



CITY OF PRINCE GEORGE

DOWNTOWN TRANSPORTATION AND PARKING STUDY

FINAL REPORT





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EXECUTIVE SUMMARY

The Prince George Downtown Transportation and Parking Study envisions a truly multimodal strategy, in which initiatives for all modes, plus a parking strategy, are integrated into an overall plan to support downtown revitalization. This document is intended to guide transportation-related decisions in the Downtown area for the next 25 years.

Major elements of the plan include:

- Road network analysis and recommendations;
- Consideration of converting the one-way couplet to a two-way road system in the downtown;
- Recommendation for a five-year transit plan and new transit services including a rapid bus system;
- Addition of a bicycle route and provisions for support facilities for cyclists including signage and end-of-trip facilities;
- Recommendations for improved pedestrian facilities to create a safer and more aesthetically-pleasing pedestrian network in support of revitalization and local businesses;
- Recommendations for new truck and dangerous goods routes;
- A new parking strategy;
- A sustainable transportation strategy; and
- An overall transportation network that is supportive of increasing residential density in the Downtown area.

Short-Term recommendations from the **Road Network Chapter** include:

Consider converting the downtown road system to a two-way system

Conduct a public consultation with design drawings of the downtown road network as a two-way system.

While the current recommendation is to provide the two-way system east of Brunswick Street only, it is important to note that this does not preclude extending the two-way system to Victoria Street or 5th Avenue. No work will be done that will prevent the extension of the two-way system from being implemented in the future (medium or long term), if the required road network and operational improvements that will support the extension of the two-way system are implemented, and if the evaluation results for the short-term conversion are positive.

Other, longer-term recommendations for the Road Network Chapter include:

- Signal Warrant Review
- Re-Synchronize Signals for Lower Speeds
- Increase Police Enforcement

In addition to the road network plan, transit, pedestrian, bicycle, truck route, and parking plans were developed as well.

Short-term recommendations of the **Transit Chapter** include:

Install a bus stop on the south side of 4th Avenue, West of Dominion Street

This bus stop is in a location of high demand and would support the guideline of providing bus stops within 400 metres walking distance of demand areas. This stop will service the demand of customers working in the downtown.

Initiate a Five Year Transit Plan in conjunction with BC Transit.

A five-year transit plan will help to articulate goals and objectives for transit not just in the downtown but throughout Prince George. An implementation and monitoring plan should also be key components so as to ensure the plan's success.

Develop a late night bus.

A late night bus route would support students travelling to UNBC and the College of New Caledonia to and from the downtown. Students represent a high number of transit riders in Prince George and can also bring vibrancy to the downtown.

Short-term recommendations of the **Bicycle Chapter Plan** include:

Develop an Implementation Strategy for the Cycling Network Plan

Developing an implementation strategy for the CNP will ensure cyclists are recognized on dedicated routes and will demonstrate the City's commitment to alternative modes of transportation.

Provide Signage

Provide signage for on-street cycling facilities including painted bike lanes with painted bicycle symbol and/or street signage to illustrate to all road users that these are also dedicated cycling facilities to demonstrate the City's commitment to alternative modes of transportation. This could make road users more aware of cyclists' presence. Well-signed and marked routes also instill confidence in cyclists that they have been considered in transportation planning infrastructure.

Provide Bicycle Parking

Secure bicycle parking is one of the major concerns for cyclists. Bicycle parking should be located close to building entrances and oriented for maximum bicycle usage.

End-of-Trip Bylaw

Prince George should consider adopting an end-of-trip facilities by-law for new developments. End-of-trip facilities include secure bicycle storage (e.g. bicycle lockers or a locked bike room), showers and changing facilities and are based on land use type.

Collect Bicycle Traffic Data

Downtown bicycle traffic volumes should be included when downtown vehicle volume counts are conducted. This will act as a base case when evaluating future improvements that are implemented. Counts should be concentrated on currently identified cycling routes.

Short-term recommendations of the **Pedestrian Chapter** include:

Curb letdown policy

The City's curb letdown policy should be implemented in conjunction with any planned street work (e.g. sewer upgrades, road revitalizations). The City has allocated budget towards new curb letdowns. Meeting with the City's Special Needs Advisory Committee can help to prioritize areas where curb letdowns should be reviewed and upgraded.

Improve visibility at crosswalks

Short-term improvements to compliance for both drivers and pedestrians at crosswalks include:

- Modify the Prince George Parking and Traffic Bylaw so that the restrictions to parking at crosswalks are consistent with TAC guidelines.
- Conduct a systematic review of the downtown crosswalks to confirm that signing and parking restrictions are consistent with TAC guidelines.
- Adopt standards (or modify Bylaw 7652) to identify allowable types of landscaping and street furniture on curb extensions. Consider implementing curb extensions in conjunction with planned road works.
- Conduct an enforcement campaign - for example, at locations where crosswalks are appropriately signed, conduct "crosswalk stings." Arrange appropriate media coverage, so that an education component is also involved.
- Educate both drivers and pedestrians about their rights and responsibilities at crosswalks.

Public Realm Conditions

Modify the Subdivision and Servicing Bylaw (No. 7652) to adopt different zones within the sidewalk designating the location of furnishings, plantings, store frontage and throughway.

Accessible Pedestrian Signals

Adoption of a policy and budget allocation for upgrades, maintenance and repair for accessible pedestrian signals will help to make the downtown a more accessible pedestrian environment. It is recommended that Prince George adopt a policy that conforms to the new TAC guidelines, expected to be released in the Summer of 2007.

Increase pedestrian walk times (if required)

Prince George may wish to increase pedestrian phasing at locations where pedestrians with slower crossing speeds are known to cross, for example those with mobility impairments, the elderly and young children, to improve crossing safety.

Short-term recommendations of the **Truck Route Chapter** include:

Develop a City-wide truck route and dangerous goods route network.

This network should be developed in consultation with the Ministry of Transportation and the public-at-large.

Seek Provincial Ministerial approval for dangerous goods routes.

The Ministry of Transportation has jurisdiction over Highway 97 and Highway 16 and should be consulted on the designation of dangerous goods routes.

Short-term recommendations of the **Parking Chapter** include:

Off-street Lots

Encourage long term parking in off-street lots which will free up on-street parking for short term demand. Some initiatives to encourage long term parking in off-street lots include:

- Providing better signing and a coherent pricing program to encourage people to use the off-street lots;

- Conversion of underutilized off-street lots to development sites could increase the potential for activity in the downtown, aiding revitalization; and
- Development of design guidelines for off-street lots to deal with security concerns such as improved lighting, good sight-lines and directed areas for pedestrian movement.

Pricing and time limit strategy

The City should consider implementing primarily time-limited parking in the downtown. Meters would be used only in areas of short-term demand such as around post offices and banks, where the time limit would be one-half hour. In all other areas, the time limit would be 2 hours. This practise would be easily understood, fair to all merchants, and possibly increase the attractiveness of downtown as a shopping destination. This strategy should be accompanied by increased enforcement of on-street parking. This is absolutely necessary if parking meters are removed. Along with additional enforcement, fines must be significant enough to act as a deterrent.



FIGURE ES-1 NEW ON-STREET PARKING STRATEGY

This enforcement strategy should include the following measures:

- Eliminating the policy of not charging people for their first two parking violations (as this policy applies only to parking meter violations, this could easily occur in conjunction with the implementation of time-limited spaces throughout the downtown);
- While the fine could remain at \$10, the City may wish to increase the fine for parking time-limit violations to \$30 for repeat offenders. For example, the fee would be \$10 for the first two violations, and \$30 for the third and subsequent violations. The fee for repeat offenders is in line with fees for first-time violations in other medium-sized municipalities in Western Canada;
- Revising parking charges to encourage short-term and long term parking in off-street lots; and
- The City should monitor and evaluate parking supply relative to downtown business occupancy rates (or some other measure to quantify the vibrancy of the downtown economy) on an ongoing basis. If the parking occupancy rates are approaching 95%, and the difficulty in finding available parking spots becomes a deterrent to shopping downtown, the City may wish to re-introduce parking meters at some future date.

It is important to note that this policy would have significant impact on income to the City from meters, currently approximately \$195,000 per annum. Increased income from fines from measures discussed above could potentially offset the decrease in meter income.

Additional report sections include:

Sustainable Transportation Strategy – This module contains recommendations for improving the sustainability of the City’s transportation system through infrastructure, land use measures and provisions for walking, cycling and transit.

Plan Implementation and Monitoring – This module contains recommendations for turning this plan into an on-the-ground reality.

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1.0 INTRODUCTION

1.1 Background

The City of Prince George has identified a need to develop transportation and parking plans to facilitate re-development of its downtown core. This will support the vision and goals identified in the City's Official Community Plan including:

- Creating a vibrant downtown that is a showcase of the community;
- Building a sustainable community;
- Building strong neighbourhoods with amenities close to home;
- Providing for the needs of all age groups;
- Retaining environmental quality; and
- Building a beautiful City.

This is to be done in a manner that accommodates foreseeable traffic growth and yet uses transportation infrastructure decisions to support the vision that the City has for the downtown.

1.2 Study Purpose

The purpose of this study is to develop a realistic plan to guide transportation infrastructure development and the City's operating practices over the next 25 years, taking into account all modes of transportation in the downtown.

1.3 Location

The study area is bounded by 1st Avenue in the north and Patricia Boulevard in the south. The western border is Winnipeg Street and the eastern boundary is Queensway. For some analysis, roadways outside the study area were considered to ensure that any solution options were likely to be feasible in the context of the entire network.

The study area is shown in FIGURE 1.1.

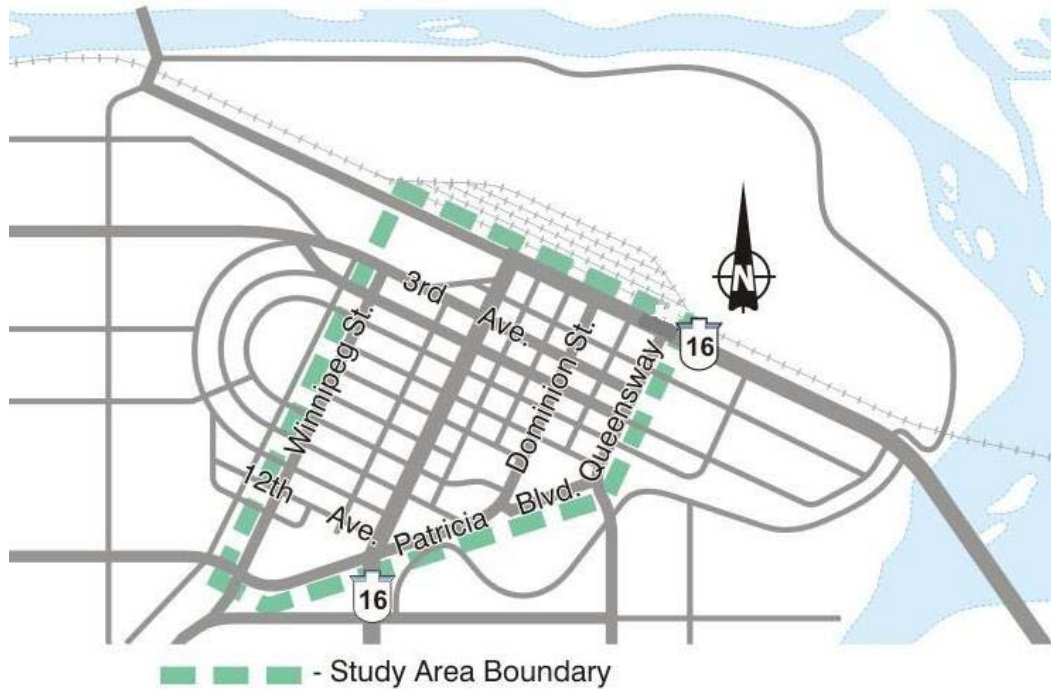


FIGURE 1.1 STUDY AREA

1.4 Methodology

The steps undertaken to prepare this Draft Final Report include:

1. Steering Committee Review and Meeting
2. Development of Implementation Plan
3. Draft Report
4. Steering Committee Review and Meeting
5. Presentation to Council
6. Stakeholder Consultation Round 2
7. Final Report
8. Presentation to Council

1.5 Organization

This document is organized by transportation mode. This Final Report contains Sections outlining the conditions, issues and recommended solutions for:

- **Land Use;**
- **Road Network and Intersections;**
- **Transit;**
- **Cycling;**
- **Walking;**
- **Truck and Hazardous Goods Movement; and**
- **Parking.**

1.6 Results of Public Surveys

Two sets of public consultation were conducted for the study, in May 2006 and in October 2007. In both cases a survey was administered. For the first phase, the survey was used to determine what the people of Prince George thought was needed for the Downtown Transportation and Parking Plan. The second phase provided people with the opportunity to comment on the draft Downtown Transportation and Parking Plan. As part of the first consultation, a hard copy survey and open house were used to solicit comments. The second round of consultation involved an on-line survey, available on the City's website as well as presentations to key stakeholder groups.

1.6.1 Public Consultation – Phase 1, Input to the Plan

As part of the Open House conducted for the Prince George Downtown Transportation and Parking Plan (2007), comments were solicited from various stakeholders and interested residents. A comment sheet was distributed to all attendees, and attendees were asked to comment on specific transportation issues for the downtown area with the purpose of gauging the attendees' perceptions of their preferred approach and prioritization of transportation issues. Comment sheets were also available on the City of Prince George's website. There were 133 comment sheets returned and used in the analysis.

Since the focus of the study is on the Downtown, general questions were also asked on the survey to understand the purpose of residents' trips to the Downtown. Respondents were asked to select all the reasons that applied. Although the majority of respondents stated that work was their main purpose, the results show that shopping, cultural activities, and other recreation opportunities have attracted people to the downtown area. The data is summarized in FIGURE 1.2.

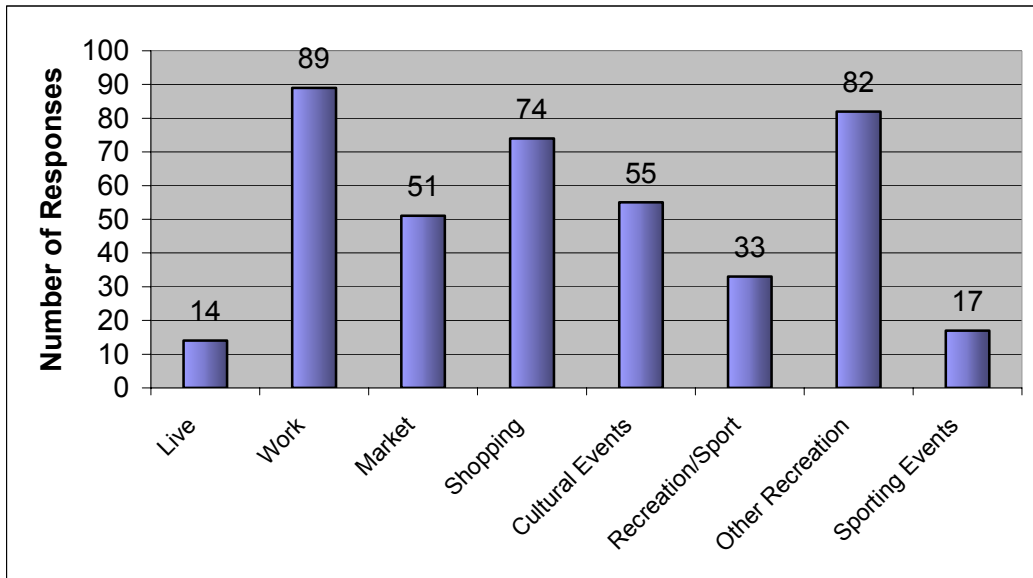


FIGURE 1.2 PRINCE GEORGE DOWNTOWN TRIP PURPOSE

The survey also revealed that a large proportion of respondents that travelled to the Downtown used the automobile as their primary mode of transportation. The pie chart in FIGURE 1.3 displays the mode splits for those surveyed.

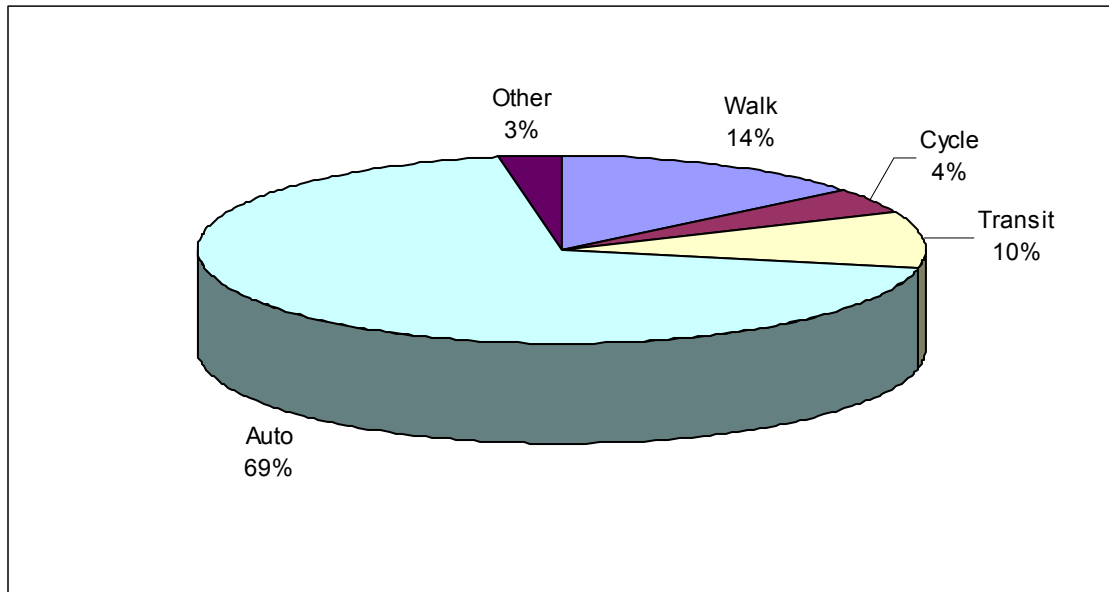


FIGURE 1.3 PRINCE GEORGE DOWNTOWN MODE SPLIT

Regarding parking, most respondents mentioned that if they were to park in the Downtown, they were there for more than two hours. However, this number largely reflects those who also work in the Downtown, and would inevitably be required to park there for a longer duration. A parking duration of less than one hour ranked next, which would reflect non-work trips to the Downtown area.

Other Findings

Comments, in addition to the survey questions, were gathered from the 133 returned surveys. Comments are summarized in APPENDIX D. Some recurring comments received included the following:

- Road conditions are deteriorating and require maintenance;
- More frequent weekend bus service, especially on Sundays, is required;

- Pedestrian facilities, particularly sidewalks, should be improved as some sidewalks do not join up with others;
- There are no cycling facilities, especially on the roads – bike lanes would make the roads safer for cyclists and increase the use of this mode in the City;
- Traffic signals along Queensway should be timed better; and
- Parking should be free in the downtown area.

Specifically, respondents felt that road maintenance in Prince George should receive the highest priority. However, ranking closely behind in order of priority (more important to less important) were: pedestrian facilities, transit service, and cycling.

Parking and traffic were ranked lowest in order of priority by the respondents. The responses seem to suggest that improving the facilities to facilitate increased usage of alternative modes ranked high in order of importance to the respondents.

The bar chart displayed in FIGURE 1.4 below summarizes the proportion of respondents that ranked the importance of each category.

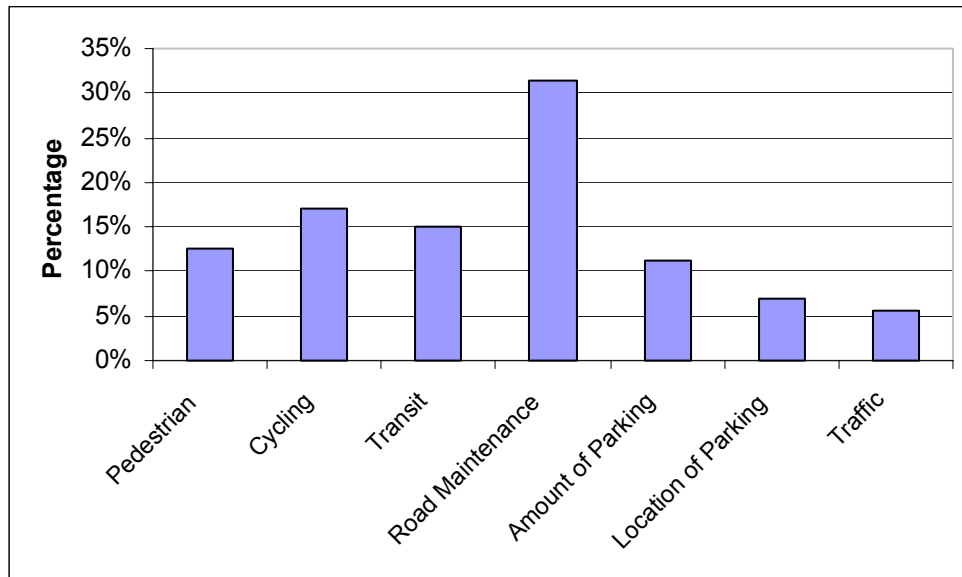


FIGURE 1.4 PRINCE GEORGE TRANSPORTATION PRIORITIES

Finally, respondents were also asked of their preferences for one-way versus two-way operations on downtown streets. The general implications for one-way versus two-way operations were also noted on the survey.

A little more than half of the survey respondents, or approximately 76 respondents felt that two-way traffic operations for Downtown would be a good idea. The remainder (62 respondents) preferred the one-way system in some form. FIGURE 1.5 displays the proportional preferences for downtown road operations by the respondents.

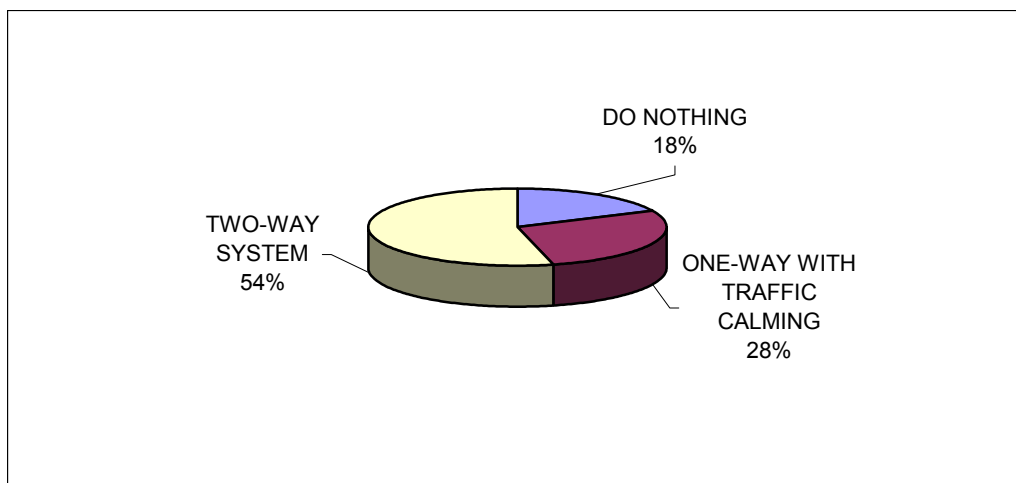


FIGURE 1.5 PREFERENCES FOR ONE-WAY OR TWO-WAY STREETS – PHASE 1 OF PUBLIC CONSULTATION

1.6.2 Public Consultation – Phase 2, Commenting on the Proposed Plan

Phase two of the public consultation involved meeting with stakeholders. Additionally, all residents were given the opportunity to review the proposed plan on the City’s website, and to respond to a survey posted on the website. Over 200 surveys were submitted with the majority being submitted electronically and five hard copy surveys being submitted. Approximately 175 of those surveys submitted were complete. The remaining surveys were missing answers to some questions.

To compile the results, responses were totalled to determine those people in favour and those not in favour of the various recommendations. The responses strongly like and somewhat like were added to determine a value for “in favour” and the responses somewhat dislike and strongly dislike were added to determine a value for “not in favour”. Residents were generally in favour of the proposed plans for cycling, improvements to pedestrian facilities, and increased transit service. Residents were generally not in favour of removing any underutilized crosswalks, increasing parking violation charges, and using a pay ‘n’ display system, for paid parking, instead of meters. Similar to the results observed at the beginning of the study, approximately half of the respondents were in favour of switching to a two-way system in the downtown. Additional discussion of survey responses will be provided in the appropriate sections.

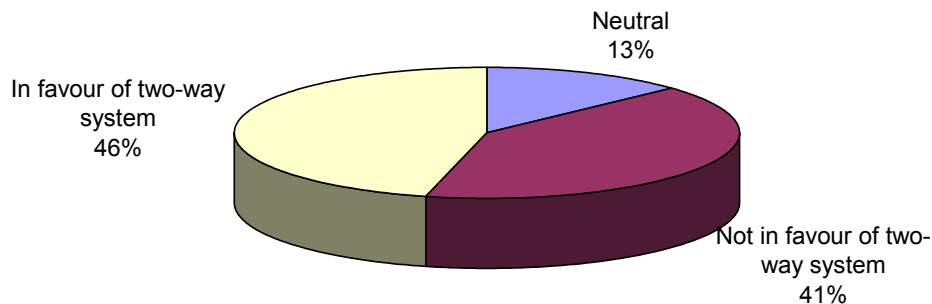


FIGURE 1.6 PREFERENCES FOR ONE-WAY OR TWO-WAY STREETS – PHASE 2 OF PUBLIC CONSULTATION

In Favour of the Plan

Respondents were asked to rank the plan on a scale from zero to ten, with ten as strongly like, and zero as strongly dislike. While respondents expressed support for many aspects of the plan, as discussed above, the rankings for the overall plan were generally neutral. The top-ranked responses were a tie, between four and zero at 14 percent. 12 percent ranked it a seven. Complete results are illustrated in FIGURE 1.7.

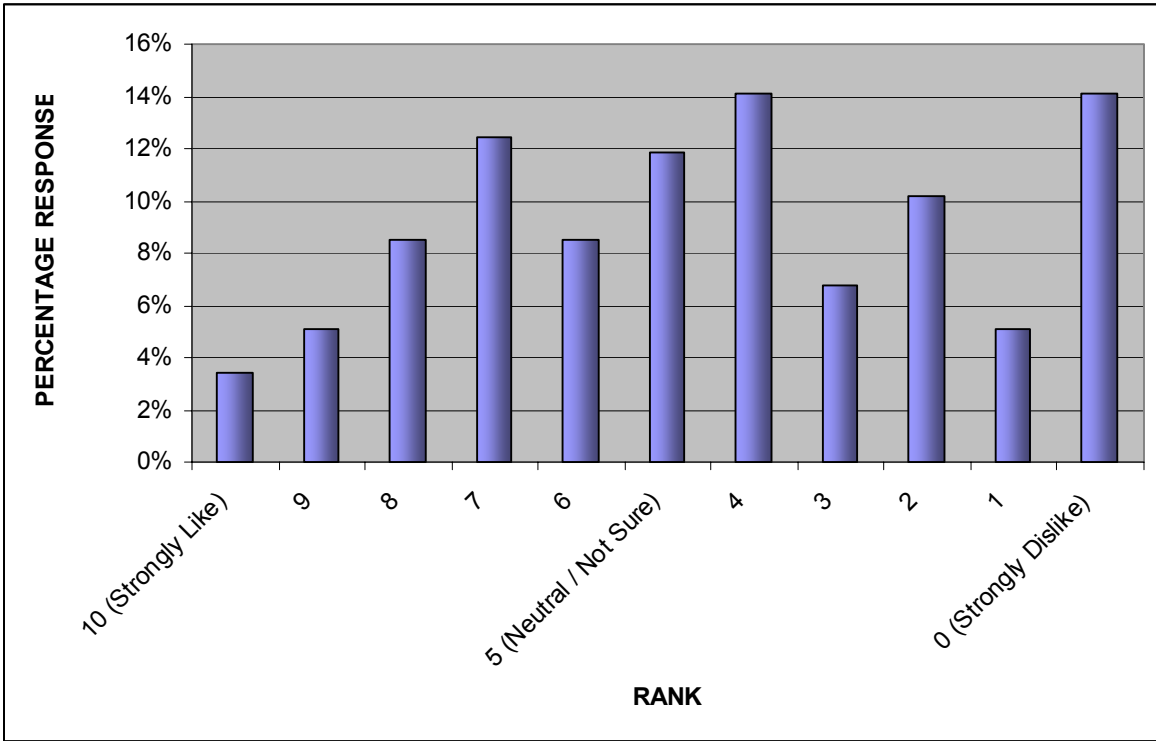


FIGURE 1.7 HOW PEOPLE RANKED THE PLAN

2.0 LAND USE

2.1 Background

A review of literature related to existing and new land uses in downtown Prince George was completed to analyse the effect they will have on the modes of transportation under evaluation. Land use and transportation are related in that the land use affects the type and amount of transportation in the downtown.

Several downtown revitalization initiatives have been conducted for Prince George. Projects that have been successfully implemented include:

- 3rd Avenue improvements, including conversion to two-way traffic;
- New development applications for residential buildings;
- Addition of UNBC offices downtown;
- Creation of a downtown revitalization tax exempt program;
- Creation of streetscape design guidelines (currently in draft form);
- Street lighting improvement program;
- Street Tree program;
- Downtown marketing implementation plan; and
- Support for building development in the downtown.

A general overview of the existing land use information was reviewed, including specific recommendations for the downtown study area, as deemed applicable. The most relevant documents related to the future land use are listed in TABLE 2.1

TABLE 2.1 RELEVANT DOCUMENTS FOR LAND USE

No.	TITLE	YEAR	FORMAT
1	Downtown Prince George Marketing Implementation Plan: Downtown Revitalization Background Report, Harris Consulting	2006	Document
2	Downtown Prince George Investment Opportunities	2005	Document
3	Official Community Plan	2001	Document
4	Downtown Prince George Revitalization Study Vols. 1 & 2	2001	Document
5	Downtown Revitalization, Prince George Community Planning Council	1996	Document
6	Downtown Revitalization, Urban Form Associates et al for City of Prince George	1992	Document
7	Downtown Revitalization Memorandum, Director of Development Services to City Manager	1993	Document
8	Prince George City Centre Strategy, Report of the City Centre Concept Committee	1990	Document

2.2 Existing Conditions

The Official Community Plan (OCP) policy objectives that support development in the downtown are listed below.

- Support the ongoing redevelopment of the downtown as the primary area of business, cultural and government activity.
- All new office development is to be directed downtown.
- Higher density housing in the downtown.
- An entertainment district, including movie theatres.
- The downtown is the cultural centre of the city.
- Speciality retail and offices, particularly mixed use are encouraged.

As the business centre of the city, downtown Prince George has commercial retail and office uses, but minimal residential development. The breakdown of each type of current land use is detailed in TABLE 2.2.

The TABLE shows a significant amount of commercial retail space in the downtown, an increasing number of residential units, and development applications for office development. Housing does exist in the study area to the west of the downtown in the Crescents Neighbourhood, bounded by Winnipeg Street to the west, 4th Avenue to the north, Vancouver Street to the East, and Parkwood Mall to the south, with a total population of just over 600 people (City of Prince George, Development Services Department, 2006).

TABLE 2.2 EXISTING LAND USES IN DOWNTOWN PRINCE GEORGE

Source: City of Prince George, Development Services Department, June 2006

LAND USE	AREA / UNITS	NOTES
Commercial Retail	973,000 square feet (90,400 square meters)	Currently operating at 17% vacancy
Office	780,000 square feet (72,500 square meters)	An additional 25,000 square feet is currently in development applications
Housing	200 units	Including a proposed 63-unit student housing building

Current land uses include a civic precinct, Civic Plaza near City Hall, bounded by Patricia Boulevard, Brunswick Street and 7th Avenue. Associated civic facilities consist of a leisure pool, art gallery, library and a community/recreation centre.

A commercial retail district is approximately bound by 2nd Avenue, 6th Avenue, Victoria Street, and George Street.

The hospital is located, just beyond the scope of this study, between 10th Avenue and 15th Avenue, west of Winnipeg Street. A light industrial area is located east of Queensway, also outside the study area.

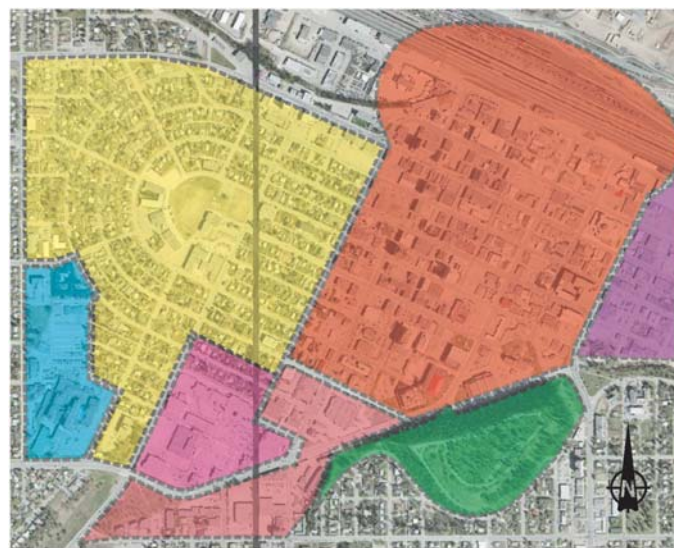
Open Space and Park areas exist just outside the study area. Connaught Hill Park is located south of Patricia Boulevard.

Statistics were unavailable to determine how many people currently work in the downtown core. Using general floor area per employee ratios, Opus Hamilton estimates that about 7,500 people currently work in the downtown core (combined office and commercial).

2.3 Future Development

A review of the OCP, provided an overview of the future land use designations in the study area, as shown in FIGURE 2.1. Relevant documents were also reviewed and possible future land uses were identified. FIGURE 2.2 is a diagrammatic figure showing where specific land uses are favoured, but is not meant to illustrate exact locations for these uses. This figure is taken directly from the OCP, Map 5.

It is important to note that these land use assumptions are speculative assumptions for the purpose of conducting a full range of transportation network options. Actual future development will be heavily influenced by market forces and development opportunities.



Legend:

 Downtown Commercial	 Public Institutional
 Arterial Commercial	 Light Industrial
 Regional Commercial	 Park
 Urban Residential	

FIGURE 2.1 FUTURE LAND USE, DOWNTOWN PRINCE GEORGE - OCP

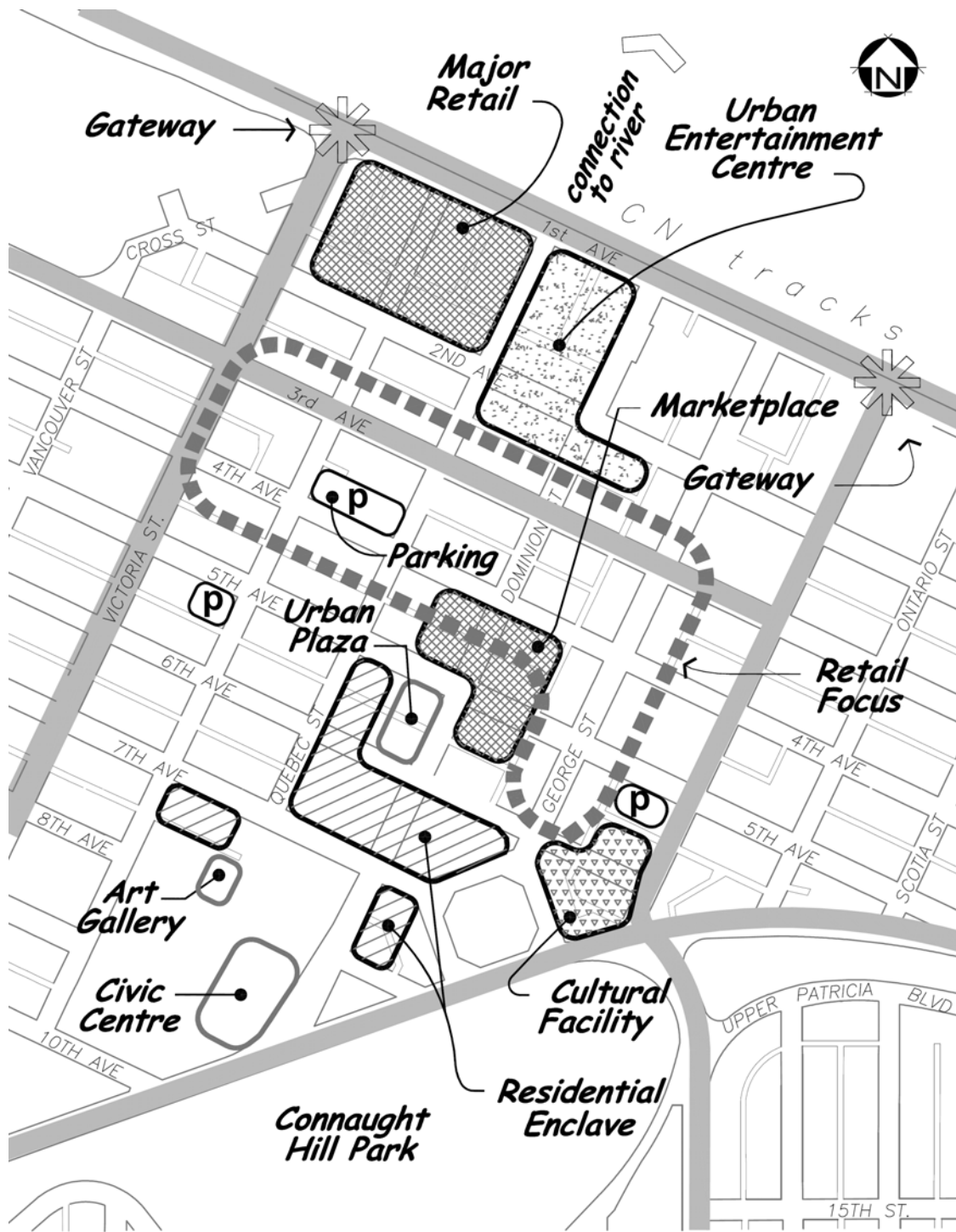


FIGURE 2.2 FUTURE LAND USE, DOWNTOWN PRINCE GEORGE

Source: City of Prince George, *Official Community Plan*, Map 5, 2001.

Current plans include a concentration of medium density housing along the Winnipeg-Vancouver corridor. As noted in the Crescents Neighbourhood Plan, the densities between 9th and 11th will be single family and townhouse developments up to 40 units per hectare. From 8th to 5th Avenue, the densities will be apartments and townhouses up to 90 units per hectare. For properties abutting the west side of Vancouver Street, conversion from existing residential to service commercial and office use is permitted. A student housing residential building is also a possible future development at the corner of 2nd Avenue and Quebec Street.

From the documents reviewed, plans indicate that a commercial retail district will continue in the current area of 2nd Avenue and 6th Avenue as well as Victoria Street and George Street. Some large format retail along 1st Avenue (Yellowhead Highway) at Victoria Street is possible in the future. As well, an urban entertainment district is possible for the area between 1st Avenue, 2nd Avenue, Quebec Street and George Street.

A future area of mixed use development has been identified between 6th Avenue and 8th Avenue and Brunswick Street and George Street.

Open space and parks are proposed at Quebec Street and 6th Avenue as well as outside the study area, north of 1st Avenue and east of Queensway along the water and River Road.

2.4 Future Growth Projections

Statscan data indicates that Prince George's population is in decreasing. According to this data, there was a 3.7 percent decline between 1996 and 2001 and a decline of 2.0 percent between 2001 and 2006 (TABLE 2.3). However, contrary to these numbers, evidence from the City indicates steady growth.

TABLE 2.3 PRINCE GEORGE POPULATION GROWTH

(Source: Statistics Canada)

YEAR		
1996	2001	2006
75,150	72,406	70,981

To establish an expected future population growth rate for Prince George, a review of existing documents was conducted. Comparisons were also made with cities of comparable size. As well, analysis was conducted of future land use and possible developments, and the resultant likely traffic volumes calculated. Prince George was experiencing a negative growth rate in 1996, and at that time a growth rate of between 1.5 and 2.0 percent was used for the projections in the Official Community Plan.

The City of Kamloops, which is in a period of economic growth, uses a 1.25 percent growth rate for its population forecast. BC Statistics calculates Prince George’s future growth at a rate of 1.1 percent.

A review of projected growth was also conducted to determine the expected increase in the number of motor vehicle trips to and from the downtown to the year 2031. Using estimates from City Staff, a table was prepared with the current and expected increases in development by land use, shown in TABLE 2.4.

TABLE 2.4 CURRENT AND EXPECTED INCREASES IN LAND USE TO 2031

LAND USE			EXISTING		PROPOSED ADDITIONAL	
Zoning	ITE Equivalent	Units	Value	Trips Generated	Value	Trips Generated
Commercial	Shopping Centre	1,000 SF	973	3,649	611	2,291
Office*	General	1,000 SF	686	1,023	119	177
Residential**	SFD	SFD	255	260	0	0
	Low Rise	MFD	192	119	235	146
	High Density	HD			314	122
TOTAL				5,050		2,736

* Reduced by 12% to account for current 17% vacancy (5% would be more typical)

** Assumed all 150 residents in Central Business District in Multiple Family Dwellings, 1.0 residents/unit, assumed 10 percent of Crescents Multiple Family Dwellings, 1.5/unit, remainder SFD, 2.2/unit

This analysis illustrates that there will be an expected increase of approximately 54 percent in the number of trips to and from the downtown to the year 2031. An estimated high growth rate of three percent was calculated based on this projected increase.

Based on discussions with City staff, a range of population and employment projections were developed for use in this study. These growth rates will be used for land use and trip generation forecasts:

A 3% growth rate may be considered “high” based on OCP assumptions for the overall city, but may reflect the growth potential of downtown with a successful revitalization.

- low growth rate of 1.0 percent,
- medium growth rate of 1.5 percent, and
- high growth rate of 3.0 percent.

2.5 Opportunities

The revitalization of downtown Prince George is one of the City’s goals. A residential population in the city centre with supporting amenities such as local grocery shopping, restaurants and entertainment, community services and recreation opportunities, as well as employment can all be key ingredients to a successful downtown.

In addition to this, as Prince George is a service centre for Northern British Columbia, regional retail opportunities located in the downtown could attract people to the area who might also enjoy other aspects and services that were not the primary reason for their trip to Prince George.

Increasing employment in the downtown can attract residents as well as decrease the distance and travel times for current residents to travel to work. This would result in a 24-hour city centre, which could promote a change in the preferred mode of transportation from automobile to transit, cycling, and walking. It could also alleviate traffic congestion by spreading trips out over the course of a day.

Future expansion of post-secondary educational institutions in the downtown core can also help to increase the number of people in the area over a longer time period.

Other populations that traditionally gravitate to city centres include young singles, potentially increasing cycling usage, and retirees, potentially increasing transit use. Amenities that these populations frequent include entertainment facilities such as restaurants, café's, nightclubs, cinemas, concert and sporting venues, attractive public places, cultural venues (art galleries, museums, libraries, etc) as well as recreation amenities.

Although this study focuses on the transportation aspects of the downtown, this section provided an overview of the expected future land use in the area. This is necessary because land use and transportation are inter-connected; a change in one affects the other.

In the future, the City may wish to plan and initiate land use changes to actively influence the nature of the downtown and its transportation system, such as those detailed in the Downtown Prince George Marketing Implementation Plan: Downtown Revitalization Background Report, Harris Consulting, 2006.

Input from the Public Consultation

Generally, people are concerned with the social and health issues of homeless people, panhandlers and drug users, which are seen as a deterrent to visiting downtown. However, respondents want the downtown to be revived as the heart of the city and they recognize the different experience it can offer. There were many comments that supportive land use, particularly residential development should be encouraged in the downtown.

3.0 ROAD NETWORK AND INTERSECTION ASSESSMENT

3.1 Background

A. Method

The road network and intersection assessment was conducted using a systematic approach, consisting of the following tasks:

- Review of background reports;
- Site observations of the physical and traffic characteristics;
- Collection of traffic volumes during the weekday peak periods; and
- The analysis of existing traffic operations of the downtown road network based on available traffic volumes and signal timing information.

B. Review of Background Reports

Previous documents dealing with the road network of Prince George's downtown were reviewed. A complete document list is included in TABLE 3.1.

TABLE 3.1 RELEVANT DOCUMENTS FOR ROAD NETWORK AND INTERSECTIONS

No.	TITLE	YEAR	FORMAT
1	Nechako Crossing Option 1D Report	2004	Document
2	Daily Traffic Volumes in Downtown Prince George	2004	Map
3	Prince George South Weigh Scale Relocation Study	2004	Document
4	Crescents Neighbourhood Plan	2003	Document
5	Existing Speed Limits	2003	Map
6	Analysis of Traffic Design Alternatives in Downtown Prince George	2003	Document
7	Official Community Plan	2001	Document
8	Prince George Transportation System Planning Study	2001	Document
9	Downtown Prince George Revitalization Study Vols. 1 & 2	2001	Document
10	Major Road Network	2001	Map

Based on this review, the following concerns were identified:

- Conversion to two-way traffic was previously considered on 2nd or 4th Avenues west of Victoria but was not recommended due to a concern about large turning volumes and geometric limitations (Analysis of Traffic Design Alternatives in Downtown Prince George);
- Two-way operation on 2nd and 4th Avenues would have issues connecting to the 5th Avenue arterial and was not considered geometrically feasible under the existing network conditions (Analysis of Traffic Design Alternatives in Downtown Prince George);
- Concern was expressed that inadequate road widths along both 2nd and 4th Avenue might hinder two-way traffic operations (Analysis of Traffic Design Alternatives in Downtown Prince George);
- Converting 2nd and 4th Avenues to two-way operations between Victoria Street and Queensway would require seven signals to be altered, requiring significant capital (Analysis of Traffic Design Alternatives in Downtown Prince George);
- Trucks use Highway 16 as an unofficial route through several downtown intersections raising many safety concerns (Prince George South Weigh Scale Relocation Study);
- Traffic calming measures in the Crescents Neighbourhood (such as horizontal and vertical displacement, signage, and a pedestrian signal at 6th Avenue and Winnipeg Street) may have a negative effect on the speed and efficiency of traffic operations on Winnipeg Street which is classified as an arterial road (Crescents Neighbourhood Plan); and
- Capacity constraints into the downtown from the bridges crossing the rivers are of concern (Nechako Crossing Option 1D Report).

3.2 Existing Conditions

A. Road Network

The grid road network in the city centre of Prince George is a combination of arterial, collector, and local roads as well as highways. For the purposes of the road and intersection capacity analysis, the study area runs east-west between Winnipeg Street and Queensway and north-south between 1st Avenue (Yellowhead Highway or Highway 16) and Patricia Boulevard. Road classifications in the downtown are illustrated in FIGURE 3.1.



FIGURE 3.1 ROAD CLASSIFICATIONS

B. Intersection Layouts and Direction of Travel

Intersection layouts vary significantly throughout the downtown of Prince George from four-lane highways intersecting four-lane arterial roads to two-lane local roads intersecting each other. The lane configurations of the signalized intersections in downtown are summarized in FIGURE 3.2.

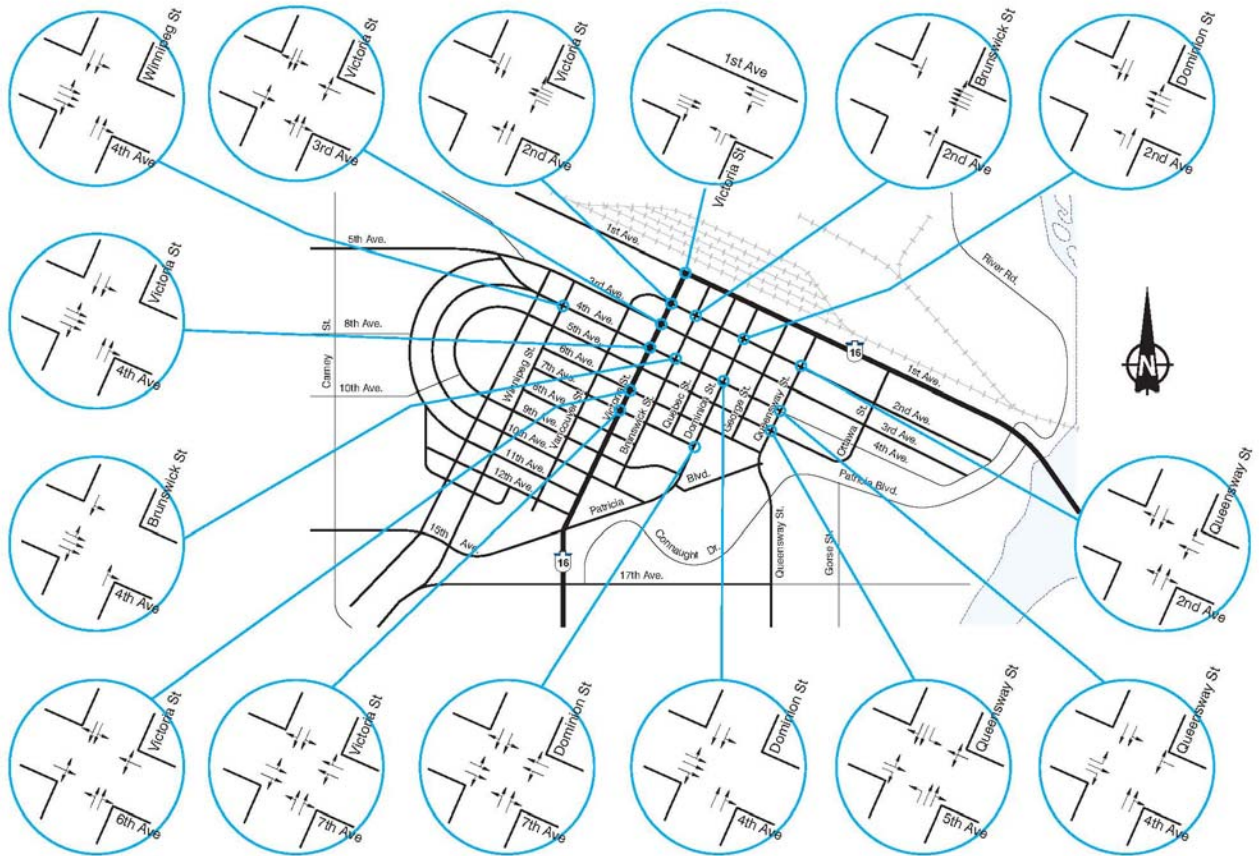


FIGURE 3.2 SIGNALIZED INTERSECTION LANING

C. Intersection Control

Currently the intersections are controlled by a mixture of traffic signals, two-way STOPS and four-way STOPS. An inventory of the STOP-controlled intersections was provided by City of Prince George staff. This inventory, along with the signalized intersection locations, is summarized graphically in FIGURE 3.3.

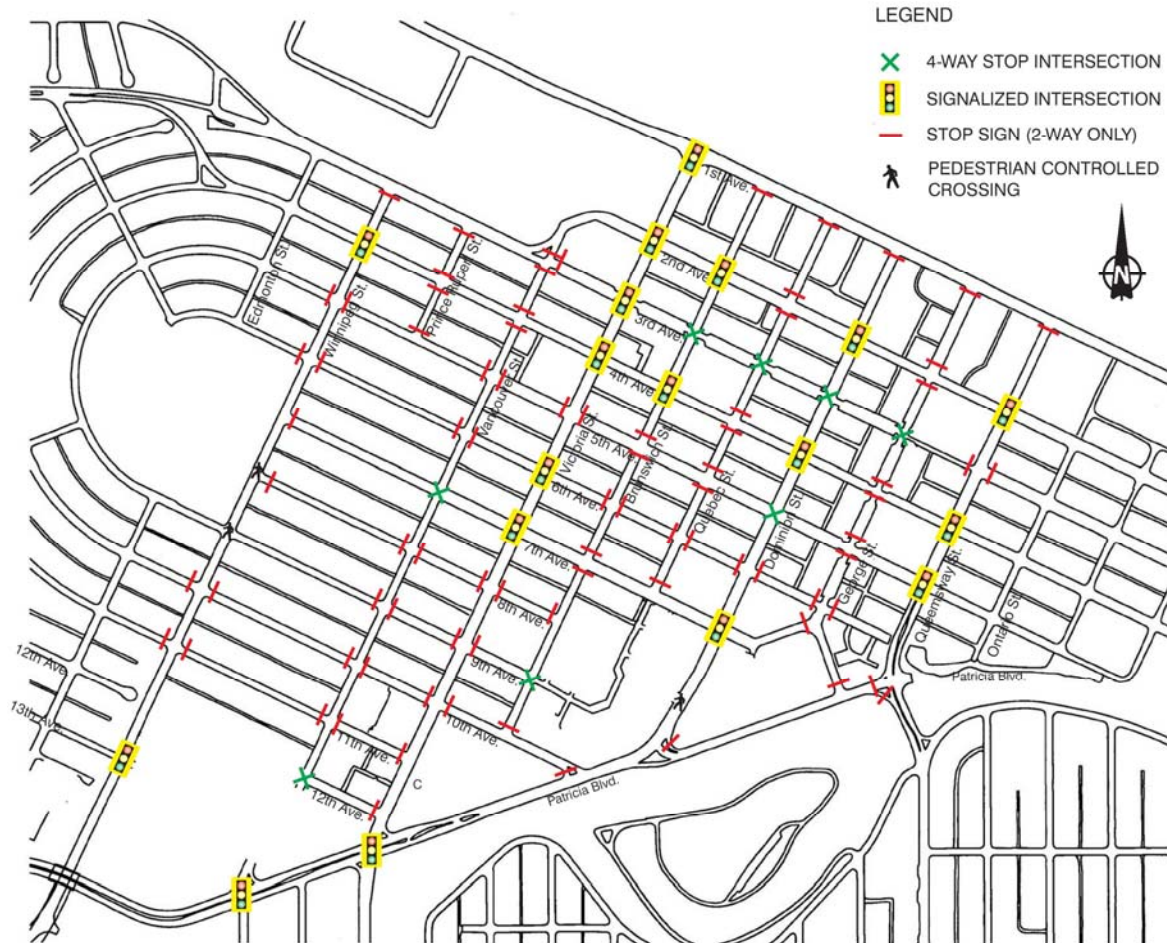


FIGURE 3.3 INTERSECTION CONTROLS

Traffic controls on Victoria Street (Highway 16 or Yellowhead Highway) are coordinated between 2nd and 7th Avenue for northbound and southbound movements. This gives priority to Victoria Street traffic as it is the major north-south arterial through downtown and is a section of Highway 16. All signals along Victoria Street are operated under the Ministry of Transportation’s jurisdiction.

The coordinated signals on Victoria Street and Queensway use fixed signal timing plans; this allows the City to coordinate their cross street signals along 2nd and 4th Avenues. The rest of the signals in the downtown area are unsynchronized and operate on a fixed time basis.

The majority of signals have relatively short cycle lengths and operate on simple two-phase plans. Dedicated turn phases are provided for all left-turn movements at the intersection of Patricia Boulevard and Victoria Street and for the northbound left-turn movement at the intersection of 2nd Avenue and Victoria Street. The eastbound and westbound movements at the intersection of 4th Avenue and Queensway operate under split phasing.

3.3 Traffic Volumes

A. Current Traffic Volumes

Traffic turning movement counts were conducted by Opus Hamilton staff in February 2006 and September 2006 at select intersections in the downtown. These counts were used in combination with counts provided on the City of Prince George website (www.city.pg.bc.ca) as the basis for the subsequent technical capacity analysis. Note that some of the counts provided by the City of Prince George occurred prior to 2004, and may have occurred prior to the transition from one-way to two-way operation for 3rd Avenue. This may result in some unusual results. For example, the count at 2nd and Victoria may have occurred when 3rd Avenue was one-way eastbound, and likely over-represents westbound traffic volumes.

The data was adjusted to represent the traffic volumes for the peak month and the year 2006 by using historical daily traffic volume patterns derived from the Ministry of Transportation. The station used, P42-1NS, was the closest to the area of study and had values for the years 2003 to 2006. This station is located on Highway 97, 0.2 Km north of Route 16th in Prince George.

The AADT volumes at station P42-1NS are summarized in FIGURE 3.4, show lower volumes in 2003 and 2004 and an increase since then. The Monthly Average Daily Traffic (MADT) volumes, summarized in FIGURE 3.5, show June as the peak month.

The counts summarized in FIGURE 3.6 represent the traffic volumes within the downtown area for the month of June, 2006. These values were used for the capacity analysis.

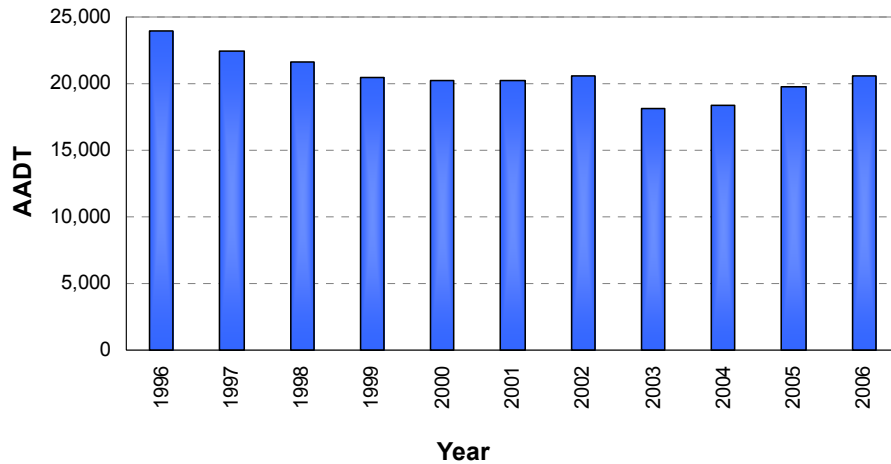


FIGURE 3.4 AADT FROM COUNT STATION P 41-1NS

AADT = Annual Average Daily Traffic (two-way).

P41-1NS is located on Highway 97 (0.2 Km south of Route 16 in Prince George)

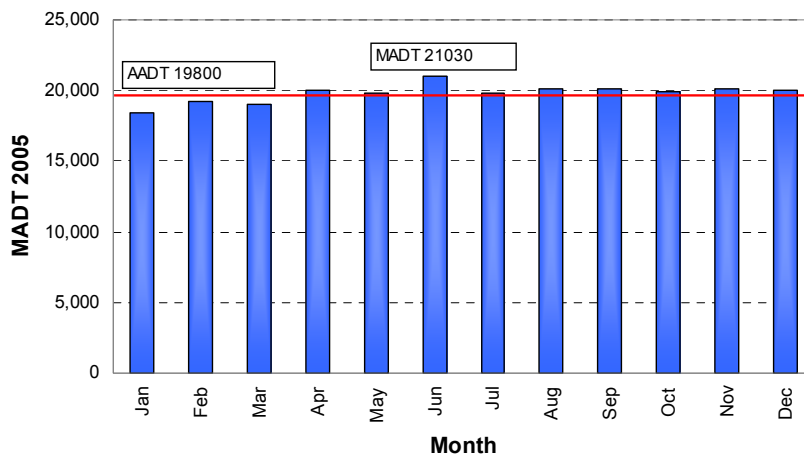
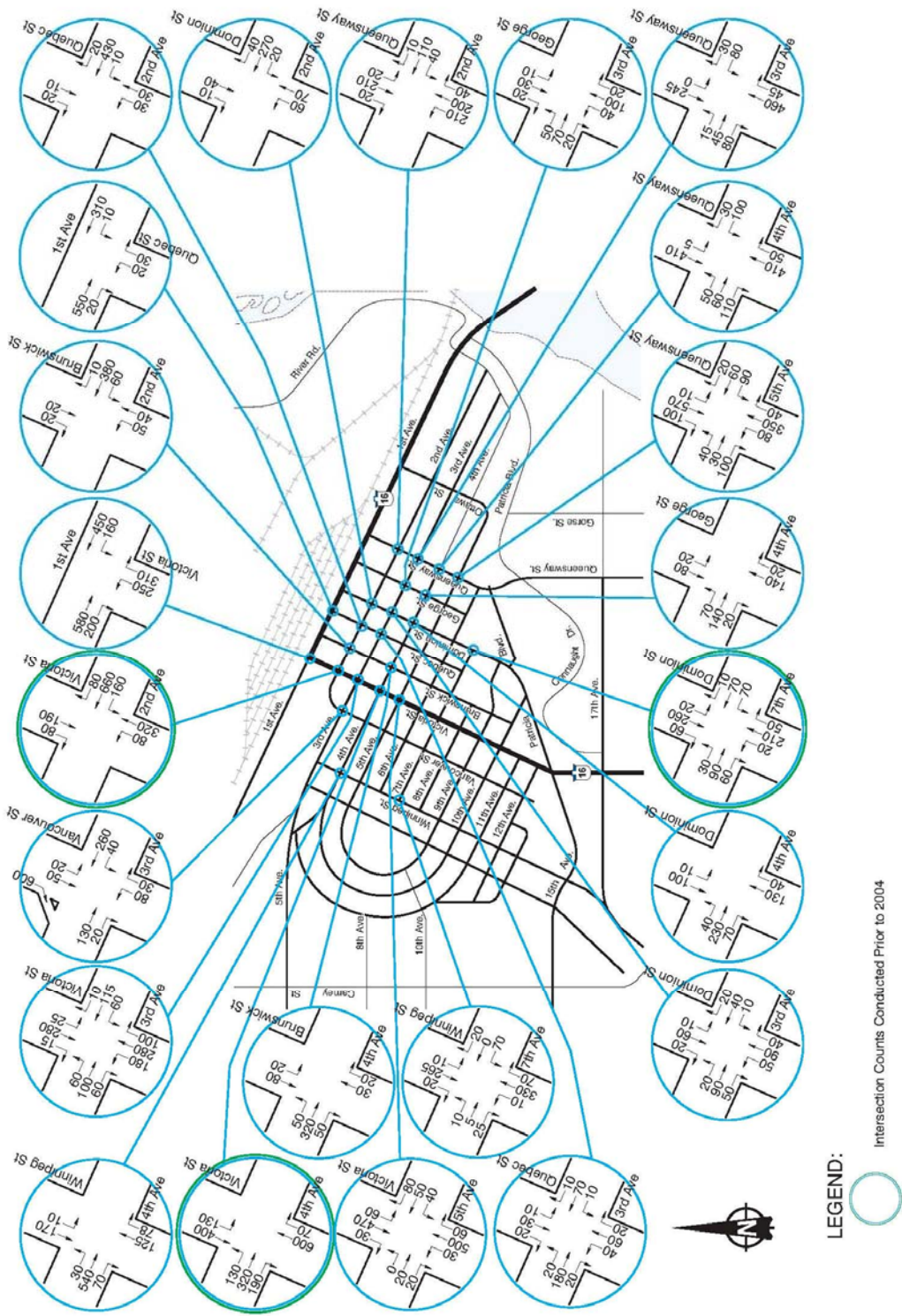


FIGURE 3.5 MADT FROM COUNT STATION P 41-1NS

MADT = Monthly Average Daily Traffic (two-way).

P41-1NS is located on Highway 97 (0.2 Km south of Route 16 in Prince George)



**FIGURE 3.6 AFTERNOON PEAK HOUR INTERSECTION TRAFFIC VOLUMES
(JUNE 2006)**

Daily two-way link traffic volumes (AADT's) throughout the downtown were also provided by the City of Prince George and are shown schematically in FIGURE 3.7 Traffic volumes through the downtown generally follow the road hierarchy as the highest traffic volumes are found on the highways and arterial roads (with the exception of 4th Avenue) and lowest volumes on local roads.

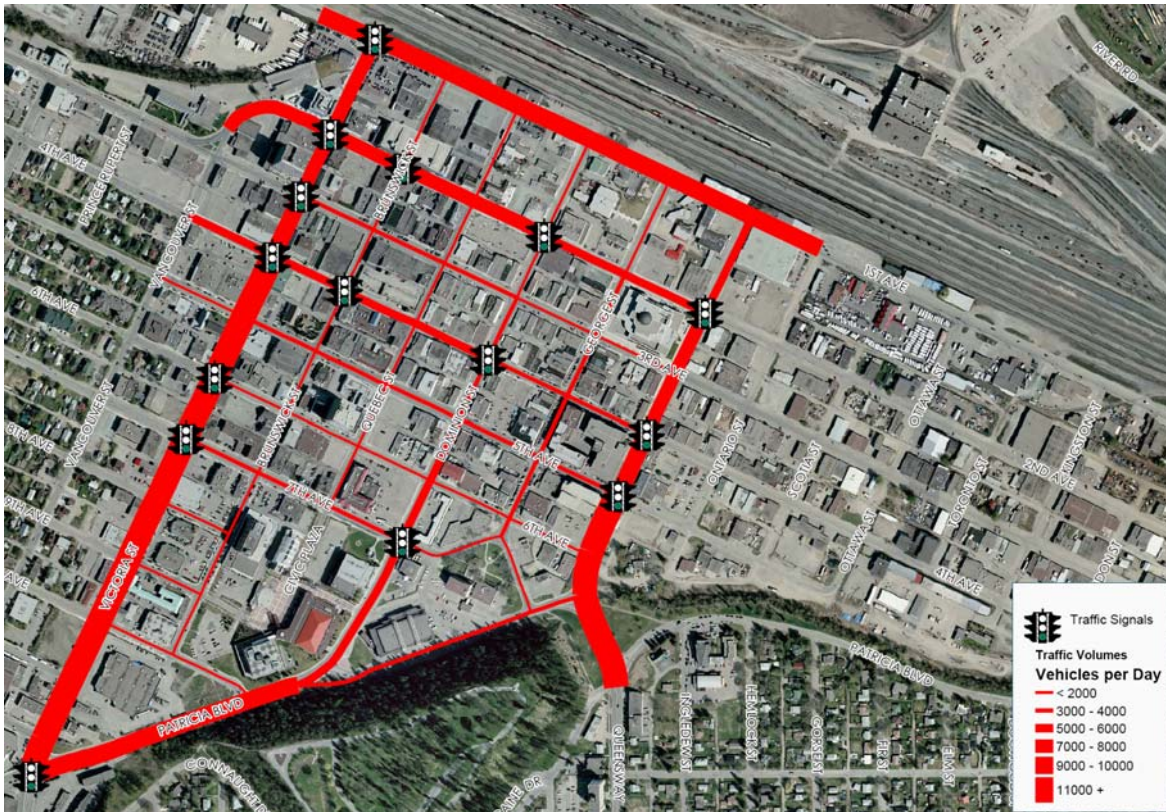


FIGURE 3.7 DAILY LINK TRAFFIC VOLUMES

Note: AADTs are estimates from intersection peak hour counts

The link volumes shown in FIGURE 3.7 are consistent with on-site observations and the intersection counts conducted by Opus Hamilton.

The daily link volumes and the individual daily lane volumes are relatively low throughout the entire downtown, as shown in TABLE 3.2, and illustrated in FIGURE 3.8.

TABLE 3.2 STREET CLASSIFICATION AND VOLUMES

STREET NAME	AADT VEHICLES/DAY (two-way)	ROAD CLASSIFICATION	NUMBER OF LANES	AVERAGE VEHICLES PER LANE PER DAY
1 st Avenue	9,000 – 10,000	Arterial	4	2,250 to 2,500
2 nd Avenue	7,000 – 8,000 and 5,000 – 6,000	Arterial	4 and 3	1,750 to 2,000 and 1,700 to 2,000
4 th Avenue	4,500 - 5,000	Arterial	3	1,500 to 1,700
10 th Avenue	< 2,000	Local	2	< 1,000
15 th Avenue / Patricia Boulevard	9,000 – 10,000 and 3,000 – 4,000	Arterial	4 and 2	2,250 to 2,500 and 1,500 to 2,000
Winnipeg Street	6,000 – 7,500	Arterial	4	1,500 to 1,900
Victoria Street	>11,000	Highway	4	>2,750
Dominion Street	3,500 – 4,000	Collector	4	900 – 1,000
Queensway	8,500 – 9,000	Arterial	4	2,100 – 2,300

Note: AADT = Annual Average Daily Traffic

The volumes range between 900 and 2,500 vehicles per lane per day (approximately 90 to 250 vehicles per lane during the peak hour. Volumes are generally at the lower end of the ranges defined for each classification in TAC Geometric Design Guidelines for Canadian Roads (TAC TABLE 1.3.4.2).

B. Historic Traffic Growth

The City currently has a practice of conducting turning movement counts at 60 main intersections over a five-year period; or one intersection count every month. This practice was implemented relatively recently and therefore few historical counts were available to identify traffic growth. Additionally, the recent change from one-way to two-way operation on 3rd Avenue resulted in some shifting of routes, limiting the usability of previous counts.



2nd Avenue – minimal traffic (mid-day)



Victoria Street – busier traffic (mid-day)

FIGURE 3.8 DOWNTOWN MID-DAY STREET PHOTOS

Historical daily traffic volume counts were available from the Ministry of Transportation for two permanent count stations on Highway 16 just outside of the study area for the period from 1996 to 2002:

- Station 42-008, located just north of the Highway 16 and 97 interchange; and
- Station 42-036, located off of the east end of the Yellowhead Bridge.

The volumes are summarized in FIGURE 3.9 and FIGURE 3.10, and indicate very little increase in traffic volumes on Highway 16 over the period shown. As Highway 16 is one of the major routes into downtown, it is reasonable to assume that traffic growth in downtown Prince George was limited leading up to the year 2002. This is consistent with the population trends shown previously in TABLE 2.3. Since traffic and population are closely related, it is expected that traffic growth has been more robust since 2002, to support the growth in population as reported in TABLE 2.3.

It should be noted that the low traffic volumes in the years 1997 (both stations) and 1998 (one station) for FIGURE 3.7 are the result of failed traffic counters.

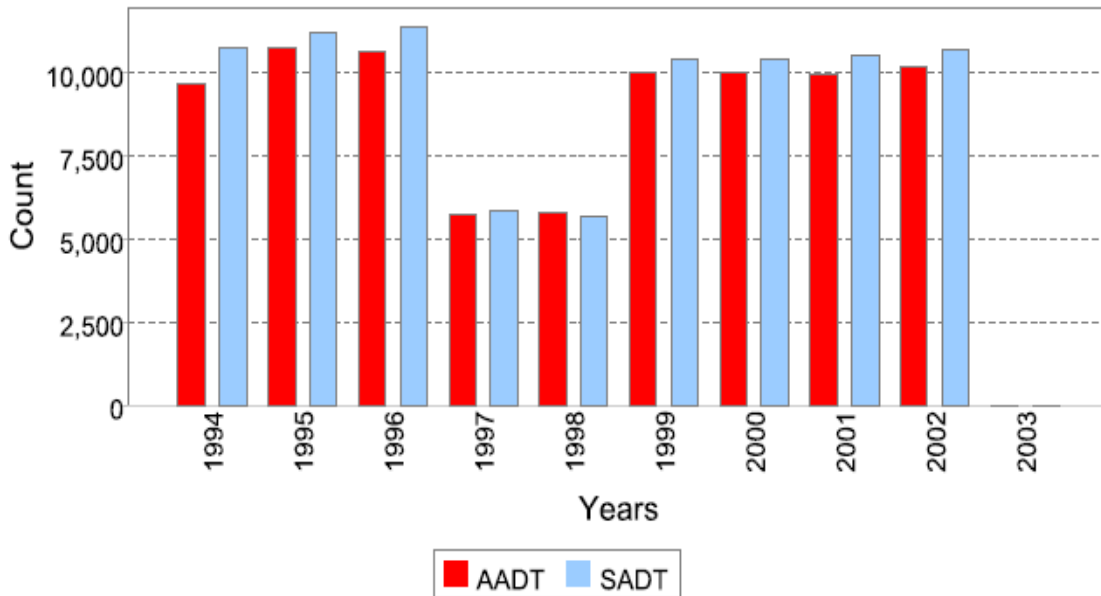


FIGURE 3.9 AVERAGE VOLUMES FROM COUNT STATION P 42-008

AADT = Annual Average Daily Traffic (two-way); SADT = Summer Average Daily Traffic (two-way)

Station 42-008 is located just north of the Highway 16 and 97 interchange

Low volumes in 1997 and 1998 are the result of failed traffic counters.

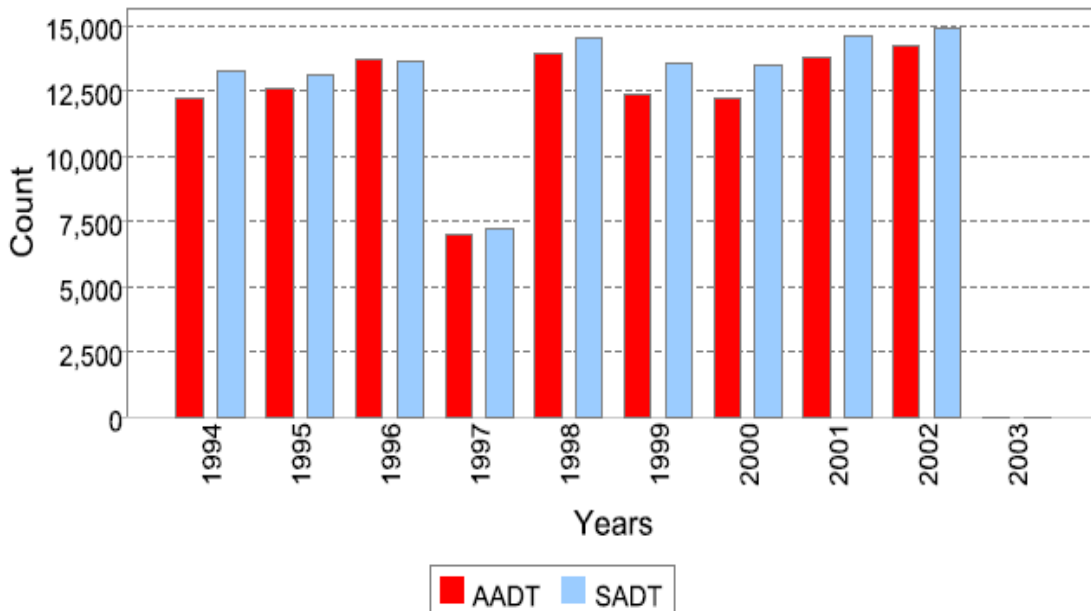


FIGURE 3.10 AVERAGE VOLUMES FROM COUNT STATION P 42-036

AADT = Annual Average Daily Traffic (two-way); SADT = Summer Average Daily Traffic (two-way)

Station 42-036 is located off of the east end of the Yellowhead Bridge

Low volumes in 1997 and 1998 are the result of failed traffic counters.

C. Vehicle Classification

The primary mode of transportation throughout the downtown of Prince George is the passenger vehicle. Counts provided by the Ministry of Transportation at the intersection of Queensway and 1st Avenue (two arterial roads) showed that during the morning and afternoon peak, passenger vehicles made up approximately 90 and 92 percent of total traffic respectively.

A summary of morning and afternoon vehicle distributions at the intersection of Queensway and 1st Avenue is summarized in TABLE 3.3.

TABLE 3.3 VEHICLE DISTRIBUTIONS

VEHICLE TYPE	VEHICLE PROPORTIONS	
	Morning Peak	Afternoon Peak
Passenger Vehicle	89.6%	92.3%
Recreational Vehicle	5.2%	4.7%
Heavy Truck	5.2%	3.0%
Total	100.0%	100.0%

On-site observations showed a higher proportion of heavy trucks on Highway 16 than on the rest of the downtown road network. This is logical as trucks carrying goods to further destinations would pass through Prince George on the most direct route possible which is currently on Highway 16. It should be noted that there is currently no designated truck route through Prince George. Truck and hazardous goods movements are discussed further in Section 7.0.

D. Modal Split

From the Draft Pedestrian Network Policy (2006), mode split was calculated for Prince George. This data is for the whole city and not specific to the downtown. Census Canada and The University of Northern British Columbia's (UNBC) Institute for Social Research and Evaluation (ISRE) Fall 2005 survey include journey-to-work mode share data as shown in TABLE 3.4. Prince George ranks above average for motor vehicle use, and below average for sustainable modes when compared with the province of British Columbia and Canada.

TABLE 3.4 JOURNEY TO WORK MODE SHARE DATA

MODE OF TRANSPORTATION	1996 Census	2001 Census			2005 ISRE Survey			
	Prince George	Prince George	BC	Canada	Adult	Post-Sec	Gr. 8-12	K-Gr. 7
Car, truck, van, as driver	80.6%	83.1%	75.0%	73.8%	85.6	73.0%	12.5%	0.0%
Car, truck, van, as passenger	9.3%	7.8%	7.1%	6.9%	9.5%	17.6%	53.6%	67.7%
Public transit	2.1%	1.6%	7.5%	10.5%	2%	2.7%	7.1%	8.3%
Walked	4.9%	4.8%	7.1%	6.6%	1.9%	2.7%	14.3%	8.3%
Bicycle	1.3%	1.2%	2.0%	1.2%	0.2%	0.0%	3.6%	1.0%
Motorcycle	0.2%	0.1%	0.2%	0.1%	0.1%	0.0%	0.0%	0.0%
Taxicab	0.4%	0.2%	0.1%	0.2%	0.1%	0.0%	0.0%	0.0%
Other method	1.2%	1.2%	0.9%	0.8%	0.5%	4.1%	8.9%	14.6%
Subtotal, sustainable modes*	19.4%	16.9%	25%	26.2%	14.4%	27%	87.5%	100%

*Public transit, passenger, walk, bicycle, motorcycle, taxicab

3.4 Intersection Operations

A. *Existing Levels of Service*

The June 2006 intersection traffic volumes were analyzed to determine current performance levels. Two busy time periods were found, namely the mid-day peak hour and the afternoon peak hour. The existing capacity performance of the study intersections was analysed using traffic volumes that represent June 2006 during the two peak periods.

Capacity performance of the study intersections was assessed using Synchro Version 6.0 software, developed by Trafficware (2004). The study intersections were evaluated by calculating the intersection and approach vehicular delays. Performance was indicated by Levels of Service (LOS):

- Levels of Service A and B represents conditions with minimum or no delays.
- Levels of Service C and D are generally considered typical operating conditions with some delays.
- Levels of Service E and F represent congested conditions where improvements should be considered.

All signalized intersections in the downtown are currently operating at excellent or good levels of service (LOS), as summarized in TABLE 3.5. All of the unsignalized intersections analyzed were operating at LOS A or better, with less than nine seconds overall delay.

Current traffic through the downtown operates at an overall LOS B or better for both signalized and unsignalized intersections. Individual movements rarely drop below LOS C and these tend to be side street movements that do not carry large volumes.

TABLE 3.5 SUMMARY OF SIGNALIZED INTERSECTION PERFORMANCE

INTERSECTION	OVERALL LEVEL OF SERVICE		AVERAGE DELAY (seconds)	
	Mid-day	PM	Mid-day	PM
1 st Avenue & Victoria Street	A	A	8.1	9.8
2 nd Avenue & Victoria Street	B	B	15.1	15.7
2 nd Avenue & Brunswick Street	B	B	11.5	10.6
2 nd Avenue & Dominion Street	A	B	9.8	10.6
2 nd Avenue & Queensway	A	A	8.9	9.9
3 rd Avenue & Victoria Street	B	B	11.3	15.7
4 th Avenue & Winnipeg Street	A	A	9.4	9.8
4 th Avenue & Victoria Street	A	B	8.5	11.1
4 th Avenue & Brunswick Street	B	A	11.2	9.5
4 th Avenue & Dominion Street	B	B	10.1	10.4
4 th Avenue & Queensway	B	B	18.4	16.0
5 th Avenue & Queensway	-	A	-	7.5
6 th Avenue & Victoria Street	-	A	-	7.0
7 th Avenue & Victoria Street	-	B	-	11.2
7 th Avenue & Dominion Street	A	B	7.9	10.1

B. Potential Signal Removals

Given the extremely high level of service provided at most signals and the relatively low traffic volumes, the potential for removing traffic signals at unwarranted intersections was reviewed. Traffic signal warrant scores were calculated following the procedures outlined in the 2005 Canadian Traffic Signal Warrant Matrix Procedure handbook. Warrant scores were based on the intersection’s layout, operation, traffic composition, and nearby land uses.

To calculate warrant scores of existing signalized intersections, the intersection was treated as un-signalized and all other signalized intersections in the network were assumed to stay signalized.

To meet current signal warrant criteria, the combined score of the intersection must be greater than 100. It should be noted that signals are not installed solely based on the warrant score; many are installed for other reasons such as a nearby

school, emergency response requirements, or a specific identified safety concern. TABLE 3.6 summarizes the calculated signal warrant scores.

TABLE 3.6 SIGNAL WARRANT SCORES

Scores significantly less than 100 (marked in Bold) indicate a possible unwarranted signal.

INTERSECTION	WARRANT SCORE	INTERSECTION	WARRANT SCORE
1 st Avenue and Victoria Street	231	4 th Avenue and Brunswick Street	40
2 nd Avenue and Victoria Street	144	4 th Avenue and Dominion Street	69
2 nd Avenue and Brunswick Street	36	4 th Avenue and Queensway	102
2 nd Avenue and Dominion Street	43	5 th Avenue and Queensway	198
2 nd Avenue and Queensway	56	6 th Avenue and Victoria Street	73
3 rd Avenue and Victoria Street	222	7 th Avenue and Victoria Street	73
4 th Avenue and Winnipeg Street	109	7 th Avenue and Dominion Street	68
4 th Avenue and Victoria Street	371		

There are issues (e.g. safety, road classification and network considerations) which may also contribute to a signal being provided, despite an intersection not meeting the warrant score.

Current research shows that signalized intersections that do not meet warrant criteria may lead to undue vehicle delays, slight increases in collision rates and a general lack of respect for signal displays. This preliminary review indicates that traffic signals at some intersections may be unwarranted, in particular, at the following locations, where less than 68 percent of the warrant score appears to be filled:

- 2nd Avenue and Brunswick Street;
- 2nd Avenue and Dominion Street;
- 2nd Avenue and Queensway; and
- 4th Avenue and Brunswick Street.

C. *Warranted Signals*

Traffic signal warrant scores for unsignalized intersections were also calculated following the procedures outlined in the 2005 Canadian Traffic Signal Warrant Matrix Procedure handbook. Warrant scores were based on the intersection's layout, operation, traffic composition, and nearby land uses.

Victoria Street and 5th Avenue was found to meet the current signal warrant criteria. In addition to a warrant score higher than 100, this intersection has other issues that would contribute to warranting a signal:

- It has had the highest number collisions in the downtown area for the past five years (January 1st, 2001 to December 31st, 2005);
- More than 50% of the collisions were angle collisions; and
- More than 45% of the collisions were injury collisions.

3.5 Network Options

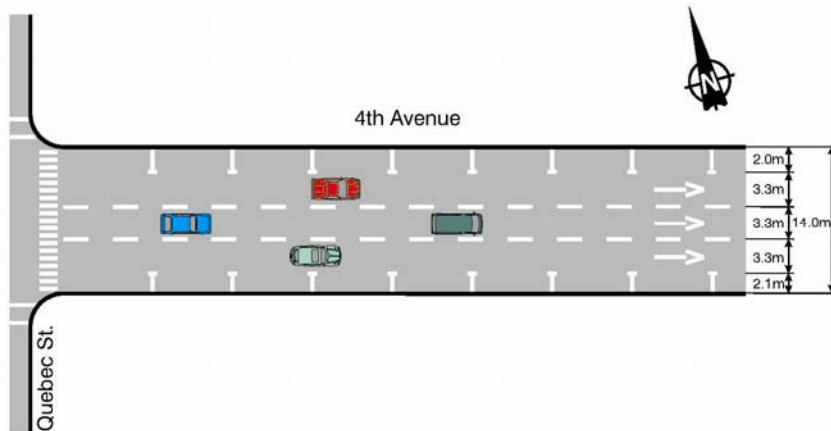
With excess capacity and a one-way couplet system, vehicles are currently experiencing a very good level of service. Opportunities may exist to re-allocate some of the excess road width to improve facilities for other modes. Three options were considered: two-way operations east of 5th Avenue at Cassiar Street (where the transition to the current one-way system begins; two-way operations east of Brunswick Street; and an enhanced one-way system. These two options were compared with a Base Case known as "Unmodified Network."

3.5.1 Unmodified Network (Base Case)

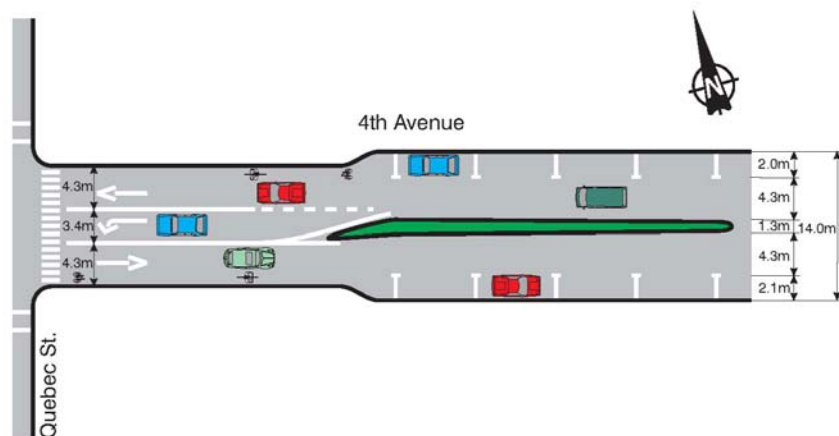
For this option, one-way operations would be retained on 2nd and 4th Avenues. 2nd Avenue would remain four lanes wide in the study area, with parking, and 4th Avenue would remain three lanes wide with parking, for a total of seven through lanes. Traffic signal timings would be optimized as necessary to address any existing delays or to accommodate future growth. If desired, traffic signals on 2nd and 4th Avenues could be co-ordinated to address any speed concerns. This option is the lowest in cost to implement, however it does not provide many opportunities for revitalization.

3.5.2 Two-Way Operations from 5th Avenue (at Cassiar Street) to Queensway St.

The two-way traffic operations option would convert the current one-way operations on 2nd and 4th Avenues to two way traffic east of Cassiar Street. It is assumed that one lane would be provided in each direction on both streets, for a total of four through lanes. Any turn lanes that would be required are outlined in the table of required improvements. This conversion would therefore provide opportunities to reduce the overall street width and allow excess road pavement to be allocated to possible landscaping, improved pedestrian facilities or bike lanes as shown in FIGURE 3.11.



Existing one-way traffic operations



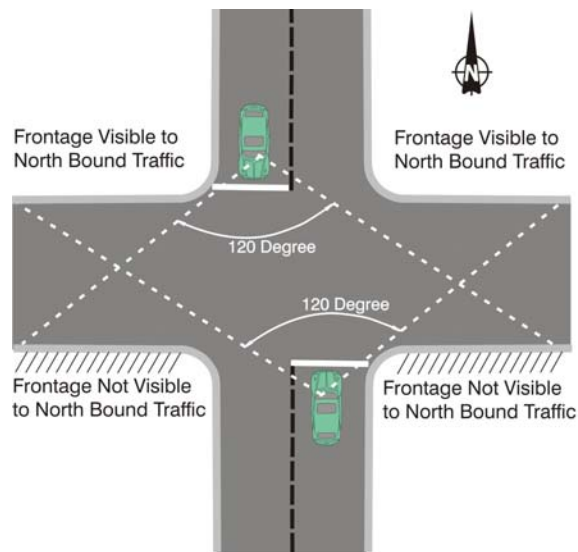
One of many potential configurations under two-way traffic operation

FIGURE 3.11 TWO-WAY TRAFFIC OPERATION CONCEPT

Two-way traffic operations have advantages and disadvantages. Some advantages include an easier system to navigate, improved emergency vehicle access and reduced turning movements. Disadvantages can include decreased capacity, and increased numbers of conflict points at intersections

Two-way operation also provides simplified transit operations by having transit stops for a particular route across the street from each other. This provides a more logical routing that would be less confusing to the occasional user. It also provides improved emergency vehicle mobility as they can bypass queued intersection traffic in free opposing lanes allowing for easier entry on red.

Overall store front exposure is improved in a two-way system. This occurs because stores get equal exposure from traffic travelling in all directions as shown in FIGURE 3.12. With Prince George's on-going downtown revitalization efforts, keeping traffic and therefore people in the downtown is advantageous to both retailers and overall contribution to vibrant street life.



**FIGURE 3.12 ONE-WAY STREET
STORE FRONT EXPOSURE**

*Source: Are We Strangling Ourselves on One-Way Networks?
Walker, Kulash, McHugh*

General discussion on two-way systems indicates that they can result in congestion. The impact of the scenarios on traffic efficiency from a Prince George perspective will be discussed in Section 3.6.

Currently, eastbound traffic travelling into downtown on 5th Avenue is diverted to 4th Avenue just west of Cassiar Street. To obtain the full benefit of the two-way system, this diversion would have to be modified to accommodate westbound traffic as well. A conceptual drawing is shown in FIGURE 3.13.



FIGURE 3.13 3RD AVENUE AND 5TH AVENUE – POSSIBLE TWO-WAY TRANSITION

Some modifications would also be required at the intersection of 3rd Avenue, 2nd Avenue and Vancouver Street.

For the purposes of analysis, when converting traffic operations on 2nd and 4th Avenues from one-way to two-way, the following assumptions were made:

- The road widths were reduced to one lane in each direction.
- The traffic volumes along 2nd and 4th Avenues were equally redistributed into the two directions.

3.5.3 Two-Way System East of Brunswick Street

In response to concerns raised during the course of the study of the impact of a two-way system on the operations of Victoria Street, as well as with the feasibility of modifying the 3rd Avenue/5th Avenue intersection, a second two-way system was developed – where two-way operations would not commence until east of Brunswick Street. Brunswick Street was selected as it has adequate surplus capacity to accommodate the turning movements that would be required for the one-way to two-way transition.

This conversion would therefore provide opportunities to reduce the overall street width of 2nd Avenue and 4th Avenue in much of their commercial areas, with excess road pavement allocated to possible landscaping, improved pedestrian facilities or bike lanes as shown in FIGURE 3.11.

This option is expected to have similar benefits in the commercial areas of downtown with respect to improved navigation, increased exposure to storefronts, and ease of use for the transit system, improved emergency vehicle access and reduced turning movements as the previously-described two-way system. Disadvantages related to decreased capacity would be directed away from Victoria Street, a major arterial.

Similar to the option described above, for the purposes of analysis, when converting traffic operations on 2nd and 4th Avenues from one-way to two-way, the following assumptions were made:

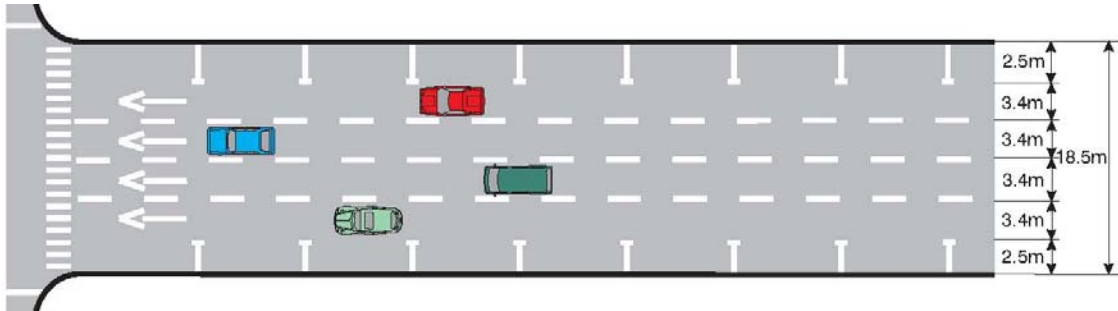
- The road widths were reduced to one lane in each direction.
- The traffic volumes along 2nd and 4th Avenues were equally redistributed into the two directions.

3.5.4 Enhanced One-Way System (Road Dieting)

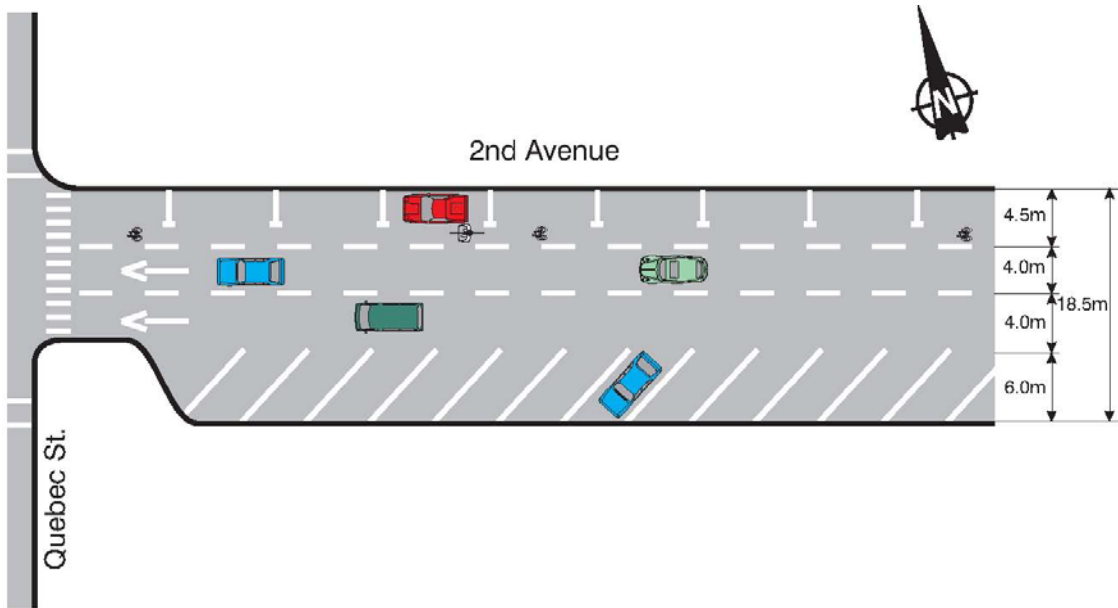
This option involves maintaining the one-way system, with its safety advantages for pedestrians and vehicles, but reducing the overall pavement width to allocate the excess pavement to possible landscaping, improved pedestrian facilities, bike lanes or increased parking. This re-configuration is often called road dieting. Given the width and functions of the subject streets, numerous configurations are possible. One example, with improved facilities for cyclists, curb extensions and increased parking is shown in FIGURE 3.14 (this example would only apply to 2nd Avenue). Other potential configurations could include wider sidewalks for landscaping and pedestrians. The analysis indicates that traffic efficiency can be maintained to a 15-year horizon (Section 3.6).

Similar to the existing conditions, with an enhanced one-way system, traffic tends to move more efficiently which can also mean more quickly between intersections. The resulting effect may be that more people are driving through an area rather than spending time there. This issue can be addressed by traffic calming or slower signal co-ordination, all of which could be incorporated into an enhanced one-way system. Similar to the existing conditions, Increased number of turning movements may be required to reach a destination, which may cause increased circulation and increased vehicle kilometres traveled. Visibility of retail storefronts also remains reduced.

For the purposes of this analysis, when converting the existing one-way couplet on 2nd and 4th Avenues to an enhanced one-way couplet, the pavement width was reduced to two-lanes on each street, for a total of four travel lanes on the two streets.



Existing layout



One of many potential configurations under two-way operations

FIGURE 3.14 ENHANCED ONE-WAY TRAFFIC CONCEPT

3.6 Future Traffic Conditions

3.6.1 Traffic Growth Rates

Current afternoon peak hour traffic volumes were projected to five, 15, and 25-year horizons under both medium (1.5 percent) and high (3.0 percent) compounded growth rates. A three percent growth rate is considered conservative and optimistic (i.e. high) for this study. These growth rates were based on projected downtown land uses and were agreed upon with the City of Prince George. Traffic increases for each horizon year are summarized in TABLE 3.7. Current volumes are considered to be far lower than the downtown’s potential as a major activity centre. Therefore the aggressive growth rates are intended to reflect both background growth and a revitalized downtown.

TABLE 3.7 TRAFFIC GROWTH SCENARIOS

ANNUAL GROWTH RATE (PERCENT)	TOTAL TRAFFIC INCREASE - PERCENTAGE AT HORIZON YEAR		
	Five Years (2011)	Fifteen Years (2021)	Twenty-Five Years (2031)
1.5	8	25	45
3.0	16	56	109

As shown in TABLE 3.7, at the 25-year horizon the medium traffic growth projection increases total traffic in the downtown network by about 50 percent and the high growth rate more than doubles the current traffic volumes.

3.6.2 Analysis Parameters

Capacity performance of the study intersections was assessed using Synchro Version 6.0 software, developed by Trafficware (2004). The study intersections were evaluated using PM peak hour counts and by calculating the intersection and approach vehicular delays and Levels of Service (LOS). Individual movements operating at a LOS D or below are considered possible “triggers” to consider improvements.

Traffic operations were modelled under four road network scenarios:

- current intersection layout;
- a two-way system from 5th Avenue to Queensway,
- a two-way system from Brunswick Street to Queensway; and
- an enhanced one-way system.

The four scenarios were analysed at the five, 15, and 25-year horizons under both the medium and high growth rates. Very few improvements were required for the medium growth rate, and for the sake of simplicity, that growth rate was dropped from further analysis. A signal cycle length of 70 seconds was used for all intersections in all scenarios.

A range of improvements including left-turn lanes and protected/permitted phasing was modelled at the trigger locations. Longer cycle lengths could reduce delays and this is a possibility to be looked at in the future. For this analysis the signal cycle length for all intersections was maintained at 70 seconds.

With these improvements, the resulting LOS for all movements would be C or better for all movements in the 5 and 15 year horizon. In the 25 year horizon, a few movements may operate at LOS D or E.

3.6.3 Network Performance

The intersections encountering level of service D or E, the “trigger intersections” are summarized in TABLE 3.8 for all three road network scenarios. The LOS results for the forecasted trigger signalized intersections are summarized in APPENDIX B.

It can be seen that several trigger intersections are common to all four scenarios. The required improvements for these intersections are summarized in TABLE 3.9.

TABLE 3.8 SUMMARY OF TRIGGER INTERSECTIONS FOR ALL ROAD NETWORK SCENARIOS

INTERSECTION	SCENARIO AND HORIZON YEAR AT WHICH THE INTERSECTION BECOMES A TRIGGER INTERSECTION			
	UNMODIFIED	2-WAY TO 5 TH AVE	2-WAY E of BRUNSWICK	ENHANCED 1-WAY
Victoria Street and 1 st Avenue	15	15	15	15
Victoria Street and 2 nd Avenue	>25	15	>25	25
Victoria Street and 3 rd Avenue	25	25	25	15
Victoria Street and 4 th Avenue	25	15	25	25
Victoria Street and 6 th Avenue*	25	25	25	25
Victoria Street and 7 th Avenue*	25	25	25	25
Queensway and 5 th Avenue	15	15	15	15

TABLE 3.9 SUMMARY OF INTERSECTION IMPROVEMENTS REQUIRED FOR ALL ROAD NETWORK SCENARIOS

INTERSECTION	IMPROVEMENT**	NOTES
Victoria Street and 1 st Avenue	WB left turn advanced phase	
Victoria Street and 3 rd Avenue	Eastbound and Westbound left-turn lanes	Requires removal of existing curb extensions, or left-turn restrictions
Victoria Street and 6 th Avenue*	NB and SB left-turn lanes	Remove parking on N-S approaches
Victoria Street and 7 th Avenue*	NB and SB left-turn lanes	Remove parking on N-S approaches
Queensway and 5 th Avenue	WB left-turn lane	Remove parking on E-W approaches

* Traffic volumes for Victoria Street from 6th Avenue to 8th Avenue were not available. Consider further analysis with traffic counts before investing on these intersections.

**UNLESS OTHERWISE NOTED, ALL IMPROVEMENTS CAN BE ACCOMMODATED WITHIN THE EXISTING PAVEMENT WIDTH

Additionally, in all scenarios, the following intersections may require traffic signals:

- Victoria Street and 5th Avenue. (5 years)
- Queensway and 3rd Avenue. (5 years)
- Victoria Street and 9th Avenue. (15 years)
- 4th Avenue and George Street. (25 years)
- 2nd Avenue and Quebec Street. (25 years)

TABLE 3.10 SUMMARY OF INTERSECTION IMPROVEMENTS SPECIFIC TO CERTAIN SCENARIOS

INTERSECTION	SCENARIO AND REQUIRED HORIZON YEAR				IMPROVEMENT**
	UNMODIFIED	2-WAY TO 5 TH AVE	2-WAY E of BRUNSWICK	ENHANCED 1-WAY	
2 nd Avenue, 3 rd Avenue and Vancouver St.	-	Required immediately	-	-	Modifications for two-way transition
3 rd Avenue, 4 th Avenue and Cassiar Street	-	Required immediately	-	-	Modifications for two-way transition
Victoria Street and 2 nd Avenue	-	15	-	-	EB left-turn lane
	-	15	-	25	WB left-turn lane
Victoria Street and 4 th Avenue	25	25	25	25	SB left turn lane
	-	15	-	-	WB left-turn lane
	25	15	25	15	EB left turn lane
	-	25	-	-	NB left turn lane
	25	-	25	-	NB right turn lane

* Traffic volumes for Victoria Street from 6th Avenue to 8th Avenue were not available. Consider further analysis with traffic counts before investing on these intersections.

**UNLESS OTHERWISE NOTED, ALL IMPROVEMENTS CAN BE ACCOMMODATED WITHIN THE EXISTING PAVEMENT WIDTH, IF PARKING IS REMOVED ON THE APPLICABLE APPROACHES

3.6.4 Summary of Analysis for Future Conditions

TABLE 3.11 shows that the network scenario where two-way operations extend west to 5th Avenue requires significantly more physical improvements than any of the other scenarios. Additionally, the timing of such improvements occurs in the 15 year horizon, rather than in the 25 year horizon. While these improvements can generally be accommodated within the existing pavement width, some parking must be removed on Victoria Street for many of the improvements, which may have an impact on downtown businesses. Additionally, the two-way system to 5th Avenue would require some major intersection reconstruction at the current transition area.

The extension of two-way operations west to 5th Avenue will require significant changes to the Provincial intersections along Victoria Street, one of the main north-south corridors in the City. To determine the impact of the two-way conversions on Victoria Street, additional detailed operational analysis will be required. The analysis should be conducted in cooperation with the BC Ministry of Transportation, and should include determining in detail:

1. The required laning changes at the Victoria Street intersections with 2nd Avenue and with 4th Avenue.
2. The required length of any new left-turn lanes.
3. The impacts of the new intersection laning on on-street parking supply, and these results should then be discussed with the directly affected businesses.
4. The impacts of the new intersection laning on signal phasing and cycle lengths, and the ability of the Ministry's existing signal controllers to accommodate the required signal operations.
5. The impact of the changes at the Victoria intersections with 2nd and 4th Avenues on overall north-south mobility along the Victoria Street corridor.

The extension of two-way operations west to 5th Avenue can be considered in the future if the results of the above analysis are favourable. In the meantime, the physical work to implement the two-way conversion east of Brunswick should not prevent the future extension of two-way operations to 5th Avenue.

3.7 Opportunities and Issues

Based on the results of the capacity analysis, site visits, review of background reports and public consultation, issues and opportunities relating to the road network in downtown Prince George were identified, and are discussed below.

3.7.1 Opportunities

A. Excellent Existing LOS

The existing LOS in the downtown of Prince George indicated that vehicles have very little delay at all intersections, even during peak periods. This excess network capacity provides many opportunities to accommodate future traffic growth and to provide facilities for other modes of transportation such as walking or cycling.

B. Short Blocks

The downtown grid system was well planned and laid out. Short blocks throughout the downtown core provide multiple routes for drivers to bypass congested areas. Short blocks also provide a pedestrian-friendly environment by reducing the distance pedestrians have to walk to reach their destination.

3.7.2 Issues

A. No Designated Truck Route

Currently there is no designated truck or dangerous goods route through the downtown. The Ministry of Transportation's policy is for no cargo restrictions on provincial highways. This issue is amplified by Highway 16, which carries trucks through the central business district.

B. Inconsistent Traffic Control

There are different traffic controls through out the downtown including two-way stops, three-way stops, four-way stops and signalized intersections. Similar intersections with similar patterns and different traffic controls may lead to driver confusion and possibly a lack of respect for certain control types.

C. Potentially Unwarranted Signals

Some of the signalized intersections in the City Centre do not meet warrant criteria based on traffic volumes, some signals may still be warranted based on safety concerns. Signalized intersections that do not meet warrant criteria may lead to undue vehicle delays, slight increases in collision rates and a general lack of respect for signal displays. The need for signals at several locations should be reviewed on a detailed site-specific basis.

D. Relatively High Vehicle Speeds

The combination of wide, multi-lane streets and significant excess capacity throughout the downtown network results in relatively higher vehicle speeds. High vehicle speeds may lead to higher collision rates and an unfriendly environment for other modes of transportation including pedestrians and cyclists.

E. Poor Pedestrian and Cyclist Operations

Some concerns have been expressed regarding the impact of the excess capacity (wide streets) on pedestrian operations, and of the one-way traffic on cyclist operations, and of both on the vitality of the downtown from an economic perspective. The impact on pedestrian operations and cyclist operations are discussed in greater detail in Chapters 5.0 and 6.0.

F. Impact of One-way System on Downtown Businesses

Downtown merchants have expressed concern that the ease of signal coordination that is usually considered a benefit of traffic movement, encourages drivers to “speed through” downtown, without time to consider the possibility of stopping at some downtown locations. Additionally, unfamiliar drivers may find it frustrating to navigate the one-way system and find their destination. This may reduce the number of pass-by or occasional shoppers.

G. Segregated Transit Operations

A one-way system may make transit operations more difficult by forcing inbound and outbound bus stops on the same route to be on different streets. Although this may support the loop system and offer better coverage throughout the

downtown, this may also confuse the unfamiliar transit rider and discourage transit use.

3.8 Recommendations

Short term (zero to four years) recommendations are proposed for road network improvements in the downtown. These recommendations are later prioritized in CHAPTER 11.

Short Term

A. Consider a two-way Road System

The matrix, shown in TABLE 3.12 was developed to evaluate the three proposed network options. Based on this matrix it is recommended that is the City convert 2nd Avenue and 4th Avenue to 2-way east of Brunswick Street. Prior to implementation, the City should conduct a public consultation with a preliminary design that includes:

- Lane striping;
- Signal operations;
- Transit impacts; and
- Parking layout.

An evaluation of the new two-way system should follow, 6 months after implementation. The evaluation should include technical elements (delays, LOS), measures for vulnerable road users (pedestrians, bikes), and a survey of residents and businesses. Intersection traffic control (4-way stops, signals, 2-way stops) within the downtown should be regularly reviewed at the operational level, particularly after the 2-way conversion, to ensure that the proper intersection control is provided at each downtown intersection; and that signal timings are optimized on a regular basis.

TABLE 3.11 ROAD NETWORK DECISION MATRIX

ROAD NETWORK DECISION MATRIX					
Item	Objective	Options			
		Existing One-Way	Enhanced One-Way	Two-Way East of Brunswick	Two-Way to 5 th Avenue
Walking	Mobility	1	1	1	1
	Conflict Points	1	2	0	0
Cycling	Mobility	0	1	2	2
	Conflict Points	1	2	1	1
Transit	Efficiency Along Major Arterials	2	1	0	0
	Accessibility/Coverage	0	1	2	2
	Conflict Points	1	1	0	0
Motor Vehicles	Efficiency Along Major Arterials	2	1	1	0
	Accessibility	0	0	2	2
	Conflict Points	1	2	1	1
Parking	Supply	2	1	1	1
Emergency Access	Mobility	1	1	2	2
	Accessibility	1	1	2	2
Business / Economic Interests	Exposure	1	1	2	2
Improvement Cost	Minimize Capital Costs	2	1	1	0
Totals		16	17	18	16

LEGEND	
2	Most Favourable
1	Somewhat Favourable
0	Least Favourable

Definitions

Accessibility - Ability to access areas of the downtown.

Exposure - Ability of visitors and residents of downtown to access local businesses.

In Phase 2 of the Public Consultation, respondents were asked if they were in favour of this conversion. 46 percent strongly liked or somewhat liked the conversion while 41 percent somewhat disliked or strongly disliked the conversion. The majority of comments on the two-way conversion were in favour of the conversion, though most people feel that the conversion should go to Victoria so as to reduce confusion.

While the current recommendation is to provide the two-way system east of Brunswick Street only, it is important to note that this does not preclude extending the two-way system to Victoria Street or 5th Avenue. No work will be done that will prevent the extension of the 2-way system from being implemented in the future (medium or long term), if the required road network and operational improvements that will support the extension of the 2-way system are implemented, and if the evaluation results for the short-term conversion are positive.

Medium Term

A. *Signal Warrant Review*

Review the need for signals on a site-specific basis.

B. *Re-Synchronize Signals for Lower Speeds*

Consider re-synchronizing traffic signals for lower speeds to reduce speeding and promote a friendlier street environment for all road users.

C. *Increase Police Enforcement*

Consider increasing police enforcement of speeding in the downtown.

4.0 TRANSIT

4.1 Background

Transit provides low-cost access to retail, recreation and entertainment opportunities and makes communities more attractive to both residents and visitors (Economic Benefits of Transit. Wisconsin Department of Transportation, 2003). Public transit also has the added advantage of depositing larger numbers of people at the doorsteps of retail shops. Those shops located at or in close proximity to a transit stop may benefit from exposure to potential patrons.

A review of Prince George transit service was completed in 2003 and service upgrades were made in 2004. Ridership grew 15 percent in 2004 and a further 21 percent increase from 2004 was recorded for 2005 ridership, as illustrated in FIGURE 4.1. This growth is due in part to the service upgrades and an increasing student population, which accounts for half of the system's riders (BC Transit News Release, Transit Ridership Jumps by 15 Percent, 2004). A smaller increase of one percent was recorded in 2006.



FIGURE 4.1 TRANSIT RIDERSHIP INCREASE

Increasing gas prices may have also contributed to ridership growth. Despite recent gains, however, the city has relatively low transit ridership when compared to other medium-sized Canadian cities.

The transit system was reviewed in relationship to other aspects of the Downtown Transportation Plan, with a focus on recommendations affecting downtown. The most relevant documents related to transit are listed in TABLE 4.1

TABLE 4.1 RELEVANT DOCUMENTS FOR TRANSIT

No.	TITLE	YEAR	FORMAT
1	BC Transit News Release: "Transit Jumps by 15 Percent"	2004	News Release
2	Transit Service Review, Stage 1-2	2003	Document
3	Conventional Transit Service Policy	2003	Policy
4	Official Community Plan	2001	Document
5	Prince George Transportation System Planning Study	2001	Document

4.2 Existing Conditions

The current routing of the transit system is shown in FIGURE 4.2. As of 2001, transit accounted for just under a 2 percent mode share for travel to work in Prince George, as shown in TABLE 4.2. This value may have increased in recent years, since transit usage has grown as shown in FIGURE 4.1. Transportation statistics will be available for the 2006 Census in 2008.

TABLE 4.2 JOURNEY-TO-WORK MODE SPLIT

Source: Census 2001, Statistics Canada and ISRE 2005 Results

MODE	PRINCE GEORGE	ISRE 2005 RESULTS (PG)	BRITISH COLUMBIA
Car, truck, van, as driver	82%	86%	75%
Car, truck, van, as passenger	8%	9%	7%
Public transit	2%	2%	8%
Walked or bicycled	7%	2%	9%
Other method	1%	1%	1%
TOTAL	100%	100%	100%

Characteristics of the transit system that are specific to downtown include the following:

- A total of six bus routes serve downtown: Routes 1, 11, 5, 55, 46, and 15.
- All downtown bus routes stop at 7th Avenue and Dominion Street (referred to as the Downtown Transit Exchange).
- The 7th and Dominion bus exchange is located within approximately seven blocks (700 meters walking distance) of most major downtown employers and is within close proximity of several civic facilities. Route catchment should ideally be no more than a two block radius of major employers.
- All bus routes serving downtown run only once per hour, with the exception of the route to the University of Northern British Columbia (UNBC), which runs every half hour.

Accessibility

- Low floor buses provide a ramp for wheelchair and scooter accessible transit, as well as a kneeling feature and no entry steps for those who experience difficulty climbing stairs.
- Handi-Dart provides door-to-door service for those unable to use regular transit due to a physical or mental impairment.

Transit Ridership

The following are characteristics of transit ridership in Prince George.

- As of January 2004, system upgrades were implemented and in 2005, the system had over one million riders, a 21 percent increase over 2004 (the projected ridership for 2005 had been 875,000).
- Students are an important market for any transit system that serves local post-secondary institutions, and particularly in Prince George, where they comprise 10 percent of the overall population and 50 percent of transit riders.
- According to the UNBC website, the university provides housing for approximately 600 students on-campus, which indicates that a majority of the approximately 4,000 students must commute to campus. The College of New Caledonia also has limited student housing on campus, making it a predominantly “commuter campus” as well.

At the time of the 2001 Census, Prince George’s transit mode share was at approximately half the average for medium-sized Canadian cities. According to the 2003 Transit Service Review, the level of investment in transit services was the lowest of all medium-sized systems in BC at that time. Since then, significant investments have been made and ridership has grown. However, Prince George likely remains below average for ridership amongst similar sized cities and transit systems.

TABLE 4.3 shows that among medium-sized Canadian cities (defined as between 50,000 and 150,000 population), both Prince George’s transit ridership and population density were among the lowest at the time of the 2001 Census.

While many factors play a role in transit ridership, transit-oriented land use and relatively high population densities are primary factors in making transit feasible and cost effective. The general trend among medium-sized Canadian cities is that those with higher population densities have higher transit ridership, as shown in FIGURE 4.2. However, even among cities with similarly low population densities, Prince George had among the lowest mode share for transit.

TABLE 4.3 COMPARISON OF MEDIUM-SIZED CANADIAN CITIES

Source: Census 2001, Statistics Canada

MEDIUM-SIZED CITY	POP. (within city limits)	POP. DENSITY (/sq.km)	% TRANSIT MODE
Barrie (ON)	129,963	1347	4.40%
Abbotsford (BC)	129,475	322	1.20%
Sherbrooke (QC)	127,354	1306	8.30%
Kelowna (BC)	108,330	456	2.80%
Kingston (ON)	108,158	254	4.20%
Guelph (ON)	106,920	1225	6.20%
Thunder Bay (ON)	103,215	332	3.40%
Moncton (NB)	90,359	433	3.60%
Brantford (ON)	86,417	1208	3.20%
Sarnia (ON)	78,577	431	2.10%
Nanaimo (BC)	77,845	819	3.00%
Peterborough (ON)	73,303	1219	3.60%
Saint-Jean-sur- Richelieu (QC)	70,455	794	4.90%
Kamloops (BC)	67,952	260	3.40%
Sault Ste. Marie (ON)	67,385	334	3.50%
Lethbridge (AB)	67,374	553	2.40%
Prince George (BC)	66,239**	229	2%*
Belleville (ON)	61,886	190	3.60%
Drummondville (QC)	58,527	652	1.70%
Fredericton (NB)	54,068	362	4.40%
<i>AVERAGE – Med.- sized cities</i>	<i>86,690</i>	<i>636</i>	<i>3.60%</i>

*2% represents the transit ridership of adults responding to the ISRE survey, 2005

** This population number represents the population within the city limits. Population figures shown in TABLE 2.3 represent the population for the area of Prince George.

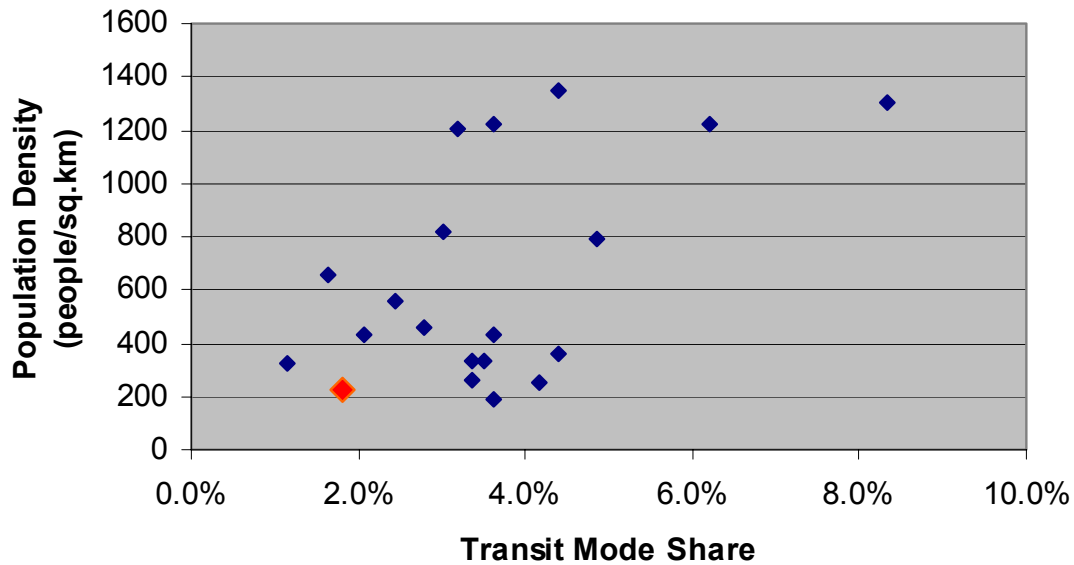


FIGURE 4.2 POPULATION DENSITY VS. TRANSIT MODE SHARE IN MEDIUM-SIZED CANADIAN CITIES
(Prince George shown in red.)

4.3 Issues

The following issues were noted in the 2003 Transit Service Review and during this study:

- The downtown transit exchange at 7th and Dominion is well-located for some civic facilities; however, it is relatively poorly located for access to the major core and employment areas, and is limited in its current ability to attract downtown ridership. (Public consultation revealed that some residents also feel that the downtown transit exchange location is poorly located to serve the major downtown employers.)
- Elimination of the downtown transit exchange was previously attempted and deemed a failure due to the confusion it created.

- On street facilities (bus shelters) need a consistent design with consideration for Prince George's winter climate and more information about routes and scheduling. On-street facilities (shelters and benches) are frequently vandalized, collect trash, are not lit and are generally considered unattractive.
- While service upgrades have been made in recent years, a service frequency of once per hour serving downtown requires long wait times by transit customers.
- Population density in the City of Prince George is too low to be supportive of an efficient transit system.
- There is a continuing issue with the location of a bus stop at 4th and Dominion. Store owners do not want a stop located in front of their shops for two main reasons:
 - The elimination of parking to accommodate the bus stop is perceived by the adjacent businesses as having a negative impact on their customers; and
 - That the buses will generate undesirable fumes on Dominion Street.

Issues Identified During Consultation

During Phase One of public consultation the following statements were made by residents and stakeholders regarding the public transit system in Prince George:

- The trip time between UNBC and downtown is too long.
- Provide express buses to/from downtown (e.g. to UNBC).
- Students must drive downtown to go to bars because buses don't run late enough (until 10PM on Fridays and 11PM on Saturdays).
- Interchange at 7th doesn't make sense; 2nd and Brunswick would be a better location.
- Turn the parking garage at 2nd and Brunswick into a transit exchange with transit-serving retail at street level.
- The northwest sector of downtown has the most employment, and therefore transit should serve this area.

- Need bus shelters with lighting and trash bins.
- Need more accessible bus stops; some are on raised platforms with no wheelchair ramps.
- Typically, municipal transit systems develop a five-year service plan with BC Transit. BC Transit indicates that initial discussions have taken place to move towards a five-year service plan in Prince George but that the discussions are very preliminary.

4.4 Potential Solutions

These solutions can be considered in the future, although many issues will need to be addressed in conjunction with BC Transit.

- Determine employment densities in the downtown core on a block-by-block basis and ensure transit routes efficiently serve the areas of greatest employment density.
- Promote Pro-Pass ridership agreements with local businesses.
- If a downtown transit exchange is deemed necessary, consider the location as part of an overall strategy for downtown and one that will serve the most businesses and housing.
- Provide a heated, enclosed bus shelter at the downtown transit exchange that incorporates transit-serving retail (e.g. coffee shops, newsstands) in order to make wait times more comfortable and enjoyable for passengers.
- Encourage growth in student housing in the downtown area in order to make transit service to and from downtown more cost-effective due to an increased ridership base living in the downtown area. This will have the additional benefit of attracting new business to downtown due to an increased customer base and better accessibility.
- Develop design standards for transit stops which include the following:
 - Lighting;
 - Adjacent sidewalk wide enough to ensure a minimum 1.5-metre “clear zone” around the transit stop (to allow pedestrians and wheelchair-users to pass);

- Consideration of accessibility for wheelchair-users;
 - Trash bins; and
 - Shelter from weather appropriate to the northern climate.
-
- Consider a series of rapid transit buses that will stop only at major destinations to get residents to their neighbourhood faster, at which point they can transfer to a local bus (community shuttle).
 - Develop a five-year transit service plan for BC Transit, and address issues arising out of the Downtown Prince George Transportation and Parking Plan.

It was noted by staff that a late night request stop bus does operate on Route 15, which effectively acts as an express bus to UNBC in the evenings. This service should be advertised on BC Transit's website to promote ridership.

Transit Stop at 4th Avenue and Dominion Street

There is currently no transit stop at this intersection. City staff indicates that there is a high demand for a stop at this location due to the number of downtown employees working in the vicinity. The nearest bus stop is half a kilometre away. The guideline for transit access is to have a stop within 400 metres walking radius, and usually an even smaller radius for denser urban areas such as downtowns. This is supported by the Prince George's Conventional Transit Service Policy (2003). Some of the features of this policy include:

Targeting transit coverage to be within:

- 400 metres walking distance of 90 percent of all residences;
- 250 metres of all future medium and high density residential developments; and
- 150 metres walking distance of all designated senior residences and other institutional facilities.

Concerns have been expressed by one business in the vicinity regarding the loss of parking in front of the store and the potential affects that may have on the store's success. It should be noted however, that transit provides greater access to downtowns and brings large numbers of people to retail districts. Those businesses located near transit stops have the added benefit of increased exposure which may result in potential patrons. Previously the following solutions were considered:

- The loading zone, previously on the southwest corner of 4th Avenue and Dominion was removed in Fall of 2006 and parking was restored.
- A transit stop on Dominion just south of 4th Avenue was tried and removed due to complaints of exhaust fumes entering the windows on the second floor.
- Rerouting buses to George Street was also considered and discarded due to insufficient traffic control and street geometry as well as numerous parking conflicts causing delays.
- Rerouting buses to Queensway was also discarded due to the lack of demand, poor route circuiting and personal safety concerns.

It is recommended that the City locate the transit stop on the south side of 4th Avenue west of Dominion Street. Converting parking spaces to a transit stop at this location would also mean that transit stops are at approximately every second block.

4.5 Recommendations

Short term (zero to four years), medium term (five to nine years) and long term (ten years or longer) recommendations are proposed for transit improvements in the downtown. These recommendations are later prioritized in CHAPTER 11.

Short Term

- A. *Install a bus stop at the on the south side of 4th Avenue west of Dominion Street.*

This bus stop is in a location of high demand and would support the guideline of providing bus stops within 400 metres walking distance of demand areas. This stop will service the demand of customers working in the downtown.

- B. *Initiate a Five Year Transit Plan in conjunction with BC Transit.*

A five-year transit plan will help to articulate goals and objectives for transit not just in the downtown but throughout Prince George. An implementation and monitoring plan should also be key components so as to ensure the plan's success.

- C. *Develop a late night bus.*

A late night bus route would support students travelling to UNBC and the College of New Caledonia to and from the downtown. Students represent a high number of transit riders in Prince George and can also bring vibrancy to the downtown.

Medium Term

- A. *Develop design standards for transit stops.*

Design standards for transit stops will help to make transit stops more comfortable for transit riders considering winter conditions in Prince George. Consistency of design standards also helps those with physical, sensorial or cognitive impairments to better navigate the transit system.

B. *Create a rapid bus service system.*

A rapid bus service system is an incentive for those travelling from neighbourhoods to the downtown, particularly commuters who are travelling to and from places of employment. The rapid bus service can operate on a schedule such that busses travel to the downtown in the morning peak hour only and out of the downtown in the afternoon peak hour only.

Long Term

A. *Monitor the success of the Five-Year Plan and re-evaluate as necessary.*

Re-evaluation of the five-year plan is necessary to review the success of original goals and objectives, determine successes, articulate solutions to issues and develop new goals and objectives to be met.

Input from Public Consultation

In Phase Two of the Public Consultation, residents were generally in favour of these recommendations.

Respondents strongly favour a five year transit plan with 74 percent strongly liking or somewhat liking the idea of a plan while six percent somewhat disliked or strongly disliked the idea of a five year transit plan.

Respondents strongly favoured a rapid transit system with 72 percent strongly liking or somewhat liking a rapid transit system while eight percent somewhat disliked or strongly disliked the idea.

People were happy about the recommendation for rapid transit, particularly for the university and the college. They would also like to see extended bus routing and an increase in service frequency in the downtown. Park and Ride facilities were also suggested.

5.0 CYCLING

5.1 Background

As part of the Downtown Transportation and Parking Study, cycling has been considered a primary mode of transportation to support the City's mode share goals. In researching cycling transportation for the study area, several reports were reviewed (listed in TABLE 5.1). Site visits were also conducted in both February and May 2006.

TABLE 5.1 RELEVANT DOCUMENTS FOR CYCLING REVIEW

No.	Document Title	Year	Format
1	A Smart Growth Direction for the City of Prince George: Development Concept for the 5 th and Tabor Site	2004	Document
2	Analysis of Traffic Design Alternatives in Downtown Prince George	2003	Document
3	Crescents Neighbourhood Plan	2003	Document
4	Existing Speed Limits	2003	Map
5	Park and Trail System	2003	Map
6	City of Prince George Official Community Plan	2001	Document
7	Prince George Transportation System Planning Study	2001	Document
8	Downtown Prince George Revitalization Study Vols. I and II	2001	Document
9	The City of Prince George <u>Cycling Network Plan</u>	2000	Document
10	Downtown Revitalization A Time for Action: A Report on the Issues of Downtown Revitalization in Prince George	1996	Document
11	Report of the City Centre Concept Committee on a Prince George City Centre Strategy	1990	Document

Opus Hamilton reviewed available data including traffic volumes, road widths and on-street parking locations. The most relevant dealing with cycling and bicycle transportation is the City of Prince George Cycling Network Plan (2000).

5.2 Existing Conditions

The planned cycling facilities for downtown are shown in FIGURE 5.1. East-west cycling facilities are planned along 1st, 2nd and 10th Avenues as well as 15th Ave / Patricia Boulevard and north-south along Queensway and Winnipeg Streets.



FIGURE 5.1 PLANNED CYCLING ROUTES AS IDENTIFIED IN THE CNP

Cycling facilities that have been implemented are shown in FIGURE 5.2 and include on-street routes along Patricia Boulevard between Victoria Street and Dominion Street and on 3rd Avenue from the Cross, at Victoria westbound to Cassiar Street, which extends outside the study area.



FIGURE 5.2 EXISTING CYCLING FACILITIES

There is also a proposed trail route that runs along 15th Avenue and Patricia Boulevard as well as an established trail route north of the study area along River Road (Heritage River Trail). The speed limits are 50 kilometres per hour for all streets in the study area. The major routes are arterial roads as identified in FIGURE 3.1.

There is a shared use trail system that runs along the outside of the study area, with potentially significant connections to the downtown. Points of interest for both residents and visitors to Prince George that are in the study area include: a civic centre and a pool, while Connaught Hill Park is immediately adjacent to the study area.

There are three identified east-west routes to the downtown that terminate at Victoria Street. There is no east-west route that crosses the downtown.

Although the Cycling Network Plan describes locations for on-street bike routes, site visits confirm that only a few recommendations from the CNP have been implemented so far. Communication from the City indicates that there are paint markings for cyclists on 2nd Avenue and 3rd Avenue as well as on the section of 2nd Avenue south to 3rd Avenue. However, according to the Cycle Network Plan, 2nd Avenue is not a designated cycling route. Other routes in the plan have yet to be formally designated.

Provincial Highway 16 (1st Avenue and Victoria Street) offers pedestrians pushbuttons to cross the street at signalized intersections, however, no actuation is provided for cyclists, neither bicycle pushbuttons nor bicycle detectors (loop or video). City staff indicates that there is, as yet, no location in Prince George with significant bicycle traffic and significant enough delay to warrant bicycle detectors or push-buttons.

A review of traffic volumes, speed and street widths are summarized in TABLE 5.2. This information can help identify additional cycling facilities in the downtown.

TABLE 5.2 VOLUMES AND WIDTHS ON DESIGNATED BIKE ROUTES

STREET NAME	VEHICLES/DAY (two-way)	POSTED SPEED LIMIT (km/h)	AVERAGE STREET WIDTH (meters)	CURB LANE WIDTH (meters)	CANDIDATE FOR SHARED LANE?
1 st Avenue	9,000 – 10,000	50	18.5	4.2	Yes
2 nd Avenue	5,000 – 6,000	50	16.8	5.0 (including parking)	Yes
10 th Avenue	< 2,000	50	13.3	3.2 (but width varies)	Yes
Winnipeg Street	6500 - 7500	50	14	3.5	Too Narrow
Queensway	11,000	50	17.25	4.0	Too Narrow
15 th Avenue / Patricia Boulevard	9,000 – 10,000 and 3,000 – 4,000	50	18.0	5.0	Yes

Other low volume continuous roads that may be attractive to cyclists include 3rd Avenue and 6th Avenue, each with less than 2,000 vehicles per day.

During the site visit, cyclists were observed riding on sidewalks, as shown in FIGURE 5.3. This could be due in part to a lack of facilities, perceived or real safety concerns, or lack of cyclist education.



Patricia Boulevard at 10th Avenue*



3rd Avenue

*Bicycle lanes are provided on this section of Patricia Boulevard

FIGURE 5.3 PHOTOGRAPHS OF CYCLISTS DOWNTOWN

5.3 Existing Plans

The 2000 Cycle Network Plan is the current plan for cycling in Prince George. Major issues dealt with in the plan include:

- Improved accessibility to major employment centres;
- Reduction in the rate of growth of motorized traffic and the promotion of biking and biking with transit;
- Designated north-south and east-west corridors to encourage increased use of cycling;
- New bike facilities and infrastructure;
- Compatibility with the Trail System Master Plan;

- Combination of on- and off-road facilities;
- Provision of a variety of options; and
- Encouragement of programs that promote cycling.

The Cycling Network Plan and the 1996 Downtown Revitalization Report state that all roads are potential cycling routes and that facilities should be designed to allow cyclists to ride with traffic while providing identical facilities on both sides of the road. These include sufficient lane widths so that motorized vehicles can pass safely as well as smooth and clean road surfaces unobstructed by debris. Encouragement for cycling included continuity, easy access to destinations and end-of-trip facilities.

Other incentives to encourage cycling included in the Cycling Network Plan are:

- Establishing an education program that would disseminate 'share the road' printed material and encourage skills training programs offering approved curriculum by certified instructors for all ages and skill levels.
- Encouraging local driver's education programs to include interaction with cyclists.
- Promoting a Selective Traffic Enforcement Program (STEP) whereby police would focus enforcement campaigns at both cyclists and motorists who disobeyed relevant laws.
- Discussing with BC Transit the use of front-loaded bike racks on buses to encourage multi-modal trips, particularly to the University, Hart Highlands and College Heights (have been installed and are in use). These were implemented in the Spring of 2006.

Residents of the Crescents Neighbourhood, in their 2003 Crescents Neighbourhood Plan identified several potential cycling routes to connect their neighbourhood to the downtown. Bike routes that were indicated include: 10th and 9th Avenues, Winnipeg Street, 15th Avenue and the North 3rd Avenue escarpment. The plan also recommends coordinating pedestrian and cycling linkages.

5.4 Future Issues and Planned Changes

Identifying future issues can lead to opportunities for planning cycling facilities. Issues identified in the Cycle Network Plan have been summarized in terms of bicycle facility issues, design issues and legal issues.

Bicycle Facility Issues

- Investigating the need to provide loop detectors or increase sensitivity for loop detectors along identified cycling routes where demand exists or to encourage cycling (FIGURE 5.4);
- Investigating the need for installation of curb side push buttons at all pedestrian controlled lights where demand exists or to encourage cycling;
- Providing bike parking close to destinations and in open and clear view; and
- Winter maintenance standards for bicycle lanes (not in the CNP, but a consideration);
- Considering access to controlled parking (bike lockers and key access underground parking) and uncontrolled parking (racks).



FIGURE 5.4 BICYCLE LOOP DETECTOR

Bicycle Design Issues

- Creating linkages between off-road and on-road facilities; and
- Employing design features such as curb cuts where off-road trails link with on-street cycling routes; and
- Considering east-west routes through downtown.

Legal Issues

- Furthering City by-laws beyond bike access and parking to include indoor parking for employees with change rooms and shower facilities;
- Including bike standards within the minimum by-law standards imposed by the City; and
- Repealing section 52.3 of the Parking and Traffic By-law 6056, “A person operating a cycle shall not ride it on a roadway if there is a usable path intended for the use of cycles adjacent to the roadway.” (The relevant section of the MVA has been changed.) This will recognize that cyclists are entitled to cycle on any roadway and will allow for on-street and off-road facilities to run along the same route.

In addition to the issues identified in the cycling plan, the following design and facility issues were identified in the course of this Downtown Parking and Transportation Study:

- One-way street system results in more circuitous routes for cyclists, but may be considered safer due to the reduced potential for conflicts with motor vehicles, and inherent gaps in traffic;
- Lack of bicycle actuation at traffic signals on Victoria Street;
- Dedicated facilities have not yet been provided on many routes designated as cycling routes;
- A lack of east-west routes through the downtown.
- Missing connections between the off-road trail network and the on-road cycle network that should be made to create a comprehensive cycling network for both off-road and on-road users - specific connections near the study area include Winnipeg Street and 3rd Avenue to the Heritage River Trail and Patricia Boulevard to the Heritage River Trail; and
- A lack of end-of-trip facilities such as bicycle parking, secure bicycle storage and employer end of trip facilities including bicycle lockers, bicycle storage rooms, and shower facilities.

However, the downtown area also has many features that may encourage cycling. These should be protected and enhanced when considering future options:

- Major destinations in proximity to residential land uses;
- Grid network with multiple route options and short blocks;
- Low-volume of vehicle traffic on some roads that should be seen as a priority to support cycling as future increases in volume may preclude these routes from becoming a viable option for cycling;
- Proximity to off-road trails; and
- Wide curb lanes on some roads.

5.5 Recommendations

Short term (zero to four years), medium term (five to nine years) and long term (ten years or longer) recommendations are proposed for cycling improvements in the downtown. These recommendations are later prioritized in CHAPTER 11.

Short Term

A. *Develop an Implementation Strategy for the Cycling Network Plan*

Developing an implementation strategy for the CNP will ensure cyclists are recognized on dedicated routes and will also demonstrate the City's commitment to alternative modes of transportation.

B. *Mark Bicycle Facilities*

Provide signage for on-street cycling facilities including painted bike lanes on 1st Avenue, 3rd Avenue, 9th Avenue, 15th Avenue and Patricia Boulevard and Winnipeg Street and Queensway with painted bicycle symbol and / or street signage to illustrate to all road users that these are also dedicated cycling facilities. To reduce visual clutter, bicycle routes signage could also be incorporated into new street name signs through the use of a bicycle symbol. Signage and road markings could make road users more aware of cyclists' presence. Well marked routes also instill confidence in cyclists that they have been considered in transportation planning infrastructure.

C. Provide Bicycle Parking

Secure bicycle parking is one of the major concerns for cyclists. Bicycle parking should be located close to building entrances and oriented for maximum bicycle usage.

Secure bicycle parking should be no further from entrances to buildings or elevators than the closest parking space and no more than 50 meters from access points. A minimum of between 5 and 10 percent of car parking requirements is recommended for bicycle parking. Bicycle racks should be oriented to maximize their efficiency with sufficient clearance from building walls to allow cyclists to be parked on either side of the rack. Examples of bicycle parking facilities are detailed in APPENDIX C.

City staff indicates that the City is currently reviewing the existing zoning bylaw to incorporate bicycle parking and end-of-trip facilities. The City of Toronto has bicycle parking requirements in its zoning bylaw, detailed in TABLE 5.3. Requirements are set for residential and commercial buildings as well as end-of-trip shower facilities for commercial buildings.

TABLE 5.3 BICYCLE PARKING REQUIREMENTS, CITY OF TORONTO
(from Zoning By-Law)

RESIDENTIAL BUILDING	<ul style="list-style-type: none"> ▪ 0.75 bike spaces/unit ▪ 200 maximum
COMMERCIAL BUILDING	<ul style="list-style-type: none"> ▪ 6 bike spaces minimum ▪ 1 bike space / 1,250 m² ▪ Both male and female shower facilities
ADDITIONAL REQUIREMENTS	
<ul style="list-style-type: none"> ▪ 80% occupant / 20% visitor ▪ Not more than 50% in vertical position ▪ Cannot be provided in dwelling unit / commercial suite or balcony 	

(Source: City of Toronto Bike Plan. Available on-line: <http://www.toronto.ca/cycling/bikeplan/pdf/chapter09.pdf>)

D. End-of-Trip Bylaw

Prince George should consider adopting an end-of-trip facilities by-law. End-of-trip facilities include secure bicycle storage (e.g. bicycle lockers or a locked bike room), showers and changing facilities and are based on land use type. For example, for commercial office buildings in the City of Toronto, both male and female shower facilities are required (TABLE 5.3). Examples of end-of-trip facilities are included in APPENDIX C. The City has confirmed that the Zoning Bylaw is being updated to incorporate these facilities.



FIGURE 5.5 SIGNED BICYCLE ROUTE AND BICYCLE LOCKER

E. Collect Bicycle Traffic Data

Downtown bicycle traffic volumes should be monitored when downtown vehicle volume counts are conducted. This will act as a base case when evaluating future improvements that are implemented. Counts should be concentrated on currently identified cycling routes.

Medium Term

Engineering, education, encouragement and enforcement are often cited as the four E's of cycling promotion. There are several opportunities for such programs for downtown Prince George as detailed in the 1996 Downtown Revitalization Report:

A. *Continue to implement the 2000 Cycle Network Plan.*

Implementation of the CNP demonstrates the City's commitment to alternative modes of transportation.

B. *Review Winter Standards for and Increase Maintenance on Surfaces and Sidewalks*

This will help to support year round cycling as well as increase the safety of routes for cyclists.

C. *Target a Selective Traffic Enforcement Program (STEP) in the Downtown*

This type of program can raise awareness for both motorists and cyclists through police enforcement campaigns focussed at people in both groups of road users who disobeyed relevant laws.

Long Term

Longer-term solutions for the future when cyclist volumes and delays warrant consideration, and in conjunction with other jurisdictions (such as the Ministry of Transportation) include:

A. *Bicycle Detection at Actuated Signals*

When and where warranted by significant cyclist volumes, or as a pro-active measure to encourage cycling, offering cyclists a pushbutton at intersections with pedestrian pushbuttons will eliminate unpredictable behaviour by cyclists, reduce cyclist delays and reduce potential conflicts with motor vehicles and pedestrians. It is understood that pushbuttons are currently only be provided at downtown signals operated by the Ministry of Transportation, so consultation with the Ministry is required. FIGURE 5.3 shows examples of cyclist pushbuttons.

Alternatively, loop detectors for motor vehicles can be reconfigured to detect bicycles and paint markings can be used as an indication of where loop detectors are so that cyclists can properly position their bicycles to initiate a signal change. Where possible, these should be used on preferred cycling routes, in critical locations, to support cycling, and in conjunction with curb-side cyclist pushbuttons to ensure timely intersection crossings for cyclists. Signal activation cameras may also be programmed to detect cyclists.



**FIGURE 5.6
CYCLIST
PUSHBUTTON**

B. In Conjunction with Road Network Upgrades

Other solutions to be developed in conjunction with the road network plan (Section 3.0) include:

- Dedicated on-street bike lanes or wide curb lanes on designated routes;
- Accommodating bicycle facilities in the two-way street system option as discussed in CHAPTER 3.0.

C. Review the Cycle Network Plan

A 10 year review of the CNP would provide opportunity to determine the plan's success, allow for expansion of the cycling network to include 5th Avenue or another comparable east-west route downtown and set new targets for increased numbers of people cycling in Prince George.

Input from Public Consultation

In Phase Two of the Public Consultation, residents were generally in favour of these recommendations. 56 percent of respondents were in favour of the installation of pushbuttons and 25 percent were not in favour. Respondents were 74 percent in favour of adding cycling routes to the downtown and 8 percent not in favour. In the comments, one person recommended loop detectors over cyclist pushbuttons and most comments were in favour of the end-of-trip facilities.

6.0 WALKING

6.1 Background

This section reviews issues related to walking. Walking is an important part of transportation - almost all trips start and end with walking. The benefits of a “walkable” community are immeasurable, ranging from economic development through increased access to business; to fewer trips in the car, resulting in less air pollution and traffic; to promoting a sense of community and transforming neighbourhoods into friendlier, more attractive places to live; to the health benefits, as residents discover that walking is one of the most affordable and accessible types of exercise available.

Site visits were conducted in February and May of 2006 to observe the pedestrian facilities and pedestrian activity in downtown Prince George.

Data collection included pedestrian counts, traffic volumes and observations of the presence of and condition of pedestrian facilities. A document review was conducted, the most relevant being the 2005 Pedestrian Network Study. A complete document list is included in TABLE 6.1.

TABLE 6.1 RELEVANT DOCUMENTS FOR WALKING REVIEW

No.	TITLE	YEAR	FORMAT
1	Pedestrian Network Policy (draft)	2006	Document
2	Pedestrian Network Study	2005	Document
3	Subdivision and Development Servicing Bylaw No. 7652	2004	Document
4	Smart Growth Direction for City of Prince George: Development concept for 5 th and Tabor	2004	Document
5	Park and Trail System	2003	Map
6	Amending Bylaws subsequent to no. 6332	2003	Spreadsheet
7	Transit Service Review, Stage 1-2	2003	Document
8	Crescents Neighbourhood Plan	2003	Document
9	Conventional Transit Service Policy	2003	Document
10	Citywide Trail System	2002	Map
11	Prince George City Wide Trail System	1998	Document

6.2 Existing Conditions

Based on the review of previous documents, and in consultation with the City of Prince George, eight locations were identified that had areas of pedestrian concerns. An experienced road safety engineer conducted site visits at those locations on February 8th and 9th, 2006. Locations are summarized in TABLE 6.2. These site visits were used to help identify area-wide pedestrian concerns.

TABLE 6.2 SITE VISIT LOCATIONS

STREET NAME	INTERSECTING STREET(S)
Winnipeg Street	From 6 th Avenue to 9 th Avenue
Victoria Street	From 7 th Avenue to 15 th Avenue
Patricia Boulevard	At 10 th Avenue
4 th Avenue	At Vancouver Street
George Street	At 4 th Avenue and at 5 th Avenue
2 nd Avenue	At Brunswick Street
Quebec Street	At 5 th Avenue and at 7 th Avenue
Queensway	At 1 st Avenue

A checklist was used to confirm the presence or absence of factors contributing to pedestrian safety. These site visits were used to identify pedestrian concerns that might be occurring area-wide throughout the downtown. The issues identified through the site visits include:

- Inconsistent signing of crosswalks;
- Ability of motorists and pedestrians to see each other at crosswalks;
- Underutilized marked crosswalks;
- Driver compliance with crosswalks;
- Lack of crossing opportunities; and
- Wide cross-sections.

These observations will be discussed in the appropriate sections below.

A summary of the issues identified during site visits at specific locations are detailed in FIGURE 6.1.

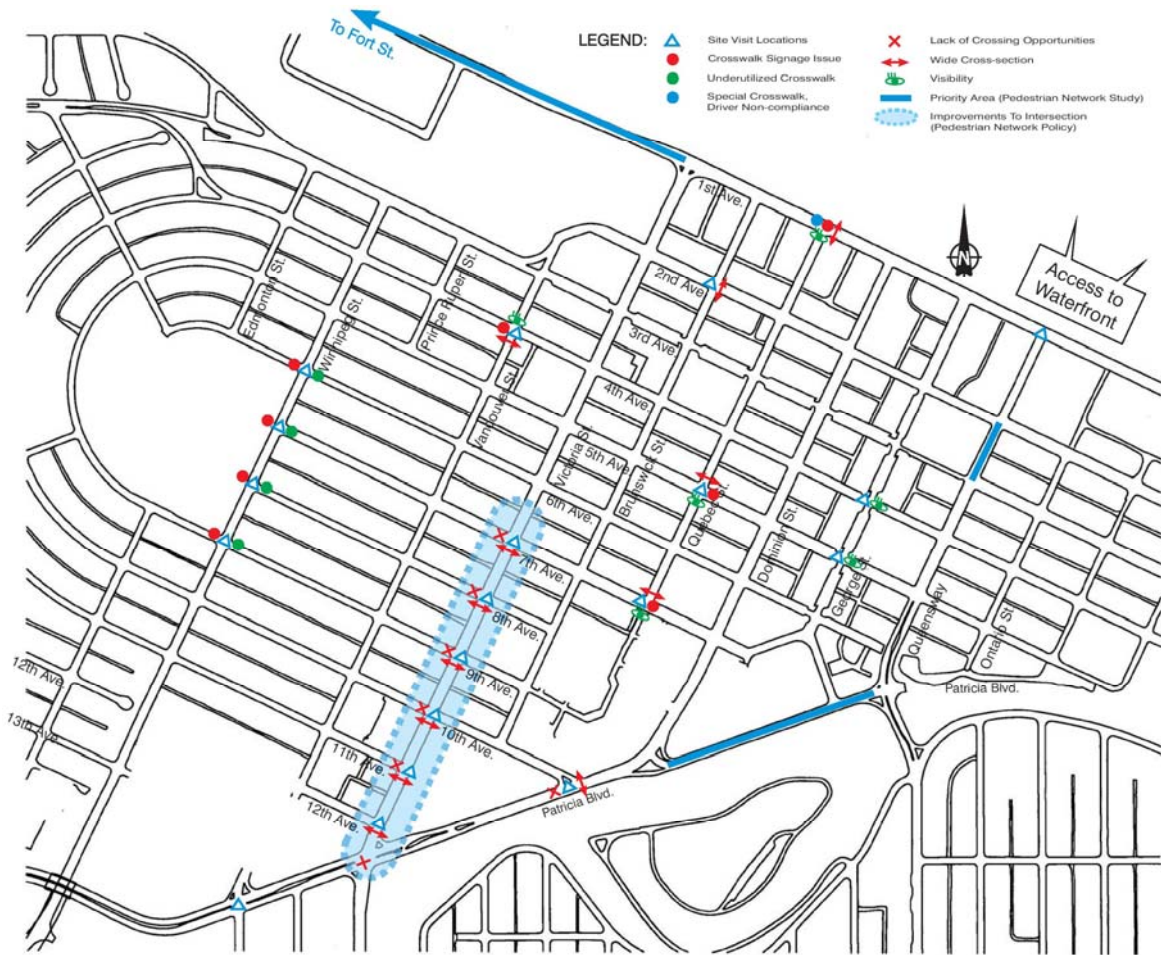


FIGURE 6.1 ISSUES IDENTIFIED THROUGH SITE VISIT AND STAKEHOLDER CONSULTATION

6.2.1 Physical Conditions

A. Sidewalks

Sidewalks are located on both sides of the street, throughout the downtown study area. Sidewalks are typically 1.8 meters to 3.0 meters wide and offer bulb-outs at certain intersections that act as both traffic calming devices and an area of refuge for pedestrians while also decreasing crossing distance and reducing exposure to traffic. Streetscaping on certain streets (for example, Brunswick Street and 3rd Avenue from Victoria Street to George Street) include a variety of pedestrian street lighting, banners, planters, trees, and curb bulb outs, all contributing to increased pedestrian comfort.

Wider sidewalks (2.0 meters to 3.0 meters) enhance the retail experience of pedestrians by indicating that walking is an encouraged and prioritized activity in this area, while providing space for streetscaping that further enhances the pedestrian experience.

It was noted on site visits curb let-downs are not always provided or, when provided, may not be aligned with crosswalks. This results in reduced accessibility for wheelchair, scooter and stroller users. FIGURE 6.2 illustrates examples of existing issues with curb letdowns.



*3rd Avenue and Edmonton Street looking west
(letdown does not line up well with crosswalk)*



*3rd Avenue and Winnipeg Street looking west
(no curb letdowns)*

FIGURE 6.2 CURB LETDOWNS

B. Road Widths

- Some street widths in the study area are wide relative to traffic volumes and the number of lanes, for example on Patricia Boulevard. Prince George uses roadway for limited snow storage in the winter however, wide street widths can have a negative impact on the pedestrian environment.

Details of streets widths in the downtown study area are summarized in TABLE 6.3.

TABLE 6.3 WIDE STREETS IN DOWNTOWN PRINCE GEORGE

STREET NAME	WIDTH (meters)	PARKING PERMITTED	NUMBER OF LANES	AADT per lane (est.)
North-South Streets				
Victoria	18.5	YES	4	>2,750
Dominion	18	YES	4	900 – 1,000
George	18	YES (angled)	2	
Queensway (South of 3 rd)	18	YES (west side between 3 rd and 4 th)	4	2,100 – 2,300
East-West Streets				
1 st	18.5	YES (both sides, various locations)	4	2,250 to 2,500
2 nd (until Dominion)	18.5/18.0	YES (both sides to George, then north side from George to Queensway)	4 and 3	1,750 to 2,000 and 1,700 to 2,000
3 rd	17.5 – 20.0	YES (angled)	2	
5 th	18.5	YES	4	
7 th	18.0	YES	4	
15 th / Patricia	18.0	NO	4	2,250 to 2,500 and 1,500 to 2,000

Note: AADT = Annual Average Daily Traffic per Lane

With these wide streets, stakeholders identified concerns with respect to lack of crossing opportunities at two locations. Site observations confirmed the following issues. There is a natural desire line, shown in FIGURE 6.3 between the library, on the left, and the yellow staircase, on the right, however, no marked crosswalks are provided between Victoria and Queensway along Patricia Boulevard. High speed, infrequent gaps and cars travelling on a curve detract from crossing opportunities at this location. A crosswalk was previously located here, but was removed as it did not meet the warrants and because of safety concerns.



10TH Avenue and Patricia Boulevard / 15th Avenue

FIGURE 6.3 LACK OF CROSSING OPPORTUNITES

There are no marked crosswalks on Victoria Street between 7th Avenue and 15th Avenue. This is a four-lane provincial highway with parking and high vehicular volumes. The distance between signals means cars are dispersed and that gaps for crossing are infrequent. A crosswalk has been proposed for the intersection of 9th Avenue and Victoria Street, which would help address this issue.

C. Traffic Signals

Pedestrian pushbuttons are located at signalized intersections along Provincial Highway 16 (also called 1st Avenue east–west and Victoria Street north–south) as well as Winnipeg Street at both 8th Avenue and 9th Avenue. All of the remaining traffic signals in the downtown are fixed time signals operated by the City, so pedestrian pushbuttons are not required.

Accessible (previously called Audible) Pedestrian Signals (APS) exist throughout downtown Prince George but City Staff indicate they have fallen into disrepair and parts for existing models are no longer available. The exception is the signal near the Canadian National Institute for the Blind office, located at Quebec Street and 4th Avenue. The Ministry of Transportation also has audibles on their signals (along Victoria Street), though they apply a different standard.

While the majority of signals in the downtown are fixed time, APS are usually provided in conjunction with a pushbutton to reduce noise pollution. The City usually turns the volume down at night to address noise concerns. It is likely that the upcoming TAC policy on APS will recommend that APS be audible only within 3.7 metres of the curb, similarly resulting in reduced volume.

If the TAC policy does not provide a policy for APS at fixed time signals, possible options for the City to consider are described in TABLE 6.5. Options include audible tones, fixed time buttons and pedestrian activated push buttons.

TABLE 6.4 OPTIONS FOR INSTALLING APS WITHOUT PEDESTRIAN PUSH BUTTONS

OPTION	PROS	CONS
Fixed time, provide audible tones with every phase (Existing policy)	Minimal delay Provides audible clues to all pedestrians, all phases (no need for education through CNIB)	Some concerns about unnecessary noise, should be addressed in new TAC guidelines.
Fixed time with buttons for visually impaired to get tones	Reduced frequency of noise	Some confusion for sighted pedestrians Some education required for visually impaired, not all visually impaired in contact with CNIB.
Pedestrian actuated, pushbutton provided	Reduced delay for some vehicles, especially at night	Increased delay for all pedestrians

D. Crosswalks

A review of the City’s crosswalk painting schedule confirmed 29 locations in the study area. During site visits, some were noted to have fairly low pedestrian volumes. The combination of a high number of crosswalks, low volumes of pedestrians and inconsistent signing may result in driver confusion and reduced compliance. A list of the 29 locations is shown in TABLE 6.6.

Site visits also indicated parking in proximity to crosswalks that could reduce the visibility of waiting pedestrians.

TABLE 6.5 CROSSWALKS IN THE DOWNTOWN

ROAD NAME	CROSS STREET	ROAD NAME (continued)	CROSS STREET (continued)
2nd Avenue	George Street	6th Avenue	Brunswick
2nd Avenue	Quebec Street	6th Avenue	Dominion
3rd Avenue	Prince Rupert Street	6th Avenue	George
3rd Avenue	Queensway	6th Avenue	Quebec
3rd Avenue	Vancouver Street	6th Avenue	Winnipeg
3rd Avenue	Winnipeg Street	7th Avenue	Brunswick
4th Avenue	George Street	7th Avenue	At City Hall
4th Avenue	Quebec Street	7th Avenue	Quebec
4th Avenue	Vancouver Street	7th Avenue	Winnipeg
5th Avenue	Brunswick Street	10th Avenue	Winnipeg
5th Avenue	George Street	11th Avenue	Winnipeg
5th Avenue	Quebec Street	17th Avenue	Winnipeg
5th Avenue	Vancouver Street	George	Patricia
5th Avenue	Winnipeg Street	Patricia	Dominion
Victoria Street	9 th Avenue		

City of Prince George Parking and Traffic Bylaw (No. 6056), Section 7 states that parking should be restricted to within:

- 6 meters of the approach side of a crosswalk and 6 meters of the leaving side of a crosswalk;
- 6 meters of the approach to a flashing beacon or stop sign at the side of a roadway; and
- 3 meters of an entrance or exit to a lane.

TAC guidelines however, indicate that parking should be restricted to within 6.5 meters of the beginning of a curb radius of a signalized intersection and should be restricted to within 20 meters of a non-signalized intersection, to allow for visibility of pedestrian crossings. Also, locating street furniture away from curb bulb-outs increases visibility of pedestrians and reduces motor vehicle-pedestrian conflicts.

Site observations indicated that parking at crosswalks met Prince George guidelines, but did not meet TAC requirements. This can block visibility of the waiting pedestrians, and of any crosswalk signage provided. An example is provided in FIGURE 6.4.



*5th Avenue and Quebec Street
Legally parked truck blocks view of waiting pedestrians.*



*4th Avenue and George Street
Street furniture and landscaping on corner bulges can block view of waiting pedestrians.*

FIGURE 6.4 DRIVER’S FIELD OF VISION AT CROSSWALK – PRINCE GEORGE EXAMPLES

A driver’s field of vision FIGURE 6.5 demonstrates the concerns relating to locating parking too close to crosswalks.

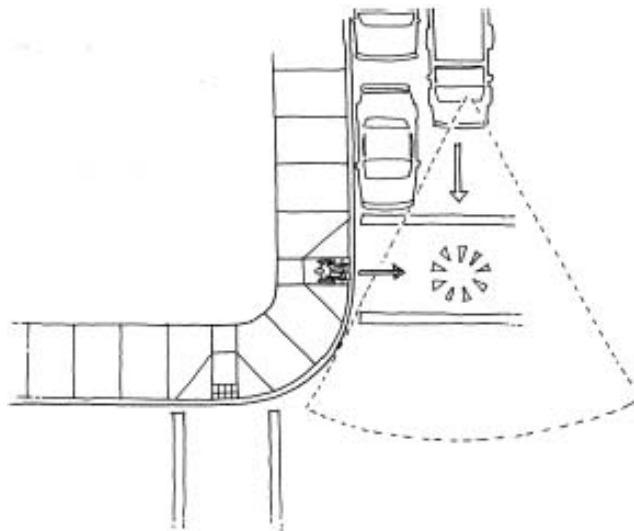


FIGURE 6.5 DRIVER’S FIELD OF VISION AT CROSSWALK
(Source: Federal Highway Administration)

Curb extensions are intended to improve the visibility of pedestrians waiting to cross. However, in many cases in Prince George, the presence of street furniture and other equipment such as traffic signal controller boxes, trash receptacles and landscaping can result in pedestrian visibility being obscured.

A crosswalk warrant review was conducted for the locations where site visits were conducted. The results of this analysis are shown in TABLE 6.7.

TABLE 6.6 CROSSWALK REVIEW

Evaluation Criteria	LOCATION												
	Winnipeg St				Victoria St., 7 th to 15 th Ave.		Patricia Blvd. at 10 th Ave	4 th Ave. and Vancouver St.	5 th Ave. at George St.	4 th Ave. at George St.	5 th Ave. at Quebec St.	7 th Ave. at Quebec St.	1 st Ave. at Queens way
	6 th Ave.	7 th Ave.	8 th Ave.	9 th Ave.	9 th Ave.	10 th Ave.							
Crosswalk Provided	Y	Y	Y	Y	N	N	N	Y	Y	Y	Y	Y	N
Next Signal > 200 m away	N	N	N	N	Y	Y	Y	N	N	N	N	N	Y
Next Crosswalk > 100 m away	N	N	N	N	Y	Y	Y	N	N	N	N	N	Y
Meets Minimum Ped Volumes	n/a	n/a	Y	Y	Y	n/a	n/a	Y	Y	n/a	n/a	N	N
Low Number of Gaps	N	N	N	N	Y	Y	Y	N	N	N	N	N	Y
Recommendation	Consolidate				Provide crossing in this segment*		Review	Review/Possibly remove					Review

*n/a = not available

*Since the original analysis, a crosswalk has been provided on Victoria Street at 9th Avenue.

This table indicates that the crosswalk at Winnipeg Street and 9th Avenue should be maintained. However, the crossing at Winnipeg Street and 8th Avenue is just barely warranted.

The City has indicated that the crosswalk at Winnipeg Street and 8th Avenue will be removed due to lack of use. The remaining crosswalks on this street are candidates for consolidation, if pedestrian counts indicate that volumes are low.

Many locations had marked zebra crosswalks but crosswalk signing was not provided. Additionally, the crosswalk signing was often placed well in advance of the actual crosswalk (FIGURE 6.6). There are multiple crosswalks on Winnipeg Street that are inconsistently signed.



Winnipeg Street looking north from 8th Avenue

FIGURE 6.6 SIGNAGE WELL IN ADVANCE OF CROSSWALK

Pedestrian crossing signs are not consistent in the downtown. According to TAC guidelines, two signs are recommended per approach, or four signs per crosswalk on a two-way street. In many cases, only two or even none were provided.

6.2.2 Pedestrian Volumes

Pedestrian traffic counts used in this study were recorded at various times throughout the year. The counts are a combination of City counts, Ministry counts and counts conducted specifically for this study. The most consistent counts from all sources were in the afternoon peak hour period (approximately 1600 to 1700 hours). These can be seen in FIGURE 6.7. The highest numbers of pedestrians are located along the 4th Avenue corridor and a significant number along the George Street corridor.

It should be noted that mid-day pedestrian volumes are perceived to be higher than PM Peak volumes but currently data is insufficient to support this. This was

generally true at locations where mid-day volumes were available, as shown in FIGURE 6.8.

According to the 2005 ISRE survey, 4.8 percent of the Prince George population walks to work. This is below both the B.C. and Canadian averages of 7.1 percent and 6.6 percent respectively. Barriers to walking, as cited by those surveyed for the Prince George Draft Pedestrian Network Policy, include:

- Weather;
- Lack of sidewalks;
- Personal security and;
- Inconvenience / distance.

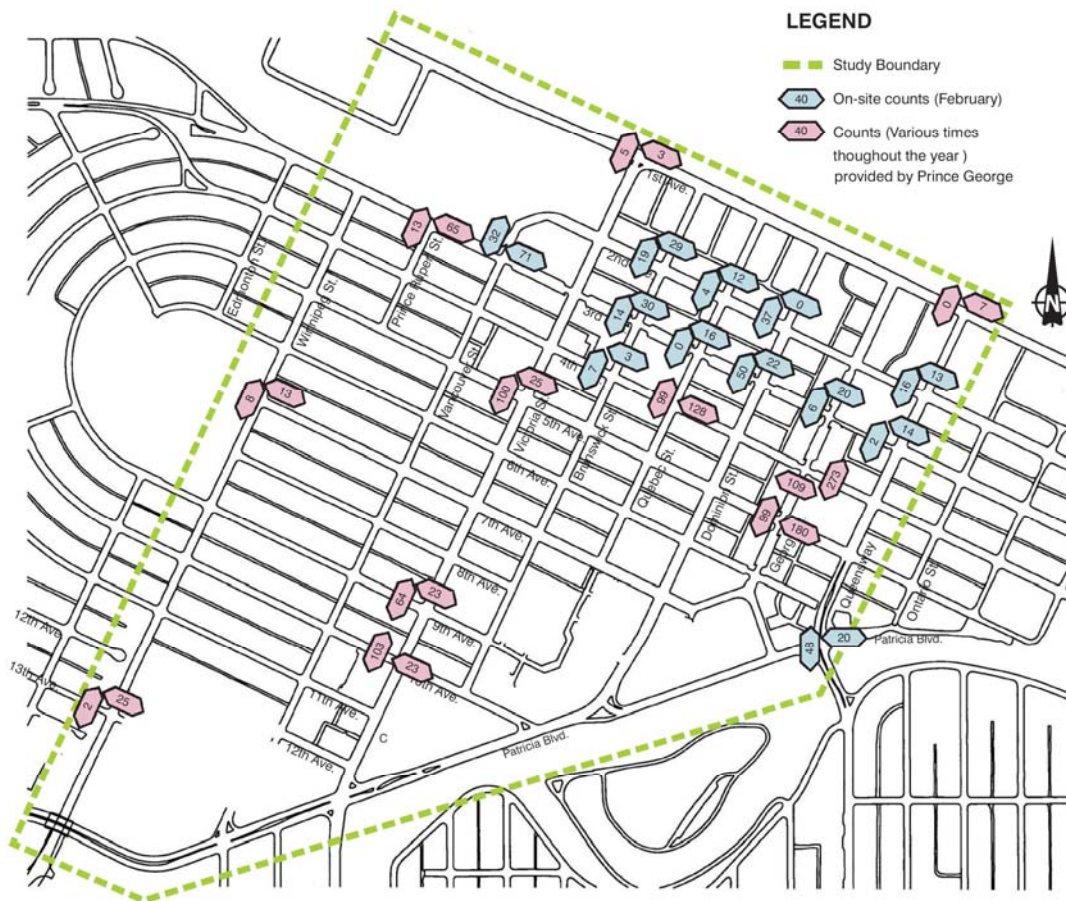


FIGURE 6.7 PM PEAK HOUR PEDESTRIAN COUNTS

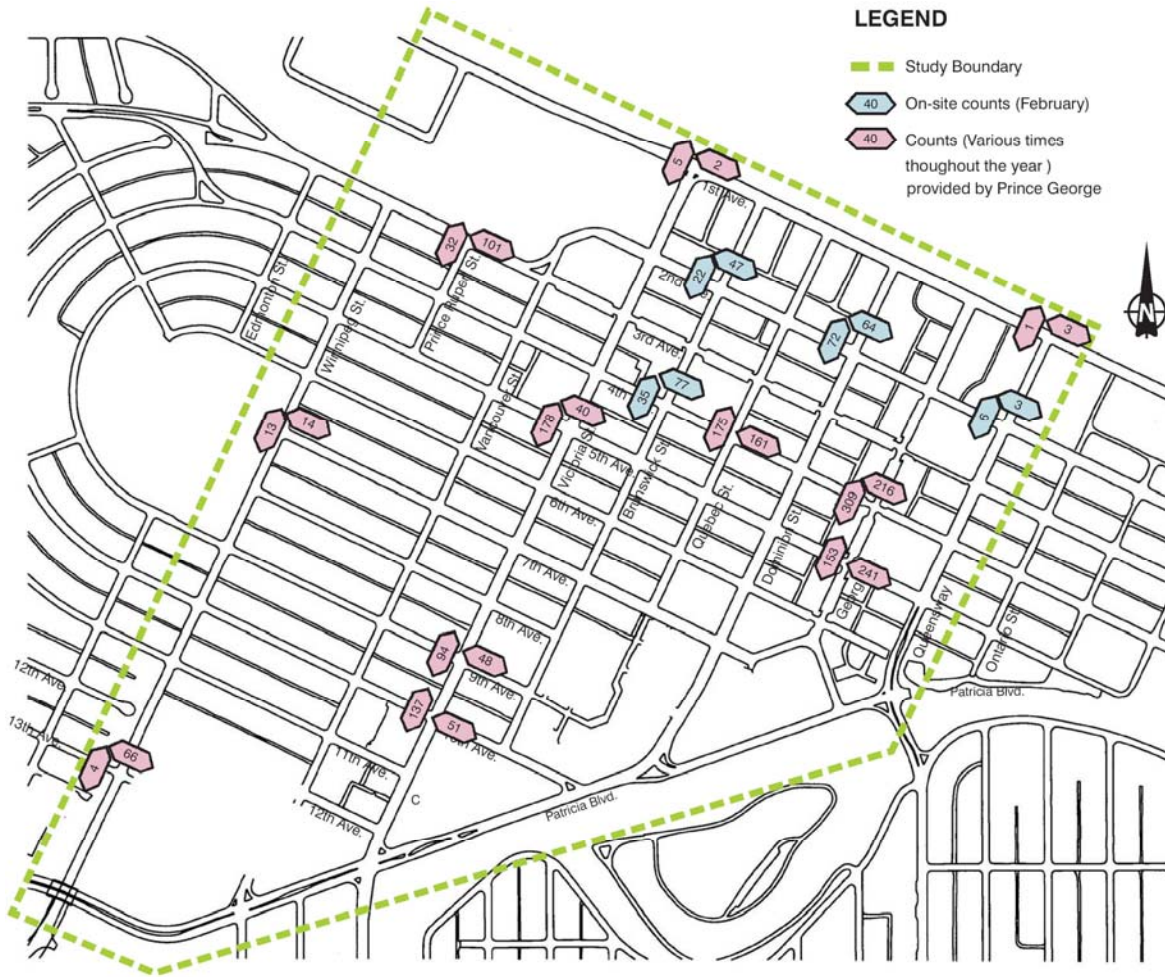


FIGURE 6.8 MID-DAY PEDESTRIAN COUNTS

6.2.3 Pedestrian Collisions

Pedestrian-related motor vehicle collisions over a three year period from January 2001 to December 2003 were researched for the Draft Pedestrian Network Policy report and a summary of the findings is listed in TABLE 6.7.

TABLE 6.7 SUMMARY OF DOWNTOWN LOCATIONS WITH PEDESTRIAN COLLISIONS

LOCATION	PEDESTRIAN COLLISIONS (3 YR PERIOD)	TRAFFIC CONTROL
15 th Ave / Victoria St (Highway 16)	3	Signal
4 th Ave / Victoria St (Highway 16)	3	Signal
13 th Ave / Winnipeg St	2	Signal
3 rd Ave / Winnipeg St	2	Uncontrolled
4 th Ave / Quebec St	2	Crosswalk
5 th Ave / George St	2	Crosswalk
8 th Ave / Victoria St (Highway 16)	2	Uncontrolled

The frequency of pedestrian-related collisions is relatively low with less than one collision per year. Collisions do however occur at locations with some form of traffic control. This could indicate issues with the control itself or else, these are high volume areas which would increase the collision exposure. Controlled intersections on wide streets tend to have high collisions rates. Driver and pedestrian education as well as traffic enforcement can help mitigate this problem.

6.3 Existing Standards and Policies

Current standards and policies that have been adopted by the City of Prince George are listed below.

A. Curb Let-Downs

City of Prince George Subdivision and Development Servicing Bylaw No. 7652, drawings C-8 and C-9, detail how curb letdowns (i.e. ramps) should line up with crosswalks. This Bylaw illustrates good standards for curb let-downs and Prince George should take advantage of implementing this Bylaw throughout the downtown as redevelopment or revitalization opportunities arise.

B. Requests for Sidewalks

Prince George has adopted a Local Improvement Charges Bylaw (No. 7288) under which requests for sidewalks on local streets are funded. Public knowledge of this program is minimal, as indicated in the Pedestrian Network Study. Program promotional ideas are being considered in the City's Draft Pedestrian Network Policy and are to be encouraged to improve conditions for pedestrians.

C. Snow Removal

According to the Draft Pedestrian Network Policy Study, Prince George removes snow from all sidewalks within approximately 72 hours of when snowfall exceeds 50 millimeters. Owners and occupiers of real property are responsible for snow and ice removal (except in residential zones) from the sidewalk adjacent or in front of the property before 10:00 am (Section 3 of the Highway Bylaw, No. 6114, 1994).

The City's Snow and Ice Control Policy, adopted in 1992 (No. 051202, last updated in 2002) requires the City to clear snow from sidewalks for non-residential properties, which is in accordance with other cities with similar or greater annual snowfalls.

6.4 Proposed Policies

The Draft Pedestrian Network Policy report recommends policies relevant to the study area. These include:

- Ensuring the mobility and safety needs of pedestrians of all abilities is an important consideration in the City's budget, planning, engineering, maintenance and, development decisions;
- Setting a goal that by 2016, 20% of all commute trips will be by sustainable modes;
- Developing a list of major sidewalk repairs and keeping it updated as well as identifying smaller maintenance projects through resident requests;
- Dedicating a minimum budget towards new sidewalk construction as well as annual sidewalk maintenance and repairs;
- Providing dedicated pedestrian facilities in areas of high demand;

- Developing a program to encourage more resident and business requests for pedestrian facilities; and
- Setting a target date and allocate sufficient budget for converting all traffic signals to accessible pedestrian signals.

6.5 Issues

Based on the review of existing conditions, background reports, site visits and stakeholder consultation; issues were identified in the study area.

A. *Visibility of Crosswalks and Signage*

Many locations had marked zebra crosswalks but crosswalk signing was not provided. Additionally, the crosswalk signing was often placed well in advance of the actual crosswalk. The combination of inconsistent signing and low pedestrian volumes may lead to driver confusion and poor compliance.

B. *Underutilized marked crosswalks*

Site observations indicated that some downtown crosswalks had low volumes of pedestrians and low traffic volumes. However, analysis of other site locations showed that many are warranted based on pedestrian volumes. There is a desire amongst City staff to remove crosswalks where they may be underutilized in order to ensure that limited maintenance funds are directed to the areas of greatest need. An underutilized crosswalk may still be maintained for non-technical reasons, such as providing network continuity downtown.

C. *Driver compliance with crosswalks*

Residents expressed concerns in the Draft Pedestrian Network Policy study that drivers are not yielding for pedestrians at crosswalks. This was observed at the special crosswalk at 1st Avenue even though the beacons were flashing. (A special crosswalk is defined as a painted crosswalk with a pedestrian push button and overhead flashing lights with pedestrian signs.) Staff indicates that this is a problem at other locations as well.

There are several factors, many discussed previously that may contribute to this issue.

- Drivers may not be aware of their need to yield, especially at the new Special Crosswalk on 1st Avenue;
- Pedestrians may be unaware of their responsibilities to under the Motor Vehicle Act to allow sufficient time for vehicles to stop and to look both ways before proceeding across a road
- Drivers may not have noticed signage;
- Parking restrictions may have limited sight lines to pedestrian crossings;
- Overall crosswalk visibility may be poor, including inadequate lighting; and
- Drivers may not be used to seeing pedestrians at underutilized crosswalks.

D. Lack of crossing opportunities on two corridors

Stakeholders have expressed concerns about lack of crossing opportunities on Victoria Street between 7th and 15th Avenues, and on Patricia Boulevard. No marked cross-sections are provided, and wide cross-sections, distance between signals, and curved approach (on Patricia Boulevard), make it difficult for pedestrians to find appropriate gaps.

E. Accessibility

Curb let-downs are not always provided or, when provided, may not be in the correct location. This results in reduced accessibility for wheelchair, scooter and stroller users.

A lack of curb ramps can prove difficult for people with mobility impairments from successfully navigating from the sidewalk to the crosswalk and result in increased crossing times. There is also the potential for conflicts with motorists as pedestrians could step into the path of turning vehicles as they are directed into traffic because of the orientation of the curb letdown. Cars have to veer around pedestrians who are in progress of accessing improperly placed curb letdowns. Pedestrian may be delayed as they wait for a gap in traffic on a main street. Correctly placed curb letdowns can provide additional guidance to crosswalks for the visually impaired.

Another issue for those with accessibility concerns may be impediments and obstacles in the sidewalk. Some downtown developments have chosen to construct pedestrian stairs or ramps in the sidewalk instead of incorporating these facilities into the building structure.

APS in the downtown are not operational. This can be a problem for the successful negotiation of crossing for those with visual impairments as they may be unable to determine when the cross phase is active.

F. Wide cross-sections

Wide cross-sections exist at several locations in the study area including:

- Victoria Street;
- 1st Avenue;
- 2nd Avenue;
- 5th Avenue;
- 7th Avenue; and
- Patricia Boulevard.

Wide streets can:

- encourage drivers to increase speed;
- create long crossing times for pedestrians, particularly those with mobility issues, including children and the elderly;
- leave pedestrians outside of the driver's cone of vision at crosswalks;
- create extra traffic streams (due to multiple, unnecessary laning) for pedestrians to cross, increasing conflicts; and
- be detrimental to pedestrian support for the City's downtown revitalization plans.

G. Public knowledge of bylaws

Prince George has adopted a Local Improvement Charges Bylaw (No. 7288) under which requests for sidewalks on local streets are funded. Public knowledge of this program is minimal, as indicated in the Draft Pedestrian Network Policy. Promotion of this program is to be encouraged to improve conditions for pedestrians.

H. Issues Identified Through Public Consultation

The following issues were identified through public consultation with regards to the pedestrian environment in the downtown.

- Need for a pedestrian mall or pedestrian priority area;
- Better street lighting: pedestrian-scale and road;
- Shopping is too spread out downtown – need a shopping street to encourage people to walk/shop downtown;
- Issues with respect to personal security;
- Suggestions to improve pedestrian environment – more street trees, more street furniture such as benches, more consistent placement of furniture, canopies over sidewalk to protect pedestrians from weather extremes and;
- Clearing of snow and gravel from curb letdowns.

Installation of a pedestrian signal at the Winnipeg Street and 6th Avenue intersection was recommended in the Crescents Neighbourhood Plan. It should be noted that the identification of this pedestrian signal was not based on technical warrants.

6.6 Planned Improvements and Changes

The City's OCP identifies several improvements to the pedestrian environment including:

- Compact urban areas that create a more pedestrian-friendly environment;
- Focus on liveability, ensuring the provision of amenities;
- Promotion of ground-level retail;
- Extension of buildings to the edge of property lines to create a continuous landscape and weather protection for pedestrians;
- Pedestrian-oriented lighting;
- Transparency of storefronts and;
- Opportunities for schools to plan sites in consideration of pedestrian network linkages to shared open space and playing fields.

The Draft Pedestrian Network Policy, Pedestrian Network Study, Smart Growth Direction for Prince George – 5th and Tabor, and Crescents Neighbourhood Plan all identified specific issues in the downtown study area (FIGURE 6.1). The Pedestrian Network Study identified 1st Avenue as a priority for improvements in the downtown. Staff indicates that low pedestrian volumes on this road prevent it from receiving priority in the City’s improvement program.

6.7 Opportunities

A. Land Use Density

Land use density is high in the downtown and small block sizes encourage walking. Some successful upgrades have been implemented including wider sidewalks and curb extensions on 3rd Avenue, 2nd Avenue and George Street. Maintaining and promoting increased density in the downtown will further facilitate walking and increase its mode share.

B. Curb Letdown Policy

The City has an excellent sidewalk ramp standard that, if implemented consistently, will increase the level of comfort for pedestrians and well as provide for more accessible and safer crossing at intersections.

C. Fixed Time Signals

The City’s traffic signals are on a fixed time rotation with short cycle lengths. This provides regular and frequent phases for pedestrians.

6.8 Recommendations

Short term (zero to four years), medium term (five to nine years) and long term (ten years or longer) recommendations are proposed for pedestrian improvements in the downtown. These recommendations are later prioritized in CHAPTER 11.

Short Term

A. *Curb letdown policy*

The City's curb letdown policy should be implemented in conjunction with any planned street work (e.g. sewer upgrades, road revitalizations). The City has allocated budget towards new curb letdowns. Meeting with the City's Accessibility Advisory Group can help to prioritize areas where curb letdowns should be reviewed and upgraded.

B. *Improve visibility at crosswalk*

Short-term improvements to compliance for both drivers and pedestrians at crosswalks include:

- Modify the Prince George Parking and Traffic Bylaw so that the restrictions to parking at crosswalks are consistent with TAC guidelines (restricted 20 metres in advance of the crosswalk).
- Conduct a systematic review of the downtown crosswalks to confirm that signing and parking restrictions are consistent with TAC guidelines. This is also recommended in the Pedestrian Network Study, Procedure 6. Some concern has been expressed that this may result in over-signing. This issue is discussed below.
- Adopt standards (or modify Bylaw 7652) to identify allowable types of landscaping and street furniture on bulb-outs. The City of Vancouver has a good example of planting and maintenance guidelines: (see: <<http://www.city.vancouver.bc.ca/engsvcs/streets/greenstreets/guidelines.htm>>). Consider implementing curb bulb-outs in conjunction with planned road works. An example of street furniture and landscaping placement is shown in FIGURE 6.9.
- Conduct an enforcement campaign - for example, at locations where crosswalks are appropriately signed, conduct "crosswalk stings." The City of Burnaby initiated "Operation Crosswalk" and information can be found here: <<http://www.burnabynow.com/issues02/114102/news/114102nn3.html>>. Arrange appropriate media coverage, so that an education component is also involved.

- Educate both drivers and pedestrians about their rights and responsibilities at crosswalks.

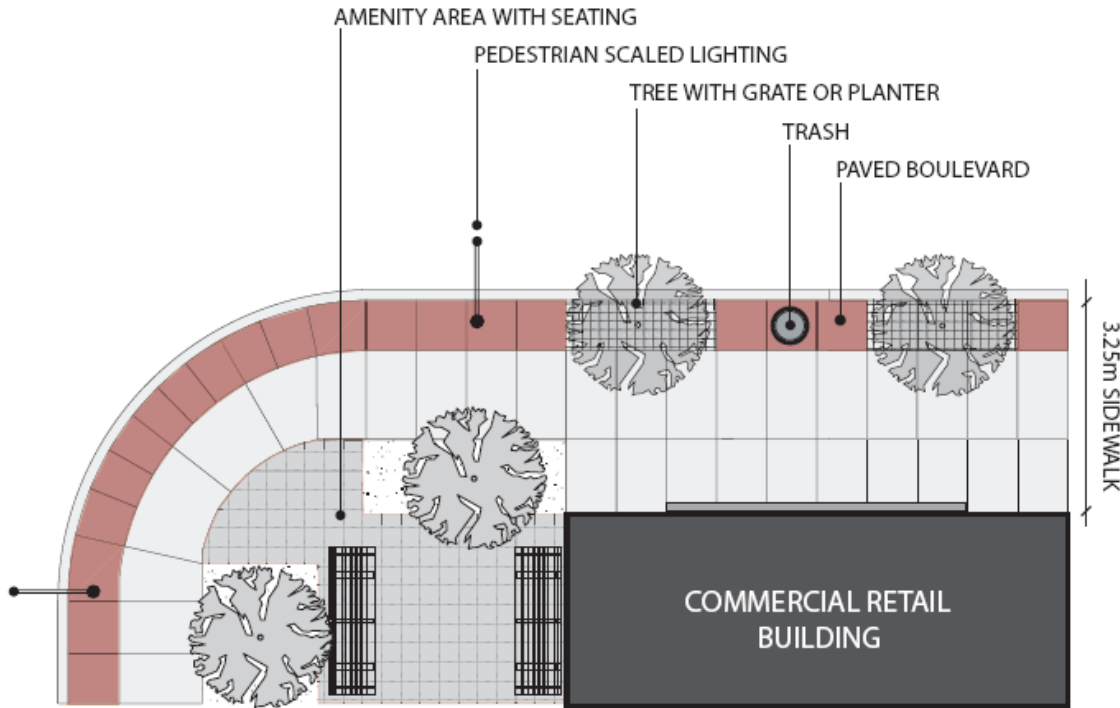


Figure: Commercial area sidewalks should include a paved boulevard, accommodating street trees, pedestrian-scaled amenities and lighting.

FIGURE 6.9 EXAMPLE OF STREET FURNITURE AND LANDSCAPE GUIDELINES

Source: *Model Urban Design Guidelines, Regional Municipality of Niagara, 2005.*

A systematic review should be done against the crosswalk removal warrants developed for the Draft Pedestrian Network Policy. Some crosswalk locations may be candidates for removal, or downgrading, while others may need additional traffic control or physical improvements.

Curb bulb outs prohibit parking close to the crosswalk allowing for maximum visibility of pedestrians crossing the street (FIGURE 6.10).

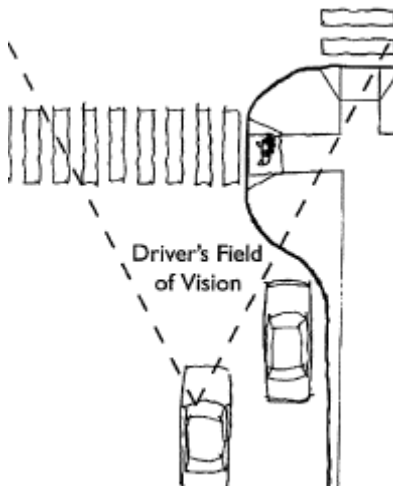


FIGURE 6.10 SOLUTION OF CURB EXTENSION

(Source: Institute of Transportation Engineers, *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities*, 2006)

TAC guidelines recommend two signs per approach per crosswalk. When crosswalks are provided on both approaches at an intersection – possibly causing some visual clutter and maintenance concerns. Because crosswalks on both approaches are in proximity to each other, many municipalities have adopted modified TAC standards – with only four signs per intersection. TAC guidelines and modifications are shown in FIGURE 6.11 below.

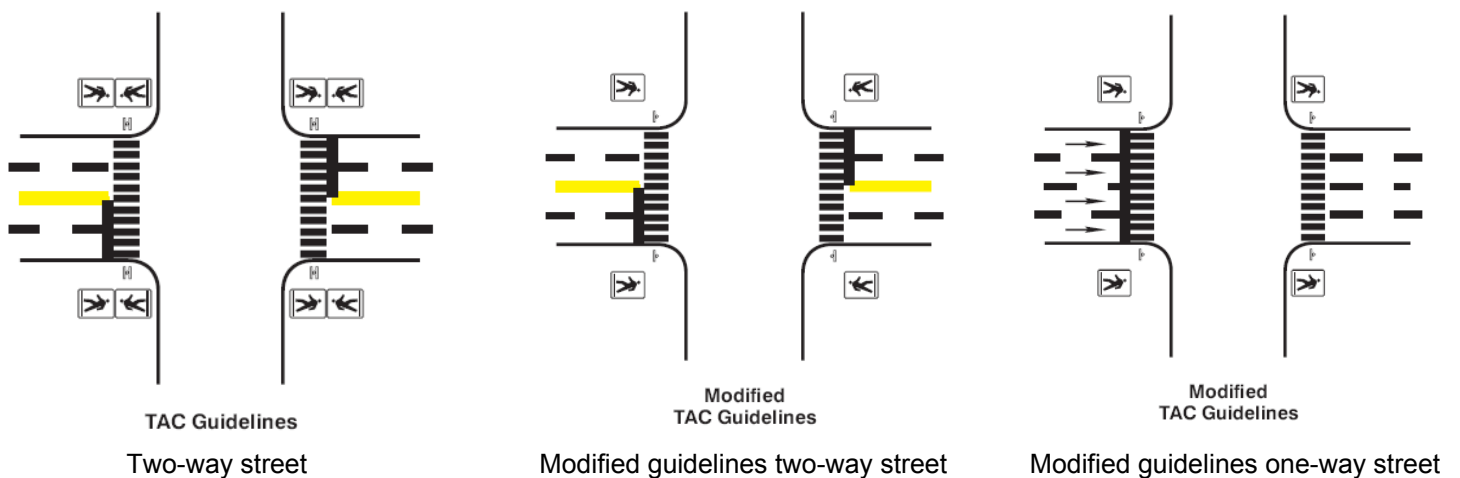


FIGURE 6.11 TAC GUIDELINES FOR CROSSWALK SIGNAGE

C. Public Realm Conditions

Modify the Subdivision and Servicing Bylaw (No. 7652) to adopt different zones within the sidewalk designating the location of furnishings, plantings, store frontage and throughway as shown in FIGURE 6.12. These zones can be incorporated into the City's Downtown Streetscape Guidelines which are in progress.

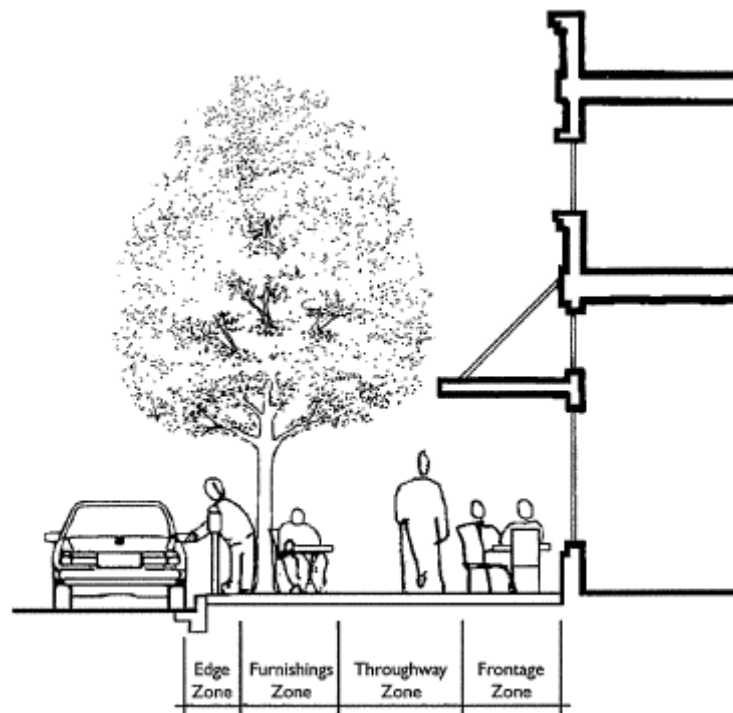


FIGURE 6.12 SIDEWALK ZONES

(Source: Institute of Transportation Engineers, Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities, 2006)

D. Accessible Pedestrian Signals

The City has accessible pedestrian signals that have fallen into disrepair due to the discontinuation of hardware support. Adoption of a policy and budget allocation for upgrades, maintenance and repair for accessible pedestrian signals will help to make the downtown a more accessible pedestrian environment. It is recommended that Prince George adopt a policy that conforms to the new TAC guidelines, expected to be released in the summer of 2007.

E. Increase pedestrian walk times (if required)

Prince George may wish to increase pedestrian phasing at locations where pedestrians with slower crossing speeds are known to cross, for example those with mobility impairments, the elderly and young children, to improve crossing safety.

Medium Term

A. Crosswalks

The City should consider removing or consolidating under-utilized crosswalks on downtown arterial roads, based on the crosswalk warrant review recommended in the short term solutions. While the City wishes to promote pedestrian activity in the downtown, crosswalks are not the only way to do this. Some of the solutions discussed under *Reduce Road Widths* in the long term recommendations, will help address some of these concerns.

B. Other Crossing Strategies

There are several options that can be implemented individually or viewed as phasing opportunities to support pedestrians through policy or infrastructure. Stand-alone low cost options include:

1. Review of Crossing Opportunities

Conduct review of crossing opportunities on Victoria Street and on Patricia Boulevard (Victoria Street would have to be conducted in conjunction with the Ministry of Transportation) - the method outlined in Procedure 6 of the Draft Pedestrian Network Policy report should be followed, involving collecting information on available gaps, pedestrian volumes and sight distance. Given the road widths and volumes, this would probably include improvements above and beyond basic crosswalk involving overhead signage and/or physical measures.

2. Provide countdown signals

This can facilitate and improve safety of road crossings for people with mobility impairments, the elderly and young children as these users have the added information to make a decision as to whether or not they will have enough time to complete crossing the road thereby eliminating potential conflict situations if the traffic light changes.

Long Term

A. *Reduce Road Widths*

Several solutions are available in the long term to address the issues related to wide cross-sections. However, as implementation of some of these improvements may affect the amount of pavement available for vehicle traffic, buses and other large vehicles, bicycle lanes, and parking, they will be considered further in the overall implementation plan.

Decreasing the width of certain streets will enhance the pedestrian experience and also act to do several other things:

- Narrower streets indicate a priority for walking as a viable mode of transportation;
- Pedestrian cross times are reduced thereby reducing exposure and increasing pedestrian visibility, improving safety and increasing efficiency for the overall flow of traffic (pedestrian, bicycle and motorized);

- Narrower streets act as a traffic calming device, reducing the speeds of motorists;
- Create increased opportunities for sidewalk activity and streetscaping (e.g. restaurant patios, sidewalk sales, trees, lighting, public art, seating, etc.); and
- Enhance exposure of business potentially increasing patronage.

B. Provide curb extensions/Provide median refuges

At intersections with high pedestrian volumes, curb bulb outs can be considered. (City of Prince George Bylaw 7652, drawings C-8 and C-9 detail layout for crosswalks and ramps.) Consistency is important, so once a strategy is adopted, it is recommended that it be implemented throughout the downtown.

Where wide cross-sections cannot be avoided, pedestrian median refuges will improve the safety of pedestrian crossings.

Once the measures described in A and B have been implemented, a systematic review should be done against the crosswalk removal warrants developed for the Draft Pedestrian Network Policy. Some crosswalk locations may be candidates for removal, or downgrading, while others may need additional traffic control or physical improvements.

C. Land Use Density

Continuing to increase land use density and supporting mixed use developments that include residential units in the downtown is one way to encourage walking.

D. Accessible Pedestrian Signals

Implementation of the Accessible Pedestrian Signal (APS) Policy (a short term recommendation), should be implemented over the long term. Implementation steps include:

1. Work with CNIB to determine most favourable solution for PG visually impaired, and/or;

2. Test out the three possible solutions on three street corners, conduct interviews to find out which solution both sighted and visually impaired prefer.

City staff indicates that these steps were completed in the original installation of APS.

E. Provide wider sidewalks

As part of reducing road widths, a long term recommendation is to provide wider sidewalks. These should be considered on routes with higher pedestrian volumes and routes with higher numbers of retail establishments. Wider sidewalks can be used to create zones as previously shown in FIGURE 6.12.

Input from Public Consultation

Respondents were asked if they supported an education campaign for both motorists and pedestrians aimed at improving the safety of pedestrians at crossing. 60 percent were in favour (strongly like or somewhat like) and 24 percent did not like the idea (somewhat disliked or strongly disliked).

People commented both for and against the education and enforcement campaign. Those opposed tended to think that people should know the rules of the road already.

73 percent of respondents were in favour of upgrading pedestrian signals. When it came to the proposed plan to remove underutilized crosswalks, 44 percent of respondents are in favour of the idea while 35 are not. The majority of comments on this issue were that respondents were not in favour of removing underutilized crosswalks. Some education campaign may have to accompany any attempts to remove crosswalks.

7.0 TRUCK AND HAZARDOUS GOODS MOVEMENT

7.1 Background

Roadways can be designated as truck routes and/or as dangerous goods routes. Municipalities typically designate these routes in a bylaw, which also specifies the applicable times and vehicle types.

Dangerous goods (also called hazardous goods) are also regulated through senior government legislation, specifically:

- Federally - Transportation of Dangerous Goods Act, 1992;
- Provincially - Transport of Dangerous Goods Act, 1996; and
- Provincially – British Columbia Community Charter, 2003.

As Highway 16 runs through downtown, the two streets (Victoria Street and 1st Avenue) operate under the jurisdiction of the Ministry of Transportation. The Highway Act regulations apply and so dangerous goods can move on these roads, unless specifically stated otherwise. For example, in some other locations dangerous goods are prohibited in tunnels and bridges. At this time no restriction exists on the downtown Prince George streets. The Ministry could sign these streets with the Dangerous Goods Route Sign.

The British Columbia Transport of Dangerous Goods Act provides for local government control under Section 23:

(1) A municipality may make bylaws with respect to highways under its direction, control and management

(a) designating the route and time of travel of road vehicles transporting dangerous goods, and

(b) prohibiting the carrying of dangerous goods on the highways specified in the bylaw.

(2) A bylaw under subsection (1) does not come into force until it is approved by the minister.

The British Columbia Community Charter provides for local government management of highways in Part 3: Division 5 – Highways:

36 (3) Authority in relation to highways that is provided to a municipality by or under this or another Act includes the power to restrict the common law right of passage by the public over a highway that is vested in the municipality, if this restriction is necessary to the exercise of the authority.

38 (1) A council may temporarily restrict or prohibit all or some types of traffic on a highway.

(2) In addition to the authority under section 154 [delegation of council authority], a council may, by bylaw, authorize a municipal employee or any other person to control traffic on a highway, or to temporarily restrict or prohibit all or some types of traffic on a highway, in relation to matters specified in the bylaw.

For the purpose of this review the following definitions will be used.

Dangerous Goods

Dangerous goods means any product, substance, or organism included in the Dangerous Goods regulations or in any of the classes listed in the sidewalk to the TDG Act, including explosives, gases, flammable liquids and solids, oxidizing substances, poisonous and infectious substances, radioactive materials, and corrosives. Placards must be displayed on the outside of trucks transporting this material.

Truck

Trucks include vehicles with more than two axles and a GVW greater than 5000 kilograms.

7.2 Existing Conditions

The City's Official Community Plan (Chapter 11) states that the City will establish a truck route plan, to include consideration of dangerous goods movement. The City of Prince George is currently initiating a comprehensive Dangerous Goods Route study (2007). Until a plan is implemented, vehicles are free to use all routes within the downtown area.

During the stakeholder consultation for this study, the need for both designated truck routes and dangerous goods routes was identified by both the public-at-large and by several invited stakeholder representatives. Most wanted the routes to bypass the downtown area. Specific concerns with having the routes downtown included:

- An increased risk when pedestrians are near dangerous goods in the case of a spill; and
- Garbage that falls off trucks onto the streets.

Limited information is currently available concerning the volume and trip pattern of trucks in the downtown area. Truck volumes were reviewed for three intersections along the Highway 16 corridor (Victoria Street and 1st Avenue). The total number of heavy trucks entering each intersection is shown in TABLE 7.1, along with the percentage of trucks as compared to all vehicles entering the intersection.

TABLE 7.1 SUMMARY OF HEAVY TRUCK TRAFFIC VOLUMES

INTERSECTION (along Highway 16)	HEAVY VEHICLES PER HOUR				
	Measure	Time of Day			
		Morning	Mid-Day	Afternoon	Average
Victoria Street and 4th Avenue	Truck Volume	1	5	0	2
	% of All Vehicles	3%	3%	1%	2%
1 st Avenue and Quebec Street	Truck Volume	57	57	66	60
	% of All Vehicles	6%	7%	5%	6%
1 st Avenue and Queensway	Truck Volume	97	95	105	99
	% of All Vehicles	5%	5%	3%	4%

Source: Ministry of Transportation

On Victoria Street, trucks constituted up to 3 percent of all vehicles at the sample intersection. Higher truck volumes were recorded on 1st Avenue, with trucks representing up to 7 percent of all vehicles at the two 1st Avenue intersections.

7.3 Opportunities and Issues

Truck routes are typically designated as the preferred road to provide:

- As direct a routing as possible;
- Access to the desired destinations;
- A roadway capable of safely accommodating the expected vehicles; and
- Minimal intrusion to the surrounding community.

In addition, the selection of dangerous goods routes must minimize the risk that the hazardous material is accidentally released. The preferred route would be one that is:

- Distant from significant institutions or high density land uses;
- Distant from environmentally sensitive areas;
- Away from well catchment areas;
- Accessible for emergency response personnel; and
- Operates with a better-than-average collision history.

Currently, Highway 16 passes through the Prince George downtown on 1st Avenue and Victoria Street. These routes provide direct routing and access to desired destinations. They also provide a good connection from points east of the City to the south and the west. However, Victoria Street in particular is very close to significant institutions and high density land uses. Nevertheless it is the Ministry's practice to allow truck on their routes.

Vehicles travelling to and from the north of the City can also be serviced by this highway routing. However, a more direct route could be provided by connecting the downtown area to Highway 97 in the north. At this time a connection might be feasible between Victoria Street and Highway 97 for an interim period, either:

- via the 2nd Avenue and 4th Avenue couplet connecting to 5th Avenue further west; or

- via 1st Avenue, Carney Street, and 5th Avenue.

A new bridge crossing of the Nechako River is planned that would provide a more direct truck route between downtown and Highway 97 north. This option is preferred for the longer term. When this new route is in place it may allow the decommissioning of any interim truck routes.

Truck drivers currently connect between the east and west sections of Highway 16 by using Queensway and Ferry Avenue. This route may have potential to become a designated truck route, subject to a city-wide review. However, some of the road sections were not designed for large vehicles and may have geometric constraints.

If connected to Highway 16, Patricia Boulevard may also provide a future truck route that by-passes the downtown core. However the curvature of the existing road and the grades involved may make this route infeasible. The intersection of Patricia Boulevard and Queensway would require particular attention. Options would need to be considered at this intersection and may involve routing traffic through other city streets such as 5th Avenue. However, the Transportation Network Study (2000) did not identify a need to construct this connector. Additionally, the analysis conducted in Section 3 did not identify the need for any additional link capacity in the downtown core.

The locations of the route options discussed are shown on a regional scale in FIGURE 7.1 and on a local downtown scale in FIGURE 7.2. While FIGURE 7.1 focuses primarily on routes that can be designated primarily on existing roadways, another potential future option, not shown in FIGURE 7.1, is to connect River Road directly across the Nechako River at Cottonwood Island, and connect to Highway 97 via the Noranda/Northwood intersection.

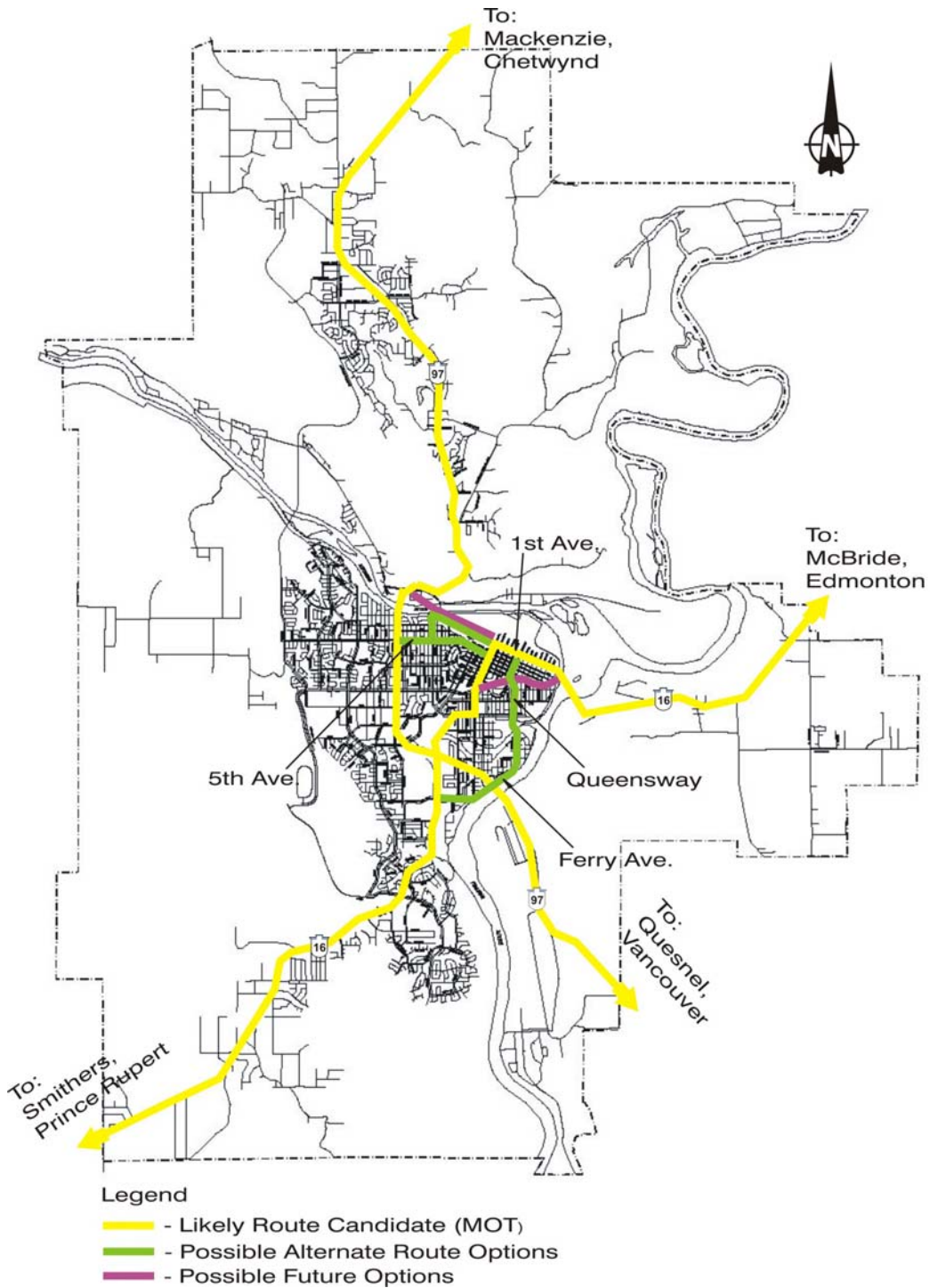


FIGURE 7.1 REGIONAL CONNECTIONS

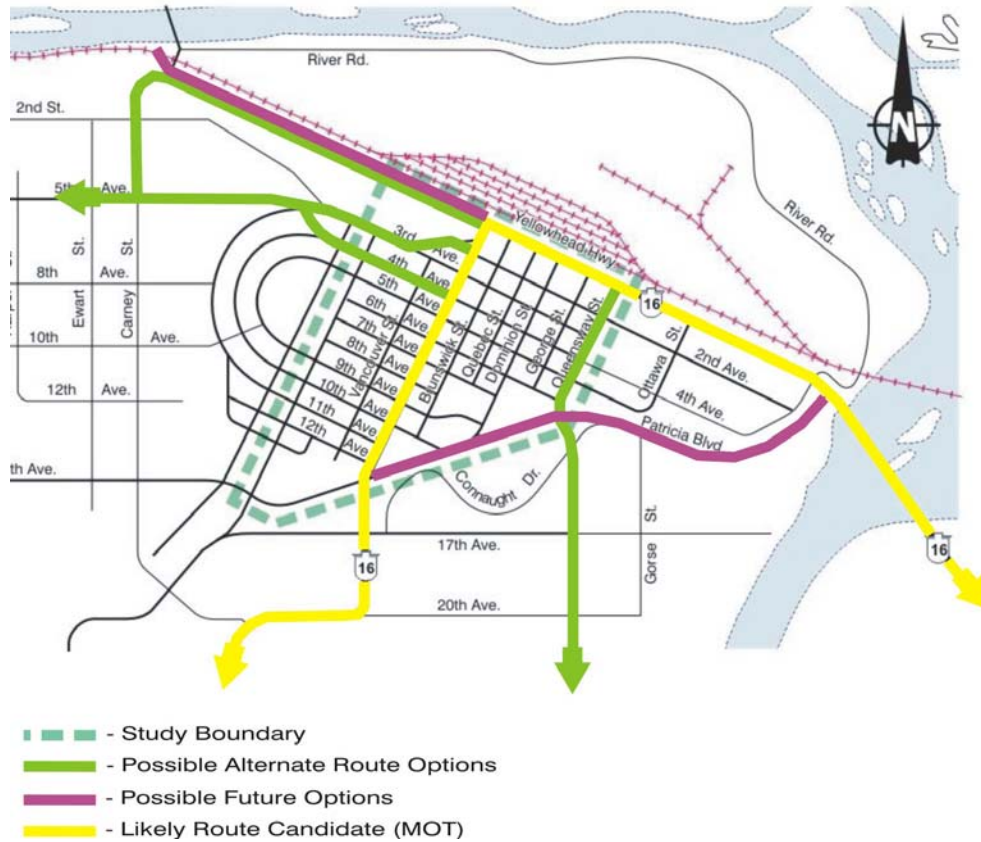


FIGURE 7.2 DOWNTOWN DETAILS OF PROPOSED ROUTES

7.4 Potential Solutions

Procedures for selecting and designating truck routes and dangerous goods routes vary. A recent detailed Alberta review found a significant amount of literature related to selection of dangerous goods routes (Hamilton-Finn, funding by the Centre of Transportation Engineering and Planning, 2003). However, as the existing methods varied widely from common sense with simple calculations to complex models with intense data requirement, the Calgary review proposed a simpler framework to select routes. The Calgary study was intended for dangerous goods routes, but is equally applicable for general truck routes.

The Calgary framework is shown in FIGURE 7.3. The framework has been used to provide a preliminary assessment of the proposed routes for downtown Prince George. The scores for the three proposed routes are shown in TABLE 7.2. Scores could be re-assessed in the future.

PART A: Evaluate each corridor / route as a complete section as follows:

ISSUE	QUESTION	MEASUREMENT	SUMMARY ASSESSMENT	SCORE	DETAILED ASSESSMENT
1 Route Purpose Functionality Metrics	Is the route serving destinations relevant to DGRs?	DG focal points served or accessed from segment	Route serves many / important DG focal points Route serves some / less important DG focal points Route serves few / unimportant DG focal points Route serves no DG focal points	100 65 35 0	Consider the number and relative importance of DG focal points served by the corridor, both current and future.
	Is the route providing direct and continuous access to the destinations relevant to DGRs?	The extent or weaving from roadway to roadway required when navigating the route	Route is very direct Route is somewhat direct Route is a little indirect Route is very indirect	100 65 35 0	Consider the desire lines of the DG transport companies as well as the length, directness and simplicity of the route.

PART B: Define homogeneous road sections for each corridor / route and evaluate each section as follows:

ISSUE	QUESTION	MEASUREMENT	SUMMARY ASSESSMENT	SCORE	DETAILED ASSESSMENT
3 Road Environment Severity Metrics	Is the road environment suitable for DGR designation?	The officially designated road class and expected traffic volumes	Low to medium volume freeway / expressway or arterial Medium to high volume freeway / expressway or arterial Collector, any traffic volumes Local, any traffic volumes	100 65 35 0	Consider the class of roadway and the type and volume of traffic: higher vs. lower road classifications, traffic volumes, school or transit bus routes. Also consider future conditions and time variations.
	Is the surrounding land use appropriate for DGR designation?	Existing and planned lane use (100m on each side)	Primarily undeveloped / industrial Primarily low density commercial Primarily low density residential Significant institutional / high density	100 65 35 0	Consider the density and type of land use: schools, hospitals, shopping malls, churches, stadiums and high-density residential areas. Also consider future conditions and time variations.
	Are there environmentally sensitive lands along the road?	Existing environmentally sensitive areas (50m on each side)	No environmentally sensitive areas Few environmentally sensitive areas Some environmentally sensitive areas Many environmentally sensitive areas	100 65 35 0	Consider the type of sensitive environment: lakes, rivers, streams, natural habitats, zoos, etc.
6 Road Geometry Probability Metrics	Is the road geometry suitable for DGR activity?	Geometric Characteristics	High standard. Meets / exceeds expectations Medium standard. Generally meets expectations Low standard. May not meet all expectations Poor / Deficient Standard. Generally fails to meet expectations	100 65 35 0	Consider lane width, shoulder width, clear zone, grade, radii, access density, number of lanes, median separation, bridges, drainage.
	Is the road operating at a suitable efficiency for a DGR?	Operational Characteristics	Delays due to significant congestion rarely ever occur Delays due to significant congestion occur but infrequently Delays due to congestion occur frequently Delays due to congestion occur very regularly	100 65 35 0	Consider typical volumes / lane and v/c ratios.
8 Traffic Safety	Is the risk of collisions considered high?	Collision history	Collision rate ³ is lower than average for the road class Collision rate ³ is about average for this road class Collision rate ³ is higher than average for the road class Collision rate ³ is among the highest in the City for the road class	100 65 35 0	3-year collision history, in crashes per million vehicle kilometres

FIGURE 7.3 CALGARY FRAMEWORK FOR ROUTE ASSESSMENT

Final Score Calculation	
1.	Combine the score each of the road segments received on each issue in Part B and divide by the number of segments to come up with a numerical score for each issue between 0 and 100 for each of the corridors.
2.	Combine the score each corridor received on each of the issues in Parts A and B and divide by the number of issues (8) to get a final score between 0 and 100 for each corridor.

Final Score	Corridor Interpretation
75 to 100	Strong Candidate for DGR designation: explore any lower-scoring segments (<50) for possible alternatives or mitigation measures
50 to 74	Good Candidate for DGR designation: explore lower-scoring segments (<50) for possible alternatives or mitigation measures
25 to 49	Weak Candidate for DGR designation: consider alternatives. Significant mitigation required and many risks may be involved.
0 to 24	Not a Candidate for DGR designation. Do not consider further.

Note: Framework was intended for dangerous goods routes.

FIGURE 7.3 CONTINUED – CALGARY FRAMEWORK

TABLE 7.2 PROPOSED ROUTE ASSESSMENT

ISSUE	POINTS FOR EACH POSSIBLE TRUCK / DANGEROUS GOODS ROUTE						
	1 ST Avenue (Hwy 16)	Victoria Street (Hwy 16)	3 rd /4 th /5 th Avenues	1 ST Avenue West/ Camey Street/ 5 th Avenue	Geensway/ Ferry Avenue	Lower Patricia Boulevard	
1 Route Purpose	100	35	35	35	65	65	
2 Route Continuity	100	100	100	65	100	100	
3 Road Environment	100	65	65	35	65	65	
4 Surrounding Land Use	35	0	0	0	0	0	
5 Surrounding Environment	65	65	65	65	65	65	
6 Road Geometry	65	65	65	35	65	65	
7 Traffic Efficiency	100	100	65	65	65	65	
8 Traffic Safety	65	50	65	65	65	65	
Total Points	630	480	460	365	490	490	
Divide by Eight Issues	79	60	58	46	61	61	
Result	Strong	Good	Good	Weak	Good	Good	

The preliminary analysis indicates that 1st Avenue east of Victoria Street, provides the strongest candidate. However, a City-wide route network, to be established in the Dangerous Goods Route study the City is currently initiating should be establish before the routes are selected.

It is recognized that routing trucks through the downtown core is not a preferred scenario. However, a lack of alternate routes makes this unavoidable at least for the short term. In the longer term, truck routes that bypass downtown could be considered, understanding that local access may still be required.

7.5 Recommendations

Short term (zero to four years), and medium term (five to nine years) recommendations are proposed for truck and dangerous goods movement improvements in the downtown. These recommendations are later prioritized in CHAPTER 11.

Short Term

- A. *Develop a City-wide truck route and dangerous goods route network.*

This network should be developed in consultation with the Ministry of Transportation and the public-at-large, using FIGURE 7.2 as a possible starting point.

- B. *Seek provincial Ministerial approval for dangerous goods routes.*

The Ministry of Transportation has jurisdiction over Highway 97 and should be consulted on the designation of dangerous goods routes.

Medium Term

- A. *Develop City Bylaws and Policies to Manage Dangerous Goods Movement*

This could include: designation of routes, along with the applicable vehicle types and times permitted to travel.

B. Ensure that the Nechako Crossing Project Provides for a Truck/Dangerous Goods Route

It is expected that this route would travel along 1st Avenue with a connection to Highway 97.

C. Conduct a Detailed Route Review

This can be used to determine whether minor improvements could improve safety for heavy vehicles, for example, longer inter-green signal times.

D. Prepare and Publish Information Material for New Network Designation

This will help to ensure the commercial vehicle operators as well as the public are knowledgeable about the designated routes.

E. Install signs.

Installing signs on all designated routes will indicate that the route is a truck route and / or a dangerous goods route and will help to ensure compliance.

Input from Public Consultation, Phase 2

It is recommended that the City adopt a bylaw with policies aimed at dealing with dangerous goods movement. It is also recommended that the City identify a route for dangerous goods movement. 86 percent are in favour and 4 percent are not in favour of the recommendation that the City adopt a bylaw with policies aimed at dealing with dangerous goods movement.

The majority of people who commented on the survey do not want a heavy truck route or a dangerous goods route directed through the downtown. There were also some suggestions for a ring road around the downtown for such traffic. Some of the comments alluded to a desire to decrease air pollution and a fear of what a dangerous goods route would imply. It is clear that a dangerous goods route should also be accompanied with a public education campaign.

8.0 PARKING

A well-managed downtown parking supply strategy contributes to the economic well-being of a vibrant downtown. This section provides detailed information on the existing conditions of parking in downtown Prince George through survey and analysis and makes recommendations to improve parking efficiency.

8.1 Background

Beginning in the mid to late 1990s, City Bylaw Services staff undertook a complete review of on-street parking and enforcement procedures. The end result of this exercise was an on-street parking strategy Action Plan (adopted by Council April 22, 2002). Key points of the strategy are detailed below.

- The vision that drives the strategy is that downtown on-street parking is for customers.
- The strategy is aimed at penalizing chronic parking abusers as opposed to people who only get one or two parking tickets per year. An analysis of 34,000 parking tickets written in one year showed 80% of the ticketed vehicles (tracked by license plate number) only got one or two tickets in any given year. With this data in mind City Administration proposed that two “Courtesy Warning Tickets” be issued in any calendar year. It was felt this would be seen as friendly to out-of-town visitors and encourage occasional users of downtown services to continue and possibly increase their visits.
- Eliminate the \$2.00 and \$5.00 early discount fees for early payment of fines and create one fine of \$10.00 for meter time expired and parking over the two hour limit. The intent of this change was to encourage people with longer term parking needs to park in the off-street lots.
- Increase parking meter rates from 25 cents per hour to 50 cents per hour.

- Remove meters in low use outlying areas of the downtown and replace the meters with two hour signed limits. This was meant to encourage people to park in these outlying areas and walk to locations downtown.

Prior to 1999 the City had approximately 1,100 meters in use. Approximately 250 meters were removed in 1999 leaving a total of 850 operational meters.

During revitalization of 3rd Avenue it was necessary to remove some 200 meters leaving an operational total of about 650 meters. This total was reduced to less than 400 during a rash of vandalism. Vandalism has not been an issue in 2006, therefore the meter head count is back close to 700.

The City's budget accounts for 650 meters generating an average of \$1.00 per meter per day for the 300 days per year that the meters operate. This results in revenue of about \$195,000.

8.2 Existing Conditions

A. Survey Method

Surveys of parking in the downtown were conducted for both on-street and off-street facilities. Different survey areas were established (FIGURE 8.1) based on a review of the issues and after discussion with City Staff:

- On-street parking boundaries were 2nd Avenue, 4th Avenue, Queensway and Vancouver Street;
- Off-street parking boundaries were 2nd Avenue, 6th Avenue, Queensway and Vancouver Street.

The rationale for these boundaries is that north of 4th Avenue is seen as the busiest area for on-street parking in the study area. Also, this report is investigating changing the one-way couplet on 2nd Avenue and 4th Avenue to a two-way system which may affect parking.

Parking surveys were conducted on February 7th and 8th, 2006, a Tuesday and Wednesday. On-street parking was surveyed from 0900 hours to 1500 hours and off-street parking was surveyed from 0900 hours to 1700 hours.

Parking supply was identified from aerial photos and materials provided by the City of Prince George. The number of on-street spaces was then confirmed through site visits.

Parking occupancy was measured and recorded at hourly intervals and is defined as the proportion of spaces occupied. For on-street spaces in the area of highest demand, turnover (the number of different vehicles parked in a specific area or facility over a given period of time divided by the number of spaces) and duration (the length of time a vehicle is parked), was also measured (FIGURE 8.1). The survey period extended from 0900 hours to 1500 hours.

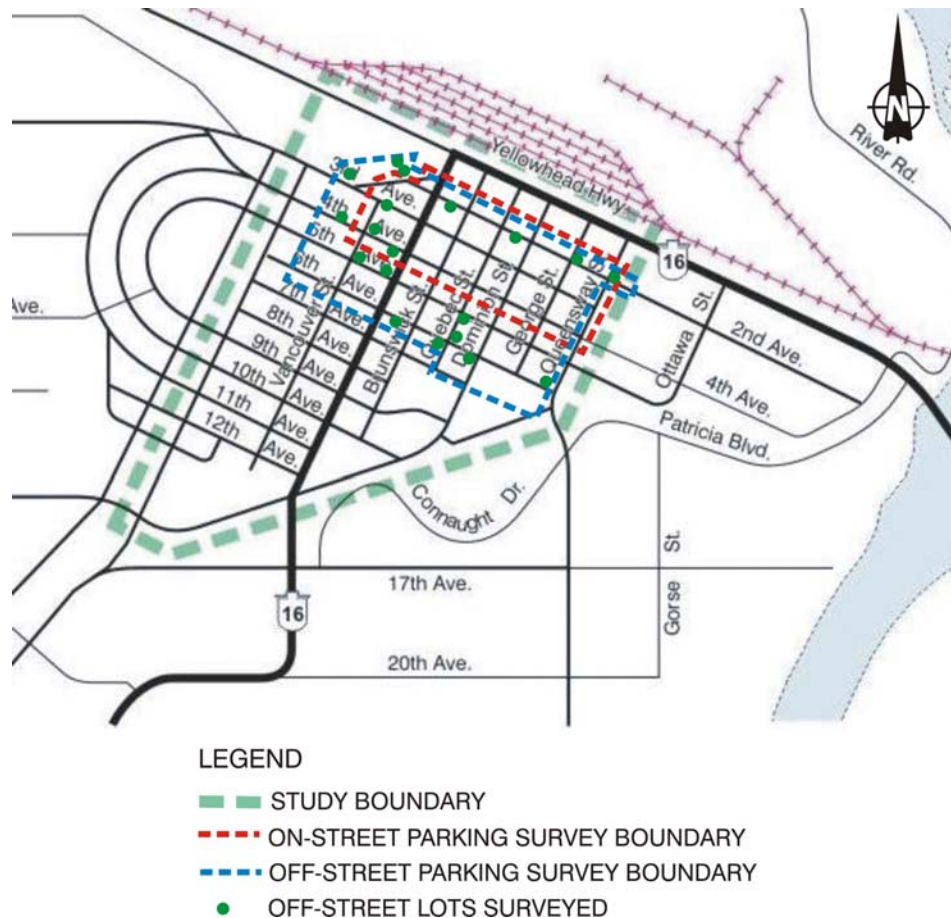


FIGURE 8.1 PARKING SURVEY BOUNDARIES

B. Parking Supply

For off-street private parkades that were not gated and city-operated lots, parking occupancy was measured in the time period from 0900 hours to 1100 hours and 1300 hours to 1700 hours or 1400 hours to 1700 hours (TABLE 8.1).

TABLE 8.1 PARKING SURVEY TIMES

PARKING SURVEY TIMES	
Parking type	Time
On-street	0900 hours to 1500 hours
Off-street Lot	0900 hours to 1100 hours
	1400 hours to 1700 hours
Off-street Parkade (private)	0900 hours to 1100 hours
	1300 hours to 1700 hours

Within the survey boundaries, it was determined that there are 919 on-street parking spaces. 85 of those are time-limited on 3rd Avenue. There are 3,457 off-street parking spaces for a total of 4,376 spaces, as summarized in TABLE 8.2.

TABLE 8.2 PARKING SUPPLY INVENTORY FOR AREAS OF PARKING OCCUPANCY SURVEYS

LOCATION OF SPACES	SUBCATEGORIES OF SPACES	Total
On-street	Time-limited (non-metered, 3 rd Avenue)	85
	Loading	20
	Accessible	19
	Police*	9
	Handi-Dart	4
	Taxi	2
	Ambulance	1
	Regular Metered Spaces	638
Off-street		3,457
Total		4,235

* Police spaces are at the court house on 2nd Avenue.

Off-street lots are located throughout the downtown. Parkade spaces tend to be limited access and rented on a monthly basis. Some are operated by private operators, others by the City of Prince George. For the lots operated by the City, spaces may be rented long term (monthly or daily) or short term (by the half-hour). Any off-street parking provided on private property primarily for the customers of one particular business was not surveyed (for example parking provided for bank customers).

For off-street parking, surveyors counted the number of spaces in a lot or parkade and recorded those spaces occupied over a period of time. This was used to determine occupancy, shown in TABLE 8.3.

TABLE 8.3 OCCUPANCY OF OFF-STREET PARKADES / LOTS

NAME	MANAGED BY	LOCATION	TOTAL SPACES	PERCENT RENTED	MAXIMUM OCCUPANCY
Native Friendship Centre -Reserved	Private	Prince Rupert St and 3 rd Ave	206		38%
Westel Surface Lot	City of PG	Corner of 2 nd Ave and Victoria St	105	n/a	n/a
Reserved for ACS	Private	2nd Ave and Queensway	30		7%
Unknown	Private	2nd Ave and George St	48		67%
Columbus Lot	City of PG	2 nd Ave between Dominion St and Quebec St	97	86%	68%
2 nd Avenue Parkade	City of PG	2 nd Ave between Victoria St and Quebec St	530	75%	Locked
Royal Lot	City of PG	Off 2 nd Ave between Victoria St and Brunswick St	60	48%	82%
Westel Parkade - Long Term	City of PG	2 nd Ave and Cross St	265	81%	Locked
Westel Parkade - Short Term	City of PG	2 nd Ave and Cross St	104		43%
Unknown	Private	4th Ave and Prince Rupert St	148		45%
Unknown	Private	4th Ave and Vancouver St	84		Locked
4 th Avenue Lot	City of PG	4th Ave between Dominion St and George St	47	30%	60%
Unknown	Private	4th Ave west of Victoria St	135		95%
Unknown	Private	4th Ave and Brunswick St	45		40%
Zellers	Private	4th Ave and Brunswick Str	190	0%	53%

TABLE 8.3 OCCUPANCY OF OFF-STREET PARKADES / LOTS (continued)

NAME	MANAGED BY	LOCATION	TOTAL SPACES	PERCENT RENTED	MAXIMUM OCCUPANCY
Unknown	City of PG	4th Ave between Dominion St and George St	90		57%
Plaza Parkade - Long Term	City of PG	Corner of 5 th Ave and Queensway Str	334	41%	Locked
Plaza Parkade - Short Term	City of PG	Corner of 5 th Ave and Queensway Str	198	0%	42%
Unknown		6th Ave and Quebec Str	36	100%	56%
6 th Avenue Lot	City of PG	Between 5 th Ave and 6th Ave on Quebec St	104		
5 th Avenue Parkade	City of PG	Corner of 5 th Ave and Brunswick St	208	90%	Locked
Earl Brown Lot	City of PG	6 th Ave between Victoria St and Brunswick St	48	65%	77%
Quebec Street Lot	City of PG	Corner of 6 th Ave and Quebec St	34	100%	59%
Days Inn Lot	City of PG	Between 6 th Ave and 7 th Ave at Dominion St	119	30%	56%
Queensway Lot	City of PG	6 th Ave and Quebec St	60	33%	63%
Unknown	Private	7th Ave and Victoria St	52		83%
Four Seasons Pool	City of PG		80		69%

C. Special Parking Zones

Use of dedicated spaces was observed and the results are in TABLE 8.4. Percentages are based on the highest occupancy during the time surveyed.

TABLE 8.4 UTILIZATION OF DEDICATED PARKING SPACES

TYPE OF DEDICATED SPACE	OBSERVED PERCENTAGE UTILIZED
Taxi	100%
Accessible	67%
Police	46%
Handi-Dart	0%

It was observed that accessible stalls are well-used with 67 percent occupancy, though Handi-Dart spaces were never occupied during our observations, likely due to quick turn around in drop-off or pick-up situations. Taxi spaces were occupied 100 percent of our observational time and police spaces had a 46 percent occupancy rate.

The American Disability Association (ADA) requires accessibility parking spaces according to the total number of marked or metered spaces on a block perimeter (TABLE 8.5).

TABLE 8.5 ACCESSIBLE PARKING SPACE REQUIREMENTS

TOTAL # OF MARKED OR METERED SPACES ON A BLOCK PERIMETER	MINIMUM REQUIRED # OF ACCESSIBLE PARKING SPACES	DOWNTOWN PRINCE GEORGE AVERAGE	# OF SUCH BLOCKS IN PARKING STUDY AREA
1 to 25	1	0.8	2
26 to 50	2	0.8	33

The ADA suggests that there should be one accessible space per block perimeter where there are up to 25 parking spaces and two accessible stalls per block perimeter where there are 26 to 50 spaces. The parking study area showed that Prince George has an average of 37 on-street parking spaces per block perimeter and provides an average of 0.8 accessible stalls per block. Within the larger project study area, 28 blocks of the 58 blocks do not have designated accessible parking spaces.

The ADA also refers to the design of on-street accessible parking stalls stating that:

[A]ccessible on-street spaces are best located where the street has the least crown and grade and close to key destinations. Adjacent sidewalk space should be free of obstructions and include curb ramps to permit deployment of a van-side lift.

An example of an on-street accessible stall in Prince George can be seen in FIGURE 8.2.



FIGURE 8.2 ACCESSIBLE PARKING STALL IN PRINCE GEORGE

The design of this stall is excellent given the requirements listed by the ADA.

Parking is restricted for special purposes in certain locations. Location of Handi-Dart, accessible spaces, bus stops, loading zones, police, ambulance and taxi zones are also indicated in FIGURE 8.3.

The City's practice has endeavoured to install one accessible parking stall per block. Accessible stalls are usually located at intersections or alleys to facilitate curb ramp access to the sidewalk.

D. Parking Charges

On-Street Parking

On-street parking charges for the study area are \$0.25 per half hour and \$0.50 per hour. Fines in Prince George for parking violations are \$10, while the first two violations are free. Parking charges in the downtown are comparable with cities of similar size but the fines for violations are lower than other cities (TABLE 8.6).

Estimates for parking revenue from meters is approximately \$195,000. In 2005, another \$130,000 revenue was collected from fines.



FIGURE 8.3 LOCATIONS OF SPECIAL ON-STREET PARKING SPACES

TABLE 8.6 COMPARISON OF ON-STREET PARKING RATES AND FINES

CITY	METRE RATE	FINE	DISCOUNT ON FINE
Prince George	\$0.50/hour	\$10	First two offences are free
Kelowna	\$0.50/hour	\$30	Charge \$5 if paid next day and \$10 if paid within seven days
Red Deer (indicates changes starting in September)	\$1/hour	\$30-35	\$15-20 reduction if paid within 10 days
Lethbridge	\$0.70/hour*	\$57	

* For all 38 minute, 1 hour, 2 hour and 3 hour meters. 10 hour meters are at a rate of \$0.20/hour.

Off-Street Parking

Average parking charges in off-street lots, operated by the City, were identified during site visits. Parking charges range from \$0.35 to \$0.50 per hour, and from \$5.00 to \$10.00 per day. During site visits it was observed that the charges were not always displayed. The hand-out advertising parking opportunities in parking lots in Downtown Prince George titled Do You Drive to Work? Convenient Low-Cost Parking details an hourly rate as well as a monthly rate, though it is not clear what the daily rate would be. Monthly rates range from \$26.75 to \$50.00.

Issues may arise when drivers who have purchased an unreserved monthly space do not find an available space in their desired lot. Information from City officials suggests that when this happens, patrons must drive to another lot to find a spot.

Special Seniors Parking Permits

The City of Prince George Parking and Traffic Bylaw No. 6056, (1993) defines parking regulations in the downtown. This Bylaw details the permit program for seniors under Section 61. Seniors, aged 65 and older, owning a vehicle registered in their name, can apply for a parking permit for Prince George for an annual fee of \$18 (including taxes). This permit allows seniors to “park at any meter space free of charge up to the maximum time permitted”. This is enforced with tire marking to determine if drivers are overstaying the meter limit.

E. System of Time Limits

Not all areas in the downtown have metered parking, but most have time limits. Parking charges and time limits in the study area are shown in FIGURE 8.4. Generally there is a two-hour time limit in the downtown. An exception exists where there are five-hour meters located on Vancouver Street between 4th Avenue and 7th Avenue. This is unusual as it discourages high turnover and limits the amount of available parking for customers to commercial business.

Properties in the study area that are expected to generate demand for high-turnover parking are shown in FIGURE 8.5. Examples of such properties include banks, post offices and gyms. Some major employers, such as government offices, may also generate high turnover parking. These are properties where

people can be expected to park for short periods of time to complete errands or short shopping trips.

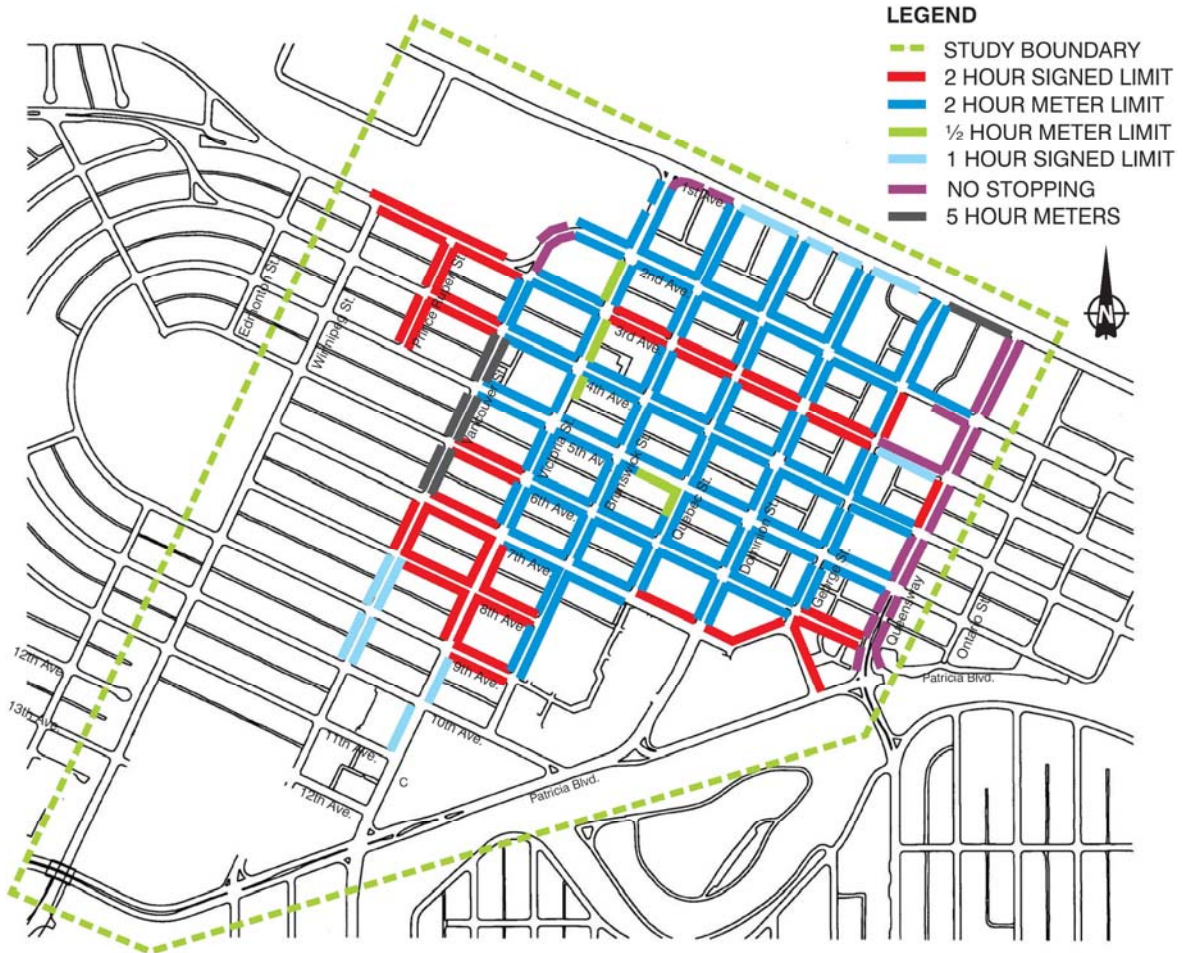


FIGURE 8.4 SYSTEM OF ON-STREET PARKING TIME LIMITS

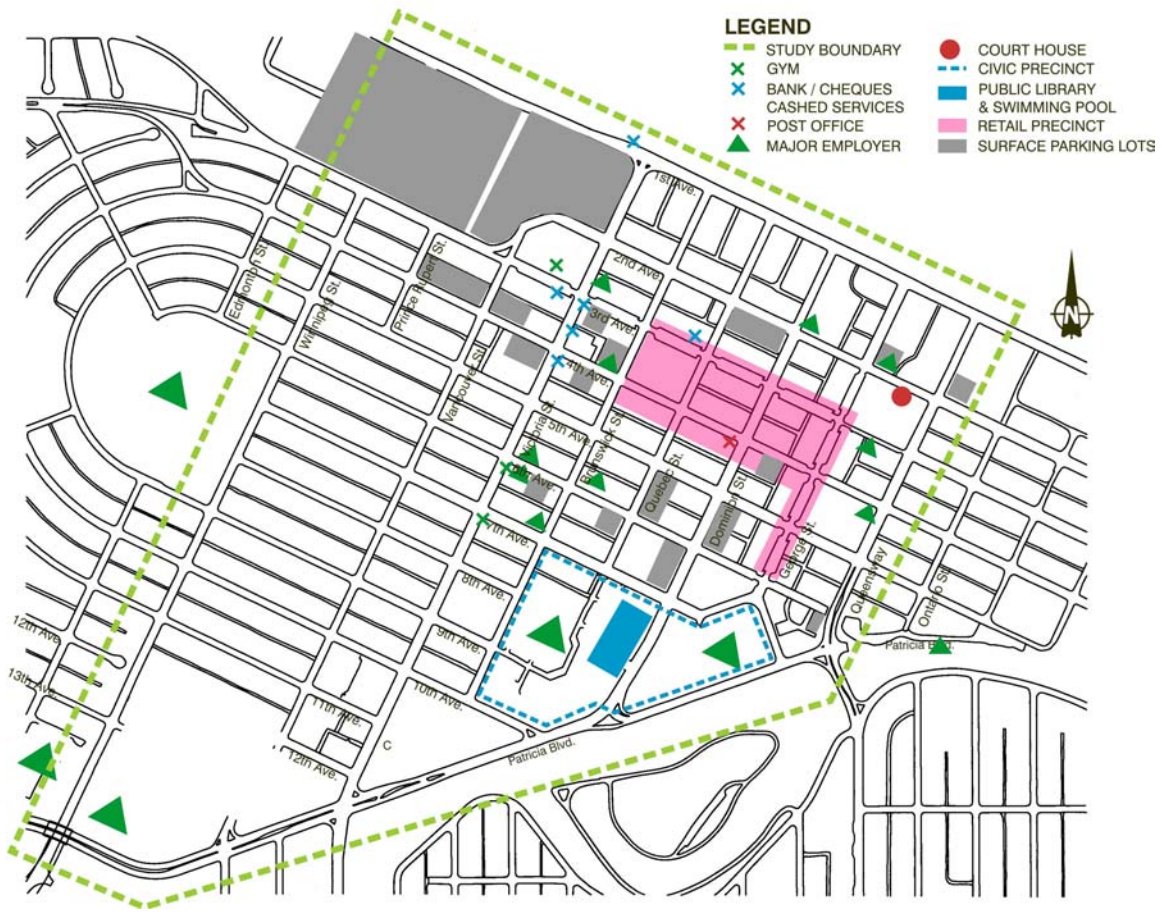


FIGURE 8.5 PROPERTIES WITH HIGH PARKING TURNOVER

To promote a high-turnover rate near businesses that require only limited-duration visits, shorter parking time limits and higher parking charges are typically used. However, in downtown Prince George, there are no charges on 3rd Avenue, which is one of the higher demand streets. Also, the five-hour time limit on Vancouver Street discourages higher parking turnover.

F. *Parking Occupancy*

On-street

On street parking appears to have higher occupancy around retail areas of downtown, as shown in FIGURE 8.6. Businesses and services that attract short visits (post offices, banks) have a higher demand for short-term parking.



FIGURE 8.6 ON-STREET WEEKDAY OCCUPANCY

Additionally, areas without parking meters were highly utilized, particularly along 3rd Avenue where there is a two-hour signed time limit. The five-hour time limit meters along Vancouver Street were also highly utilized though they may be taking away business from off-street lots as discussed below in the *Issues* section. Half-hour meters along Victoria Street at 3rd Avenue and 4th Avenue were also highly utilized.

On-street parking occupancy appears to be in lower demand in the early morning hours and peaks around mid-day as shown in FIGURE 8.7. On-street parking is considered well-utilized if demand is around 85 percent of supply during peak periods (shown as the red line in FIGURE 8.7). Parking is considered to be at capacity if 95 percent of stalls are in use. The survey results suggest that while certain blocks were heavily utilized, overall downtown Prince George has more on-street parking than is currently required by demand.

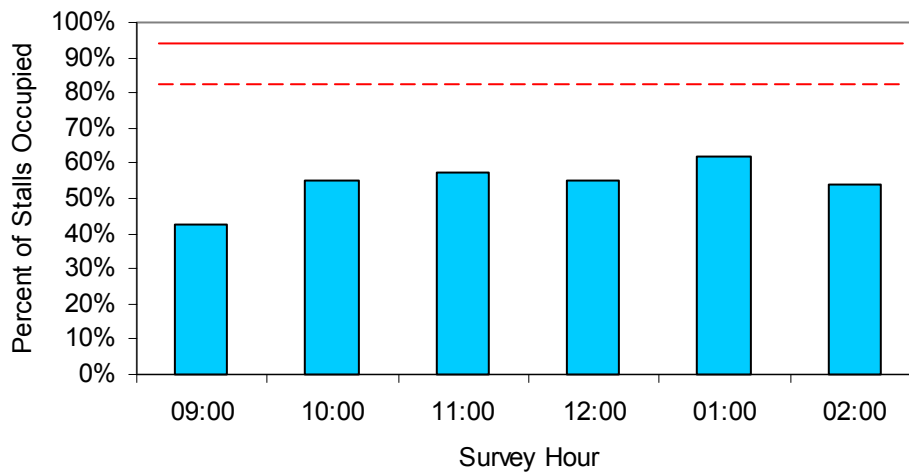


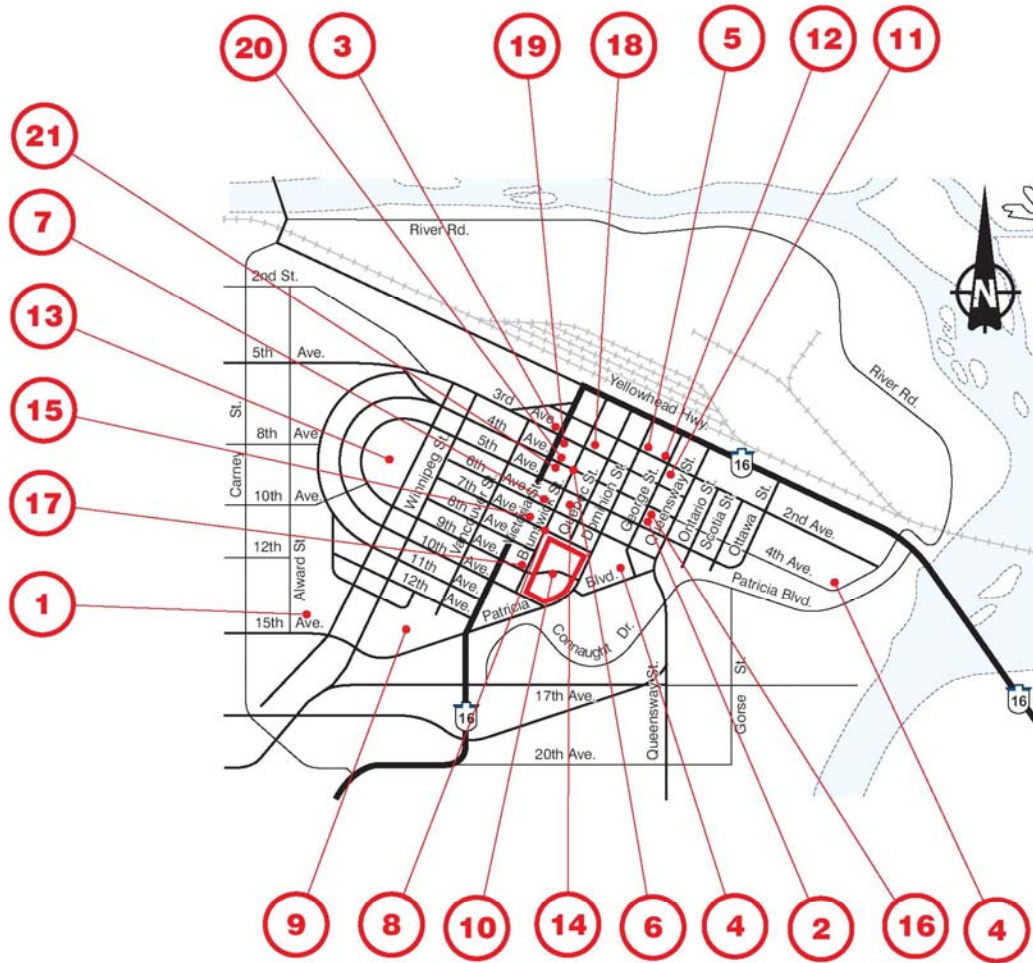
FIGURE 8.7 ON-STREET PARKING OCCUPANCY BY TIME OF DAY

Off-street

Off-street parking lots and garages are located throughout the downtown to accommodate longer-term parking demand. Almost half of the observed lots were operating at 61% to 80% occupancy. Maximum occupancy of the lots was surveyed (FIGURE 8.8) to determine the locations where the highest demand occurs, relative to the major downtown employers (FIGURE 8.9).



FIGURE 8.8 OCCUPANCY OF OFF-STREET LOTS



#	Name of Company	Rank in top 25 employers	Number of Employees	#	Other Major Downtown Employers not in Top 25
1	Prince George Regional Hospital	3	1700	9	Parkwood Mall
2	BC Government and Service Employees' Union (Government of BC)	4	1500	10	Civic Precinct
3	Northern Health Authority	5	800	11	Court House
4	City of Prince George	6	695	12	FFGRD Office
5	LiveBridge Canada ULC (call centre)	7	650	13	School District #57
6	Synovate Ltd (call centre)	16	220	14	Post Office
7	Royal Bank (main branch)	23	140	15	Barton Insurance
8	Coast Inn of the North	25	127	16	Ramada Inn
				17	RCMP
				18	CIBC
				19	Scotiabank
				20	Canadian Western Bank
				21	TD Financial Group

**Major Downtown Employers
and Other Major Employment Areas**

FIGURE 8.9 LOCATION OF MAJOR EMPLOYERS IN THE DOWNTOWN

Major employers, defined as work places with a relatively high numbers of employees, are located primarily between Victoria Street and Brunswick Street, and as far south as 9th Avenue. There is a cluster of parking lots in the vicinity of 4th Avenue and Victoria Street, two of which appear to be underutilized.

Analysis showed that many off-street lots had relatively low occupancies (FIGURE 8.8) with none occupied over 80 percent. This is below optimum efficiency levels of 85 to 95 percent occupancy for off-street lots where 85 percent occupancy is considered full¹. It was also observed that not all monthly parkers are using their spaces, as indicated in TABLE 8.3. The highest demand for off-street parking was observed in the retail and commercial areas, particularly along 3rd Avenue and 4th Avenue at Victoria Street.

The City indicated that despite low occupancy, all available spots in these lots are rented on a monthly basis, and a waiting list exists. The City indicated that the people who rent the spots don't always use them. This may indicate that monthly charges are too low. The City may wish to survey the users to find out why parkers are paying for spots that they are not using on a daily basis.

G. Parking Duration

The parking charge schedule details the time limits or meter limits for the downtown area. An assessment of this schedule against parking areas of high demand is useful to determine an evaluation of parking charges. Average duration of parking, according to signed or metered time limit (FIGURE 8.10), shows that people are overstaying limits in the one-hour signed time limit areas. People are generally staying 1.5 hours in both the one hour and two hour parking areas (metered and signed).

Parking duration averaged 1.5 hours, no matter what the posted time limit was for the area. However, average duration appears to exceed time limits on blocks where parking is regulated only by signed time limits.

¹ Litman, Todd. 2006. *Parking Management – Strategies, Evaluation and Planning*. Victoria Transportation Policy Institute. Available on-line: http://www.vtpi.org/park_man.pdf. Last accessed: July 26, 2006.

Comments from the open house found anecdotal information regarding “chronic parkers”. Analysis determined that a small number of parkers will park in one space and then move their vehicle a few spaces over to park all day in time limited spaces. Approximately 5.5 percent of parkers observed were found doing this.



**FIGURE 8.10 ON-STREET PARKING AVERAGE DURATION
COMPARED WITH TIME LIMITS**

8.3 Existing Policies and Practices

A. Maintenance

Parking is restricted in the downtown area for winter maintenance between the hours of 0100 hours and 0800 hours. This restriction remains in place during the summer months as well. From the parking survey summarized in Section 1.0, 74

percent of respondents agree with this regulation. City staff indicates that the restriction is only enforced when actual snow clearing and street cleaning operations are in effect. However, it is not clear how this information is communicated to residents and visitors to the downtown. Revisiting this regulation may allow for more flexibility in parking during evening visits to the downtown enabling more people to frequent the downtown, and become familiar with it outside regular business hours. It is recommended that the city lift this restriction during the summer months for most days of the week. It could perhaps be retained for one day of the week during summer months to allow for street sweeping. It is recommended that the restriction be retained for the winter months, as snow clearing requirements can come on suddenly.

B. Enforcement

Prince George employs four Parking Control Officers, a meter maintenance person and one Supervisor for a total budget of just over \$270,000. Three of the Parking Control Officers work almost exclusively downtown controlling both on and off-street stalls.

Parking Control Officers chalk tires as a method of keeping track of parking violations in time limit areas only.

The percentage of parkers overstaying their time limit is shown in FIGURE 8.11. Analysis shows that people are overstaying the signed limit most of the time. Survey observations show that people are sometimes staying as long as four hours past the posted time limits in some on-street parking areas.

C. Utilization of Dedicated Spaces (taxi, accessible, police, Handi-Dart)

Under the City's Parking and Traffic Bylaw No. 6056, 1993, allowances for dedicated on-street parking spaces are made. Designations include spaces for taxis, accessible parking, police and Handi-Dart. Accessible parking is addressed in Section 60 of the Traffic Bylaw. Where eligible, a valid numbered accessible placard as well as a permit identification marker is issued by the Social Planning and Research Council Association (S.P.A.R.C) of BC, to a person with physical disabilities or to a person in respect of a motor vehicle by another jurisdiction. Handi-Dart vehicles are permitted to park in a dedicated accessible space in

addition to the six designated Handi-Dart spaces located in the study area. (Note that the six Handi-Dart spaces include Handi-Dart spaces outside the parking survey area.)



FIGURE 8.11 PERCENTAGE OF PEOPLE OVERSTAYING TIME LIMITS

Off-street parking for physically disabled persons is detailed in section 62 of the City's Parking and Traffic Bylaw No. 6056:

Every owner of a public parking area shall provide reserved parking spaces for the exclusive use of physically disabled persons, or persons conveying physically disabled persons to park their motor vehicles in the amount and standards prescribed by the City.

The city's Zoning Bylaw, Section 29 "Off-street Parking and Loading", sub-section 29.9 (4) DEVELOPMENT STANDARDS FOR OFF-STREET PARKING AND LOADING says that:

If any development requires or provides more than fifty off-street parking spaces, one parking space shall be provided for the use of persons with a physical disability, together with one additional disability space for each additional one hundred fifty off-street parking spaces required or provided. Each physically disabled space shall be 4.00 m in width and shall be properly identified.

Taxi zones, emergency zones and accessible parking spaces are all authorized by the Director of Development Services. There are no details in the Bylaw indicating the criteria for applying for a zone designation. City staff has explained that special parking zones are approved on an individual basis, based on needs and established precedents. This is consistent with other cities that take requests for special parking designations and evaluate them on a case-by-case basis. Things to consider may include: proximity to other similarly dedicated space, types of land use that can support the parking designation and guidelines for designating accessible spaces.

The City's Zoning Bylaw states that new developments in the Central Business District do not have to provide parking. However, if parking is provided, it must meet the minimum required by the bylaw. No maximum parking requirements are set.

8.4 Issues Identified in Public Consultation

Results of Phase 1

An open house public consultation was held in Prince George in May, 2006 where specific stakeholders and the general public were invited to provide feedback on the development of the Downtown Transportation and Parking Study. A survey was also circulated at the open house as well as on the City's website and an event in June. Results from this survey are presented in Section 1.0. Several issues emerged from the consultation:

- Off-street parking needs to be cleaner and safer;
- Better signage and information regarding prices for off-street parking is needed;
- Anecdotal reports of what are termed “chronic parkers”, i.e. downtown workers who move their car every two hours vs. parking in garage – the “2-hour shuffle”;
- Angled parking allows for selling of drugs and also results in headlights shine into restaurant windows at night;
- The accessible spaces on 3rd Avenue are well received because they don’t force wheelchair-users into the street;
- Suggestion for street cross-section with parking at same height as sidewalks with rolled curb and bollards between the parking space and the sidewalk. This design would also be good for wheelchair users, because a ramp would not be necessary
- There is a perception that parking charges deter people from shopping downtown;
- Consideration should be given to evening and weekend parking as separate from daytime parking, especially in regards to the entertainment district; and
- It is hard to get out of angled parking spaces on 3rd Avenue.

Results of Phase 2

There were many comments regarding parking on the survey. The majority of people do not want an increase in parking violation charges to \$30. Residents and business owners are also not in favour of the pay and display system of parking. In general, respondents want time-limited but non-metered parking, and monies collected from violation charges to be invested in the downtown. There is recognition of a parking problem with employees using short-term on-street

parking all day. One such employee commented on this personally saying that feeding a meter all day was inconvenient.

There were some comments that the pay and display system of parking would probably work in off-street lots. Several other comments included:

- Decreased parking rates for small cars and motorcycles; and,
- Meters should accept dimes and nickels.

8.5 Opportunities and Issues

A. Opportunities

- Parking charges for Prince George are in line with other communities. In the short-term, if desired, there are opportunities to increase parking revenue by ensuring that meters are provided and functional at the metered parking spaces. Over the longer term, an increase in parking rates could be used to encourage higher turn-over and alternate modes.
- There is currently an excess of parking supply in many off-street lots. These lots may provide future opportunities for re-development to a higher form of land use. Potential lots to consider for development opportunities are located at the following intersections:
 - The northeast corner of 2nd Avenue and Queensway
 - At Dominion Street between 4th Avenue and 5th Avenue
- There is currently an excess supply of on-street parking throughout the day, as peak parking demand is not approaching 85 percent. This provides an opportunity for re-allocating on-street parking space to other uses, such as revised laning, bicycle lanes or wider sidewalks, in the long term.
- Implement small vehicle parking spaces for use of small vehicles or motorcycles. On-Street parking spaces can be sub-divided into smaller spaces to accommodate different sized vehicles.
- City staff asked to consider curb painting however, given the number of months that snow is on the ground in Prince George, it is not recommended.

- The City may wish to consider designating different types of loading zones with different time limits depending on their location and associated land uses. For example, passenger loading zones with a 15 minute time limit and commercial loading zones with a 30 minute time limit. Existing loading zones can be used for commercial deliveries and for passenger loading.

B. Issues

The parking management strategy currently in place discourages high-turnover at downtown locations where high turnover is desirable and should be encouraged.

On-street parking durations do not appear to be sufficiently influenced by signed parking time limits. Either a higher level of enforcement is required, or the conversion of 1-hour limits to 2-hour limits can be considered.

Dedicated spaces appear to be well-utilized, however, a lack of guidelines for dedicated parking stalls for example, taxi, accessible spaces, Handi-Dart, etc., results in ad-hoc responses to requests and potentially inequitable distribution which consumes staff time.

Senior permit holders receive free on-street parking privileges which also makes enforcement of time limits difficult. City staff admits that although tires are marked, towing is a rare form of enforcement.

Abundant, available and cheap parking attracts trips away from more sustainable modes (especially transit).

Broad policies with regards to street maintenance conflict with late night parking.

C. Future Parking Demand

This report has revealed that the City's parking supply exceeds current demand for both on-street and off-street parking. Because of this, it would be best to review the management and time limits of the current parking supply which has the potential of addressing future demand.

8.6 Recommendations

Short-term

Off-street Lots

Off-street lots are used primarily for longer term parking needs. Long term parking is typically defined as parking for 3 hours or more. For example, employees are usually long term parkers. Encouraging long term parking in off-street lots frees up on-street parking for short term demand. Some initiatives to encourage long term parking in off-street lots include:

- Undertaking a survey of users to determine why parkers are paying for spots that they do not use on a daily basis.
- Providing better signing and a coherent pricing program can encourage people to use the off-street lots;
- Possibly converting hourly spots in off-street lots to monthly spots;
- Reduce the per hour costs relative to street parking to increase attractiveness of off-street lots;
- Conversion of underutilized off-street lots to development sites could increase the potential for activity in the downtown, aiding revitalization; and
- Development of design guidelines for off-street lots to deal with security concerns such as improved lighting, good sight-lines and directed areas for pedestrian movement.

On-Street Parking

In commercial areas, on-street parking is usually short term parking. Short term parking is typically defined as parking for 3 hours or less. Visitors and shoppers are usually short term parkers.

1. Pricing and time limit strategy

A pricing and time limit strategy in the downtown for on-street parking should be employed. Potential options include:

- No metered parking anywhere in the downtown;
- Meters on high demand streets (3rd Avenue and George Street) and two-hour time limit everywhere else;
- Meters on high and medium demand streets (based on % occupied at noon) with two-hour time limit everywhere else; and,
- Meters on all streets.

Advantages and disadvantages for each option are detailed in TABLE 8.7.

Input from Phase 2 of the public consultation, showed strong support for removing all the meters from downtown streets. It was felt that this would improve the economic competitiveness for downtown merchants relative to suburban malls. It is important to note that this policy would have significant impact on income to the City from meters, currently approximately \$195,000 per annum. Additionally, in order to ensure that stalls are available under such a system, consistent enforcement of time-limited parking spaces is required, and fines for overstaying time limits must be a substantial enough to be a deterrent. Increased income from fines from measures discussed under point 2 below would somewhat offset the decrease in meter income.

Areas closest to retail and commercial land uses such as banks, post office and shops, which have the highest turnover rates, should have shorter time limits and areas further from the concentration of such land uses should have longer time limits. Short-term demand around post offices and banks could be 15 minutes or ½ hour, and two hours in other areas. Elimination of the 5 hour metre areas should also be considered so as to discourage employees from parking on-street as well as to encourage use of the off-street lots. If parking meters are removed, time limits could be set at two hours throughout most of the downtown area, as shown in FIGURE 8.12.

**TABLE 8.7 ADVANTAGES AND DISADVANTAGES OF
ON-STREET PARKING OPTIONS**

OPTION	PROS	CONS
No meters anywhere	<ul style="list-style-type: none"> ▪ No deterrent to parking downtown ▪ No maintenance of meters, no need to replace missing meters ▪ Easily understood 	<ul style="list-style-type: none"> ▪ Revenue from fines only ▪ Difficult to enforce time limit ▪ Likely reduced availability of parking
Meters on high-demand streets, (3 rd and George only) 2-hour time limits everywhere else	<ul style="list-style-type: none"> ▪ Could use existing meter supply, wouldn't have to buy additional ▪ Could encourage pedestrian traffic on commercial streets with less activity as people walk from free parking areas to retail areas. ▪ More easily understood 	<ul style="list-style-type: none"> ▪ Reduced revenue ▪ Difficulty in enforcing time limit on non-metered streets ▪ Maybe perceived as unfair to some off-street lot operators
Meters on high and medium demand streets (based on % occupied at noon) 2-hour time limits everywhere else.	<ul style="list-style-type: none"> ▪ Could use existing meter supply, wouldn't have to buy additional ▪ Similar revenue ▪ Could encourage pedestrian traffic on commercial streets with less activity ▪ Could encourage patronage of commercial streets 	<ul style="list-style-type: none"> ▪ Difficulty in enforcing time limit on non-metered streets ▪ Maybe perceived as unfair to some off-street lot operators
Meters everywhere	<ul style="list-style-type: none"> ▪ Increases revenue ▪ Consistent application results in reduced driving around looking for free spots. ▪ Easily understood 	<ul style="list-style-type: none"> ▪ Additional meters required ▪ May increase enforcement requirements ▪ May be perceived as unfair in areas of low demand

2. Increased enforcement of on-street parking

A short-term strategy that the City should consider includes increased enforcement of on-street parking. This is absolutely necessary if parking meters are removed. Along with additional enforcement, fines must be significant enough to act as a deterrent.

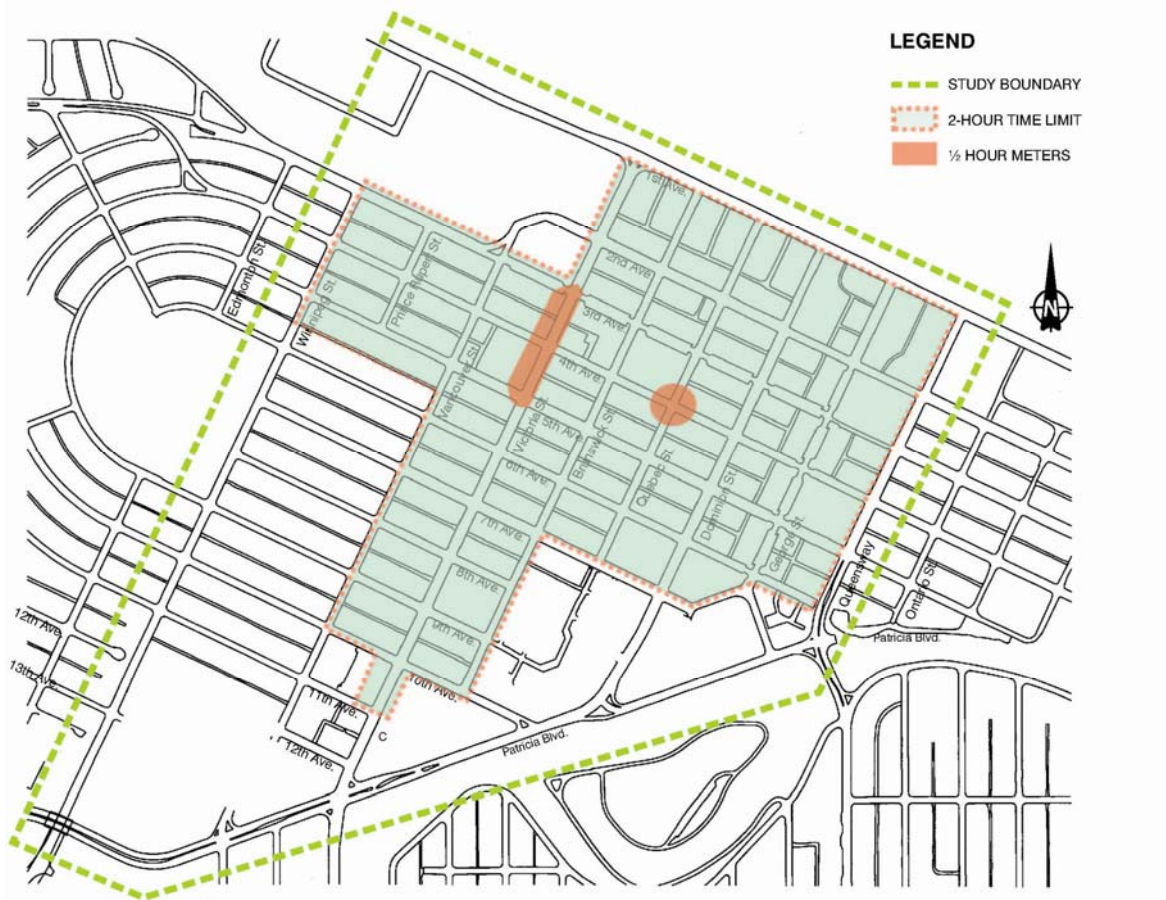


FIGURE 8.12 NEW ON-STREET PARKING STRATEGY

As discussed under point one, in order to maintain availability of parking stalls for short-term parking, the City should consider adopting the following measures:

- Eliminating the policy of not charging people for their first two parking violations (as this policy applies only to parking meter violations, this could easily occur in conjunction with the implementation of time-limited spaces throughout the downtown);
- While the fine could remain at \$10, the City may wish to increase the fine for parking time-limit violations to \$30 for repeat offenders. For example, the fee would be \$10 for the first two violations, and \$30 for the third and subsequent violations. The fee for repeat offenders is in line with fees for first-time violations in other medium-sized municipalities in Western Canada;

- Revising parking charges to encourage short-term and long term parking in off-street lots. A fee structure is shown in TABLE 8.8 for off-street parking; and

- The City should monitor and evaluate parking supply relative to downtown business occupancy rates (or some other measure to quantify the vibrancy of the downtown economy) on an ongoing basis. If the parking occupancy rates are approaching 95%, and the difficulty in finding available parking spots becomes a deterrent to shopping downtown, the City may wish to re-introduce parking meters at some future date.

- If meters are retained, maintain a parking charge of \$0.25 per half hour.

The pricing program detailed in TABLE 8.8 coincides with the recommendations from the Civic Precinct Parking Study (2007).

TABLE 8.8 NEW PRICING PROGRAM FOR OFF-STREET PARKING

TIME PERIOD	MAXIMUM RATE at meter rate of \$.50/hour	PROPOSED RATE RANGE	EXPLANATION
1 hour	\$0.50	No charge	Encourage use of downtown area. May attract on-street parking
2 hours	\$1.00		
3 hours	\$1.50	\$1.25	Provide a longer term option for those staying longer than two hours
8 hours (daily)	\$4.00	\$3.50 to \$3.75	Less than meter rate to provide incentive to use off-street lot; longer term should be more than daily transit rate (now \$4.00)
Monthly	\$80.00	\$48.00	Provide a rate equal to the monthly Prince George transit pass and similar to other monthly parking rates in the downtown; in long term employers could offer parking or transit pass

3. Small vehicle spaces

Most other cities of comparable size with Prince George do not have special provisions for motorcycle parking however members of staff indicates that there are an increasing number of motorcycles in Prince George. Most other cities of comparable size have yet to provide such provisions in their respective parking bylaws; however, the City of Victoria encourages small vehicles and motorcycles as sustainable alternatives to regular and over-sized automobiles.

The City has implemented small car spaces that allow motorcycles and they charge half price for the metered spaces. Approximately one percent of their on-street parking spaces in the downtown are designated for smaller vehicles. Victoria also allows motorcycles to double up at regular metered spaces. FIGURE 8.13 is an example of a small vehicle space in Victoria.



FIGURE 8.13 SMALL VEHICLE PARKING SPACE IN VICTORIA

In parkades and off-street parking the City of Victoria offers small vehicle spaces and sections off motorcycle spaces in the summer. Motorcycles pay the same rate for the first three hours of parking to a maximum of \$3 per day.

In Phase 2 of the public consultation, 55 percent of respondents were in favour and 26 percent were not in favour.

Medium Term

1. Address Issues Related to Parking Meter Maintenance

The City is having difficulty obtaining parts for its current style of parking meter. If the City decides to retain parking meters, or to re-introduce them the future, the City will have to address these issues. Discussion evaluating different types of

parking meter technology is provided in APPENDIX E. A previous version of this report recommended that the City adopt the pay and display system of parking to deal with the vandalized parking meters and help improve management of on-street parking. 21 percent of respondents were in favour of the pay and display system and 70 percent were not in favour of it.

2. Increase parking charges

If parking occupancy reaches critical levels, consider re-implementing or increasing parking charges for both on- and off-street parking. Parking charges should be set to encourage people to take transit. Implementing parking charges for on-street parking and shorter term off-street parking that are higher than the cost of a return transit trip and increase monthly parking charges for off-street parking that are higher than the cost of a monthly bus pass.

Long term

1. Set Maximum Parking Supply Bylaws

Observations suggest that downtown Prince George currently has an over-supply of parking. Reviewing the Zoning Bylaw with consideration for setting maximum parking supply limits for new developments is an appropriate way of handling parking demand into the future, and encouraging downtown development.

2. Alternate Modes

A more complete downtown neighbourhood of land uses that promote walking, cycling and transit may reduce the demand for parking. An increase in rates can help decrease demand.

3. Longer-Term Policies

Longer-term policies should be adopted to support the revitalization of the downtown. The City could consider recovering underutilized surface parking lots and parkades for conversion to development sites. The City could also consider increasing parking fees over the long term to support alternative modes of transportation.

9.0 SUSTAINABLE TRANSPORTATION STRATEGY

9.1 Transportation Demand Management

Transportation Demand Management (TDM) is a general term for strategies that would result in more efficient use of transportation resources. These strategies focus on reducing the need or scope for new transportation infrastructure by managing demands through improved efficiency. This section provides information on TDM strategies that are most appropriate to the Downtown Prince George context.

Prince George's OCP supports TDM in section 11.5:

Encourage the reduction of reliance on the private automobile through comprehensive Transportation Demand Management.

The OCP does lack specific details as to how the City will accomplish this. A TDM plan can help Prince George to achieve more balanced multi-modal split for trips to, from and within the downtown by encouraging transit, cycling and walking. Other stated goals that can be furthered by TDM include:

- Encourage alternative transportation systems and minimize transportation-related environmental impact;
- Encourage maintenance of a population with varying income levels, lifestyles, and age groups;
- Foster the creation of and maintenance of local employment;
- Promote a pedestrian-oriented environment;
- Reduce greenhouse gas emissions; and
- Further social, environmental, and economic sustainability.

9.2 Recommendations

Effective TDM measures must provide individuals with choices. For Prince George, in particular the downtown, the most effective TDM measures combine three elements: services, design and pricing. Services provide and enhance the attractiveness or the convenience of alternate modes. Design provides a high quality pedestrian environment, to increase the attractiveness of the walk mode. Pricing strategies provide incentives or disincentives to increase or decrease the attractiveness of alternate modes.

As a policy, Prince George should adopt a Comprehensive TDM Program and Implementation Plan. The primary objective of the Plan would be to reduce overall driving trips to and from the downtown. The secondary objective would be to reduce vehicle use in the city. The major components of the Comprehensive TDM Program and Implementation Plan should include land uses, transit, cycling and pedestrian facilities, road maintenance and associated facilities.

Council may adopt the following recommendations in support of the TMP:

A. *Consider a Two-Way Road System*

Conduct a public consultation for the two-way system east of Brunswick with a preliminary design that includes:

- Lane striping;
- Signal operations;
- Transit impacts; and
- Parking layout.

B. *Single-Occupancy Vehicle Trip Reduction Policies:*

1. Parking incentives for ridesharing, smaller vehicles and motorcycles.

C. *Transit*

Prince George's Conventional Transit Service Policy (2003) has good examples of including TDM policies. Some of the features of this policy include:

Targeting transit coverage to be within:

- 400 metres walking distance of 90 percent of all residences;
- 250 metres of all future medium and high density residential developments; and
- 150 metres walking distance of all designated senior residences and other institutional facilities.

Other features of the policy include: fully accessible bus stops, bus stops located in accordance with walking distance standards, providing amenities such as benches and shelters, priority for snow and ice removal, increased transit service for special events, and city-subsidized transit passes for organizations and individuals.

In addition to this, Prince George may want to consider the following to enhance the transit policy, furthering support for TDM:

1. Establishing a five-year transit plan in conjunction with BC Transit.
2. Consider a rapid bus system that will stop only at major destinations or major intersections to move passengers faster and more efficiently. Transfer points will connect to local-serving routes and community shuttles.
3. Support development patterns that would encourage transit use.
4. Establish a late night bus system, especially on weekends with service to UNBC and the College of New Caledonia.
5. Help develop design standards for transit stops with consideration for the following:
 - Lighting;
 - Trash bins; and
 - Shelter from weather appropriate to the northern climate.

D. Cycling

1. Adopt an implementation strategy for the Cycle Network Plan.
2. Bicycle racks and other end-of-trip facilities at office in the downtown.

E. Walking

1. Implement the Draft Pedestrian Network Policy.
2. The downtown generally supports walking, but enhancements to safety and the overall walking environment such as safe intersection crossings, and attractive street furniture could help improve the pedestrian environment.

F. Land Use

1. Encourage increased student housing development in the downtown core to take advantage of a large ridership base and to provide increased economic activity in the downtown.
2. Encourage mixed use developments within the same building and within the same zone to increase resident population in the downtown and to provide amenities for residents.

10.0 ROAD SAFETY

This chapter summarizes the current safety performance of the downtown road network. Collision data was reviewed to determine which intersections are the most collision-prone and to identify cost-effective safety improvements.

10.1 Collision Review

Historical collision data was reviewed to evaluate the characteristics of collisions in downtown Prince George. The collision data was received from the Business Information Warehouse branch of ICBC. The data period studied is three years, from January 1, 2003 to December 31, 2005.

A total of 659 incidents were reported within the downtown during the study period. Duplicate reports, vandalism reports, collisions that occurred in off-street parking lots and other claims that were not collision-related were removed. This filtering resulted in 603 distinct collision incidents reported occurring at intersections in the downtown network.

A. *Collision Characteristics*

The collision characteristics as distributed by year, month, day of the week, time and collision type are summarized below.

The yearly distribution shown in FIGURE 10.1 demonstrates that the frequency of collisions was practically constant during the three years, with about 200 collisions per year. The percentages of property damage only collisions and injury collisions are 63 percent and 37 percent respectively.

The monthly collision distribution shown in FIGURE 10.2 indicates that December and January have the highest collision frequency. The data for these two months was examined in terms of the time and day of the week they occurred. No unique data trends were identified to explain the higher frequency so it is likely due to weather conditions in the winter.

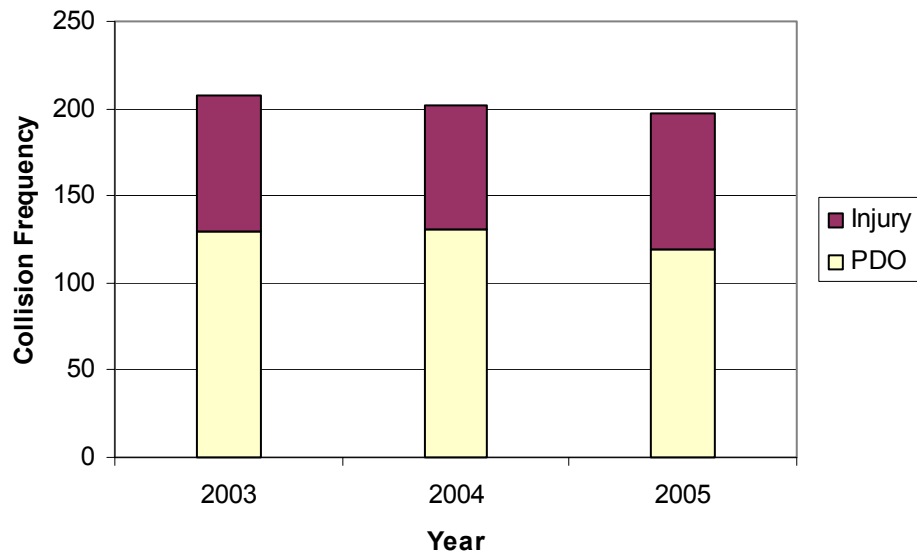


FIGURE 10.1 COLLISION DISTRIBUTION BY YEAR

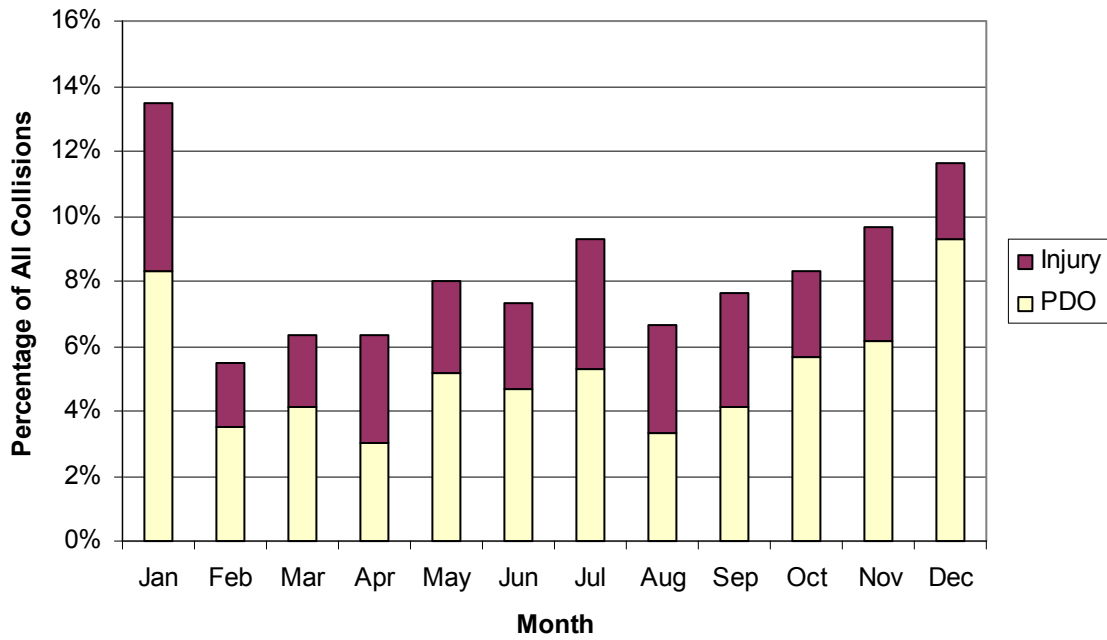


FIGURE 10.2 COLLISION DISTRIBUTION BY MONTH

The distribution by the day of the week shown in FIGURE 10.3 indicates that most of the collisions occurred during week days, with Fridays having the highest collision frequency.

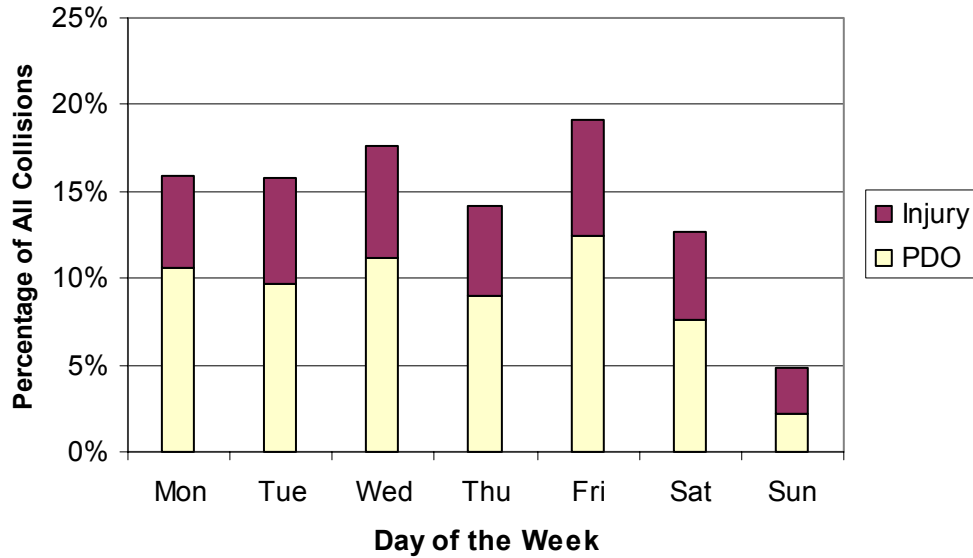


FIGURE 10.3 COLLISION DISTRIBUTION BY DAY OF THE WEEK

The collision frequency distribution by time of day, shown in FIGURE 10.4, indicates that the highest frequency of collisions occurs between 1100 and 1700 hours (11:00 am and 5:00 pm), corresponding to peak hour traffic volumes. This likely reflects higher afternoon traffic due to the afternoon mix of commuter and retail activity in the downtown.

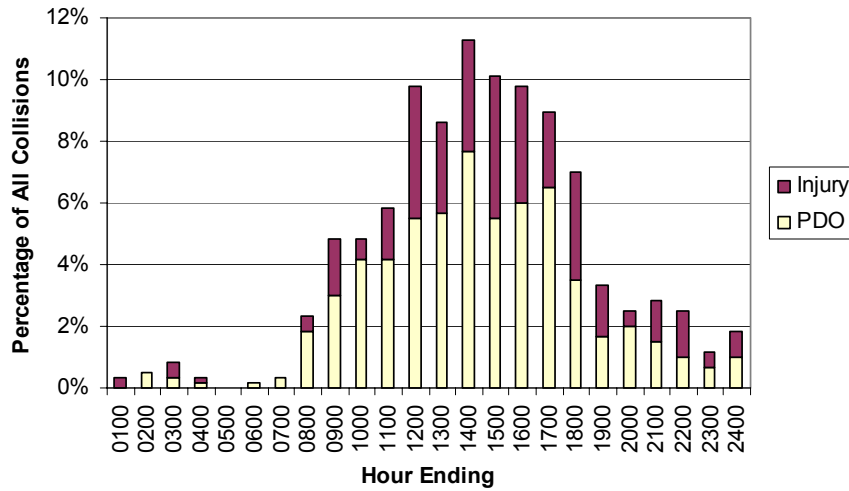


FIGURE 10.4 COLLISION DISTRIBUTION BY TIME OF DAY

The collision type was identified based on the information provided in the collision claim reports of ICBC. The collision type distribution is shown in FIGURE 10.5. Angle collisions were the most frequent type, followed by rear-end, sideswipe and left-turn opposing.

Rear-end and angle collisions are typical at urban intersections; however, the frequency of angle collisions appears to be high compared to other urban areas. Rear-end collisions occur between two vehicles travelling in the same direction and lane; angle collisions occur between a through vehicle and another through vehicle travelling on the cross street.

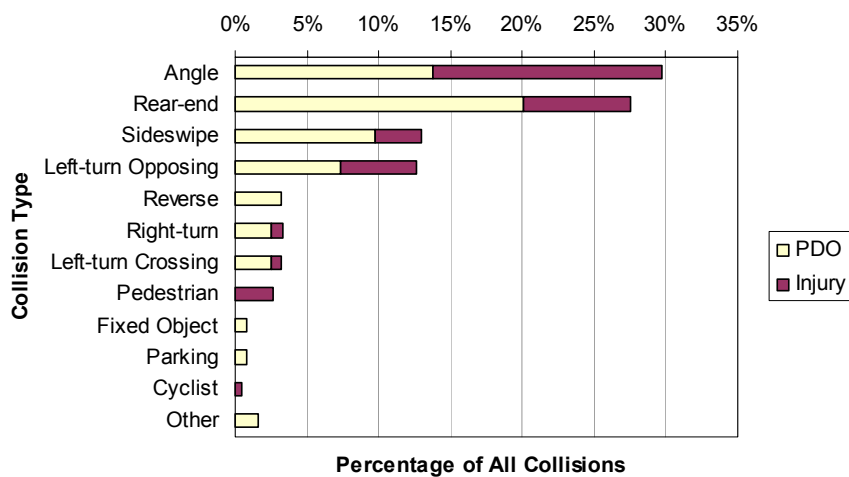


FIGURE 10.5 COLLISION TYPE DISTRIBUTION

B. Intersection Control and Collision Type

The study area has a mixture of signalized intersections and STOP-controlled intersections as discussed in Chapter 3. FIGURE 10.6 shows the collision type distribution for signalized intersections and FIGURE 10.7 shows the collision type distribution for STOP-controlled intersections.

As shown, the STOP-controlled intersections have a higher frequency of angle or “crossing” collisions (38 percent versus 25 percent for signalized intersections). This proportion is relatively high for STOP controlled intersections. Angle collisions are typically more severe than other types of collisions. This is shown in FIGURES 10.6 and 10.7, where injuries occur in half or more of the angle collisions.

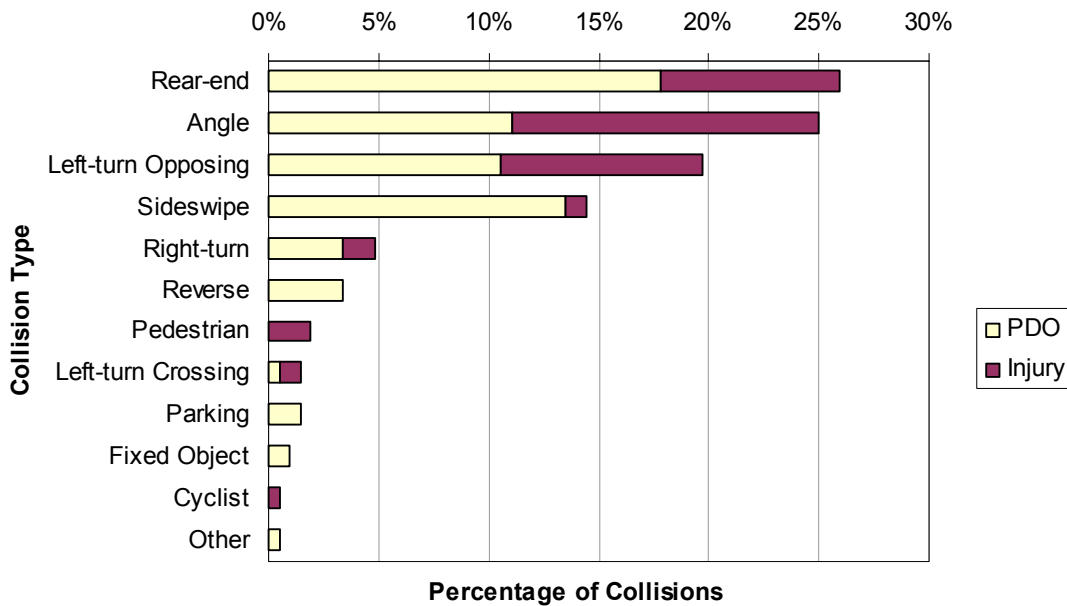


FIGURE 10.6 COLLISION TYPE DISTRIBUTION FOR SIGNALIZED INTERSECTIONS

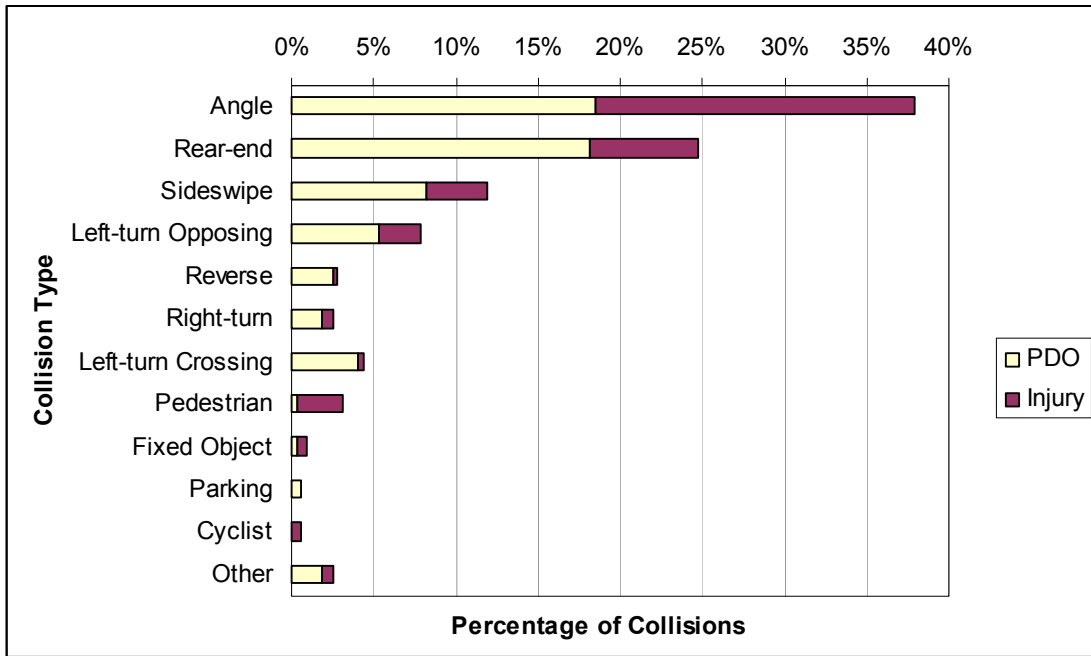


FIGURE 10.7 COLLISION TYPE DISTRIBUTION FOR STOP-CONTROLLED INTERSECTIONS

10.2 Collision-Prone Intersections

The safety performance of the downtown area was evaluated to identify the top collision-prone intersections. These intersections were then examined to identify whether improvements may be appropriate due to safety considerations.

A. Method

To determine the top collision-prone intersections, locations were selected based on collision frequency, percentage of injury collisions and collision rate. The threshold values established for this study are summarized in TABLE 10.1.

TABLE 10.1 THRESHOLD VALUES

CATEGORY	THRESHOLD VALUE
Collision Frequency	More than 3 collisions per year
Percentage of Injury Collisions	Greater than 30% of all collisions
Collision Rate	Greater than 1.5 collisions per million entering vehicles

For each intersection, collision data and traffic volume data was combined to determine the average collision rate per million entering vehicles. The collision rate better represents a measure of collision risk for the road user, since the exposure (traffic volume) is normalized.

The Rate Quality Control Method was used to calculate critical collision rates and reduce the likelihood that low volume locations with low collision frequencies are designated as “high risk”. The collision rate was then compared to the critical collision rate using the Critical Collision Rate Index (CCRI).

Annual collision frequency, percentage of injury collisions and collision rate were prepared for each downtown intersection, and the top collision prone intersections were selected.

B. Results

Within the downtown area, 19 intersections had more than three collisions per year. TABLE 10.2 presents the list of the 19 intersections with details such as intersection control, Average Daily Traffic (ADT), collision frequency, percentage of injury collisions, collision rate and critical collision rate index (CCRI). The table is ranked by collision rate.

TABLE 10.2 INTERSECTIONS RANKED BY COLLISION RATE

LOCATION	JURISDICTION	TRAFFIC CONTROL	ADT	COLLISION FREQUENCY (3 years)	PERCENTAGE OF INJURY COLLISIONS	ANNUAL COST TO ICBC	COLLISION RATE	CCRI
5 th Avenue and Brunswick St.	City	2-way STOP	5,800	15	40%	\$ 56,000	2.4	1.10
5 th Avenue and Victoria St.	MoT	2-way STOP	13,600	30	47%	\$ 127,000	2.0	1.23
4 th Avenue and Winnipeg St.	City	Signalized	9,650	16	31%	\$ 49,000	1.5	0.84
4 th Avenue and Vancouver St.	City	2-way STOP	6,100	10	40%	\$ 37,000	1.5	0.71
2 nd Avenue and Victoria St.	MoT	Signalized	13,800	22	36%	\$ 76,000	1.5	0.89
Patricia Blvd and Queensway St.	City	1-way STOP	9,000	14	21%	\$ 32,000	1.4	0.77
5 th Avenue and George St.	City	2-way STOP	9,670	14	29%	\$ 40,000	1.3	0.73
7 th Avenue and Victoria St.	MoT	Signalized	17,000	22	36%	\$ 76,000	1.2	0.76
4 th Avenue and Queensway St.	City	Signalized	11,050	14	43%	\$ 55,000	1.2	0.67
7 th Avenue and Dominion St.	City	Signalized	8,050	10	50%	\$ 45,000	1.1	0.59
3 rd Avenue and Victoria St.	MoT	Signalized	16,250	20	30%	\$ 59,000	1.1	0.72
5 th Avenue and Queensway St.	City	Signalized	13,330	16	50%	\$ 72,000	1.1	0.66
1 st Avenue and Queensway St.	City	1-way STOP	11,810	14	43%	\$ 55,000	1.1	0.63
4 th Avenue and Victoria St.	MoT	Signalized	16,050	17	29%	\$ 50,000	1.0	0.62
1 st Avenue and Victoria St.	MoT	Signalized	18,000	19	16%	\$ 36,000	1.0	0.63
9 th Avenue and Victoria St.	MoT	2-way STOP	14,250	14	29%	\$ 40,000	0.9	0.55
6 th Avenue and Victoria St	MoT	Signalized	14,000	12	33%	\$ 39,000	0.8	0.48
3 rd Avenue and Vancouver St.	City	3-way STOP	13,000	10	50%	\$ 45,000	0.7	0.42
10 th Avenue and Victoria St.	MoT	2-way STOP	14,780	10	40%	\$ 37,000	0.6	0.39

The rank of the intersections by collision frequency, percentage of injury collisions and rate index is summarized in TABLE 10.3.

TABLE 10.3 INTERSECTION RANKINGS

LOCATION	BY COLLISION FREQUENCY	BY PERCENTAGE OF INJURY COLLISIONS	BY COLLISION RATE
5 th Avenue and Brunswick St.	9	7	1
5 th Avenue and Victoria St.	1	4	2
4 th Avenue and Winnipeg St.	7	13	3
4 th Avenue and Vancouver St.	16	8	4
2 nd Avenue and Victoria St.	2	10	5
Patricia Blvd and Queensway St.	10	18	6
5 th Avenue and George St.	11	16	7
7 th Avenue and Victoria St.	3	11	8
4 th Avenue and Queensway St.	12	5	9
7 th Avenue and Dominion St.	17	1	10
3 rd Avenue and Victoria St.	4	14	11
5 th Avenue and Queensway St.	8	2	12
1 st Avenue and Queensway St.	13	6	13
4 th Avenue and Victoria St.	6	15	14
1 st Avenue and Victoria St.	5	19	15
9 th Avenue and Victoria St.	14	17	16
6 th Avenue and Victoria St.	15	12	17
3 rd Avenue and Vancouver St.	18	3	18
10 th Avenue and Victoria St.	19	9	19

Six intersections were selected for further study:

- 5th Avenue and Victoria Street;
- 5th Avenue and Brunswick Street;
- 2nd Avenue and Victoria Street;
- 4th Avenue and Winnipeg Street;
- 4th Avenue and Vancouver Street; and
- Patricia Boulevard and Queensway Street.

The locations of the top six collision-prone intersections are shown in FIGURE 10.8.

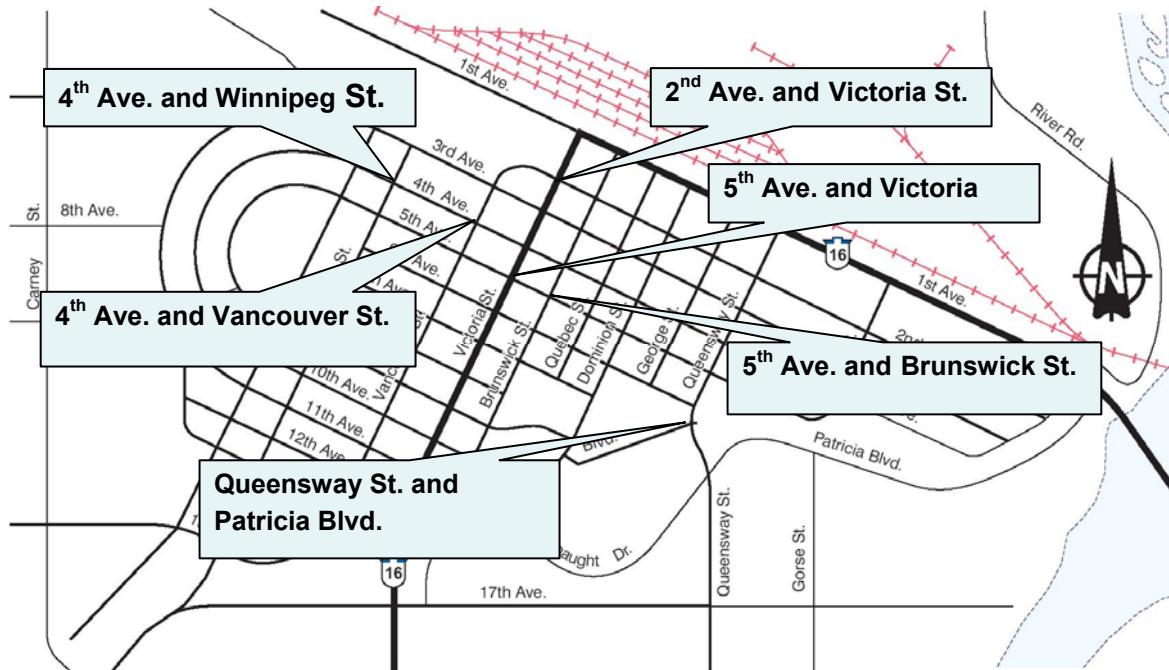


FIGURE 10.8 LOCATION OF THE HIGHEST COLLISION-PRONE INTERSECTIONS

10.3 Study of Selected Intersections

The preliminary findings of safety issues and improvement recommendations for the intersections selected in the previous section are summarized in APPENDIX F. These findings need to be confirmed with in-depth road safety analysis.

10.4 Safety Issues in Prince George Downtown

Some of the general road safety issues for the downtown area that were identified during this review are discussed below, specifically

- The mixture of STOP and signal control;
- The high proportion of angle crashes;
- Wide road cross-sections; and

- Pavement condition.

A. *Mixture of STOP and Signal Control*

The intersections in the downtown area are controlled by a mixture of traffic signals, two-way STOPs and four-way STOPs. A graphic representation of this is shown in CHAPTER 3, of the Downtown Transportation and Parking Study (2007), FIGURE 3.3. This may create inconsistency as drivers may not correctly interpret which traffic control device is at each intersection and fail to comply.

Providing a consistent control organization may increase driver expectancy, increasing compliance with the traffic control and increasing traffic safety.

B. *General High Proportion of Angle Crashes*

The overall percentage of angle collisions in the downtown area is 30 percent. This proportion is relatively high compared to other intersections studied in British Columbia and may indicate a systematic trend.

The high proportion of angle crashes may be related to one or several of:

- The inconsistency in intersection control as discussed above;
- Wide road cross-sections such that drivers do not see the traffic control;
- Drivers intentionally ignoring the traffic control;
- Inappropriate signal timing, for example with limited intergreen time; and/or
- Other yet-undetermined causes.

C. *Wide Road Cross-sections*

Drivers' ability to scan the necessary information at an intersection can be limited when there is a larger area that must be scanned. Wide road cross-sections can therefore increase the driver workload and/or mean that important information is missed. For example, an important sign may not be properly interpreted by the driver.

Also, wide roadways with relatively low traffic volumes may encourage higher travel speeds, particularly during off peak periods. Higher speeds may increase collision risk and/or the severity of those collisions that do occur.

Wide roads also increase the time that pedestrians need to cross the road. This may increase the risk to pedestrians as their exposure is increased. It can also signal an unfriendly pedestrian environment and reduce the liveability of the area, as discussed elsewhere.

Solutions that involve reducing the road width may also allow for allocation of the space to alternative modes that would achieve the City's goals for the downtown. For example, space could be allocated to a bicycle lane, curb extensions could be provided, wider sidewalks could be installed and more parking spaces provided. The consideration of education and enforcement initiatives is also an important tool to help alleviate issues of compliance and help to inform both pedestrians and motorists of their roles and responsibilities at crossings.

D. Pavement Condition

At several of the study intersections, the pavement markings were faded and/or the pavement was rutted. Non-visible markings can result in drivers not being aware of where they should be. Rutting can reduce driver control of the vehicle, particularly if water or ice collects into the ruts.

11.0 SUMMARY OF MAJOR RECOMMENDATIONS

This section outlines a series of recommendations that may be adopted as policy by the Council of the City of Prince George.

11.1 Road Network

1. Consistent Traffic Control
Adopt consistent traffic control for intersections with similar characteristics so as to avoid driver confusion.
2. Signal Warrant Review
Review the need for signals at locations on a site-specific basis.
3. Increase Police Enforcement
Increase police enforcement of speeding in the downtown.
4. Re-Synchronize Signals for Lower Speeds
Consider re-synchronizing traffic signals for lower speeds to reduce speeding and promote a friendlier street environment.
5. Conversion to a Two-Way System
Consider implementing a two-way system in the downtown core east of Brunswick Street on 2nd Avenue and 4th Avenue. This can provide easier access and more direct routes to destinations. It will eliminate some driver confusion by reducing the number of turning movements required to reach a destination. It can also reduce confusion for those new to using the transit system and reduce the potential number of cyclists riding against the one-way. This also has the potential to support downtown revitalization efforts as a two-way system provides better sightlines to retail shops and can indicate that the downtown area is a place to stop and visit as opposed to facilitate through traffic.

While the current recommendation is to provide the two-way system east of Brunswick Street only, it is important to note that this does not preclude extending the two-way system to Victoria Street or 5th Avenue. No work will be done that will prevent the extension of the two-way system from being implemented in the future (medium or long term), if the required road

network and operational improvements that will support the extension of the two-way system are implemented, and if the evaluation results for the short-term conversion are positive.

11.2 Transit

1. Five-Year Plan

It is advisable that the City establish a five-year transit plan in conjunction with BC Transit to ensure that transit goals, targets and needs are being met.

2. Late Night Bus

It is advisable that the City establish a late night bus system, especially on weekends, with service to UNBC and the College of New Caledonia.

3. Design Standards

It is recommended that the City develop design standards for transit stops, as discussed in Section 4.3, considering the following:

- Lighting;
- Adjacent sidewalk wide enough to ensure a minimum 1.5-metre “clear zone” around the transit stop (to allow pedestrians and wheelchair-users to pass);
- Consideration of accessibility for wheelchair-users and those with sensorial, cognitive and physical disabilities;
- Trash bins; and
- Shelter from weather appropriate to the northern climate.

4. Rapid Bus Service

It is recommended that the City consider a rapid bus system that will stop only at major destinations or major intersections to move passengers faster and more efficiently. Transfer points will connect to local-serving routes and community shuttles.

5. Install a bus stop on the south side of 4th Avenue west of Dominion Street
It is recommended that the City implement a bus stop at this location in order to provide a bus stop within 400 metres walking distance of demand areas.

11.3 Cycling

1. Implementation Strategy for the Cycle Network Plan
Develop and adopt an implementation strategy for the Cycle Network Plan in the downtown area.
2. Extend End-of-Trip Facilities
Revisit the end-of-trip facilities by-law that requires bicycle parking to be included as part of development permits to also include a requirement for office buildings to install shower and change facilities for employees.
3. Additional Cycling Routes
Consider an east-west cycling route in the downtown along 5th Avenue to complete a comprehensive east-west and north-south system of cycling routes through the downtown.

11.4 Walking

1. Review of Lower Patricia Boulevard at 10th Avenue
Review the demand for crossing on Lower Patricia Boulevard at 10th Avenue as per the new policy adopted in the Draft Pedestrian Network Policy report, PROCEDURE 6: Warrants for New Marked Crosswalks. If the warrant is not met, consider other measures to improve pedestrian safety.
2. Review Crossing Opportunities on Victoria Street
While a crosswalk has recently been implemented at 9th Avenue, there may still be demand for crossing opportunities at other locations on Victoria Street. If it is acceptable to the Ministry, conduct a review of crossing

opportunities as per PROCEDURE 6 from the Draft Pedestrian Network Policy for locations on Victoria Street between 7th Avenue and 15th Avenue.

3. Education and Enforcement Campaign for Drivers and Pedestrians
Develop an education and enforcement campaign in conjunction with local police, directed at both drivers and pedestrians regarding individual responsibilities at road crossings.
4. Consistent Crosswalk Signage and Standards
Adopt a consistent signage policy and standards for crosswalks on all classifications of roads that complies with TAC guidelines. TAC guidelines are summarized in TABLE 10.X. For complete standards, please refer to the Pedestrian Crossing Control Manual, TAC, 1998.
5. Consistent Implementation of Curb Letdown Policy
Adopt an implementation strategy for prioritizing consistent construction of curb letdowns throughout the downtown as per Subdivision and Development Servicing Bylaw No. 7652, drawings C-8 and C-9 for all new developments in the downtown. Also continue retro-fitting existing curbs with consistent letdowns with sidewalk maintenance projects, redevelopment or roadway reconstruction.
6. Accessible Pedestrian Signals
Develop a schedule and dedicated budget for upgrading existing APS as well as on-going maintenance. The City should consider working with the Ministry of Transportation to implement and ensure proper maintenance of APS on all signals on Victoria Street.
7. Landscaping and Street Furniture Guidelines
Adopt guidelines or standards (or modify Bylaw 7652) to identify allowable types of landscaping and street furniture suitable for sidewalks and bulb-outs. An example of landscaping guidelines is available from the City of Saskatoon, SK: Landscape Guidelines – A Companion to the City of Saskatoon Zoning Bylaw No. 7800, City of Saskatoon Community Services Department (2004). An example of street furniture guidelines is available from the City of Niagara, ON: Model Urban Design Guidelines, Regional Municipality of Niagara (2005). FIGURE 10.1 illustrates in plan view the

elements of street furniture and landscaping that can be successfully incorporated into a sidewalk.

These can be incorporated as part of the City's Downtown Streetscape Guidelines (in progress). Public input is recommended before the adoption of a landscaping and street furniture guideline.

11.5 Trucks and Hazardous Goods Movement

1. Trucks and Hazardous Goods Movement Plan

Develop a city-wide trucks and hazardous goods movement network, in consultation with the Ministry of Transportation and the public-at-large.

2. Bylaw to Manage Dangerous Goods Movement

Develop a bylaw and policies to manage dangerous goods movement including designation of routes, along with the applicable vehicle types and times.

11.6 Parking

1. Conversion of Off-Street Lots to Development Sites

Undertaking a survey of users to determine why parkers are paying for spots that they do not use on a daily basis.

Undertake a review of off-street lots to determine suitability for conversion to development sites. Initial candidates include the following lots:

- The northeast corner of 2nd Avenue and Queensway
- At Dominion Street between 4th Avenue and 5th Avenue

2. Introduce a System of Time-Limited Parking

Adopt a coherent system of primarily time-limited parking that will be easy to understand and fair to all merchants, as per FIGURE 8.12.

3. Implement a System of Fines which is a Deterrent to Long-Term On-street Parking

The policy of not charging people for their first two parking violations should be eliminated. While the fine could remain at \$10, the City may wish to increase the fine for parking time-limit violations to \$30 for repeat offenders.

For off-street parking, introduce lower daily rates to encourage the use of parking lots in the downtown for longer term parking needs. TABLE 11.2 details recommended parking charges for downtown lots.

TABLE 11.1 NEW PRICING PROGRAM FOR OFF-STREET PARKING

TIME PERIOD	MAXIMUM RATE at meter rate of \$.50/hour	PROPOSED RATE RANGE	EXPLANATION
1 hour	\$0.50	No charge	Encourage use of Civic Precinct facilities such as pool, library in short term; in longer term consider charging for first two hours
2 hours	\$1.00		
3 hours	\$1.50	\$1.25	Provide a longer term option for those staying longer than two hours
8 hours (daily)	\$4.00	\$3.50 to \$3.75	Less than meter rate to provide incentive to use off-street lot; longer term should be more than daily transit rate (now \$4.00)
Monthly	\$80.00	\$48.00	Provide a rate equal to the monthly Prince George transit pass and similar to other monthly parking rates in the downtown; in long term employers could offer parking or transit pass

4. Maximum Parking Supply Bylaw
Establish a maximum parking supply by-law for new developments in the central business district.

5. Special Zones
For designating on-street spaces, adopt the American Disability Act (ADA) procedure for designating accessible spaces (TABLE 8.5) and the Canadian Standards Association, Accessible Design for the Built Environment (2004) guideline for accessible parking space signage,

specifications and design. These spaces should be located at the corner to facilitate access to the curb ramp.

For designating off-street spaces, amend the Zoning Bylaw (No. 3482), Section 29, Off-Street Parking and Loading to accommodate accessible parking as per ADA guidelines detailed in TABLE 11.3.

TABLE 11.2 OFF-STREET PARKING SPACE REQUIREMENTS

TOTAL PARKING IN LOT	REQUIRED MINIMUM NUMBER OF ACCESSIBLE SPACES
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5

*Source: Accessibility Guidelines for Buildings and Facilities,
American Disabilities Association (2002).*

It is recommended that the City also consider designation of spaces for smaller vehicles that can accommodate “Smart” cars as well as motorcycles.

Research of other municipality’s special parking zone designations indicate that taxi, loading and Handi-Dart (or equivalent) spaces are dealt with on a case-by-case basis. Most municipalities look at the requested location and accept or reject the request based on other nearby spaces already designated.

It is recommended that the City review its loading zones to incorporate both passenger and commercial loading with time limits relevant to each. For example a 10 minute time limit for passenger loading zones and up to 30 minutes for commercial loading zones.

11.5 Transportation Demand Management

1. Transportation Demand Management Policy

It is recommended that the City adopt a Transportation Demand Management policy as per Chapter 9.0 in its Official Community Plan.

12.0 IMPLEMENTATION STRATEGY

The following section outlines an implementation strategy for the Prince George Downtown Transportation and Parking Study. The implementation strategy identifies short-term (zero to four years), medium-term (five to nine years) and long-term strategies (ten years or more) to ensure the plan's success.

12.1 Early Winners

The first step in implementing the plan should be to complete relatively low-cost, short-term projects that will have a significant impact, in order to “jump start” the plan and support downtown revitalization efforts. The following items are “early winners”: relatively low-cost items that can be implemented immediately to make progress on the plan within a short time-frame. Although this list doesn't include all the short-term strategies, the following are projects that can be undertaken to begin implementing the Downtown Transportation and Parking Plan.

Implementation Strategy for the Cycle Network Plan

The Cycle Network Plan was completed in 2000 and site visits indicate that the majority of the plan has yet to be implemented. Demonstrating priority for alternative modes of transportation in the downtown will indicate a welcoming environment for cyclists, encourage them to cycle on the road as opposed to the sidewalk (as was observed many times), and illustrate to motorists that the road is to be shared. Marking routes is a simple first step to help with the implementation of this plan.

Create an Education and Enforcement Campaign for Motorists and Pedestrians

Concerns were expressed about driver compliance at crosswalks and pedestrians' lack of knowledge regarding their responsibilities at crosswalks. Education of both groups will help manage expectations and improve behaviour. Another option is to conduct “crosswalk stings” aimed at both motorists and pedestrians. This will help to reduce potential conflicts, show priority for pedestrians in the downtown core and begin to raise awareness of the downtown as a place where patronage is a priority.

Introduce New Parking Violation Charges

Introducing new parking violation charges will help address the problem of people overstaying their limits and help to support high turnover parking in retail areas.

Introduce a coherent strategy for parking and violations

The City should consider implementing primarily time-limited parking in the downtown. Meters would be used only in areas of short-term demand such as around post offices and banks, where the time limit would be one-half hour. In all other areas, the time limit would be 2 hours. This practise would be easily understood, fair to all merchants, and increase the attractiveness of downtown as a shopping destination. This strategy should be accompanied by increased enforcement of on-street parking. Along with additional enforcement, fines must significant enough to act as a deterrent.

12.2 Highest Priority (zero to four years)

Consider a Two-Way Road System.

It is recommended that Prince George conduct a public consultation for the two-way road system east of Brunswick. A preliminary design should be presented as part of the public process.

Adopt Crossing Strategies

The City should evaluate the pedestrian crossing opportunities on Victoria Street and Patricia Boulevard using the warrant method outlined in Procedure 6 of the Draft Pedestrian Network Policy. If crosswalks are not warranted, other measures should be considered to improve pedestrian safety, as outlined in Procedure 7, section D of the Draft Pedestrian Network Policy.

It is also recommended that the City increase the length of pedestrian phases at signals where pedestrians with slower speeds are known to cross.

Adopt Strategies to Improve Driver Compliance at Crosswalks

This may include restricting parking at crosswalks, implementing TAC standards (or modified TAC standards) for consistent crosswalk signage, undertaking a systematic review of existing crosswalks using Procedure 7 of the Draft Pedestrian Network Policy and ensuring crosswalk painting is maintained on a regular schedule.

Accessible Pedestrian Signals

It is recommended that Staff put forth recommendations for the City to adopt a policy and budget allocation for the upgrading, maintenance and repair of APS. The policy should be reflective of the new TAC guidelines expected to be released Summer 2007.

Public Realm Strategies

The City should work with their Accessibility Advisory Group to prioritize areas for implementation of their curb let-down policy. As well, it is recommended that the City adopt standards or modify Bylaw 7652 to identify allowable types of landscaping and street furniture on curb bulb-outs. Similarly, the City should identify in that bylaw different activity zones within the sidewalk for the location of furniture, plantings, store frontage and throughway. It is understood that the City is currently developing Streetscape Guidelines to address this.

Transit Plans

It is recommended that the City initiate a five year transit plan in conjunction with BC Transit. This plan should provide provision for a late night bus system as well as establishing a bus stop on the south side of 4th Avenue west of Dominion Street to meet transit demand in the area.

Support Strategies for the Cycle Network Plan

These should include a schedule for collection of bicycle count data, and providing bicycle parking as well as continuing to support end-of-trip facilities.

City-wide truck route and dangerous goods route network

Working in consultation with the Ministry of Transportation, it is recommended that the City develop a plan for truck and dangerous goods routes and seek ministerial approval of the identified routes.

Designation of Parking Spaces for Smaller Cars and Motorcycles

It is recommended that the City identify locations where on-street and off-street parking spaces can be identified to accommodate small cars and motorcycles.

12.3 Medium-term Strategies

Medium-term strategies are meant to be those more substantial items that will also support revitalization efforts but will require more time to implement.

Dangerous Goods Movement and Truck Routes

The City should develop City Bylaws and policies to manage dangerous goods movement. This could include designation of routes, applicable vehicle types and times of permitted travel. The City should work with the Ministry of Transportation to ensure that the Nechako Crossing Project provides for a truck and Dangerous Goods route. It is expected that this route would travel along 1st Avenue with a connection to Highway 97. Preparing and publishing informational material for the new network designation will ensure the commercial vehicle operators as well as the public are knowledgeable about the designated routes.

Transit and Cycling

The City should develop design standards for transit stops to help make waiting for a bus more comfortable for customers. Consistency of design standards will also help those with physical, sensorial or cognitive impairments to better navigate the transit system.

Implement a rapid bus service as an incentive for those travelling from neighbourhoods to the downtown, particularly commuters who are travelling to and from places of employment. The bus service may operate on a schedule such that

buses travel to the downtown in the morning peak hour and out of the downtown in the afternoon peak hour only.

Continue implementation of the Cycle Network Plan (CNP) to demonstrate to cyclists and non-cyclists that the City is committed to supporting cycling as a viable transportation mode and is encouraged for recreation.

Police Enforcement

Consider increasing police enforcement in the downtown to deal with speeding, disregard for pedestrian crossings, cycling on the sidewalk, etc. One option is to target a Selective Traffic Enforcement Program (STEP) in the Downtown. This type of program can raise awareness for both motorists and cyclists through police enforcement campaigns focussed at people in both groups of road users who disobey relevant laws. The same can be done for motorists and pedestrians.

Traffic Controls

Adopt consistent traffic control for intersections with similar characteristics so as to avoid driver confusion. Consider re-synchronizing traffic signals for lower speeds to reduce speeding and promote a friendlier street environment for all road users. Once a dangerous good route has been selected, conduct a detailed route review to determine whether minor improvements could improve safety for heavier vehicles, for example longer inter-green signal times.

Crosswalks

Remove or consolidate under-utilized crosswalks on downtown arterial roads. While the City wishes to promote pedestrian activity in the downtown, crosswalks are not the only way to do this. Some of the solutions discussed under Reduce Road Widths in the long term recommendations will help address some of these concerns.

Winter Maintenance

Review winter maintenance standards and increase maintenance on surfaces and sidewalks. This will help support year round cycling and walking and increase safety of these routes.

Truck and Dangerous Goods Route Signage

Once a dangerous goods route has been selected, install signs on all designated routes to indicate the route is a truck and / or dangerous goods route to help ensure compliance.

12.4 Long-term Strategies

Long-term strategies are those recommendations that either build on short-term or medium-term strategies or require a longer time or budget to implement.

Reduce Road Widths for Pedestrians

Several solutions are available in the long term to address the issues related to wide cross-sections. Decreasing the width of certain streets can be done through provision of curb extensions and providing median refuges. At intersections with high pedestrian volumes, curb extensions can be considered. (City of Prince George Bylaw 7652, drawings C-8 and C-9 detail layout for crosswalks and ramps.) Consistency is important, so once a strategy is adopted, it is recommended that it be implemented throughout the downtown. Where wide cross-sections cannot be avoided, pedestrian median refuges will improve the safety of pedestrian crossings.

Widening sidewalks is another strategy for reducing road widths and this should be considered on routes with higher pedestrian volumes and routes with higher numbers of retail establishments.

Traffic Signal Enhancement for Non-Motorists

Implement the APS policy (short-term implementation) by working with the CNIB to determine the most favourable solution for Prince George's visually impaired residents and / or test out three possible solutions on three street corners, conduct interviews to determine which solution both sighted and visually impaired users prefer. Allocate a budget and implement on an annual basis.

Bicycle pushbutton should be installed at signal locations where warranted by significant cyclist volumes and delays, particularly on routes designated in the

CNP. Sensitive in-pavement loop detectors should be installed where cyclist volumes warrant them. There should also be a painted indication of loop detectors on the pavement to show cyclists where to position their bicycle to initiate a signal change. These should be installed in conjunction with curb-side cyclist pushbuttons to ensure timely intersection crossings for cyclists.

Road Network Upgrades

Accommodate bicycle facilities in the two-way street system with dedicated on-street bike lanes or wide curb lanes on designated routes. Consider including 5th Avenue as an east-west on-street cycling route in the CNP.

Downtown Revitalization

Continue to increase land use density and support mixed-use developments that include residential units to support downtown revitalization. Recover under-utilized off-street parking lots for conversion to development sites. Promotion of walking, cycling and transit may reduce parking demand and support a more complete downtown.

Cycling

When updating the Cycling Network Plan the city should designate 5th Avenue or another comparable east-west bicycle route through the downtown.

Monitoring Companion Plans

Re-evaluation of the Five-Year Transit Plan to review success of the original goals and objectives, determine successes, articulate solutions to new issues and develop new goals and objectives to be met.

A ten year review of the Cycle Network Plan provides opportunity to determine the plans' success, allow for expansion of the cycling network and sets new targets for increased number of people cycling in Prince George.

12.5 Monitoring Strategy

To ensure proper implementation of the plan and to incorporate changes as needed, the Downtown Transportation and Parking Plan should be revisited every five years to review success of implementation and coordinate future needs. When the plan is revisited, a new implementation strategy should also be developed so as to ensure continued success of the plan.

Updates should occur on the following timeline:

- First Update: 2012
- Second Update: 2017
- Third Update: 2022

APPENDIX A
REVIEW OF BACKGROUND DOCUMENTS

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APPENDIX A REVIEW OF BACKGROUND DOCUMENTS

This document provides an annotated bibliography of the reference background documents for the study. Documents are listed by date, with the most recent first. TABLE A.1 provides an overview of the documents summarized.

The documents reviewed provide background material on topics that are relevant to different parts of the final plan. The physical form of the Downtown Transportation and Parking Study will be in a three-ring binder, with each module in a separate tabbed section. The module(s) most relevant to each reviewed document is listed in TABLE A.1, according to the module lettering proposed:

- A. Network Assessment
- B. Intersection Assessment
- C. Transit Service
- D. Bicycle Plan
- E. Pedestrian Plan
- F. Truck and Hazardous Goods Movements
- G. Parking Strategy
- H. Road Safety Strategy
- I. Sustainable Transportation Strategy
- J. Policy Review and Recommendations
- K. Monitoring and Updating Plan
- L. Implementation Strategy and Program

DOWNTOWN TRANSPORTATION AND PARKING STUDY
CITY OF PRINCE GEORGE

TABLE A.1 DOCUMENTS REVIEWED FOR DOWNTOWN TRANSPORTATION PLAN

NO.	TITLE	YEAR	MODULE S
1.	Downtown Prince George Investment Opportunities, Harris Consulting for City Centre Ventures	2005	A. I. J.
2.	Pedestrian Priority Policy, Draft Report, Hamilton Associates	2005	E. L.
3.	Pedestrian Network Study, Hamilton Associates	2005	E.
4.	2004 Network Screening Program, Hamilton Associates for ICBC and City	2005	G. H.
5.	Prince George South Weigh Scale Relocation, Earth Tech Canada for Ministry of Transportation	2004	A. B. F.
6.	City of Prince George Parking and Traffic Bylaw No. 6056	2004	G. H. J.
7.	Subdivision and Development Servicing Bylaw No. 7652, including Schedule D: Standard Infrastructure Drawings	2004	A. B. D. E. H. J.
8.	New Nechako River Industrial Crossing: Final Report, Briefing Notes and Drawings	2004	A. F. L.
9.	Smart Growth Direction for City of Prince George: Development Concept for 5th & Tabor, West Coast Environmental Law	2004	C. D. E. G. I.
10.	Analysis of Traffic Design Alternatives in Downtown Prince George, City staff	2003	A. B.
11.	MAP: Park and Trail System, Leisure Services Department	2003	A. B. C. D. E.
12.	Spreadsheet (large format): Amending Bylaws subsequent to No. 6332.	2003	A. B. C. D. E.
13.	MAP: Existing Speed Limits	2003	A. H.
14.	Transit Service Review, Stage 1-2, Entra Consultants & JMK Consulting	2003	C. E.
15.	Crescents Neighbourhood Plan, City of Prince George	2003	A. B. C. D. E.
16.	MAP: Central Business District – Exempt Parking Area, part of Bylaw No. 674	2003	G. J.
17.	Conventional Transit Service Policy	2003	C. E.
18.	MAP: Citywide Trail System, Leisure Services Department	2002	D. E.
19.	Official Community Plan, Bylaw No. 7821, City of Prince George Includes separate Long Range Land Use Map	2001	A. B. D.
20.	Prince George Transportation System Planning Study, UMA for City of Prince George and Ministry of Transportation	2001	A. B.
21.	Downtown Prince George Revitalization Study, Vol. 1-2, Urbanics Consultants Ltd., Hotson Bakker Architects, UMA Engineering Ltd. for City of Prince George and Downtown BIA	2001	A. to L. inclusive
22.	MAP: Handicap Downtown Parking, City of Prince George	2001	G.
23.	Cycle Network Plan, UMA & Laidlaw Consulting for City of Prince George Includes separate map of Cycling Network Plan	2000	B.
24.	Staff Report to Council: Civic Facilities Parking Update, Public Works, City of Prince George	2000	G. J.
25.	Prince George City Wide Trail System, Carson/McCulloch & Associates for Parks Division	1998	D. E.
26.	Lower Patricia Boulevard Functional Plan, Consultant for City of Prince George	1998	A. F. L.
27.	Civic Facilities Downtown Parking Committee Report, Director of Public Works	1997	G. J.
28.	Downtown Revitalization, Prince George Community Planning Council	1996	A. to L.
29.	Downtown Revitalization, Urban Form Associates et al for City of Prince George	1992	A. B. L.
30.	Downtown Revitalization Memorandum, Director of Development Services to City Manager	1993	L.
31.	Prince George City Centre Strategy, Report of the City Centre Concept Committee	1990	A. B. G.
32.	Report to Ministry of Transportation and Highways on Prince George Transportation Planning Study, Consultant for City of Prince George	1990	A. B. F.
33.	Report to Council: Mayor's Task Force on Downtown Concerns	1989	-
34.	Report to Council: Downtown Parking, City Clerk	1983	G. J.
35.	Prince George Town Centre Revitalization, Town Centre Business Association	1983	-
36.	Central Business District Study, Vol. 1-4, City of Prince George	1980	-
37.	Section 29 of Zoning Bylaw No. 3482 related to Off-Street Parking and Loading	1980	G. J.
38.	Prince George Traffic Study, Stanley Associates for City Council	1978	-
39.	Traffic Planning Study, Stanley Associates for City of Prince George	1974	A.

40.	Downtown Study, Regional Development Commission	1974	-
41.	Transportation Objectives in Downtown Prince George and Citizen Survey Form	No Date	A. to L.
42.	Inventory of Off-Street Parkades/Lots (may be incomplete)	No Date	G.

1. Downtown Prince George Investment Opportunities, Harris Consulting for City Centre Ventures (2005)

This discussion paper provides the context of the Downtown Marketing Implementation Plan currently in preparation. It reviews the trend of declining retail sales for downtown areas of medium-sized cities including Prince George. An overview of recent development in Prince George is provided. Although some previous plans were discounted as unrealistic, several future land uses and business opportunities were recommended for the downtown, including:

- multi-family, seniors and low-income housing;
- grocery stores, seasonal market, small retailers;
- cinemas, gaming facilities, accommodation, restaurants and other entertainment;
- museums, theatre;
- post-secondary education facilities, government offices; and/or
- recreation uses such as a skating rink, fitness facility or community centre.

This document is considered most relevant for: predicting future traffic volumes and types, promoting sustainability and developing appropriate policies.

2. Pedestrian Priority Policy, Draft Report, Hamilton Associates (2005)

The purpose of this study was to recommend new policies and revisions to existing City of Prince George bylaws to:

- support pedestrian travel; and
- heighten awareness of the need for pedestrian facilities in infrastructure and budgeting decisions.

Policies were prepared and submitted for City consideration. The proposals related to defining the role of pedestrians, setting targets for sustainable trips, recommending funding levels for sidewalk construction and maintenance, snow removal, facility provision in rural areas, and cost sharing considerations.

This document is most relevant for: the pedestrian plan and the implementation strategy.

3. Pedestrian Network Study, Hamilton Associates (2005)

The Pedestrian Network Study was undertaken to develop a plan for:

- identifying high-priority new pedestrian links;
- identifying improvements to existing sidewalks and walkways; and
- suggesting possible areas for change to the City's current policies and practices related to pedestrian facilities.

The study produced ranked lists and maps identifying potential new walking links and locations for repairs, along with preliminary cost estimates.

This document is most relevant for: the pedestrian plan.

4. 2004 Network Screening Program, Hamilton Associates for ICBC and City (2005)

The study goal identified correctable intersections (both signalized and unsignalized) in the City of Prince George that may benefit from the Insurance Corporation of British Columbia's Road Improvement Program funding and achieve the Program's investment targets. Twenty intersections were selected for analysis and a site visit was conducted to identify obvious safety issues, traffic characteristics, and opportunities for improvement at the intersection. An experienced road safety engineer observed the characteristics of the intersection and determined the likelihood that the intersection could be cost-effectively improved.

Within the downtown area, the intersection of 4th Avenue and Vancouver Street was identified for further study as it could likely be improved. Angle collisions were relatively high and might be mitigated by prohibiting parking near the intersection, upgrading signs and using more durable pavement markings.

This document is most relevant for: the road safety plan and may affect the parking supply.

5. Prince George South Weigh Scale Relocation, Ministry of Transportation (2004)

This study was undertaken to replace a Highway 97 weigh scale being decommissioned by the Ministry. It also examined the overall weigh scale program for the next three years.

Truck volumes were monitored on the four main highway approaches to the City. The study identified the locations creating demand for truck access, typically from the logging industry or the sand and gravel industry. Future truck volumes will likely be affected by the Mountain Pine Beetle epidemic (increasing traffic in the near future), new industrial development, the Prince Rupert container port development, and the growth of the mining, oil and gas industries.

A traffic survey was also conducted as part of this work. The findings relevant to downtown are:

- Trucks were found to be 6 percent of the total traffic volume (intersection of Highway 97 and Sintich Road) and the City estimates truck volume to generally be between 5 and 10 percent of all traffic volume;
- The Ministry has a permanent count station just west of the Yellowhead Bridge that would generally capture truck traffic entering the downtown area via 1st Avenue (Station 42-036);
- It was estimated that approximately half of the truck traffic originates outside of the City;
- Current signing for trucks southbound on Highway 97 directs trucks to the downtown via 5th Avenue; and
- The downtown routes identified as having significant truck traffic were Queensway, 1st Avenue, and 5th Avenue.

This document is most relevant for: assessing truck traffic volumes at intersections and considering truck and/or hazardous good routes.

6. Parking and Traffic ByLaw No. 6056 (last update 2004)

This Bylaw document outlines cases where parking is prohibited with signs, namely, within 1.5 metres of a driveway, within 5 metres of a fire hydrant, within 6 metres of a crosswalk, beacon, stop sign, traffic signal or public driveway, within 3 metres of a lane, and in a lane.

It also contains references to parking meters in Schedule C-2a of Bylaw No. 7557 (2004).

Special parking zones are defined for loading, commercial, bus, school bus, passenger loading, taxi, emergency vehicle, ambulance, and for the physically disabled. Details include:

- Commercial loading zones require a decal (15 minutes maximum);
- Passenger zones have two-minute maximum;
- City Council members and senior citizens can have permits for free parking; and
- The Zoning Bylaw prescribes the number of accessible parking spaces required.

Parking fines vary between \$25 and \$65.

This document is most relevant for: the parking assessment, road safety considerations, and policy development.

7. Subdivision and Development Servicing Bylaw No. 7652, including Schedule D: Standard Infrastructure Drawings. (2004)

The sections which are transportation-related are the following:

Division 1: Traffic Control, Temporary Barriers and Enclosures

Division 2: Roadway Excavation, Embankment & Compaction, Painted Traffic Lines & Markings

Division 16: Street Lighting Poles and Luminaires

Schedule D includes the following transportation-related drawings:

- Urban Walkway;
- Signal/Sign Pole Elevations;
- Trail Standards;
- Local, Collector, Arterial Roads; and
- Recommended Planting Offset Downtown.

This document is most relevant for: proposed physical improvements to the infrastructure for vehicles, cyclists, or pedestrians and for identifying where bylaw changes could occur.

8. New Nechako River Industrial Crossing: Final Report, Briefing Notes, and Drawings (2004)

This report follows the 2003 study entitled Nechako Crossing Conceptual Study which examined options that retained the existing Cameron Street Bridge. Deterioration of the bridge prompted development of this additional option where the Cameron Street Bridge would be removed.

With this plan, the new bridge would connect Pulpmill Road (north of the river) directly to 1st Avenue (just west of downtown). The configuration would eventually create an at-grade intersection with Carney Street and River Road. Traffic volumes for the years 2010 and 2020 were predicted as part of the study.

A cost of \$22.4 Million dollars was estimated for the project, with a two-year construction period. This option was approved by City Council in November of 2004, subject to funding.

This document is most relevant for: understanding the future road network, including the truck routes, and for preparing the implementation strategy.

9. Smart Growth Direction for City of Prince George: Development Concept for 5th Avenue & Tabor (2004)

This report provides a smart growth concept for a City-owned site, a location that is outside of the downtown study area. Recommendations were made for residential and commercial zoning, design and layout, with open space, parks and walkways within the site. The transportation features would focus on pedestrians, cyclists and those using aids such as scooters.

Specific transportation recommendations included:

- Minimize off-street surface parking but when required access it from rear lanes;

- Use on-street parking in a design with street trees, boulevards, and sidewalks;
- Upgrading bus stops and shelters;
- Providing a pedestrian-oriented environment;
- Requiring bicycle parking facilities; and
- Connect all on-site corridors to the City walking and cycling routes.

This document is most relevant for: providing an example as to how infrastructure and City policies can be changed to support sustainable transportation.

10. Analysis of Traffic Design Alternatives in Downtown Prince George (2003)

This document summarized a staff analysis of options for the one-way streets of Second and Fourth Avenues. The report documents the design vehicle, traffic volume, lane width, and parking assumptions used in the analysis. Specifically the two options are:

- Changing the existing one-way couplet to two-way traffic, east of Victoria Street (\$730,000 cost); or
- Applying traffic calming techniques to the existing one-way couplet, possibly including signal coordination, on-street parking, curb extensions, and/or textured crosswalks or intersections (\$585,000 cost).

An attached memorandum discussed another option of also converting Third Avenue from one-way eastbound to two-way, in addition to the conversion of Second and Fourth Avenues. The analysis does not compare the alternatives quantitatively, nor does it make a recommendation as to the preferred option.

This document is most relevant for: highlighting the issues resulting from a network change.

11. MAP: Park and Trail System, Leisure Services Department. (2003)

This map depicts Parks and Open Spaces, using a classification system which includes:

- City Wide (Passive);
- Athletic Park;
- Natural Park;
- Tot Lot/Neighbourhood Park;
- Special Purpose Park;
- Aesthetic Park;
- Greenbelt;
- Other Park; and
- Public Park (Not City-Owned).

It also shows existing trails.

This document is most relevant for: understanding current land use and traffic generation and for the bicycle and pedestrian plans.

12. Spreadsheet: Amending Bylaws Subsequent to No. 6332, Development Services Community Planning (2003)

This single-page spreadsheet lists bylaws between the years 1995 and 2003 that created zoning amendments. The bylaw number is listed with the date it was adopted and the related map sheet. The document also lists the definitions of the codes used to define each zoning district.

This document is most relevant for: understanding the current zoning and the resulting traffic patterns.

13. MAP: Existing Speed Limits, City of Prince George. (2003)

This map depicts the speed limits on arterials and collectors.

This document is most relevant for: analyzing roadway network characteristics and for considering possible changes.

14. Transit Service Review, Entra Consultants & JMK Consulting for City of PG (2003)

This study found a transit mode share of 2 percent in the City (2001 Census) and noted that Prince George has lost 4 percent of its population since 1996. At the time, it stated that transit service is below average when compared to comparable, medium-sized systems and that the existing routes provided inconsistent coverage, circuitous routing, long travel times, inappropriate use of local streets.

The study did find that the downtown had good transit route coverage and made several recommendations regarding downtown routing. It considered the existing downtown exchange poorly-located for accessing the majority of offices.

Since this time, the transit service has been revised in the City and indications from the Planning and Engineering department are that ridership has experienced a significant increase since the implementation of new routes and schedules.

This document is most relevant for: the transit service module and the pedestrian plan.

15. Crescents Neighbourhood Plan (2003)

The Crescents Neighbourhood is directly west of the downtown study area, and for long range planning purposes offers considerable context to the downtown. It is mostly a single-family neighbourhood with some commercial land uses.

This document is a more detailed land use plan as follow-up to the Official Community Plan. It proposed to keep the neighbourhood mostly single-family residential, but adds some multi-family development and a small amount of institutional use.

The study also involved a public survey which found that the residents had complaints about traffic cutting through the neighbourhood. It states that traffic calming should be considered and also makes recommendations for pedestrian improvements; bicycle lane identification, parking restrictions on bike lanes, transit service and better snow removal.

With respect to the road network, the plan mentions a possible off-ramp* at the south-east corner of the current grade separation at Winnipeg Street, Massey Drive and 15th Avenue. Such a configuration may require neighbourhood road improvements on Winnipeg Street and other neighbourhood streets.

*Traffic analysis was conducted by UMA and a ramp at 5th and Winnipeg is being constructed in 2006.

This document is most relevant for: it previous recommended improvements to the transportation system and for understanding the expected future land use of this adjacent neighbourhood.

16. MAP: Central Business District – Exempt Parking Area, part of Bylaw No. 674 (2003)

This map designates the area affected by the current bylaw with a green line. The Central Business District is also outlined with a blue line.

This document is most relevant for: the parking plan and for policy recommendations.

17. Conventional Transit Service Policy (2003)

This policy proposed a level of service to be provided by the City's conventional transit system based on the maximum walking distance to a bus stop, the hours and frequency of service, the staging procedure for new subdivisions, and minimum passenger levels. Guidelines for bus stop configuration and snow clearing are also provided. This policy was passed by council in December 2003.

This document is most relevant for: the transit and pedestrian plans.

19. Official Community Plan, Bylaw No. 7821 (2001)

The Official Community Plan was adopted in 2001 to establish a framework for future growth. It states the City's mission to fulfill its destiny as British Columbia's 'Northern Capital' through the provision of an excellent quality of life. Specific principles were identified including:

- Create a vibrant downtown that is a showcase of the community;
- Build a sustainable community;
- Build strong neighbourhoods with amenities close to home;
- Provide for the needs of all age groups;
- Retain environmental quality; and
- Build a beautiful City.

Chapter 7 identifies Council's support for the "on-going redevelopment of the downtown area as the primary area of business, cultural, and government activity". The area has a long range land use designation for 'Downtown Commercial' from Victoria Street to the east and for 'Urban' west of Victoria. Specific policies include:

- Increase density;
- Create an entertainment district and make downtown the cultural centre for the City; and
- Encourage development of a commercial marketplace building, additional office space, specialty retail, and higher density housing (higher than 90 units per hectare).

Chapter 11 provides the bicycle network, with the following downtown streets designated for on-street bicycle routes: Winnipeg Street, Queensway, Patricia Boulevard, Tenth Avenue, and Second Avenue. Road classifications relevant to the downtown area are shown in TABLE 2.

TABLE 2 DOWNTOWN ROAD CLASSIFICATIONS

CLASSIFICATION	STREETS	
Highway	1 st Avenue, east of Victoria Street Victoria Street	
Arterial	1 st Avenue, west of Victoria Street 2 nd Avenue Winnipeg Street Queensway 3 rd Avenue 4 th Avenue	
Collector	Dominion Street Vancouver Street	
Local	5 th Avenue* 6 th Avenue 7 th Avenue* 8 th Avenue 9 th Avenue 10 th Avenue	11 th Avenue 12 th Avenue Brunswick Street Quebec Street George Street

*Act like collectors as they are wide.

Support for Transportation Demand Management measures is also encouraged to reduce the use of the private automobile. The need for a truck route plan was also identified, as was the possibility of closures or reversions from one-way to two-way for downtown streets. A downtown rail terminal by First Avenue was also raised as a long term option.

The OCP estimates a future population growth rate of 1.5 percent per year for the City.

This document is most relevant for: its vision for downtown as a general guide, the bicycle plan, and the current and future road network analysis.

20. Prince George Transportation System Planning Study, UMA (2001)

The Ministry of Transportation and Highways and the City of Prince George jointly undertook this study to develop recommendations for the long-term provincial and municipal road networks. Most of the study focused on the long-term (2020) major road network. The principal change recommended in the study that could affect the downtown area involved rebuilding the Cameron Street Bridge with two lanes. This bridge is located northwest of the downtown area and links directly to 1st Avenue.

An option to extend Patricia Boulevard in a north-easterly direction from Queensway, crossing Highway 16 on an overpass to River Road was examined but discarded.

For modeling purposes, employment was forecast for the 'Bowl' area, which includes the downtown (Table 6.4). Employment was recorded as approximately 29,500 jobs in the year 1999. It was then

forecast to be 38,400 jobs in the year 2005 and 43,800 jobs in the year 2020, an 11 percent increase over the 15-year period. This may provide an indication of the expected increase in traffic volumes.

The study also made general recommendations to improve traffic progression, manage access, identify truck routes, improve signage, provide bus bays, and improve cycling and pedestrian facilities.

This document is most relevant for: the future road network.

21. Downtown Prince George Revitalization Study Vol. 1 & 2; Urbanics Consultants Ltd., Hotson Bakker Architects, UMA Engineering Ltd. (2001)

This study is comprised of two volumes. The first sets the context by summarizing some background issues and opportunities for downtown revitalization. The second volume sets the plan to implement various projects that will help revitalize the downtown.

The overall results from the study show that in order to have a sustainable revitalization program for the downtown, it is important to accommodate traffic-generating land-use which will attract people from throughout the region. The current market of office and residential developments seems to be weak. It is perceived that commercial development of various scales should be exploited to its full potential.

Volume One outlines major constraints which have a negative impact on downtown revitalization such as social problems; lack of man-made attractions; limited attractive natural landscape; little residential development; limited variety of entertainment and leisure activities; spread-out development; short and small blocks; competing suburban shopping centers; lack of major educational facilities; and in particular, a weak public transit system which relates to the downtown core.

Volume One also outlines the opportunities for revitalization such as centrality and accessibility of the downtown; extensive street grid system with large road right-of-ways; relatively short easy to walk blocks; proximity to inter-city rail system; large amount of undeveloped and under-developed land; and underutilized parking structures.

Volume Two establishes objectives for the redevelopment of the downtown area. Guidelines regarding transportation include the creation of a pedestrian-friendly environment and the reversal of the one-way road system to two-way traffic. Such reversal is intended to calm traffic and provide better accessibility to the various developments.

The street grid system allows for the closure of certain streets to accommodate large developments. Wherever parking is needed, it should be of a non-surface orientation. The study anticipated that the downtown would be better served by a better city-wide public transportation/bus system.

Volume Two also discusses various proposed developments. A particular section about Transportation and Infrastructure proposes specific street closures while other streets evolve into increased traffic movement. It also proposes the extension of Quebec Street as a crossing over the railway track.

This section also notes locations for an inter-modal complex and for future below-grade parking facilities. It found that downtown Prince George has an unregulated amount of excess infrastructure capacity and systems. Recommendations to reduce the impact of the private vehicle and increase pedestrian usage were made, including:

- narrowing most of the local streets;
- providing left-hand turning bays;
- providing bicycle lanes; and/or
- widening sidewalks.

This document is most relevant for: all modules of the downtown transportation plan.

22. MAP: Handicap Downtown Parking, City of Prince George (Drawn 2001, checked 2004)

The map depicts the location of the following:

- Handicapped Parking Spaces;
- Handi Dart Parking Spaces;
- Ambulance Parking only;
- Bus Stop;
- Loading Zones;
- Police Parking only; and
- Taxi Zones.

This document is most relevant for: the parking strategy.

23. Cycle Network Plan, UMA & Laidlaw Consulting for City of Prince George (2000)

The Cycling Network Plan makes recommendations to facilitate and encourage cycling. A large map showing the Prince George Cycling Network Plan is also provided.

At the time, the only cycling facilities provided in the downtown area were on Patricia Boulevard, between Victoria Street and Queensway. The plan recommended new or upgraded facilities as follows in or near the downtown area:

- Converting the Cameron Street Bridge for non-motorized travel only (staff indicate this is not cost-effective due to the expense involved to maintain the bridge due to its age);
- Creation of a direct link between the Cameron Street Bridge and the downtown via 1st Avenue; and

- Designation of Winnipeg Street as a bicycle route, eventually linking to an extension of the Heritage River Trail.

A supplementary table includes the following downtown streets to be signed bicycle routes, possibly including traffic calming measures to avoid traffic volume increases:

- 15th Avenue/ Patricia Boulevard;
- Queensway;
- Winnipeg;
- 1st Avenue; and
- 2nd Avenue.

The accompanying large-format map shows an additional proposed on-street bike route on 9th Avenue. This map appears to be the one adopted in the Official Community Plan (referenced as Bylaw 7281, adopted 2001).

Providing adequate bicycle parking and other end-of-trip facilities was also considered to be integral to the plan. This could be done through municipal by-law.

This document is most relevant for: the bicycle plan, although selecting a traffic calming option would affect the road network, transit, and pedestrian plans.

24. Staff Report to Council: Civic Facilities Parking Update, Director of Public Works (2000)

This report documents staff work that found that parking capacity is provided in the Civic Zone for 1,214 vehicles. The zone is defined by a two-block radius from the Library, Swimming Pool, Coliseum, Civic Centre and new Art Gallery. Appendix A contains a block-by-block inventory of parking spaces.

Parking demand from a major event was estimated to be approximately 1,400 vehicles, or more than the supply within the two-block definition. However, it was estimated that demand would be sufficient if the area were enlarged slightly.

Staff recommended increasing pay parking at the civic facilities, along with promotion of alternatives to personal vehicle use to reduce parking demand. This would include active coordination of major events and the use of shuttle buses.

At the time, municipal parking lots in the civic zone offered two hours of free parking. Replacing this with metered parking was recommended to avoid competing with on-street meters, to free up space for longer term users, and to promote alternative modes of transportation. Four locations for additional parking were also proposed including City Hall, the Fire Hall site, the RCMP facility and a site to be developed by the Downtown Parking Commission.

This document is most relevant for: the parking strategy and possible future policy changes.

25. Prince George City Wide Trail System Master Plan (1998)

This plan recommends a series of design standards for City Trail, Local Trail, Rustic Trail and On-Street Bicycle Lanes (2.0 m preferred; 1.5 m, both sides). It also specifies the proposed trail hierarchy and lists critical links required for the network. “City Trails” were proposed that would circumnavigate downtown area and the proposed trail system would provide good connections between residential areas and downtown. It was thought that this network could encourage cycle-commuting to the downtown.

This map depicts Park and Trail classification systems. The Park Classification includes:

- Parks;
- Greenbelt;
- Other Park (Boulevard & Buffers);
- Public Park (Not City-Owned); and
- Proposed Greenway.

The Trail Classification is broken down into existing and proposed and includes:

- Paved Trails;
- Granular Trails; and
- Rustic Trails.

This document is most relevant for: the pedestrian and bicycle plans.

26. Lower Patricia Boulevard Functional Plan, Brave Engineering Ltd. (1998)

The purpose of this study was to redesign Lower Patricia Boulevard as an Urban Major Collector and as a proposed truck route. The section of the road is between Queensway and 1st Avenue. Functional plans also include the proposed overpass to Cottonwood Island and an on-ramp to Yellowhead Bridge. The scope of the study included the following:

- Determine alignment of on-ramp;
- Determine traffic volumes and road standards of Lower Patricia Boulevard;
- Determine impact on neighbouring streets and provide improvements;
- Determine impact on existing infrastructure above and below ground; and
- Provide a functional design and a cost estimate.

The report reviews the impacts on existing infrastructure at intersections of Lower Patricia Boulevard with Queensway, Ontario Street, and Scotia Street. Functional plans are provided in the report for each section of the road.

This document is most relevant for: the future road network, trucks and dangerous goods movement and the implementation plan.

27. Civic Facilities Downtown Parking Committee Report, Director of Public Works (1997)

The committee projects a need for 227 parking spaces in addition to those existing in the downtown core. This demand is due to the growing number of Municipal facilities in the area and due to major events at the Coliseum or Civic Centre.

Additional parking spaces can be achieved by converting 7th Avenue to angled parking and by relocating the Fire Services and the RCMP. Other means are by maximizing the existing parking spaces and by encouraging people to use alternate means of transportation or car pooling.

This document is most relevant for: the parking strategy and the policy review.

28. Downtown Revitalization: A Time for Action, Prince George Community Planning Council (1996)

This study took the view that for Prince George to gain the title of British Columbia's northern capital, private and public sectors have to collaborate in revitalizing the downtown core. The report presents an overview of downtown revitalization in Prince George. It covers a brief history of downtown Prince George and previous attempts at revitalizing the area and elsewhere in Canada. The Committee describes their methodology, a relatively large part of which was public input, and then includes recommendations.

The Committee called for the creation of a joint public/private commission to oversee the revitalization of the downtown. The purpose of this commission would also be as proponent in all future planning such as public transit, bikeways, and pedestrian pathways.

After public consultation, two major issues were determined: appearance of the downtown and social issues. Concerns about the appearance of the built environment include the following:

- Pedestrian environment;
- Traffic circulation;
- Parking;
- Downtown housing; and
- Heritage resources.

Various recommendations are presented including some for the built environment such as streetscape design, sidewalks and streets, and parking. The report suggested that streetscape design should incorporate bikeways, greenways, plazas, and parks. Sidewalks and streets would be considered as multi-modal transportation arteries. Parking lots would incorporate characteristics that make them part of the streetscape.

This document is relevant for: all modules due to its general vision for downtown, with focus on the sustainable transportation strategy and the parking strategy.

29. Downtown Revitalization Memorandum, Director of Development Services to City Manager (1993)

This internal memorandum recommends proceeding with the downtown revitalization program prepared by Urban Forum Associates (dated 1992, see below). The plans for 3rd Avenue (conversion to two-way, removal of sidewalk canopies, removal of parking meters) and for the Law Courts Plaza were endorsed, but some concerns were identified with respect to the proposed Gateway at 1st Avenue and George Street. Cost sharing options were discussed.

This document is most relevant for: the implementation plan.

30. Prince George City Centre Strategy, City Centre Concept Committee, Prince George Region Development Corporation (1990)

This report listed 13 specific objectives to constitute the first phase of a strategy for the downtown, as summarized in TABLE 3. Each objective was tied to specific tasks.

TABLE 3 OBJECTIVES FROM CITY CENTRE STRATEGY

NO.	OBJECTIVE	IMPLEMENTATION TASKS PROPOSED
1	Promote the City Centre	<ul style="list-style-type: none"> - review the OCP - enhance appearance - assess current zoning and development controls
2	Generate commitment and cooperation	<ul style="list-style-type: none"> - foster ongoing consultation amongst officials - inform the general public - regular communication with business community
3	Promote downtown commercial development	<ul style="list-style-type: none"> - communicate downtown vision during consideration of new development
4	Encourage re-development of Parkwood Mall	<ul style="list-style-type: none"> - work with owners
5	Upgrade the social environment	<ul style="list-style-type: none"> - work with Community Social Development Board
6	Improve supply of convenient parking and increase use of off-street parking	<ul style="list-style-type: none"> - consider more free parking during selected periods - promote off-street parking - increase monthly parking use of off-street lots - consider ways to increase turnover of on-street parking spaces - improve parking management including - reconsider 3rd Street conversion to two-way traffic - ensure traffic light coordination - improve accessibility to downtown by upgrading arterial roads - study downtown parking supply and demand - consider relocating the bus exchange
7	Upgrade streetscape	<ul style="list-style-type: none"> - develop park-like open spaces - develop an indoor or covered space - consider additional landscaping - conduct street lighting study - improve cleanliness

- increase snow removal priority
- new maintenance by-law
- consider special signs, including directory signs
- provide streetscape improvements
- 8 Upgrade building appearance
 - implement Façade Design Guidelines
 - encourage clean-up and painting
 - provide design advice to private owners
- 9 Develop catalyst projects
 - liaise with senior governments concerning developments
 - support civic centre complex
 - consider farmer's market
- 10 Market downtown
 - target through brochures and flyers
 - facilitate media coverage
- 11 Improve air quality
 - support provincial initiatives
- 12 Develop multi-family housing
 - encourage and assist development
- 13 Build downtown organization
 - enhance the Town Centre Business Association
 - liaise with other organizations
 - consider a Business Improvement Area
 - hire a business manager

This document is most relevant for: generating ideas for the roadway and parking plans.

31. Downtown Revitalization, Urban Forum Associates, The DM Group Landscape Architects, & McElhanney Engineering (1992)

This study includes preliminary designs and cost estimates for a downtown revitalization plan. The task was subdivided into three areas: 3rd Avenue Revitalization, Law Courts Plaza, and George Street Gateway.

Preliminary design considerations for 3rd Avenue Revitalization include roadworks such as widening the sidewalks. It was proposed that parallel parking be incorporated on both sides of the street without meter parking. Proposed widths for crosswalks are given in the report.

This document is most relevant for: the road network assessment and the implementation strategy.

32. Report to Ministry of Transportation and Highways on Prince George Transportation Planning Study, Ward Consulting Group (1990)

The primary objective of this study was to develop a network of arterial roads which can accommodate growth in Prince George up to 2015. The report determined the sequence of implementation of the network components. Specific areas of concern are also addressed such as the alignment of the Highway 16 through the downtown. The report also recommends truck routes and dangerous goods routes for the City of Prince George.

The maps and tables of interest include:

- Location of Signalized Intersections;
- Analysis of Signalized Intersections (Queensway & 2nd; Queensway & 4th; Victoria & 2nd; Victoria & 3rd); and Victoria & 4th);
- Present and Future Population;
- Present and Future Employment;
- Recommended Truck Routes; and
- Recommended Dangerous Goods Routes.

The report describes trip types and trip generation. The study recommended that the existing routing of Highway 16 remain the same for the short term. In the long term, it was perceived that the proposed Cranbrook Boulevard will provide an alternative route to Highway 16.

This document is most relevant for: road and intersection assessment and for the development of truck and/or hazardous goods movement routes..

33. Mayor's Task Force on Downtown Concerns (1989)

The purpose of the Mayor's Task Force was to make recommendations towards the general appearance, accessibility, and social problems of the downtown core. Seven specific concerns were addressed one of which was parking. The purpose of the recommendations presented was to speed up the cycle of downtown renewal by limiting growth to outlying commercial centers and the active location or relocation of suitable projects to downtown Prince George.

Recommendations regarding parking and transportation include the following:

- Create a single administration for all downtown parking which would lead to more efficient usage and result in cost savings;

- Prepare a three to five-year strategic plan for the number and type of parking spaces to meet the growth;
- Provide additional marketing to encourage the use of off-street parking;
- Provide incentives for developers who provide additional off-street parking;
- Intensify the cleaning of streets and sidewalks;
- Revise the Official Community Plan and Zoning Bylaws to encourage an attractive people-oriented core area; and
- Improve street lighting.

This document is most relevant for: its historical context, but appears to be superceded by other more recent documents.

34. Report to Council: Downtown Parking, City Clerk (1983)

The report provides the following information:

- A brief history leading up to the meeting between Council, Downtown Parking Commission (DPC), and Town Centre Business Association (TCBA) to discuss the entire issue of downtown parking;
- Outline of findings after discussions with other similar municipalities like Kelowna and Victoria;
- Revision of the hierarchy of the downtown parking facilities;
- Analysis of the 1982 Prince George free parking experiment;
- Description of the unwritten goal regarding the provision and operation of the downtown parking facilities; and
- Conclusions, recommendations, and approach to addressing changes to the parking system.

The report includes a copy of a 1982 Parking Study conducted by the City of Victoria and the University of Victoria. The City Clerk feels that this Victoria Study can be applied to Prince George due to the similarities of the two cities. The 1982 Parking Study in Victoria provides statistical tables and results of surveys. The study also discusses the impact of various actions and provides recommendations regarding the operations of the various facilities.

This document is most relevant for: the parking strategy and for policy development.

35. Prince George Town Centre Revitalization, Town Centre Business Association (1983)

This is a conceptual plan presented to the business people and property owners in the downtown for their consideration and approval. The Town Centre Business Association (TCBA) and the Downtown Parking Commission were applying to the Ministry of Municipal Affairs for financial assistance under the Downtown Revitalization Program. Some of the design options include:

- Extension of sidewalks at crossings;
- New mid-block crosswalks;
- Elimination of selected diagonal parking;
- Continuation of two-lane traffic; and
- Continuation of the ample provision of parking by the Downtown Parking Commission.

This document is most relevant for: its historical context, but appears to be superceded by more recent documents.

36. Central Business District Study, Volume 1-4, City of Prince George (1980)

This study has six inter-related goals. The most important of the goals is to produce several proposals to implement the objectives of the Official Community Plan. The study also provides an analytical data base which leads to recommendations regarding downtown redevelopment.

Volume One, *Goals and Issues*, provides a summary of recommendations regarding retail, office, hotel, and residential developments. It also provides recommendations regarding transportation, parking, and pedestrian considerations.

This volume discusses general goals regarding the same areas mentioned above. Specifically regarding transportation, this volume discusses issues such as congestion, overall circulation, unsynchronized signals, high accident rate, and the need for bus shelters. Data of interest are 1980 traffic volumes and capacity.

Volume Two, *Analysis of Market Potential*, addresses the commercial sector relating to three types of facilities: retail, office, and hotel.

Volume Three, *Transportation and Appendices*, was prepared by Hamilton Associates and provides a descriptive overview of transportation, traffic, and parking. This volume covers street hierarchy, traffic flow characteristics, traffic signals, accident patterns, and parking. This part of the study concludes that the automobile will remain as the primary mode of travel in Prince George. It is also essential to apply traffic management techniques to provide a safe and adequate access to the already established CBD street pattern.

Two appendices in Volume Three which may be of interest include the impact of the new Fraser Bridge on transportation and traffic synchronization.

Volume Four, *Redevelopment Site Alternatives*, presents and comments on five possible redevelopment site alternatives in the downtown core.

This document is most relevant for: its historical context, but due to its date may not be directly applicable.

37. Section 29 of Zoning Bylaw No. 3482, related to Off-Street Parking and Loading

This bylaw provides detailed information as to how parking and loading spaces are to be provided. Stall dimensions are provided - for example, 5.5 metres by 2.7 metres for a stall at 90 degrees to its maneuvering aisle. Section 29.11 is a table of the number of spaces required for each land use.

This document is most relevant for: the parking strategy and for policy development.

38. Prince George Traffic Study, Stanley Associates Engineering Ltd. (1978)

This report is divided into six parts:

1. Study background objective and scope: The principal objective of this study is to define a major road network that would be capable of serving a population of 104,000 by year 1992 within the city limits of Prince George. The scope of the study included:

- Revision of existing and projections of future traffic volumes;
- Determining the required roadway improvements;
- Development and cost estimates of road improvements in the first five years;
- Implementation of other improvements beyond five years; and
- Comments on specific traffic concerns and their impact on the new proposed roadway system one of which is about the approaches to the CBD.

2. Existing transportation infrastructure and traffic volumes: This section describes the existing roadway and transit system. An illustration of existing traffic volumes is also provided.

3. Travel analysis covers the existing travel behaviour such as trip generation, trip distribution, internal trips, and external trips. This section also tabulates the existing land use by zone and discusses the model calibration procedure.

4. Traffic forecasts: describes the forecasts developed utilizing the expected land use changes and the calibrated simulation model. This section provides a projected volume/capacity analysis of principal road sections. Projection is for year 1992. The road section of interest is Victoria Street between 1st Avenue and Patricia Boulevard.

5. Evaluation of identified problem areas: This section describes problem areas in more detail and presents various alternatives for improving the deficiencies. The Victoria Avenue corridor was identified as deficient. The construction of a Massey Avenue/Winnipeg Street connection was expected to improve the situation of the Victoria corridor was expected to be completed two years from the date of this report.

6. Recommended improvement program and costs: This section summarizes the improvement program and costs for the corridors which have been identified as deficient. Priorities for construction were identified.

This document is most relevant for: its historical context, but due to its date likely has limited applicability.

39. Traffic Planning Study: City of Prince George, Stanley Associates Engineering Ltd. (1974)

The primary purpose of this study is to review and up-date a 1965 Traffic Study for Metropolitan Prince George. The other purpose of this study is to define a basic roadway network which will accommodate future population growth of up to 150,000 people in Prince George and its surrounding area.

Existing network capacity is established and new road links are determined which include additional river crossing capacity. The report also deals with the improvement of downtown traffic circulation and the future parking requirements in that area. The study also presents a staging program and cost estimates for the construction of the roadway network.

The study provides recommendations regarding roadways, bridges, interchanges, rights-of-way, and public transit. Recommendations regarding the downtown area include:

- Extension of Queensway to the north, over the CNR and the Nechako River to connect with Pulp Mill Road and the industrial area to the north;
- Construction of a new Queensway Bridge over the Nechako River on the northerly extension of Queensway to Pulp Mill Road; and
- Construction of traffic structures on Highway 16 and both bridgeheads, at Queensway and First Avenue, and at Queensway and Pulp Mill Road.

Section Four of this report discusses existing traffic characteristics indicating concentrated volumes on various streets including Victoria Street and Highway 16 and substantially lower volumes on Queensway. The main arteries connecting to the downtown from the west at the time were 15th, 5th, and 1st Avenues. The main arteries from the south were Victoria Street and Queensway. This section also discusses future traffic characteristics expected at the time.

Section Six of this study discusses the recommended network. There are recommendations regarding traffic congestion in the downtown area as well as its traffic circulation. A recommended arterial system adjacent to the downtown acts as a by-pass to the downtown area. The recommended roadway network would provide access to the downtown from the north and east. A new traffic management scheme is illustrated which takes these new access points into account. Long term parking is suggested to be peripheral. Public transit was briefly discussed in relation to its effect on the recommended design roadway network.

This document is most relevant for: generating possible future road network options.

40. Downtown Study, Regional Development Commission (1974)

This report provides statistical data on various commercial sectors: retail, office, and service commercial. Field surveys and market analysis procedures were undertaken. Recommendations include:

- Developing a policy for commercial development in the downtown;
- Reviewing regulations about the location and design of high rises while considering the need for light and space and the need for complementary urban activities such as restaurants and shops; and
- Studying the needs of downtown employees while considering leisure open space, provision of bicycle racks, improving pedestrian network, and upgrading the transit system.

This document is most relevant for: its historical context, but has likely been superseded by more recent documents.

41. Transportation Objectives in Downtown Prince George and Citizen Survey Form (undated)

This material was used in a previous public consultation process related to the downtown area. It was provided to generate ideas for this study.

This document is most relevant for: public consultation throughout the planning process.

42. Inventory of Off-Street Parkades/Lots (undated)

This table provides the parking supply currently available in several of the downtown parking facilities. It may not be a complete inventory.

This document is most relevant for: the parking strategy.

**Literature Review of Existing Documents from
Blue File Provided by City of Prince George**

TABLE 1 DOCUMENTS REVIEWED FOR DOWNTOWN TRANSPORTATION PLAN (Blue File)

	TITLE	YEAR	MODULE
1.	Traffic Design Rationale for the Proposed Ramp in the SE Corner of 15 th Ave at Winnipeg St., UMA Engineering	2005	A, B, D, E, H
2.	15 th Avenue/Winnipeg Street Ramp (SE Corner) Traffic Analysis, Glen Stanker, September 29, 2004	2004	A, B, D, E, H
3.	Letter: Re: Crescents Neighbourhood Traffic Analysis, UMA, September 16, 2004	2004	A, B, D, E, H
4.	Memorandum: To: Mark Mertz, Re: Crescents Neighbourhood Traffic Analysis – EMME/2 Modelling, From: Leah Libsekal, UMA, September 9, 2004	2004	A, B, D, E, H
5.	City of Prince George Downtown Revitalization Plan, Arlington Group, Paul Merrick Architecture, Jay Lazzarin Landscape Architects, KLM Engineering, Ltd.	1991	A, B, D, E, G
6.	The City of Prince George Proposed Downtown Centre Development Proposal, Cadillac Fairview Corp. Ltd. And the Hudson's Bay Company	1980	A, B, D, E, G
7.	Downtown Riverbank Study Phase I – Downtown, Regional Development Commission	1974	D, E, G
8.	Memorandum to: Community Development committee Re: Centrum, Central Interior Planning Consultants,	1970	A, B, G
9.	Report on Downtown Parking Area Prince George, B.C., Joseph B. Ward and Associates, Ltd.	1964	G

1. Traffic Design Rationale for the Proposed Ramp in the SE Corner of 15th Ave at Winnipeg Street, UMA Engineering (July 2005)

This report details the peak hour traffic demand at Winnipeg Street and 15th Avenue and suggests that the largest traffic demand exists between Winnipeg Street. It concludes that a ramp at this intersection to will likely relieve traffic from 17th Avenue.

This document is most relevant for: network assessment, intersection assessment, road safety strategy, bicycle plan and pedestrian plan

2. 15th Avenue/Winnipeg Street Ramp (SE Corner) Traffic Analysis, Glen Stanker, September 29, 2004

This report provides brief history about the project saying that it was bumped up to 2004 from a 5-10 year plan for this area due to concerns about external traffic in the Gateway BIA and Crescents Neighbourhood. It quantifies the amount of traffic that would be relieved and determines the ramp configuration that would maximize benefits.

The study involved:

- Origin-Destination survey to evaluate the amount of external traffic traveling through the study area and;
- Analysis of various ramp options using the City's EMME/2 transportation model

Findings included:

1. Do nothing – the ramp option had low-benefits and high costs
2. Proceed with the ramp which would provide a logical connection and would be needed in the future or;
3. (Recommended) Undertake a transportation study to identify measures that would directly address the BIA and neighbourhood concerns.

This document is most relevant for: network assessment, intersection assessment, road safety strategy bicyclists and pedestrians

3. Letter: Re: Crescents Neighbourhood Traffic Analysis, UMA, September 16, 2004

This letter summarizes the EMME/2 Modelling results to say that a ramp at the Winnipeg/15th Avenue intersection would be ineffective at diverting trips from the 10th Avenue/Crescents Neighbourhood area.

This document is most relevant for: network assessment, intersection assessment, road safety strategy bicyclists and pedestrians

4. Memorandum: To: Mark Mertz, Re: Crescents Neighbourhood Traffic Analysis – EMME/2 Modelling, From: Leah Libsekal, UMA, September 9, 2004

This memorandum provides an overview of options and finds that neither option addresses the neighbourhood's concerns for the study area. It recommends a more appropriate response for the problem for example, traffic calming along 10th Avenue that should be within the context of the overall traffic calming strategy for the Crescents Neighbourhood.

This document is most relevant for: network assessment, intersection assessment, road safety strategy bicyclists and pedestrians

5. City of Prince George Downtown Revitalization, Arlington Group, Paul Marrick Architecture, Jay Lazzarin Landscape Architects, KLM Engineering Ltd. (1991)

This Urban Design plan for the downtown operates within the boundaries of 1st Avenue and 7th Avenue to the north and south and Victoria Street and Queensway to the west and east. It recommends that roads have vehicles travelling in both directions with multiple vehicle lanes in each direction along Victoria Street, 1st Avenue, Queensway and Patricia Boulevard. The transportation focus is given to 1st and 4th Avenues in an east-west direction and to Quebec and Victoria Streets in a north-south direction. Specific recommendations regarding transportation include:

- Angled parking on 3rd Avenue
- Common depot for transportation (city transit, intercity bus and train)

This document is most relevant for: intersection assessment, network assessment, the parking strategy, bicycle plan and pedestrian plan

6. The City of Prince George Proposed Downtown Centre Development Proposal, Cadillac Fairview Corp. Ltd. And the Hudson's Bay Company (1980)

This proposal operates within the boundaries of 2nd and 4th Avenues north and south and Brunswick and Dominion west and east for a retail centre in the downtown.

Specifics regarding transportation and parking in the downtown include:

- Basement parking allowing 940 spaces for new 2-level shopping complex at 3rd and Quebec (including the existing 200 spaces for The Bay equals 1140 spaces)
- Pedestrian walkway over 2nd Avenue
- Town centre with 20 000 ft² of landscaped activity area
- Creation of basement parking to address public perception of difficulty parking in the downtown
- 3rd Avenue would become the main shopping district
- An office tower offering 100 000 ft² office space on 3rd Avenue

This document is most relevant for: the parking strategy, bicycle plan, pedestrian plan, intersection assessment, network assessment

7. Downtown Riverbank Study Phase I – Downtown, Regional Development Commission (1974)

This study offers statistical data on retail, office space and service commercial as well as projections for retail and office in the downtown. Several recommendations are offered including:

Developing a policy for commercial development retaining 60% retail in the downtown until Prince George's population reaches 100 000

Review regulations of other urban centres with regard to location and design of high rise office towers

Provisions for downtown employees for leisure and open space

Under this third recommendation there is a short discussion of provisions for cycling facilities including bike lanes and bike racks adjacent to office buildings. An improved pedestrian network in the core is advised as well as urgent consideration for an upgraded transit system.

Provisions for an increased pedestrian system are listed as:

- Continuity – continuous walkway system that is separated from wheeled traffic. Close off one street or create an underground system (which, at the time, was previously proposed)
- Climate Control – covered, at grade, pedestrian separation
- Open Spaces – small quiet green areas especially along high pedestrian routes
- Variety in service office needs with ecological planning structure (with adequate lighting and climate conditions)

This document is most relevant for: the parking strategy, bicycle plan and pedestrian plan

8. Memorandum to: Community Development Committee, Re: Centrum, From: Central Interior Planning Consultants (1970)

This memorandum discusses the Centrum development for downtown Prince George, where the study area was defined as: 2nd Avenue and 7th Avenue north and south and Queensway and Dominion Street east-west. It has a population forecast, economic demand study of existing downtown and non-downtown activity, a conceptual study for a pedestrian mall development and a parking demand study.

It is here that the one-way road system is recommended. As an intermediary step to a full-time pedestrian mall along 3rd Avenue, a parking mall is suggested. Recommendations for parking include:

- Extensive parking facilities in the vicinity of 2nd Avenue and Dominion Street (where the 2nd Avenue facility was built)
- Several locations for parking along 4th Avenue and 5th Avenue (where a facility on 5th Avenue was built)

This document is most relevant for: network assessment, intersection assessment, the parking strategy

9. Report on Downtown Parking Area Prince George, B.C., Joseph B. Ward and Associates, Ltd. (1964)

This report details areas showing highest demand for parking including occupancy rates for two separate areas in the downtown.

- Area A – Vancouver Street, 5th Avenue, Quebec Street and 2nd Avenue, which contained the majority of parking intake and;
- Area B – Brunswick Street, Quebec Street, 6th Avenue and, 7th Avenue

A closure was proposed between Brunswick Street and Dominion Street between 4th Avenue and 2nd Avenue for an enclosed parking facility in Area A. A civic lot was proposed at 2nd Avenue and Quebec Street with 100 spaces. A short range strategy was to acquire property at 2nd Avenue and Quebec Street. Long term strategy included a forecast of motor vehicle registration of Prince George and additional area expected to increase by 55% between 1964 and 1968. Short-term parking was recommended for visitors and all-day parking in public lots for downtown workers.

This document is most relevant for: the parking strategy

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APPENDIX B

**INDIVIDUAL MOVEMENT LEVELS OF SERVICE
AT TRIGGER INTERSECTIONS**

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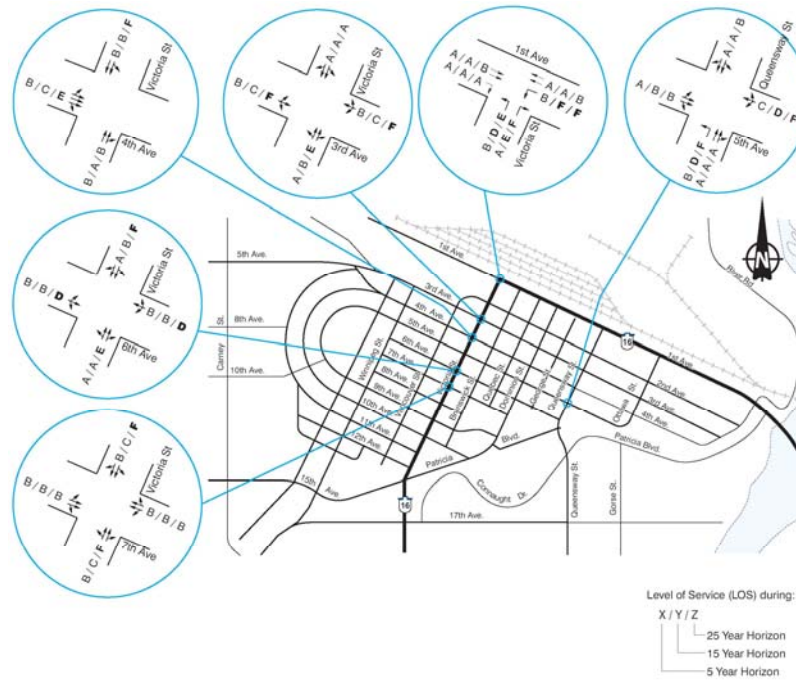


FIGURE B.1 LEVELS OF SERVICE FOR TRIGGER INTERSECTIONS – UNMODIFIED NETWORK

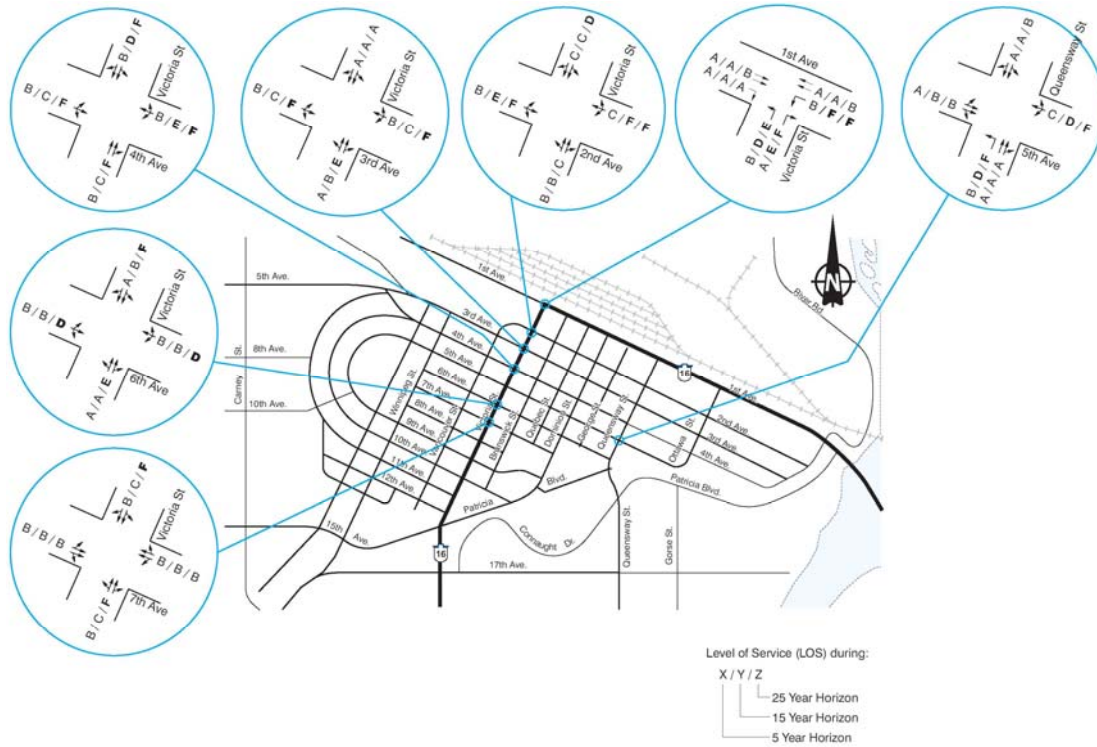


FIGURE B.2 LEVELS OF SERVICE FOR TRIGGER INTERSECTIONS – TWO-WAY NETWORK EAST OF FIFTH AVENUE

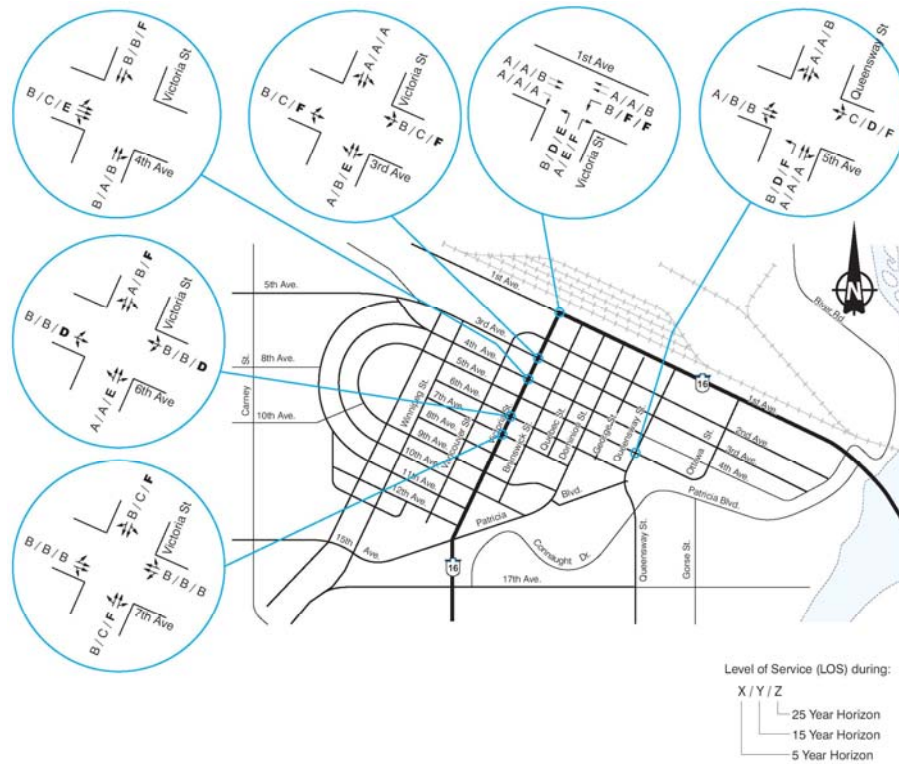


FIGURE B.3 LEVELS OF SERVICE FOR TRIGGER INTERSECTIONS – TWO-WAY NETWORK EAST OF BRUNSWICK STREET

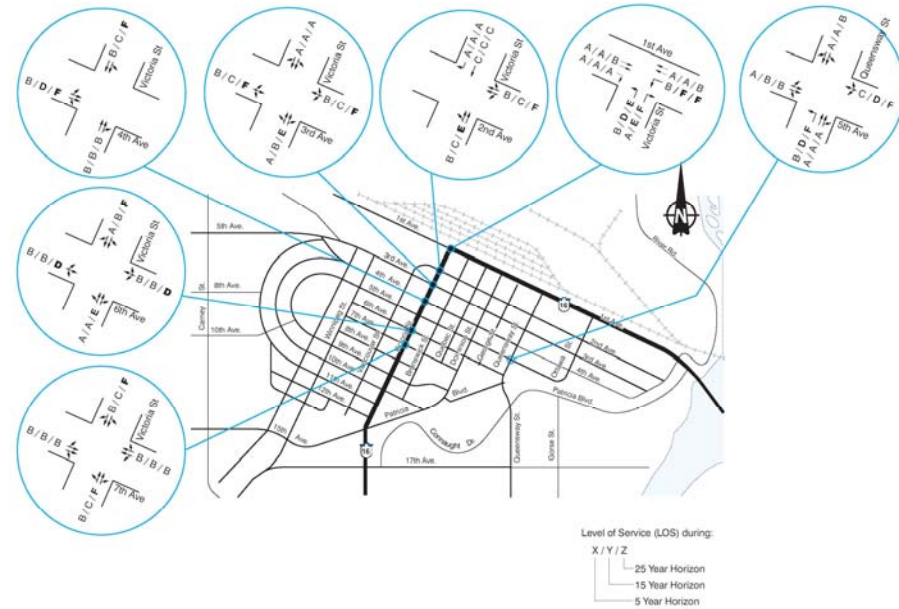


FIGURE B.4 LEVELS OF SERVICE FOR TRIGGER INTERSECTIONS – ENHANCED ONE-WAY NETWORK

APPENDIX C
CYCLING END-OF-TRIP FACILITIES

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APPENDIX C

CYCLING END-OF-TRIP FACILITIES

End-of-trip facilities include bicycle parking and/or storage, changing, and shower facilities at destinations. They are a means of supporting cycling as a mode of transportation and help to make cycling a more secure and convenient option.

Bicycle parking is one component of end-of-trip facilities and perhaps the most important to encourage cycling. Secure bicycle parking is a major concern for cyclists. Providing end-of-trip parking can eliminate fears of bicycle theft.











A variety of bicycle parking options exist depending on the location and duration of parking. These range from outdoor bike racks for short-term (Class II) parking to secure indoor bicycle rooms and bike lockers for long-term (Class I) parking. Currently there are no requirements for bicycle end-of-trip facilities in Prince George's zoning bylaw, TABLE C.1 outlines several options that could be employed by the City of Prince George.

General recommendations, from the Victoria Transport Policy Institute, for providing bicycle parking include:

- Provide suitable bicycle parking where cyclists stop;
- Choose properly designed bicycle racks that support a bicycle's frame and are secure;
- Locate bicycle parking where it is convenient to use, secure, visible, protected from weather, and has adequate clearance;
- Provide well-protected, long-term bicycle parking for commuters, residents or anywhere else cyclists will leave a bicycle for several hours and;
- Do not locate bicycle racks where they are in the way of pedestrian traffic.

Other recommended end-of-trip facilities include change rooms, lockers and showers.

TABLE C.1 BICYCLE PARKING FACILITIES, CLASS I VS. CLASS II

CLASS I	CLASS II
<p>Bicycle Locker</p> 	<p>'Coat Hanger' Racks</p> 
<p>Bicycle Room</p> 	<p>Ring and Post</p> 
<p>Bicycle Cage</p> 	<p>Decorative Racks</p> 
<p>Multi-level Parking</p> 	<p>Bike Rack Advertising</p> 
<p>Covered Outdoor Parking</p> 	<p>Parking Meter</p> 

APPENDIX D
SUMMARY OF PUBLIC CONSULTATION

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D.0 Prince George Public Surveys – Summaries of Comments

Two sets of public consultation were conducted for the study, in May 2006 and in October 2007. In both cases a survey was administered. For the first phase, the survey was used to determine what the people of Prince George thought was needed for the Downtown Transportation and Parking Plan. The second phase provided people with the opportunity to comment on the draft Downtown Transportation and Parking Plan

D.1 INPUT TO THE PLAN (MAY 2006)

The 127 written comments were divided into categories. The categories include:

- Bus Service;
- Crosswalks;
- Sidewalks;
- Parking;
- Cycling;
- Traffic Signals;
- Public Realm;
- Commercial Vehicles; and
- Roadway.

The majority of comments were regarding parking. FIGURE D.1 illustrates the responses in each of the nine categories.

The top issues were identified in each category and are summarized below.

More frequent transit service

Respondents want more transit service throughout the day. Numerous responses asked for increased transit service in the morning and afternoon rush hours for commuters as well as later at night for those wanting to frequent downtown establishments later at night. Sunday service was also requested as was more transit stops in the northeast corner of the downtown.

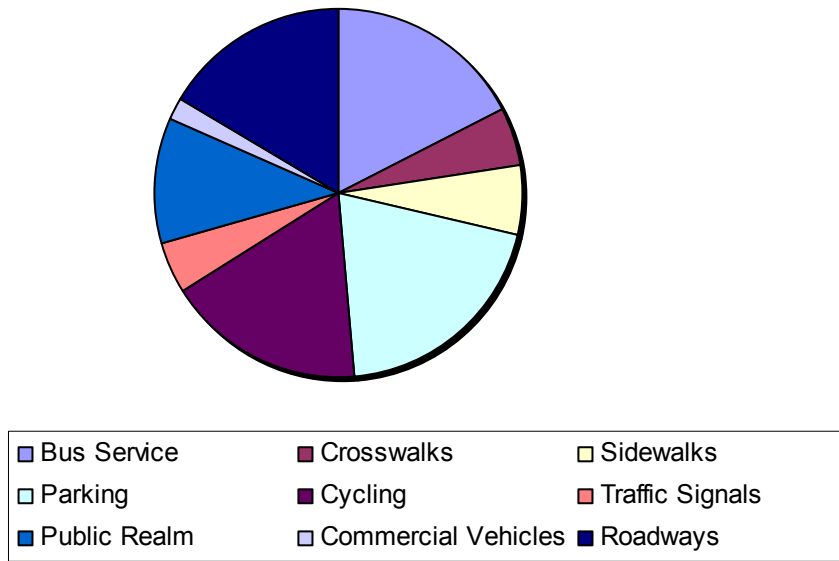


FIGURE D.1 SURVEY RESPONSE BY CATEGORY

Road widths make for difficult crossings

Respondents felt that crosswalks were too wide due to road widths and were difficult to cross. Solutions offered by those who completed the survey include: widening sidewalks; more visibility of crosswalks; and more frequent crossing opportunities.

Better overall maintenance

Those responding to the survey were interested in better overall maintenance of the sidewalks and public realm. Sidewalk sweeping and garbage collection were cited as things to improve as well as better lighting.

Free parking

Free parking in the downtown at all times was requested but there were also people requesting free parking on Sundays only. Concerns raised about parking include improved lighting in parking lots, better signage for parking rates, updated parking technology and restricting parking at intersections.

Cycling infrastructure

Many respondents want cycling infrastructure implemented in the downtown. This is seen as something necessary to encourage cycling. Respondents were also requesting more and better bike parking opportunities. Many people would also like to see a complete cycling network with connections to surrounding neighbourhoods as well as enforcement of laws against sidewalk cycling.

Public Realm

People are interesting in a more inviting atmosphere in the downtown. Requests for greenery, planters, more attractive street wall and streetscape design guidelines were numerous.

Roadway

The highest number of comments categorized under roadway is for improved maintenance. People would like to see pot holes filled in more frequently, a regular and more frequent schedule for lane painting and improved winter maintenance.

D.2 COMMENTS ON DRAFT TRANSPORTATION PLAN (OCTOBER 2007)

Just over 200 surveys were submitted with the majority being submitted electronically and five hard copy surveys being submitted. Approximately 175 of those surveys submitted were complete. The remaining surveys were missing answers to some questions.

To compile the results, responses were added to determine those people in favour and those not in favour of the various recommendations. The responses strongly like and somewhat like were added to determine a value for “in favour” and the responses somewhat dislike and strongly dislike were added to determine a value for “not in favour”.

Interest in the Survey

Respondents were asked what their interest was in the survey. We were interested to know what their relationship was to the City of Prince George. Respondents were encouraged to select all answers that applied. The majority of respondents (54%) are residents of the City, 30 percent work in Prince George and 11 percent own a business in the City.

Complete results are illustrated in FIGURE D.2.

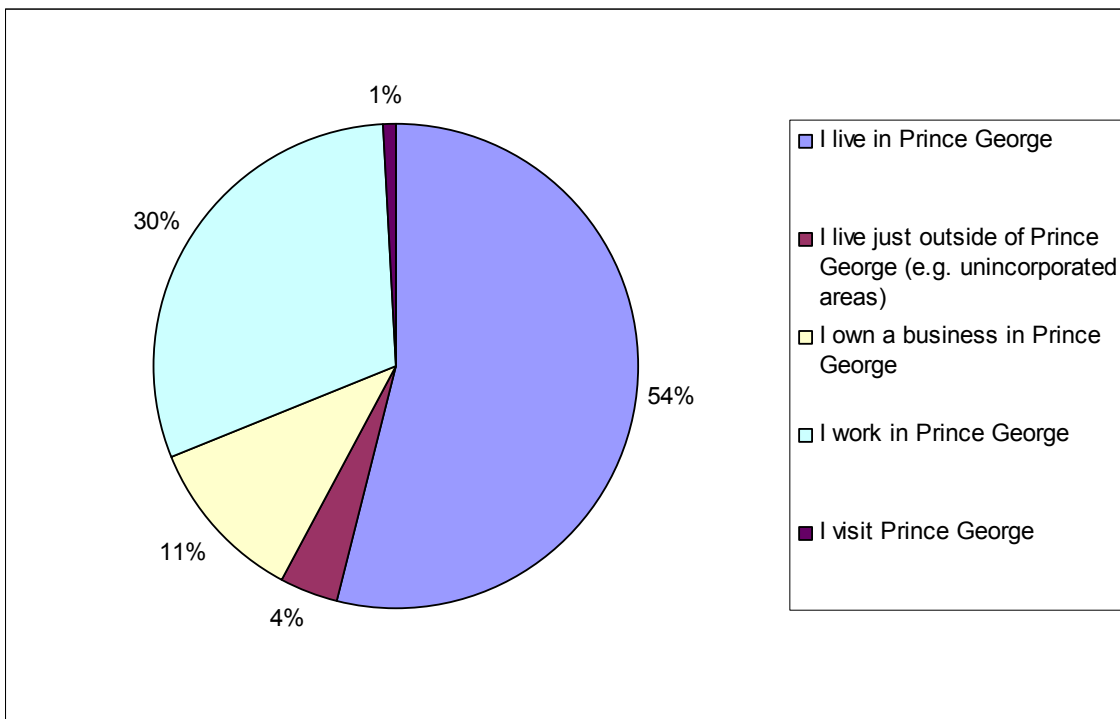


FIGURE D.2 RELATION TO PRINCE GEORGE

Conversion to a Two-Way Road Network System

The report recommends changing the one-way couplet of 2nd and 4th Avenues to a two-way system east of Brunswick Street. Respondents were asked if they were in favour of this conversion. 46 percent strongly liked or somewhat liked the conversion while 41 percent somewhat disliked or strongly disliked the conversion. Comments suggest that respondents are interested in the two-way system to Victoria Street.

Transit Plans

Respondents strongly favour a five year transit plan with 74 percent strongly liking or somewhat liking the idea of a plan while six percent somewhat disliked or strongly disliked the idea of a five year transit plan.

Respondents strongly favoured a rapid transit system with 72 percent strongly liking or somewhat liking a rapid transit system while eight percent somewhat disliked or strongly disliked the idea.

Education Campaign

Respondents were asked if they supported an education campaign for both motorists and pedestrians aimed at improving the safety of pedestrians at crossing. 60 percent were in favour (strongly like or somewhat like) and 24 percent did not like the idea (somewhat disliked or strongly disliked).

Accessible Pedestrian Signals

It is recommended that the City develop a schedule for installing and upgrading accessible pedestrian signals and 73 percent of respondents are in favour while 10 percent are not in favour of this.

Underutilized Crosswalks

It is recommended in the report that the City remove some underutilized crosswalks to increase the visibility of well-used crosswalks in an effort to increase pedestrian safety. 44 percent of respondents are in favour of the idea while 35 are not.

Cyclist Pushbuttons

Cyclist pushbuttons allow cyclists to request signal changes in the same way that pedestrian pushbuttons operate. The pushbuttons are located at the curb where cyclists can access them without having to dismount. 56 percent of respondents are in favour of the installation of pushbuttons and 25 percent are not in favour.

Additional Cycling Routes

The Cycle Network Plan details cycling routes through the downtown, but it is recommended that the City adopt an additional east-west route to complete the downtown network. Respondents were 74 percent in favour of adding cycling routes to the downtown and 8 percent not in favour.

Parking Violation Charges

It is recommended that the City of Prince George do away with two free parking violations and increase the fine to \$30 from \$10. This will help to prevent long-term parking in short-term spaces and help to better manage downtown parking so that priority is given to high turnover retail areas. It will also bring Prince George's parking fines in line with municipalities of similar size. 12 percent of respondents are in favour of this and 86 percent are not in favour of the fine increase.

Parking Strategy

It is recommended that the City adopt a new parking pricing strategy that would see shorter time limits for parking in areas where high turnover is favoured and longer time limits in areas where parkers would expect to have longer stays. 37 percent of respondents are in favour of this and 53 percent are not in favour of the pricing strategy.

Smaller Vehicle Parking

The report recommends that the City adopt a bylaw to encourage smaller vehicle and motorcycle parking spaces in the downtown. 55 percent of respondents are in favour and 26 percent are not in favour.

Pay and Display Payment System

The report recommends the City adopt the pay and display system of parking to deal with the vandalized parking meters and help improve management of on-street parking. 21 percent of respondents were in favour of the pay and display system and 70 percent were not in favour of it.

Dangerous Goods Movement

It is recommended that the City adopt a bylaw a policies aimed at dealing with dangerous goods movement. It is also recommended that the City identify a route for dangerous goods movement. 86 percent are in favour and 4 percent are not in favour.

In Favour of the Plan

Respondents were asked to rank the plan on a scale from zero to ten with ten as strongly like and zero as strongly dislike.

The most responses ranked the plan a four at 15 percent. 12 percent ranked it a seven. The same percentage of respondents gave it a five (or neutral). Complete results are illustrated in FIGURE D.3.

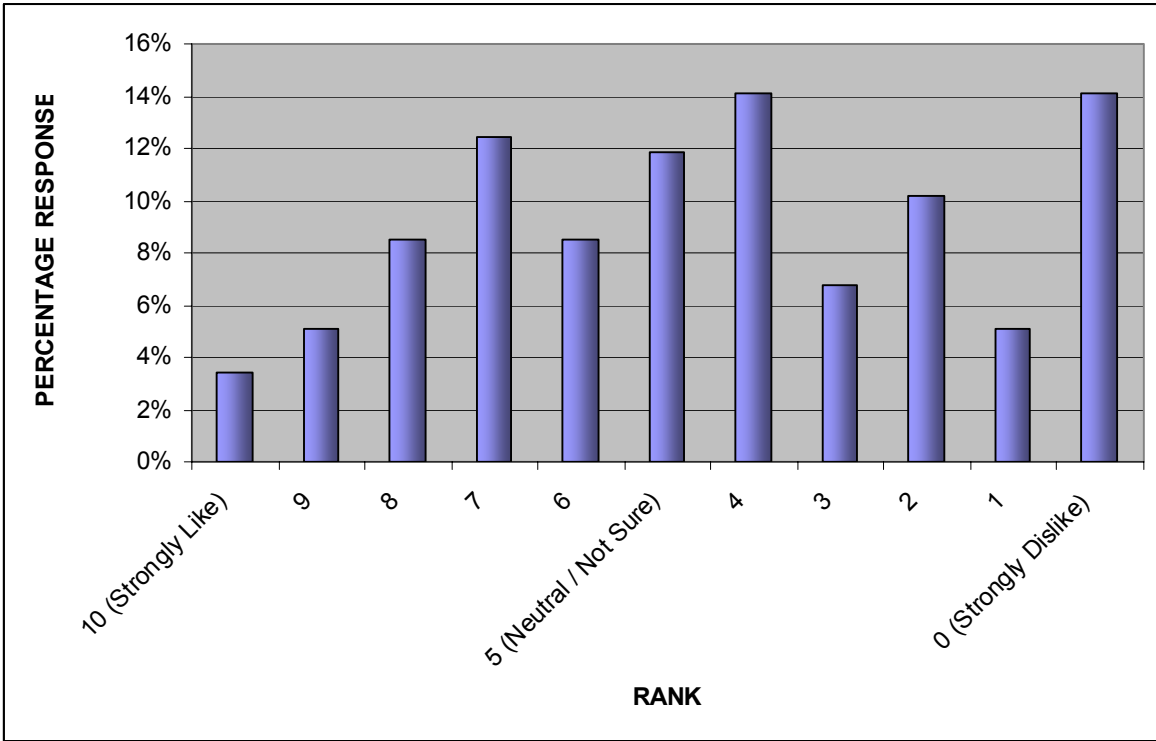


FIGURE D.3 HOW PEOPLE RANKED THE PLAN

APPENDIX E DISCUSSION OF PARKING METER TECHNOLOGY

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APPENDIX E DISCUSSION OF PARKING METER TECHNOLOGY

During the course of the data collection, it was observed that many of the parking meters in Downtown Prince George were missing. City staff indicated that it was difficult to obtain replacement parts for missing or damaged meter heads.

New technology exists that may alleviate some of the issues surrounding maintenance of older meter heads and increase on-street parking revenue for the City. The Pay 'n' Display system has gained popularity in many North American cities. Time is purchased and a ticket is displayed in the window of the vehicle with the expiration time showing. Bylaw enforcement can check the expiration time of the ticket, as they would have checked time remaining on a meter, to determine validity of the ticket, and enforce time limits.

A second option is to replace the existing mechanical meters with electronic heads. These heads would look similar to the existing heads, but would provide some flexibility in terms of method of payment, and it would be easier for the City to obtain parts for this newer technology.

Another new form of metered parking offers individual ownership of parking cards with pre-paid time that is vehicle-attached. The cards can be programmed with the cost and maximum time allowed in a given parking zone. Advantages and disadvantages of each of these options are discussed in TABLE E.1.

The pay and display system of parking has been used by some cities in Canada for almost 10 years now and offers considerable benefits to the metered on-street parking system. A telephone survey of several locations in Canada using this system provided positive response to the replacement of parking meters by the pay and display devices.

TABLE E.1 TECHNOLOGICAL OPTIONS FOR ON-STREET PARKING

OPTION	PROS	CONS
Existing meter style	<ul style="list-style-type: none"> ▪ Meter is close to parking stall ▪ Easy to understand method of paid parking 	<ul style="list-style-type: none"> ▪ Expensive to maintain ▪ No flexible payment options
Electronic heads for existing meters	<ul style="list-style-type: none"> ▪ Meter is close to parking stall ▪ Easy to understand method of paid parking ▪ Configuration flexibility 	<ul style="list-style-type: none"> ▪ Moderate capital investment ▪ Sidewalk clutter ▪ More maintenance
Pay and display	<ul style="list-style-type: none"> ▪ Pay by space or pay and display (or both) ▪ Simple maintenance ▪ Better enforcement ▪ Vandal/theft resistance ▪ Configuration flexibility (more rate options, more payment options including on-line credit card payment) ▪ Data collection capabilities ▪ Reduced sidewalk clutter (easy for snow removal and sidewalk maintenance) 	<ul style="list-style-type: none"> ▪ Significant capital investment ▪ Potential for re-use of tickets (potential loss of revenue) ▪ User must walk to central dispenser and back to car ▪ Some initial public education and signing required ▪ Loss of bike parking
Parking cards	<ul style="list-style-type: none"> ▪ No need to fumble for change ▪ Pay only for time required ▪ Enforcement efficiency ▪ Reduced maintenance and repair costs ▪ No sidewalk clutter for winter maintenance 	<ul style="list-style-type: none"> ▪ Some capital investment by City ▪ Deposit for user (~\$50)

The City of Kelowna, BC has recently implemented a one-year trial with a similar system of paid, on-street parking. The University of British Columbia has operated their system since 1995. The City of Ottawa has implemented the system in the Byward Market area of its downtown (which was used as a case study for Prince George’s downtown revitalization). The benefits and costs evaluated by each area are included in TABLE E.2.

TABLE E.2 PAY AND DISPLAY PARKING SYSTEMS

LOCATION	REASON FOR NEW SYSTEM / ADVANTAGES	DISADVANTAGES
Kelowna	<ul style="list-style-type: none"> ▪ Difficult to locate parts for old meters. A lot of what they were using was second-hand; ▪ Not enough memory in the existing meters for all of the Canadian and American coins; ▪ Maintenance costs were high due to replacing batteries and vandalism; ▪ Removing the meters cleans up the sidewalks in line with their downtown streetscape plan; ▪ 1 to 2 pay and display machines per block front. (They have maintained clearance for their bobcat plow for snow removal.) 	No disadvantages were listed.
UBC	<ul style="list-style-type: none"> ▪ Reallocated human resources to parkade kiosks (pay and display operates outside staffed hours) and enforcement; ▪ Observed a reduction in costs associated with maintenance, enforcement; ▪ Increased their staffing capabilities due to simplified logistics. 	<ul style="list-style-type: none"> ▪ Loss of revenue due to students giving tickets away before time limit has expired; ▪ System only in English.
Ottawa	<ul style="list-style-type: none"> ▪ Data collection (easily accessible from internet or can be monitored from cell phone, PDA, computer, office or from the company's website); ▪ Payment options: Accept any major credit card (and people pay more than they need with credit cards), City of Ottawa Parking Card, City of Ottawa Parking Tokens and coins; ▪ People get a receipt if they need to write off parking charges; ▪ Machines are indestructible and, if maintained properly, work well; ▪ Languages: service is offered in French and English as well, in specific neighbourhoods, service is offered in Cantonese and Vietnamese; ▪ Credit cards payments are batched and sent every night. 	<ul style="list-style-type: none"> ▪ Issues around software changes. Their machines are older than technology currently available so software changes (e.g. to increase the cost of parking) are complicated and expensive: \$750 per machine per request; ▪ Motorcycle drivers can't display tickets in a windshield, so they are exploring options for this; ▪ People do pass off tickets, but city isn't sure how big a problem this is; ▪ There is no provider in Ottawa to service the machines. However, the city has trained their staff to service them.

The City of Kelowna indicated that for their trial the units were donated by the contractor and that at the end of the trial (end of April 2007) they will likely be going ahead with the program and purchasing the units for approximately \$8,800 each. The difference in initial cost for meters and pay and display units is illustrated in TABLE E.3.

TABLE E.3 COST OF REPLACING METER TECHNOLOGY

NUMBER OF UNITS	TECHNOLOGY	COST PER UNIT	SUBTOTAL
638*	Cost of old meters (per unit)	\$300	\$191,400
	Cost of new meters (per unit)	\$800	\$510,400
106**	Cost of pay and display (per unit)	\$8,800	\$935,733
	Range of difference	\$425,300 - \$744, 300	

* This number is taken from TABLE 8.2.

** This number is based on a replacement rate for meters. One pay and display unit for approximately every 6 meters.

The technology no longer exists for the current (i.e. old) meters and finding replacements has proven difficult for the City. Purchasing new meters may appear less expensive than purchasing Pay and Display units however, meter technology is becoming an older form of paying for parking and the City may very well find itself in a similar position in the future with regards to maintenance and replacement cost and not having units readily available for replacement.

APPENDIX F

SAFETY STUDY OF SELECTED INTERSECTIONS

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APPENDIX F SAFETY STUDY OF SELECTED INTERSECTIONS

This section summarizes the preliminary findings of safety issues and improvement recommendations for the intersections selected in CHAPTER 10. These findings need to be confirmed with in-depth road safety analysis.

F.1 Victoria Street and 5th Avenue

Victoria Street and 5th Avenue is a two-way STOP controlled intersection under the jurisdiction of the Ministry of Transportation. It has the highest collision frequency in the study area and the highest annual claim cost to ICBC.

A. *Intersection Characteristics*

The intersection layout is shown in FIGURE F.1 and some of the characteristics include:

- Two-way STOP on 5th Avenue;
- Marked crosswalks and STOP bars on 5th Avenue;
- Parking allowed on all sides; and
- A shared through and right lane and a shared through and left lane in all directions.

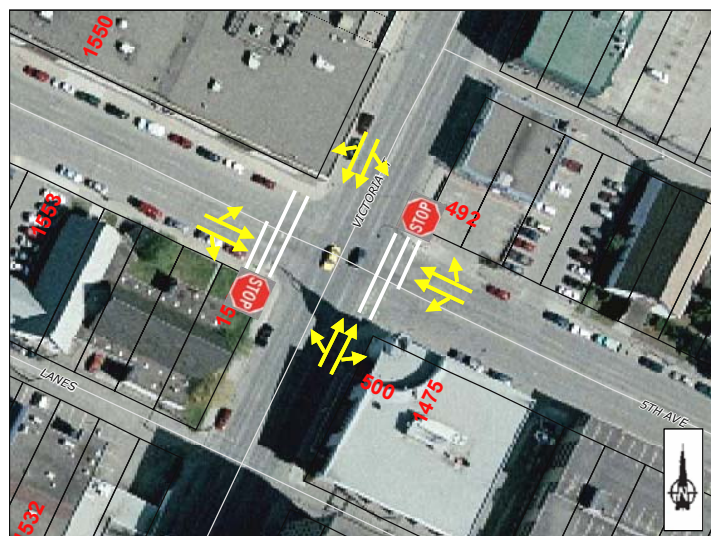


FIGURE F.1 VICTORIA STREET AND 5TH AVENUE LAYOUT
(Base map from the City of Prince George PGMap. The laning is superimposed.)

B. Collision Type Distribution

The collision type distribution, presented in FIGURE F.2, shows a high percentage (64 percent) of angle collisions. Almost 50 percent of all the collisions are injury collisions.

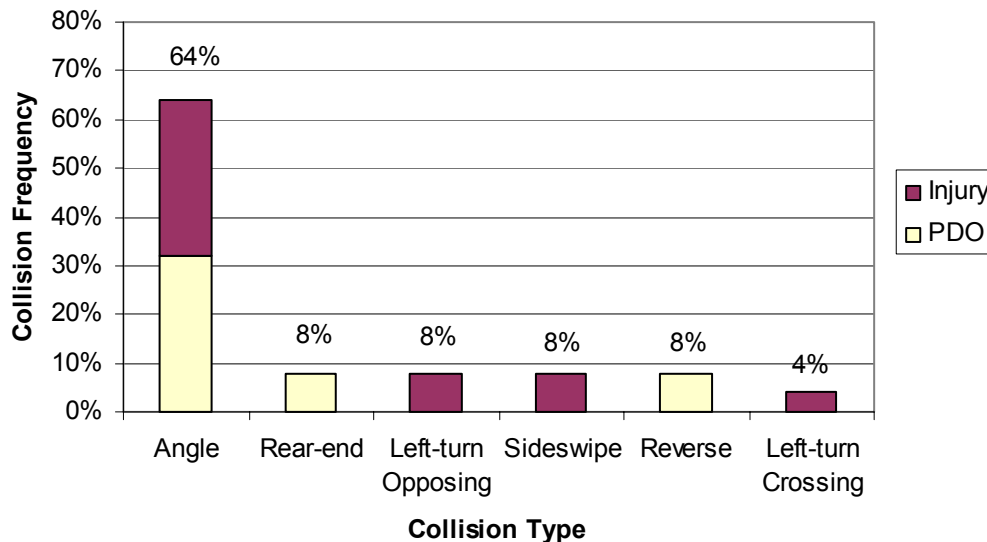


FIGURE F.2 COLLISION TYPE DISTRIBUTION

Out of the 16 angle collisions, 12 involved a vehicle travelling in the westbound direction likely violating the STOP sign. In the collision claim report, some of the reasons for the angle collisions included sight distance issues from the STOP position and some included not seeing the STOP sign.

C. Observation and Findings

- The road is wide, making the stop signs inconspicuous.
- The pavement on Victoria Street is rutted.
- The pavement markings are faded.
- As determined in Chapter 3, this intersection currently warrants a signal.
- Drivers travelling west may not be expecting a STOP sign given that the two intersections to the east have the right of way assigned to 5th Avenue.
- Intersection lighting may be poor, but this requires further investigation.

FIGURE F.3 shows photographs of the intersection.



Looking south (shows east side of Victoria St.)



Looking north



Looking east



Looking south (shows west side of Victoria St.)

FIGURE F.3 VICTORIA STREET AND 5TH AVENUE PICTURES

D. Short-Term Potential Mitigating Measures

- Bigger stop signs and street signage could be provided to increase the intersection conspicuity as well as the sign conspicuity.
- Curb extensions along 5th Avenue could be provided to reduce the road width and increase the conspicuity of the intersection and the STOP signs. As an alternative, a median on 5th Avenue could be installed to provide a STOP sign on both sides of the approach.
- Repave Victoria Street to improve rutted areas.

- Pavement marking could be installed with more durable material or marked more frequently throughout the year.
- Parking should be at least six meters from the intersection to improve visibility of cross traffic, pedestrians and STOP signs.

E. Long-Term Potential Mitigating Measures

- The intersection could be signalized and synchronized with Victoria Street. As an alternative, a centre median along Victoria Street could be considered to prevent through movement on 5th Avenue.
- Traffic calming techniques, such as raising the crosswalk on 5th Avenue could be used.
- Insure intersection sight distance is met when corners are redeveloped to reduce angle collisions.
- Improved lighting to increase visibility at night could be investigated.

F.2 Brunswick Street and 5th Avenue

Brunswick Street and 5th Avenue is a two-way STOP controlled intersection under the jurisdiction of the City of Prince George. This intersection was selected in the 2004 Network Screening Program for the City of Prince George (2004 Network Screening Program, City of Prince George, Opus Hamilton) as one of the top 20 locations for improvement.

A. Intersection Characteristics

The intersection layout is shown in FIGURE F.4 and some of the characteristics include:

- Two-way STOP on Brunswick Street;
- Marked crosswalks and STOP bars on Brunswick Street, and zebra crosswalks on 5th Avenue;
- Parking is allowed on all sides;
- A shared through and right lane and a shared through and left lane on 5th Avenue; and

- A shared through and right lane and a dedicated left-turn lane in both directions on Brunswick Street.

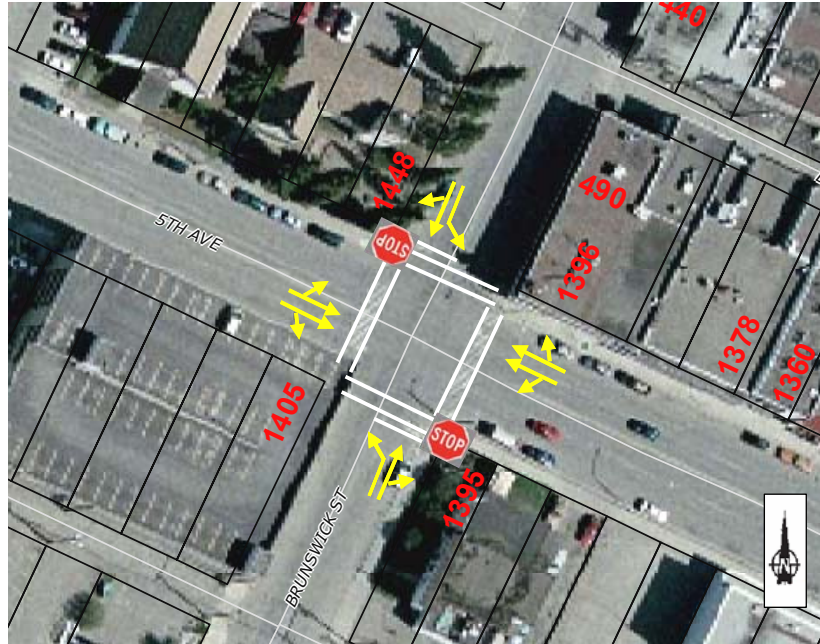


FIGURE F.4 BRUNSWICK STREET AND 5TH AVENUE LAYOUT
(Base map from the City of Prince George PGMap. The laning is superimposed.)

B. Collision Type Distribution

The collision type distribution is shown in FIGURE F.5. Angle collisions were predominant with 65 percent of all collisions. In the collision claim report, some of the reasons for the angle collisions included drivers not seeing the STOP sign; drivers thinking it is a four-way STOP intersection, and having sight distance issues from the STOP position.

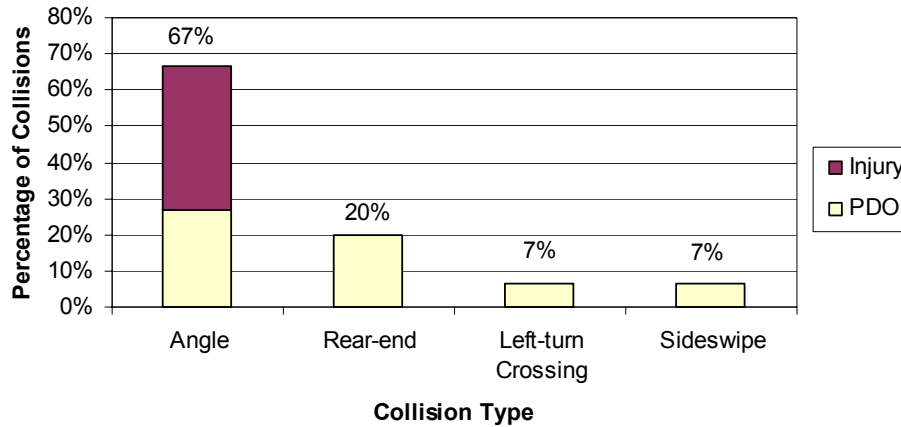


FIGURE F.5 COLLISION TYPE DISTRIBUTION

C. Observation and Findings

- The road is wide, making the stop signs inconspicuous.
- The pavement on the westbound approach of 5th Avenue and the north approach of Brunswick Street is rutted.
- Buildings close to the intersection may limit sight distance.
- Parked cars close to the intersection may limit sight distance.
- Intersection lighting may be poor, subject to further investigation.
- Turning movement volumes were not available, but appear to be low, so likely a four-way stop is not warranted based on operations alone.

FIGURE F.6 shows the intersection.



Looking north



Looking south



Looking east



Looking west

FIGURE F.6 BRUNSWICK STREET AND 5TH AVENUE PICTURES

D. Short-Term Potential Mitigating Measures

Some of the potential mitigating measures were determined in the 2004 Network Screening Program and include:

- Bigger STOP signs and street signage could be provided to increase the intersection conspicuity as well as the intersection control conspicuity;
- The road could be repaved to improve rutted areas;
- Pavement markings could be installed with more durable material or marked more frequently throughout the year; and
- Parking should be at least six meters from the intersection to improve visibility of cross traffic, pedestrians and STOP signs. Parking setback should be even more where a crosswalk is provided.

Four-way STOP control tends to be confusing to drivers at intersections with multi-lane approaches and frequent pedestrian crossings. It is therefore not recommended for this intersection unless road dieting is implemented.

E. Long-Term Potential Mitigating Measures

- Traffic calming techniques such as raising the crosswalk on Brunswick Street, road dieting or curb bulb-outs could be used.
- Insure intersection sight distance is met when corners are redeveloped to reduce angle collisions.
- Improved lighting to increase visibility could be investigated.

F.3 Winnipeg Street and 4th Avenue

Winnipeg Street and 4th Avenue is a signalized intersection under the jurisdiction of the City of Prince George. This intersection was selected in the 2004 Network Screening Program for the City of Prince George (2004 Network Screening Program, City of Prince George, Hamilton Associates) as one of top 20 locations for improvements.

A. Intersection Characteristics

The intersection layout is shown in FIGURE F.7 and some of the characteristics include:

- Signalized intersection;
- All turning movements are permissive;
- 4th Avenue is a one-way street with a shared through and right lane, a through lane, and a shared through and left lane;
- 4th Avenue has two overhead signals of 300 millimetre lenses and one mounted signal on the left of 200 millimetre lenses;
- Winnipeg Street has a shared through and right lane and a shared through and left lane;
- Winnipeg Street has one overhead signal of 300 millimetre lenses and one mounted signal on the left of 200 millimetre lenses;
- Marked crosswalks and STOP bars are provided on all approaches; and
- Pedestrian push buttons are provided on every crosswalk.

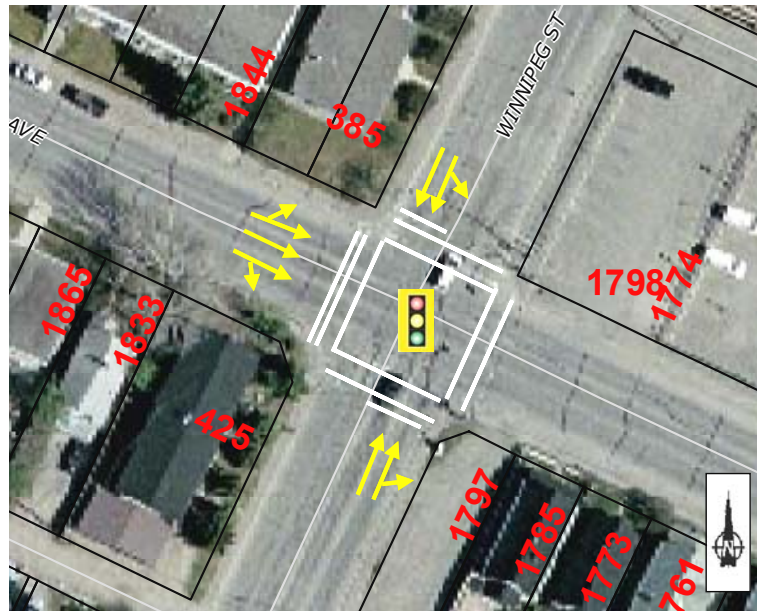


FIGURE F.7 WINNIPEG STREET AND 4TH AVENUE LAYOUT
(Base map from the City of Prince George PGMap. The laning is superimposed.)

B. Collision Type Distribution

The collision type distribution is shown in FIGURE F.8. Angle collisions were predominant with 63 percent of all collisions, followed by 25 percent of rear-end collisions. Out of the nine angle collisions, five involved a driver on Winnipeg Street running the red light, one involved a driver in 4th Avenue not seeing the red light, one happened during the intergreen period, and the other two do not provide details.

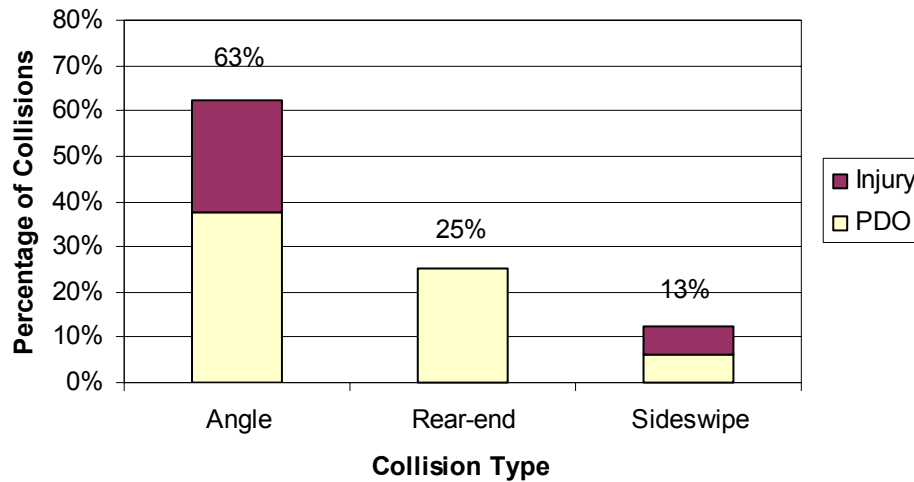


FIGURE F.8 COLLISION TYPE DISTRIBUTION

C. Observation and Findings

- The road is wide, which makes the intersection inconspicuous.
- Pavement markings are faded.
- Overhead signal heads are not aligned with the lanes.
- The “One Way” signs used are inconsistent with the current national guideline. The guideline for “One Way” signs is a white arrow on a black background of dimensions 900 millimetres by 300 millimetres. The reference is RB-21 in the Manual of Uniform Traffic Control Devices for Canada, 2002 (MUTCDC).
- Drivers may not expect a signal since none of the intersections surrounding Winnipeg Street and 4th Avenue are signalized

FIGURE F.9 shows photographs of the intersection.



Looking north



Looking south



Looking east



Looking east

FIGURE F.9 WINNIPEG STREET AND 4TH AVENUE PICTURES

D. Short-Term Potential Mitigating Measures

Some of the potential mitigating measures were determined in the 2004 Network Screening Program:

- “One-Way” signs (RB-21 in the MUTCDC) of dimensions 900 millimetres by 300 millimetres could be installed at both approaches on Winnipeg Street, increasing the conspicuity of the signs;
- Bigger street signage could be provided to increase the conspicuity of the intersection;
- Pavement markings could be installed with more durable material or marked more frequently throughout the year;

- Reflective tape could be provided on the signal backplates to increase signal conspicuity;
- One signal per lane could be provided on every approach increasing the conspicuity of the intersection while emphasizing the laning; and
- “Signal Ahead” warning sign (WB-4 in the MUTCDC) could be provided.

E. Long-Term Potential Mitigating Measures

- Modifications to the one-way roads considered in Chapter 3 could be applied to reduce the width of the roads and make the intersection more conspicuous;
- Signal and intergreen timings could be revised; and
- Mounted signals with 300 millimetre lenses could replace the current 200 millimetre lenses.

F.4 Vancouver Street and 4th Avenue

Vancouver Street and 4th Avenue is a two-way STOP controlled intersection under the jurisdiction of the City of Prince George. This intersection was selected in the 2004 Network Screening Program for the City of Prince George (2004 Network Screening Program, City of Prince George, Opus Hamilton) as one of the top 20 locations for improvements.

A. Intersection Characteristics

The intersection layout is shown in FIGURE F.10 and some of the characteristics include:

- Two-way STOP on Vancouver Street;
- 4th Avenue is a one-way street with a shared through and right lane, a through lane, and a shared through and left lane;
- Vancouver Street has one through lane and one lane for east turning movements;
- Marked crosswalks and STOP bars are provided on Vancouver Street and zebra crosswalks are provided on 4th Avenue; and
- Parking is allowed on all sides.

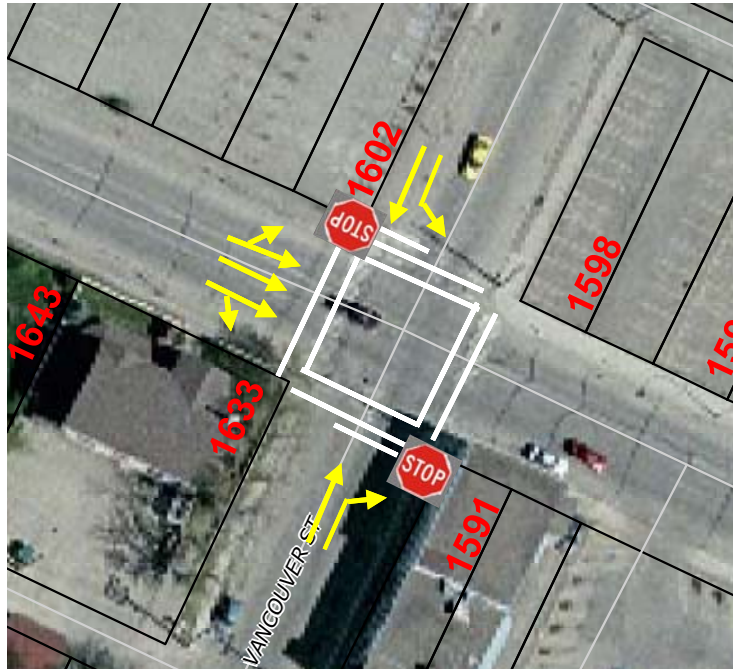


FIGURE F.10 VANCOUVER STREET AND 4TH AVENUE LAYOUT
(Base map from the City of Prince George PGMap. The laning is superimposed.)

B. Collision Type Distribution

The collision type distribution is shown in FIGURE F.11. Angle collisions were predominant with 55 percent of all collisions. Angle collisions tended to occur between eastbound and southbound vehicles.

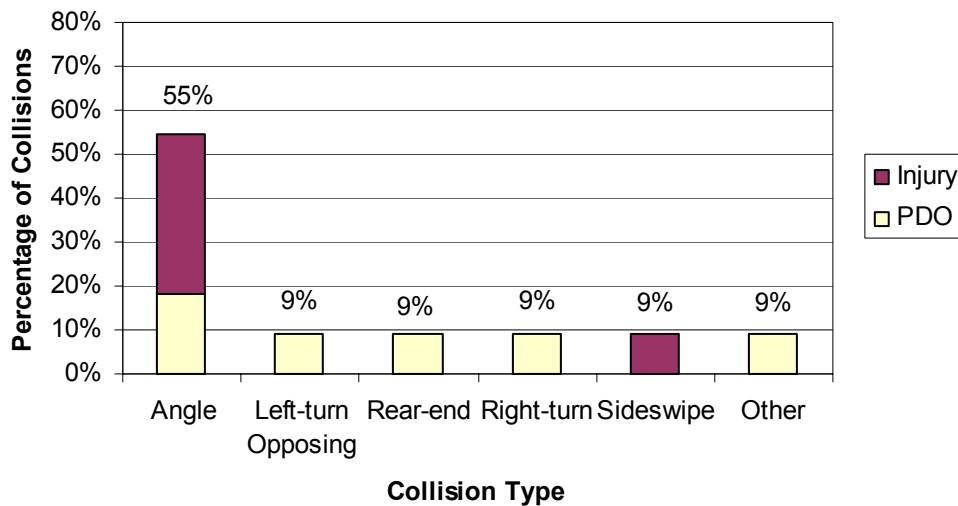


FIGURE F.11 COLLISION TYPE DISTRIBUTION

C. *Observation and Findings*

- The road is wide, which makes the intersection inconspicuous.
- Traffic volumes are low, and pavement markings are faded, so there are few visual cues to remind drivers that 4th Avenue is a one-way street.
- The southbound approach on Vancouver Street is rutted.
- Parking is permitted close to all corners.
- The “One-Way” signs on Vancouver Street are too low and not compliant with the current national guideline.
- Street lighting may be poor.
- Turning movement volumes were not available, but appear to be low, so likely a four-way stop is not warranted based on operations alone.

FIGURE F.12 shows the intersection.



Looking north



Looking south



Looking east



Looking west

FIGURE F.12 VANCOUVER STREET AND 4TH AVENUE PICTURES

D. Short-Term Potential Mitigating Measures

Some of the potential mitigating measures were determined in the 2004 Network Screening Program:

- “One-Way” signs could be upgraded by installing RB-21 (MUTCDC) signs of dimensions 900 millimetres by 300 millimetres on both approaches on Vancouver Street;
- Bigger street name signage could be provided to increase the conspicuity of the intersection;
- Curb extensions along Vancouver Street could be provided to reduce the road width and increase the conspicuity of the intersection and the STOP signs;
- As an alternative, a median on Vancouver Street could be considered to provide a STOP sign on both sides of the approach; and
- Pavement marking could be installed with more durable material or more frequently throughout the year.

In addition to this, parking setbacks as discussed in CHAPTER 8.0 PARKING, could be increased, particularly on Fourth Avenue, to ensure greater visibility of both motorists and pedestrians at this intersection.

E. Long-Term Potential Mitigating Measures

- Modifications to the one-way roads considered in Chapter 3 such as curb extensions or road dieting could be applied to reduce the width of the roads and make the intersection more conspicuous.
- Insure intersection sight distance is met when corners are redeveloped to reduce angle collisions.
- Improved lighting to increase visibility at night could be investigated.

F.5 Victoria Street and 2nd Avenue

Victoria Street and 2nd Avenue is a signalized intersection under the jurisdiction of the Ministry of Transportation. The Level of Service (LOS) for this intersection was analyzed in Chapter 3 for different conditions (current, two-ways and one-way enhanced).

A. Intersection Characteristics

The intersection layout is shown in FIGURE F.13 and some of the characteristics are summarized below:

- Signalized intersection;
- Marked crosswalks and STOP bars on all approaches;
- 2nd Avenue is a one-way street with two through lanes, one assigned lane for left-turns and one assigned lane for right-turns;
- 2nd Avenue has two overhead signals of 300 millimetre lenses and one mounted signal on the left of 200 millimetre lenses;
- Victoria Street has a shared through and right turn lane and a shared through and left-turn lane;
- Victoria Street has two signals of 300 millimetre lenses and one mounted signal on the left of 200 millimetre lenses; and
- Pedestrian push buttons are provided on all crosswalks.

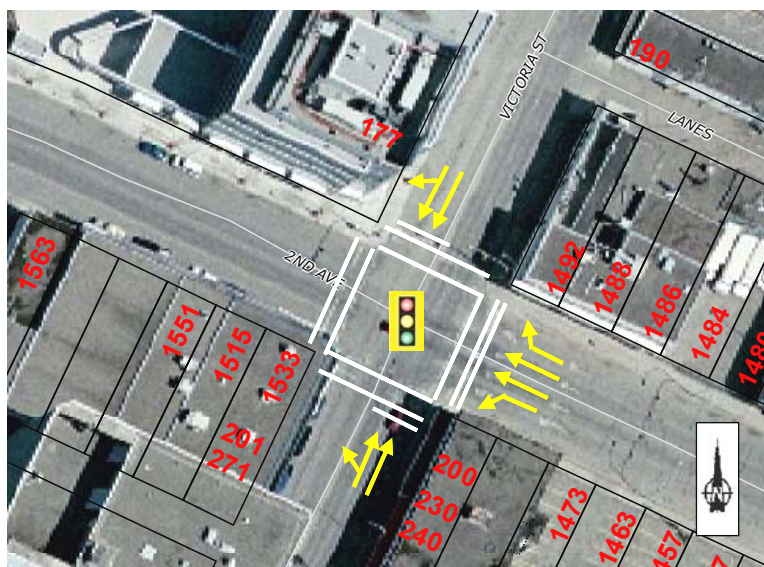


FIGURE F.13 VICTORIA STREET AND 2ND AVENUE LAYOUT
(Base map from the City of Prince George PGMap. The laning is superimposed.)

B. Collision Type Distribution

The collision type distribution is shown in FIGURE F.14. Sideswipe collisions were predominant with 36 percent of all collisions, followed by angle collisions with 32 percent. All of the sideswipe collisions happened on 2nd Avenue. Some of reasons for the sideswipe collisions involved drivers turning left from the wrong lanes and drivers changing lanes to turn. Most of the angle collisions involved a driver on 2nd Avenue running the red light.

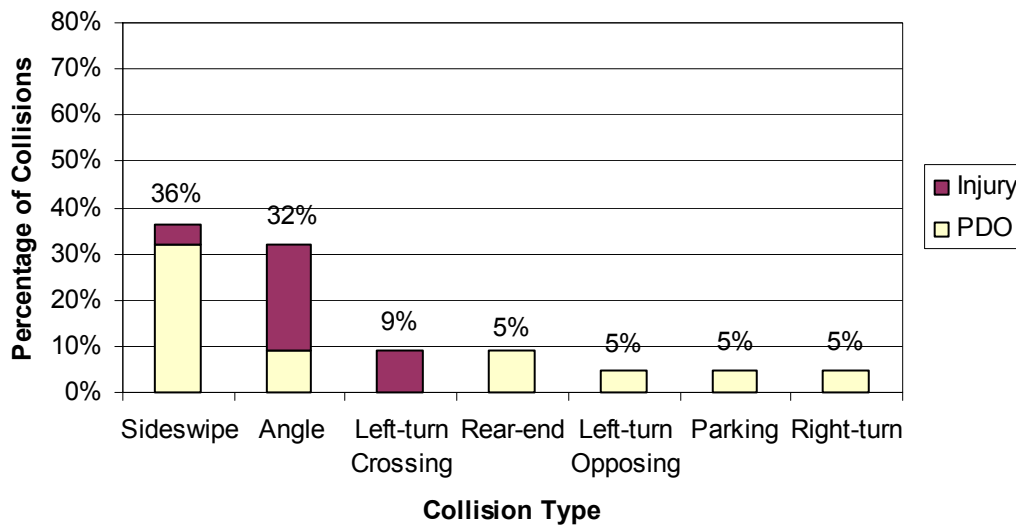


FIGURE F.14 COLLISION TYPE DISTRIBUTION

C. Observation and Findings

- The road is wide, especially the four lanes on 2nd Avenue.
- Overhead signals are not aligned with the lanes.
- The “One-Way” signs are not current national standard.
- The northbound approach does not have a “One-Way” sign except for the arrow indicating parking.
- The lane usage signs provided on 2nd Avenue before the intersection have a “No Left-Turn” sign that may be confusing to drivers.
- No “Lane Usage” signs are provided on 2nd Avenue at the intersection (after drivers have passed the overhead lane use designation signs).

FIGURE F.15 shows photographs of the intersection.



Looking north



Looking south



Looking west



Looking west

FIGURE F.15 VICTORIA STREET AND 2ND AVENUE PICTURES

D. Short-Term Potential Mitigating Measures

- Bigger street name signage could be provided to increase the conspicuity of the intersection.
- Reflective tape could be provided on the signal backplates.
- Signal and intergreen timings should be reviewed.
- Additional enforcement of left-turns from the centre lane.

E. Long-Term Potential Mitigating Measures

- Modifications to the one-way roads considered in Chapter 3 such as curb extensions and road dieting could be applied to reduce the width of the roads and make the intersection more conspicuous.
- Insure intersection sight distance is met when corners are redeveloped to reduce angle collisions. Curb bulb-outs could help to increase visibility.
- Mounted signals of 300 millimetre lenses could replace the current 200 millimetre lenses.

F.6 Queensway Street and Patricia Boulevard

Patricia Boulevard and Queensway Street is a STOP controlled intersection under the jurisdiction of the City of Prince George.

A. Intersection Characteristics

The intersection layout is shown in FIGURE F.16 and some of the characteristics are:

- STOP on Patricia Boulevard, with one left-turn lane and a channelized right-turn lane; and
- Queensway Street is a high volume street with two through lanes in each direction, a channelized right turn lane in the southbound approach and a dedicated left-turn lane in the northbound approach.

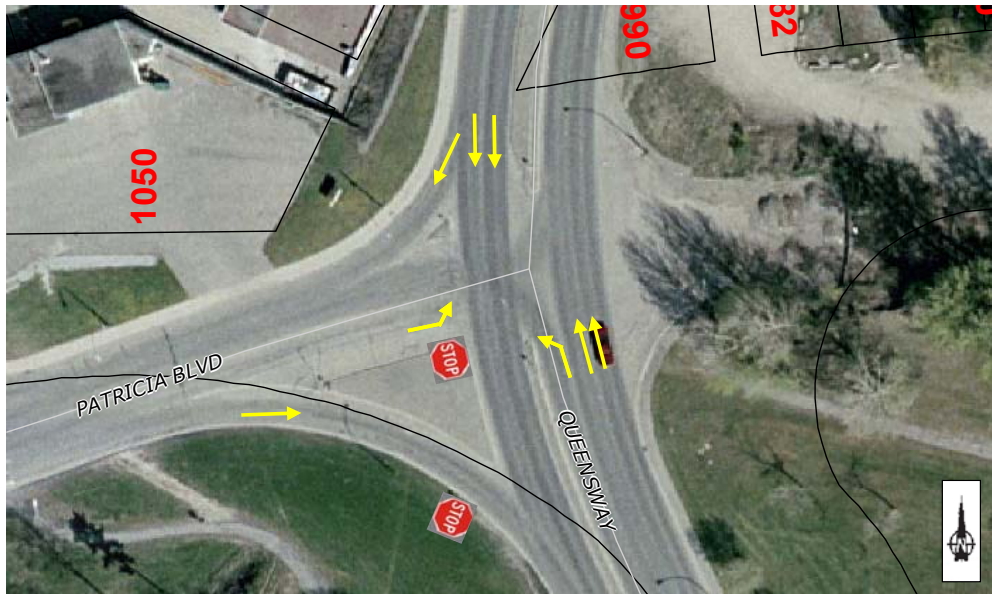


FIGURE F.16 QUEENSWAY STREET AND PATRICIA BOULEVARD LAYOUT
(Base map from the City of Prince George PGMap. The laning is superimposed.)

B. Collision Type Distribution

The collision type distribution is shown in FIGURE F.17. Rear-end collisions were predominant at this intersection with 60 percent of all collisions. Most of these collisions happened at the channelized right-turn on Patricia Boulevard, while a couple were related to pedestrians crossing Queensway Street.

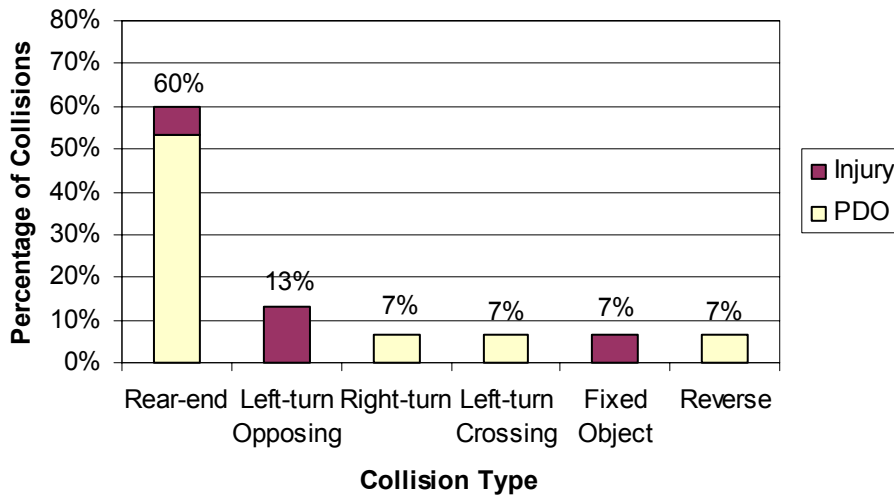


FIGURE F.17 COLLISION TYPE DISTRIBUTION

C. Observation and Findings

- Pedestrian crossing opportunities do not seem to be provided to meet the demand. City staff indicates that a pedestrian crossing previously existed at this location, but was removed due to safety concerns related to grades, alignment, sight distance and speeds.
- Most of the collisions are related to the channelized right-turn lane in the eastbound direction. This is consistent with current reviews which have found that right-turn channelization can result in unintended risks.

D. Short-Term Potential Mitigating Measures

- Street lighting could be improved to increase visibility at night, subject to more detailed review.
- Physically redirect pedestrians to crossing facilities provided at Upper Patricia and 5th Avenue.

E. Long-Term Potential Mitigating Measures

- Consider removing the channelized right turn, especially Patricia Boulevard to Queensway Street.

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- Traffic Operations
- Transportation Planning
- Road Safety Engineering
- Transit and Sustainability
- Asset Management
- Project Management