS		
35M AND SMALLER		19mm (3/4")
BEAM AND COLUMN PRIMARY REINF., TIES, STIRRUPS, AND SPIRALS		
35M AND SMALLER		38mm (1-1/2")

4. LAP SPLICES OF REINFORCING STEEL IN CONCRETE BEAMS, SLABS AND FOOTINGS SHALL BE ACCORDING TO CAN/CSA A23.3 OR LAP SCHEDULE BELOW, UNO. STAGGER SPLICES A MIN OF ONE LAP LENGTH. NO TACK WELDING OF REINFORCING BARS ALLOWED. LATEST CAN/CSA CODE AND DETAILING MANUAL APPLY. PROVIDE BENT CORNER BARS TO MATCH AND LAP W/ HORIZONTAL BARS AT ALL CORNERS AND INTERSECTIONS PER TYPICAL DETAILS WHERE PROVIDED. VERTICAL WALL BARS SHALL BE SPLICED AT OR NEAR FLOOR LINES, SPLICE TOP BARS AT CENTER LINE OF SPAN AND BOTTOM BARS AT THE SUPPORT IN SPANDRELS, BEAMS, GRADE BEAMS, ETC, UNO.

REBAR LAP SCHEDULE:

BAR SIZE:	LAP
10M	16"
15M	24"

5. WELDING OF REINFORCING BARS, METAL INSERTS, AND CONNECTIONS SHALL CONFORM TO CAN/CSA W186-M1990 AND SHALL BE MADE ONLY AT LOCATIONS SHOWN ON PLANS OR DETAILS. ALL REINFORCING SHALL BE BENT COLD. BARS SHALL ONLY BE BENT ONCE.

6. REINFORCING BAR SPACING SHOWN ON PLANS ARE MAX ON CENTERS. DOWEL ALL VERTICAL REINFORCING INTO FOUNDATION. SECURELY TIE ALL BARS IN LOCATION PRIOR TO CONCRETE PLACEMENT.

CONCRETE

1. ALL CONCRETE SHALL BE NORMAL WEIGHT CONCRETE.

2. CONTRACTOR SHALL COORDINATE WITH WORK OF ALL OTHER TRADES AND WHERE REQUIRED INSTALL ALL BUILT-IN WORK, SLEEVES, INSERTS, ETC...AS REQUIRED.

3. CONCRETE TO MEET THE FOLLOWING REQUIREMENTS:

CONCRETE SCHEDULE

URE S	ELEMENT	CEMENT TYPE	MIN. STRENGTH	SLUMP	MAX. AGG. SIZE	W/C RATIO	AIR ENTRAINMENT
	PILES, FOOTINGS, PILE CAPS, PIERS, FOUNDATION WALLS, RETAINING WALLS & GRADE BEAMS	HS	32 MPa @ 56 DAYS	3" (76mm)	3/4" (20mm)	0.45	4%-7%

4. CONCRETE MIXES SHALL BE DESIGNED BY A CERTIFIED LABORATORY AND

No.	Description	Date
2	REVISION TO SITE PLAN	2019-04-05
1	ISSUED FOR REVIEW	2019-02-15

P: 780 532 4919 F: 780 532 4739
Grande Prairie
10940-92 Ave, Grande Prairie, AB T8V 6B5
Fort St. John
10012-97 Ave, Fort St. John, BC V1J 5P3
www.baseng.ca
P: 780 532 4919 F: 780 532 4739

OWNER

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4. ALL WORK MUST COMPLY WITH THE MOST RECENT EDITION OF THE APPLICABLE BUILDING CODE, AND ANY OTHER GOVERNING AUTHORITY.

FORT ST. JOHN
The Energetic City

SEAL

DRAWN BY:	JCM
CHECKED BY:	-
ENGINEER:	-
PROJECT No:	18FEBD5014
DATE:	APRIL 2019
SCALE:	AS INDICATED

DESCRIPTION

PRELIMINARY ONLY
ISSUED FOR REVIEW
NOT FOR CONSTRUCTION

Foundation Details

DRAWING NO.

S1.1

SHEET 2 / 2

FESTIVAL PLAZA

2019-04-05 12:31:03 PM

BASIS FOR DESIGN

GOVERNING BUILDING CODE: 2018 BC BUILDING CODE
PROJECT LOCATION: . . . . . .FORT ST. JOHN, BC

DESIGN LOADS:. . . . . .PER TABLE

FOUNDATION DESIGN

GEOTECHNICAL ENGINEER: . . . . . .SNC LAVALIN
REPORT NUMBER/ DATED: . . . . . 663229 / FEBRUARY 20, 2019

PRELIMINARY REPORT ONLY

REINFORCING STEEL

1. REINFORCING STEEL SHALL BE DETAILED AND PLACED IN ACCORDANCE W/ CAN/CSA 23.3-04 AND THE LATEST EDITION RSIC's MANUAL OF STANDARD PRACTICE.

2. REINFORCING STEEL SHALL CONFORM TO CAN/CSA G30.18-M92 GRADE 400 MPa AND 400W (FOR ALL REINFORCING TO BE WELDED) AND SHALL BE DEFORMED BARS UNO.

3. ALL DIMENSIONS SHOWING THE LOCATION OF REINFORCING STEEL NOT NOTED AS "CLEAR" OR "CLR" ARE TO CENTER OF STEEL. CLEAR COVER SHALL BE AS NOTED BELOW, UNO ON PLANS OR DETAILS.

EXPOSURE CONDITION:	COVER:
CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	76mm (3")
EXPOSED TO EARTH OR WEATHER (INCLUDES SLABS ON GRADE)	

P: 780 532 4919 F: 780 532 4739
Grande Prairie
10940-92 Ave, Grande Prairie, AB T8V 6B5
Fort St. John
10012-97 Ave, Fort St. John, BC V1J 5P3

www.baseng.ca
P: 780 532 4919 F: 780 532 4739

OWNER

SEAL

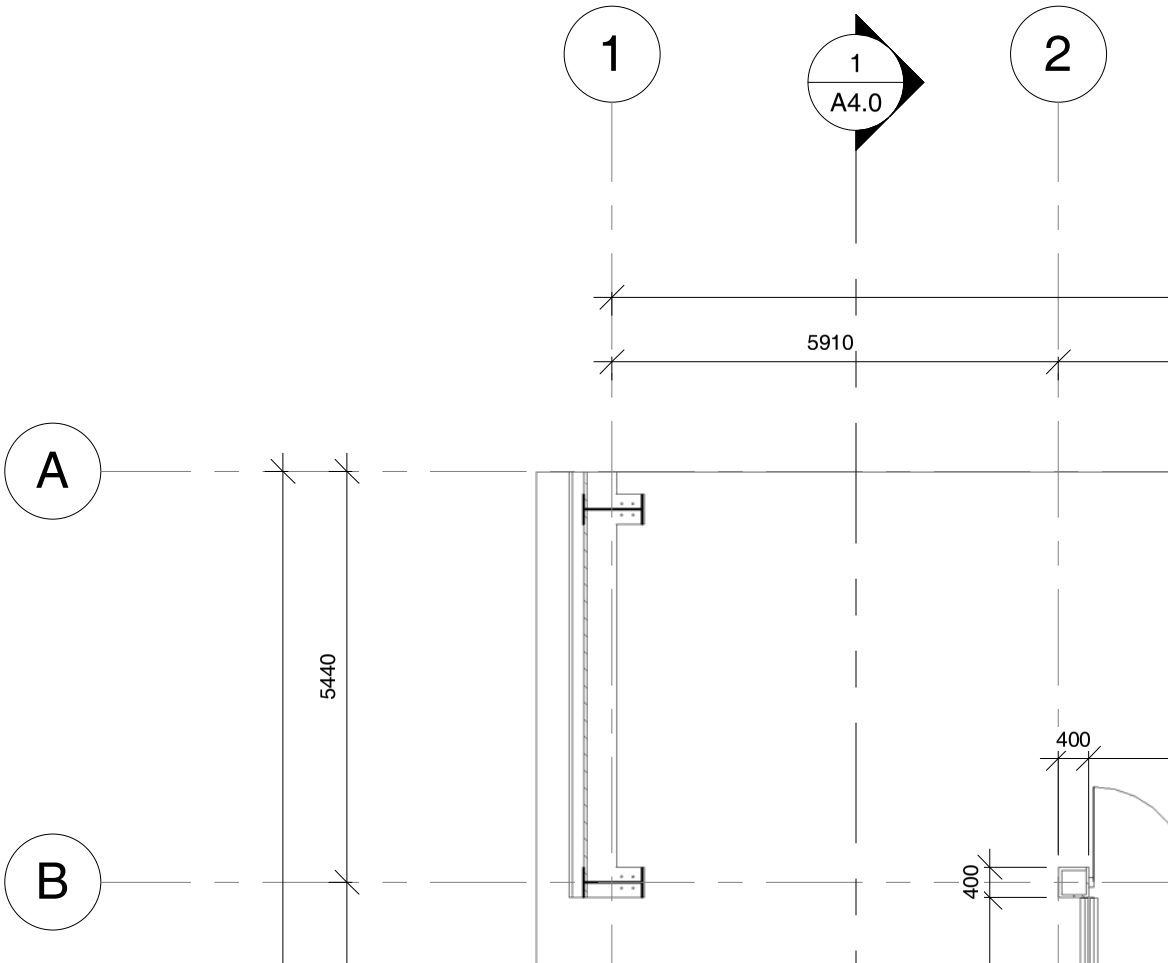
PROJECT

FESTIVAL PLAZA

LEGEND
PRELIMINARY
ISSUED FOR REVIEW
NOT FOR CONSTRUCTION
■ PARKING LOT PEDESTAL VALID MANUFACTURING RVP16
● BOLLARD - LUMEN PULSE ELMB10-RA-240-CIR80-RGBW(3000K)-S120-O-BK-DMX/RDM-SP
(J) IN GROUND JUNCTION BOX C/W LID GASKET JB-6-S
S-SMALL-LARGE
SEARCHLIGHT - LUMEN PULSE LBX-HO-240-RGBW-XN-XXX
FLOOD LIGHT - LUMEN PULSE XXX
(A1) X - CIRCUITING & SURVEY
- RECEPTACLE NUMBER

FORT ST. JOHN

The Energetic City


1
1
A4.0
2
5910
A
B
5440
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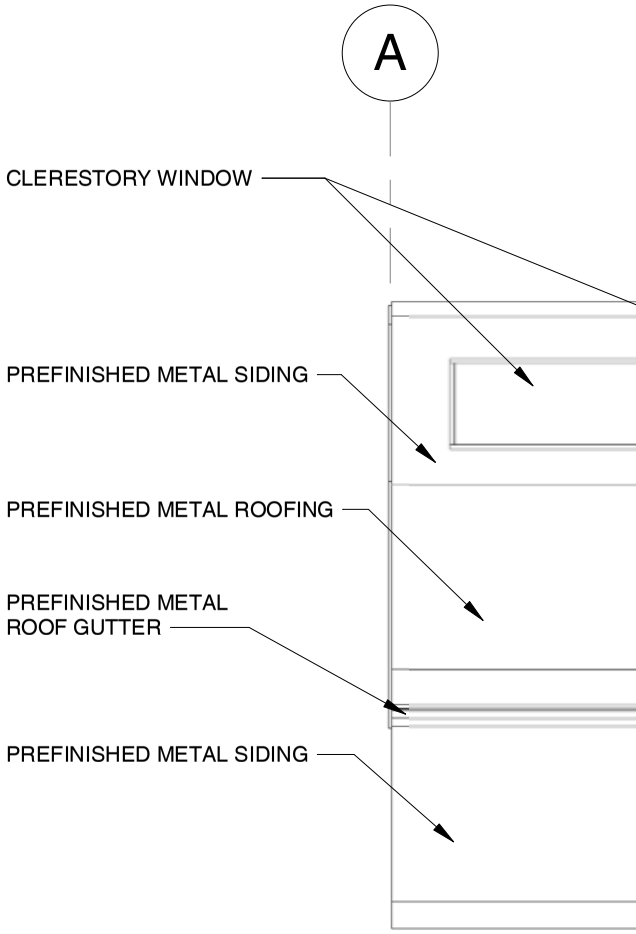

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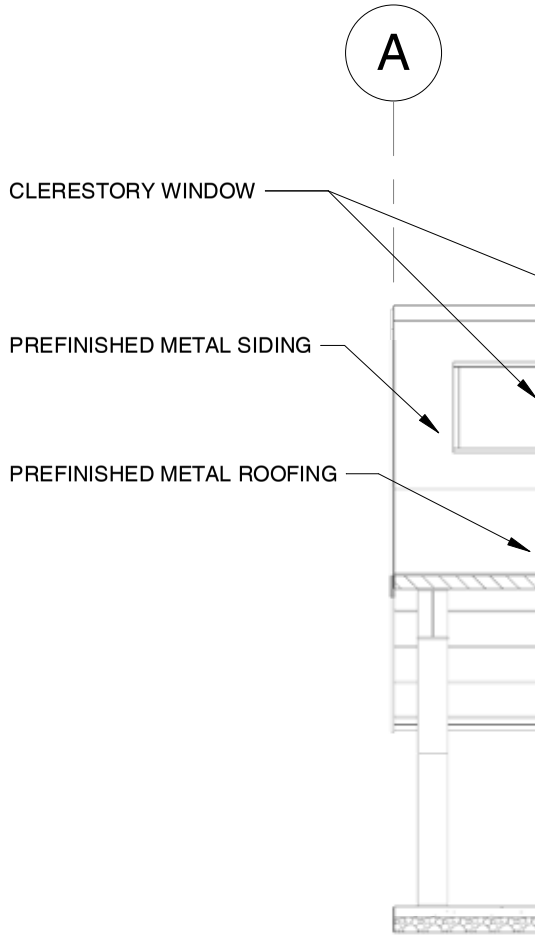
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APPENDICES

A | 100 Street Charrette Final Presentation

B | Transportation Analysis

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C | Mapping & Analysis (Charrette Design Brief materials)

a. Figure-ground
b. Zoning
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E | Special Projects

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(Downtown Public Realm and Streetscape Master Plan extract)
c. Festival Plaza Design

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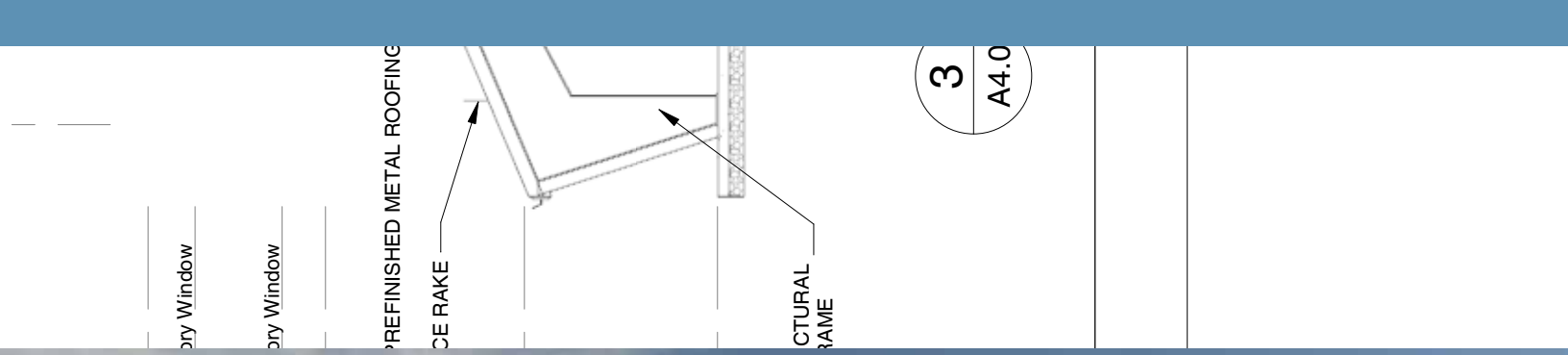
a. 100 Street Parking Study (Draft)
b. Future Climate Tree Suitability and Best Management Practices
c. 100 Street Ingrid Cloud Wind Simulation Presentation
d. Retail Vitality and Impact Mitigation Review
e. Downtown Business Mitigation Strategy



100 Street Parking Study

Phase 1 - Draft Report

FORT ST. JOHN
The Energetic City

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July 2019 | File: 1958.0430.04

100 Street Parking Study

Phase 1 - Draft Report

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Project No.: 1958.0430.04

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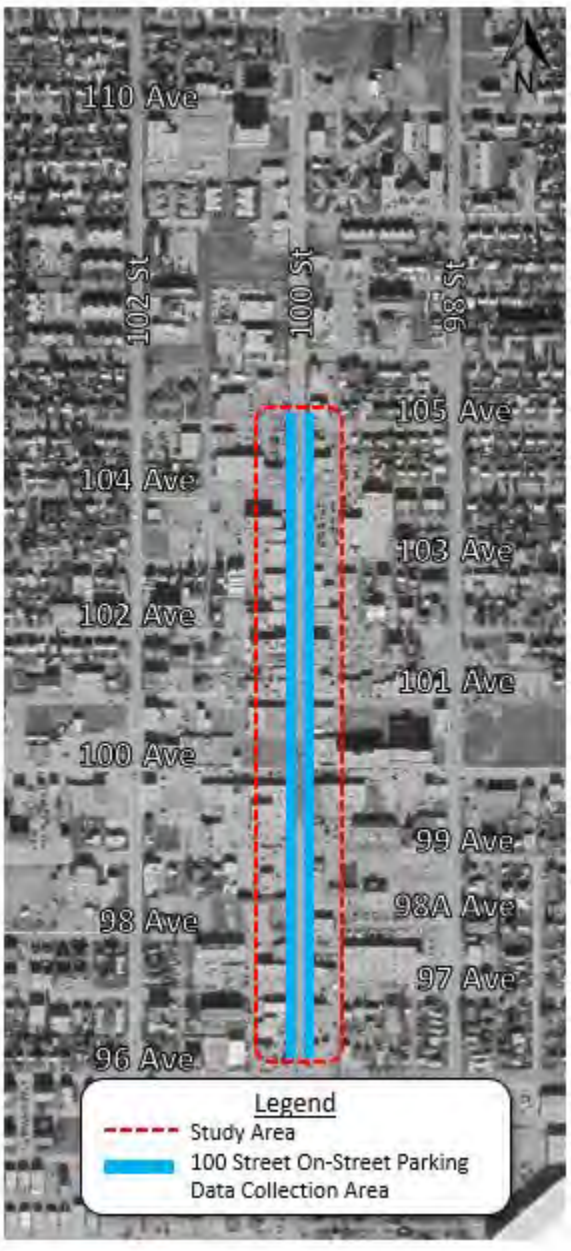
1.0 INTRODUCTION

The City of Fort St. John retained Urban Systems Ltd. to undertake a Parking Study for 100 Street and the Downtown area. The first phase of this study will focus on the 100 Street corridor from 96 Avenue to 110 Avenue. The purpose of this study was to address the parking issues that currently exist on 100 Street as well as develop short-, medium-, and long-term strategies to optimize parking within the downtown core.

The objectives for Phase 1 of the parking study and this memorandum were to:

- Collect new parking data on 100 Street on weekday and weekend dates
- Investigate current parking availability, usage, and demand
- Investigate private/public parking relationships and identify opportunities for shared parking arrangements

Figure 1-1: 100 Street Parking Study Scope



1.1 Study Area

The study area includes on-street parking along 100 Street between 96 Avenue and 110 Avenue. All parking areas within the study scope are illustrated in **Figure 1-1**, as shown in blue.

1.2 Previous Studies

Two studies of note which reviewed the parking situation for 100 Street were completed prior to this 2019 study. In 1998, the City observed parking along 100 Street between 95 Avenue and 110 Avenue. The study area for the 1998 report extended 5 additional streets north and 1 less street south than the current study. Key observations pertaining to on-street parking trends on 100 Street at that time were as follows:

- The average weekday parking occupancy level was 36%
- The average weekend parking occupancy level was 29%
- Parking occupancy levels peaked at 2:00 pm on both weekdays and weekends
- The highest level of parking occupancy was observed on the east side of 100 Street between 99 Avenue and 100 Avenue
- Parking occupancy levels were highest around the 100 Street and 100 Avenue intersection on weekdays due to the number of major employers that were situated at this intersection
- Parking occupancy levels were highest along 100 Street north of 100 Avenue on weekends due to the number of commercial retail land uses that were located in this area of the City
- 89% of vehicles parked on a weekday were parked for 1 hour or less

- 87% of vehicles parked on a weekend were parked for 1 hour or less

An additional parking inventory was conducted in summer 2018 of the Downtown area between 96 Avenue and 105 Avenue from north to south, and between 104 Street and 96 Street from west to east. This inventory largely aimed to determine where the concentration of on-street metered parking stalls were located. Occupancy rates were also observed for metered parking spaces. Key observations pertaining to on-street parking trends in Downtown Fort St. John in 2018 were as follows:

- Metered parking spaces were largely located on 100 Street between 99 Avenue and 105 Avenue with some spaces on 100 Avenue between 102 Street and 98 Street, as well as on 101 Avenue between 102 Street and 98 Street
- Parking occupancy rates were highest (between 61% and 80%) in the following areas:
    - On 102 Avenue, east of 100 Street
    - On 100 Street between 101 Avenue and 100 Avenue
    - On 100 Street between 99 Avenue and 100 Avenue
- Parking occupancy rates were lowest (between 0% and 40%) in the following areas:
    - On 100 Street, north of 102 Avenue
    - On 102 Avenue, east of 100 Street
    - On 101 Avenue, west of 100 Street
    - On 102 Street between 100 Avenue and 101 Avenue
    - On 98 Street between 100 Avenue and 101 Avenue

Despite the 20-year time period gap, both of these parking studies observed that the highest parking occupancy levels were evident on 100 Street between 99 Avenue and 100 Avenue. This is an important consideration moving forward with the current 2019 Parking Study for 100 Street.

2.0 EXISTING CONDITIONS ASSESSMENT

2.1 Data Collection

Parking data was collected on 100 Street between 96 Avenue and 105 Avenue. Occupancy and turnover data were simultaneously collected each hour by recording the last 3 digits of the license plate of the vehicle occupying a parking space at the observed time. The data was collected during the following time periods to represent typical spring weekday and weekend parking scenarios:

- Saturday April 13th, 2019 (8:00 AM – 6:00PM)
- Tuesday April 16th, 2019 (8:00AM – 6:00PM)

The data collected is provided for reference in **Appendix A**.

On Saturday, April 13, 2019, the weather had a high of 8 degrees, no precipitation, with a mix of sun and clouds. There was no snow remaining on the road or boulevards.

On Tuesday, April 16, 2019, the weather had a high of 12 degrees, no precipitation, with a mix of sun and clouds. There was no snow remaining on the road or boulevards.

2.2 Parking Observations

To better understand parking behaviours in the City of Fort St. John, the following observations were noted throughout the data collection process:

- Parking near 100 Street and 100 Avenue is very rotational. Vehicles in this area were parked for shorter periods of time
- Vehicles tend to park for longer periods of time as stalls get further away from the 100 Street / 100 Avenue intersection. Some vehicles were even observed in the same non-metered stall for 10 hours.
- Many people did not pay for parking, even if parked in a metered parking space.

While not affecting parking, it was noted during the data collection that multiple bollards were missing from the corners of intersections along 100 Street.

2.3 Parking Inventory

An inventory of the existing on-street parking spaces on 100 Street was taken at the time of data collection. The parking study was divided into 18 different study areas, as shown in **Figure 2-1**. The existing parking inventory is summarized below in **Table 2.1**.

Table 2.1: Parking Inventory

Zone	# of Spaces	Parking Type
ZN01	2	Non-Metered
ZN02	3	Metered
ZN03	2 1 1	Accessible Metered Express
ZN04	6	Metered
ZN05	6	Metered
ZN06	1 6	Accessible Metered
ZN07	6	Metered
ZN08	2 6	Accessible Metered
ZN09	7	Metered
ZN010	7	Metered
ZN011	0	-
ZN012	9	Metered
ZN013	2	Non-Metered
ZN014	2	Non-Metered
ZN015	2 1	Non-Metered Accessible
ZN016	3	Non-Metered
ZN017	2	Non-Metered
ZN018	2	Non-Metered
Total Capacity	**79**	

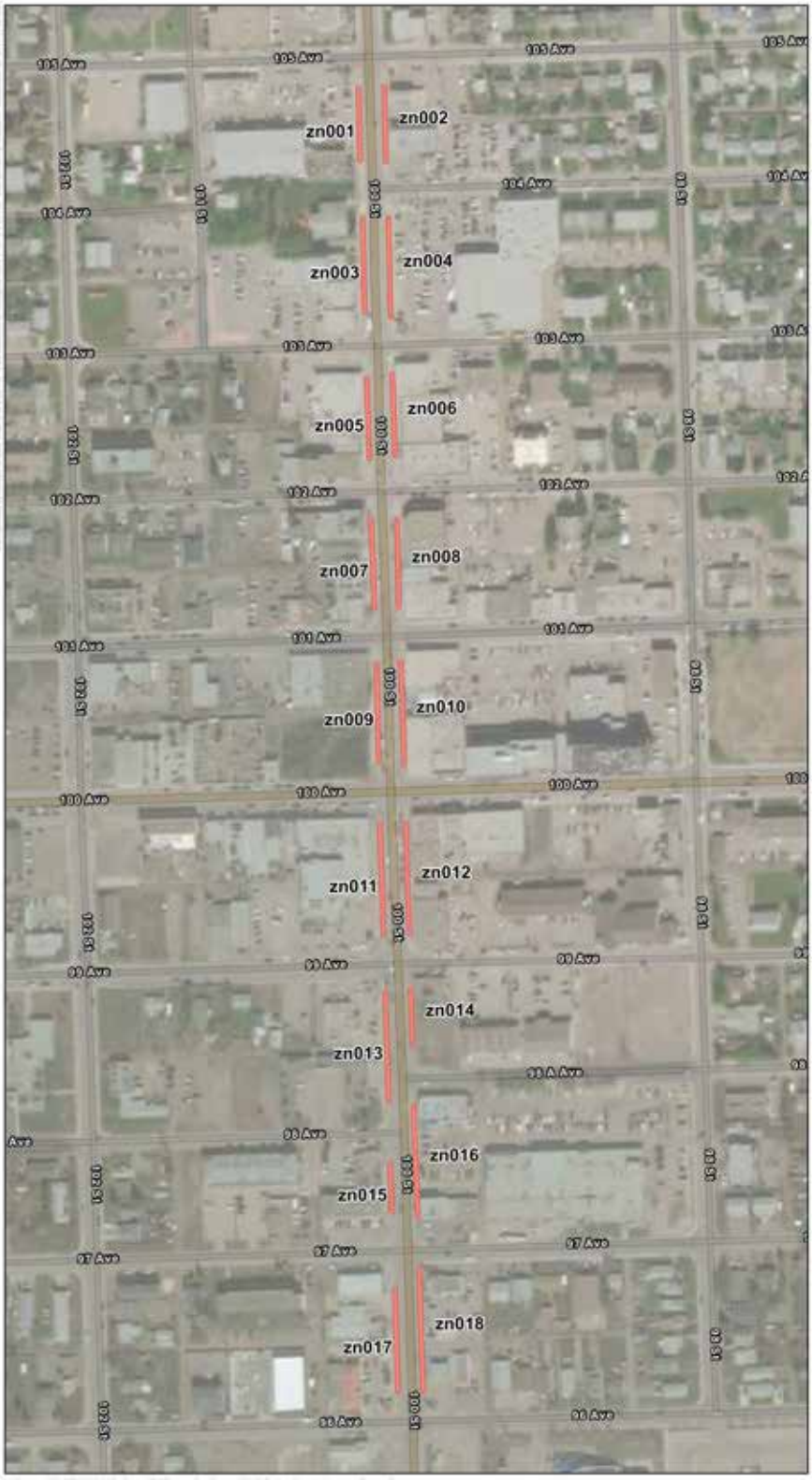


Figure 2-1: Study Area – Parking Occupancy and Turnover Data Collection Zones

2.4 Occupancy

The 100 Street parking occupancy rates for a typical spring weekday and weekend are shown below in **Figure 2-2**. Parking usage increases significantly at 10:00 AM for both weekday and weekend dates. The figures demonstrate that parking usage peaks during mid-day and decreases throughout the afternoon. Average parking occupancy rates on 100 Street do not exceed 33% on Tuesdays and 37% on Saturdays.

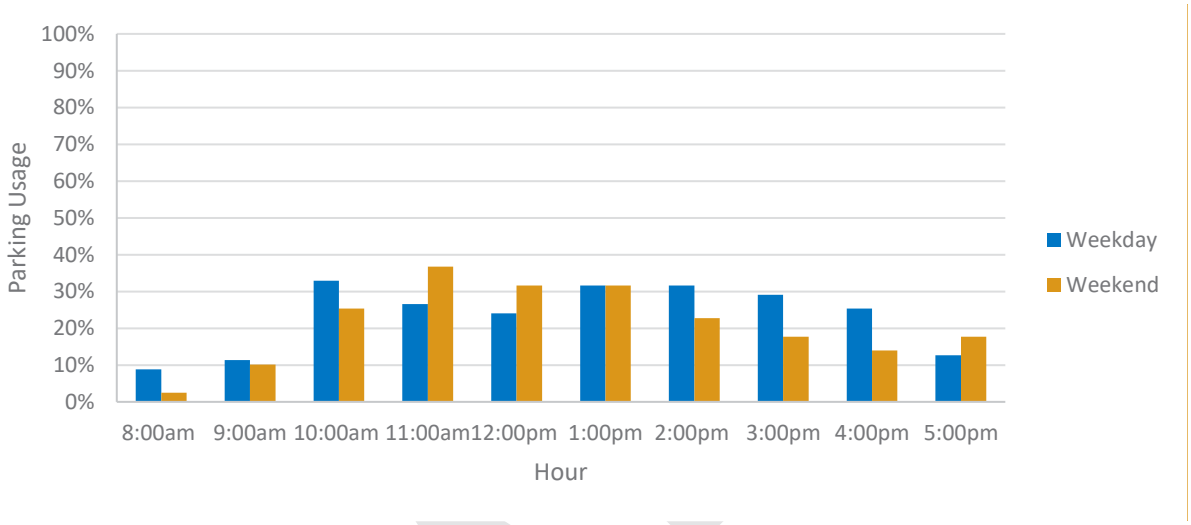


Figure 2-2: Parking Occupancy on 100 Street

Figure 2-3 and **Figure 2-4** parking usage in various sections along 100 Street on weekdays and weekends, respectively. 100 Street was separated into the following 4 sections:

- Between 96 Avenue and 98 Avenue
- Between 98 Avenue and 100 Avenue
- Between 100 Avenue and 102 Avenue
- Between 102 Avenue and 105 Avenue

It was found that parking usage on 100 Street increases closer to the Downtown core (between 98 Avenue and 102 Avenue). At peak weekday and weekend parking demand, between 100 Ave and 102 Ave, 64% and 57% of parking spaces were occupied, respectively.

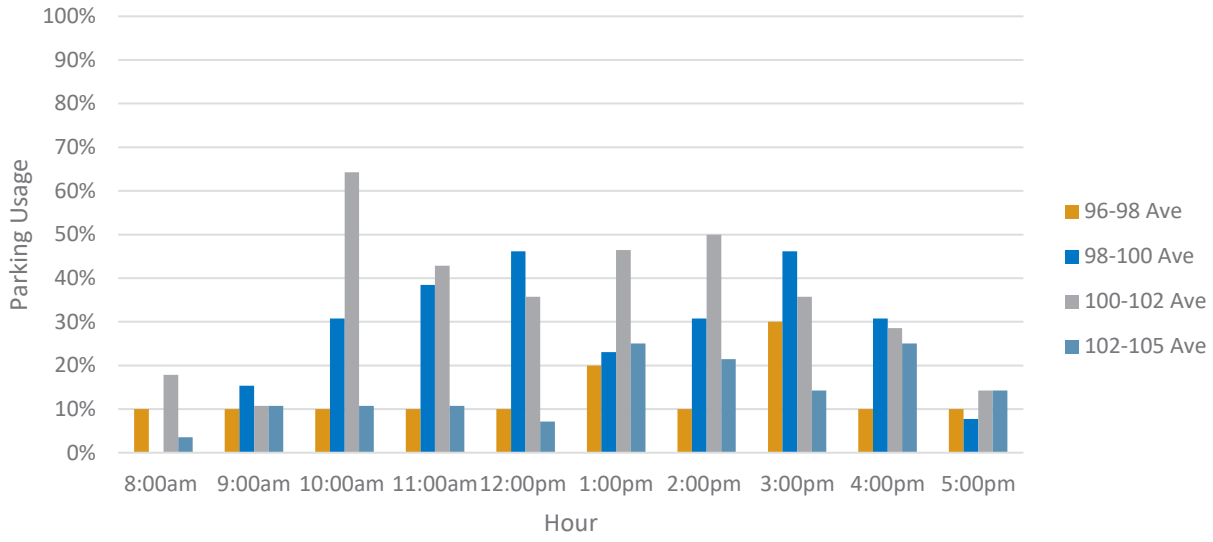


Figure 2-3: Weekday Parking Occupancy in 4 sections Along 100 Street:

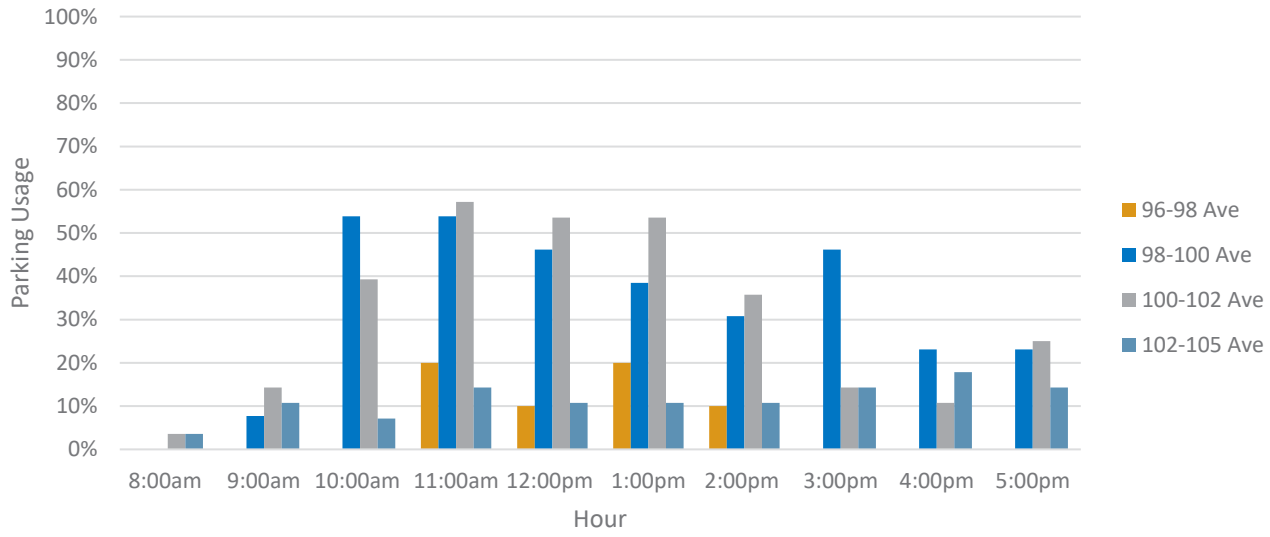


Figure 2-4: Weekend Parking Occupancy in 4 sections Along 100 Street

The percent parking occupancy per zone at the peak hour (2:00 pm – 3:00 pm) on a typical Tuesday and Saturday are illustrated below in **Figure 2-5** and **Figure 2-6**. 60 – 80% of parking stalls were occupied from 2:00-3:00pm on a typical weekday between 101 Ave and 102 Ave (zone 8). Meanwhile, 60-80% of parking stalls were occupied from 2:00-3:00pm in 3 zones on a typical weekend date. These were: between 99 Ave and 100 Ave (zone 12), 100 Ave and 101 Ave (zone 9) and 101 Ave and 102 Ave (zone 7).

Figure 2-5: Percent Occupancy at Peak Hour (2:00-3:00pm) on a Weekday (Tuesday)

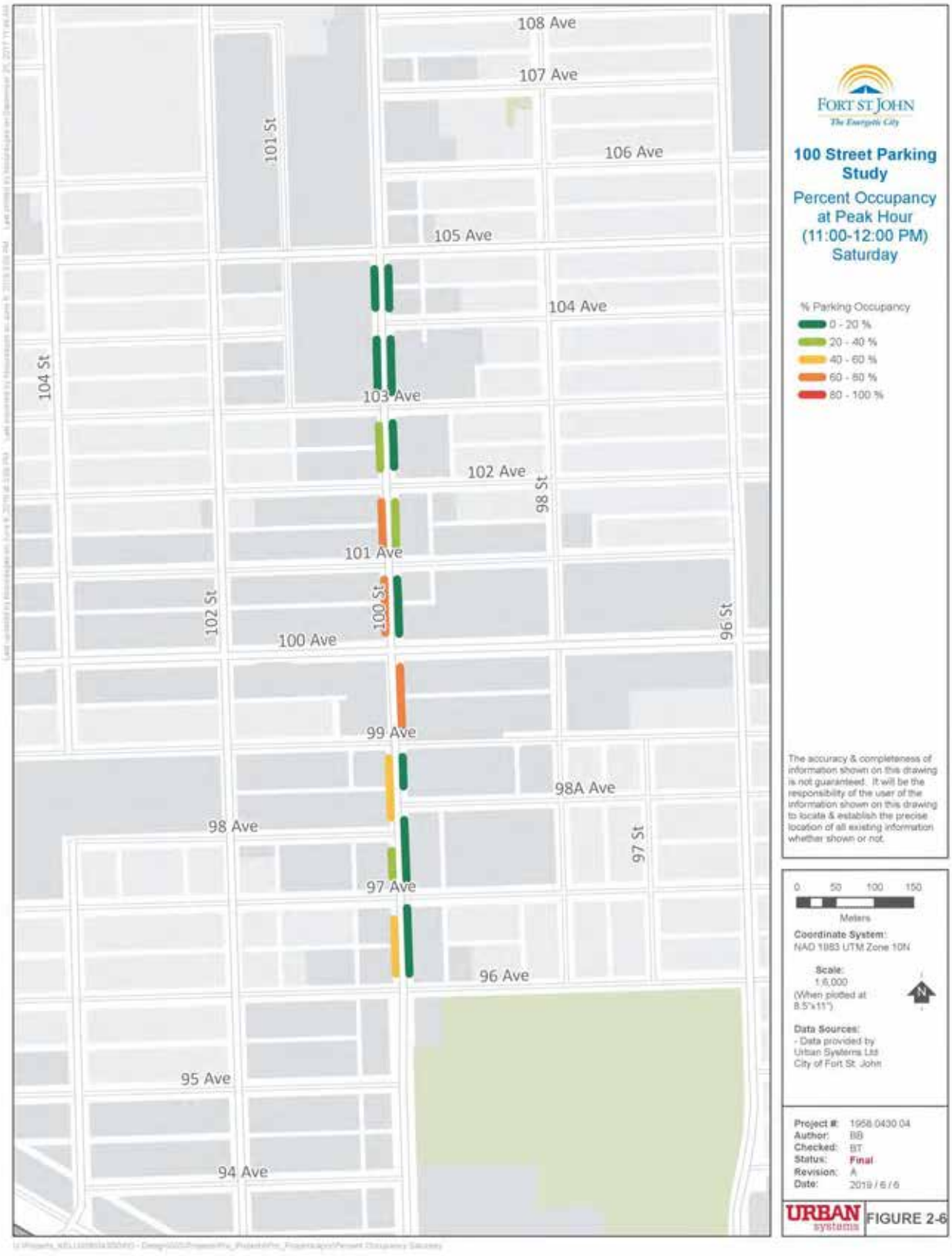


Figure 2-6: Percent Occupancy at Peak Hour (11:00-12:00pm) on a Weekend Date (Saturday)

2.5 Parking Turnover

The data was analyzed to determine the typical duration of vehicles parked along 100 Street. **Figure 2-7** shows the percentage of vehicles parked on 100 Street and the corresponding length of time they were parked for. There is one express parking stall located between 103 Avenue and 104 Avenue that was not included in this analysis since parking data was surveyed on an hourly basis and this stall limits vehicles to park for a maximum of 15 minutes.

On a typical weekday, a total of 140 unique vehicles were observed, which corresponds to an average turnover of 1.79 vehicles per stall over the course of the 10-hour data collection period. 85% of these vehicles were parked for a period of 1 hour or less, while 10% of vehicles were parked for a period of 1- 2 hours.

On a typical weekend, a total of 118 unique vehicles were observed, which corresponds to an average turnover of 1.51 vehicles per stall over the course of the 10-hour data collection period. 76% of these vehicles were parked for a period of 1 hour or less, while 19% of vehicles were parked for a period of 1- 2 hours.

As shown in the figures below, few vehicles were observed in the same parking space for a period of time greater than 2 hours over a weekday or a weekend during the data collection period. However, vehicles tend to be parked for longer periods of time on weekends versus weekdays.

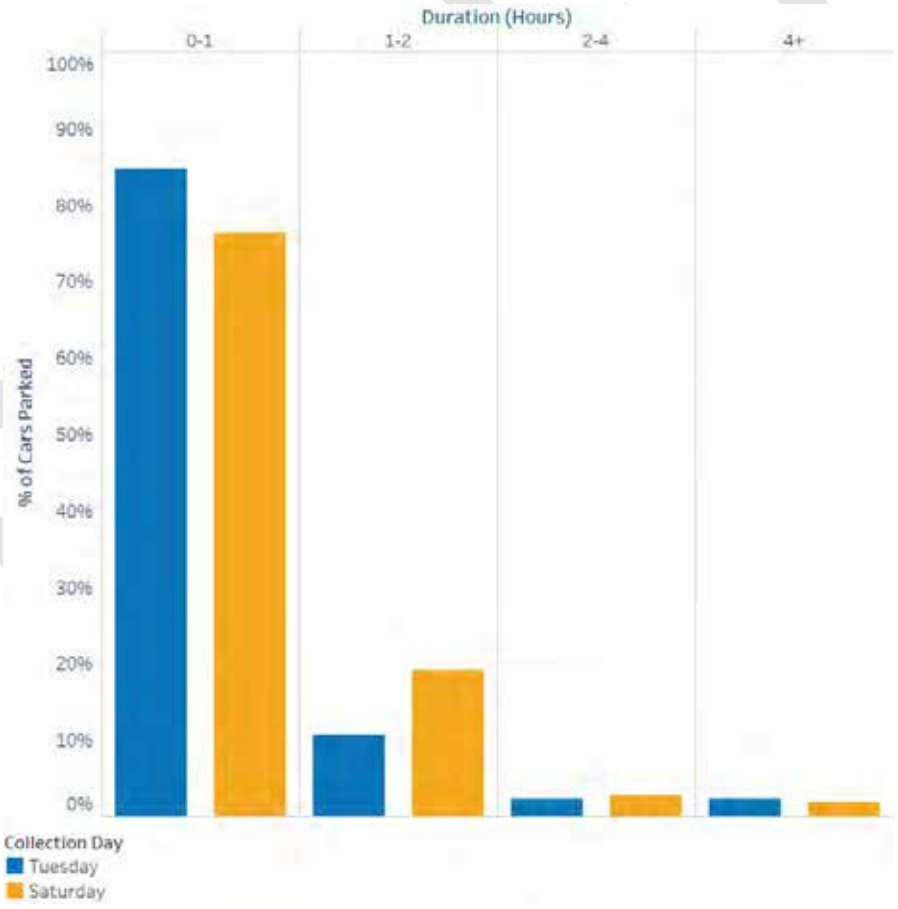


Figure 2-7: Parking Turnover for 100 Street

Figure *2-8* and **Figure 2-9** show the percentage of vehicles parked on 100 Street and the amount of time they spent parked in metered vs non-metered stalls. Vehicles in non-metered stalls were parked for longer periods of time than vehicles parked in metered stalls on both weekdays and weekends, as shown in the figures below. This is particularly evident on weekend dates.

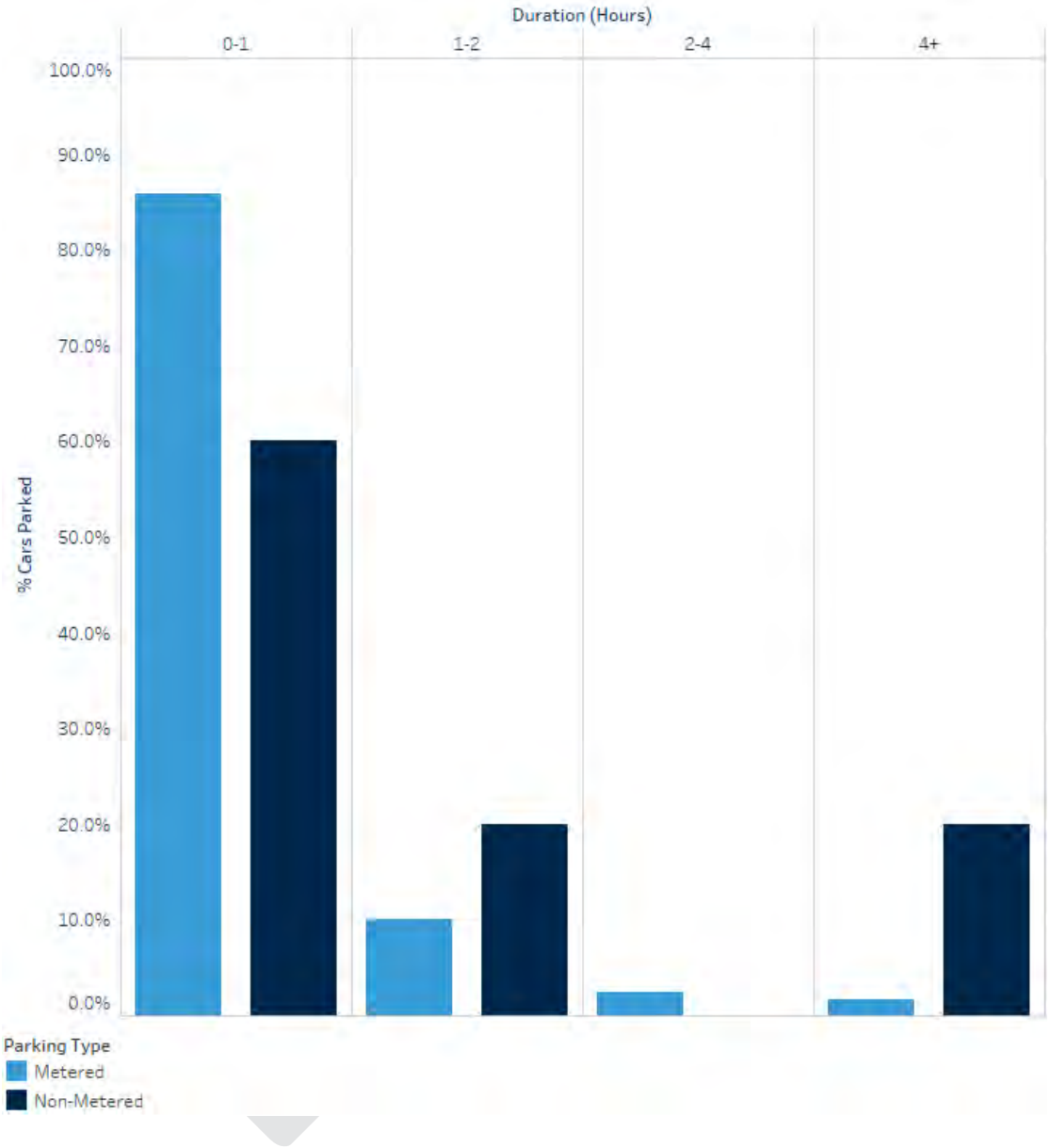


Figure 2-8: Duration of Cars Parked (Metered vs. Non--Metered) - Tuesday

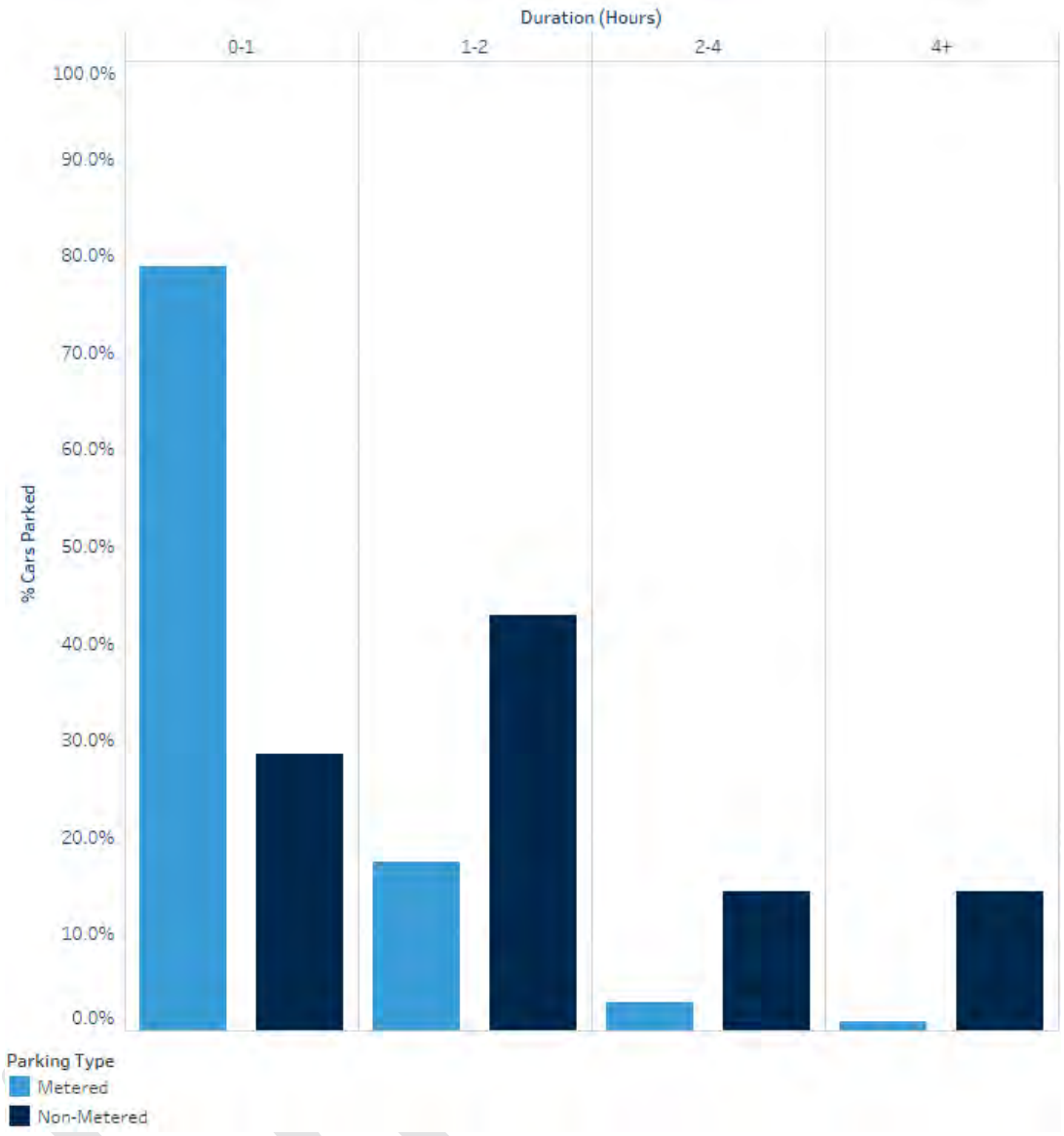


Figure 2-9: Duration of Cars Parked (Metered vs. Non--Metered) - Saturday

2.6 Accessibility Parking

The data was analyzed to understand accessibility parking occupancy. There is a total of 6 accessibility parking spaces on 100 Street between 96 Avenue and 105 Avenue which are non-metered. A maximum of 2 accessible parking stalls were occupied during a 1-hour time frame on a weekday, while only 1 accessible parking stall was occupied during a 1-hour period on a weekend date. All observed vehicles were parked for less than 2 hours on a typical weekday and weekend.

2.7 Express Parking

There is 1 express parking stall on 100 Street, located between 103 Avenue and 104 Avenue which is non-metered. The City limits express parking to a maximum of 15 minutes per parking stall. This allows for quick turnover rates and more vehicles to make use of the parking stall throughout the day. On a weekday, this stall was occupied for a total combined period of 6 hours. Similarly, on a Saturday, the express parking stall was

occupied for a total combined period of 5 hours. It is important to note that because the parking survey was conducted on an hourly basis, vehicles that were parked for the 15-minute maximum may not have been captured.

Shorter time restrictions on parking stalls are intended to maximize turnover for the most convenient parking stalls where the demand for parking is high.

2.8 Bus Loading Areas

All 5 transit routes in Fort St. John utilize the bus loading areas on 100 Street adjacent to the North Peace Cultural Centre. There are 5 bus loading areas on 100 Street between 96 Avenue and 110 Avenue, and they are located at the following locations:

- 100 Street and 97 Avenue
- 100 Street and 100 Avenue
- 100 Street and 104 Avenue
- 100 Street and 106 Avenue
- 100 Street and 108 Avenue

3.0 SHARED AND PAID PARKING OPPORTUNITIES

3.1 Shared Parking

The City may wish to explore opportunities for implementing shared parking along 100 Street. Shared parking is implemented in areas of a community where a parking lot or garage can be used to serve 2 or more properties or land uses. These land uses must all differ slightly in order to accommodate different peak parking demand times. If two land uses sharing a parking facility have the same parking demand times, then the shared parking strategy may be ineffective. Therefore, it is best to implement shared parking facilities for uses that have opposite peak demand times. For example, an office and an auditorium may have effective shared parking facility users because the peak demand time for the office would be during the weekday business hours (8:00 am to 5:00 pm), while the peak demand time for the auditorium would be during the weekday evening hours (6:00 pm to 10:00 pm) or on weekends.

When selecting land uses to share a parking facility, it is important to consider the proximity of the land uses sharing the facility to the facility itself. It may be acceptable to locate shared parking facilities for auditoriums at a further walking distance (i.e. 500 m or an 8-minute walk), however this may not be appropriate for uses such as grocery stores which should be within a short walk's distance from the facility (i.e. 250 m or a 3 minute walk).

A few potential shared parking opportunities were identified for 100 Street. The surface parking lot located in front of the Save On Foods and Shoppers Drug Mart on 100 Street could serve as a shared parking lot for these two commercial retail uses in addition to the RBC Bank and North Peace Credit Union located directly across the street. This could be a successful shared parking facility because the peak parking demand for these uses varies. The bank and credit union would experience their highest levels of customer traffic during typical business hours of 9:00 am – 5:00 pm while demand for Save On and Shoppers Drug Mart likely peaks at the end of the work day and into the early evening hours (4:00 pm – 8:00 pm).

Other shared parking opportunities include:

- Evangel Chapel (100 Street / 101 Avenue)
- Alliance Church (98 Street / 99 Ave)
- The recreational district surrounding centennial park (100 Street / 96 Avenue)

While there are few opportunities for shared parking on 100 Street, the City may wish to further explore the potential for shared parking within the Downtown area as a whole in the next phase of this parking study.

3.2 Paid Parking

The City currently applies metered parking to encourage parking turnover and uses coin-operated devices at each parking stall as its monetary collection method for on-street parking along 100 Street. With the advancement of technology and a switch to the use of smartphones, paid on-street parking forms have evolved to allow both the parking user and owner (the City) to have a more seamless and efficient experience. Some municipalities began to replace parking meters with more mobile paid parking kiosks such as those implemented by companies like Easy Park and Impark. Switching to these parking kiosks allows for reduced sidewalk maintenance issues in the winter months as they reduce the number of posts obstructing the surface of the boulevard.

These kiosks also take advantage of smartphone app technology that allows users to pay for parking directly from their smartphone devices by simply entering their vehicle license plate number and credit card information into an app. Many municipalities including Vancouver, Lethbridge, Kelowna, Kamloops, Prince George, Whistler, Saskatoon, and London, amongst others, have made the switch to these paid parking kiosks that incorporate smartphone app technology due to the enhanced user and owner experience that they provide. The kiosks also allow for manual coin and credit card payment methods.

3.3 Interim Parking

The City may also explore interim parking opportunities along 100 Street on vacant or underutilized land near the blocks of 98A Avenue, 100 Avenue, 104 Avenue, and 108 Avenue. Implementing interim parking opportunities would require collaboration between the City and property owners.

We understand that a new surface parking lot is under construction at the south-east corner of 100 Street and 103 Avenue. This surface parking lot will be created following the demolition of an existing commercial building to provide additional parking for a new retail commercial tenant.

4.0 FUTURE PARKING CONSIDERATIONS

4.1 Parking Scenarios

Potential future parking demand, occupancy, and capacity rates were assessed for 100 Street based on 3 models that were created using CityEngine technology. These scenarios explore potential future short-term parking options for 100 Street.

4.1.1 *Parking Scenario 1 – Angled Parking on Both Sides of 100 St*

The first parking scenario analyzes removing parallel parking from both sides of 100 Street and replacing these spaces with angled parking on both sides of the street (see **Figure 4-1** below). As a result, less space would be available on 100 Street for traffic lanes, reducing the total number of traffic lanes from 4 to 2.

Figure 4-1: Parking Scenario 1 – Angled Parking on Both Sides

Figure 4-2 and **Figure 4-3** show the parking usage for this parking scenario in various sections along 100 Street on a weekday and weekend date, respectively. Replacing the parallel parking stalls with angled parking stalls on both sides of 100 Street would increase the parking inventory from 79 to 133 spaces. It was found that parking demand for this parking scenario would decrease relative to the existing conditions. Between 98 Ave & 100 Ave and 100 Ave & 102 Ave during the peak parking demand period on a weekday, 29% of parking spaces could be occupied. Between 98 Ave and 100 Ave during the peak parking demand period on a weekend date, 33% of parking stalls could be occupied.

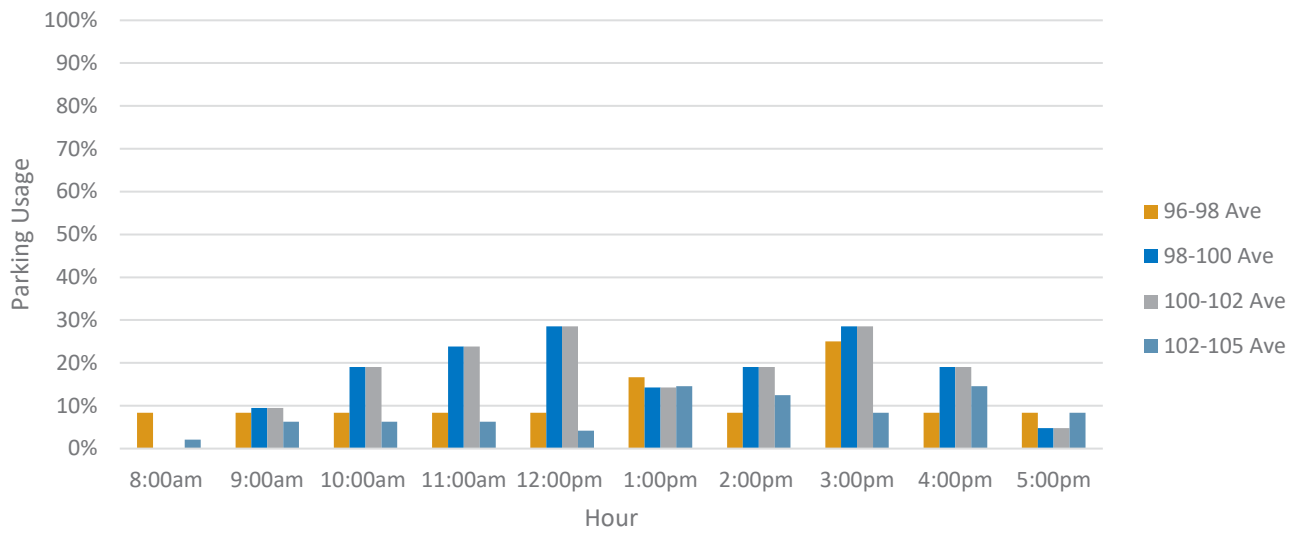


Figure 4-2: Weekday Parking Occupancy for Scenario 1

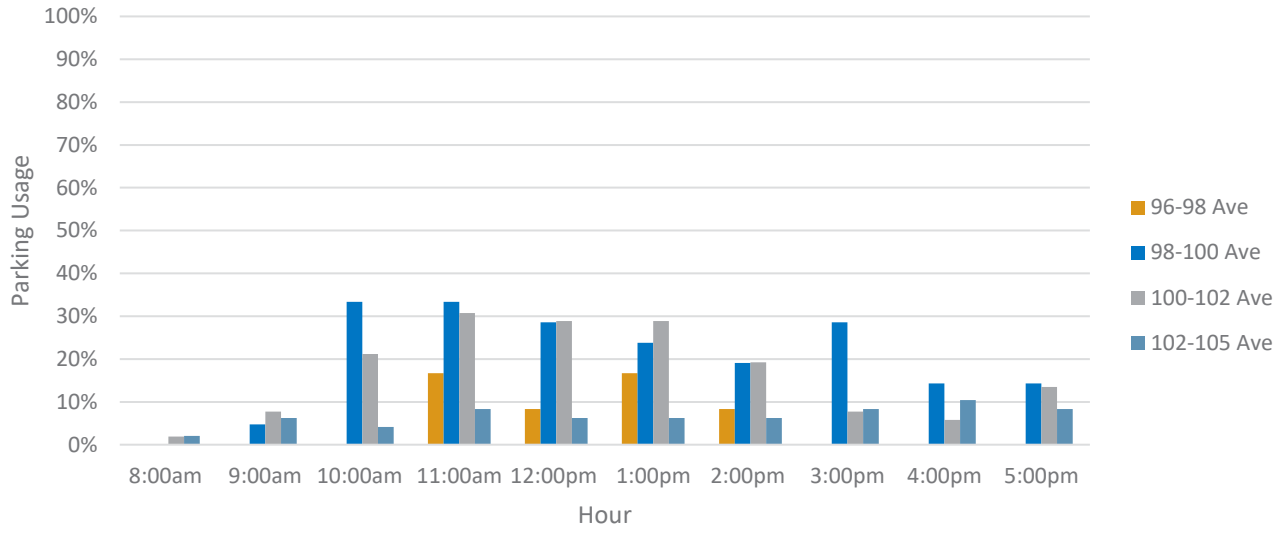


Figure 4-3: Weekend Parking Occupancy for Scenario 1

4.1.2 Parking Scenarios 2a & 2b – Parallel Parking on One Side of 100 St

The second parking scenario has been split into two options as they are both created on the premise that parallel parking would be on only one side of 100 Street. By removing parking from the west side of 100 Street, this reduces the total number of traffic lanes from 4 to 3 lanes. The reduction in the number of traffic lanes and the situation of parallel parking on only one side of the street assumes the additional space is either shifted to allow for wider boulevard improvements to 100 Street or to allow for a raised center median.

Figure 4-4 shows Scenario 2a which proposes to widen the sidewalk on both sides of 100 Street. By widening the sidewalk, this would provide additional space for the provision of street trees and pedestrian amenities such as benches.

Figure 4-4: Parking Scenario 2a – Parallel Parking on the East Side Only and Sidewalk Widening

Figure 4-5 shows Scenario 2b which proposes to add a median to the middle of 100 Street. The median would act as a traffic calming measure while also better separating northbound and southbound traffic lanes.

Figure 4-5: Parking Scenario 2b – Parallel Parking and Median

Figure 4-6 and **Figure 4-7** show potential parking usage rates for Scenarios 2a and 2b in various sections along 100 Street on weekdays and weekends, respectively. Replacing parallel parking on the west side of 100 Street with wider sidewalks would decrease the parking inventory from 79 to 47 parking spaces. It was found that parking demand for this future parking scenario would increase relative to the existing conditions. Between 100 Ave and 102 Ave during the peak weekday parking demand period, 87% of parking spaces could be occupied. Between 98 Ave and 100 Ave during the peak weekend parking demand period, 91% of parking stalls could be occupied.

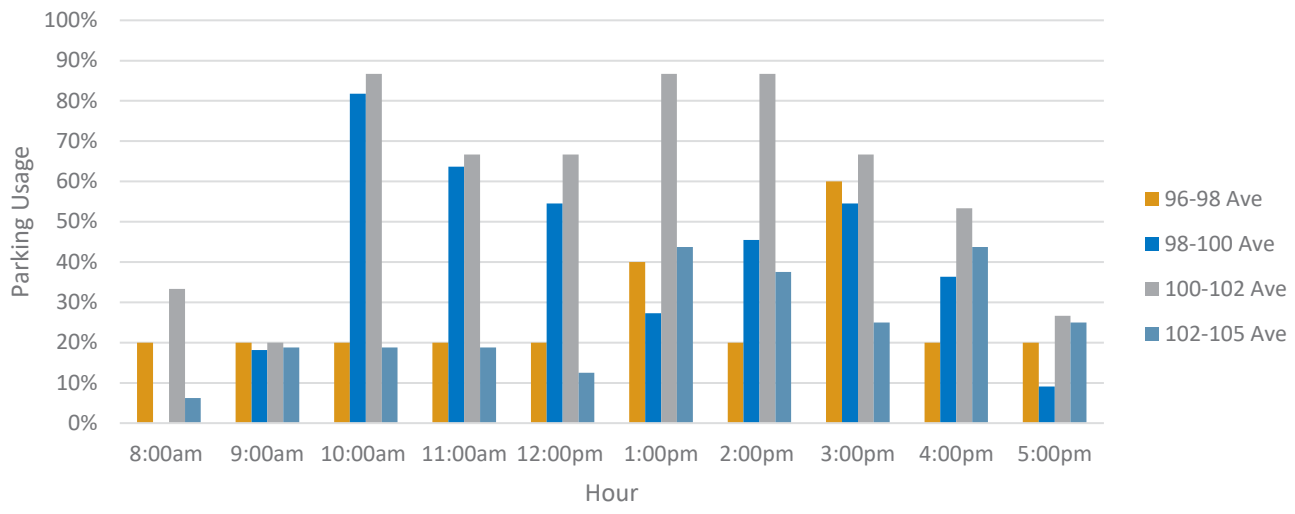


Figure 4-6: Weekday Parking Occupancy for Scenarios 2a and 2b

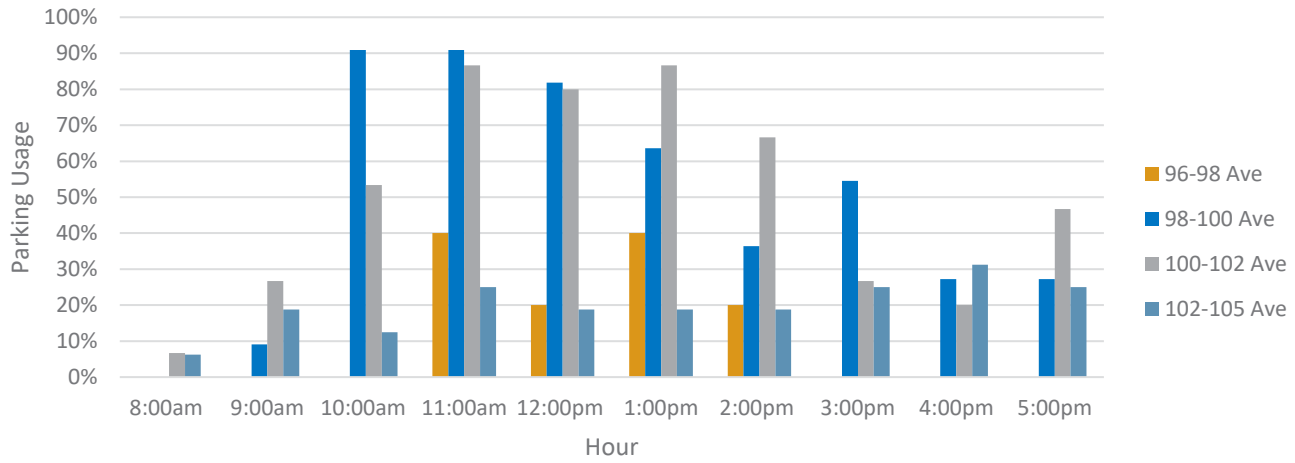


Figure 4-7: Weekend Parking Occupancy for Scenarios 2a and 2b

4.2 Express Parking

One of the most common ways to manage parking is to limit the duration period. Time restrictions are intended to maximize the turnover of the most convenient and valuable parking spaces. That being said, 15-minute interval express parking may not suitable along 100 Street for the following reasons:

- It is more challenging to monitor parking stalls with shorter time limits than longer time limits due to the increased surveillance required by municipal bylaw enforcement officers. For this reason, metered parking stalls are recommended.
- Loading zones and other parking stalls with very short time periods (3-10 minutes) can accommodate passenger drop offs and deliveries for buildings such as schools, hotels or hospitals. The City has one express parking stall on 100 Street that is located near areas with lower turnover rates and longer parking times (between 103 Avenue and 104 Avenue), the parking stall would not fit the needs of users.

- The express parking stall is located in an area where metered stalls are present. This would encourage users to park in the express parking stall in order to avoid having to pay for parking.

4.3 Accessible Parking

Recognizing the mobility needs of all people is important in creating a vibrant downtown core. The following should be considered to meet the accessible parking needs on 100 Street:

- There should be 1 accessible parking stall per block in the most convenient locations (particularly near 100 Street and 100 Avenue intersection). The number of spaces should depend on the number of retail stores, the slope of the street, the type of parking and the destination for the user.
- The most practical locations for accessible parking stalls are at street corners, adjacent to alley entrances or near pedestrian crosswalks.
- As avenues intersecting 100 Street often have lower traffic volumes and wider lane widths, accessible parking is recommended to be accommodated on avenues near street corners of 100 Street. With 100 Street having shorter blocks than the avenues, users will have better access and similarly short travel distances to storefronts.

5.0 CONCLUSION

5.1 Key Findings

Phase One of this project revealed some key trends regarding the use of on-street parking on 100 Street in Downtown Fort St John. The following are key trends to note pertaining to parking occupancy and turnover rates:

- Parking occupancy levels on 100 Street are highest between 98 Avenue and 102 Avenue, similar to historic on-street parking trends. This is likely due to the number of retail stores concentrated in this area as well as the reduced number of off-street parking options
- Where properties adjacent to 100 Street provide surface parking options, such as between 96 Avenue to 98 Avenue, on-street peak parking occupancy levels are below 30% occupancy.
- On weekdays, parking occupancy levels peak between 2:00 pm and 3:00 pm on 100 Street between 101 Avenue and 102 Avenue
- On weekends, parking occupancy levels peak between 11:00 am and 12:00 pm between 99 Avenue and 102 Avenue
- On weekdays, most vehicles are parked for less than a 1-hour time period
- On weekends, most vehicles are parked for less than a 1-hour time period, however the number of vehicles that are parked for a 1 – 2 hour time period is greater than the number parked for this period of time on a weekday
- The number of vehicles parked in non-metered parking spaces versus metered parking spaces for a duration of longer than 1 hour is higher than the number of vehicles parked in metered spaces for this duration
- Parking users are typically not paying for use of parking even if they are parked in a metered parking space
- Peak parking occupancy for any grouped area never exceeded 80% occupancy

- In some areas along 100 Street where on-street parking use is low, opportunities exist to utilize on-street parking spaces for other uses

It is important that these key findings be considered when beginning Phase 2 of this study, which focusses on the broader Downtown area.

5.2 Next Steps

Once the findings of Phase One of this study have been presented at a public design charette in June 2019 and public feedback has been collected, Phase Two of the study will commence. The objectives of Phase 2 are:

- Collect new parking data for the broader downtown area over a weekday and weekend
- Investigate current parking availability, usage, and demand
- Investigate private/public parking relationships and identify opportunities for shared parking arrangements
- Explore future parking conditions and develop parking improvement options
- Present these findings to the public and obtain input
- Develop a parking strategy with short-, medium- and long-term improvement recommendations

APPENDIX A

Parking Count Data

Zone	Parking Stall No.	Parking Type	Counts Collected on Tuesday April 16, 2019									
			8:00 am - 9:00 am	9:00 am - 10:00 am	10:00 am - 11:00 am	11:00 am - 12:00 pm	12:00 pm - 1:00 pm	1:00 pm - 2:00 pm	2:00 pm - 3:00 pm	3:00 pm - 4:00 pm	4:00 pm - 5:00 pm	5:00 pm - 6:00 pm
001	1	NM										
	2	NM										
002	1	M									3747	
	2	M			GIK			04V	1886			
	3	M				JKV						
003	1	H						7210				7456
	2	E		4321				7309	BMW	65P	5707	KE
	3	BUS						2P07				
	4	H								74X		
	5	M									3628	
004	1	M									3155	
	2	M										
	3	M		62N								
	4	M										4346
	5	M						3750				4272
	6	M										
	7	BUS AREA							FRW			
005	1	M										
	2	M								924F		
	3	M			KTX							
	4	M				475					415	
	5	M										
	6	M										
006	1	H							20S			
	2	M				29N	15N	4906				
	3	M			47D			8305	792		39E	
	4	M		RVA					54T	54T	54T	
	5	M					1590					
	6	M						8127				
	7	M	3901						6637			
007	1	M						HRX				
	2	M						MJK	6K1			4231
	3	M						84G				
	4	M				80V		35W			38P	
	5	M										
	6	M						53M				
	1	H					7134	3739	3739			6965

008	2	M			JR		60P	4115		61K		
	3	M			86H	4254	4008		35W	45F	32L	
	4	M			7734				7770	42C	42C	
	5	M	2969		50M	50M	96W		80N		7216	
	6	M			LKB							
	7	M			KE				3210		8315	4632
	8	H										
009	1	M				XVC	BJ	63V	2954			
	2	M			2046		8701					
	3	M	3443		2657	75X		NMD	48H	48H	48H	
	4	M			5548	3638						
	5	M			2954				964	964		
	6	M			96E							
	7	M			8313	8313	8313	8313	8313	8313	8313	8313
010	1	M		SFV	WPL	WPL						
	2	M	26V		19V		44E	44E	XSW	Motorbike	62M	
	3	M	9472		8820	8699			PWG			
	4	M							408D	9006		
	5	M			783	8781	8781					
	6	M		9321	9321	9321		no plate	68N	68N		
	7	M	9201	9201	9201	9201	9201	9201		9115		
011	1	BUS AREA							XKV			
012	1	M				3724				23N		
	2	M								52A	30G	
	3	M			6055	80W			JTP	NWV	178M	
	4	M					70H	MRS		9335	52B	
	5	M			7736	5900	5900		40W	6803		
	6	M						4975		6064	89B	
	7	M		08P		4371	Big truck					
	8	M			2750		Big truck		MJK			3775
	9	M		4761	965	WTN	5419					
013	1	NM					38L					
	2	NM										
014	1	NM										
	2	NM						4256	4256			
015	1	NM										
	2	NM										
	3	H								7851		
016	1	NM	LVW	LVW	LVW	LVW	LVW	LVW	LVW	LVW	LVW	LVW
	2	NM										
	3	NM						7344				
017	1	NM										

017	2	NM								46C		
018	1	NM										
	2	NM										

Zone	Parking Stall No.	Parking Type: Metered Non-metered Handicapped Express Other	Turnover 8:00 am - 9:00 am	Counts Collected on Saturday April 13th 2019									Time Restriction? (Y/N)
				9:00 am - 10:00 am	10:00 am - 11:00 am	11:00 am - 12:00 pm	12:00 pm - 1:00 pm	1:00 pm - 2:00 pm	2:00 pm - 3:00 pm	3:00 pm - 4:00 pm	4:00 pm - 5:00 pm	5:00 pm - 6:00 pm	
001	1	NM											
	2	NM											
002	1	M											
	2	M					385T		3838		485	485	
	3	M							LTN				
003	1	H								TGP			
	2	E		TXG		75H	NCJ	119			12H		
	3	BUS											
	4	H											
	5	M		3928									
004	1	M											
	2	M									6618		
	3	M						6797			DTV		
	4	M			8316								
	5	M											
	6	M										KL	
005	1	M											
	2	M				62N				4436		1509	
	3	M				6239				21B			
	4	M											
	5	M											
	6	M											
006	1	H											
	2	M											
	3	M								9878			
	4	M											
	5	M											
	6	M											
	7	M											
007	1	M			354W	354W		7776	GMB				
	2	M				54D							
	3	M				45H	26A	26A	34J	JBP		EVE	
	4	M				66H					61K		
	5	M					8641	3341					
	6	M						2113	4262		99C		
008	1	H											
	2	M					76W			07N			
	3	M					XMG						
	4	M					LTN						

008	5	M				61V							
	6	M		9949		233N		9047	9047				
	7	M											
	8	H						4372	4372				
009	1	M		6889		6813			4910				
	2	M			6589	RKE		TGP			4326		
	3	M				3989	3628					91E	
	4	M			620		05K	8539				5760	
	5	M			3989	5LV		8A65				MCE	
	6	M			5LV	5LV	5LV	5LV	5LV	5LV			
	7	M			10S	10S	10S	10S					
010	1	M		4024	62G	PJF	PJF	7738				1827	
	2	M	48W	87P	7125	56D	56D		4080			1966	
	3	M			4154	50M	50M	XFC	XFC	2954			
	4	M			XKV			ENW	5732			LRK	
	5	M			7125		5727	5727					
	6	M					28J						
	7	M				83F	83F						
011	1	BUS AREA											
012	1	M			3434					1JVE		XFB	
	2	M			MRT	17 B	17B	17B	7762		38X		
	3	M			1575	99N	519						
	4	M			9942	00V		WXK		8807			
	5	M								BKL		2216	
	6	M			207			TRM	38T	No plate			
	7	M				9186	9186	51C	51C	SRX			
	8	M				18S	18S						
	9	M				2305	2305				4205		
013	1	NM											
	2	NM				09P	09P	09P	09P	09P	09P	09P	
014	1	NM			5760								
	2	NM		MRT	MRT								
015	1	NM				10B	3704	9981					
	2	NM											
	3	H											
016	1	NM											
	2	NM											
	3	NM						3970	3970				
017	1	NM											
	2	NM				10B							
018	1	NM											
	2	NM											

DIAMOND HEAD
3559 Commercial Street
Vancouver, BC 604.733.4886

June 6, 2019

Edward Porter
Senior Urban Designer
Modus
#400-509 Richards Street
Vancouver, BC, V6B 2Z6

Re: Projected climate changes and their implications for urban trees in Fort St. John DRAFT

Diamond Head Consulting Ltd. (DHC) was asked by Modus to provide:

1) A summary of future climate;
2) Comments on climate suitability of the tree list in Subdivision and Development Servicing Bylaw No. 2405; and,
3) Best practices recommendations for tree planting and management for climate resilience.

1) Summary of Future Climate:

To summarize future climate for Fort St. John, ClimateBC software (Wang, Hamman, Spittlehouse, & Hamann, 2016) was used to export past and modeled future climate data for an ensemble of climate models. Below, we describe how Fort St. John's climate is projected to change in the future, and the broad climate impacts resulting from those changes. The information below summarizes climate variables for the baseline (1961-1990) and projections for the 2050s (2041-2070) and 2080s (2071-2100) time periods. Three Relative Concentration Pathway (RCP) scenarios are presented: 1) Low Emissions scenario RCP2.6 assumes that GHG emissions peak between 2010 and 2020 and then decline; 2) Moderate Emissions scenario RCP 4.5 assumes that emissions peak around 2040, then decline 3) High Emissions scenario RCP 8.5 assumes that emissions continue to rise throughout the 21st century (Meinshausen, et al., 2011). While changes in variability and extreme weather are also anticipated in the future, they are not predicted well by climate models and are not explicitly reported on in this summary.

Summary of annual changes

Fort St. John's climate today has cold winters, hot summers and relatively low annual rainfall that is highest in the summer months. The annual climate variables presented in Table 1 are relevant for urban trees because they summarize changes in temperature, growing season and moisture availability that influence tree growth and survival. The projections indicate the Fort St. John is likely to experience:

- Large increases in mean annual temperatures from 1°C to as much as 7°C.
- Small increases in mean annual precipitation from 460 mm to as much as 522 mm.

- Large increases in growing degree day units above 5°C, which is an indicator of the heat energy available for plant growth through the year.
- Earlier and longer frost free periods, shifting from a start at the end of May to early May, or even late April, and ending as late as October.
- Small decrease in precipitation as snow.
- Moderate increase in extreme minimum temperatures, from -46.5°C to as high as -36.6°C.
- Small increases in extreme maximum temperatures, from 32.8°C to as high as 38°C.
- Moderate increase in evapotranspiration rates from 508 mm to as much as 630 mm.
- Moderate increases in climatic moisture deficit, an indicator of the moisture available to plants, from 193 mm to as much as 263 mm.

Table 1. Summary of predicted changes in annual climate variables

Time period and model	Climate Variable									
	MAT	**MAP**	**DD5**	**bFFP**	**eFFP**	**PAS**	**EMT**	**EXT**	**Eref**	**CMD**
Normal (1961-1990)	1.1	461	1177	29-May	09-Sep	152	-46.5	32.8	508	193
RCP 2.6 2050s	3.4	498	1533	12-May	19-Sep	150	-43	34.3	544	209
RCP 2.6 2080s	3.5	503	1545	01-May	20-Sep	149	-43.1	34.3	544	204
RCP 4.5 2050s	4	498	1623	09-May	23-Sep	146	-41.9	34.9	553	217
RCP 4.5 2080s	4.6	506	1740	05-May	26-Sep	143	-40.8	35.5	564	226
RCP 8.5 2050s	4.8	508	1775	04-May	27-Sep	142	-40.3	35.7	564	223
RCP 8.5 2080s	6.9	522	2190	23-Apr	08-Oct	127	-36.6	38	630	263
Min change (2080s)	2.4	42	368	-19	11	-3	3.4	1.5	36	11
Max change (2080s)	5.8	61	1013	-36	29	-25	9.9	5.2	122	70
Range of change	3.4	19	645	-17	18	-22	6.5	3.7	86	59
% change min	**218%**	**9%**	**31%**	**-13%**	**4%**	**-2%**	**7%**	**5%**	**7%**	**6%**
% change max	**527%**	**13%**	**86%**	**-24%**	**12%**	**-16%**	**21%**	**16%**	**24%**	**36%**

Variables shown are the following: MAT = Mean Annual Temperature (°C); MAP = Mean Annual Precipitation (mm); DD5 = degree-days above 5°C/growing degree-days; bFFP = beginning of frost free period; eFFP = end of frost free period; PAS = Precipitation as Snow (mm); EMT = Extreme Minimum Temperature (°C); EXT = Extreme Maximum Temperature (°C); Eref = Hargreaves reference evaporation (mm); CMD = mm of climatic moisture deficit based on the cumulative monthly average of months when Eref exceeds precipitation.

Another annual climate variable of interest for tree growth is Climatic Moisture Index (CMI). East of the Rocky Mountains, CMI corresponds well with the differentiation of forest and grassland ecosystems (Hogg E. , 1997). It is a similar metric to CMD, which is also the monthly difference between evaporation and precipitation but evaporation is calculated using a simplified Penman-Monteith equation (Hogg E. , 1997; Schneider, 2013). Values for CMI are positive when precipitation exceeds evaporation and negative when there is a moisture deficit and so, when summed over the year, reflect the net moisture surplus or deficit. Presently, CMI not available for the current RCP projections but is available for the older scenarios. Given its relevance, we have presented the projected zero isoline of CMI for the Fort St. John region, along with mean annual temperature and mean annual precipitation, in Figure 1.

The changes mapped in Figure 1 show that large changes in temperature are driving reductions in climatic moisture availability across the region despite slight increases in overall rainfall. Notably, the CMI zero isoline (CMI≤0) is broadening extensively, indicating a likely change from predominantly forested to more grassland ecosystems in and around Fort St. John.

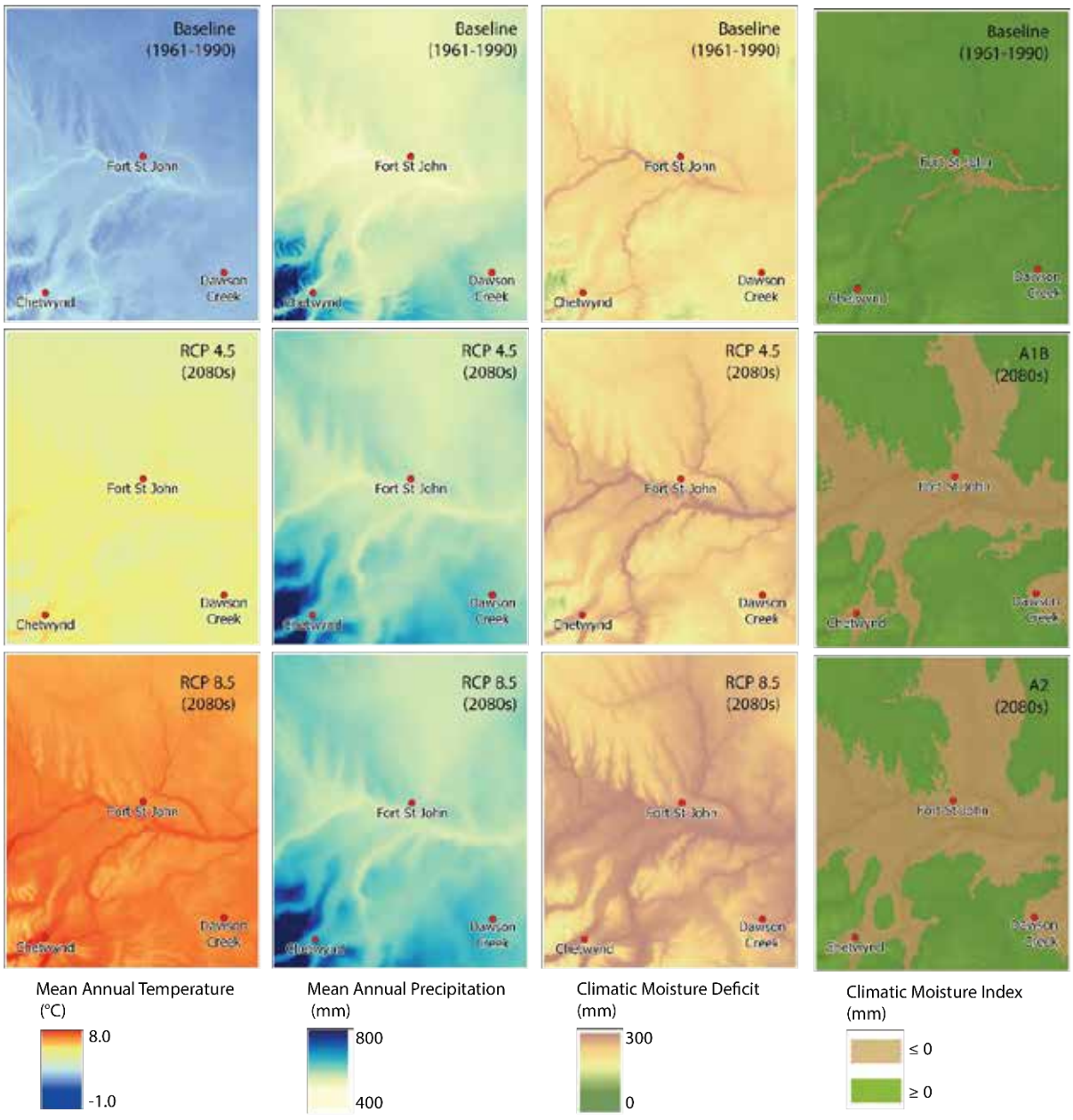


Figure 1. Mapped mean annual temperature, precipitation and climatic moisture index for Fort St. John over the baseline time period and projected 2080s futures under the RCP 4.5 and 8.5 emissions scenarios.

Monthly variables are also of interest given that the growing season for plants is typically from April to October. Figures 2 – 5 show the projected shifts, based on the RCP 8.5 scenario, in monthly average temperature, precipitation, growing degree days and climatic moisture deficit. Average temperatures increase in every month and fairly consistently. Precipitation increases in all months except July and August. Growing degree days increase substantially between April and October. Climatic moisture deficits increase from April to September but most significantly in July and August.

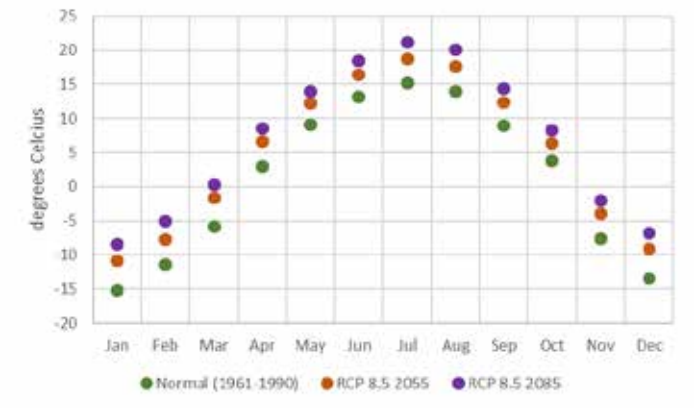


Figure 2. Average monthly temperature for normal, 2050s and 2080s.

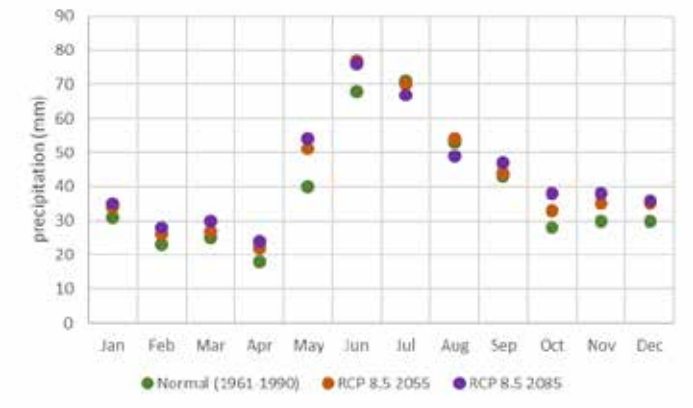


Figure 3. Average monthly precipitation for normal, 2050s and 2080s.

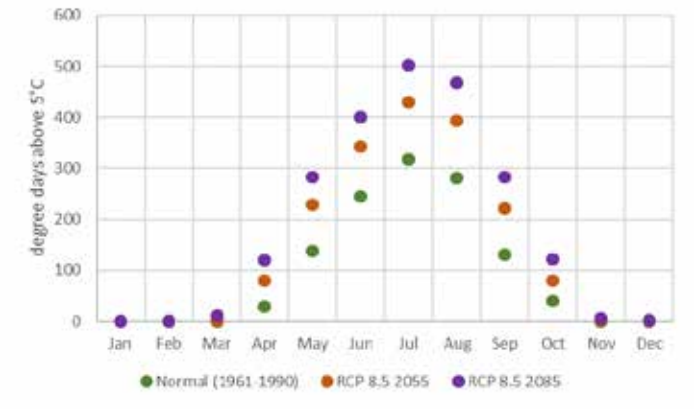


Figure 4. Average monthly degree days for normal, 2050s and 2080s.

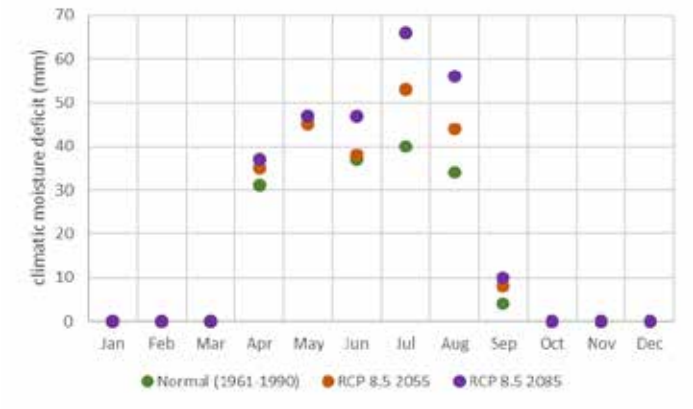


Figure 5. Average monthly climatic moisture deficit for normal, 2050s and 2080s.

2) Climate Suitability of Tree List in Bylaw No. 2405

The climate projections presented for Fort St. John contain several changes of relevance for planted urban trees:

- Summer rainfall is decreasing slightly, while temperatures are increasing significantly resulting in a drier growing season, particularly in July and August.
- Growing seasons will be longer and warmer.
- Extreme minimum temperatures are likely to increase.

Increases in extreme minimum temperatures may enable new varieties of trees to be planted in Fort St. John. However, it would be prudent to continue to select species that are tolerant of Fort St. John's current hardiness zone until there are consistent trends in warmer winters leading to a change in the hardiness zone guidance. Longer, warmer growing seasons will also provide more energy for plant growth but this advantage may be somewhat offset by increasing moisture limitations in the summer. Tolerance to drought (or supplemental irrigation) is likely to become a more important attribute of trees planted in the City.

A review of the Tree List in Bylaw No. 2405 is presented in Appendix 1. Of the species listed, several are anticipated to have limited suitability due to either drought tolerance or cold hardiness. It is recommended that those with limited suitability, where it pertains to drought tolerance, be used only in situations where there is irrigation, or that are naturally moist. For those species that are not hardy to extreme cold, they should be used in sheltered microclimates only. Given the limited range of species that can grow in Fort St. John's climate, consideration should be given to trialling, or if proven, expanding the list to include the following species:

- *Aesculus glabra*, Ohio buckeye
- *Celtis occidentalis*, Northern hackberry
- *Gleditsia triacanthos* 'Northern Acclaim', Honeylocust
- *Pinus cembra*, Swiss stone pine
- *Ulmus americana*, American elm
- *Ulmus pumila*, Siberian elm

3) Best Practices Recommendations

In addition to the changes projected from climate modelling, members of the scientific community believe that climate change is likely to bring changes in the frequency and characteristics of extreme weather events globally (Seneviratne, et al., 2012). When considering management practices to increase climate resilience, it is relevant to prepare both for predicted changes and extreme events. For urban tree management, the following is recommended:

1. Planning and policy recommendations:
    - Implement design criteria, development guidelines and standards for constructing soil volume that will be adequate support healthy urban trees and that integrate stormwater management where feasible;
    - Require FireSmart construction and landscaping with development in wildland interface areas;

- Reduce potable water reliance by using grey or black water recycling to irrigate vegetated landscapes;
- Protect or replace native soils during development;
- Set suitable targets for managing species and age diversity in urban trees;
- Develop and urban forest management plan to guide urban tree planting and management.

2. Planting recommendations:
   - Select species suitable for current and future extreme cold and drought conditions;
   - Trial disease and pest resistant cultivars of urban trees.
3. Management and plant health care recommendations:
   - Establish young tree watering programs of 3 to 5 years as needed;
   - Integrate passive or active irrigation (non-potable water) into urban landscapes to aid tree establishment and increase the range of species that can continue to be planted (i.e., enable species with lower drought tolerance to be planted);
   - Detect and control priority invasive plant and pest species that will become more competitive in a changed climate; and,
   - Implement preventative pruning cycles and young tree pruning programs.
4. Risk management recommendations:
   - Select low flammability trees for interface neighbourhoods;
   - Develop a storm response plan for responding to tree damage.
5. Engagement recommendations:
   - Educate the public about climate change and priorities for adapting urban forests as an important tool for community climate adaptation;
   - Work together with First Nations to identify culturally appropriate stewardship practices for coping with climatic variability and changes in forest structure and function;
   - Work together with NGOs, schools and community organizations to develop monitoring networks to track phenological changes in natural and urban forests;
   - Provide public guidance for climate suitable species selection;
   - Increase awareness about wildfire risk, fuel management and prescribed burning, and community FireSmart practices.

With reference to Fort St. John downtown hardscape streetscapes, the following is recommended:

Planting site construction:

- Prioritize a minimum of 2 m boulevard width plus sidewalk.
- Provide soil volume to support the size of tree desired to achieve streetscape design outcomes:

Tree size definitions	Preferred spacing	Max spacing	Soil volume (m3)*
Very small tree canopy spread is up to 3 m	3 m	6 m	not less than 4
Small tree canopy spread is up to 6 m	6 m	10 m	5 to 14
Medium tree canopy spread is up to 10 m	8 m	14 m	15 to 30
Large tree canopy spread is greater than 10 m	10 m	16 m	>30

*Structural soil provides 20% actual soil, soil cells provide 92% actual soil

- Achieve soil volume efficiently under hardscape by:
    - Establishing the largest tree pit opening possible within the constraints of the streetscape (minimum 1.2 m opening).
    - Provide a minimum of 400 mm depth of topsoil when planting over scarified subsoils or structural soil. If expanding soil volume with slabs or soil cells, a depth of 1,000 mm is preferred to maximize soil volume.
    - Build root bridges to adjacent soil volume with structural soil or suspended slab whenever possible.
    - Where bridging is not possible, use solutions to expand soil volume such as:
        - Suspended slabs or soil cell trenches between tree pits to create pure soil volume (see Appendix 2)
        - Structural soil under sidewalks (see Appendix 2).
    - Connect soil volumes between trees via trenches or continuous structural soils under sidewalk and boulevard.

Tree placement and species selection:

- Ensure tree location and spacing provides appropriate setbacks for utilities and streetlights, and provides spaces for snow removal.
- Select the largest tree suitable for the site and streetscape design in order to maximize carbon sequestration, shade and rainwater interception benefits.

Tree health maintenance

- Provide irrigation or young tree watering for at least 3 and up to 5 years if needed.
- Consider alternatives to salt for ice control on sidewalks that are gentle on vegetation. If using salt to manage sidewalks, then irrigation should be installed to ensure salt can be washed through the soil in the spring – irrigation lines would need to be drained in the fall.
- Structurally prune young trees if needed at time of planting and then at 3, 6, 9 and 15 years.

Please don't hesitate to call us if you have any questions regarding the material discussed in this report.

Sincerely,

Amelia Needoba, B.Sc., B.For.Sc.
ISA Certified Arborist (AU-0343A)
ISA Tree Risk Assessment Qualified (TRAQ)

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Insurance Information:

WCB:	# 657906 AQ (003)
General Liability:	Northbridge General Insurance Corporation - Policy #CBC1935506, $10,000,000
Errors and Omissions:	Lloyds Underwriters – Policy #1010615D, $1,000,000

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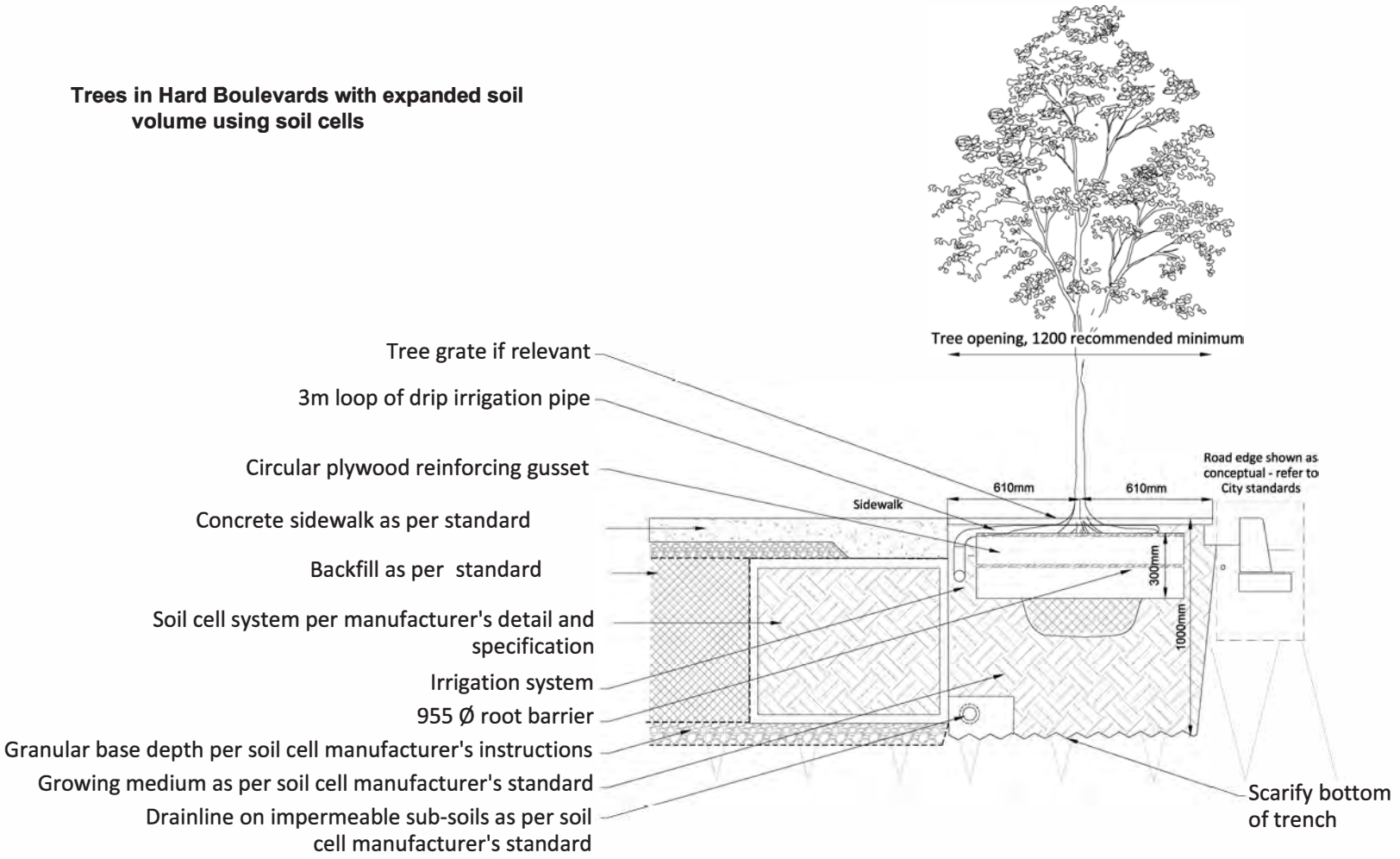
Appendix 1 – Review of Tree List

Species_Botanical	Species_Common	Shade	Drought	Water-logging	Size Class (height)	USDA lower hardiness zone	Future Climate Suitability
Abies balsamea	Fir, Balsam	H	L	L	L	2	Limited suitability
Acer tartaricum spp. ginnala	Maple, Amur	M	M	L	S	3	Suitable
Acer negundo	Maple, Manitoba	M	M	Tolerant	M	2	Suitable
Betula papyrifera	Birch, Paper	L	L	L	L	2	Limited suitability
Betula pendula	Birch, Weeping	L	L	L	L	2	Limited suitability
Caragana arborescens	Caragana, Upright	L	H	L	S	2	Suitable
Crataegus arnoldiana	Hawthorn, Arnold				M	3	Suitable
Crataegus x mordenensis 'Toba'	Hawthorn, Toba				M	3	Suitable
Eleagnus angustifolia	Russian Olive				S	2	Suitable
Fraxinus nigra	Ash, Black	M	L	Tolerant	L	2	Limited suitability
Fraxinus pennsylvanica	Ash, Green	M	H	Tolerant	L	2	Suitable
Juniperus virginiana	Juniper, eastern red cedar	L	H	L	S	3	Suitable
Larix laricina	Larch, American	L	L	Tolerant	L	2	Limited suitability
Larix sibirica	Larch, Siberian	L	L	L	L	2	Limited suitability
Malus sp.							Suitable if tolerant of >3 weeks of drought
Picea glauca	Spruce, White	H	M	L	L	3	Suitable
Picea pungens	Spruce, Blue/Colorado	H	M	L	L	3	Suitable
Pinus contorta latifolia	Pine, Lodgepole	L	H	L	L	3	Suitable
Pinus resinosa	Pine, Red	L	M	L	M	2	Suitable
Pinus sylvestris	Pine, Scots	L	H	Tolerant	L	2	Suitable
Populus nigra italica	Poplar, Black	L	L	Tolerant	L	3	Limited suitability
Populus sargentii	Cottonwood, Sargents	L	L	Tolerant	L	3	Limited suitability
Populus tremula	Aspen, Swedish Columnar	L	M	L	M	2	Suitable
Populus tremuloides	Aspen, Trembling	L	L	L	M	1	Limited suitability
Populus x canescens	Poplar, Grey	M	L	L	L	2	Limited suitability
Prunus ameniaca	Apricot		M	L	S	6	Limited suitability
Prunus maackii	Cherry, Amur	L	L	L	S	3	Limited suitability
prunus cerasifera	Plum, Canada	L	M	L	S	5	Limited suitability
Prunus padus	Plum, Mayday	M	L	Tolerant	S	3	Limited suitability
Prunus virginiana	Chokecherry	M	M	L	S	3	Suitable

Species_Botanical	Species_Common	Shade	Drought	Water-logging	Size Class (height)	USDA lower hardiness zone	Future Climate Suitability
Pyrus communis	Pear, Common	M	M	L	M	5	Limited suitability
Pyrus ussuriensis	Pear, Ussurian	L	M	L	M	3	Suitable
Quercus macrocarpa	Oak, Bur	M	H	L	L	3	Suitable
Salix pentandra	Willow, Laurel Leaf	L	L	Tolerant	S	2	Limited suitability
Sorbus aucuparia	Mountain Ash	M	L	L	M	2	Limited suitability
Thuja occidentalis	Cedar, Eastern White	M	M	L	M	3	Suitable
Tilia cordata	Linden, Little-leaf	H	M	L	L	3	Suitable
Tilia platyphyllos	Linden, Big-leaf	H	M	L	M	5	Limited suitability
Tilia x flavescens 'Dropmore'	Linden, Dropmore	H	M	L	M	3	Suitable

Appendix 2 – Tree Pit Details Under Hardscape

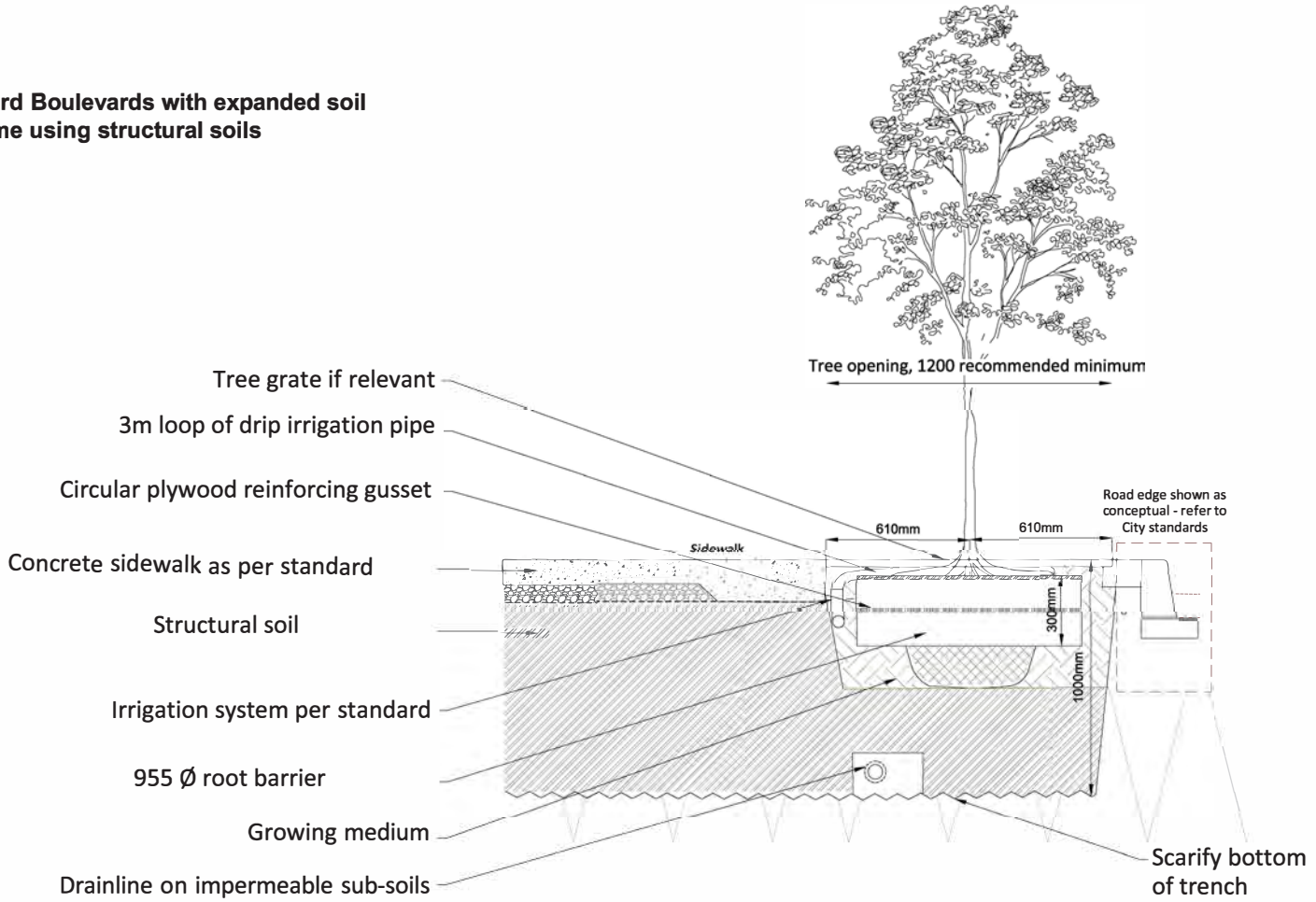
Trees in Hard Boulevards with expanded soil volume using soil cells



Notes:

1. Locate and flag all buried utilities in tree planting site prior to digging tree pits.
2. Trees to be located/ laid out so as not to impact street light coverage, underground services, bus stops etc.

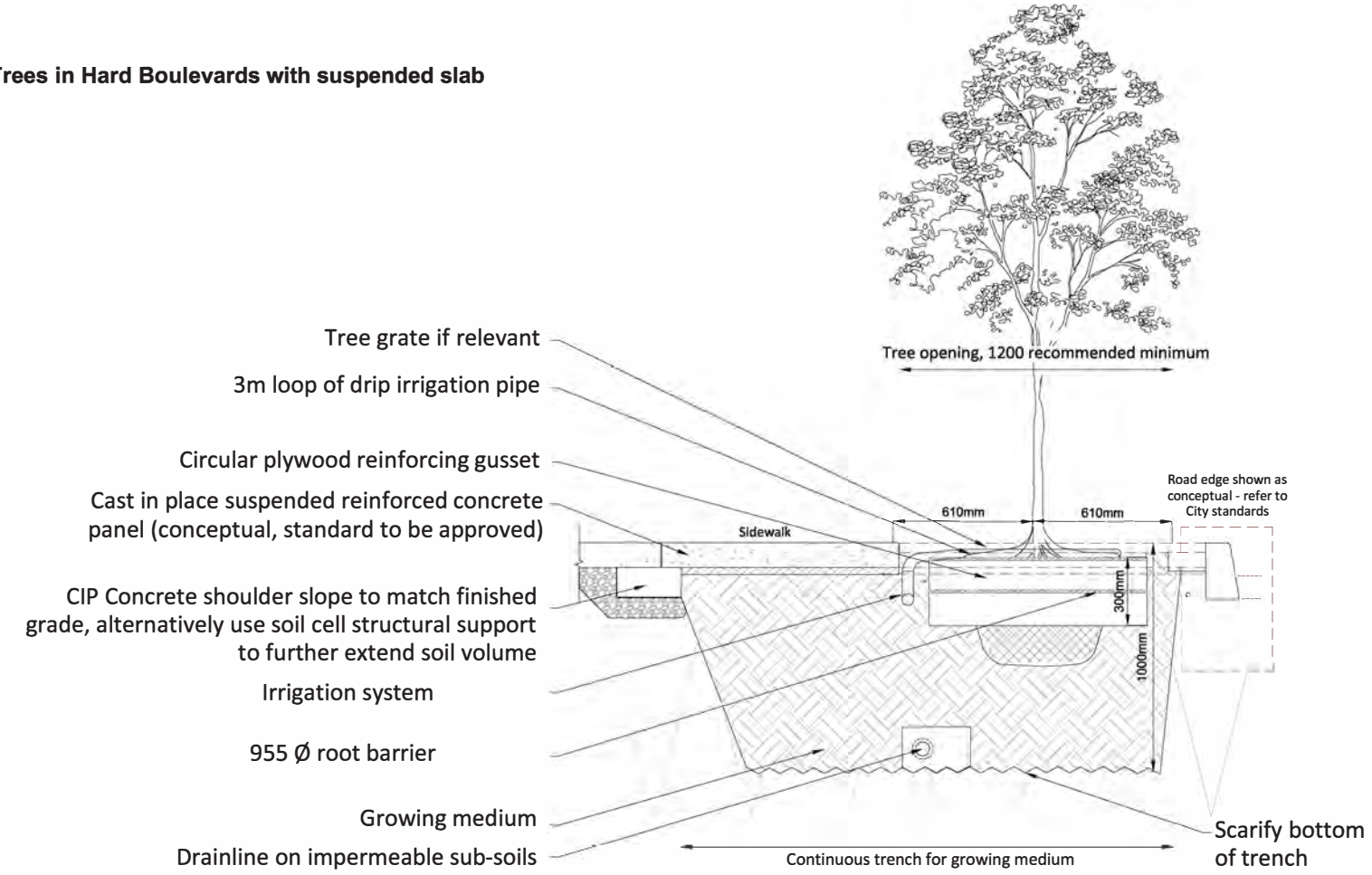
Trees in Hard Boulevards with expanded soil volume using structural soils



Notes:

1. Locate and flag all buried utilities in tree planting site prior to digging tree pits.
2. Trees to be located/ laid out so as not to impact street light coverage, underground services, bus stops etc.

Trees in Hard Boulevards with suspended slab



Notes:

1. Locate and flag all buried utilities in tree planting site prior to digging tree pits.
2. Trees to be located/ laid out so as not to impact street light coverage, underground services, bus stops etc.

Wind Simulations

Saint John Main Road
2019-06-05

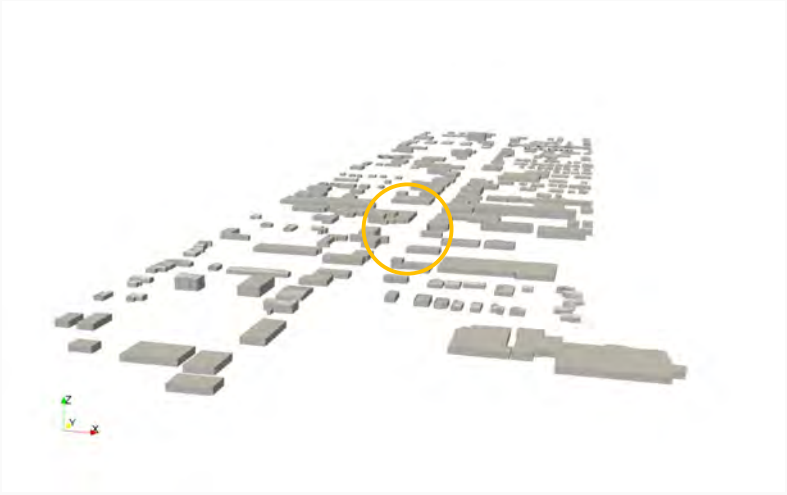
Introduction

Traditionally in building engineering, wind tunnel experiments have been used to measure the wind speed. However, computer simulation has emerged as an important tool in enhancing our understanding of fluid motion and offers the potential to serve as decision support in urban planning. Computational fluid dynamics (CFD) can provide detailed information of the fluid flow which are difficult to measure by experiments, and it offers the possibility for large-scale studies and sensitivity analysis.
The quantification of the complex wind dynamic around high-rise building can answer questions concerning life quality, security and the development of the surrounding area.
The factors as shape, size, orientation and vicinity of a building can alternate the wind flow in a favorable or unfavorable manner for a pedestrian. Increased wind speed can create a dangerous environment for the elderly or infants, but reduced wind speed can also lead to insufficient exchange of air.

The goal of this investigation was to examine the security and comfort of inhabitants and to identify crucial wind effects by numerical simulations for two different versions of a building. All analysis are conducted at pedestrian level i.e. at 1.75 m.

Disclaimer
Despite high resolution and accuracy, numerical simulations always contain sources of errors from modeling, discretization and calculation.

Visualization of the model!!



The perspective of the visualization in the automated process makes this building seem to be high but in the simulation itself it is lower

Wind Effect on Pedestrian (1.75m)

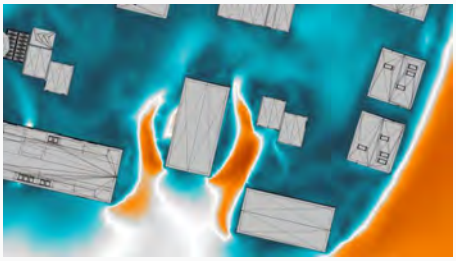
Beaufort number	Description	Hourly average windspeed (m/s)	Effect
0	Calm	0—0.25	
1	Light air	0.25—1.55	No noticeable wind
2	Light breeze	1.55—3.35	Wind felt on face
3	Gentle breeze	3.35—5.45	Hair disturbed, clothing flaps, newspaper difficult to read
4	Moderate breeze	5.45—7.95	Raises dust and loose paper, hair disarranged
5	Fresh breeze	7.95—10.75	Force of wind felt on body, danger of stumbling
6	Strong breeze	10.75—13.85	Umbrellas used with difficulty, hair blown straight, difficult to walk steadily, wind noise on ears unpleasant
7	Near gale	13.85—17.15	Inconvenience felt when walking
8	Gale	17.15—20.75	Generally impedes progress, difficulty balancing in gusts
9	Strong gale	20.75—24.45	People blown over

This table correlates the wind speed to its effect on people*. This makes it easier to understand the visualizations included in this report.

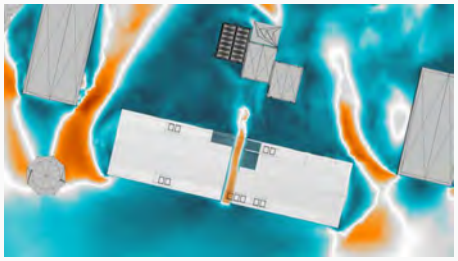
T.V. Lawson and A.D. Penwarden. The effects of wind on people in the vicinity os building. Proceedings of the Fourth International Conference on Wind Effects on Buildings and Structures, p. 605-622, 1975

Wind Effects

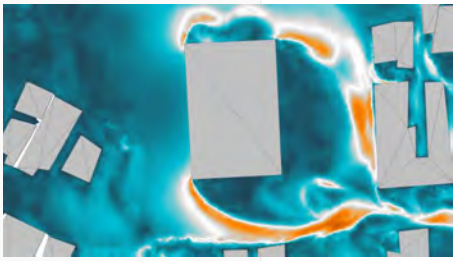
Different wind effects are described to support the understanding of the simulated velocity field.



Corner Effects:
Also known as corner streams or corner jets. The wind speeds up near the corners of buildings. Pedestrian discomfort is mainly due to transition and turbulence.



Passage Effects:
Passage effect can be seen in any passage through a building or small gap between two buildings.
Pedestrian discomfort is mainly due to high winds.



Venturi Effects:
Speed up between two buildings or rows of buildings.
Pedestrian discomfort is mainly due to high winds.

Comfort Criteria

Different guidelines to quantify the wind conditions for pedestrians have been established. They measure the percentage of exceedance of the wind speed during a defined time period, but they differ in thresholds, consideration or disregard of gusts (local wind speed) and categories of ativities. Ingrid Cloud offers two different pedestrian comfort criteria: one based on Lawson (keep threshold percentage) and one based on Davenport (keep threshold magnitude).

Lawson

0.0 - 2.5 m/s	5%	Sitting	Acceptable for frequent outdoor sittings use. For example at a restaurant or cafe.
2.5 - 4.0 m/s	5%	Occasional sitting	Acceptable for occasional outdoor seating. For example general outdoot spaces.
4.0 - 6.0 m/s	5%	Standing	Acceptable for example entrances, bus stops or covered walkways.
6.0 - 8.0 m/s	5%	Strolling	Acceptable for slow paced walking with occasional
8.0 - 10 m/s	5%	Jogging	Acceptable for jogging, cycling and other lighter exercises.
> 10 m/s	5%	Uncomfortable	Not comfortable for regular pedestrian access.
> 15 m/s	0.022%	Dangerous	Can be considered dangerous.

Percentage 5% (0.022% Dangerous)

Davenport

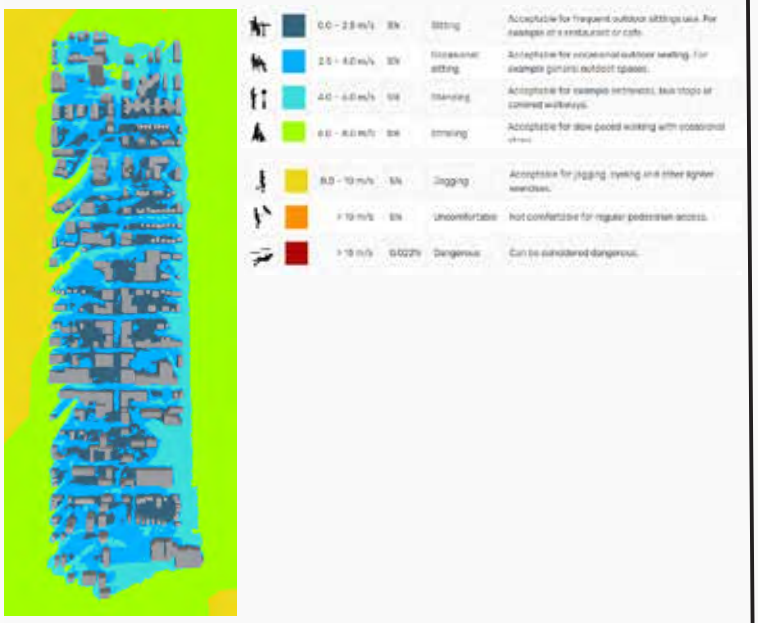
A	ACTIVITY	PREFERABLE	ACCEPTABLE	UNCOMFORTABLE	DANGEROUS
	Sitting	0.0 - 0.1 %	0.1 - 3.0 %	3.0 - 53 %	> 53 %
B	ACTIVITY	PREFERABLE	ACCEPTABLE	UNCOMFORTABLE	DANGEROUS
	Occasional sitting	0.0 - 6.0 %	6.0 - 15 %	15 - 53 %	> 53 %
C	ACTIVITY	PREFERABLE	ACCEPTABLE	UNCOMFORTABLE	DANGEROUS
	Strolling	0.0 - 23 %	23 - 34 %	34 - 53 %	> 53 %
D	ACTIVITY	PREFERABLE	ACCEPTABLE	UNCOMFORTABLE	DANGEROUS
	Jogging or Cycling	0.0 - 43 %	43 - 50 %	50 - 53 %	> 53 %

Velocity Magnitude 5m/s

Guidelines used by City of London, 7th International Symposium on Computational Wind Engineering 2018

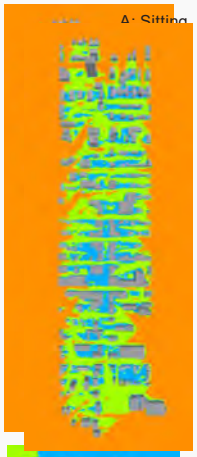
Similar to the guidelines used SMHI and FORCE Technology DMI (Denmark)

Q1 – Level 1



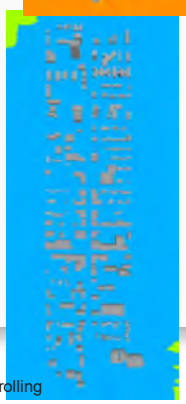
Davenport

PREFERABLE ACCEPTABLE UNCOMFORTABLE DANGEROUS



A: Sitting

B: Occasional Sitting

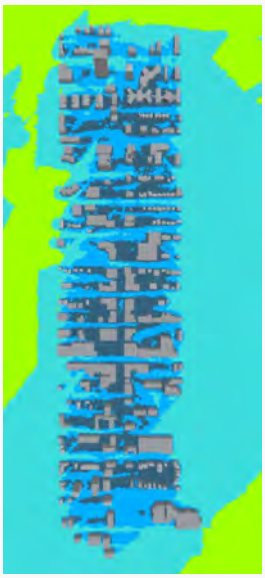


C: Strolling

D: Jogging/Cycling

Q2 – Level 1

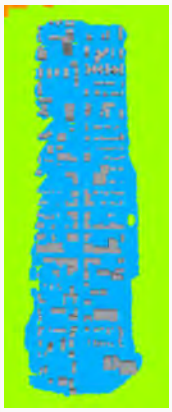
Lawson



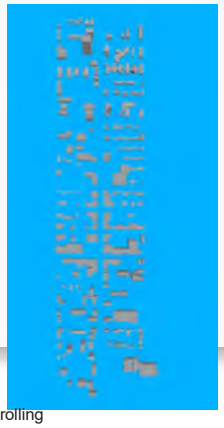
Davenport

PREFERABLE ACCEPTABLE UNCOMFORTABLE DANGEROUS

A: Sitting



B: Occasional Sitting

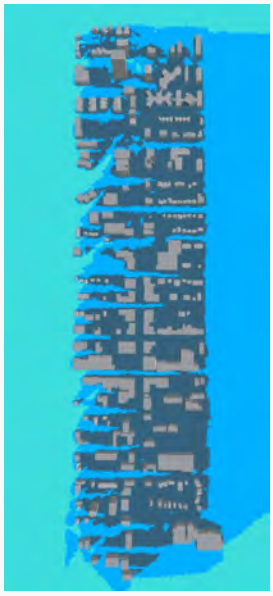


C: Strolling

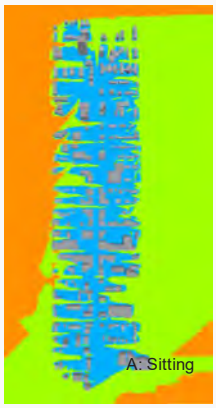
D: Jogging/Cycling

Q3 – Level 1

Lawson



Davenport



A: Sitting

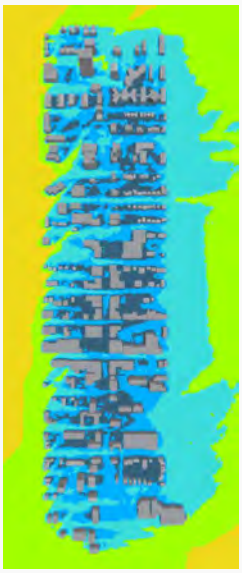
B: Occasional Sitting

C: Strolling

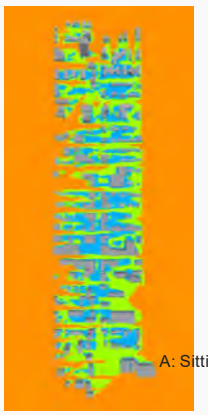
D: Jogging/Cycling

Q4 – Level 1

Lawson

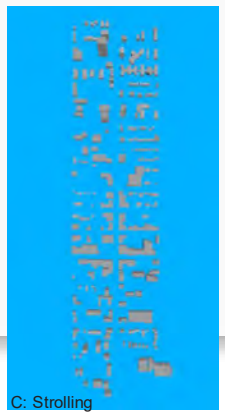


Davenport



A: Sitting

B: Occasional Sitting



C: Strolling

D: Jogging/Cycling

Fig. 1

Fig. 2

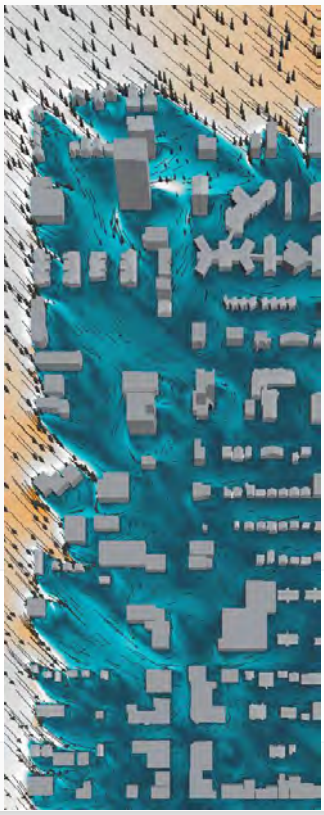
In general, these simulations indicate

Most of the houses are of similar height. Therefore, there are not many places on the main road where wind is pushed down to the streets. The only spot where a downwash effect can be observed is at the north end of the street. This area is marked as uncomfortable for longer, not moving activities.

The main road is protected by the houses to its side. The area sensitive for longer sitting are places where the main street is crossed by roads stretching from east to west.

Visualization
Via interface

NW

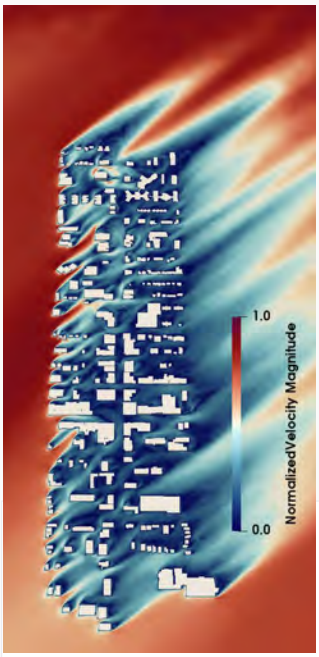


SW

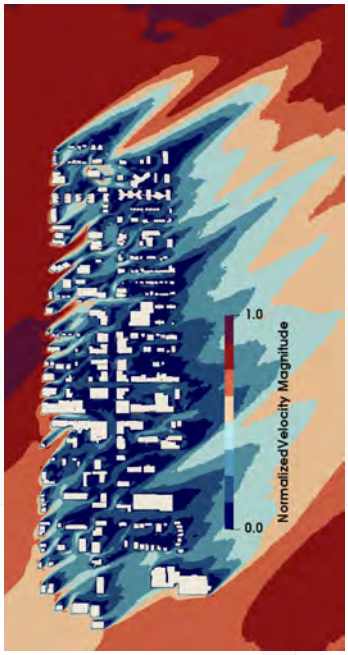
Images can be zoomed in to analyze the wind dynamic

Visualization
Via raw data

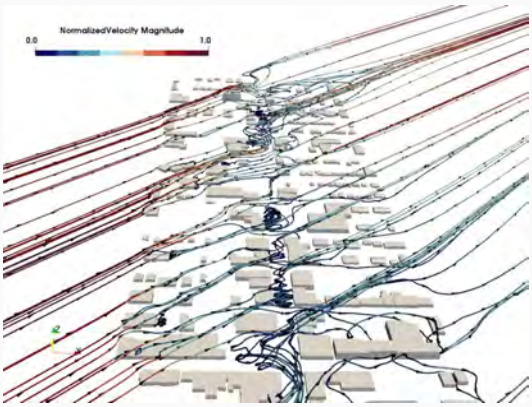
SW



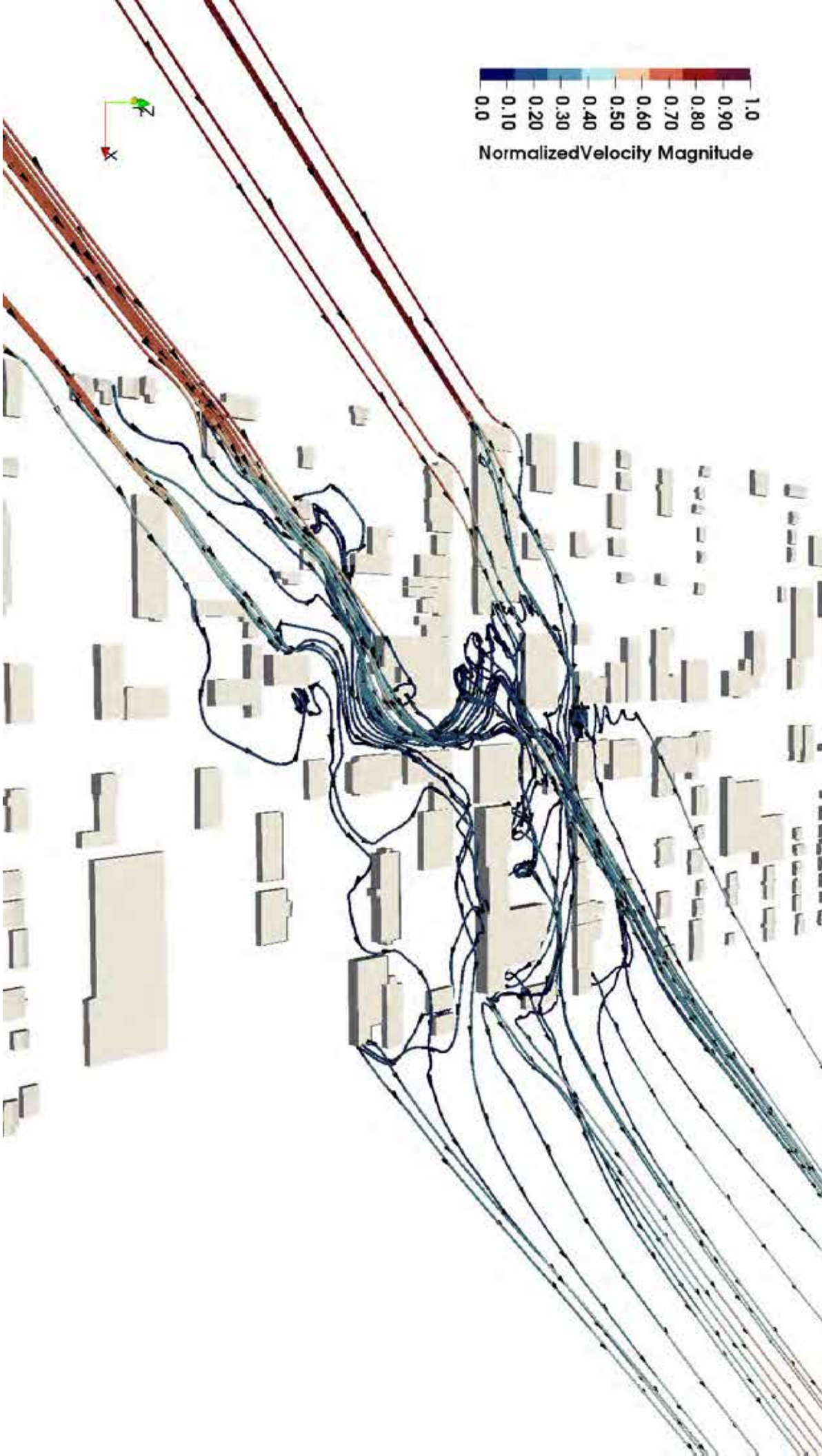
Continuous Color field



Discrete Color field, easier to differentiate areas with similar velocity



Streamlines


0.0
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.0
NormalizedVelocity Magnitude

REPORT

100 Street Retail Vitality and Impact Mitigation Review

Prepared for:

City of Fort St. John

550 - 1090 Homer Street, Vancouver,
BC V6B 2W9 | T: 604.235.1701

Draft

June 2019

File: 1958.0430.02

Contents

1.0 Introduction

This document has been prepared to provide background information for the 100 Street Charrette in the following categories:

1. Principles for downtown retail health and vitality
2. Emerging retail trends and implications
3. Current business mix and composition along 100 Street and the immediate adjacent buildings along the avenues feeding into 100 Street, with preliminary commentary on positioning strategy
4. Research on main street revitalization case studies, focusing on the themes of business impacts and impact mitigation

2.0 Context: Positioning Street Retail for Success

Is downtown Fort St. John generally, and 100 Street specifically, well positioned for successful business attraction and retention?

Fundamentally, the creation and maintenance of a thriving street retail precinct comes down to tenant retention and tenant recruitment. To ensure that existing businesses survive and thrive, and that complementary businesses are attracted, 100 Street and its immediate surrounding area must offer businesses the fundamentals that they need to succeed. At a minimum, this includes a strong customer base, and a clean, safe, attractive commercial environment. Understanding the types of improvements needed to move the business district towards being ready for success is a fundamental piece of background information going into a charrette process which will result in a complete re-think of the public realm, given its importance in setting the stage for recruitment and retention efforts that will impact the future of the downtown.

In this section, we briefly outline some of the core principles for a strong town centre from a commercial health and vitality perspective. This sets the stage for the review of business mix and composition, and subsequent case studies on street re-design impact and impact mitigation.

2.1 Principle 1: Retail and People-Oriented Built Form

Commercial uses should be laid out in a compact, contiguous and uninterrupted shopping environment. Shoppers should be able to see new storefronts from multiple directions and should be able to access these stores without hindrance or delay. Shopping environments work best when designed for maximum pedestrian ease, both through minimizing walking distances, but also through removal of physical and psychological barriers. In practice, this means creating retail environments that embody the following characteristics:

- Avoidance of gaps in active land uses that deter shoppers from travelling further, including surface parking lots, large setbacks, and vacant commercial space or empty lots

- Land uses with low ground-floor activity (offices, banks) should be designed to minimize the width of entrances fronting the main street, and lined wherever possible with smaller retail tenants (i.e. “liner” retail or “wrap-around” retail)
- Concentrate retail activity in 2-3 core retail blocks, with clear edges / boundaries to prevent unnecessary over-extension, which can lead to gaps in active uses
- Line streets with active uses on both sides
- Create frequent street crossing points to enable safe and easy crossing with minimal delay
- Build immediately adjacent to the public realm, with surface parking at rear

2.2 Principle 2: Compelling Storefront Design

Storefronts provide businesses with the ability to showcase their individuality and branding, which shape a downtown’s uniqueness and vibrancy. At the same time, poorly designed and unmaintained storefronts can detract from not only individual businesses, but can impact the success of adjacent properties. A downtown should aim to achieve storefronts that provide:

- A range of signage diversity that allows retailers to achieve a degree of authenticity, but still maintain a high design quality
- Awnings that provide cover for pedestrians
- Inviting / transparent window displays and easy to circulate store layouts that welcome customers
- Avoidance of blank walls, window wall advertising, and gaps between operable doors
- Regularly cleaned, painted storefronts that see periodic reinvestment to ensure businesses stay relevant to changing preferences
- Physical design elements that align with pedestrians rather than the vehicle

2.3 Principle 3: Public Realm that Attracts and Retains People

The public realm of a downtown is akin to the common areas (hallways) of a shopping mall. Over the long-term, the public realm is more important than the stores around them as they are the one constant in a changing environment. The public realm plays a critical role in the actual and perceived safety of a town centre, critical factors for encouraging customers to visit, linger, and cross-pollinate across different retailers and service providers. Increasingly, successful town centres are turning their focus to creating high quality and shopper-friendly public realm through strategies such as:

- Ensuring sidewalks are of a sufficient width to comfortably accommodate higher pedestrian volumes, and provide flexibility for seasonal patio seating and outdoor merchandise displays

- Providing climatically appropriate vegetation to give people shading, wind abatement, improve air quality, and provide enhanced visual aesthetics. At the same time, it is important to ensure that foliage and planters do not obstruct sightlines to businesses and pedestrian movements
- Bright, frequent and unique lighting that creates a safer feeling environment (and possibly a festive atmosphere), which can help to support extended shopping hours (particularly during the winter)
- The creation of gathering places such as plazas and parkettes that accommodate small events (formal and informal), public space programming, and temporary pop-up retail
- The use of other street enhancement features such as seating, art, historical plaques, and bicycle racks
- A strong emphasis on pedestrian networks and protection, including well marked street crossings, way finding, and weather protection
- Improving interface between the built environment and public realm to allow customers to easily access stores (i.e. low barriers to entry)
- Flexible use of streets and on-street parking on a temporary basis to accommodate events, summer patios, food trucks, and other mobile retailers

2.4 Principle 4: Convenient and Accessible Environments

A major deciding factor in a shopper's preference of where to visit regularly relates to overall convenience of the destination. If a shopping area is not easy to access, or to navigate, the likelihood of frequent return visits declines given alternatives. The evolution of the shopping centre industry and e-commerce has elevated consumer demands and expectations regarding convenience. To compete in terms of access and convenience, successful downtowns must create environments that:

- Are accessible by multiple modes, including vehicles, transit, cyclists, and pedestrians, in a balanced and planned manner
- Have a parking strategy in place that keeps spaces in front of retailers clear of long-term parkers to maximize convenience for shoppers, but provides abundant sign-posted off-street at low cost or free for long-term parking
- Offers a broad merchandising mix that facilitates one-stop shopping, but groups complementary tenancies to maximize convenience (i.e. anchor clusters)
- Implement effective wayfinding strategies
- Collectively shift opening hours to include evenings and weekends to better correspond with the realities of most people's schedules
- Better integrate e-commerce to provide shoppers with improved awareness of the diversity and precise locations of businesses, and explore potential new channels for retail such as online shopping (delivery, in-store pickup)

2.5 Principle 5: Market Dynamics

Attracting local and regional shoppers, and giving them reasons to stay, requires a deep understanding of customer profiles and the nuances of their preferences (such as matching opening hours with shopping hours). Drawing visitors from further afield necessitates that the downtown offer compelling reasons for customers to travel past closer, competing retail destinations. One-of-a-kind businesses, authentic urban experiences, or festivals and events are among the range of drawing factors that successful downtowns leverage to attract non-local visitors (as well as local ones).

There must be a high level of local and regional awareness of the range of goods and services available in the downtown. Effective branding and marketing can help better position a downtown as a competitive destination. By leveraging market dynamics and capturing sufficient spending to support local businesses, over the long-term the successful downtowns are able to thrive and adapt to changing needs.

2.6 Principle 6: The Businesses

2.6.1 Tenant Mix and Retail Hierarchy

- The most important ingredients of commercial success are the variety and quality of merchandising. The downtown must offer a sufficient selection of quality stores and services that can attract shoppers on a regular basis
- Anchor tenants (be they retail, service, institutional or recreational) or anchor category clusters play a critical role in drawing visitors (local and regional), subsequently allowing them to disperse to smaller, adjacent retailers. This anchoring role can be played equally by retailers or non-retail uses

2.6.2 Market Positioning and Precincts

- A downtown must focus on creating a merchandising mix that provides either a unique or complementary shopping experience compared to shopping centre destinations
- In most consumer surveys, shoppers identify the variety and selection of merchandise as one of the most important reasons for patronizing a particular retail destination. The downtown must provide variety and selection of goods and services (‘critical mass’) to attract shoppers
- Success may also be achieved in the downtown by becoming dominant in one or more merchandising niches compared to other shopping destinations
- Note that the positioning of a downtown may vary significantly across its sub-areas. This is particularly important for downtowns that are ‘stretched’ out along a long linear corridor (as in Fort St. John). This variation is what makes cities interesting and provides a special character not present in shopping centres. It is also very important to consider sub-areas when developing tenant mix, attraction and retention strategies / priorities.

2.6.3 Competitive Businesses

- Downtown businesses must deliver high quality goods and services, exceptional service, and competitive pricing
- While a degree of retail turnover enables a downtown to shift to meet changing needs, high turnover indicates unviable economic conditions
- Healthy downtowns are grounded in stable market conditions and merchandising that competitively responds to changing demands

2.7 Principle 7: Consistent and Engaged Leadership

Downtowns often face immense challenges due to the many separate interest groups active in the downtown including landlords, tenants, business associations, politicians, and planners. The goals and objectives of these groups often do not match. In particular, divided land ownership and absentee landlords are a frequent obstacle to initiating change to transform a struggling downtown into a successful vibrant destination.

The cornerstone for commercial success is the ability for all vested interest groups to find the means and will to cooperate and coordinate activities so as to benefit the downtown overall. If positive changes are first made for the benefit of downtown, then all stakeholders and the community at large will benefit.

Successful revitalizations require strong partnerships and commitment among stakeholders, led by a committed leadership team that can take coordinated action.

A Business Improvement Area (BIA) is a legislated method to bring together vested interest groups in a specified commercial area to promote the economic development of the area. This form of collective and engaged leadership has proven to be a successful measure for many thriving downtowns throughout British Columbia.

3.0 Impacts of Major Trends

The retail market is constantly evolving. Many are now speaking about the 'death of bricks and mortar retail' in the face of growing online competition. In fact, brisk and mortar stores are not all a dying breed. The future viability of retail will be shaped by numerous factors, among them:

1. Technology: how is e-commerce likely to impact retail within cities like Fort St. John?
2. Demographics: which age groups are disrupting the retail market?
3. Consumer demand: how are consumer preferences shifting, and what does this mean?

3.1 E-Commerce and Omni-Channel

Back in 2013, the Centre for the Study of Commercial Activity at Ryerson University predicted that online shopping in Canada would double as a percentage of overall retail sales by 2018. At the time, the most recent data (2012) indicated that the annual per-capita online sales in Canada was $170, significantly lagging the $600 per capita spent online in the United States. It was projected then that by 2018, Canadian per-capita online sales would reach $340.

Data from Statistics Canada indicates that the $340 per-capita e-commerce sales threshold in Canada was crossed around 2016, or 2 years before the Ryerson forecast. By 2018, Canadian e-commerce sales surpassed $22.4 billion, or nearly $606 per capita.[1] As a proportion of total sales made by Canadian retailers, e-commerce sales grew from 2.2% in 2016 to 3.7% in 2018.

Table 1: Canadian Retail Sales and E-Commerce Sales, 2016 to 2018 (x1,000)

	2016	2017	2018
Retail Sales	$549,711,319	$588,828,031	$605,934,029
Retail E-Commerce Sales	$12,321,519	$16,693,000	$22,453,278
E-Commerce as % of Total	2.2%	2.7%	3.7%
E-Commerce Sales Per Capita	$351	$429	$606

Beyond the sales data, the internet is playing an ever-increasing role in consumer research, with online research often directing customers into bricks-and-mortar stores. However, if the stores do not have online presence, even customers who want to support local businesses may struggle to find those retailers and will go elsewhere. A 2015 study by Vancity indicated that 61% of Canadian independent retailers had no online presence.

Northern Development Institute Trust's *Small Town Love* program was a successful initiative brought to Fort St. John to address the gap of small, independent bricks-and-mortar stores without an online presence. This program created a website for each business with high quality promotional photographs to

[1] Note that this only includes online sales made by Canadian retailers. Purchases made by Canadian consumers from foreign-based retailers are excluded.

enhance visual communication. Programs like this should occur on an on-going basis to ensure all downtown stores have online presence generally, and possibly help them achieve 'omni-channel' abilities for sales and order fulfillment.

E-Commerce is not likely to be the death of bricks and mortar retail. Customers are making it increasingly clear that they want both online and in-store choice, both for product and service. Online shoppers increasingly demand physical locations nearby to complete their shopping experience.

Also notable is the varied impact of e-commerce across different retail sectors. Convenience, price and selection are key factors driving e-commerce sales, and while some categories are struggling, others are flourishing.

- Resilient Retail Categories:
  - Food and Beverage
  - Personal Care
  - Service Commercial
  - Fitness
  - Value, Athletic Apparel

- Less Resilient Retail Categories:
  - Electronics
  - Books, media, toys
  - Mid-market apparel
  - Homeware and furniture
  - Department store type merchandise

In the coming years, the most competitive businesses will have a combination of strong customer service and client relationships, combined with strong online presence that will include online transactions. In other words, the most successful retailers will need to focus on being omni-channel and 'frictionless' when it comes to research, shopping, sales, and delivery, otherwise they risk losing market share.

As we are in a time of rapid change, any new retail / commercial space should be designed for adaptability and convertibility over time.

3.2 Demographic Shifts

Fort St. John is a very young city and metropolitan region. The Fort St. John Census Metropolitan Area (CMA) – extending northwest to Charlie Lake and southeast to the confluence of the Beatton and Peace Rivers – had an estimated population of 29,800 residents as of 2018, with a median age of only 33.3. This compares to a median age of 42.4 for the Province overall. Over 53% of the Fort St. John CMA population was under the age of 35 (vs. 40% in the province). Conversely, only 8.3% of the Fort St. John population was over the age of 65, vs. nearly 19% in the province.

Table 2: Population Proportions, Fort St. John CMA vs. British Columbia, 2018

Population Proportions Comparison, 2018		
Age	Fort St. John CMA	British Columbia
0 to 4 years	7.5%	4.8%
5 to 9 years	7.3%	4.9%
10 to 14 years	6.3%	4.9%
15 to 19 years	5.9%	5.2%
20 to 24 years	7.3%	6.7%
25 to 29 years	9.6%	6.9%
30 to 34 years	9.3%	6.9%
35 to 39 years	8.8%	6.9%
40 to 44 years	7.4%	6.4%
45 to 49 years	6.4%	6.7%
50 to 54 years	5.3%	6.9%
55 to 59 years	5.8%	7.4%
60 to 64 years	4.7%	6.8%
65 to 69 years	3.2%	5.9%
70 to 74 years	2.1%	4.8%
75 to 79 years	1.1%	3.3%
80 to 84 years	0.9%	2.3%
85 years and over	0.9%	2.5%
Median Age	33.3	42.4

Source: Environics Analytics

The Fort St. John CMA population is expected to grow by just over 4% in the next 5 years, and 8% in the next 10, reaching 31,000 residents by 2023 and over 32,000 by 2028. With growing population will come growing consumer expenditure potential. Key hurdles for retailer growth in Fort St. John will be the boom-bust nature of the local economy, and the impact of unemployment (or underemployment) on consumer confidence. While the labour force participation rate is very high in Fort St. John at over 77% (a function of the age of the population), the rate of unemployment as of 2016 was nearly 11%.

Fort St. John CMA Population Projection		
	Population	% Change since 2018
2018	29,814	
2021	30,591	2.6%
2023	31,027	4.1%
2028	32,226	8.1%

Source: Environics Analytics

Tracking and projecting the demographic breakdown of the population over the coming decade can help inform the types of businesses that may be most successful, and understand how different business types might work best in specific locations.

- In British Columbia, the combined population of Millennials (age 25 to 39) and Generation Z (5 to 24) is already within 150,000 people of the combined population of Gen X (40 to 54) and Baby Boomers (55 to 74).
- Within 5 years, Millennials/Gen Z will exceed the Baby Boom/Gen X groups by nearly 50,000.
- Within 10 years, they will exceed the latter by over 300,000
- In Fort St. John, the Generation Z and Millennial cohorts already account for 60% of the population
- By 2028, these groups will account for nearly 70% of the population.

Figure 1: British Columbia Population by Generation, 2018 to 2028

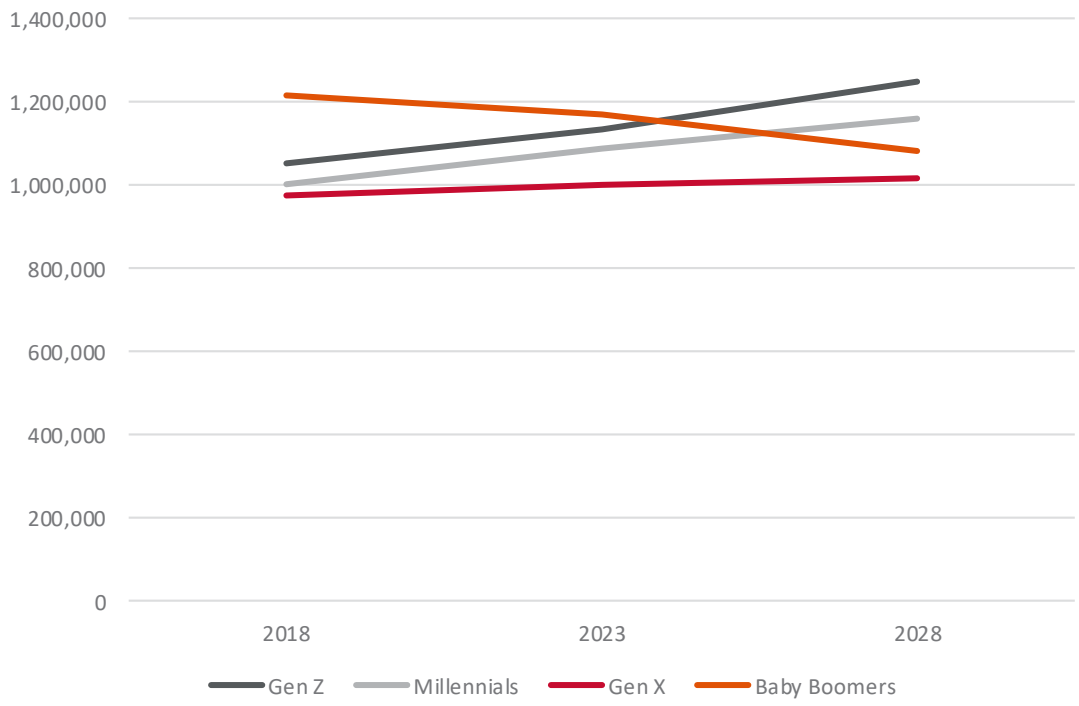
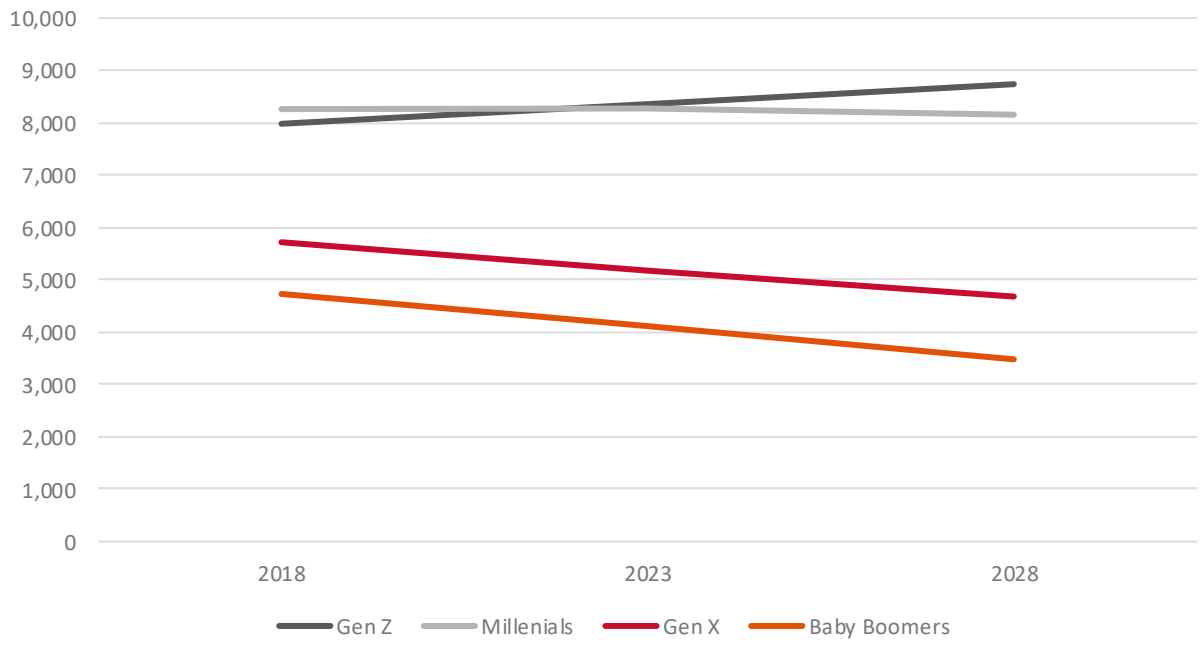


Figure 2: Fort St. John CMA Population by Generation, 2018 to 2028



Millennial spending habits differ from Baby Boomers. According to research prepared by Colliers International in 2018, Millennials significantly underspend on groceries, health care, alcohol, out-of-home entertainment and travel accommodations compared to Boomers. By contrast, they significantly overspend on clothing and accessories, restaurants, personal care (including fitness), air travel, and home entertainment. Spending patterns of Generation Z are only beginning to emerge. It is therefore critical to keep track of demographic change in the community and understand that different demographic groups spend in different ways.

3.3 Shifting Consumer Demand

It is important to continuously track changing consumer demand, and design for adaptability and convertibility to remain nimble to changes. Current / emerging consumer demand trends of note can be categorized as follows:

- Experience: strong demand for 'experiential' retail and service. Includes categories like:
    - Entertainment
    - Restaurants
    - New concepts
    - Hybrid stores (e.g. craft production / consumption on-site)

- Value:
    - Affordability is key in the face of economic uncertainty, particularly in resource-driven environments
    - Online options are critical (as discussed above)
    - Value oriented retailers that also offer experience and customer service can thrive
- Convenience:
    - Mixed-use formats are critical
    - Offer everyday needs within proximity to home and work
    - Offer housing choices in close proximity to downtown retail
    - Create walkable, pleasant environments to attract and retain shoppers
- Innovation:
    - Businesses need to be omni-channel to succeed. This will only become more important in the coming 5+ years
    - Businesses that can offer something unique will be better positioned for competitiveness vs. online conglomerates
    - Personalization will be key – create link between customer and business

4.0 100 Street Business Mix and Composition

This section provides a snapshot of the current retail environment along 100 Street and its immediate surrounding areas. Painting a brief picture of what we have today can, in conjunction with an understanding of core retail principles, inform what we do moving forward to ensure that 100 Street is positioned for success in the next 5, 15, and 50 years.

4.1 Approach

The business mix along 100 Street has been assessed through a review of the most recently available BC Assessment database for Fort St. John. It therefore would not capture any change to the business mix that has occurred since mid-year 2018. The database was analysed using GIS, focusing on:

1. Businesses with 100 Street addresses between 96 Avenue and 110 Avenue
2. Businesses within the immediate 100 Street 'sphere', defined for this analysis as those businesses along the Avenues feeding into 100 Street that are either:
    a. Contained within buildings that have direct 100 Street presence (e.g. CIBC at 9959 100 Ave), or
    b. Are considered part of the immediate 100 Street catchment (e.g. No Frills, 9831 98a Avenue; businesses along 100 Avenue)

Business mix has been further reviewed by breaking the overall study area into the following-sub-areas:

1. 96 Avenue to 99 Avenue
2. 99 Avenue to 102 Avenue
3. 102 Avenue to 105 Avenue
4. 105 Avenue to 110 Avenue

4.2 Study Area Delineation

The image below shows the area that is included in the 100 Street business mix review. As shown, this includes some businesses that have “avenue” addresses off 100 Street, but which are considered part of the extended 100 Street area.

Figure 3: 100 Street Study Area

4.3 Overall Business Mix

The entirety of the study area depicted in Figure 3 above contains 119 businesses (including 8 vacant units or buildings). Note that this business count excludes any businesses related to accommodation services, and excludes businesses that do not provide goods or services directly to the public via the storefront (e.g. Moose FM, Shaw Cable offices, property management). The vacancy count is for built space only; it does not include vacant lots, or lots currently used for surface parking.

The distribution of businesses by category is presented in the table below. The mix is heavily weighted toward "Service Commercial", accounting for 53% of total businesses. This includes many financial and professional service providers, social and public administrative services, health care services, and personal services.

Table 3: Business Mix in Study Area

Study Area Business Mix		
Category	**Count**	**%**
Convenience	**6**	**5%**
Supermarket	2	2%
Convenience and Specialty Foods	1	1%
Health and Personal Goods	1	1%
Beer, Wine, Liquor Stores	2	2%
Comparison Goods	**20**	**17%**
Clothing and Accessories	4	3%
Electronics and Appliances	2	2%
Furniture and Home Furnishings	3	3%
Sporting Goods, Hobbies, Books, Music	3	3%
Miscellaneous Retail	8	7%
Entertainment and Recreation	**4**	**3%**
Food and Beverage	**15**	**13%**
Café	2	2%
Full-Service Restaurant	6	5%
Quick Service Restaurant	7	6%
Automotive Services	**3**	**3%**
Service Commercial	**63**	**53%**
Health Services	4	3%
Financial Services	14	12%
Personal Services	6	5%
Professional Services	21	18%
Social Services	10	8%
Educational Services	1	1%
Other Services	7	6%
Vacant	**8**	**7%**
TOTAL	**119**	**100%**

Source: BC Assessment 2019; Urban Systems

4.4 Sub-Area Business Mix

4.4.1 96 Avenue to 99 Avenue

The south end of the study area – between 96 and 99 Avenues – contains 23 businesses, or just under 20% of the total study area count. Like the study area overall, service commercial remains the dominant business category (35%). However, it is much more evenly balanced in this area with Food and Beverage (30%). Some of the notable businesses in this sub-area include No-Frills, Homesteader Health Foods, Browns Social House, Mama Panda, and Roustabouts,

96 Avenue to 99 Avenue		
Category	**Count**	**%**
Convenience	2	**9%**
Supermarket	1	4%
Convenience and Specialty Foods	1	4%
Health and Personal Goods	0	0%
Beer, Wine, Liquor Stores	0	0%
Comparison Goods	2	**9%**
Clothing and Accessories	0	0%
Electronics and Appliances	0	0%
Furniture and Home Furnishings	0	0%
Sporting Goods, Hobbies, Books, Music	1	4%
Miscellaneous Retail	1	4%
Entertainment and Recreation	**2**	**9%**
Food and Beverage	**7**	**30%**
Café	0	0%
Full-Service Restaurant	5	22%
Quick Service Restaurant	2	9%
Automotive Services	**2**	**9%**
Service Commercial	**8**	**35%**
Health Services	0	0%
Financial Services	0	0%
Personal Services	0	0%
Professional Services	4	17%
Social Services	0	0%
Educational Services	0	0%
Other Services	4	17%
Vacant	0	**0%**
TOTAL	**23**	**100%**

Figure 4: Business Locations and Counts – 96 Avenue to 99 Avenue

4.4.2 99 Avenue to 102 Avenue

This sub-area encompasses the heart of Downtown Fort St. John, including the City's main downtown intersection at 100 Avenue and 100 Street. This area contains most of downtown's comparison goods retailers (65%), nearly half of the service commercial providers (including 100% of health service providers), and 40% of Food and Beverage locations. Notable businesses in this area include Whole Wheat and Honey café, 3 major banks (Scotia, CIBC, TD), and downtown's most notable hotel (not included in the inventory).

99 Avenue to 102 Avenue		
Category	**Count**	**%**
Convenience	**0**	**0%**
Supermarket	0	0%
Convenience and Specialty Foods	0	0%
Health and Personal Goods	0	0%
Beer, Wine, Liquor Stores	0	0%
Comparison Goods	**13**	**24%**
Clothing and Accessories	3	6%
Electronics and Appliances	1	2%
Furniture and Home Furnishings	3	6%
Sporting Goods, Hobbies, Books, Music	1	2%
Miscellaneous Retail	5	9%
Entertainment and Recreation	**0**	**0%**
Food and Beverage	**6**	**11%**
Café	2	4%
Full-Service Restaurant	1	2%
Quick Service Restaurant	3	6%
Automotive Services	**0**	**0%**
Service Commercial	**30**	**56%**
Health Services	4	7%
Financial Services	8	15%
Personal Services	2	4%
Professional Services	9	17%
Social Services	5	9%
Educational Services	1	2%
Other Services	1	2%
Vacant	5	**9%**
TOTAL	**54**	**100%**

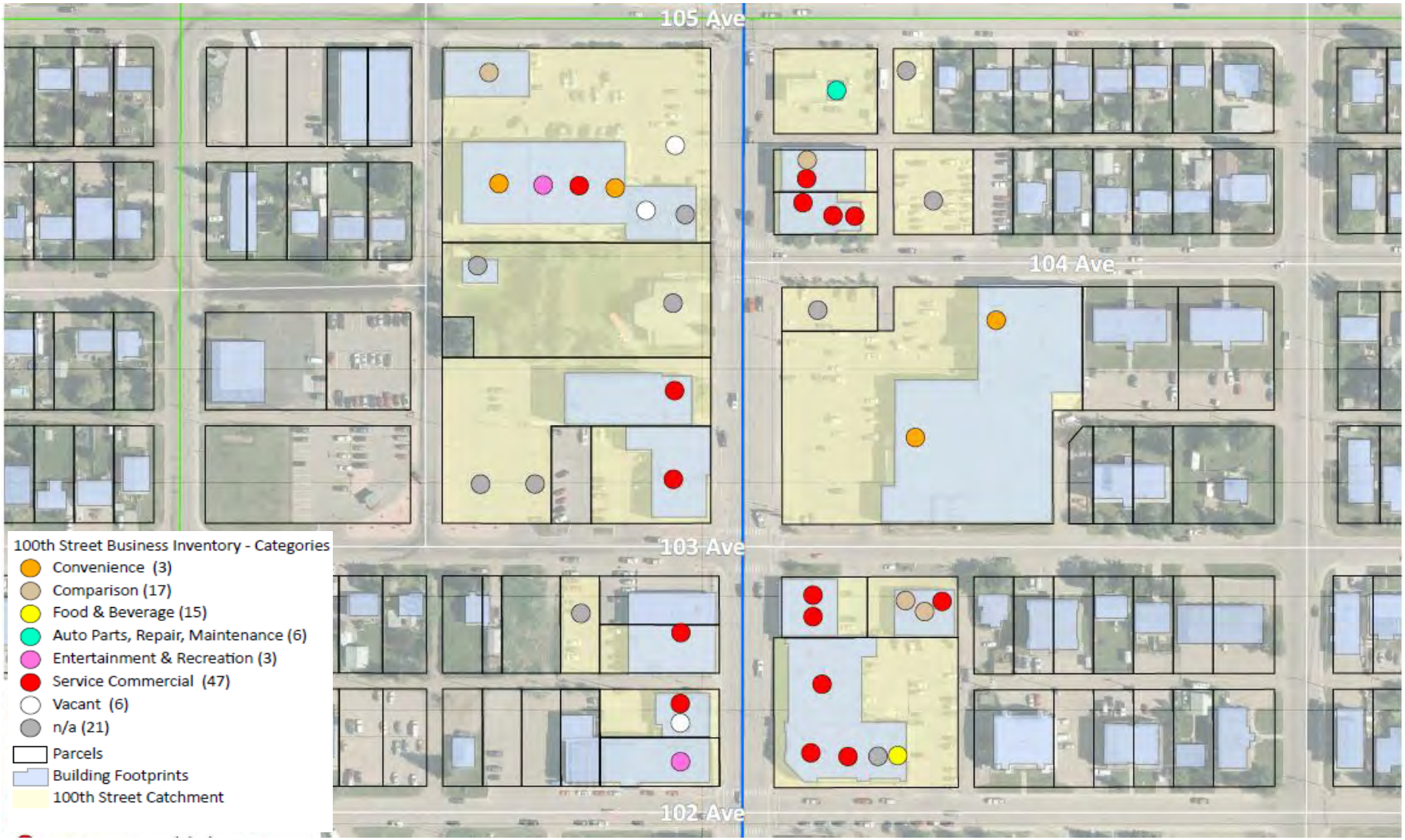
Figure 5: Business Locations and Counts – 99 Avenue to 102 Avenue

4.4.3 102 Avenue to 105 Avenue

The 102-105 Avenue section of the study area contains 30 businesses (including 3 vacant), accounting for 25% of the total count. This area contains the primary clusters of downtown businesses in the "convenience" category, including one major supermarket (Save-On), downtown's only health and personal goods provider (Shoppers Drug Mart), and the BC Liquor Store. Other notable businesses include Systems Sound Source and a variety of hair and nail salons.

102 to 105 Avenue		
Category	**Count**	**%**
Convenience	4	**13%**
Supermarket	1	3%
Convenience and Specialty Foods	0	0%
Health and Personal Goods	1	3%
Beer, Wine, Liquor Stores	2	7%
Comparison Goods	4	**13%**
Clothing and Accessories	1	3%
Electronics and Appliances	1	3%
Furniture and Home Furnishings	0	0%
Sporting Goods, Hobbies, Books, Music	1	3%
Miscellaneous Retail	1	3%
Entertainment and Recreation	**2**	**7%**
Food and Beverage	**1**	**3%**
Café	0	0%
Full-Service Restaurant	0	0%
Quick Service Restaurant	1	3%
Automotive Services	**1**	**3%**
Service Commercial	**15**	**50%**
Health Services	0	0%
Financial Services	5	17%
Personal Services	4	13%
Professional Services	3	10%
Social Services	2	7%
Educational Services	0	0%
Other Services	1	3%
Vacant	3	**10%**
TOTAL	**30**	**100%**

Figure 6: Business Locations and Counts – 102 Avenue to 105 Avenue



4.4.4 105 Avenue to 110 Avenue

The stretch from 105 to 110 Avenue is home to many notable institutional buildings in Fort St. John, including City Hall, the RCMP, WorkSafe BC, and the Provincial Government Building and Law Courts. From a commercial retail perspective, this stretch contains only 10% of the total business count. Most businesses fall into the service commercial cluster (with the exception of one quick-serve restaurant – Tim Horton's).

105 to 110 Avenue		
Category	**Count**	**%**
Convenience	0	**0%**
Supermarket	0	0%
Convenience and Specialty Foods	0	0%
Health and Personal Goods	0	0%
Beer, Wine, Liquor Stores	0	0%
Comparison Goods	1	**8%**
Clothing and Accessories	0	0%
Electronics and Appliances	0	0%
Furniture and Home Furnishings	0	0%
Sporting Goods, Hobbies, Books, Music	0	0%
Miscellaneous Retail	1	8%
Entertainment and Recreation	**0**	**0%**
Food and Beverage	**1**	**8%**
Café	0	0%
Full-Service Restaurant	0	0%
Quick Service Restaurant	1	8%
Automotive Services	**0**	**0%**
Service Commercial	**10**	**83%**
Health Services	0	0%
Financial Services	1	8%
Personal Services	0	0%
Professional Services	5	42%
Social Services	3	25%
Educational Services	0	0%
Other Services	1	8%
Vacant	0	**0%**
TOTAL	**12**	**100%**

Figure 7: Business Locations and Counts – 105 to 110 Avenue

4.5 Tenant Mix and Positioning Commentary

Downtown Fort St. John has many strong elements today that can be built on and complemented in order to maximize the benefit from the substantial infrastructure investment of a 100 Street renewal. A more detailed, stand-alone Downtown Repositioning, Retention and Attraction Strategy should be considered as a 'next step' piece following completion of this charrette to ensure that all stakeholders are properly aligned and resources properly allocated such that the substantial 100 Street surface investment to come achieves positive and lasting results for downtown businesses and Fort St. John residents.

We offer the following commentary based on the foregoing snapshot of the current business mix in Fort St. John between 96 and 110 Avenue.

- The 100 Street tenant mix overall is heavily dominated by service commercial categories, including a substantial amount of social and public service agencies. This attracts lots of traffic, but the mix of services also lends itself to some concerns around safety. Generally speaking, the over-representation of social agencies in the downtown can prove a negative to attracting shoppers
- The presence of major financial institution locations in the downtown is a core strength that should be maintained. Many smaller communities achieve excellent spinoff benefit from traffic generated by downtown banks and their presence should not be taken for granted
- The downtown benefits from two major retail grocery stores, and two pharmacies, and is home to the City's only major health food store. All are destination draws, with spinoff spending potential
- The downtown benefits from the presence of notable institutional and cultural anchors beyond the above convenience retail anchors:
    - The North Peace Cultural Centre is a critical downtown anchor, and its location at the core intersection of the downtown is a valuable asset. As the City's only true "community centre", it serves as a major downtown anchor and draws significant traffic which can lead to spinoff benefits for businesses within a walking catchment
    - The Lido Theatre is a unique community asset, and its presence downtown could create notable spin-of benefits if future complementary businesses are co-located in that sub-area
    - Centennial Park and its recreational campus act as a downtown anchor at the south end. The Festival Plaza (currently under construction) will act as a permanent space for the local farmers market. The improvement of pedestrian connections between the heart of downtown and Centennial Park will help to draw commerce between the two
- The downtown has some notable restaurants (e.g. Browns, Roustabouts), but overall entertainment and destination restaurants are under-represented
- Beyond convenience and food and beverage categories noted above, there is insufficient critical mass in any other category to serve an anchoring role in the downtown

- While there are unique, independent businesses that are destinations unto themselves, there is no clustering or critical mass in complementary categories in any one sub-area to create a compelling destination 'node'
- An example of a destination 'cluster' could be a group of independent clothing retailers, or home furnishings retailers, or perhaps a compelling mix of destination restaurants

Independent Business Cluster as Anchor Case Study: Napanee, Ontario

Context:

- Downtown Napanee was negatively impacted by outflow spending to major retail centres in nearby communities
- A small collection of fashion-forward independent retailers have created a cluster of businesses in the downtown that now attract comparison retail shoppers
- The businesses offer something that cannot be found at nearby malls – high quality products, knowledgeable and consistent staff, and a pleasant shopping environment (due to public realm investments)

Lessons Learned:

- Strong urban design plan allowed residents, business owners, landlords all buy into a comprehensive vision for the area
- Collaboration across stakeholder groups was critical, including public, private and non-profit organizations which all helped raise funds and support business-led initiatives (through a BIA)
- Showed the benefit of a strong BIA with a dedicated full-time staff person mandated with leading the revitalization initiative

- Adding additional anchor clusters over time in both food and beverage and comparison goods categories will be critical
- The primary geographic focus in downtown going forward should be within the 1-2 blocks radiating north-south and east-west from the main intersection at 100 Avenue and 100 Street. If a critical mass of comparison business and destination food and beverage can be established in this area, this will serve as a key point of attraction, which could ultimately serve as a catalyst for attracting other businesses into the downtown
- Within this defined 'focus precinct', an investment by the municipality into the physical environment (as is about to occur along 100 Street), and addressing pre-existing social problems, are both essential pre-conditions for proceeding with further changes
- The downtown should complement rather than compete with the major shopping centre (Totem Mall) and the large format retail and strip retail around it. Since most of downtown has lower rents than these shopping centres, this can be an important marketing and leasing tool

5.0 Case Studies on Impact and Mitigation

The purpose of this section is twofold:

1. First, to document primary and secondary research findings from comparable communities in BC and Alberta that have undertaken similar street renewal projects to identify impact on businesses during construction, initiatives to mitigate those impacts, and subsequent impacts/benefits from new street treatments.
2. Second, to present summary findings from published literature on the topic of infrastructure investment and business impacts

The case study communities were selected based on both recency of their main street renewal undertakings (all since 2012) and an internal survey across our organization to identify relevant examples. The following communities were selected:

- Innisfail, Alberta
- Rocky Mountain House, Alberta
- High River, Alberta
- Kelowna, BC
- Quesnel, BC

5.1 Case Study #1: Innisfail, Alberta

Population: 7,847 (2016)

Street Profiled: 50th Street between 53rd Street and Highway 2A

Year of Project: 2010 – 2015

Project Budget: $8.5 Million

Plan: Downtown Innisfail Area Redevelopment Plan - 2013

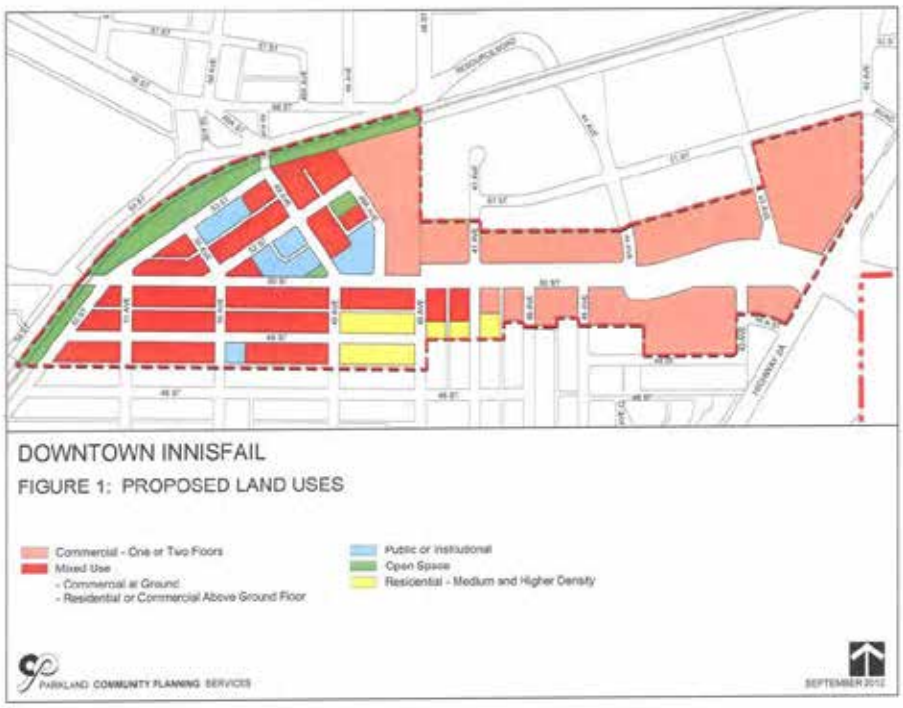


Figure 8 - Downtown Innisfail Area Redevelopment Plan (Parkland Planning Services, 2013)

Description and Project Drivers:

The Downtown Innisfail Area Redevelopment plan was created to address several issues that had been raised by staff and the community. The redevelopment project hoped to encourage investment in the downtown to attract new businesses to increase the variety of stores found downtown as well as to make the area more attractive and comfortable for residents and visitors. The project also intended to address the perception of a lack of parking, vandalism concerns, accessibility for mobility challenged residents and the appearance of buildings. In addition, the project would replace the aging utility infrastructure and road surface. The project focused on the replacement and beautification of six blocks of 50th Street.

Business Impact:

The project was completed in three phases. Each phase consisted of approximately two blocks of 50th Street for three consecutive construction seasons. Phase 1 and two both consisted of approximately 15 weeks of construction, and Phase 3 consisted of approximately 13 weeks of construction. During this time several traffic detours and road closures were put in place which did affect businesses along 50th Street.

The main core of downtown was impacted for a year. During this time efforts were made to mitigate construction impacts by encouraging rear access, and staging construction, so that sidewalks were completed last, but impacts were still severe.

Degree of Impact:

There was a significant impact on downtown businesses during construction. Most businesses in the project area reported losses of at least 50% and two businesses closed over the course of the project. Businesses need to be well aware of potential impacts to their operations and given as much notice as is possible. Businesses that struggle before construction are the most vulnerable.

Success of Mitigation Strategies:

Key actions that can help make a revitalization project go smoothly are good project communications and a good team. Throughout the project, key updates were made available to the public through news stories, and, media releases and a variety of other platforms. The engagement process began a full two years before construction with some discussions with businesses and the public. Regular open houses and discussions with individual business owners began one year before construction. There were regular updates in the news and communications to businesses; stakeholders were able to stay up to date with the project's progress.

Another key mitigation strategy used in the Downtown Innisfail Area Redevelopment project was to have a consistent and high-quality project team. Parts of the project were awarded by phases meaning that there was potential to have different contractors work on the project year to year. However, the prime contractor advised the municipal council to keep the same team throughout which provided consistency and eliminated the need to bring new contractors up to speed part way through the project. The result was a project team that operated efficiently and delivered the project on budget and even delivered Phase 2 two weeks ahead of schedule despite delays early in the season from excess precipitation.

Maintaining access to businesses is difficult during construction, but there are strategies to mitigate impacts. The project team for Downtown Innisfail completed the work in two block segments. In each segment, the middle of the street was completed first to leave sidewalks open for businesses, and rear access was encouraged where possible. During the sidewalk replacement, the team constructed bridges to the doorway of each business to maintain access.

One of the Town Councillors at the time was able to share the sales data for a restaurant that they owned in the project area. An analysis of the restaurant's sales data revealed when the establishment was likely to be busiest during the construction activities. Some construction was able to be rescheduled to try and minimize sales loss. However, despite these strategies, impacts on businesses were still significant.

Lessons Learned:

Several important lessons can be learned from the Downtown Innisfail Area Redevelopment project that can be used to inform similar projects in other jurisdictions, including Fort St. John.

1. Design for user comfort

   Two years after installation, many of the benches installed during the redevelopment project had to be reinstalled because their original locations were too close to the street. The benches were not well used in part because users complained about sitting so close to traffic and expressed safety concerns associated with being so close to moving vehicles. The benches were moved further from the street and re-orientated to face the street as part of a construction project in April 2019

Figure 9 - Bench too close to roadway Innisfail, AB (source: Innisfail Province, https://www.innisfailprovince.ca/article/town-shuffles-main-street-aesthetics-20190423)

2. Timing of construction is important

   Phase 2 of the project was delayed due to excessive precipitation in late spring / early summer 2013. Ensure the project schedule allows for some flexibility to accommodate for unforeseen weather events.

3. Maintain access

   Encourage rear access where possible and sequence construction activities, so that sidewalk access is maintained as long as possible.

4. Analyze Sales Data if available

   If affected businesses are willing, it is beneficial to analyze sales data to see if construction can be scheduled to minimize the impact on affected businesses. Work can be slowed or modified during known busy times in the construction season to help ensure that businesses can survive.

5. Rear Lane Access results in cleaned up alleyways

   As a result of encouraged rear lane access, business owners cleaned up the rear entrances to their businesses. The improved rear lanes had less litter, were more orderly and had new signage installed.

6. Create a façade improvement program

   A façade improvement program allows businesses to participate in downtown beautification efforts directly. Creating a fund that matches contributions towards beautification efforts can increase buy-in and enhance the overall effect of parallel improvement efforts.

7. Develop a downtown organization

   The final plan recommended the development of a Downtown organization to represent the interested of businesses in the downtown. Before the planning process, a downtown organization did not exist, which made it more difficult to contact all business owners throughout the project. The development of a downtown organization allows business owners to consolidate their voice as one entity that can carry more weight in the planning process.

5.2 Case Study #2: Rocky Mountain House, Alberta

Population: 6,635 (2016)

Street Profiled: Main Street Between Edgerton Street/ 48th Avenue and Highway 11 A / 52 Avenue

Year of Project: 2014 – 2016

Plan: Rocky Mountain House: Our Main Street Conceptual Plan - 2013

Description and Project Drivers:

Rocky Mountain House's Main Street revitalization was an effort to enhance the downtown to make it more welcoming for residents and visitors and to replace utility infrastructure and road surfacing that was reaching the end of its life. In total four blocks of downtown were revitalized with new road surfacing, utilities and landscaping.

- 3-year infrastructure improvement project along the 4-block main street
- Before: wide enough for four drive lanes, but used as two extra-wide lanes, plus angled parking on either side.
- After: significantly narrowed drive lanes (1 in each direction), angled parking remained, sidewalks widened by 3 metres
- Challenge of significant grade changes, requiring innovative solutions

Figure 10 - Elevation drawing from "Our Main Street" Conceptual Plan (Town of Rocky Mountain House, 2013)

Business Impact:

The Main Street revitalization project spanned a total of four years, which began with the call for proposals for a qualified contractor to complete the work and the associated engagement in 2012. The project was completed in late 2016.

The first two years of the project saw two downtown blocks closed to traffic. Year one of the project saw the first two blocks of the project area revitalized with new utilities and road surfacing. In year two, the

road surface and utilities were replaced for the remaining two blocks. Landscaping improvements were completed in the third year.

The drawn-out phasing process was ultimately seen as a negative by most businesses looking back, as it was felt this 'dragged things out' too long. Planning believed there was no other choice due to project complexity and seasonality of construction.

Degree of Impact:

Figure 11 - Street revitalization construction (Google Street view, June 2014)

Traffic was disrupted in downtown Rocky Mountain House for two years which did have an impact on businesses. Some businesses were unable to cope with the construction and were forced to close due to decreased business resulting from the access impacts. During construction, impacted businesses could not rely on street parking and could only be accessed by a 2-metre sidewalk directly abutting building facades.

Success of Mitigation Strategies:

Despite the closure of some businesses along Main Street during construction, the project was deemed a success and was given an award for Main Street Rehabilitation by the Consulting Engineers of Alberta in 2016. The project faced grade challenges due to the streets natural 4% gradient, but the project team was able to maintain access for people with mobility challenges both during construction and in the final design after construction.

A key component of the project's success was the robust communications strategy that was implemented throughout the project. The strategy included a schedule of open houses, social media messaging, and both website and email updates to the public and affected businesses. The communications started well before construction to inform people of pending traffic impacts, and the anticipated schedule before the project started, which helped to let the community know what to expect.

Communications through multiple channels continued throughout the project. The project team provided weekly updates on construction activities to residents and business owners across a variety of platforms. The project updates were complete with scheduled and completed activities and a contact person for

questions. The project update page is still on the municipality's webpage and provides a full record of all construction activities over the course of the entire project.

Since the project was completed, businesses indicate they have seen an increase in the amount of foot traffic versus under pre-construction conditions. They feel strongly that the much-improved street – with generous pedestrian realm – has and will have long-term business improvement benefits.

Key communications activities that contributed to the project's success were:

- Once logistics, construction schedule, phasing and accessibility routes were finalized, and before construction start-up, a "project information session" was hosted to provide all public and business stakeholders with key information, as well as to introduce the contractor and project managers to the public
- An ongoing website presence with frequent updates was provided to give information on new construction/accessibility status information on at least a weekly basis
    - The link to this website was provided to all business and property owners
- Bi-weekly ads were placed in the local newspapers updating status of the project and encouraging people to shop downtown and support downtown businesses
- The Town advertised for any on-off events specifically designed to support the businesses impacted during construction. Such events included:
    - Weekly downtown marketplace (outdoor vendors, live music)
    - Downtown farmers market
- Weekly construction updates were circulated to downtown businesses owners, along with councillors, chamber of commerce and all town staff
- A vacant tenant space along main street was rented for the duration of construction to host the project manager for the Town's engineering consultant. In addition, the consultant had an on-site trailer which acted as a place for public inquiry
- Social media was used extensively to send project updates of temporary road closures, water and sewer shutdowns, and pedestrian accessibility changes.
- Engineering consultants had presence at outdoor vendor stalls during weekly Marketplace on Main event to provide updates, present designs, and receive public feedback

Lessons Learned:

Several important lessons can be learned from the Rocky Mountain House downtown revitalization project:

1. A robust communications plan is very important

   The project team should share communications, engagement and construction methodology to stay on the same page and ensure consistent messaging to stakeholders.

   Consistent and regular updates should be communicated with public and business owners to keep them in the loop about traffic impacts, delays, and overall project progress.

2. Having a functional team is critical

   This project was awarded in stages. The first stage was to hire a prime constructor who was first tasked with coming up with a construction plan that included the design and assembly of the whole construction and contractor team in advance of the construction season.

   To get a good project that is on time and budget requires hiring an experienced and organized contractor and a good team. Awarding work to the lowest bidder is not a strategy that is likely to yield success.

3. Timing of construction is important

   Temporary utility lines can still freeze and cause problems in early spring. Careful attention should be paid during early in the construction season to avoid problems which could cause damage and delays.

4. Ongoing efforts to mitigate parking and wayfinding issues

   The Town and project team provided ongoing communication, and attention to details regarding wayfinding proved critical to maintaining access and traffic to downtown businesses.

   The Town worked continuously to provide free parking just off the main street throughout construction. Parking was provided on city-owned vacant lots as well as other vacant lots that were leased for the purpose of parking.

5.3 Case Study #3: High River, Alberta

Population: 13,584 (2016)

Street Profiled: 4th Avenue South West between Macleod Trail SW and 1st Street SW

Year of Project: 2013 – 2019

Project Budget: $100 million

Plan: Town of High River Downtown Area Redevelopment Plan – 2015

Description and Project Drivers:

A catastrophic flood in 2013 inundated much of downtown High River. Floodwaters ruined many businesses and put the town on hold for several years. The redevelopment project was an effort to recover from the flood and was used as an opportunity to drastically reimagine the downtown public realm.

Residents and business owners do not want to be defined by the flood, which is why the improvements downtown are so important. The revitalization of downtown High River allows the community to "build it back better", reinventing itself as a place that prioritizes people rather than vehicles.

Figure 12 Public Realm Illustrative Concept Plan (Town of High River Downtown Area Redevelopment Plan, 2015)

Business Impact:

Several businesses were forced to close after the floods, and more were affected by the slow recovery and construction in the downtown. Recovery and construction are still ongoing, but the impacts on original businesses, especially after the initial hardship of the flood cannot be overstated.

Success of Mitigation Strategies:

The downtown redevelopment in High River prioritizes people rather than vehicles. Some residents and businesses are split on the success of the upgrades, but the award-winning project has attracted several new businesses to the downtown and has signalled that High River is business friendly. Since the flood, the downtown vacancy rate is reportedly down by 60%, and the population has risen 5%.

The town has been careful to coordinate construction efforts with downtown businesses to mitigate impacts and has also been proactive in offering grants and loans to struggling businesses to help them through the construction and also to attract new businesses. Despite these efforts, some businesses still have had to close their doors, but the overall trend has been successful. The Town's "High River Business Advantage" offers:

- Free business licenses to those under 25 years old
- 0% business, manufacturing, and equipment tax
- $700k investment in high-speed broadband internet

The downtown redevelopment of High River has been successful. Several new businesses have been attracted to the downtown, and business owners report that the downtown is better than ever.

Figure 13 - Businesses are open in downtown High River (CBC, 2017, https://www.cbc.ca/news/canada/calgary/high-river-flood-rebrand-1.3992449)

Lessons Learned:

The driver for redevelopment in downtown High River was sudden and unexpected, setting it apart from other redevelopment projects elsewhere. However, despite the unexpected nature of the project, High River's redevelopment has been very successful, and the Redevelopment Plan was honoured with a gold award for planning excellence from the Canadian Institute of Planners. Key lessons from High River include:

1. Improvements are not going to appeal to everyone

   Change is not welcomed by everyone, but the result has been successful in revitalizing the downtown and making it more comfortable to pedestrians.

2. Design with resilience in mind

   The driver for this project was the 2013 flood. The town has since learned the severe and years-long impact to residents and businesses alike of not designing for resilience in the face of natural disasters. A significant portion of the redevelopment project was a $100 million-dollar flood mitigation system which makes High River one of the best flood protected communities in the country.

Figure 14 - 4th Avenue SW three years after the flood (Google Street View, 2016)

3. Have a clear plan for sidewalk snow removal

   Many business owners were unwilling to clear snow from the significantly wider sidewalks in front of their stores. This has led to the Town of High River taking on the responsibility (and expense) of all public realm snow clearing. This is something that should be considered and budgeted for.

5.4 Case Study #4: Bernard Avenue Revitalization, Kelowna BC

Population: 132,084 (2017)

Street Profiled: Bernard Avenue

Year of Project: 2012-2014

Plan: City of Kelowna, My Downtown! - 2012

Description and Project Drivers:

The Revitalization of Bernard Avenue was a priority project in the My Downtown! plan of 2012. The main goals of the downtown plan were to attract people to downtown, increase sense of safety, and attract private sector investment. To achieve these goals, some specific strategies were laid out to support the Bernard Avenue corridor, the most important of which was to support Bernard Avenue as the focus of the downtown shopping area. Parts of this strategy included eliminating parking requirements and supporting single day closures for festivals and markets.

Figure 15 - Bernard Avenue Revitalization

The project involved the following components:

- Replacement of 4 driving lanes plus angled parking with two driving lanes and parallel parking, plus a centre turning lane

- Significant widening of sidewalks: 7 metre sidewalks were installed, split into three 'zones'
    - Middle zone – a 2-metre unobstructed corridor for pedestrian movement
    - Furnishing zone – for benches, trees, lights between middle zone and roadway
    - Merchant zone – adjacent to buildings for display and patios
- Part of the street revitalization effort included a comprehensive Business Attraction and Retention Strategy, which included tenant mix and positioning recommendations for defined 'retial precinct's along Bernard Avenue

Business Impact:

The Bernard Avenue project was completed over three years and replaced seven city blocks in three phases. No construction was completed in the winter, but businesses along the street still experienced impacts from access and noise.

Success of Mitigation Strategies:

Key drivers of the project's success revolved around the City's marketing and communications plan as well as efforts made by the construction team to maintain access to impacted businesses. Specifically:

- City set aside a considerable budget for communications throughout the project and employed a comprehensive communications plan
- Had a dedicated communication official acting as a liaison between the City, the contractor, and the Bernard Avenue merchants
- Downtown Kelowna Association (DKA) set aside money in their annual budget over two years in advance of the project to develop a comprehensive marketing plan and worked closely with the City's communications people to ensure consistency of messaging
- Contractor and City both worked diligently to provide continuous access to all businesses through wooden walkways, and made efforts to provide wayfinding signage and key information such as where to park
- Construction was halted during the summer tourism months, and during December.
- BIA reached out to stakeholders and helped facilitate the review of the different design scenarios
    - Planners gave 3 scenarios for construction timeline
    - BIA facilitated communication, workshops, feedback, to come to a consensus on which scenario would be best for the business and downtown, and the tourist season
    - BIA also put aside money to develop marketing plan to work with the City's messaging.

Lessons Learned:

The Bernard Avenue Project provided insights into the importance of good communications and access to businesses throughout the process. It also provided insight into the impact of existing businesses both from a business health and scheduling standpoints.

1. Ongoing Project Communication is Key

   Good signage and ongoing communication between the City, the contractor, and the business owners were incredibly important to business success during construction

2. Shorter construction timelines are better for businesses

   Very staggered construction schedule ultimately seen as a negative by businesses along Bernard Avenue, as the project dragged for too long

Figure 16 - Bernard Avenue Revitalization

3. Maintaining access is critical for business health

   - Business impacts were felt more significantly by those businesses in mid-block points away from the intersections. Extra attention was paid to drive foot traffic to these buildings

   - Providing ongoing access to pedestrians, and clear signage is critical

4. Businesses that struggled before construction will be most impacted

   Several businesses closed during the construction phase; however, these were known to be struggling before the commencement of construction

5. Be mindful of materials, structures, and usability

   Bike racks that look like a bollard are limited to 2 bikes per rack

   Composite seating is very porous and stains easily

   New parking pads are flush with sidewalk which has caused some drivers to accidentally park in the sidewalk. Roll over curbs provide a barrier that drivers can feel which makes it easier to park.

5.5 Literature Scan – Complete Streets

In addition to the case studies described above, Urban Systems conducted a brief literature scan which looked at the implications of street redesign initiatives for private investment, retail sales, and other municipal benefits.

There is a growing literature documenting case study research on the benefits of Complete Streets implementation. Complete streets are streets are designed for all ages, abilities, and modes of travel, and provide safe and comfortable access for all users. While Complete Streets are typically considered in denser, urban contexts, there is increasing demand to create these types of physical environments in smaller, rural communities.

There are clear economic and business benefits from complete street implementation.

5.5.1 Spurring Private Investment and Increasing Retail Sales

Investments in complete street policies and programs can stimulate both concurrent and subsequent private investment, particularly in retail districts and downtowns where pedestrians and cyclists currently feel unwelcome.

- *Washington, DC (Barrack's Row)*:
  - Design improvements along a ¾ mile corridor included new sidewalks and traffic signals
  - Helped to attract 40 new businesses and nearly 200 jobs, along with documented increases in foot traffic and sales
- *Lancaster, California:*
  - Added pedestrian safety features as part of downtown revitalization effort, including pedestrian-only plaza, wider sidewalks, landscaping and traffic calming
  - Project spurred $125 million in private investment, a 26% increase in sales tax revenue, and 800 new jobs after public investment of $10.6 million
- *Mountain View, California*:
  - Addition of space for sidewalk cafes and redesign of the street for pedestrians were followed by private investment of $150 million, including residential, retail, offices
- *Buffalo, New York:*
  - In evaluating the impacts of complete street initiatives, it was noted that survey data from local business owners indicating an increase in sales following complete streets overhauls
- *Toronto, ON*
  - The Toronto Centre for Active Transportation (TCAT) prepared an economic impact study of bike lanes in two highly active downtown neighbourhoods as part of a 2.4km bike infrastructure pilot project

- Survey data was collected before and after bike lane installation over 3 time periods, including visitor surveys, merchant surveys and vacancy scans. The same data was collected for 2 control areas
- Additional data was collected from Moneris Solutions Corporation to track actual recorded point-of-sale transactional trends for businesses in the pilot and control areas
- Survey findings showed:
  - Increased customer counts vs. control areas
  - Increased frequency of customer visits
  - Increase of frequency arriving by non-automotive means
  - No change in vacancy rates
- Moneris Point of Sale data showed:
  - Transactional volumes grew more in the pilot areas than the control areas
  - Average transaction size declined less in the study area than in the control area (within industry-wide decrease in per-transaction sizes)

- *Vancouver, BC*
  - Stantec, in partnership with Site Economics and Mustel Group, prepared a Business Impact Study in 2011 related to two separated bike lanes constructed in Downtown Vancouver on Dunsmuir Street and Hornby Street. In each case road space was re-allocated, parking was removed, loading zones were reduced, and turning restrictions were introduced
  - The study relied on a combination of:
    - Survey of area businesses asking about percentage change in annual sales (vs. control areas)
    - Survey of commercial property owners and property managers
    - Customer exit surveys
  - The study found that there was a modest impact on sales (negative) in the year following bike land installation and changes to parking and traffic flow
  - Anecdotally, the businesses in the area have recovered and thrived since that time

5.5.2 Raising Property Values

Complete streets policies lead to networks of streets that are safe and accessible, which can in turn raise property values.

A survey of 15 real estate markets in the United States found that a one-point increase in walkability of a neighbourhood (as measured by WalkScore.com) increased home values by $700 to $3,000. In

Washington DC region, becoming one step more walkable (on a 5-point scale) added $9 per square foot to retail rents and $82 per square foot in home values. This impact is amplified when walkable areas are near one another.

The preference for walkable neighbourhoods is likely to increase in the coming decades.

Downtown Business Mitigation Strategy

FORT ST. JOHN
The Energetic City

October 2019

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APPENDICES

2.0 INTRODUCTION

The City of Fort St. John recognizes the unique features and challenges of reconstructing the public right-of-way in an urban downtown environment. Therefore, the City began the process of creating a Downtown Business Mitigation Strategy to be completed in advance of significant multi-year revitalization construction, scheduled to start in 2020.

The 100 Street project will be similar to other construction projects and we anticipate that construction phases will change the routines and habits of owners, operators, and customers. However, a well-developed business mitigation strategy can reduce the impacts on businesses with the objectives of:

- That pre-construction, businesses have a clear understanding of the construction process and the multiple tools the City is applying to support businesses during construction
- That during construction, there are no unreasonable impacts or burdens on existing businesses
- That post-construction, businesses have an opportunity to thrive in a revitalized urban environment designed with high quality urban design that emphasizes the pedestrian experience. Infrastructure will be new and sized to accommodate modern developments, leading to increased investor confidence knowing there is resilient infrastructure in place.

2.1 Study Area

The study area is focused on 100 Street from 96 Avenue to 105 Avenue. However, the strategies applied in this report can be extended to other areas of the downtown as construction extends beyond the study area.

3.0 COMMUNICATION

A communications plan is currently under development with underlying principles of communicating early and often and such that there are no surprises to the affected downtown businesses.

- A city-sponsored, extensive public marketing campaign that addresses the 'open for business' message and helps to educate the public on how to access impacted businesses throughout the construction phase. Considerations for this include:
    - Advertising
    - Social media
    - Website
    - Mapping
    - Signage
    - Road-side signage
    - Parking information

4.0 OFF-SITE INVESTMENTS

In advance of construction along 100 Street occurring, there are numerous off-site investments the City has made to ease the impacts to the downtown business community and community members during construction.

4.1 Existing Investments

Over the previous three years, the City proactively invested in the following off-site investments to support the anticipated 100 Street revitalization construction.

4.1.1 Lanes

Lanes (alleys) provide an operational function for adjacent properties and can accommodate deliveries, utilities, staff entrances, and operational services such as garbage disposal to occur. During construction, lanes may also be used more frequently by customers.

The City has upgraded the following gravel lanes to an asphalt surface complete with underground stormwater systems for improved drainage:

- Lane north of 100 Avenue, 100 Street to 102 Street
  (Green Space / Evangel Chapel to Lido Theatre / Canada Post)
- Lane south of 100 Avenue, 100 Street to 102 Street
  (Cultural Centre to BCGEU building)
- Lane south of 100 Avenue, 100 Street to 98 Street
  (CIBC / Allied Answering Service to Alaska Highway News)

4.1.2 Asphalt Overlays

Existing asphalt roads adjacent to 100 Street are anticipated to receive higher traffic volumes during construction of 100 Street as the roadway will be closed in segments thereby restricting continuous north-south through movements.

The following existing asphalt surfaces adjacent to 100 Street received asphalt overlays to extend the useful life of each roadway and to provide a more desirable driving surface for alternate routes:

- 98 Street, 103 Avenue to 106 Avenue (2019)
- 102 Street, 93 Avenue to 94 Avenue (2019)
- 101 Avenue, 100 Street to 102 Street (2017)
- 101 Avenue, 100 Street to 98 Street (2017)
- 99 Avenue, 100 Street to 102 Street (2017)

4.1.3 Enhanced Downtown Maintenance

Since 2016, the City invested an additional $100,000 per year in enhanced downtown maintenance. This allows for enhanced operational activities such as snow clearing, street sweeping, sidewalk sweeping and washing, painting of furnishings, and garbage removal.

The City intends to continue this enhanced downtown maintenance program throughout downtown revitalization construction phases.

4.1.4 Manager of Economic Development

The City created a new permanent staff position in 2018 for the Manager of Economic Development. Part of the mandate of this position is to work with downtown businesses to curate a thriving downtown environment and to manage community communications.

Jennifer Decker, Manager of Economic Development, offers a direct line of communication between the City of Fort St. John and business owners and operators.

4.1.5 98 Street at 100 Avenue Intersection

The intersection of 98 Street at 100 Avenue currently allows for 4-lanes of through east-west vehicle movements and a two-way stop for north-south vehicle movements. There is an existing unsignalized pedestrian crossing across 100 Avenue.

Existing traffic count data and traffic modelling identifies this intersection operating at a low level for north and southbound approaches, respectively.

Signalizing the intersection, similar to Figure 4-1, will provide greater opportunities north-south traffic movements parallel to 100 Street in a similar function as 102 Street. The new signalized intersection will also introduce left-hand turn slots for north-south vehicle movements.

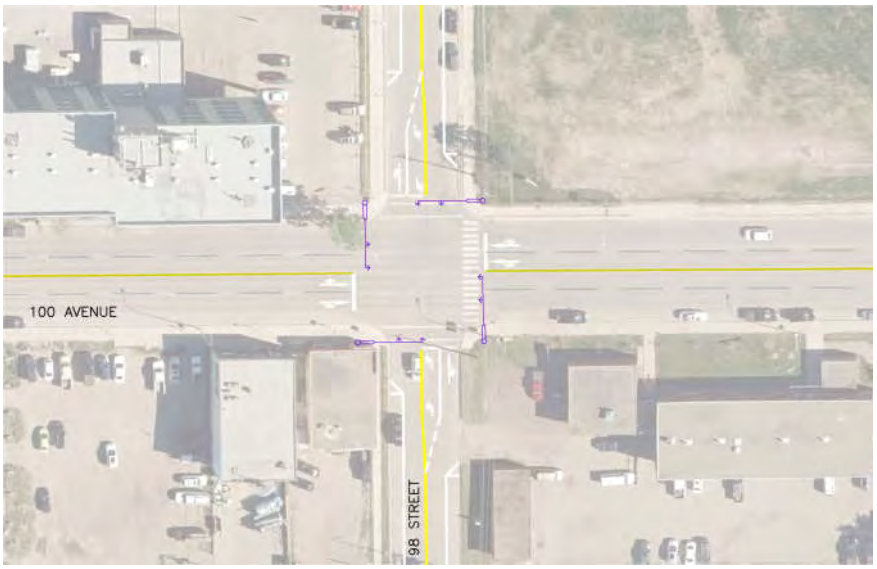

Figure 4-1: Proposed upgrades to 98 Street at 100 Avenue intersection

The City is targeting to complete this work by the end of November 2019.

4.1.6 102 Street at 100 Avenue Intersection

The intersection of 102 Street at 100 Avenue is currently a signalized intersection that allows for 4-lanes of through east-west vehicle movements and a 2-lanes of through north-south vehicle movements.

The City plans to upgrade the existing signalized intersection, similar to Figure 4-2, to introduce left-hand turn slots for north-south vehicle movements. These upgrades will better accommodate turning movements and higher volumes of vehicles which are anticipated to occur during construction phases.

Figure 4-2: Proposed upgrades to 102 Street at 100 Avenue intersection

The City is targeting to complete this work by the end of October 2019.

4.2 Proposed Investments

The City is exploring the following off-site investments to mitigate impacts to their transportation network and businesses.

4.2.1 Intersection of 96 Avenue at 96 Street

The intersection of 96 Street at 96 Avenue currently allows for 4-lanes of through north-south vehicle movements and a two-way stop for east-west vehicle movements. There is an existing unsignalized pedestrian crossing across 96 Street.

The east-west movements along 96 Avenue provide an opportunity for motorists to take an alternate route around the downtown area and provides strong linkages to 104 Street, 96 Street, and 93 Street, which all connect to the Alaska Highway.

Paired with this proposed intersection upgrade is an opportunity to have a traffic warrant study completed along 96 Avenue between 100 Street and 96 Street to determine if the 30 km/hr reduced speed limit is still appropriate given the current adjacent uses. Speed restrictions on roads can influence users' decisions of using alternate routes.

4.2.2 North Peace Cultural Centre Offsite Parking Lot

There is an existing parking lot owned by the City of Fort St. John, to provide additional parking spaces for the North Peace Cultural Centre, located on the south side of 99 Avenue with red steel bollards defining its entrance. This parking lot is observed to be underutilized during most daytime periods. This parking lot surface may be upgraded during Phase 1 of construction with enhanced signage to promote it as an alternative downtown parking use, particularly throughout the downtown construction phases.

5.0 DATA COLLECTION AND ANALYSIS

Good data can help make better decisions. And repeatedly collecting specific pieces of data over time allows one to establish baselines, track changes, evaluate trends, and predict outcomes.

By initiating data collection and analysis programs, and then by actively evaluating new data, the City can apply additional measures or strategies.

Given the annual construction window, data collected within a single calendar year will be able to evaluate during various conditions. When evaluating this data, seasonal variances in businesses will be considered, among other variables.

5.1 Vacancy/Occupancy Data Collection

Since 2018, the City began collecting data within the downtown to include:

- Vacant parcels: number and locations
- Vacant storefronts for sale or lease: number and locations

This is in addition to longstanding data maintained such as building permits to indicate economic investments at specific locations.

The City will add to their data collection:

- Number of business openings, closings, or relocations before, during, and after construction

5.2 Longitudinal Business Survey

A longitudinal survey repeatedly collects data of the same variables over an extended period. Applied to the downtown business community, it aims to collect self-reported data with regards to:

- Relative sales volumes in year-to-year and month-to-month comparisons
- Approximated customer volumes
- Customer satisfaction
- Business owner/operator satisfaction

This survey will be distributed to owners and operators of downtown commercial businesses – both fronting 100 Street and adjacent to 100 Street – multiple times per year.

Downtown business trends can further be evaluated based on broader local economic trends.

6.0 BUSINESS ASSISTANCE

Downtown businesses form a strong economy in the heart of our city and are a reason for people to spend time in the downtown. The City will provide enhanced business assistance throughout construction as described in the following sub-sections.

6.1 Dedicated Connections

The City will offer a dedicated email address to downtown owners and operators as a way of direct communications. The email will be easy to remember and will not change regardless of the staff who monitors it.

This email will be monitored continuously and responded to promptly to build trust with downtown businesses and to address concerns that arise during construction. If the principle staff member is away (i.e. on vacation), the task of monitoring the email address will be covered by another staff member to monitor.

In addition to a dedicated downtown email address, other contact details of people closely involved in the construction project will be offered to downtown owners and operators. These will include:

- The Manager of Economic Development
- The Manager of Engineering
- The Stakeholder Relations Coordinator (Business Liaison)
- The Contract Administrator

The contact information will be printed on a distinguishable item, separate from other letters that will be distributed throughout the course of the project.

By providing the above, when an issue or concern arises and needs to be taken care of promptly, the downtown business can quickly locate be connected with someone who is knowledgeable about the project. This fulfils one of the City's objectives of minimizing frustrations by creating an efficient process which enables a fast response to issues or concerns.

6.2 Stakeholder Relations Coordinator (Business Liaison)

The City is seeking to assign a member of their team to act as a Downtown Business Liaison Associate throughout construction phases.

The staff member would make daily contact with businesses affected by construction, develop relationships with business owners and operators, and hold regular office hours in a downtown office location that is convenient to the businesses they serve. In addition to being in regular contact with the contractor and the contract administrator, the Downtown Business Liaison Associate will attend weekly construction meetings and communicate back to businesses about upcoming construction activities, construction sequencing, and access changes. They will work to ensure signage, wayfinding, and customer access is reasonable throughout construction. Issues or concerns raised by business owners and operators will be managed by the Downtown Business Liaison Associate and will be coordinated with the contractor, contract administrator, and other City departments and staff.

Other communities that have undertaken similar downtown revitalization projects attribute the success of the project to a staff person acting in a liaison role as described above.

6.3 Downtown Office and Business Check-Ins

During each construction season, the City will open a downtown office where the Stakeholder Relations Coordinator (Business Liaison), other City staff related to the project, and the contract administrator can regularly operate in. A fixed schedule will be posted on the outside such that business owners and operators can choose to conveniently come through the open doors and speak to someone in person knowledgably about the project.

This will be the primary 'home' location for the City's Downtown Businesses Liaison Associate, who will regularly check-in on businesses by going door-to-door inquiring about any concerns, and informing them of current and upcoming construction activities.

6.4 Technical Assistance and Training

The City will host, co-host, or support in arranging subsidized workshops for existing downtown businesses to improve capacity. This may include a variety of supporting interventions such as:

- Marketing support
- Advocacy
- Tutoring / mentoring
- Business planning
- Marketing and design assistance
- Classes and workshops
- One-on-one training on technical, tax, legal, and accounting matters
- Networking events and referrals to potential clients and partners

The City will explore teaming up with the local Fort St. John and District Chamber of Commerce or with Northern Development Initiative Trust (NDIT) and their *Love Northern BC* campaign which focuses to connect people with locally-owned businesses that are the heart and soul of their communities. The City has previously hosted in-partnership events with other organizations to offer similar community resources.

7.0 ENHANCEMENT GRANTS

The City is exploring existing grant opportunities such as those offered by the Northern Development Initiative Trust, to enhance the downtown environment beyond the road right-of-way. Each of these grant programs will require property owners to apply and make a shared investment into upgrading their buildings.

7.1 Façade Improvements

The City is exploring a façade improvement grant through Northern Development Initiative Trust, for businesses to improve their building façades.

8.0 INDIVIDUAL BUSINESS MITIGATION PLANS

Each property along 100 Street that is directly affected by construction will have an individual business mitigation plan developed in advance of construction. This assembly of non-public plans will be jointly developed between City staff, property owners, and business operators.

Features of each individual business mitigation plan will capture information such as:

- Property address
- Business name
- Description of business and its activities
- Key contacts
- Site plan for each property
- Normal access routes for customers and deliveries
- Modified access routes for customers and deliveries during construction
- Notes on specific business needs
- Business-specific mitigation measures

The City will use these individual business mitigation plans to inform design, manage construction, and maintain public access to businesses.

APPENDIX A

CONSTRUCTION MEASURES

A1.0 CONSTRUCTION MEASURES

For all City construction projects, construction mitigation measures are regularly applied at a scale related to the disruption to the public. For construction along 100 Street, the principles are no different.

During construction of downtown revitalization phases, the east-west construction limits will extend from property line to property line with all above ground surfaces removed, and all deep utilities of water, sanitary, and storm systems replaced.

The first phase of construction along 100 Street is estimated to begin approximately 30 m south of 96 Avenue and extend upwards to 98 Avenue.

While construction to reconstruct an enhanced roadway with new utilities will be disruptive, the City will follow past construction practices and implement a number of strategies during each construction phase to mitigate impacts to the community.

A1.1 Signage and Wayfinding

Most downtown businesses rely on customer interactions as part of their normal business operations, so it is critical that customers are able to access their destinations in an accessible manner.

During construction, the City will develop a temporary access plan to illustrate how customers can reach their desired destination. This access plan will include additional signage and wayfinding to emphasize that business remain open and accessible during construction (Figure A1-1). The access plan will be reviewed with all businesses prior to construction occurring.

Figure A1-1: In 2016, enhanced signage reinforcing that businesses remained open and accessible was placed along 100 Street and 93 Avenue while construction impacted vehicle and pedestrian movements.

A1.2 Promote Downtown Business Use During Construction

Ahead of construction activities, and during construction, the City will develop a downtown branded campaign to acknowledge that construction will be occurring but that businesses are still open to serve its customers. Through the use of printed mediums posted throughout the downtown, it can make customers feel more comfortable about accessing businesses adjacent to an active construction site. Successful campaigns, such as Calgary's recent improvements to their retail and entertainment district along 17 Avenue, are an example of clever advertising that doesn't hide that disruptions are occurring but reinforces the message that the City is supporting businesses through construction (Figures A-2).

Figures A1-2: A branded promotional campaign along Calgary's 17 Avenue business area is wrapped around utility boxes to acknowledge that construction is occurring but that shops are maintaining business as usual (2018)

A1.3 Screened Construction Fencing and Lighting

Screened construction fencing makes the downtown environment more appealing to businesses and customers, and creates a physical and visual separation from an active, intimidating construction site. The public realm that remains is colourful, tidy, organized, and safe (Figures A1-3, A1-4).

Screened construction fences will be required by the contract documents to be the first activity to be completed on- site. On top of the construction fences, temporary lighting will be strung to provide additional lighting for public safety considerations. Construction fencing will be placed along the edges of existing sidewalks, and the sidewalks will be required by the contract to be open as long as possible.

The City will design and purchase the screening ahead of construction and provided as an owner supplied material for contractors such that the screening can be re-used throughout multiple construction phases.

Figure A1-3: Continuous, screened construction fencing applied along Calgary's 17 Avenue as viewed from the pedestrian viewpoint. The screening features municipal and project-specific branding.

Figure A1-4: A view from the inside of screened construction fencing along Calgary's 17 Avenue construction site. An active, intimidating construction site is hidden from the view from pedestrians passing-by.

A1.4 Phased Parking Solutions

For each phase of construction, the City will seek land adjacent to the downtown area that is underutilized or currently undeveloped and provide it as surface parking options for downtown commerce purposes.

The location of each of these phased parking solutions will be assessed and may change based on the phase and location of construction.

A1.5 New Services

Construction along 100 Street will include new water mains, sanitary sewer mains, and storm sewer mains. In addition to the infrastructure that serves a broader city purpose for collection, conveyance, and distribution of water and sewer, each individual property will receive new services to their property line for water and sanitary. Storm sewer connections will depend on the configurations of each property but will be replaced with new pipes where existing connections exist.

A1.6 Camera Existing Sewer Services

As new sanitary services are installed to the property line separating the municipal roadway to private property, the contractor will be required to camera services beyond the property line and into the building. This will provide evidence that the service was installed correctly and will identify if any existing issues with the service on the private side occur.

Providing this service serves as a win-win: if there is an issue with the existing service on the private side of the property, the property owner can discover the damaged service and repair it (at their cost); and the City and the public benefits by keeping the new surface restoration uniform and undamaged.

A1.7 Minimal Service Disruption

Businesses can be assured that water and sewer services will not be significantly affected during construction.

For when services are temporarily out of service, there will be advance notices sent to businesses and property owners at least 48 hours in advance such that businesses can plan their operations accordingly. The contractor can also coordinate with businesses on a preferred day or time-of-day for temporary service disruptions (e.g. a Sunday morning). Emergency situations may occur where the advance notice cannot be met.

To minimize water service disruptions, a temporary overland water system will be setup in advance of replacing the existing underground water network.

To minimize sanitary sewer service disruptions, temporary sewer bypass pumping or tank storage will be utilized.

A1.8 Accessible Building Entrances

As part of the detailed design, all efforts will be undertaken to design the surface of the sidewalk to match the elevation of the existing door entrance such that buildings are accessible to users.

A1.9 Weekly Work Schedules

It is common for City projects in residential areas to restrict work on Sundays without prior permission to offer a day without construction to families living nearby. Recognizing that downtown businesses may be closed on Sundays, and that customer interactions are higher on Saturdays, restricting work on Saturdays without prior permission may be a more desirable approach for downtown revitalization construction.

Consultation with downtown business owners and operators will be held to determine if there is a preferred day of the week to limit construction activities.

A1.10 Dust Mitigation and Window Cleaning

Dust will be monitored throughout construction. If an excess amount of dust is created, the contractor will be required to apply water on the surface to suppress the dust.

For businesses adjacent to construction that experience a heightened film of dirt and dust on windows, the City will provide complimentary window washing services at the end of the construction phase.