FINAL REPORT

Safer City

City of Kamloops

An Access Management Strategy

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1.0 INTRODUCTION

Safety and mobility of the transportation system in the City of Kamloops relies on the integration of land use and transportation decisions. On a city-wide scale, land use decisions affect how much and where people travel. In this regard, they influence mobility and support safety of the transportation system. At a corridor level, transportation and land use decisions also affect mobility along major roadways in the City as well as safety for local and through traffic. Further, site level transportation and land use decisions – including the types, density, design and layout of land uses – can also influence travel patterns and safety immediately surrounding the site. In general terms, integrated land use and transportation decisions at all levels affect safety and mobility of the transportation system in Kamloops.

Today, the City of Kamloops is a leader in the area of integrated land use and transportation planning and engineering. The city-wide transportation plan – TravelSmart – was developed with the explicit goal of combining land use and transportation decisions that maintain network mobility and support land use goals. At a site level, the City also reviews proposals for developments that recognize both land use and transportation goals. Through the Safer City process, transportation safety will serve a prominent role in city-wide and site specific land use and transportation decisions.

Although city-wide and site specific decisions in Kamloops explicitly consider transportation safety and mobility, the challenge is the scale in which decisions are made. Transportation and land use decisions made at the City-wide scale are generally very broad, while site specific decisions are often too isolated to provide system-level solutions and benefits. To more effectively address transportation safety and mobility within the City and overcome the large differences in scale between city-wide and site specific decisions, many communities have undertaken corridor strategies that address land use and / or transportation in order to improve safety and mobility, particularly along major arterial roads. The transportation strategies for the arterial roadways are typically directed at managing the number, types, configuration and design of accesses to support safety and mobility, while achieving land use goals. In this regard, corridor specific access management strategies can be used to maintain the intended function and safety of the roadway network at a level which bridges the significant gap between city-wide and site specific policies and decisions.

This Access Management Strategy provides Kamloops with a means of advancing corridor strategies to achieve the transportation goals of the City and support existing and planned land uses along major roadways. In particular, the strategy identifies:

- why access management is needed to achieve the City's transportation goals for mobility and safety;
- what other communities are doing in the area of access management;
- the general approach and process of developing access management strategies;
- the overall framework and guidelines for access management conditions; and
- access management needs in the City and priorities based on the need to address safety and mobility.

This report provides an overall strategy to manage the key corridors necessary to achieve the City's transportation, land use, social and environmental goals. This access management strategy for the City of Kamloops, while designed for the City as a whole, has been developed with the intention of being implemented in the short term on the corridors where issues are most prevalent and the implementation of an access management strategy could achieve the greatest benefits.

2.0 OVERVIEW OF ACCESS MANAGEMENT

This section introduces the concept of access management through background information and case studies, and describes the potential benefits from introducing access management strategies as a means of realistically achieving the transportation goals of the City of Kamloops.

2.1 What is Access Management?

Overall, access management is essentially a strategy to maintain compatibility between the function of major roadways and access to adjacent properties. This often requires a comprehensive corridor solution to meet the needs of the City and the individual property owners.

A good access management program will balance the need for access to developed land while ensuring a safe, efficient transportation system. Techniques, such as managing where and how accesses or signals are allowed, implementation of medians, construction of turn lanes, and maintenance of the local network support can be combined to regulate the amount and location of traffic entering and exiting the arterial.

Access management strategies typically include:

- classifying roadways based upon functional criteria, which reflect the importance of each roadway to regional and local mobility;
- defining allowable levels of access for each road class, including criteria for the spacing of signalized and unsignalized access points;
- applying appropriate geometric design criteria and traffic engineering analysis to the allowable access; and
- developing supporting plans, policies and administrative procedures.

Roadway classification for Kamloops is currently being addressed as part of the Network Classification Strategy.

Access management can be proactive – policies are implemented as a corridor and land uses are being developed; or reactive – based on inconsistencies between the functional role of the roadway and access characteristics. The proactive approach to access management should be based on design and planning guidelines and standards. The reactive approach often deals with conditions where the access characteristics are not compatible with the function of the roadway

and where safety and/or mobility have become problematic. Ideally, redevelopment of land can be used to address these issues, but in some cases, access management strategies may provide a means of addressing the situation without short-term changes in land use patterns.

While access management is based on engineering and planning concepts, acceptance and buy-in can only be attained if the strategy and action can protect or even improve local economic conditions and enhance the liveability of the community. A primary goal of any access management program is to improve the performance of the arterial in terms of safety and mobility for all modes of transportation, while the most successful programs will seek to have a net impact on business that is neutral or even positive. The transportation objective should not be met at the expense of the overall economic health of the community.

2.1.1 Canadian Examples

Most communities have some form of access management whether it is implicitly stated within existing policies such as Official Community Plans (OCP) and Zoning Bylaws or whether it is explicitly stated in an access management strategy. The first approach is usually more ad-hoc. Access management planning in Regina, Saskatchewan highlights some of the shortcomings of this approach. While it is the goal of the City to fully restrict access on arterials, it is often subverted by the pressure to attract further development. Without a sound access management strategy that permeates throughout the regulatory framework, it has become difficult to preserve the integrity of the arterial road system. This is similar to the current situation in Kamloops and reinforces the need for clear access management guidelines. Other Canadian examples include:

- ***Winnipeg, Manitoba*** has policies in place that restrict access on their main North-South and East-West routes and no private access is allowed in their downtown area.
- ***Medicine Hat, Alberta*** examines access in the development review stage of a proposed development. In older areas of the City, full access has been granted to private property and in some cases the arterial cuts through residential areas where every property has a private driveway. However, in new development areas, no access is allowed to the arterial. All commercial development must be accessed by a nearby collector or arterial road or by an intersection.
- The cities of ***Belleville, Ontario*** and ***Lethbridge, Alberta*** have utilized the TAC guidelines in ensuring accesses are managed. Lethbridge is in the process of developing an access management strategy. The City's guidelines currently require that arterials should be located at 1.6 km intervals and intersections along the arterial should be spaced at 300 to 400 m intervals.

In these cases, the focus has been entirely on roadway classification and broader network strategy, and is lacking the more detailed view to address specific mobility and safety issues.

2.1.2 Case Studies

Gorham, Maine

The Town of Gorham, Maine has successfully implemented an access management program that addressed the problems associated with having a busy regional highway as the main commercial street. This situation caused significant concerns with respect to mobility and safety and resulted in complaints from the public and private businesses that access was deteriorating. Due to these complaints, the Town, in partnership with the State Department of Transportation, embarked on an access management program.

As part of the plan preparation and implementation, numerous opportunities were made available for the public to add their input. In order to achieve buy-in, the Town pointed out that some existing businesses already employed access management techniques such as access consolidation. Though there were some reservations about the cost of implementing some components of the access management plan, it was agreed that many of the traffic improvements aided both pedestrians and traffic flow. The Town was also able to take a two-phased approach to the access management plan with both short and long-term implementation plans. The easily implemented access improvements were made in the initial 5-year period. This phase included measures that required cooperation between the Town and property owners and business but also included many measures that the Town could implement on its own as part of its annual capital improvements plan. The second phase of the plan included measures that required more intensive capital work and changes in various regulatory policies.

Throughout the process of developing the plan it became apparent that many of the traffic improvements aided pedestrian movement. Reducing the number of curb cuts as part of the access management plan also increased the amount of sidewalks and landscaping treatments in the public right-of-way. This measure reduced the number of vehicle-vehicle and vehicle-pedestrian conflict points. Much of the success of this plan was based on the incremental approach taken which demonstrated to citizens and business alike the positive impact of the plan.

Ames, Iowa

Ames is a community of approximately 50,000 people and is home to Iowa State University. One of the City's major streets is South Duff Avenue, which is a four-lane facility that is part of US Highway 69, but serves mainly local traffic. By 1992, there were 33 driveway access points on a

0.8 km stretch of road. Traffic volumes were heaviest in this area due to the significant commercial development that included motels, recreational facilities, fast-food restaurants, convenience stores, service stations, small shopping centres and other commercial businesses. A number of these access points were located in close proximity to intersections, thus disrupting traffic flow and hindering access to these properties. Safety in the corridor was being compromised, an indication of which was the higher than average mid-block accident rate. The majority of these accidents were due to vehicles turning in and out of businesses located along the corridor.

Further indicative of the problems on the corridor was the fact that the two intersections located within the study area had long line-ups of traffic using the inside lane for left turns, precluding its use for through traffic and thus reducing the capacity of the roadway. These intersections were also the location of many accidents.

The City of Ames undertook a program of access management that included the installation of a two-way left turn lane along the entire length of the corridor, driveway consolidations and closures at strategic locations, resulting in the closure of 25% of the access points along the corridor, and signal upgrades at the two intersections.

The access management program resulted in a 68% reduction in the number of accidents and a significant reduction in the number of accidents that are generally caused by driveway movements. Operations on this corridor segment improved from a LOS C to a LOS B, despite a significant increase in traffic. It is anticipated that with these improvements in place that the corridor will be able to handle the expected growth in traffic without suffering significant increases in delay.

Westminster, Colorado

In 1980, The City of Westminster, Colorado developed an access management plan for the Sheridan Boulevard Corridor, which at that time was still relatively undeveloped. However, it was anticipated that the area was going to experience significant development pressure that could compromise Sheridan Boulevard's role as a major arterial. In order to protect their investment in the corridor and to maintain the operational and safety performance, it was believed that the implementation of an access management strategy would help the City maintain both operational and safety performance and ensure that the City's investment in the corridor was preserved. The City believes that the plan has been successful because it was implemented prior to development occurring.

In order to develop the access management plan, the City followed a set work program which included:

1. Developing appropriate access control goals for the corridor;
2. Developing an understanding of the guiding principals behind the plan;
3. Preparing a model for the access plan based upon the determined criteria and then to examine each access thoroughly to make tradeoffs and exceptions if required;
4. Preparing for and conducting public meetings and hearing; and
5. Asking for and gaining city council approval.

The plan has been a major success story for the City and has been used as the model for the implementation of other access management plans on other corridors within the City. One reason the plan has been successful is due to the fact that the plan has been adopted throughout the planning regulatory framework of the City and has been adhered to by City staff. For instance, "in cases where development proposals had been prepared and were in conflict with the access plan, the City's insistence on adherence to the plan caused the development interests to reformulate plans for access." In no recorded cases did this cause development not to occur and the plan itself has proven "to be a constraint within which development is possible" (Reish and Normandin 1996). Adherence to the plan ensured that there was consistency and equality in the decisions that were made, giving the appearance of an objective plan.

Improved Business Vitality in Iowa

Many business owners will perceive an access management strategy as having adverse impacts on their business as customers will no longer be able to access their businesses as easily. A study conducted for the Iowa Department of Transportation's Access Management Task Force examined the impacts of access management on business vitality in five communities throughout the State. The study concluded that there was very little change in the business composition after implementation. In four of the five cases, the five-year business failure rates for businesses along the corridor were substantially lower than the community at-large. Further, retail sales grew at a significantly higher rate along the corridor than the surrounding neighbourhoods. However, the most compelling evidence was that 53% of business owners stated that their post-project sales were the same and 33% stated that they were higher. The success of these ventures could be summarized by the business owner who strongly opposed an access management plan. His opposition was so strong that he offered a reward to anyone that would

help ensure that the plan was defeated. Despite his opposition, the plan was implemented and the business owner eventually recognized the positive impact that it had.[1]

2.2 Why Manage Accesses?

The need for access management often arises when an arterial road that functions well and offers convenience experiences pressure to be developed for commercial uses. These businesses will likely want and/or require access to the arterial. An increase in the density of accesses causes conflict with the primary function of the arterial – to move traffic in an efficient manner. This in turn can cause an increase in the number and severity of collisions and a decline in traffic service. The arterial then becomes a less attractive route for drivers who begin to choose alternate routes through neighbourhoods or begin to demand that alternatives be developed. Finally, this results in a long-term reduction in business along the corridor. Access problems are therefore viewed as symptoms of inadequate coordination between transportation and land use decisions.

An access management strategy provides a systematic approach to dealing with existing and potential problems by meeting transportation and development objectives. The situation described above can be avoided when decisions are made based on the overall role and function of a corridor, rather than on a site specific basis. In this way, development along the corridor can be supported with a more comprehensive approach to providing access that also preserves the integrity of the arterial.

In considering an access management strategy, it is important to weigh the costs of operating an arterial without a strategy with the benefits of operating an arterial that has managed access. Table 2.1 provides a summary of the potential benefits of access management and the costs of not having an access management strategy.

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[1] Plazak D. et. al, The Impact of Access Management on Business Vitality. Section 20-1998 National Conference on Access Management, 1998.

Table 2.1
Benefits of Access Management

Managed Corridor	Non-Managed Corridor
• Lower collision rates	• Higher collision rate with more severe accidents and more risk taking
• Minimal delays	• Poor traffic flow, congestion, increased travel times, fuel consumption, and vehicular emissions
• Extends life of the road	• Unsightly strip development
• Consistent treatment of applicants for access permits	• Local roads begin to be used for through traffic causing neighbourhood disruption
• Protects investment in the abutting properties	• Use of a local street parallel to the overburdened arterial to make a one way pair
• Enhanced capacity of existing facilities	• Pressures to widen an existing street or build a bypass
• Decreases fuel consumption/reduces emissions	• Decrease in property values
• Reduces capital costs	• Businesses become more difficult to access in the long-term and newer businesses shift to better-managed corridors

In addition to the benefits for economic growth and vehicular traffic, there are also significant benefits for pedestrians and cyclists. The provision of fewer, but more prominent accesses make non-vehicular travelers less vulnerable to unexpected vehicle movements. It allows for better continuity of sidewalks and bicycle lanes and can include access design guidelines that specifically address pedestrian and cyclist issues.

While most access management methods are based in traffic engineering principles, the outcomes of an access management plan must add to the public and private good in order to ensure success. As mentioned previously, there are many benefits of implementing an access management strategy. These benefits can generally be described in terms of their impacts to safety as well as other attributes such as mobility, land-use, affordability and the community and environment. The following sections outline some of the primary benefits arising from an access management planning program.

2.2.1 Safety

Access characteristics influence safety in many ways. At a planning level for a corridor, the types of access and access density influence safety for vehicles as well as other modes of transportation. At a design level, the layout and configuration of accesses along an arterial can influence collision patterns. Access management strategies provide a means of minimizing

collisions by managing the type and density of access. The difference in speed that arises between through traffic and traffic moving and to and from driveways can lead to a higher frequency of roadside and rear-end collisions between vehicles.

The Transportation Association of Canada *Geometric Design Guide for Canadian Roads* presents comparisons of collision and fatality rates with varying degrees of access management along urban and rural roads (See Table 2.2 below).

Table 2.2
Effects of Access on Collisions and Fatalities in Urban & Rural Areas (# of collisions per mvk)

Access Control	Urban		Rural	
	Total	Fatal	Total	Fatal
Full	1.12	0.01	0.91	0.02
Partial	2.98	0.03	1.27	0.04
None	3.16	0.02	2.00	0.05

Source: Transportation Association of Canada, Geometric Design Guide for Canadian Roads, September 1999.

These patterns indicate that the collision rates can be two and three times higher in urban and rural areas respectively along roadways with no access in comparison to those with full access.

Recent research has indicated that there is a direct relationship between access density and safety along the roadway network. This has indicated the following:

- A reduction of accesses from 31 to 25 per km (80% decline) would result in an 8% to 17% reduction in collision potential.
- A doubling of access spacing from 6 to 12 driveways per km would increase accident exposure by approximately 29%.

Consistent with the above research, collision rates are influenced significantly by the density of accesses along a given roadway with differences in road geometry, operating speeds, and driveway and intersection traffic volumes. In fact, the collision rates within an urban area increase by anywhere from 30% to 50% with a doubling in access density. In rural areas, collision rates also increase by similar proportions with increase of access density. Safety research shows that access managed routes usually experience 50-60% less accidents. Several accident studies indicate a strong correlation between increases in frequency of accesses and increases in accidents. Some of the safety benefits of access management occur because:

- longer driveway and median spacing results in fewer locations at which traffic conflicts occur;
- drivers have adequate time to respond to one access conflict at a time;
- conflict and speed differential between turning vehicles and other traffic vehicles in the traffic stream is reduced; and
- the improved design of access gives drivers a better visual cue of the upcoming driveway location.

By limiting the number of conflict points, separating conflict areas and removing turning vehicles from through traffic, driver expectation is improved and risk-taking reduced. High accident rates on a roadway can affect driver psychology. Often times, when there is a higher accident rate, there are also many near misses and while certain situations may not lead to an accident, they can affect the perception of drivers on the roadway. If the level of comfort is compromised significantly, drivers may either choose to use local roads for through traffic or choose to stay away completely unless absolutely necessary. Similarly, if turning into a business "feels" risky, drivers are less likely to do so.

While primary safety benefits of an access management strategy will accrue mainly to motorists along the corridor, an access management strategy can also enhance the safety of pedestrians and cyclists. Improved definition of access points and an overall reduction in the number of accesses provides pedestrians and cyclists with a better indication of possible vehicle movements. A reduction in the number of accesses will cause a reduction in the number of potential conflict points. The provision of more prominent and well designed access locations with proper treatments such as medians will make drivers more aware of pedestrians and cyclists at the access locations. In particular, non-traversable medians provide a refuge for pedestrians when crossing and generally are safer, as indicated by study results that show a 78% reduction in pedestrian fatalities (per 100 mile of roadway)[2] when compared with traversable medians (two-way left turn lane).

2.2.2 Other Attributes

The reasons for access management extend beyond safety as other experiences suggest. While safety may be the primary motivating factor for implementation, an access management strategy

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2 Access Management Manual, Transportation Research Board, Washington DC, 2003, p. 18.

can have direct benefits to other attributes such as mobility, land use, community aesthetics, and affordability of the overall network.

Mobility

An effective access management strategy will impact mobility by reducing delay and by preserving and increasing capacity along the roadway at desirable speeds. Mobility on the major roadways in Kamloops is an important goal of TravelSmart. High access density contributes significantly towards the degradation of mobility and decrease in capacity in urban areas. An access management strategy can preserve roadway capacity thus reducing or delaying the need to build new corridors. Maintenance of mobility on the arterial system helps to minimize spill-over of through traffic trying to find short-cuts through the adjacent residential street network (i.e., "rat-running"). By reducing the number of turning vehicles, improving operations on the roadway and reducing the number of access locations, less traffic will be delayed waiting for others to complete turning manoeuvres, particularly left turners.

A project completed by the Colorado Access Control Demonstration concluded that a section of 4-lane divided road with ½ mile signal spacing and right turn only at the ¼ mile midpoint had 42% fewer total vehicle-hours of travel and 59% less vehicle-hours of delay than a 4 lane section of divided road with ¼-mile signal spacing and all movements allowed at the 1/8-mile midpoint (Access Management Location and Design, 1998). With decreases in delay, there is a corresponding increase in the capacity of the roadway which would prolong the useful life of the road. It is further noted that capacity can be increased by 25 – 45% with access control by controlling left and right turns, lateral friction, and speed of access and egress. Further travel time and delay can be reduced by 40-60% as a result of fewer stops and smoother traffic flow (Access Management Location and Design, 1998).

The Florida Department of Transportation has estimated that the LOS D threshold is met on a four lane road once traffic volumes reach 23,592 vehicles per day in a situation where there is low access management. However, in a situation where there is high access management, this threshold is not achieved until there are 33,500 vehicles per day. This results in a 42% increase in capacity.

A study completed by the Iowa Department of Transportation in 1997 examined seven different communities within the State that had retrofitted access management to a corridor. As part of this study, a summary of operational benefits was completed. As indicated in Table 2.3, all of the communities were able to either maintain or improve the operations of the corridor, even with significant increases in traffic volumes.

Table 2.3
Affects of Access Management on Mobility and Capacity

Project Location	Before Project		After Project		
	AADT	LOS	AADT	Change in Traffic Volume	LOS
Ames (US 69/ S. Duff Ave.)	20,500	C	21,800	6.3%	B
Ankeny (US 69/Ankeny Blvd.)	12,000	C/D	16,300	35.8%	B
Clive (NW 86th St.)	26,000	D	28,000	7.7%	B/C
Des Moines (US 65-69/14th St.)	25,900	D	27,800	7.3%	B/C
Fairfield	16,800	B	15,800	-6.0%	B
Mason City	19,000	B	22,000	15.8%	B
Spencer (US 71/Grand Ave.)	14,800	B	17,600	18.9%	B

Source: Access Management Awareness Program Phase II Report, 1997

Other studies indicate the correlation between signal spacing and density with travel time and speed. As signal density increases, travel times would also increase, thus reducing speeds. For each signal added per 1.6 km on a roadway, the speed decreases by 3.2 to 4.8 km per hour[3]. Optimal combination of the number of signals and appropriate signal spacing would yield uniform traffic flow.

Land Use

An access management strategy is one tool among many that can help a City maintain its hierarchy of roads and improve the design of residential divisions and commercial circulation systems. The hierarchy of roads within a community is often used as a guide to develop zoning and Official Community Plan designations. For instance, small lot, low density residential development is discouraged along a major arterial unless access can be achieved on a lower form of road. At the same time large scale commercial development is discouraged on local streets due to the high traffic generation characteristics of these land uses. A well designed access management strategy aids in maintaining the hierarchy of roads by ensuring that mobility goals for multi-modes are achieved along the corridor. A rigidly enforced hierarchy of roads, in turn, supports land use goals by reducing the potential for land use conflict.

Typically, access management and land use planning go hand in hand. If every building lot along a road is guaranteed at least one access, it makes sense, if it is desired to limit access, to increase minimum lot sizes, particularly lot frontages, so that the number of guaranteed access

[3] Ibid., p. 20.

points is limited. This will help to preserve the investment in the roadway and encourage the type of development that is desired for these corridors.

Affordability

A well-implemented access management program can reduce costs. These benefits can be generated primarily in terms of preserved investment in existing facilities as well as reduced fuel and accident costs. As noted previously, an access managed corridor will have greater capacity thus prolonging the useful life of the corridor, which in turn gives decision-makers more time to make proactive decisions on major construction projects. In its simplest terms, it can defer investment in capacity improvements. Financial benefits can also accrue to businesses as the transportation of goods and people becomes more efficient.

Community/Environmental

Though these are not often the primary reasons for implementing an access management strategy, an effective access management strategy can accrue benefits to the community and the environment. These benefits can include:

- neighbourhood integrity – less need or desire for through traffic to use local roads through neighbourhoods when good mobility is maintained on the arterial;
- The opportunity for more coordinated landscaping along a corridor to improve streetscape image and provide visual cue for driveways and median openings;
- Reduction in traffic congestion and delay which can lead to a decrease in car emissions improves fuel efficiency;
- Attraction of economic development; and
- Preservation of mobility and capacity to postpone need for new major roadways or by-pass facilities.

2.2.3 Obstacles to Access Management

Although there are many potential benefits of access management, there are also inherent obstacles and barriers. These obstacles will be different for every corridor and will influence the approach taken in implementing the access management strategy. It must be noted that obstacles will be more prevalent on established corridors as opposed to newly constructed corridors. Some barriers include:

- The presence of established land uses and the possible appearance that individual properties are being singled out;
- Lack of support from the community, particularly land owners;
- Limited support networks;
- Narrow classification system and lack of guidelines;
- Lack of support from existing policies, procedures, land development regulations; and
- Limited acquisition of access rights.

3.0 THE STRATEGY

Access management is not a project. While many individual projects may be carried out that meet the objectives of access management, ultimately it is the ongoing **management** that ensures there is a policy that is "triggered" as certain events occur. An access management strategy should be considered in the same context as other regulatory policies such as an Official Community Plan or a Zoning Bylaw, and in fact, should be incorporated in these policies. This section of the Access Management Strategy describes:

- The overall framework in which access management is applied to both new and existing major roadways;
- The principles that guide considerations for access management that recognize transportation, land use, social, financial, and environmental goals;
- Guidelines for type and density of access in the City of Kamloops consistent with the role and function of the corridor;
- A "toolbox" of treatments for access management that may be considered within corridor specific strategies;
- An assessment of existing major corridors in the City in order to identify access management needs and priorities;
- A process for developing an access management plan for a specific corridor; and
- The use of the access management strategy to support and complement existing regulatory policies.

3.1 Framework

As previously noted, access management can be applied to new corridors, or to an already developed corridor. Ideally, an access management strategy would be developed when a corridor is first constructed. However, in most cases, the role and function of arterial corridors change over time as development occurs and the community grows. Even corridors that are initially constructed with good access management practices can deteriorate with development pressures, particularly when incremental, site by site assessment of impacts are considered, i.e., the impact of one new development is often minimal, but the cumulative impact of several developments and their respective accesses can be significant.

In reality, most access management strategies are reactive in nature. As mentioned earlier, implementing an access management strategy can be challenging and barriers could be present.

Therefore, implementation of a strategy will generally be a slow process and associated with land use change. Full implementation of desired guidelines will often be difficult because of the development constraints. In some cases, it will not be possible to achieve the desired effect since property adjacent to the roadway is often already built and redevelopment will take a long time to occur, if at all. Also, intersections and support networks are generally already established as are the functional characteristics of traffic along the major roadways. In this regard, the access management approach needs to recognize both short-term and long-term realities. This can be in the form of various degrees of management or other interim measures such as provision of alternate routes or speed management.

A framework for an access management strategy in Kamloops should consider the functional objectives of the corridor. In general, a high degree of management is appropriate for major arterials that are intended to move large volumes of vehicles and where property access is a secondary consideration. More moderate management approaches are often intended to maintain property access while addressing safety and mobility issues. Similarly, a more moderate approach may be possible in the short term, with the goal of meeting more aggressive guidelines in the long term. When considering an access management strategy, the class and function/role of each roadway must be considered. Further consideration must be given to the issue precipitating an access management strategy. For a new roadway, the issue may be to preserve capacity for as long as possible while for an existing roadway, more careful consideration must be given to the exact needs and the type of response. A thorough assessment of issues and needs must be undertaken to generate the appropriate response.

3.2 Strategy Principles

Some of the fundamental principles of access management are described in the following points.

- ***Access management should permeate through the regulatory framework of land use planning, transportation planning and engineering.*** Specific policy statements related to access management on arterials should be included in the Official Community Plan, the Zoning Bylaw, the Subdivision Bylaw, and the Site Plan Approval.
- ***Access management is a multi-stakeholder process,*** not just a traffic engineering exercise. It is most successful as an integrated land use and transportation strategy. The process must include City officials, property owners, land developers and business owners to ensure input from these various parties is collected and synthesized into a workable strategy.

- ***An access management strategy must make economic sense.*** A successful access management plan will inevitably prove fruitful economically if mobility and safety are improved while at the same time access to property is enhanced.
- ***Access management must recognize the goals of the city and the needs of the property and business owners.*** It must not be perceived as a win-lose situation where the goals of the City to improve arterial performance supersede the needs of the property owners for access to their property, or where the desire for more development adversely impacts the mobility and safety performance of the arterial.
- ***The access management plan should be implemented over the long term.*** There should be recognition that implementation is long-term and that full benefits will not be significantly realized until the plan is fully implemented. This means that the basic principles of the plan need to remain in place, even if it is updated over time.
- ***Communication*** is critical to the success of the access management plan. A communications program should be developed in conjunction with the implementation plan. Coordination would play an important role between agencies and stake-holders to build and ensure consensus and support for components of the access management plan. Affected parties should be informed about the principles and benefits of access management.
- ***The plan details, but not the principles should be flexible.*** The access management plan must be monitored and updated on a regular basis to reflect changing land uses, but the overall principles of the plan must be retained to allow implementation to be successful.

3.3 Access Guidelines

In an effort to support goals for safety, mobility, liveability and economic sustainability in Kamloops, access guidelines have been developed to provide clear and practical policies for decision-makers. These guidelines outline the overall approach towards managing the number and type of accesses consistent with a given class of road and identify specific desirable design features. For new corridors, it is expected that the guidelines would be achieved to limit the need for long-term change. Along existing corridors, the guidelines are used as benchmarks for identifying potential issues and concerns that may be addressed through access management. In this regard, they are not considered standards where changes are essential.

Table 3.1 summarizes access guidelines for each class of roadway in the City as defined within the Network Classification Strategy.

Table 3.1
Recommended Access Management Guidelines

Characteristics	Freeway/ Expressway	Major Arterial	Minor Arterial	Downtown and Commercial Arterial	Primary Collector	Neighbourhood Collector, Local, Industrial
Property Access	None	Limited access (right-in/right-out)	Limited access (right-in/right-out)	All way access permitted	All way access permitted	All way access permitted
Density (access/km)	n/a	0-5 per km	5-10 per km	10-20 per km	20-30 per km	20-50 per km
Types of Connecting Roadways	Express, Major/Minor Arterials only	Express, Major/Minor Arterials, Hillside and Collectors only	All Types. Locals discouraged.	All Types. Locals discouraged	All Types except Express	*Collector/Industrial:* All Types except Express *Local:* All Types except Express. Major Arterials discouraged
Adjacent Land Uses	Commercial, Industrial	Commercial, Industrial, High density residential	Commercial, Industrial, Residential	Commercial	Commercial, Residential	Commercial, Industrial, Residential
Lot Characteristics	Large parcel sizes. Lots front on a minor road	Moderate sized parcel. Can front on the arterial but large lot frontages encouraged	Moderate sized parcel. Can front on the arterial but large lot frontages encouraged. High density residential can have access, lower density will "back" on the arterial	Smaller parcels, small lot frontages, smaller depth, particularly in downtown, downtown businesses and strip plazas may share access	Parcels sizes vary, frontages are smaller and there is typically less depth to parcels	Small lot frontages for residential, larger for industrial. Local roads serve developments in these areas

Note: Density = full accesses, plus any left-out movement access per km.

3.4 "The Toolbox"

There are literally dozens of initiatives and strategies to support access management goals for different classes of roadways. The following section identifies specific treatments that may be applied to achieve the access type and density guidelines. The treatments or "toolbox" consists of several design and policy techniques that can be employed to implement an access management strategy. The technique that is used may depend on the circumstances that surround the need for an access management strategy. If, for instance, the access management strategy is being employed for a new corridor that has not been constructed, there may be an opportunity to include such measures as frontage roads or restrictions on adjacent land uses. However, where the access management strategy is implemented in reaction to existing conditions, it may be more feasible to employ measures such as medians and left turn lanes. The following are examples of some access management techniques which reduce the number of conflict points between various modes (vehicle, pedestrian and cyclists).

3.4.1 Frontage Roads

When land is subdivided for small commercial or residential uses, the lots abutting the arterial should not be allowed direct access to the road. Instead, a frontage road, which provides access to the property, should be constructed. This approach is common on provincial highways. Frontage roads eliminate the conflicts between high-speed traffic and traffic entering and exiting closely spaced driveways and accommodates pedestrians and cyclists. Parking on frontal roads may be permitted and access to the arterial is provided at locations that can be designed to more safely handle the traffic. Landscaping, berms, or other barriers with a minimum buffer width of 7.6 metres may be provided to buffer properties from the noise, and traffic on the arterial. While frontage roads can be used as a means of consolidating driveways, one must be cognizant that as traffic volumes increase and as the frontage road extends to major cross streets, adverse impacts can accrue to the intersection serving the frontage road as the frontage road intersection is situated close to the arterial. A preferred strategy in some instances would be the construction of backage roads which are much like frontage roads except they are developed behind the corridor development. This automatically provides a large separation between the service road terminus and the major intersection (Sokolow, 2000).

3.4.2 Median & Left-Turns

Median and median opening are roadway design elements that may be considered as access features for managing. There are three general median types: two-way left turn lane (TWLTL), traversable median and non-traversable median. Traversable median does not effectively control

vehicles from entering marked areas and therefore is not usually considered as an access management measure. Two-way left turn lanes are commonly used on 4- to 6-lane undivided roadways and have the ability to increase capacity and reduce delay. There are setbacks to using this median type, as left-turns may overlap, strip development is accommodated and no refuge is provided for pedestrians. A non-traversable median is more desirable as it is a divider that separates opposing traffic streams and provides refuge for pedestrians attempting to cross the street as well as for vehicles making left-turns from or to a street. Non-traversable median is suitable for roadways with 4 lanes or more, existing major roadways with daily traffic volumes ranging from 24,000 to 28,000, major roadways at new locations, and undivided roadways or roadways with two-way left turn lanes that are experiencing safety problems.

The technique with non-traversable median results in crash rates on major roadways to be substantially lower than undivided roadways or roadways having a two-way left-turn lane. They provide sufficient space for left-turn bays, reduce the number of conflict points and also provide the opportunity for some beautification such as landscaping.

Memorial Drive in the Atlanta area is an example where a raised median was installed. Previous to the installation, a two-way left turn lane was in place that provided access to businesses and other connecting roads. The section of road was 4.3 miles long with 6 lanes of traffic. The new median was 14 ft wide and had 14 openings. Besides the businesses that lost left turn access, seven public streets were also not given median openings. The results of the introduction of the median were the virtual elimination of mid-block, left-turn collisions and a reduction in intersection crashes. Left turn crashes between intersections were virtually eliminated and there was a reduction in intersection crashes. The accident rate was reduced from 947 accidents per million vehicle miles to 511 accidents per million vehicle miles and since the installation, there have been no fatalities, where in the ten years previous to the installation, there had been 15 deaths, 6 of which were pedestrians (Parsonson 2000). Median opening depends on intersection spacing interval criteria. In general, longer spacing improves safety and operation but may influence lengthier trips.

3.4.3 Auxiliary Lanes

Left-turn and right-turn bays minimize the conflict and speed differential between turning vehicles and following through traffic. They also provide storage space where drivers can wait to complete the turn manoeuvre. This results in smoother traffic flow and increased safety. Key factors to consider for design consist of manoeuvre distance, queue storage and turn bay length.

A widely used access management technique is to provide a dedicated two way left turn lane for conditions that involve high speed roadways, areas with high left-turn volumes and when traffic volumes are greater than 200 vehicles per hour. While there are many benefits to this, it has been proven that with regard to safety, that a raised median with cut-outs for selected access locations provides greater safety benefits, due to the reduced number of turning opportunities.

Much research has been completed that states when a right turn bay should be installed. The Florida Department of Transportation has provided guidance as to when right turn bays should be installed. One guideline stipulates that a right turn bay should be provided once right-turn volumes reach 700 vehicles per hour. Other key conditions include areas where there is a high collision pattern of rear-end collisions that involves right-turns, at signalized intersections to increase capacity and removal of right-turn movement from through traffic lanes.

3.4.4 Access/Driveway Location and Spacing

Driveway location affects the ability of a driver to safely and easily enter and exit a site. If not properly placed, exiting vehicles may be unable to see oncoming vehicles, and motorists on the roadway may not have adequate time to stop.

Driveway spacing standards establish a minimum distance that should be maintained between driveways. Reasonable spacing between driveways is important to the safety and capacity of roadways, as well as the appearance of a corridor. Managing driveway spacing is essential on major roadways. Drivers need time to respond to vehicles leaving and entering the roadway and to safely manoeuvre their vehicle. Therefore, the minimum distance needed between driveways is greater as speed limits increase. Driveway spacing standards are therefore more stringent for major arterials than for collectors and minor arterials. Driveway or connection spacing standards are derived from traffic engineering principles, driver behaviour, and vehicle dynamics. Considerations in establishing spacing standards include highway function, access classification, roadway speed, traffic flow, location of streets and driveways, stopping/intersection sight distance, influence distance, egress capacity, presence of any medians, volume of trucks, driver expectancy, and separation and reduction of conflicts.

Some of the key considerations for access location are based on roadway characteristics, site characteristics and user characteristics. Roadway characteristics include functional class/area, operating speeds, traffic volumes/flow, sight distance, collision history, and median provision. Site characteristics involve type/size of development, frontage/depth, ingress/egress volumes,

and alternative access availability. User characteristics relate to driver perception-reaction, vehicle type mixture (% trucks), and other modes on roadway (transit, pedestrians and cyclists).

3.4.5 Access/Driveway Design

The important elements of driveway design that should be considered include[4]:

- Driveway Width
- Driveway Length
- Return Radius
- Lateral Offset
- Approach Angle
- Approach Flare
- Number of lanes
- Auxiliary turn lanes
- Directional controls (example, right turn only)
- One-way or two-way design
- Design vehicle
- Driveway profile (grade between access connection and roadway)
- Driveway visibility (roadway alignment, signing and lighting)

If driveways are too narrow or have an inadequate turning radius, drivers will be unable to manoeuvre safely and comfortably on and off the roadway. If the turning radius and width are excessive, the large intersection area is confusing and a hazard for pedestrians, bicycles, and vehicles. The need for vehicles to wait in the through lanes to enter a site should be minimized.

It has been stated that once driveway volumes exceed 500 vehicles per day, it may be appropriate to have dedicated left and right turn lanes as well as an entrance lane. In addition, if right turn channelization is installed, a slip ramp may be more appropriate than an acceleration

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[4] Access Management, Location and Design: NHI Course No. 15255.
Access Management Manual, Transportation Research Board, Washington DC, 2003.

lane as it reduces the amount the driver must turn their head to see oncoming traffic and thus reduces the potential for collisions with oncoming traffic or pedestrians.

Driveway length is also an important consideration as driveways that are too shallow will cause traffic to queue on the through lanes on the road and increases the potential for there to be a rear-end accident. Driveway length is dependent on projected driveway volumes and its intended usage (primary or secondary).

There are alternatives which may also be applied. They include driveway offset and alignment, corner clearance, joint and cross access, and out-parcel requirements. Driveway offset and alignment aims to either offset or align opposing driveways to reduce left-turn overlapping, and improve manoeuvring to address any safety or operational problems. Corner clearance removes or separates access connections from functional area of an intersection. Joint and cross access consolidate or share unified driveways for adjacent properties which help to reduce or separate conflict points. Out-parcel requirements refer to co-ordination of on-site circulation systems between interior developments and the outer lots (out-parcels). Since out-parcels usually have their own driveways to increase business opportunity, regulations may need to be implemented to enforce standards such as the number of out-parcels, minimum lot frontage, access, unified parking and circulation system, pedestrian facilities, building height, setback measures and signage in order to minimize access problems.[5]

3.4.6 Traffic Controls

Long, uniform, signalized intersection spacing on major roadways facilitate the use of signal timing plans, which can respond to peak and off-peak traffic conditions. This improves the progress of traffic flow at desirable speeds through the signal system and causes an increase in capacity, improves safety and results in a reduction in fuel consumption. Capacity is increased, fuel consumption and emissions are decreased and traffic safety is improved. Signal installation should meet signal warrant and be consistent with access spacing criteria to maintain traffic flow efficiency. To achieve desirable signal spacing, a supporting road network or circulation system is important.

3.5 Corridor Assessment and Priorities

One of the challenges in designing an access management strategy for the City of Kamloops is assessing corridors and determining which ones could benefit from the implementation of an

[5] Ibid, p. 110.

access management program. While the strategy for each corridor will differ, by undertaking a holistic assessment of corridors within the city and assigning priorities, it is possible to make wise investments that have substantial impact. Three factors are considered in identifying and prioritizing opportunities for access management in the City as follows:

1. Comparison of Access Guidelines (Table 3.1) with existing conditions along the major and minor arterial road system in Kamloops to identify the degree of the inconsistencies;
2. Examination of other key factors that would potentially increase the need to consider access management such as the collision history and mobility along arterial roads; and
3. Identification of those corridors where potential for change in land use and/or corridor characteristics, regardless of access conditions, are anticipated and could provide an opportunity to implement a coordinated access management strategy with land use / corridor enhancements.

The outcome of this review is the identification of priority corridors for an access management plan. It must be emphasized at this point that this assessment is for existing arterial corridors, the implication of which is that any access management strategy will be reactive in nature.

3.5.1 Network Classification System

As part of the Safer City initiative, a Network Classification Strategy was developed for the City that includes a draft classified network. As noted earlier in Table 3.1, the Network Classification Strategy supports this access management strategy by identifying preferred access densities and types for the various classes of roadways.

Figure 3.1 illustrates the draft classified network. As can be seen, the classified network contains several classes of roads which have been identified to better match the range of conditions along the existing roadway and the functions they serve. These include:

Freeway and Expressways are both designed to accommodate high volumes of traffic moving at high speeds under free-flowing conditions. In urban and rural areas, Freeway and Expressway facilities can connect major areas of the City and serve longer-distance travel from outside the community. In view of the need to serve through traffic at higher speeds, mobility and safety goals generally restrict access to these roadways.

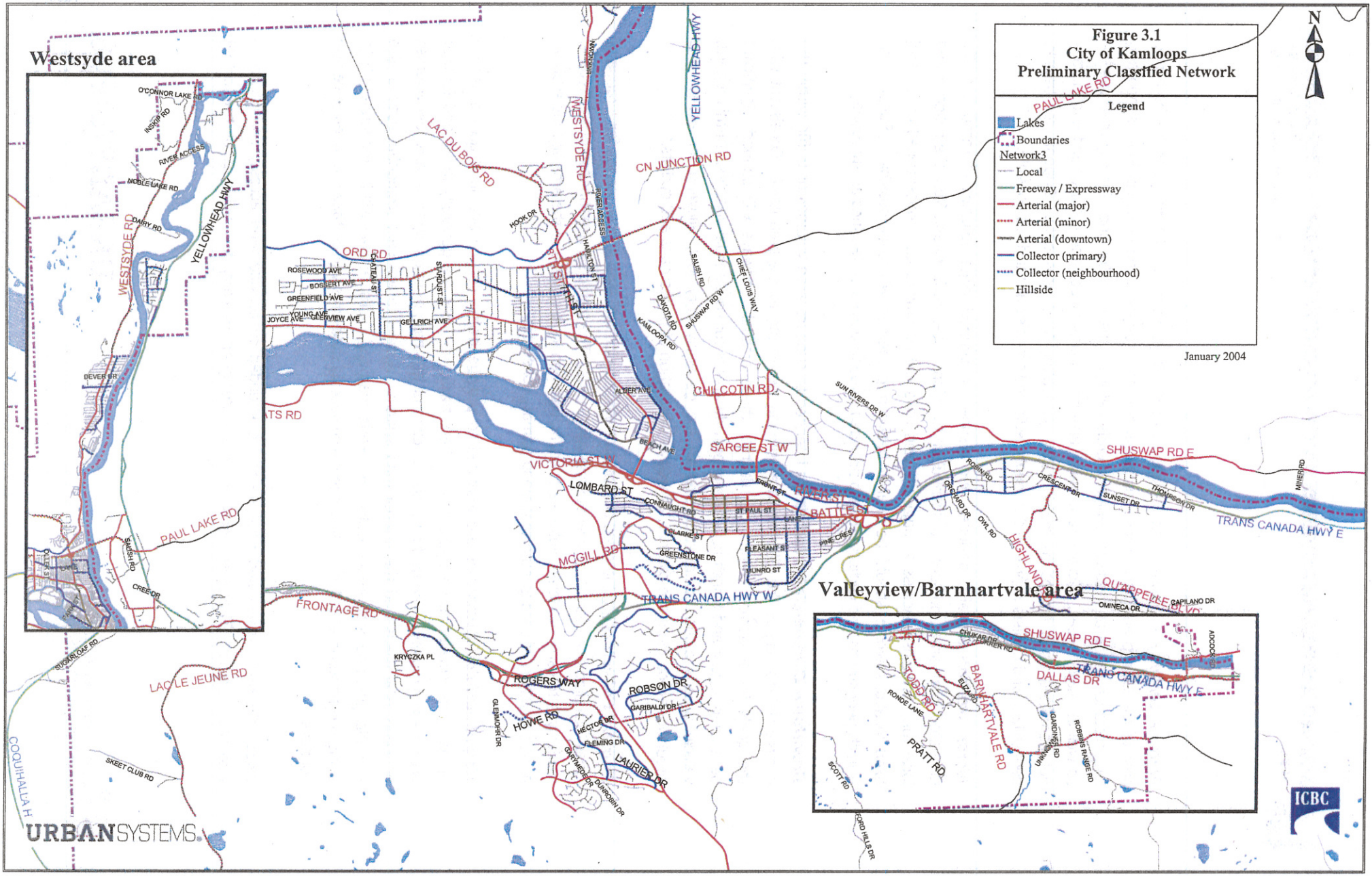


Figure 3.1
City of Kamloops
Preliminary Classified Network
Legend
Lakes
Boundaries
Network3
Local
Freeway / Expressway
Arterial (major)
Arterial (minor)
Arterial (downtown)
Collector (primary)
Collector (neighbourhood)
Hillside
January 2004
N
Westsyde area
Valleyview/Barnhartvale area
WESTSYDE RD
YELLOWHEAD HWY
LAC DU BOIS RD
CN JUNCTION RD
ORD RD
PAUL LAKE RD
CHILCOTIN RD
SARCEE ST W
VICTORIA ST W
LOMBARD ST
MCGILL RD
TRANS CANADA HWY W
FRONTAGE RD
LAC LE JEUNE RD
ROGERS WAY
ROBSON DR
HOWE RD
LAURIER DR
SHUSWAP RD E
TRANS CANADA HWY E
DALLAS DR
TODD RD
BARNHARTVALE RD
PRATT RD
SUGARLOAF RD
SKEET CLUB RD
COQUIHALLA H
URBANSYSTEMS
ICBC

Major Arterials are planned and designed to carry large volumes of through traffic from one area of the City to another. These roadways are often longer, continuous corridors supporting long-distance travel at medium-to-high speeds between the collector and highway road system as well as major areas. Access to a major arterial impacts safety and mobility and is generally not permitted or is limited to major traffic generating land uses only. Support for transit, pedestrians and cyclists is provided through dedicated facilities as much as possible.

Minor Arterials are also designed and planned to support large volumes of through traffic unrelated to an area and serves a distribution function to get traffic to and from the collector and local road systems. Access to adjacent land uses will be limited and concentrated on several fixed locations which should be shared between properties wherever possible. Support for transit, pedestrians and cyclists are also provided through dedicated facilities as appropriate.

Downtown Commercial Arterials are intended to support large volumes of traffic within the commercial districts of the City that are primarily generated to the area itself. Consistent with the goals for a vibrant commercial district, these arterial roadways will support significant pedestrian, cyclist and transit activity and provide access for commercial vehicles. In this regard, vehicle speeds along commercial arterials are generally very low, allowing for access and circulation throughout the corridor, as well as integration of pedestrians and cyclists.

Primary Collectors are intended to provide traffic service and land access service for a range of areas including commercial, residential and office uses. The traffic service function of this type of roadway is to carry moderate volumes of traffic between local roads and the arterial road system. Access to adjacent uses is important along primary collectors.

Neighbourhood Collectors are intended to provide traffic service and land access service primarily for smaller residential areas – where traffic volumes are generally lower and familiar with the community. The traffic service function of this type of roadway is to carry low volumes between local roads and the arterial road system. Access to adjacent residential uses is also essential along neighbourhood collectors. Pedestrian and cyclist activity will be moderately high along neighbourhood collector streets in which specific measures will be taken to manage vehicle conflicts.

Local Roads in urban and rural areas are intended to provide land access, particularly in residential areas. Therefore, local roads are designed to carry low volumes of traffic that

originates or is destined to adjacent uses. It is anticipated that the local road system will support significant pedestrian and cyclist activity in which to manage conflicts with vehicle traffic.

Industrial Roads, as suggested, are designed to support a moderate volume of traffic, largely consisting of commercial vehicles and other business traffic. Although some access restrictions may apply, the industrial roads typically link surrounding area properties with the arterial road system.

Hillside Roads are unique to Kamloops due to the topographic conditions of the City. Hillside roads are intended to support moderate-to-high traffic volumes between key hillside areas to other parts of the City. Depending on the length of the roadway and scale of development served by the area, Hillside Roads may be 2 or 4 lanes and some access restrictions may apply. Although walking and cycling may be modest in these areas, dedicated facilities are needed to support goals for safety and enhanced mobility.

3.5.2 Problem Identification

At a strategy level, the primary access features considered in this assessment of the arterial system in Kamloops is the type and density of accesses along the existing corridor. The following discussion highlights the comparison of actual conditions and the access guidelines set out in Table 3.1. While any inconsistencies are "flagged," a response may only be necessary or desired if safety and mobility concerns are identified or where redevelopment provides an opportunity for systematic changes to the corridor. This section provides a review of the conditions along each arterial road segment and identifies the potential importance of addressing the issue based on collision experience and mobility in the short term and long term. This should not imply that without a collision history or the presence of mobility issues that nothing should be done, but rather it helps to gauge the degree of the problem for those corridors where inconsistencies exist. A summary of the access type and access density issues is provided in the following sections.

Type

The type of access to land that is provided can impact mobility and safety as most accesses require some vehicular deceleration or even a complete stop in order to negotiate a turn. Impacts on mobility are introduced when traffic in a through lane is forced to stop as a vehicle attempts a turn, particularly a left-turn. It has been noted that on four-lane arterials where the volume of left-turning traffic is high, the left lane can, in effect, become an exclusive left-turn

lane with through traffic being limited to one lane. The need to stop in a through lane also introduces safety issues as it increases the vulnerability to rear-end accidents.

The impacts on safety and mobility mentioned above can be mitigated with properly designed property accesses. Well-designed right-in, right-outs will provide better mobility and safety benefits than a full access. In conjunction with the type of access, driveway design can also influence safety and mobility. A poorly designed driveway at a major access point will cause traffic to back up onto the road thus slowing traffic and increasing the opportunity for a collision. Further, poorly designed driveways could increase risk taking activities when exiting an access thus increasing the opportunity for a collision to occur.

The reduction in the number of full movement accesses can be a key component of an access management strategy. The situation can be addressed either through the total elimination of left turns through the construction of a median or through the introduction of a left-turn lane which still provides full movement access, but removes left-turning traffic from the through lane.

The access guidelines presented in Table 3.1 suggest that full accesses should not be provided from major and minor arterials. Figure 3.2 shows the major and minor arterial segments that are inconsistent with this guideline. Within the City of Kamloops, most of the arterials have developed inconsistencies with this guideline. This is due to the fact that many of the arterials, while having a role and function of carrying through traffic, have also evolved into commercial corridors and thus carry significant portions of local traffic that require access to businesses.

Access Density

High access density can inhibit mobility on a corridor and can result in diminished safety. This is particularly relevant on corridors where traffic volumes are high with large amounts of turning traffic. Corridors with higher access densities generally have higher volumes of turning movements. This creates a situation where there vehicles travelling at a wide range of speeds.

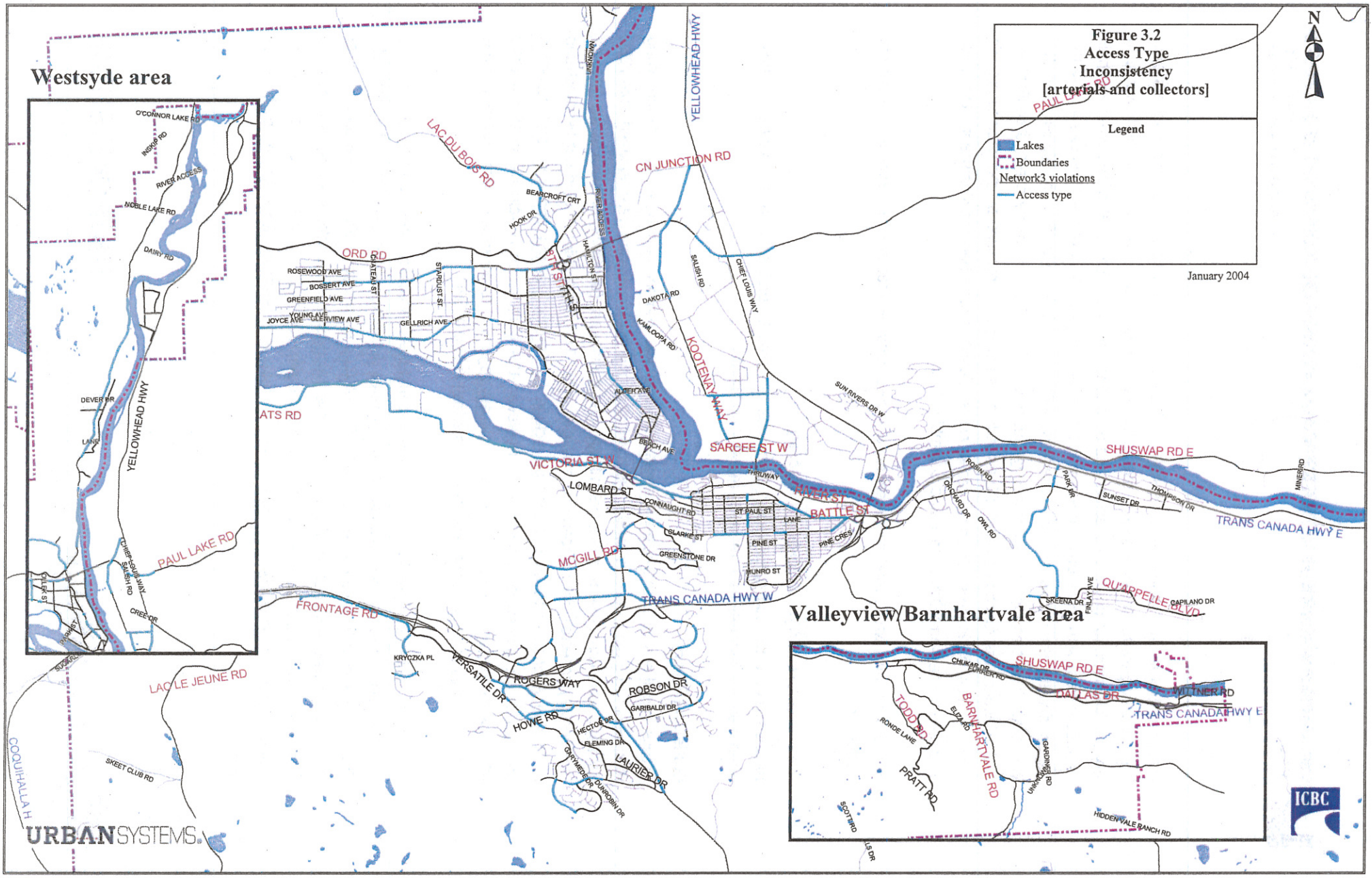


Figure 3.2
Access Type
Inconsistency
[arterials and collectors]
Legend
Lakes
Boundaries
Network3 violations
Access type
January 2004
N
Westsyde area
Valleyview/Barnhartvale area
YELLOWHEAD HWY
LAC DU BOIS RD
CN JUNCTION RD
ORD RD
KOOTENAY WAY
SARCEE ST W
VICTORIA ST W
LOMBARD ST
RIVER ST
BATTLE ST
SHUSWAP RD E
TRANS CANADA HWY E
TRANS CANADA HWY W
MCGILL RD
FRONTAGE RD
PAUL LAKE RD
LAC LE JEUNE RD
ROGERS WAY
VERSATILE DR
HOWE RD
ROBSON DR
LAURIER DR
QU'APPELLE BLVD
DALLAS DR
TODD RD
BARNHARTVALE RD
PRATT RD
HIDDENVALE RANCH RD
URBANSYSTEMS
ICBC

According to the draft guidelines presented in Table 3.1, the desired access density is less than five per kilometre for major arterials, five to ten per kilometre for minor arterials and twenty to fifty per kilometre for primary collectors and downtown arterials. Almost all of the urban arterials are inconsistent with these guidelines, some by a wide margin. Many of the collectors violate the access density thresholds set for collectors, with some being significantly higher than the threshold. This trend is consistent throughout much of the City. In many cases, a conflict has evolved where the functional class of the roadway is being compromised by the need to provide access to local businesses. In these cases, access densities have become significant. Examples of these include Notre Dame Drive and Columbia Street.

Figure 3.3 shows which road segments have access densities that are inconsistent with current guidelines.

3.5.3 Relationships to Safety & Mobility

Inconsistency with road classification guidelines can lead to problems on the corridor. These often manifest themselves in terms of mobility and safety.

Collision History

Access conditions and characteristics can influence the number and types of collision along roadways. In order to assess safety, the number of mid-block collisions were obtained from ICBC data and were converted to a rate per million vehicle kilometre (acc/mvk) for each of the arterials and primary collectors for comparative purposes only. This information should not be construed as a true accident rate as it does not include intersection related accidents and reporting procedures are somewhat inconsistent. However, this information is valuable in that it does allow for comparison between arterial and collector segments to determine where problem areas exist. The mid-block accident rates are summarized in Figure 3.4.

The results of the analysis indicate that highest mid-block accident rates occur on the primary collectors within the City with significantly lower rates occurring on the major and minor arterials. This is misleading to a certain extent as traffic volumes on primary collectors are usually lower than on arterials and due to the nature of the calculation of accidents rates, one accident becomes more magnified where there are lower traffic volumes. Another issue is that due to greater speeds experienced on major arterials, there is a tendency for collisions to be more severe.

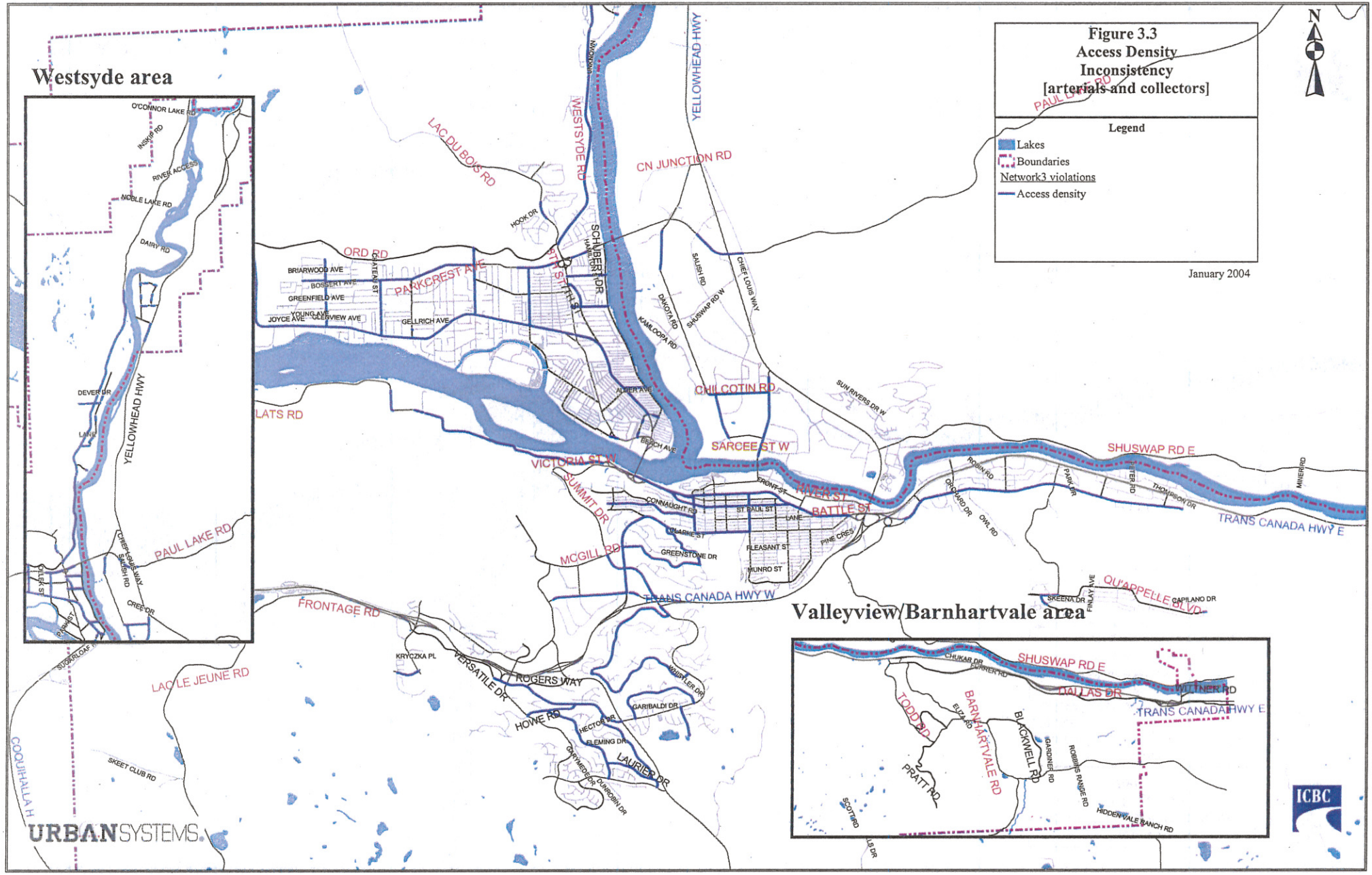


Figure 3.3
Access Density
Inconsistency
[arterials and collectors]
Legend
Lakes
Boundaries
Network3 violations
Access density
January 2004
N
Westsyde area
Valleyview/Barnhartvale area
O'CONNOR LAKE RD
INSHIP RD
RIVER ACCESS
NOBLE LAKE RD
DAIRY RD
DEVER DR
YELLOWHEAD HWY
PAUL LAKE RD
CHIEF LOUIS WAY
SAHSIS RD
CREE DR
SUGARLOAF
LAC LE JEUNE RD
COQUIHALLA H
SKEET CLUB RD
FRONTAGE RD
KRYCZKA PL
VERSATILE DR
T RODGERS WAY
HOWE RD
HECTOR DR
FLEMING DR
GARIBALDI DR
WISHLER DR
LAURIER DR
CARYMERE DR
DUNROBIN DR
LATS RD
ORD RD
BRIARWOOD AVE
BOSSERT AVE
GREENFIELD AVE
YOUNG AVE
JOYCE AVE
GLENVIEW AVE
GELLRICH AVE
CATEEN ST
PARKCREST AVE
WESTSYDE RD
5TH ST
SCHUBERT DR
HAMILTON CT
HOOK DR
LAC DU BOIS RD
NAKONIN
CN JUNCTION RD
YELLOWHEAD HWY
DAKOTA RD
KAMLOOPA RD
SHUSWAP RD W
CHIEF LOUIS WAY
SUN RIVERS DR W
ALDER AVE
BIRCH AVE
CHILCOTIN RD
SARCEE ST W
VICTORIA ST N
SUMMIT DR
MCGILL RD
TRANS CANADA HWY W
FRONT ST
RIVER ST
BATTLE ST
CONNAUGHT RD
ST PAUL ST
LANE
OSBORNE ST
GREENSTONE DR
PLEASANT ST
MUNRO ST
PINE CRES
SHUSWAP RD E
ROBIN RD
ORCHARD DR
OWL RD
PARK DR
FISHER RD
THOMPSON DR
MINER RD
TRANS CANADA HWY E
QU'APPELLE BLVD
SKEENA DR
FINLAY AVE
CAPILANO DR
CHUKAR DR
EUREKA RD
DALLAS DR
WHITNEY RD
TODD RD
ELIZA RD
BARNHARTVALE RD
BLACKWELL RD
GARDINER RD
ROBBINS RANGE RD
PRATT RD
SCOTT RD
HIDDENVALE RANCH RD
URBANSYSTEMS
ICBC

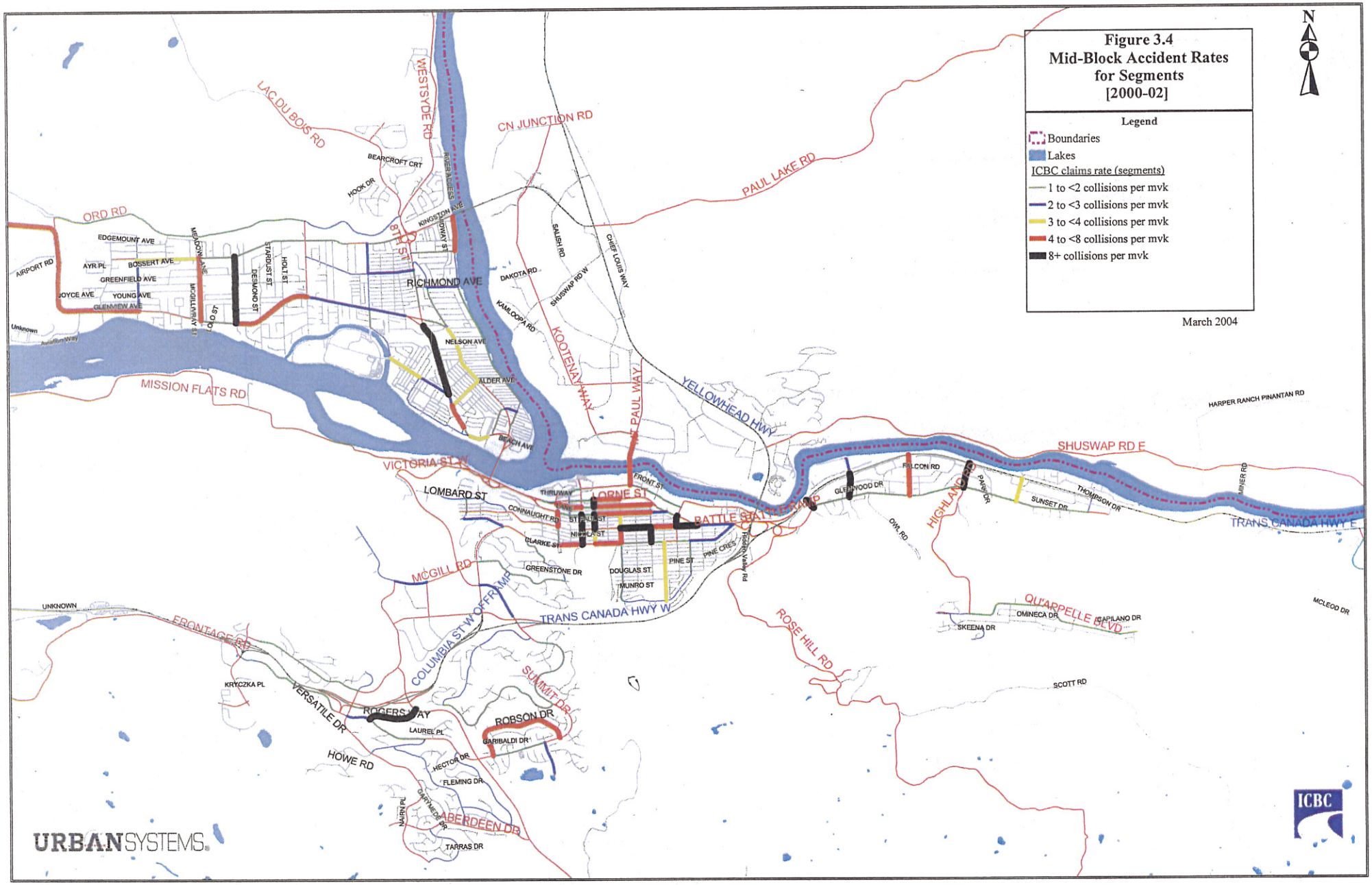


Figure 3.4
Mid-Block Accident Rates
for Segments
[2000-02]
Legend
Boundaries
Lakes
ICBC claims rate (segments)
1 to <2 collisions per mvk
2 to <3 collisions per mvk
3 to <4 collisions per mvk
4 to <8 collisions per mvk
8+ collisions per mvk
March 2004
N
LAC DU BOIS RD
WESTSYDE RD
CN JUNCTION RD
PAUL LAKE RD
ORD RD
BEARCROFT CRT
HOOK DR
ROGER ALDEN PL
KINGSTON AVE
8TH ST
RICHMOND AVE
EDGEMONT AVE
AIRPORT RD
AYR PL
BOSSERT AVE
GREENFIELD AVE
JOYCE AVE
YOUNG AVE
GLENVIEW AVE
MEADOW AVE
MCGILLIVRAY ST
STARDUST ST
DESMOND ST
HOLT ST
10TH ST
Unknown
Avon Rim Way
NELSON AVE
ALDER AVE
BEACH AVE
DAKOTA RD
KAMLOOPA RD
SHUSWAP RD W
SALISH RD
CHIEF LOUIS WAY
KOOTENAY HWY
ST PAUL WAY
YELLOWHEAD HWY
MISSION FLATS RD
HARPER RANCH PINANTAN RD
SHUSWAP RD E
VICTORIA ST W
LOMBARD ST
THRUWAY
CONNAUGHT RD
LORNE ST
FRONT ST
ST PAUL ST
NICOLA ST
CLARKE ST
BATTLE STATION RAMP
FALCON RD
GLENWOOD DR
HIGHLAND DR
PARK DR
SUNSET DR
THOMPSON DR
TRANS CANADA HWY E
OWL RD
RIDGEVALLEY RD
MCGILL RD
GREENSTONE DR
DOUGLAS ST
MUNRO ST
PINE ST
PINE CRES
TRANS CANADA HWY W
COLUMBIA ST W OFFRAMP
UNKNOWN
FRONTAGE RD
KRYCZKA PL
VERSATILE DR
ROGERS WAY
LAUREL PL
SUMMIT DR
ROBSON DR
GARIBALDI DR
HOWE RD
HECTOR DR
FLEMING DR
NAIRN PL
DARTMOOR RD
ABERDEEN DR
TARRAS DR
ROSE HILL RD
QU'APPELLE BLVD
OMINECA DR
CAPILANO DR
SKEENA DR
SCOTT RD
MCLEOD DR
URBANSYSTEMS
ICBC

Mobility

The ability to move people efficiently is the goal of any transportation network. It affects the liveability of a community, the environment and in some cases, the economic well-being of neighbourhoods and the City as a whole. Many cities, including the City of Kamloops have established a hierarchy of roads. Based on a system of arterials, collectors and local roads, a well maintained hierarchy is dependent on the establishment and adherence to guidelines that ensure enough capacity is maintained on roads in order to preserve desired mobility standards. Not only does the establishment of the road network hierarchy ensure that there is sufficient mobility on the road, but it preserves the investment in the existing infrastructure and delays the need for costly new infrastructure to address problems. Poor mobility can be an indicator that a city's network hierarchy is failing. Some of the impacts of poor mobility are spill-over traffic into neighbourhoods with roads being forced to serve a purpose that they were not intended as an increase in the number and scope of improvements required on the main corridor and parallel routes.

In order to assess mobility in the City, two measures were used. The first was the establishment of present and future peak hour traffic volumes. By locating where the highest traffic volumes were occurring in the City, both in present and in the future, it was determined which corridors handle the most traffic and are most important to the City's transportation network. This examination indicated that the corridors that have the highest traffic volumes include Columbia Street, Notre Dame Drive, Summit Drive, and sections of Tranquille Road. Refer to Appendix A for diagrams showing both existing and future traffic volumes for the City's corridors.

The second measure that was used was peak hour speed data for each of the corridors. This data was obtained from the City's Emme/2 model and provides an indication of the speeds that can be expected based on road design and traffic volumes. By comparing this to the posted speed limits, it was determined which corridors were experiencing slower than acceptable speeds and was an indicator that mobility was becoming an issue. Particular problems were noted on Tranquille Road, Columbia Street, Fortune Drive, Valleyview Drive and Summit Drive. In these instances, actual speeds were between 9 and 25 km/h lower than the posted speed. Refer to Appendix B for diagrams showing both existing and future speed data.

The combination of volume and speed data can aid in determining which areas are having capacity issues. While not a substitute for volume-capacity ratios which is a direct comparison of traffic volume to the capacity of the roadway, the combination of measures can indicate where mobility issues are beginning to arise. By determining the areas where there is anticipated to be high volumes of traffic or slow traffic movement, either in the present or the future, the City can

determine which corridors need attention now and which corridors can be left as they are. This analysis also provides an opportunity for the City to be more proactive in their approach to access management. By acknowledging future issues in the present and finding solutions to anticipated problems, the City will be able to implement access management strategies in a more coordinated manner that will give them more time to achieve buy-in from the public. Tranquille Road and Columbia Street appear to be two corridors that have potential mobility issues based on the two measures.

Problem Identification Summary

In identifying problem areas, an analysis was done that determined certain thresholds. The safety threshold was based on total number of collisions for a corridor regardless of type, length or corridor, or traffic volumes. The rationale for using this measure is that each accident has an economic cost and that cannot necessarily be captured in the accident rate which can be high for a corridor, but due to the low traffic volume, it may take several years for there to be an accident. In contrast, the accident rate for a major arterial may be low but due to the high volumes of traffic, the number of accident occurrences is higher. The following threshold values were used to determine the degree of the safety issue:

- High >10 accidents
- Moderate 5 – 10 accidents
- Low < 5 Accidents

The analysis indicated that many of the corridors with the highest numbers of collisions were arterial roads located near the downtown core. Other areas included Fortune Drive, Westsyde Road, and segments of Tranquille Road.

In order to assign values to mobility, a comparison of the modelled/actual speeds achieved on a corridor was compared to the posted speed limit. Corridors where modelled/actual speeds were significantly lower than posted speeds were deemed to have decreased mobility. The thresholds used for this analysis were as follows:

- High – modelled speed at least 5 km/h lower than the posted speed limit
- Moderate – modelled speed is between 0 km/h and 5 km/h less than the posted speed limit
- Low – modelled speed is greater than or equal to the posted speed

This analysis indicated several locations throughout the City where there are issues with regards to mobility both on arterial and collector roads.

3.5.4 Response and Priorities

This section of the strategy examines the needs and opportunities for access management in Kamloops. The outcome is a clearly defined set of priorities in which to develop localized access management plans. These may be developed in isolation or in coordination with other initiatives such as a local area plan.

In considering appropriate access management strategies for the various arterial and collector corridors within the City, it is important to prioritize and choose an appropriate response to each situation. In determining the appropriate response several factors were considered. The first among these was whether or not there were inconsistencies with the City of Kamloops Network Classification Strategy in terms of land access and/or access density. Any road segment where there was at least one inconsistency was compared in terms of mobility and safety indicators to determine where there were problems that might indicate if an access management strategy could improve the existing conditions. Once this initial analysis was complete, each segment was assessed to determine the potential for either land use change or corridor change. Land use change was based on whether development was anticipated to occur either on or in the area near the segment that would influence traffic characteristics. Corridor change was based on whether there were plans or potential for there to be improvements made to the existing corridor that would increase capacity or change the characteristic of the corridor. For each of these indicators, a comment was made stating whether change was expected in the short- or long-term or if limited change was expected.

There were four basic responses to the preparation of an access management strategy for a corridor. These include:

1. ***Short-term development and implementation of the strategy*** – This would require the development of the strategy in the next 1-3 years, with implementation in the next 2-5 years, regardless of the extent of the work to be done. It is anticipated that this work could be implemented quickly due to existing conditions and the desire for a strategy to be developed.

2. ***Long-term development and implementation of the strategy*** – This would require the development of a strategy in the next 2-5 years, with implementation in the next 10-20 years, regardless of the extent of the work to be done.
3. ***Limited/No Change with Speed and Route Management*** – The City would continually monitor the situation on the corridor to determine if there are safety problems and would address issues through low impact resolutions to either manage vehicle speeds or routes through the area.
4. ***Limited/No Change with No Action*** – This implies that the situation on the existing corridor is suitable.

Finally, a priority ranking was assigned to decide which corridors offered the greatest opportunity and/or had the greatest need for access management.

High – a high priority ranking indicates that action on the corridor, at some point in time, will need to be taken and will need to be addressed with some importance. Several corridors have been identified as having a high priority for action, though action may not necessarily be warranted until the long-term. This is due to the importance of the corridor to the city-wide transportation network. Also, a high priority ranking can be assigned because change in land-use or the role/function of the corridor is expected to change.

Moderate – a ranking of this type indicates that action may need to be taken at some point in time and that there should be constant monitoring of the situation to see if there are any changes to conditions that warrant immediate action. Corridors with this priority ranking are generally important to the city-wide transportation network but not critical.

Low – action is likely not needed as land-use or the corridor is not expected to change in the future and the corridor is not as important to the city-wide transportation network.

Table 3.2 shows the road segments that have at least one inconsistency with access guidelines, and outlines the safety and mobility concerns for each of these segments. Further addressed is the potential for change, either in land-use or on the corridor itself. Finally, an outline of the potential response and the priority that should be given to the response is presented.

Table 3.2
Summary of Priorities

Corridor	Segment	Access Guidelines (# of inconsistencies)	Problem Identification		Potential for Change		Action	
			Relative Collision History	Mobility Issues – Present or Future	Land Use	Corridor Change	Response*	Priority
Hillside Drive	Pacific Way To McGill Road	2	Low	Moderate	Long-term	Long-term	2	High
Columbia Street West	Trans Canada Highway West To 1st Avenue	2	Low	Moderate	Short-term	Long-term	2	High
Summit Drive	Trans-Canada Highway to McGill Road	2	Moderate	Moderate	Long-term	Long-term	2	High
Battle Street/Victoria Street	Battle Street From Victoria Street To Columbia Street Victoria Street From Lansdowne Street To Battle Street	2	Moderate	High	Long-term	Long-term	1	High
Victoria Street West	1st Avenue To Overlander Bridge Ramp	2	Moderate	Moderate	Long-term	Long-term	1	High
Columbia Street	1st Avenue To 6th Avenue	2	High	High	Short-term	Long-term	2	High
Tranquille Road	Leigh Road To Simcoe Avenue	2	High	High	Limited	Limited	1	High
McGill Road	Columbia Street to Hillside Drive	2	Moderate	High	Short-term	Long-term	1	High
Notre Dame Drive	Trans-Canada Highway to Hillside Drive	2	Moderate	Moderate	Short-term	Long-term	1	High
Singh Street	Tranquille Road To Ord Road	2	Low	High	Long-term	Long-term	2	Moderate
6th Avenue	Lansdowne Street To Columbia Street	2	Low	Moderate	Short-term	Short-term	2	Moderate
8th Street	Fortune Drive To Halston Interchange Ramp	1	Low	High	Long-term	Long-term	2	Moderate
Tranquille Road	Southill Street to Airport	2	Moderate	High	Long-term	Long-term	2	Moderate
Tranquille Road	9th Street to Mayfair Street	2	High	High	Long-term	Limited	3	Moderate
Fortune Drive	Fort Avenue To 8th Street	2	High	High	Limited	Limited	2	Moderate
Lansdowne Street	Victoria Street To 1st Avenue	1	High	High	Long-term	Limited	2	Moderate
Seymour Street	Entire Length	1	High	Low	Long-term	Limited	2	Moderate
Mission Flats Road		2	Low	High	Limited	Long-term	3	Moderate
Parkcrest Drive/Halston Road		2	Moderate	Moderate	Long-term	Long-term	2	Moderate
Summit Drive	Trans Canada Highway to Highway 5A	1	Moderate	High	Long-term	Long-term	2	Moderate
Hugh Allan Drive	Highway 5A to Pacific Way	2	Moderate	Low	Long-term	Long-term	2	Moderate
Columbia Street	6th Avenue to Battle Street	1	High	Low	Limited	Limited	2	Moderate
Battle Street West	1st Avenue to Centre Street	2	Low	High	Long-term	Long-term	2	Moderate
Valleyview Drive	Highland Road East	2	Low	High	Long-term	Long-term	2	Moderate
12th Street/MacKenzie Avenue/Kenora Road	South of Tranquille	2	Low	Moderate	Short-term	Long-term	2	Moderate
Lorne Street		2	Moderate	Moderate	Short-term	Limited	2	Moderate
Valleyview Drive	Chickadee Road to Highland Road	2	Moderate	High	Limited	Long-term	2	Moderate
Hillside Drive	South to Copperhead Drive	2	Low	Moderate	Long-term	Long-term	2	Moderate
1st Avenue	Victoria Street West to Columbia Street West	1	Low	Moderate	Long-term	Limited	3	Low

Corridor	Segment	Access Guidelines (# of inconsistencies)	Problem Identification		Potential for Change		Action	
			Relative Collision History	Mobility Issues – Present or Future	Land Use	Corridor Change	Response*	Priority
Pacific Way	To Aberdeen Drive	2	Low	Low	Long-term	Long-term	3	Low
Westsyde Road	Ord Road North	2	Low	Low	Long-term	Limited	3	Low
Westsyde Road	Parkview Drive North	2	High	Low	Limited	Limited	4	Low
Highway 5A	North to Hillside	1	Low	High	Long-term	Long-term	3	Low
Copperhead Drive		1	Low	Low	Long-term	Long-term	3	Low
Howe Road	Hugh Allan Drive To Pacific Way	2	Low	Low	Limited	Limited	3	Low
Aberdeen Drive		1	Low	Low	Long-term	Long-term	2	Low
River Street/10th Avenue	10th Avenue to Highway 5 10th Avenue from River Street to Victoria Street	2	Low	High	Short-term	Limited	3	Low
Lac Le Jeune Road		1	Low	Low	Long-term	Long-term	4	Low
Highland Road		1	Low	Low	Long-term	Long-term	3	Low
Tremerton Drive	Summit Drive to end	2	Low	High	Long-term	Long-term	3	Low
12th Street	Tranquille Road to Halston Road	2	Low	High	Long-term	Limited	2	Low
McGill Road	West of Hillside Drive	2	Moderate	High	Short-term	Long-term	2	Low
Robson Drive		2	Low	Low	Limited	Limited	4	Low
Sifton Avenue		2	Low	Moderate	Limited	Limited	4	Low
Schreiner Street	Tranquille Road to Edgemount Avenue	2	Low	High	Limited	Limited	4	Low
7th Street		2	Low	Low	Limited	Limited	4	Low
Van Horne Drive	Howe Road to Aberdeen Drive	2	Low	Low	Limited	Limited	3	Low
Laurier Drive		2	Low	High	Limited	Limited	3	Low

3.5.5 High Priority Areas

Hillside Drive

Hillside Drive from Pacific Way to Hillside Drive has been identified as a high priority candidate for access management due to the fact that it is anticipated that greater volumes of traffic will be using this road in the future. According to KAMPLAN, it is expected that Hillside Drive will be extended in the future to connect with Summit Drive. There is significant commercial development in the area, with the southwest in general being one of the high growth areas of the City. While the existing situation would not be considered problematic, it is important that mobility and safety be maintained on this corridor and therefore there may need to be an access management strategy developed in the near future to be implemented over the long term.

Columbia Street West

Columbia Street West is an important corridor in the City as it provides access to the Southwest Business Sector and access to and from the Trans-Canada Highway. While the primary role of the corridor is to serve streets such as McGill Road, Summit Drive, Notre Dame Drive and the Trans-Canada Highway and points beyond, it is also utilized as a means of accessing big box developments in the area. While the corridor already has some access management treatments in place, it will be important that as traffic volumes grow on this corridor, that principles of access management are rigorously enforced in order to preserve the City's investment in this important arterial. Therefore some plans for access management should be made over the medium term with implementation over the long-term.

Summit Drive

Summit Drive, from the Trans-Canada Highway to McGill Road provides a transition between Summit's role as a feeder to residential areas to its role as a commercial arterial and access to the Summit Connector. The focus on this corridor will be to maintain existing access management tools already in place and to ensure that as land use and corridor change occurs on nearby corridors that capacity will be maintained. The one main area of concern is Summit Drive between Columbia Street and the Trans-Canada Highway where there is a high access density. A long-term strategy and implementation will be necessary.

Battle Street/Victoria Street

This corridor provides access to and from the east end of the City to the City Centre. At present, this corridor has developed into a commercial arterial strip at the edge of downtown with businesses having full access to the street. This situation can affect both safety and mobility and

has impacted the aesthetic quality of this gateway to the downtown. As traffic grows on this corridor, businesses may be impacted as it will become more difficult to access businesses. An access management strategy should be developed early on and be implemented in the short term to address issues that are beginning to occur and to ensure that safety and mobility do not degrade to an unacceptable level.

Victoria Street West

This corridor provides access to the City Centre to and from the North Shore and the southwest. Similar to the Battle Street/Victoria Street corridor, Victoria Street West has developed into a commercial arterial at the edge of downtown with similar aesthetic qualities. While traffic generally travels well on this corridor, with continued development in the southwest and the downtown, it can be expected that traffic will increase on the corridor and there will be greater conflict between the corridor's role as a major arterial and its role as a means of accessing businesses. Therefore, the City should aim to develop and implement an access management strategy over the long-term.

Columbia Street – Downtown

This section of Columbia Street provides access to the government precinct and the hospital as well as the core area of the City. In this capacity it serves traffic from both the east and west end of the City. It also serves the role of providing direct access to businesses in the area consisting of a few restaurants, hotels and a plaza. There is a potential that there will be land use change in this area which may influence traffic patterns in the area. There may be some emphasis on changing the type of access available to businesses in the area in order to improve mobility and safety. Therefore, a short-term strategy development and implementation should be undertaken.

Tranquille Road

The Tranquille Road business area could be characterized as a downtown for the North Shore. Typical on this corridor is slow moving traffic with on-street parking allowed on both sides. Many businesses have direct access to the corridor. The corridor also serves through traffic going to other parts of the North Shore, particularly McArthur Park which undergo facility enhancement. There have also been many plans for enhancement of the Tranquille Business Area which could bring more traffic to the area. If it is the desire of the City to improve mobility and safety on the corridor, then it may be prudent to start an access management strategy in the near future. However, if it is the desire of the City to maintain the "downtown" character of the Tranquille business area, then it may be appropriate to maintain the existing situation with provisions that

no new accesses be allowed to the corridor and reduction in the number of accesses as land use changes.

McGill Road

McGill Road is due for significant change in the short-term and will become one of the most important corridors in the City as it serves the University College of the Cariboo. The McGill Corridor plan forecasts significant commercial and residential development in the area that will increase the amount of traffic that uses this corridor. With further development, there will be greater pressure to obtain access to McGill Road. While McGill Road will have status as a primary collector, there will still be a need to ensure appropriate access is offered. Therefore, it will be important to develop and implement an access management strategy for McGill Road in the short term.

Notre Dame Drive

Notre Dame Drive, similar to McGill Road, will see significant increases in traffic due to further development in the Southgate Industrial Park. The addition of Home Depot combined with greater development at UCC will increase Notre Dame's role as a means of moving non-local traffic as well as serving the various businesses that have direct access to Notre Dame. With increased traffic growth, it can be expected that safety and mobility will be adversely impacted and thus an access management strategy may be necessary to preserve investment in the corridor. An access management strategy should be developed and implemented in the short-term to address issues of access density and the high number of full movement accesses. Notre Dame drive likely provides the greatest opportunity for access management in the near future.

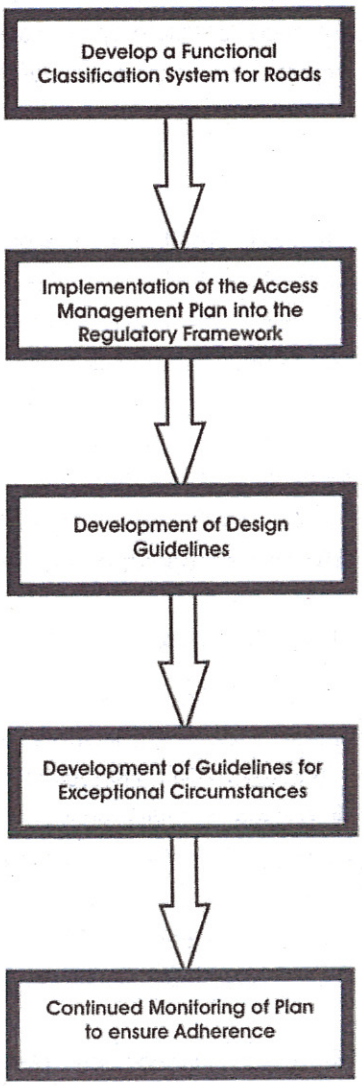
3.6 Access Management Processes

As mentioned earlier in this report, the process of developing and implementing an access management plan is sometimes more important than the tools that are used. This process will require a number of steps. While the overarching goals and objectives of an access management plan may be the same, the process of implementing the plan will differ dependent on whether the plan is a retrofit of an existing corridor or is for a planned development. Further, while access management policies for planned developments may be more easily implemented on a City-wide scale, a retrofit access management plan will likely be implemented on a corridor by corridor basis, thus taking into account the uniqueness of each corridor.

The implementation of an access management plan for a planned development has the advantage of there being greater ability to control the plan and to implement it. Once the plan is

established, less flexibility is required on the part of the City to maintain the plan. In this case, future development will have to accommodate the plan rather than the plan having to work within existing conditions. Further, while opportunities may be made for interested parties to comment on the plan, their input is not as essential for successful implementation. Figure 3.4 illustrates the process of developing and implementing an access management plan for a planned development.

Figure 3.4
Implementation of Access Management for Planned Corridor Development



1. ***Development of a functional classification system for roads***. As part of this, the City will develop goals and objectives for each type of road such as:
    - Capacity
    - Desired mobility
    - Access Density
    - Adjacent Land Use
2. ***Implementation of the Access Management Strategy into the regulatory framework***. This is an important step as it ensures that the plan will be enforceable. This step can also be used as an opportunity to educate politicians and other City staff on the benefits of access management which will make it easier to communicate the strategy to the public. It is also an opportunity for interested parties to add their comments. Enforceable access management is important as it provides consistency and equality in the decision making process, presents a framework with which developers must work within, and gives the plan a legal standing should a challenge ever occur. A firm plan will be less susceptible to political pressure, particularly as the plan begins to be implemented, and gains momentum and general acceptance.
3. ***Development of design guidelines***. Design guidelines will set standards for the design and location of access points, medians, and traffic signalization and coordination.
4. ***Development of guidelines that will address potential exceptional circumstances that may require deviation from the plan***. While the access management plan should be given the muscle of being included in the regulatory framework, there must be an inherent flexibility that allows for exceptional circumstances. These include properties that would be unduly harmed by having no access to the major arterial or in the case of major development where the benefits of the development to the economy would be greater than the benefits of restricting access to the property. However, in-depth study should be completed to find workable solutions to these circumstances in order to preserve the integrity of the Access Management Plan. A case in point where additional study may be required prior to the granting or rejecting of access would be the Home Depot development in Kamloops. Full access was desired to the proposed Hillside Drive extension – however, the City was steadfast in their refusal to grant this and now access is granted in the location preferred by the City. In this case, even though the new Home Depot represents a major investment in the City and could have been viewed as an exceptional circumstance, the fact of the matter is that

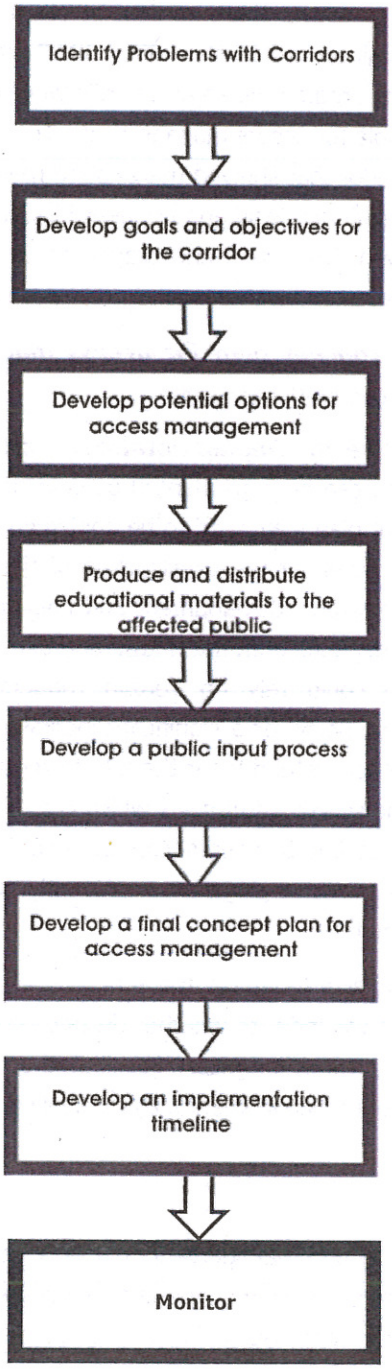
they still located within the City, worked within the parameters the City set forth, and their growth will not likely be adversely hindered by the lack of full access to Hillside Drive.

5. ***Continued monitoring of the plan to ensure adherence*** and effectiveness of adopted standards. Areas where desired results are not achieved, re-evaluation may be necessary to modify measures to address any deficiencies.

As mentioned previously, a retrofit access management plan will require different steps. Perhaps most critical will be getting the public, particularly business and property owners along the potentially treated corridors to buy into and accept the concept. Figure 3.5 illustrates what the framework might look like for a retrofit access management plan.

1. ***Identify how corridor performance has deteriorated and determine what problems do exist.*** This is an important step in establishing the need for an access management program. Particular attention should be paid to operational and safety deficiencies combined with an examination of traffic volume growth and whether these problems will increase in the future.
2. ***Develop goals and objectives for the corridor.*** These should be developed in terms of what kind of traffic should be handled and how access to the road should be allowed.
3. ***Develop potential options for access management.*** While a preferred plan may be easily discernable, to present this to affected parties as the de facto plan may create a contentious atmosphere. Therefore it is advisable to develop a series of options that can be presented to the public, with a clear indication that a final decision has not been made.
4. ***Produce educational materials.*** These should be used to present to property and business owners the facts about access management – what it is, how they can benefit and how they may be affected. While in the process of developing a retrofit access management plan, the Oregon Department of Transportation (ODOT) prepared a videotape that explained what the issues were, the alternatives, and the benefits of access management.

Figure 3.5
Implementation of Access Management for Retrofit Projects



5. ***Develop a public participation process.*** This process will outline how public involvement will be sought and used, particularly with business and property owners on affected corridors. Allowing the public to view potential designs and giving them the opportunity to voice their concerns allows them to feel involved and in some instances can add local knowledge not obtained previously. The ODOT had particular success in developing an access management program when at a public workshop; they informed the public about the various tools available for access management. The workshop participants were then given a drawing of the corridor that showed the existing roadway, driveways, buildings, parking lots, traffic volumes at each driveway and accident history. With the access management options that they were given, they were encouraged to develop their own conceptual plans. This allowed them to feel more involved in the process and to add local knowledge to the plan.

6. ***Develop a final concept plan for access management.*** This will include the final designs and the implementation steps.

7. ***Develop a timeline for implementation.*** Unlike access management for a planned development, which can be implemented as development occurs along a corridor, a retrofit access management plan may need to be implemented over time so that businesses are not adversely affected by either the construction of the design or the restrictive nature of the access management plan. Development and implementation of the strategy may be short-term or long-term depending on the nature and extent of the work to be done. One method of implementation could rely on certain triggers such as the sale of property, the redevelopment of property, or a significant increase in the trip generation characteristics of the property. Another method is for the City to regularly conduct a work or project program review to determine scheduled projects which can provide access management opportunities. Access management improvements can be tied in with planned corridor reconstruction projects or road resurfacing projects to efficiently combine activities with less disruption to business and commuters.

8. ***Monitor*** actual impacts to gauge the effectiveness of the access management plan after implementation. It will indicate whether desired results are achieved and provide insight to modify measures for future projects. For limited or no change, additional effective methods such as speed or route management may be applied.

3.7 Policies

The most effective land use management tool is a comprehensive approach to development review which incorporates access management principles into every development approval. The Official Community Plan and other local area plans can be used to help in the access

management plan implementation. The preparation of these plans and application of the planning tools such as site plan review, development permit areas and design guidelines should reflect the principles contained within the access management plan.

The link between land use planning, transportation and access management can be formalized to include a framework whereby the various approving authorities incorporate the access management plan into their development review. This would apply to functions from site plan review to zoning to building permits. This multi level approach will work to ensure that new development and redevelopment along the City's arterials meet the principles of the access management plan. Another advantage of this coordinated approach will be that all of the parties will be working "off the same page" and developers and landowners will receive a consistent response to development proposals. This coordinated approach will lead to an equitable application of access management plan policies to all developers regardless of who is the approving authority for the application. In turn, a clear and distinct policy will streamline the process of development approval as developers will know how to design access to their sites in order that they be approved.

The following are examples of the various regulatory policies that are used by the City of Kamloops to guide development and how these policies can advance an access management policy.

3.7.1 Community Plans (OCPs & Area Plans)

Official Community Plans (OCP) allow communities to define their road network as it relates to land use. Many OCPs define the hierarchy of their roads within their community. Broad policies can be implemented that determine the desired development along these roads and in general, the primary purpose of these roads. This brings a harmony to land use and transportation planning to minimize potential conflicts.

The 1997 Official Community Plan for Kamloops (KAMPLAN) included a section related to the transportation network and in particular, the hierarchy of roads within the City. Further, KAMPLAN includes the following statements:

- "single family residential units should not have direct access to arterials";
- "through traffic should be discouraged from local streets"; and

- "truck routes and industrial traffic should be restricted to designated arterials and appropriate industrial collectors."

Most pointedly, it is stated as part of the Official Community Plan, that the City should develop an Access Management Plan.

As part of the City's transportation goals, it was stated that land use planning should be integrated with transportation planning by managing future development patterns in a manner which minimizes the rate of increase in travel demand. Further it is stated that the City should ensure the compatibility of transportation corridors and facilities with adjacent land uses and the overall character and image of the community.

It is important that access management principles be included in the Official Community Plan and not simply alluded to. The OCP should include special policies regulating how development occurs along an arterial. Specific policy statements should be included in KAMPLAN that address:

- Connectivity of supporting streets as part of access management objectives;
- The level of desired management on selected arterials or class of arterials;
- For existing properties, a process through a multi-stakeholder review, to establish the feasibility of access management; and
- Provisions for access to/from redeveloped parcels fronting access managed arterials.

3.7.2 Zoning

Zoning bylaws regulate the manner in which parcels of specific designations can be developed. Policies related to each designation are generated that pertain to:

- Setbacks
- Lot sizes
- Maximum floor area and building height
- Use of land
- Footprint size
- Provision of off-street parking

The zoning bylaw could be refined such that design guidelines meet the principles of the access management strategy. Thus, as land redevelops and approvals are required, only plans that are consistent with the access management strategy would be approved. Developer land dedications would be included in this process.

3.7.3 Subdivision Bylaw

Kamloops has a Subdivision Control Bylaw. The purpose of this bylaw is to:

- Regulate the subdivision of land;
- Regulate the area, shape, dimensions and arrangement of parcels of land;
- Regulate the dimensions, location, design and construction of streets, works and services;
- Prevent premature subdivision and control urban expansion;
- Prevent the development of land whereon site conditions render such land unsuited to further subdivision;
- Preserve and expand the amenities of the City; and
- Promote the orderly, efficient, safe, healthful and aesthetically pleasing subdivision and development of land.

The bylaw regulates how land is to be serviced and provides policy for minimum parcel sizes for lands of certain zoning designations. The Bylaw spells out the responsibilities of the City and the applicant in adhering to the bylaw and provides guidance to ensure that the purposes of the bylaw are met.

The City of Kamloops could include in their Subdivision Bylaw site design principles which support access management objectives of the access management plan. Some of these principles include shared driveway/parking strategies, building setbacks, density provisions and access design standards. It is important that within the subdivision bylaw that there is a standard that regulates the size of lots, particularly the lot frontage.

3.7.4 TravelSmart

TravelSmart is a program by the City of Kamloops that integrates land use and transportation system planning management. The principles of the TravelSmart program included:

- Maintain mobility levels as Kamloops continues to grow by means of a transportation system which is effective, yet affordable;
- Integrate land use and transportation planning by managing future development patterns in a manner which minimizes the rate of increase in travel demand;
- Strive for further reductions in the rate of increase in travel demand through implementation of other feasible travel demand management techniques tailored to Kamloops;
- Protect the integrity of the provincial highway corridors within Kamloops;
- Recognize the linkage between the goal of environmental sustainability and an integrated land use and transportation system;
- Encourage economic efficiency in providing and financing transportation services; and
- Ensure compatibility of transportation facilities with adjacent land uses and the overall character and image of the community.

A number of Neighbourhood Design Considerations were included as part of this plan. These included:

- The provision of the development of neighbourhood centres which would contain a variety of stores that would reduce the need for multiple trips and precipitate more trips by non-vehicular means;
- The dispersion of employment opportunities so that living near work is a greater possibility;
- Mix of residential development types and densities – by including more higher density developments in traditional low density neighbourhoods would help to reduce automobile travel demands on City-wide basis ;
- Development of a street network that more closely resembles a grid where possible;
- Proper transit routing and the installation of bus shelters that would promote the use of public transit; and

- Implementation of Pedestrian and Bicycle circulation systems which make these modes of transportation more desirable.

3.7.5 Site Plan Approval

Before a parcel of land can be developed, the site plan must be approved. Some of the key information needed for site plan review includes:

- Proposed access or driveways
- Any internal site circulation element that may impact surrounding road network
- Right of way and property lines
- Critical road features
- Distance to neighbouring access, median openings, and signals

The review stage usually includes an associated traffic impact study that contains elements that identify any traffic deficiencies as a result of development, and recommends mitigation schemes that may contribute to access management implementation. Access management could become a critical component of site plan approval as only those site plans that adhere to the principles of access management would be approved. With the knowledge of this policy, developers could work together to design shared accesses to properties so that their site plans may be approved more efficiently. Further, the location of the building footprint should be managed in such a way that parking lots and accesses can be shared between surrounding properties. This would also allow the opportunity for the City and the developer to work together to find access solutions that meet the needs of both parties.

4.0 SUMMARY

Access management is one tool, among many available, that cities can use to preserve their investment in arterial roads. As has been noted in this report, there are many tools and variations available to communities in pursuing an access management strategy. This report has detailed some of these tools and how they should be implemented.

The City of Kamloops, through the course of various planning processes, such as KAMPLAN and TravelSmart, has demonstrated a commitment to preserving their investment in their road network and ensuring that goals for safety and mobility are met. The preparation of this Access Management Strategy has demonstrated a further commitment on the part of the City to achieve these goals.

Corridors exhibiting the highest priority for the development of an access management strategy have been identified. These candidate corridors have been established based on their inconsistency with current access guidelines, demonstrated deterioration in mobility and/or safety, expected change in corridor characteristics, and finally the opportunity or need for change. A suggested timeline for development and implementation of an access management strategy has been offered for each of these corridors along with the rationale for their identification. Further, a general process for the development implementation of an access management strategy for both existing corridors and new corridors has been presented. While every situation will be unique, these steps offer guidance for the eventual formulation of corridor specific access management strategies.

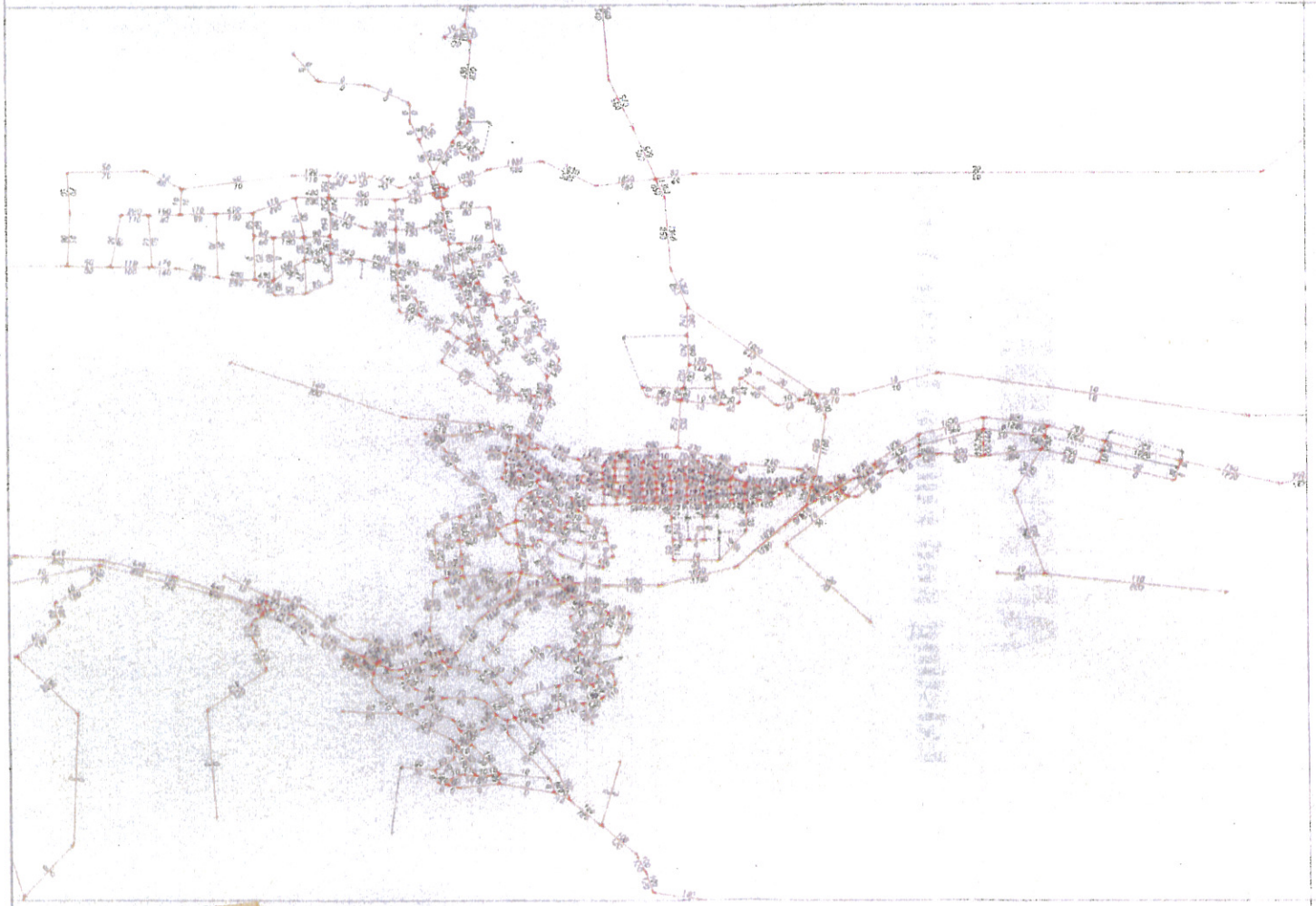
APPENDIX A

Existing and Future Traffic Volumes

COMPOSED VOLUMES ON AUTO NETWORK

SUM OF AUTO AND ADDITIONAL VOLUMES

emme/2



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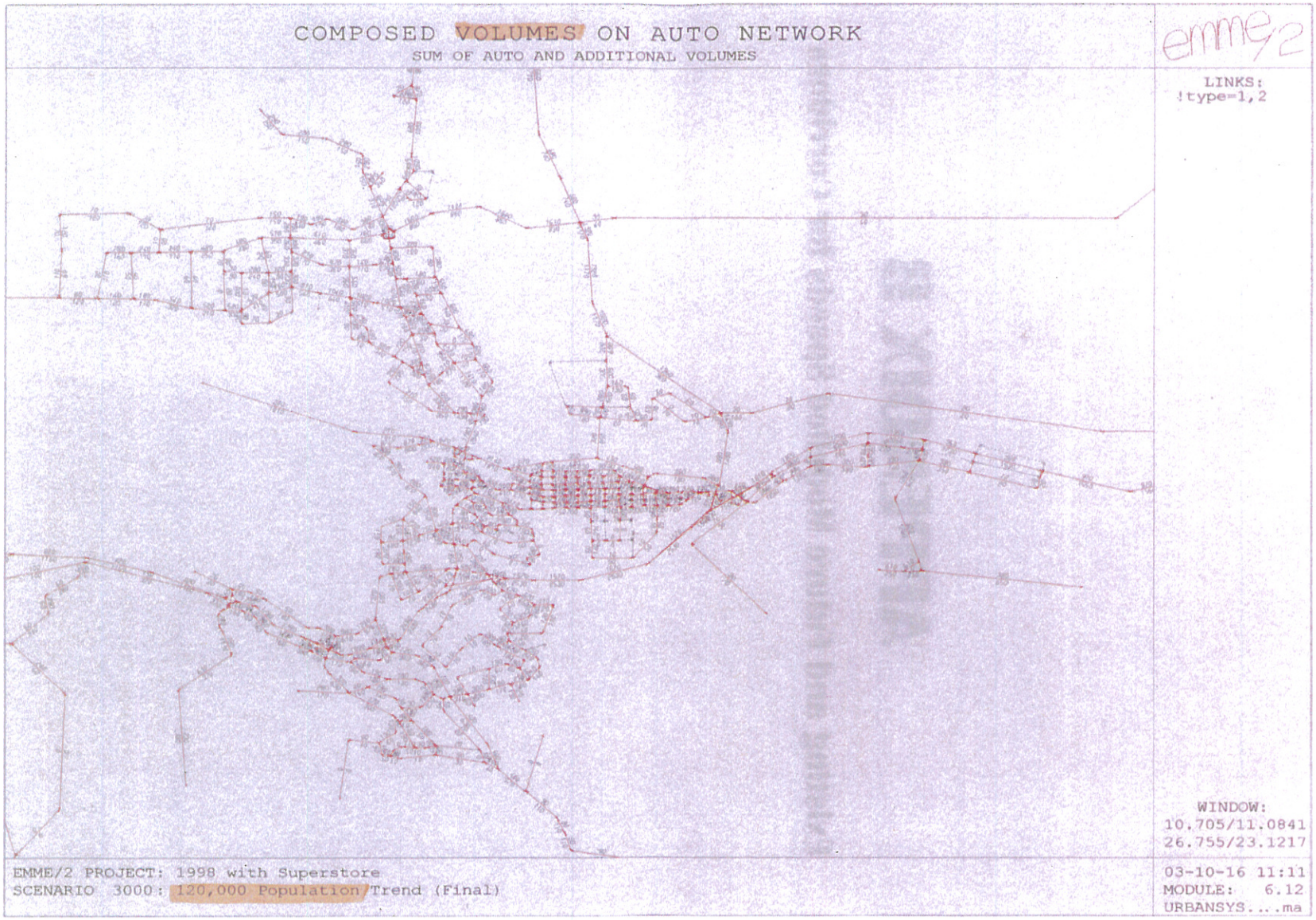
!type=1,2

WINDOW:
10.705/11.0841
26.755/23.1217

EMME/2 PROJECT: 1998 with Superstore
SCENARIO 1210: 1998 Base with Superstore (Factored)

03-10-16 11:04
MODULE: 6.12
URBANSYS....ma


COMPOSED VOLUMES ON AUTO NETWORK
SUM OF AUTO AND ADDITIONAL VOLUMES
emme/2
LINKS:
!type=1,2
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10.705/11.0841
26.755/23.1217
EMME/2 PROJECT: 1998 with Superstore
SCENARIO 3000: 120,000 Population Trend (Final)
03-10-16 11:11
MODULE: 6.12
URBANSYS....ma

APPENDIX B

Existing and Future Modelled Speeds for Corridors


AUTO SPEEDS (KM/H)
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WINDOW:
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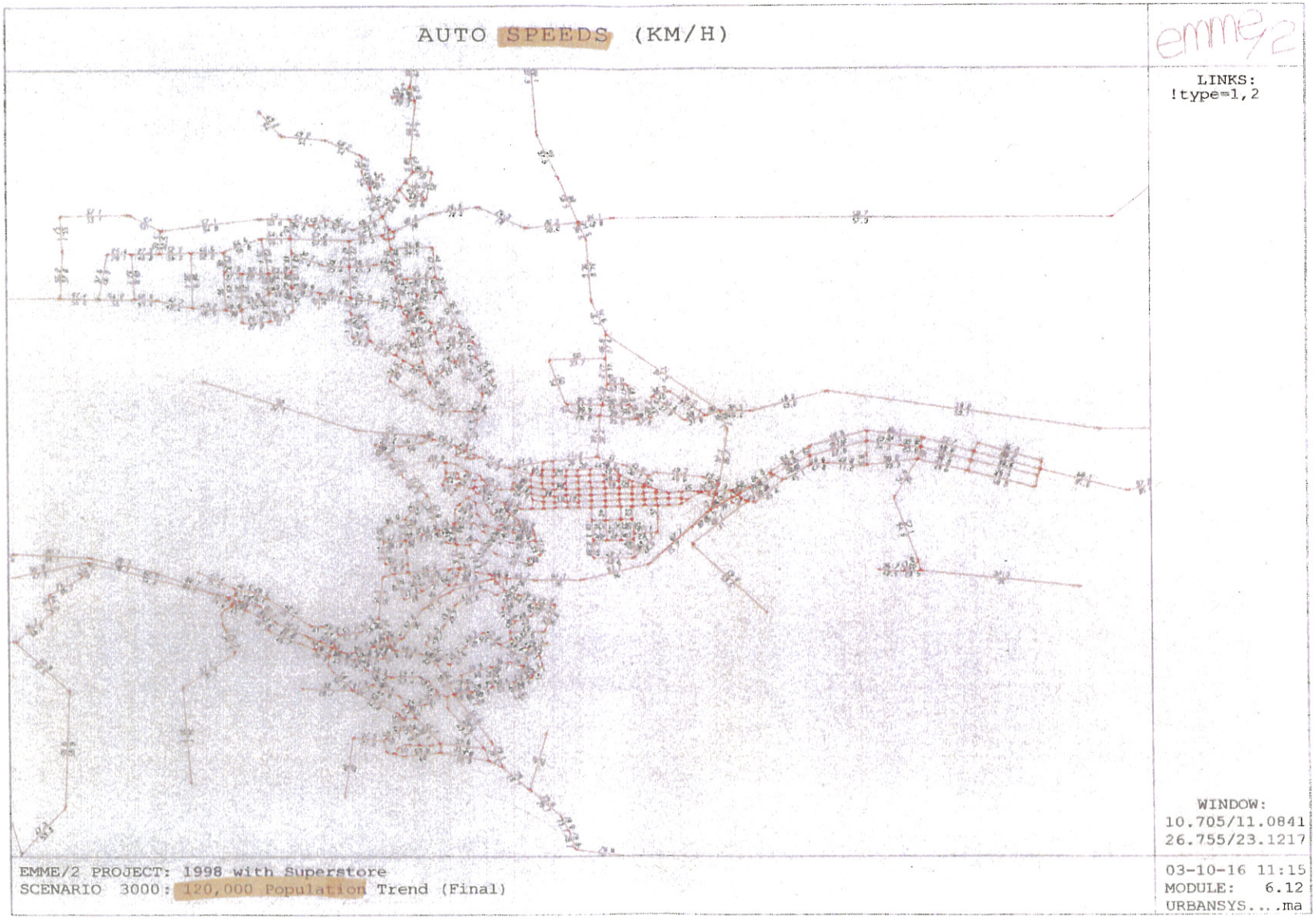
26.755/23.1217
EMME/2 PROJECT: 1998 with Superstore
SCENARIO 1210: 1998 Base with Superstore (Factored)
03-10-16 11:11
MODULE: 6.12
URBANSYS....ma


AUTO SPEEDS (KM/H)
emme/2
LINKS:
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10.705/11.0841
26.755/23.1217
EMME/2 PROJECT: 1998 with Superstore
SCENARIO 3000: 120,000 Population Trend (Final)
03-10-16 11:15
MODULE: 6.12
URBANSYS....ma