

The Development Approval Process in BC

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Abstract

The paper overviews the process for the review of Off and On-Site issues relevant to the approval of development adjacent to Provincially managed road facilities. These include “Arterial Highways” in municipalities (essentially “numbered” highways), and all roads in unincorporated areas.

This paper is based on course material developed to guide Ministry staff in the Development Approvals function carried out by District and Regional offices of the Ministry. The course covers 7 areas: Introduction to the Topic, Ministry Policy, Technical Background, Trip and Parking Analysis, the Roadway, the Access Point, and On-Site Issues. Extensive use is made of material based on actual submissions to the Ministry. This presentation focuses on key policy, analysis and review techniques, “what to look out for” in a review, and how to deal with typical issues in a submission. The presentation focuses on issues such as:

- Intersection Functional Areas
- Access Location
- Turn Slots
- Signals
- Queue Storage
- Safety Issues
- On-site Circulation
- Truck Access

The importance of system and operational issues is noted both as "Background" and in relation to site specific projects. Access Management issues are noted in relation to “single site” approval both with and without Access Management Plans in place. Sensitivity analysis for trip generation, parking requirements and traffic projections, and, the robustness of solutions are reviewed from both the Developer's and Road Authorities perspectives. Safety considerations, particularly in relation to the access point intersections are stressed.

Biographies

Richard James

Richard James, P. Eng, PTOE, has over 30 years of Transportation Planning and Engineering experience in BC, Alberta and England, including Municipal and Provincial Governments, and Consulting. Richard has been involved in all levels of the planning and design of transportation systems for many years. Throughout this time he has stressed safety and provision of facilities for all road users. Richard's experience includes road network planning, functional and detailed design, neighbourhood transportation management, cycling facility design, traffic operations and development impact reviews.

Richard has provided training to BC Ministry of Transportation staff in Development Access Design and Review for more than 10 years (course completely revised in 2002). Richard also provides beta testing services for the HCS software package, and technical support to the McTrans Center (Univ of Florida) for training in the HCM/HCS procedures to CalTrans staff and at other locations in Western USA and Canada.

Jon Conquist

Jon Conquist, P.Eng. has a B.Sc. (Eng.) from the University of Manitoba and an M.Sc. (Construction Management) from Loughborough University in the U.K. Jon has 18 years of transportation-related engineering experience, the past 13 of which have been with the B.C. Ministry of Transportation, where he is currently the Manager of Highway Planning at the Ministry's headquarters in Victoria.

The Highway Planning Branch's mandate includes the development of tools and methods to better identify and define problems and to develop and evaluate highway improvement options. Jon views the implementation of "the access management philosophy" as one of the most important activities of any agency or firm working with road systems or in land development, and one of the most promising activities for promoting safety and mobility. He managed the development of the Site Impact Analysis Course recently carried out by Richard James & Associates.

Background

MoT Jurisdiction

In British Columbia the Ministry of Transportation (MoT) has jurisdiction over all Provincial Highways (except in the City of Victoria and City of Vancouver where there is no provision for this in the City's Charters).

Within Municipalities these are classified as "Arterial Highways" under the Highway Act. The Jurisdiction extends only to construction and maintenance, approval of subdivision of abutting property, access, and a veto over zoning within 800m of an intersection of designated "Controlled Access" Highways.

Controlled Access Highways are specifically designated to give the Ministry more powers to manage access to preserve the capacity and safety of identified major facilities.

The Municipality is always responsible for zoning of land. The Ministry's veto extends to determining that the proposed type of land use and its intensity would generate too much traffic to be carried by the Provincial facility. A rejection or veto is always based on this criterion. Clearly, the proponent could agree to provide mitigation that would satisfy the Ministry.

Outside Municipalities, MoT has jurisdiction over all roads (construction, maintenance and access), but not Land Use, for all roads.

In a similar manner to within municipalities, the Regional Districts (aka "Counties") have jurisdiction over land use. A rejection based on traffic volume is always based on this criterion. Clearly, the proponent could agree to provide mitigation that would satisfy the Ministry.

As the Road Authority, the Ministry may decline access or require improvements on any road under its jurisdiction. If access to the road system is refused, there is an effective "Expropriation" and an appropriate process is followed.

Getting Approval for a Development on a Provincial Highway in BC

There are 4 main occasions when approval of MoT is required. The application process differs for each.

- Rezoning and Subdivision, application is to the Municipality or Regional District who will refer it to MoT if required (i.e. on Arterial Highways or within 800m of an intersection with a CA Highway in a municipality). Regional Districts must always refer these applications to MoT.
- Building Permit, application to Municipality or Regional District, referred to MoT if required (rarely)
- Access, any development (or existing use) on land abutting a MoT facility requires an access permit. Access Permits normally go through the same review process used when a subdivision or rezoning is submitted as approval of those implies an access permit is issuable. Exceptions to this are a recent change that no longer requires Ministry review of single family residential driveways on minor rural roads. A plan must still be submitted for filing.
- An access permit lapses on change of use (even though rezoning is not necessarily required) or ownership. However, this is not rigorously enforced, and owners are expected to apply to the MoT District Office for an access permit for all roads under MoT jurisdiction.

What is Important

- The BC Site Impact Analysis Requirements Manual, this document was developed in 1997 and describes the process and technical requirements for a Site Impact Study for BC MoT. Development of this manual brought together a number of practices for the first time in a single document. It was based on research of practices in various provinces and states, but relies heavily on experience in Colorado. It was intended to be a guide to be used by MoT staff, municipalities and Transportation Engineering Consultants involved in the process.

- One of the objectives of the document was to promote a uniform approach to development proposals by all MoT offices. Prior to this time, consistency was variable between Ministry offices.
- Another objective was to promote a unified approach with Municipal approval processes. The goal was an agreement on a single "Terms of Reference" for studies by requiring an initial scope meeting and agreed written scope prior to commencement of the study. Prior to this time, there was often little coordination and few attempts were made to ensure compatible criteria.
- The studies produced had to be technically justifiable, that is mitigation (or lack thereof) had to be substantiated by appropriate analysis that looked at the required range of parameters, and made appropriate assumptions about, for example, future Highway improvements.
- The required improvements to the Road system have to be economically feasible, both for the Ministry and Developer.
- The process must be that it permits development, not restrains it.
- The process must also preserve the value of public funds invested in the Provincial Road System.

What's Reviewed

- Traffic Impact - the technical analysis of traffic operations, including existing and projected traffic with and without the site in place, and the various mitigation options are reviewed for compliance with the Ministry's criteria including the use of appropriate methodology and assumptions.
- Road Design - the proposed roadway design is reviewed for compliance with design guidelines (BC no longer uses "Standards"), and for the presentation of a good design that will function well in the future under changing traffic conditions.
- Access - the proposed access points and layout are reviewed, generally using the same criteria as the roadway. An access point is simply a special case of an intersection.
- On Site Design - the on-site design is reviewed for issues that impact the operation of the access point, principally magazine storage lengths and their capacity. Other on-site issues become less important if the access design is adequate.
- Other issues - outside municipalities the Ministry acts as a clearing house to ensure other approvals are obtained. Other roadway issues are also reviewed such as drainage and, if appropriate, environmental impacts.

Training

Given the varying level of technical expertise available for the review process, the Ministry has provided training to its staff over the last 10 years or so. This training has been in the form of a 2 - 4 day workshop style course held at various locations throughout the province. The course material has been prepared and presented by Richard James.

The training focuses on :

- What's Important
- Why
- What to Look For
- Who to Ask for Help

The training material uses a number of published references in addition to the BC Site Impact Analysis Requirements Manual. The material is provided on CD-Rom in PDF format and is fully indexed with search capability.

The material, a 7 segment (4 day) presentation, is cross-referenced to the Site Impact Requirements Manual as well as the National Highway Institute (NHI) Access Management Coursebook. Approximately 18 case studies are included with comments on significant issues in each one.

Process

- Submission

The key issues that are stressed to improve the application process are:

- The Earlier the Better! - contact and working jointly with Ministry and Municipal staff early in the process is going to ensure that the goals of all organisations are addressed and achieved early.
- Early Contact – before the site plan is developed is key to success. If the submission or contact is only made after the building is placed on the site plan and parking layouts developed with the access located "where ever it fits", then conflict is assured.
- Maximize Access Potential - this is to everyone's benefit, the developer needs good access, preferably better than their competitors! The Road authority wants good and safe access to preserve the integrity of the Highway system.
- Minimise Access Restrictions - results in easier access for customers and less conflict with traffic searching for the access (or exit).
- Best Access = Best Value for Developer - poor access, especially in comparison to competing business, is a liability to a business. Good access may cost more initially (if planned from day one, it shouldn't!), but the long term loss due to decreased business will cost more than the "savings" due to poor access.
- Find Out What is Required Before You Start.... You might think you know the site, but the Road authority will know their concerns a lot better than you do.

Who's Doing the Review

Two Ministry offices may be involved in the definition and review of a Site Impact Study. In the case of smaller, low impact, projects the work is normally done in the District office. Larger or more complex projects, and those with exceptional issues (for example a pre-existing safety issue), would be "front-ended" by the District office but with significant technical support from the Regional Office. There is now essentially no technical support on a project level from Ministry Headquarters.

Primary Review: District Office Staff

- Varied Technical Background

Secondary Referral to Regional Office

- Traffic Operations
- Planning
- Design

What's Reviewed

- Big Projects vs. Little Projects

A key requirement of the Ministry's procedure is the early development of an appropriate **Scope and Terms of Reference** for an Impact Study. The initial step is to determine if a "simplified" process can be used or if a "Full" study is required. This is based on the "100 vph" criterion, with consideration of other issues such as proposed access location, known safety or capacity issues etc.

The Scope development meeting defines the issues to be addressed. This includes issues such as trip generation rates, analysis methods and parameters, committed ministry projects, available planning documents (Corridor and Access Management Plans, Official Community Plan (OCP) or Official Settlement Plan (OSP) documents etc.) and other issues that may be relevant to the particular site and roadway configuration.

The differences between larger and smaller proposal can be summarized as:

Larger Projects (>100 vph)	Smaller Projects (<100 vph)
Larger Area of Impact	Immediate Area of Site
Require Detailed Traffic Analysis	Less Detailed Traffic Analysis
Mitigation and Design of Improvements	Minimal Design

Study ToR - Key Issues

- Study Area of Impact is defined at the scope meeting. It can vary from the immediate access area to a radius of 2km or more from the site depending on site and roadway conditions. The analysis must include all intersections and access points (to other developments) within this area.
- Site Specific Issues to be addressed are identified. These may include:
 - Safety
 - Known Problem Intersections/Accesses
 - "Committed" Upgrading Projects

These can have a significant impact on access location and operation. For example, if the site is in the area of a proposed Access Management Project, the site may have to comply with criteria that are quite different to a development elsewhere.

"Committed" projects are an issue, clearly developers would like to "benefit" from unconstructed projects, yet the Road Authority may have no assurance of funding for construction. This may result in a requirement for with/without analysis and some way of determining who is responsible for what costs.

- Methodology: Analysis methods and traffic projections required should be defined in the scope development meeting. Approval of non-standard methods and assumptions or criteria is also required (why does the developer want to use HCS version 2?)
- Background Information to be used in the study must be identified to ensure that previous work is recognized. This would include:
 - Data Sources
 - Previous Studies, including Other Developments
 - Regional Plans, OCP/OSP's etc.
 - Corridor and Access Management Plans
- The Study should address all feasible options including "no direct access" to the major road fronting the site. This is not to say that no direct access to "the Highway" will be permitted, rather it is to ensure that the implications of doing so are understood and analysed as part of a rational access policy.

- Small Projects

For smaller projects a Simplified Process is used. This is summarized on a 2 page checklist vs. 13 pages for the detailed process.

- Development details have to be provided including:
 - Land use
 - Parking layout and numbers
 - Site plan – fully detailed
 - Access plan – fully detailed
 - Highway plan
- Trip generation, assignment, traffic projections are required if appropriate (dependent on development size and adjacent street conditions) but at a reduced level of detail to a full study.
- Capacity analysis for access point including signal phasing if signalized (the impact of these projects is generally limited to the access point or adjacent intersections)

- Larger Projects

For larger projects a "full" study is required. This can become quite complex, it is essential that the study Terms of Reference are comprehensive and fully understood by all parties. In urban areas the active participation of municipal staff is essential from day one.

- Full Terms of Reference
 - Scope Development
 - Level of Detail
 - Acceptable Methodologies
 - "Formal" Review
- Full Design of all mitigation on the street and of the access point roadways is required. A full parking layout will also be reviewed to ensure that on-site features do not compromise efficient access.
- If Staging of the development is proposed, then each stage of the development, and associated mitigation, must be analysed. Improvements should always be tied to traffic volumes rather than a "year".

Technical Issues

The technical issues that are of increasing importance are discussed in this paper under 4 main headings. They have been selected to stress points rather than because they are the most important or most neglected in submissions. This certainly not an exclusive or all encompassing list as many issues go into the unique characteristics of many development projects.

- **Safety**

The key issue is - "Is proposed location "Safe"?" If there are existing safety issues, without the site, who will be responsible for addressing them, assuming that this can be done at a reasonable cost?

Resolution of Safety Issues

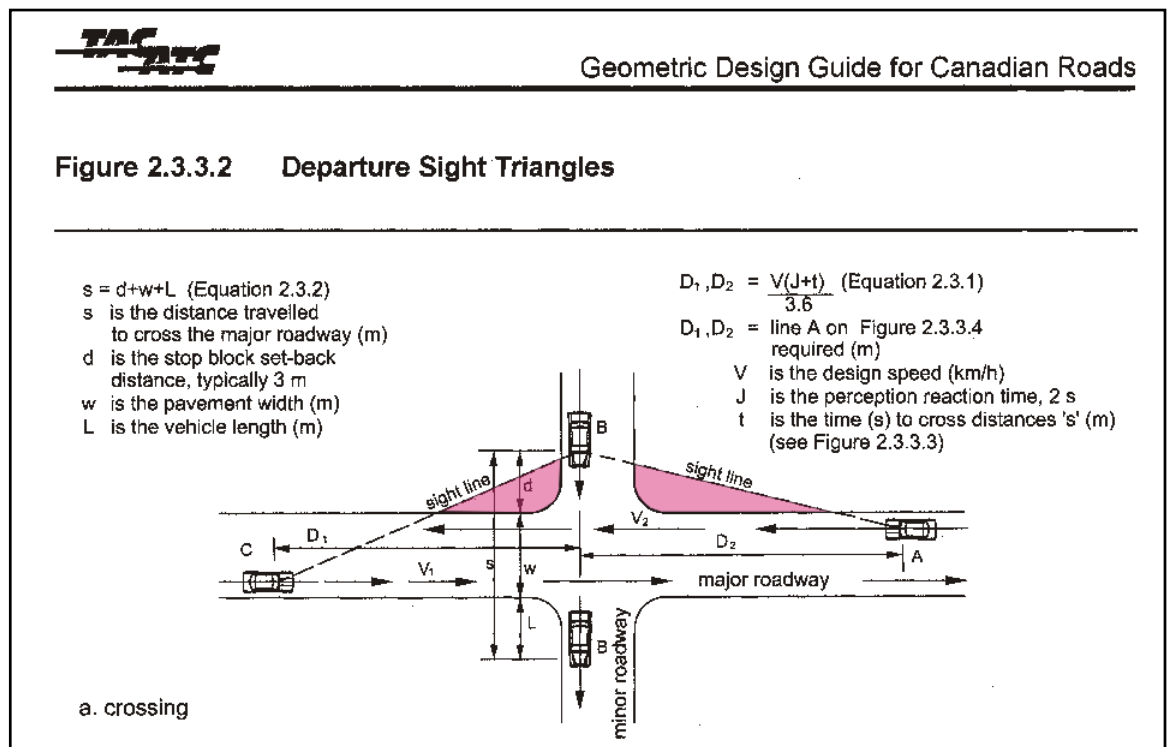
- "Safety Conscious Design"

We should be looking for "Safety Conscious Design" in all projects. In the past, it was often assumed that if you "designed to the Standard" all would be well, you would have a safe, high capacity design. We now know this is simply not true.

- Sight Distance

Adequate sight distance is a key issue. Normally we should require Decision Sight Distance rather than simply Stopping Sight Distance. However on rural 2 lane facilities, Passing Sight Distance criteria may also impact the desirable location of an access. If an access splits a tangent section such that there is inadequate passing sight distance, we have built in a problem.

The other sight distance that is often a problem is "Turning Sight Distance", the sight distance required at intersections to make safe turns.



- “Logical” Traffic Patterns.

Logical traffic patterns promote safety (drivers don't make unexpected manoeuvres), and aid customer friendliness. "The best route home is the route I took to get there" is often true. Logical traffic patterns also minimize the need for signing.

- Minimize Conflicts

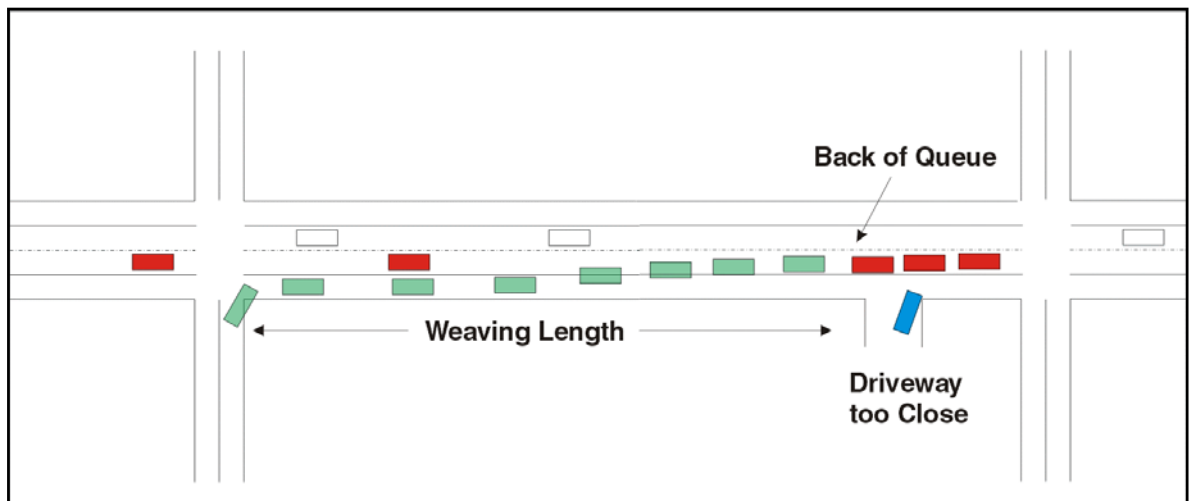
Conflicts between vehicles on the road system are generally avoided by good design. We can take various steps to minimize the number of conflict points, restrict turns, minimize the number of access points etc.. However, on site, care is required that conflicts, such as circulation road/aisle intersections, do not interfere with the critical operation of the access roadway "magazine" area. On-site conflicts, while generally lower speed events, are still significant and good design, rather than "squeeze it in - somehow" is required to make a customer friendly site.

- Adequate Intersection Spacing

We often talk about the desirable spacing for signalized intersections based on signal progression. Access points are simply "special cases" of intersections and spacing issues can become critically important. Where accesses are too close, driver confusion becomes an issue, is the approaching driver turning into this or the next/previous driveway? Is there sufficient storage length between intersections for vehicle queuing (Minimum "Corner Clearances" do not fully address these issues).

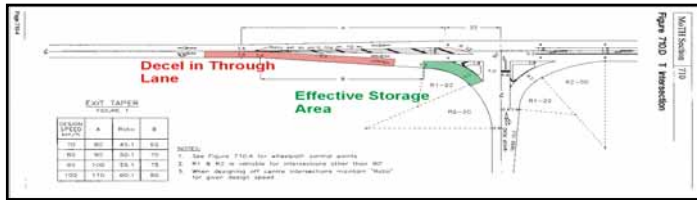
- Minimize “Weaving”

Often neglected on "city streets" as opposed to freeways, weaving can significantly increase delay and have a negative impact on safety if there is inadequate distance to do so safely at the prevailing traffic speed and volume.



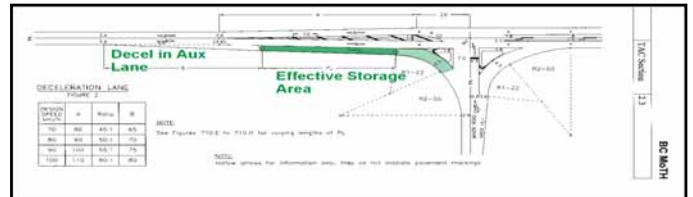
- Turn Storage Lengths – Critical on Higher Speed Facilities

Two issues arise with turn storage, blockage affecting through lane capacity and the need for vehicles to slow in through lanes due to inadequate deceleration distance in the turn lane. On high speed facilities this can be a critical safety issue.



The sketch on the left shows a poor design with deceleration in the through lane.

The sketch on the right shows a safer design with most or all of the deceleration taking place in a separate lane.



Finally, we can't expect the developer to fix existing problems ... but we can decline access if it is unsafe.

- Capacity

- Trip Generation, ITE or Ministry Approved Rates

Determination of trip generation rates for a particular land use has been a "hot issue" on many projects. Typically a developer will present an argument that "I'm different, I have another store at XYZ, and we only get X vph, why do I have to design for your inflated rate?"

The range of trip generation rates within a given category is often a 2:1 ratio up and down (ITE Trip Generation manual). Clearly, no one site is going to have "average" trip generation. Moreover, a successful development will have a higher than average trip generation. Of course, all developments will be successful, won't they.

The key to reviewing proposed trip generation (or parking) rates is statistical reliability. How reliable is the data presented, do the surveyed sites truly represent the proposed business, is the "Business" wide enough in scope, and is the sample size big enough to show a true variation from the accepted rate? More critically have the sample sites been biased in selection to produce a desired result?

One overlooked technique is Sensitivity Analysis. By testing a range of assumptions (including Trip Generation Rates), the analyst can determine how changes in assumptions impact the solution. If the Developers rate works but the ITE rate fails in 5 years, you know what the problem is.

- Design years

We have to design not just for "Opening Day"; but for several future Design Years. Typically these would include 5, 10, 15 Year scenarios as well as any project phasing or years modeled in a local Transportation Model.

There are of course some assumptions built in, including linear growth of traffic, site traffic does not change etc. The best that can be said is probably that the projected traffic might occur at some time around the projected year, depending on regional growth, business success etc..

Other Developments and "Regional Growth" have to be considered, not just the impact of the subject development site. This is important as they are not necessarily included in historic "Growth Factor" analysis or may not be adequately represented in a traffic model.

- **Capacity Analysis**

To ensure comparability between projects and compatibility with Ministry analyses, appropriate analysis techniques and software must be used. This typically means software based on the current version of the Highway Capacity Manual. There have been occasions when "older" versions of software were used for analysis. This is not appropriate as they do not reflect current analysis techniques and may contain flaws (aka bugs) that have since been fixed.

Signal Progression must be addressed if the streets are, or may be, signalized. This precludes use of the HCM/HCS software for many signalized intersections as the procedures do not address progression in a meaningful way. In these cases, not only do capacity and delay have to be addressed, but signal spacing and progression bandwidth become critical parameters that may restrict access location or desirable access volumes to maintain the integrity of the operation of the main street. Currently, Synchro is the preferred signal software used by the Ministry on its facilities.

- **Mitigation - Maintain Minimum LoS**

The key output of any Site Impact Study is to determine what mitigation is reasonably required to enable the project to go forward. Typically this may include:

- Intersection Improvements
- Road Widening – Adjacent, Build or Protect
- Off Site – Other Intersections Impacted
- Transit/Bike/Ped Facilities
- Transportation Demand Management (TDM)

These are normally implemented at the developers cost. Off Site (other than frontage or "next intersection") improvements are more difficult to deal with, especially with a smaller development where it is often argued, sometimes rightly, that "it's not all our responsibility". At the present time there is generally no mechanism in place for the Ministry to hold funds for deferred work, so other mechanisms have to be found.

Pedestrian and bicycle facilities, and transit service are often overlooked. However if we expect people to use these alternative modes we need to build (and retrofit) appropriate infrastructure. All new developments should incorporate these facilities to the extent appropriate.

- **Intersections**

Access Capacity and the impact of added traffic on available (for other traffic) roadway capacity have been discussed. Mitigation requirements have been noted. The next key issue is to put "intersections", of which Access Points are but a special case, in the context of the overall Roadway Management System.

- **Access Management**

The concept of a planned Access Management strategy for a segment of roadway is not new. Unfortunately BC has few such plans. The application of Access Management concepts to isolated sites should not be a radical concept although it may be more difficult to conceptualise than as a coordinated effort along a corridor.

The key points are that you need to:

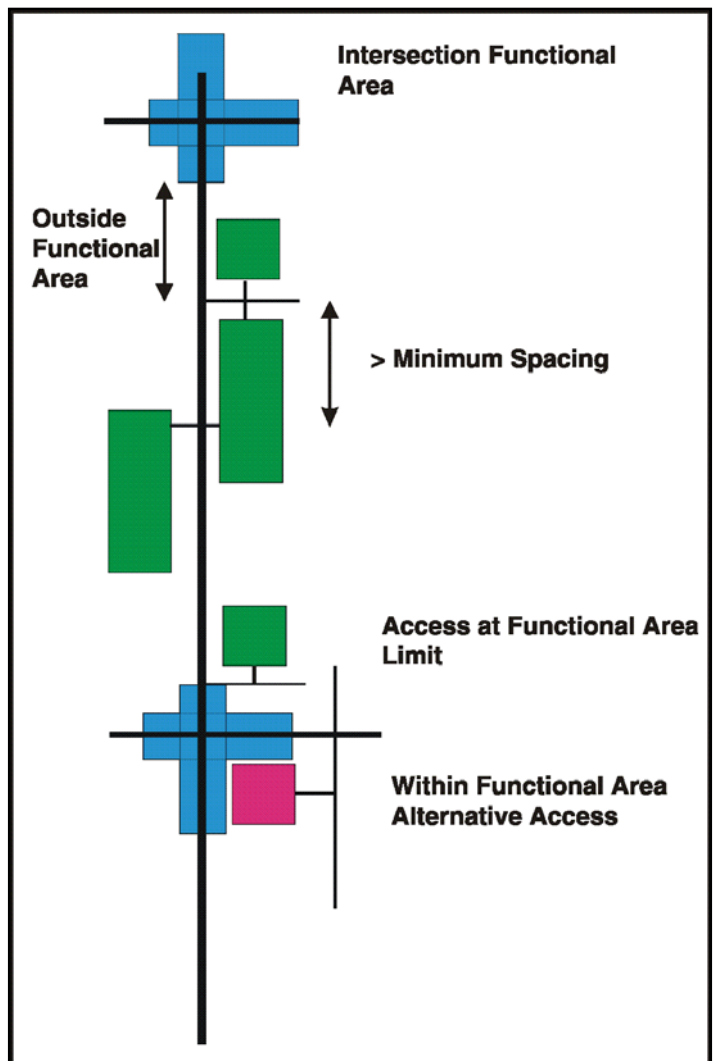
- Identify the constraints imposed by the site
- Identify which overall management techniques are likely to be achievable in the particular corridor
- Develop a site access management strategy that preserves as many future options as are reasonable
- Provides adequate access on opening day

If we can do this, then we:

- Design the site as if an access management plan was in place
- Consider the “site” in relation to access management concepts
- Provide flexibility to develop an access management plan around the site access

Some examples of this would include:

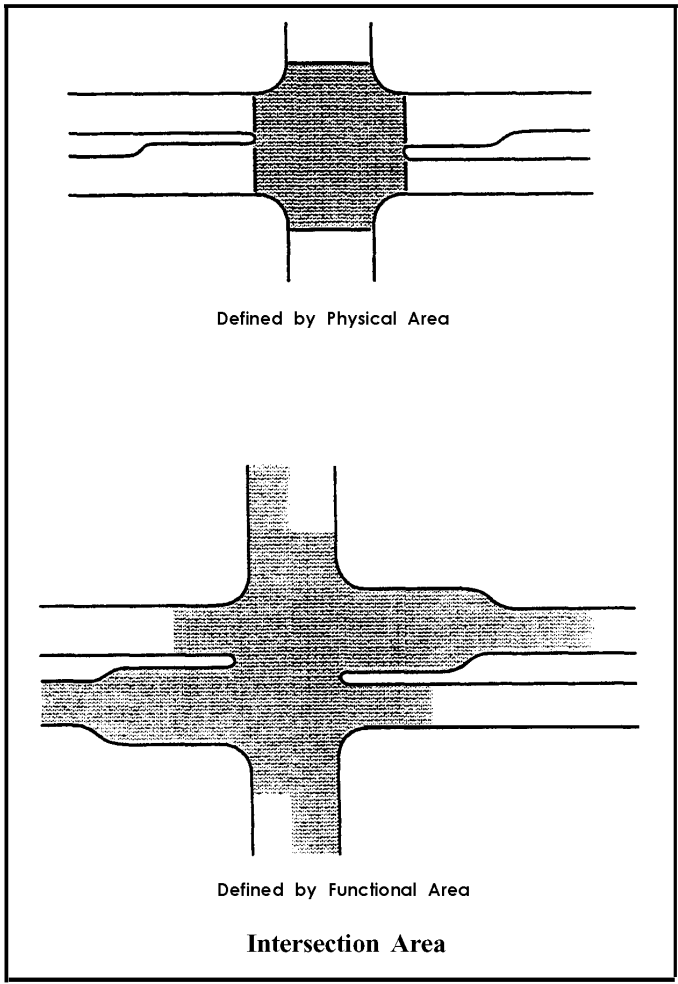
- Access outside of the adjacent intersection functional area
- Minimum spacing between access points
- Alternative access if the site is within the intersection functional area



- **Access Capacity**

After mitigation, improvements to maintain overall capacity, the number of access points required for a site to maintain a balance between capacity and spacing is an important issue. While frequent accesses "spread the load" they also increase the number of conflict points and in some cases introduce new conflict types (intersection overlap for example). The best approach is to have the minimum number of accesses required to service the projected traffic volumes, and to place them on all side streets with a minimum number of access points on the major road.

A critical issue related to intersection spacing is the Intersection Functional Area (definition on next page). This is an area around the intersection where intersection operations affect traffic operations. It is more extensive around signalised intersections, but also applies to unsignalized intersections (left and right turn lanes on the through legs) and side streets.



Source: Reference (7), Figure 4-16, p. 100

Definition

“the area in which traffic operations are effected by the intersection”

Importance

It is a critical area of conflict. Conflicts play a significant role in collisions, and we wish to avoid additional collisions

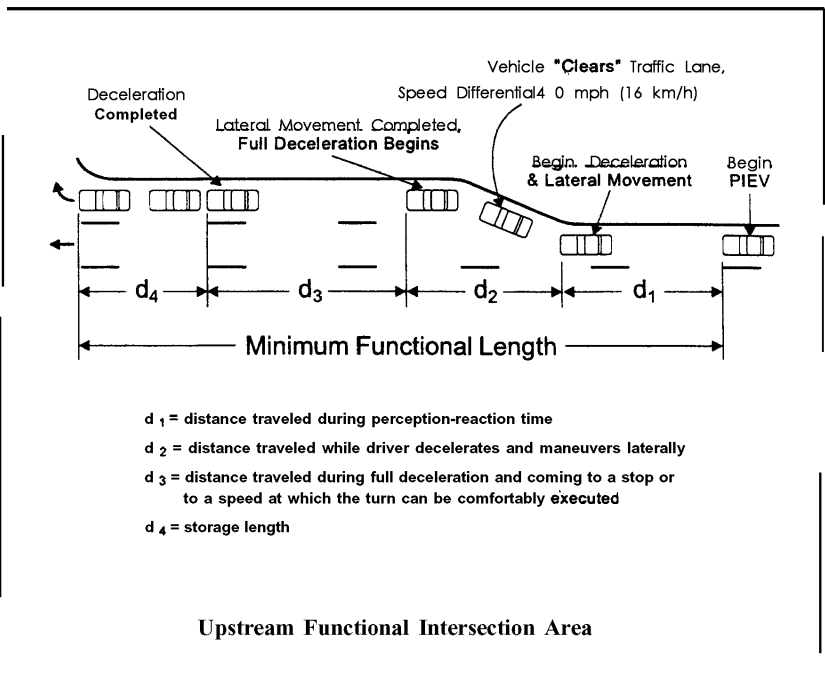
Affects on Access

The Intersection Functional Area affects access because it may indicate that we should either relocate the access outside this area or restrict turns (i.e. Right Turn in Only)

The Intersection Functional area is more fully defined on the following sketch.

The area includes all queuing areas plus their respective Perception, Evaluation and Reaction time zones, and deceleration distance for the operating speed of the facility.

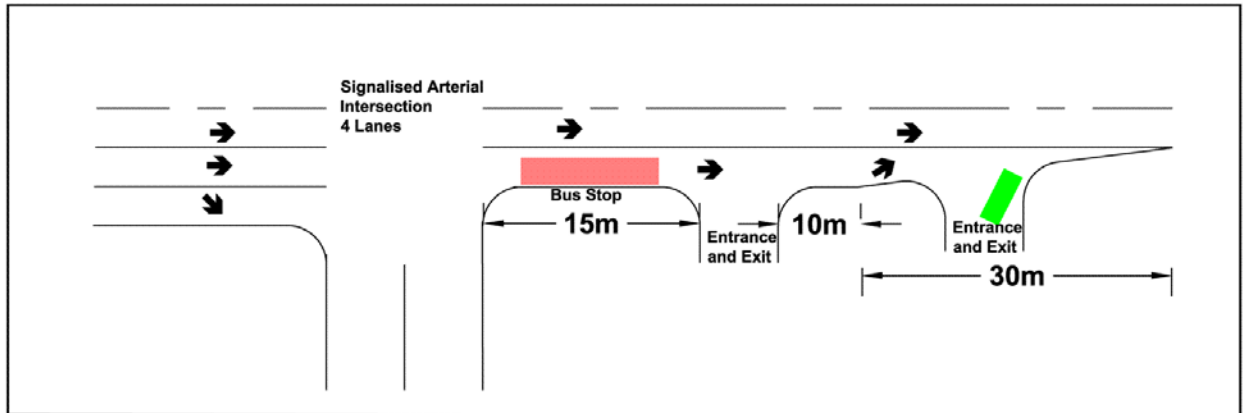
Where Functional Areas of adjacent intersections overlap, turning should be restricted or eliminated.



Each of the components $d_1 - d_4$ has to be determined separately for each lane group, operating speed and projected volume. At low Levels of Service, this can clearly become a quite restrictive condition on access location due to excessive queue storage requirements.

Source: Reference (4)

The sketch below illustrates a complex case of too much happening within the downstream area of an intersection. Both streets are 4 lane, however in the left to right direction there is a bus stop, 2 driveways (one on the taper) and a lane drop within approximately 55 meters of the intersection. The intersection effectively operates with one lane in this direction.



Sometimes we can use intersection configuration to manage these conflicts by restricting movements to a "T" configuration or eliminating movements that impinge on the conflict area.

- **Signalised Access Points**

In the past there has been a general aversion to signalising access to development as it was thought the perception might be that the developer somehow "owned" the signal and there would be pressure to modify signal timings to "favour" development access. However there are clearly circumstances where signalisation is the best or only reasonable solution. In these cases it is critical that the solution be built to look and operate like a public road.



In the top picture the intersection of 2 Provincial Highways is a "T" intersection with the fourth leg (shown) a one way (in) commercial driveway. There is a high traffic volume turning left from the stem of the "T" (out of the picture). Although the intersection is signalised, the driveway is "ignored"



In the lower picture the intersection and building have been rebuilt with a 4 lane divided road into the site and a full 4 leg intersection developed. High turning movements on all legs make for a complex intersection, but it is safer and operates more efficiently than the previous layout.

The building in the top photograph is on the left of the lower photograph. The road in the top photograph is the top of the "T", the road in the lower photograph is the stem of the old "T" intersection.

All parameters relating to the roadway signal system must be honoured in the access point signal design (progression, phasing design restrictions etc.).

A key issue is that:

More Access = More Friction = Lower Capacity

So we wish to minimize the number of access points and to design access points to minimize conflicts

To achieve this we may sometimes wish to restrict unsignalized intersections to Right In - Right Out only, or left-in and Right In/Out only, and manage their location with respect to other intersections, especially signalized intersections.

In general, on higher speed facilities we also want to consider Deceleration Tapers that improve safety by removing speed differential from the through lanes and, increase capacity. Unless adequate acceleration length can be provided we generally want to avoid acceleration lanes.

On-site

The key issue for Road Authorities is: Does it Impact the Highway? If the answer is "No"... then are we concerned if there are problems on the site? The answer to that is less clear, it's "Maybe"... if the on-site issues cause a problem at the access point intersections then we are concerned. However, if the site does not work well internally, the developer should be concerned because he will possibly lose business to competitors with a better (easier to use by the customer) site layout.

The key issues to us are:

- Magazine Storage, if sufficient storage is provided to ensure there is no queuing from the internal intersection into the access point we have less concern about on-site layout.



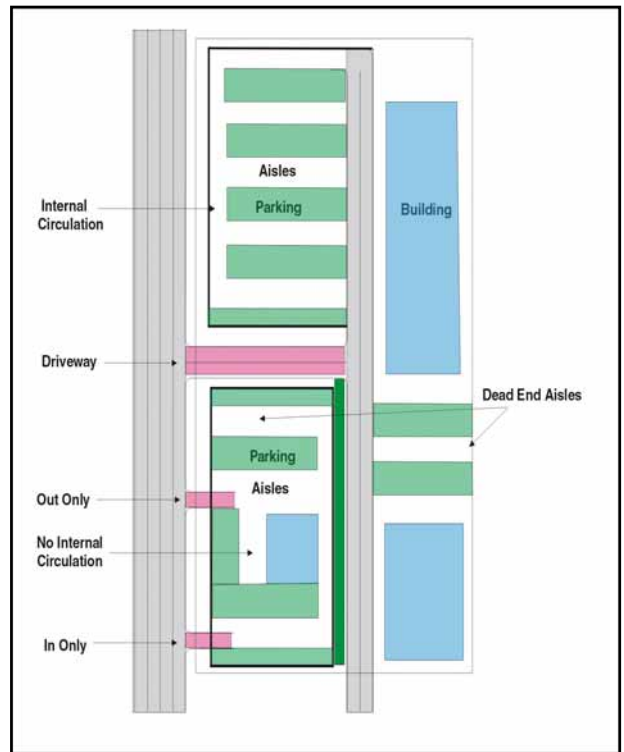
In the upper picture a site with a good "clean" magazine is shown. In the lower 2 pictures another site is shown, but the magazine is too short to accommodate the incoming traffic (left picture), resulting in congestion in the access point signal area, and too short to accommodate the exit left turn (right picture) queue resulting in blockage on the internal intersection.



- Circulation, if there is adequate on-site circulation so that traffic can move around and find parking stalls etc. without impacting the access point magazine storage, then we are less concerned.

Other issues with circulation include:

- Circulation must be internal to the site, the street must not be used to link parking aisles
- No stalls on the main circulation aisles
- Avoid dead end aisles except in residential or assigned low turnover parking



Adequate Parking Provision, if the number of stalls and their layout are adequate so that customers can find empty stalls and get into them easily, then we are less concerned. In this area, we find that many municipally specified parking requirements are minimal values and can not be substantiated by verifiable data. The Ministry usually insists on the use of their own data or data from the ITE trip generation and parking rates manuals (MoT data is based on these sources). Parking stall size is also a function of the vehicle fleet mix. In some parts of BC (i.e. outside Greater Vancouver/Greater Victoria) the increasing percentage of larger vehicles (SUV/minivan) is causing problems, especially with "small car spaces" resulting in inadequate parking provision.

- Truck Access is often overlooked and "added" at the last minute when the loading dock is fitted into a corner of the building. Adequate access to loading docks requires recognition of truck turning templates that are quite different for forward movements and backing. The top picture is an older retail development where the original truck loading dock access has been compromised by addition of a parking structure ramp resulting in almost impossible access by semi-trailer trucks.



The lower picture is a new (under construction) development where an open area (right foreground) has been preserved adjacent to the access (to left of the truck) permitting a "single backing" movement into the loading dock.



- Transit, Bicycle and Pedestrian Access

Provision of these facilities is often an afterthought, even on new developments. On-Site vs. On Street Transit facilities may be preferable if reasonable transit usage can be expected, or a transit exchange is required. Access to the transit stops has to be provided that will accommodate busses rather than cars.

If sidewalks are provided on the street (why not?), then sidewalks must be provided safely linking the roadway to the main entrance(s) to the building(s). At the site below it was clearly an afterthought... and is blatantly unsafe. The stairway (railings) is not connected to a sidewalk, it just links the access driveway to the parking, not the sidewalk on the street to the customer entrance to the building.

Where appropriate, user facilities for cyclists and pedestrians should be provided. Bike racks, benches and if the development includes significant employment, locker rooms and shower facilities may be appropriate. Connection of on-street bike lanes to the site is also required where these exist.



Conclusion

The process that is being used for review of development access in BC is based on:

- A defined process that includes
 - Staff training
 - Positive guidance to Developers and their consultants on what is required for an Impact Study
- Identify key issues and document them in a written Scope/Terms of Reference
 - “does it impact highway operations”
- Thorough and consistent analysis, that is well founded technically, using current tools
 - Compatible with municipal processes
- Develop acceptable mitigation that meets the needs of the Ministry and developer
- So that the development can be approved with safe access with minimum traffic impact

References

BC MoT Site Impact Analysis Requirements Manual

BC MoT Trip and Parking Generation Manual

Transportation Assn of Canada (TAC) Geometric Design Guide for Canadian Roads

BC MoT Supplement to the TAC Geometric Design Guide for Canadian Roads

National Highway Institute Access Management Course 15255

and documents referenced therein.