Central Okanagan Smart Transit Plan

Transit-Supportive Guidelines

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by
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Introduction

INTEGRATED COMMUNITY PLANNING

Decades of uncoordinated land use and transportation planning have produced a common pattern of growth across North America— one of urban sprawl. Environmentally, economically and socially unsustainable, sprawl requires almost total dependence on the automobile and renders public transit ineffective. Out of synch with land use, transit has been a consistent money loser due to low ridership and poor service levels.

A more sustainable and transit-supportive pattern of urban development, ‘Smart Growth’, is now available to both public and private sectors alike. Involving the reintegration of transportation and land use planning through the process of Integrated Community Planning (ICP), Smart Growth promotes the development of ‘complete communities’— emphasizing mixed land uses, compact built forms and walkable, multi-modal streets. ICP also promotes ‘Smart Transit’, involving transit technology and systems better matched to land use patterns and the needs of transit users.

ICP is the central premise of this set of Transit-Supportive Guidelines. However, mutually supportive transit infrastructure, land use patterns and built form cannot be achieved without close cooperation between transportation engineers, planners and urban designers. These disciplines can no longer be carried out independently, otherwise sprawl development and automobile dependence will continue.

These Transit-Supportive Guidelines were developed in conjunction with the Central Okanagan Smart Transit Plan through special funding provided by the Federation of Canadian Municipalities. While the Guidelines are intended to be applicable more to medium-size cities where conventional bus transit systems are in operation, reference is made to successful transit-supportive applications in larger municipalities, which can also serve as preferred growth patterns for mid-size cities.

URBAN SPRAWL—UNCOORDINATED TRANSPORTATION & LAND USE PLANNING

Urban areas in the first few decades of the twentieth century were compact, mixed-use and walkable concentrations of activity, and inherently transit-supportive. A radical change occurred following the post Second World War boom, as rising automobile ownership, cheap energy and housing fueled the rapid development of urban sprawl. Today, transit-supportive areas are often found only within downtown and ‘main street’ commercial areas.

Sprawl development has continued into the 21st Century. The primary characteristics of sprawl include:

- Low-density development on the fringes of urban areas and city-regions, typically ‘leapfrogging’ into agricultural and natural lands;
- Widely separated, single land use ‘superblocks’, containing residential neighbourhoods, shopping malls or office parks; and
Hierarchical road networks—high speed/high capacity arterials for connecting superblocks and curvilinear collectors within these superblocks. Long and winding curvilinear streets replace the grid, and cul-de-sacs are used extensively for reducing through traffic.

Widely separated land uses, the long, circuitous routing of curvilinear streets and a lack of direct connections between streets make pedestrian travel difficult—thus automobile travel is a necessity. Wide arterials, infrequent intersections and a lack of buildings that directly front streets also creates sterile, inconvenient and sometimes dangerous pedestrian environments.

Transit suffers greatly within the context of sprawl. Buses have to negotiate curvilinear streets and fight congestion on arterials, slowing average speeds and service reliability. Combined with low densities and hostile pedestrian environments, low ridership is often the result. This consequently lowers service levels and significantly reduces the attractiveness and cost-effectiveness of transit. Users have to endure lengthy waits at transit stops, most affecting those who are too young, too old, disabled or can’t afford an automobile.

Rapid transit has also suffered low ridership, since the densities or pedestrian-friendly built forms necessary to support it are absent. Transit has become a consistent money loser within the context of sprawl, and is typically subsidized at the expense of transit routes operating in transit-supportive urban areas.

Furthermore, sprawl and automobile dependence have become the source of other serious problems across North America. Examples include:

- North America accounts for 26 percent of global carbon dioxide emissions. Climate change is now accepted as a reality, thus these emissions have global impact.
- 100 million Americans live in city-regions that consistently fail the Environmental Protection Agency’s (EPA) air pollution standards.
- To keep traffic congestion at present levels relative to a 33 percent increase in population in the Vancouver city-region, the number of bridge lanes in the region will have to rise from 47 to 85. Given that a new six-lane bridge costs $600 million, this is an unacceptable challenge to meet.
• The Toronto region lost over 1,000 square kilometres of prime agricultural land to sprawl over the last 20 years—a rate of 50 square kilometres annually. These problems illustrate an unsustainable situation. If new growth continues to be accommodated as ‘business as usual’, and our automobile dependence intensifies, these problems will undoubtedly worsen.

**SMART GROWTH**

Smart Growth offers an alternative to this situation, through Transit-Oriented Development (TOD). TOD aims to provide more transit-supportive land use contexts, and is complemented by transportation planning that ensures transit is in sync with land use and responds to the needs of transit users.
Land Use Planning–TOD

TOD involves higher density, mixed-use and pedestrian-friendly neighbourhoods developed around centralized transit stations. Individual examples, known as ‘TODs’, employ grid street networks and short blocks, allowing residents an easy walk to transit.

- The transit station or stop is surrounded by a mixed-use core or corridor. Here residents can access retail, commercial and civic services, employment and recreational facilities without needing to travel by automobile. Buildings also directly front streets, creating a more interesting and comfortable pedestrian experience necessary to support transit.

- Nodal TOD configurations occur when located on rapid transit routes (stations 1 to 2 kilometres apart). The distance of a 5 to 10 minute walk, or between 400 to 800 metres, typically defines the edges. TODs on higher frequency and higher capacity transit routes are larger and higher density due to the stronger ‘drawing power’ rapid transit has on attracting ridership and developer interest.

- TODs can also occur in smaller, corridor-like forms along bus routes, primarily due to a closer spacing of stops. This development typically extends about 200 metres from transit stops, and provides the necessary contexts for future transit upgrades (bus to rail).

- Existing transit-supportive areas, such as downtowns and ‘inner city’ areas, should be priority areas for TOD intensification to support additional transit routes or upgrades. This could involve the infill of empty parcels, or the redevelopment of low-density/derelict properties.

- See the TOD Characteristic Checklist in Appendix A for more detail regarding TODs.
Benefits of Transit-Supportive Land Use Planning

Transit-supportive areas and TODs offer a number of Smart Growth benefits, including:

- Placement of more people close to transit and providing mixed-use amenities justifies higher service frequencies and promotes high ridership levels, enabling transit to be more competitive with the automobile.
- Intensification of existing land use patterns utilizes existing infrastructure, and reduces low-density growth at the fringes of the city-region.
- Provision of more compact patterns of growth at ‘greenfield’ sites conserves agricultural and natural lands and reduces new infrastructure requirements.
- Delivery of pedestrian-friendly built forms makes walking an enjoyable, convenient and safe experience. This creates contexts for vibrant ‘public realms’ and makes transit more attractive.
- Grid street network design is also a critical element, to ensure direct and convenient routing for transit vehicles and pedestrians.

Transportation Planning – Smart Transit

Alternatives to the automobile – namely public transit, walking and cycling – are the central focus of transportation planning within the context of ICP and Smart Growth.

- Transit-focused transportation planning, or Smart Transit, encourages prioritization of transit vehicle movement on regional and local roads through transit-only lanes, high occupancy vehicle (HOV) lanes, traffic signal priority and queue-jumping facilities. Transit station and stop design are also key to ensuring transit is attractive to users.
- Smart Transit also utilizes real time transit information technology, conveying transit vehicle locations and estimated arrival times to transit users and thus making transit more convenient for users. Users can now plan around transit arrival times with a much greater sense of certainty. Real time information can be accessed via the internet, television, telephone and at transit stations.
The use of real time traveler information, in conjunction with TOD development, can increase the attractiveness of using transit and the prospect of living in TODs for potential transit users.

Benefits of Transit

Transit is a more effective and efficient way of moving people within city-regions and towns, when all costs are considered. The benefits of transit include:

- Space Efficiency: Less land is required to move a small number of transit vehicles relative to a large number of automobiles carrying the same number of people;
- Energy Efficiency: Less energy is needed to move one person by transit than by automobile, assuming transit vehicle normal loading conditions;
- Cleaner: Since less energy is required to move people, fossil fuel-based transit vehicles emit smaller amounts of smog-forming and climate change-inducing pollutants. Electric-powered transit vehicles emit no local pollutants; and
- Transit Provides Mobility to All Persons in Society: People who can’t drive or don’t have access to an automobile will use transit if it is available and convenient.

TRANSIT-SUPPORTIVE GUIDELINES

A Multi-Scale Planning Approach

Tackling sprawl via Smart Growth and TOD requires a multi-scale planning approach, considering regional, city wide, neighbourhood and local scales of inquiry, policy and action, since the health of the region is based on the health of its local parts, and vice versa.
- It is important to ensure regional initiatives are reflected at the scale of municipal policy, and more importantly, in the built form of individual neighbourhoods, blocks and streets.

- Rapidly growing city-regions, such as Greater Vancouver and Metro Portland, have used this approach. Regional plans identify ‘centres’ and ‘corridors’ that act as growth ‘sinks’, host TOD and are connected by rapid transit. ‘Preserves’, designated as undevelopable, protect agricultural and natural lands from development and encourage more intense development in existing urban areas and around transit routes.

- At the neighbourhood scale, TOD is encouraged to occur around transit stations and stops, to ensure the transit network is collecting as many riders as possible. Much attention is also paid to ensuring the pedestrian environment, at the street and block scale, is pleasant and safe.

**Organization & Applicability of the Guidelines**

The Guidelines presented herein are organized into region, city, neighbourhood and local (block and street) subsections. This organization is designed to be applicable to a range of urban sizes, including large city-regions and smaller cities and towns.

The Guidelines themselves are divided into three categories, reflecting the integration of transportation and land use planning necessary for Smart Growth and TOD:

1. Transportation & Land Use, or TL: These Guidelines highlight key elements of ICP.
2. Transportation, or T: These Guidelines emphasize transportation elements necessary to make transit more competitive.
3. Land Use, or L: These Guidelines emphasize the land use and urban design elements necessary to support effective transit service.

Each Guideline is presented in a common format and contains:

- A short clear statement of the Guideline—each Guideline is stated as an objective;
- A brief explanation of the Guideline and why it is relevant;
- Actions: Recommendations, including administrative actions, for achieving the Guideline objective. Administrative actions required to make the Guideline a reality are also included, based on provincial/state or regional land use plans, regional transportation plans, municipal Official Community Plans (OCPs) and transportation plans, neighbourhood plans, urban design plans and engineering standards;
- Central Okanagan Initiatives: Highlights existing policies within the Central Okanagan context, contained in regional plans, OCPs and neighbourhood plans that support the relevant Guideline; and
• Precedents/Best Practices: Provides empirical support for each Guideline, drawn from examples from streets, neighbourhoods, towns and city-regions across North America. Each example also provides a website link(s), giving readers an opportunity to research the example and relevant Guideline further.

The majority of the Guidelines consider all of the major transit technologies, including neighbourhood or community 'shuttles', conventional buses, Bus Rapid Transit (BRT) and Guided Light Transit (GLT), and rail based technologies such as Light Rail Transit (LRT), Advanced Light Rail Transit (ALRT), heavy rail (subway) systems and commuter rail.

It is important not to perceive the Guidelines as simple 'cookbook' recipes. They are not the only way of ensuring effective transit and transit-supportive cityscapes. It is expected that regional and municipal authorities will adapt these Guidelines to their own individual situations and develop solutions and approaches beyond those contained in this document.

LIST OF TRANSIT-SUPPORTIVE GUIDELINES

A total of 30 Transit-Supportive Guidelines define the preferred development actions at the regional, city, neighbourhood and local scales, in terms of transportation and land use (TL), transportation planning (T), and land use planning (L) terms. These are listed below and described in much greater detail in the Guidelines Report.

Regional Scale Guidelines

TL 1.1: Regional growth centres should be connected by a high quality transit network.
TL 1.2: Ensure statutory plans provide for appropriate densities before making major investment in new transit facilities.
T 1.1: A hierarchical regional transit network should be defined, with higher quality services in higher density areas, and less frequent services in low-density areas.
T 1.2: Provide region-wide transit information systems to attract more transit users.
T 1.3: Ensure that roadways are designed to accommodate transit priority measures to improve transit speeds and reliability.
T 1.4: Define multi-modal transfer nodes at high volume junction points.
L 1.1: Define urban growth boundaries large enough to meet development requirements, but not too large to encourage sprawl.
L 1.2: Designate growth concentration areas which can be efficiently served by transit.
L 1.3: Regional growth centres should be designated for higher density, mixed-use, ‘complete communities’.
City Scale Guidelines

TL 2.1: Encourage TODs around transit stations on a high quality transit line.
T 2.1: Ensure transit service frequencies and capacities are consistent with planned land use characteristics and densities.
T 2.2: Ensure that street networks are continuous in order to provide for efficient transit routing.
T 2.3: Ensure city-wide bicycle networks are available to connect all centres.
L 2.1: Encourage large retail and office developments to locate in designated centres.
L 2.2: Diversify and intensify large single land uses to encourage walking and transit usage.

Neighbourhood Scale Guidelines

TL 3.1: Ensure that TODs are consistent with existing built form and neighbourhood contexts.
T 3.1: Design urban areas to provide walkable streets and path networks, providing direct and convenient pedestrian access throughout.
T 3.2: Design multi-modal transfer nodes which can evolve into higher density, mixed-use transit-supportive areas.
T 3.3: Reduce parking standards in developments adjacent to high quality transit services.
L 3.1: Concentrate high trip generating land uses adjacent to transit stations and stops.
L 3.2: Locate highest densities around transit stations and stops.

Local Scale Guidelines

TL 4.1: Create pedestrian-friendly built forms in terms of street widths, building heights and setbacks, etc.
TL 4.2: Utilize Crime Prevention Through Environmental Design (CPTED) tactics to create safe communities.
T 4.1: Design local streets to be narrow and calmed to discourage auto travel and encourage walk, bicycle and transit travel.
T 4.2: Ensure sidewalk and path widths are appropriate for pedestrian traffic level.
T 4.3: Ensure transit stations and stops are accessible, provide adequate capacity, are weather protected, promote safety and provide transit information and bicycle storage.
T 4.4: Use transit stations and stops as identifiable icons to promote transit usage.
L 4.1: Provide public spaces adjacent to transit stations and stops to encourage a pedestrian-friendly environment.
L 4.2: Encourage mixed-use buildings to promote mixed-use development at centres.
L 4.3: Provide architectural variety to promote market interest in the community.
Guidelines Reference Matrix

The following table offers a convenient summarization of the Guidelines within this document, according to the TL, T and L categories and relevant scale of application.

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1. Region

The Guidelines in this subsection apply to a region-wide basis and across municipal boundaries. They are broad stroke Guidelines that can assist in coordinating regional growth with regional transit facilitation, and aim to provide an alternative transportation and land use vision.

This subsection also provides the foundational context for the Guidelines in the City, Neighbourhood and Local subsections, as they ultimately contribute to any regional vision—since the region is the sum of its local parts.

The Region-Scale Guidelines include:

- TL 1.1 Regional Growth Centres Connected by Transit Network
- TL 1.2 Ensure Appropriate Densities Before New Transit Investments/Upgrades
- T 1.1 Hierarchical Regional Transit Network
- T 1.2 Region-Wide Transit Information Systems
- T 1.3 Roadways to Accommodate Transit Priority Measures
- T 1.4 Appropriate Locations for Multi-Modal Transfer Nodes
- L 1.1 Urban Growth Boundaries to Constrain Sprawl
- L 1.2 Designate Growth Concentration Areas
- L 1.3 Higher Density, Mixed-Use Growth in Regional/Sub-Regional Centres
TL 1.1 Regional Growth Centres Connected by Transit Network

Directing significant amounts of regional growth into designated ‘centres’ can help reduce sprawl growth and effectively support regional transit. Centres should be connected to each other by a regional transit network, offering residents high speed and quality mobility options to the automobile. Connection to transit, particularly rapid transit, also promotes the development and/or intensification of centres by attracting development interest and new residents.

Actions

• Designate a system of centres across a region. This system should be hierarchical, consisting of primary, secondary and tertiary centres.
  – Centres can be either existing transit-supportive areas, such as downtowns, suburban downtowns / ‘edge cities’, existing commercial ‘main streets’, and small neighbourhood scale retail concentrations, or areas of anticipated growth along existing or future regional transit alignments.
  – New centres or the intensification/revitalization of existing centres typically involves Transit-Oriented Development (TOD).
  – Care should be taken to ensure centres are defined areas of transit-supportive development, including elongated nodes similar to or reinforcing existing main street areas, not city wide commercial ‘strips’.

• Encourage centres to be of a higher residential and commercial density than surrounding areas, contain a diverse mix of land uses and be pedestrian-oriented (Guideline L 1.3 and TL 4.1). Consider appropriate economic and regulatory incentives.

• Set population and employment targets for centres, ensuring a mix of each.

• Connect centres to each other with a high speed, high quality transit network – preferably involving rapid transit running in exclusive rights-of-way or other transit priority measures.

• Combine the above actions into a regional plan document administered by a regional or provincial level of government.

• Ensure regional plan policies are accurately reflected in the Official Community Plans (OCPs) and zoning by-laws of municipalities within the jurisdiction of the regional government.
Central Okanagan Initiatives

The designation of higher density, mixed-use growth centres is a favoured policy direction within the Central Okanagan region. However, it is not typically linked with the provision of high speed, high quality transit connecting these centres. Policies supporting this designation can be found in the OCPs of the City of Kelowna, District of Peachland and Westside. The Growth Management Plan (GMP) for the Regional District of the Central Okanagan (RDCO) calls for directing growth into existing urban areas first—a policy that supports the designation of growth centres. Similar supporting policies are found in plans with narrower scope, including the Beach Neighbourhood Plan (BNP) for Peachland, the Kelowna Downtown Plan (KDP) and the Westbank Town Centre Strategic Plan (WTCSP).

Precedents/Best Practices

Livable Region Strategic Plan (LRSP), Greater Vancouver Regional District (1995): The LRSP was developed in an effort to preserve the existing natural context that the Vancouver region is famous for, and to reduce the growth of urban sprawl through rejection of ‘business as usual’ development approaches. Key policies of the plan involve concentrating growth into a specified area of the region, and the development of ‘complete communities’ to serve as a focus of regional growth. The primary instruments for fulfilling these policy directions include a series of designated regional growth centres—specifically the Metropolitan Core (downtown Vancouver), Regional Town Centres (RTCs) and Municipal Town Centres (MTCs), listed in descending order of size, densities and level of mixed-use activity. Furthermore, the Metropolitan Core, RTCs and MTCs are to be connected to each other by a regional rapid transit network. Municipal plans are mandated to follow LRSP policy; this has resulted in a notable success in terms of slowing the growth of sprawl. The Metropolitan Core has gained over 20,000 new residents in the last decade. The Metrotown, Richmond and Coquitlam RTCs have experienced significant residential and employment intensification, and the Brentwood and Edmonds MTCs are currently experiencing significant residential growth. Growth along rapid transit corridors has also been strong, as exhibited by the Joyce-Collingwood and Citygate TODs in Vancouver. LINK: www.gvrd.bc.ca

LRSP—regional centres connected by rapid transit (Source: GVRD, 2004).
Region 2040, METRO, Portland Region (1995): Region 2040 aims to reduce sprawl growth and offer transit as a viable alternative to the automobile. A hierarchal system of growth centres, anchored by downtown Portland, was designated within the plan, connected to each other by the regional LRT (MAX) network. Growth corridors were also part of the plan; potential TOD areas were designated around LRT stations located outside of centres, to ensure transit-supportive contexts for the LRT while also using the high quality image of the LRT to encourage higher density and mixed-use development of greenfield, brownfield and greyfield sites adjacent to stations. A good example of this is the development of the Orenco Station TOD on the Westside MAX Line, located near the Hillsboro town centre. Orenco has been a success in both marketing and customer satisfaction, indicating that Smart Growth is both feasible and marketable. LINK: www.metro-region.org
TL 1.2 Ensure Appropriate Densities Before New Transit Investments or Upgrades

New transit investments or upgrades to existing systems can be expensive, particularly so when rail based technologies are considered. Care must be taken to direct new investments and upgrades into areas that can provide reasonable levels of ridership in the near future. This will not only immediately generate revenue necessary to contribute to the capital and operating costs of transit, but can also allow for the effective conversion of automobile drivers to transit users.

Actions

- Coordinate transit investments with the development of region-wide ‘growth sinks’ for residential and employment growth (Guideline TL 1.1). Priority should be given to servicing areas experiencing the highest growth first with the ‘highest and best’ transit technology that can be reasonably financed.

- Service designated growth centres with less expensive, rubber tired transit technologies (sharing roadways with automobiles) until residential and employment densities are high enough to warrant upgrades to more expensive, exclusive rights-of-way transit.

- If expensive investments are to be made along alignments with large expanses of low-density development, transit authorities should actively work with municipalities and developers to encourage new TOD development within density ‘gaps’.

- New or upgraded transit route alignments should be placed through designated areas that can be easily ‘intensified’ with high-density, mixed-use growth, such as low-density commercial strips, shopping malls, brownfield sites and areas with significant infill and compact development opportunities.

- A minimum residential density of 37 dwelling units per hectare should be present along alignments considered for upgrades in transit service and/or technology (eg. conventional bus to rapid transit). This density can apply to both small municipal and large regional contexts, since housing typologies yielding this density can involve mixtures of ground-oriented townhouses and low to mid-rise walk-up apartments.

- Ensure regional transportation plans reflect the land use assumptions of regional land use plans and municipal OCPs.
Central Okanagan Initiatives

RDCO GMP policy stresses maximizing the efficiency of the transportation system by integrating transportation and land use planning and making efficient use of existing infrastructure—a direction that indirectly supports this Guideline.

Precedents / Best Practices

Northeast Sector Rapid Transit Project, Greater Vancouver (2003): Slated for completion in 2013, a new rapid transit alignment is planned to extend to the Coquitlam Regional Town Centre (RTC) from the existing SkyTrain system. The extension of rapid transit to this RTC has long been a regional planning goal, yet has only now become a priority since the municipality is densifying in the wake of recent planning initiatives encouraging rapid transit-supportive development. The RTC has been connected to the SkyTrain by a ‘rapid bus’ system since 2002; new high-density developments and projected population and employment growth within the RTC now justifies an upgrade in technology. LINK: www.translink.bc.ca

Markham Transportation Planning Study, City of Markham (2002): The City of Markham has become a Canadian model for Smart Growth, and tailors transportation investments to land use planning. The Official Plan calls for new growth to be accommodated through compact and mixed-use neighbourhoods on the municipal fringe, and intensification of existing ‘suburban strip’ landscapes along the Highway 7 corridor. Upgrading transit to service this land use vision has become a top priority, and the City of Markham has proposed to designate Highway 7 as a new rapid transit right-of-way. This alignment will take full advantage of existing nodes of high-density employment activity near Highway 404 and 407 and the higher density, mixed-use and pedestrian-oriented areas of Main Street Markham and the Cornell community. This alignment will also benefit from the planned development of the new Markham downtown, and the presence of...
of rapid transit will encourage the intensification of existing shopping strips and malls into more transit-supportive forms. LINK: www.city.markham.on.ca

**Winnipeg Transit BRT Implementation, City of Winnipeg (2004):** The first phase, the Southwestern Corridor, is planned to connect two of Winnipeg’s largest transit destinations—the downtown and the University of Manitoba. BRT was chosen as the viable option to upgrade existing transit service between these two destinations, due to its relatively low cost (compared to other rapid transit technologies) and its appropriateness to the medium-density character of Winnipeg’s inner city. LINK: www.winnipegtransit.com

Winnipeg BRT—transit priority and bus-only lanes to provide rapid transit service frequencies (Source: Winnipeg Transit, 2004).
T 1.1 Hierarchical Regional Transit Network

A region-wide transit network acts as a ‘backbone’ for structuring new growth in a transit-supportive manner. This system should also be planned and implemented in a manner that serves regional growth centres and corridors of all scales—in the most cost-efficient and convenient manner possible.

Thus regional transit networks should be hierarchical, composed of rapid transit, commuter rail, and feeder and local transit service components. The organization of these components should reflect existing and planned regional land use structure. Smaller, individual municipalities can also have hierarchical transit networks, yet they may not possess the scale and density required for rapid transit or commuter rail.

Also critical to the efficient operation of a regional transit system is careful integration of different transit alignments into one seamless operation. Furthermore, any region-wide transit network should also be capable of staged expansion, and future technology upgrades should be considered when original alignments are designed and developed.

Actions

- Develop a hierarchical region-wide transit system, composed of the following components:
  - Rapid Transit Alignments: ‘Line haul’ with frequent service, connecting primary regional centres, supporting ridership derived from feeder systems, transit-supportive areas and Park-and-Rides;
  - Commuter Rail Alignments: Similar to rapid transit alignments, connecting centres and towns/villages on the regional fringe; may have lower service frequency, may act as a feeder system into a rapid transit network, supporting ridership derived from feeder systems, transit-supportive areas and Park-and-Rides;
  - High Frequency Conventional Transit: ‘Rapid bus’ alignments with high frequencies, connecting both primary and secondary centres; acts as feeder system into rapid transit and commuter rail alignments; supporting ridership derived primarily from local feeder systems, transit-supportive areas and Park-and-Rides;
  - Local Feeder: Lower frequency bus based alignments that provide local service across city and town-scapes (and within these areas); acts as a feeder for high frequency conventional transit, rapid transit and commuter rail systems, ridership derived from transit-supportive areas/low-density areas; and
  - Community Shuttles/HandiDART: Lower frequency service in low-density areas and/or small urban areas on the regional periphery; utilize smaller buses than high frequency conventional transit and local feeder buses; could be a part of ‘Dial-a-Ride’ service or ‘door-to-door’ service (it is in the case of HandiDART—a service for mobility-impaired persons); ridership derived from low-density areas.
Integrate transit system components via:

- Convenient physical integration of transit components and technologies at transit stations, stops and multi-modal transfer nodes; and
- Careful coordination of transit schedules to facilitate convenient and timely transfers between different transit services.

Design the regional transit system to reflect regional scale and evolve with regional growth:

- In regions (or municipalities) with a single concentration of higher density, mixed-use activity (downtown or central business district centre), the transit network typically takes a radial form. Network components could include conventional transit alignments converging on the downtown, supported by local feeder services. Commuter rail may also exist, converging on the downtown and bringing in commuters from smaller urban areas far from the downtown and Park-and-Ride lots.

- In regions with multiple centres (in addition to the existing downtown), the transit network is typically more grid-based, with rapid transit and/or high frequency bus based alignments connecting multiple centres and the downtown together. High service alignments between two or more suburban centres are common, reflecting contemporary commuting patterns involving increasing ‘suburb-to-suburb’ commuting. However, commuter rail alignments typically remain radially-oriented, connecting to suburban centres along the way to the downtown and interfacing with the regional rapid transit and conventional bus network. Local feeder and community shuttle services can also retain radial service patterns, converging on major and secondary centres, rapid transit or commuter rail stations and bus/multi-modal transfer nodes.
• Develop regional transit systems with expansion and technology upgrades in mind, via:
  – The use of easily extendible transit technologies;
  – Reserving future transit rights-of-way in areas of no or new development, and along major existing transportation corridors; and
  – Considering future demand requirements along existing and planned transit alignments.

• Create a regional transit authority to develop, implement and financially support a regional transit network, provide a vision for planned transit expansion and operate this network under one jurisdictional authority.

• Ensure regional transit network planning is coordinated with regional land use and urban structure planning (Guideline TL 1.1 and L 1.3).

Central Okanagan Initiatives

The Central Okanagan region is currently serviced by a BC Transit network (the Kelowna Regional Transit System) composed of conventional bus transit, local feeder buses and community shuttles/HandiDART. According to KELTrans 2016—the Official Transit Plan for the Central Okanagan—the expansion of the existing transit network is to include ‘rapid bus’ service between designated town centres (including downtown Kelowna, South Pandosy, Orchard Park and Rutland).

Precedents / Best Practices

GO Boulder Transit Network, Boulder Region (2003): The regional transit network in the Boulder region (known as the Community Transit Network or CTN) is composed of four distinct components—including 13 high frequency bus transit routes offering service frequencies of 10 minutes or less (from 7am to 7pm) between downtown and other major regional centres—and local feeder bus and community shuttle buses servicing lower density areas. Some of the high frequency bus alignments, such as BOUND, LEAP and SKIP, provide limited stop service similar to rapid bus or BRT rapid transit service (yet operate in mixed traffic contexts). The CTN has undergone a recent expansion to keep up with regional growth and promote TOD in new growth areas. The continued use of conventional buses as the primary transit vehicles, and the use of smaller vehicles on lower frequency routes has made this significant expansion possible in a smaller region—due to the affordability and easy extendibility of the existing bus-based network. LINK: www.ci.boulder.co.us/goboulder/

OC Transpo Transit Network, Ottawa Region (1983): In 1983, the existing conventional transit network within the Ottawa region was upgraded to include a rapid transit ‘Transitway’. This responded to increasing demand for rapid transit service, and also provided the necessary rapid transit ‘backbone’ connecting a series of regional growth centres. The Transitway involves the use of BRT technology, allowing for an affordable rapid transit solution, while exclusive transit rights-of-way guarantee rapid transit frequencies. The Transitway has been a major success in terms of attracting ridership and promoting growth within regional centres, and has recently been augmented by the addition of a new LRT route running between downtown Ottawa and Carleton University. LINK: www.octranspo.com
Winnipeg Transit BRT Implementation, City of Winnipeg (2004): In response to increasing demand for high speed, high quality rapid transit, the existing conventional transit network is planned to be augmented with new radial BRT routes. This radial arrangement directly responds to the monocentric urban form of Winnipeg. The initial stage, known as the Southwestern Corridor, will include a 3.4km exclusive right-of-way ‘busway’ (bus-only lanes), on-street bus-only lanes outside of the busway, traffic signal priority at intersections and BRT stations that provide real time schedule information for transit users. When complete, the BRT system will become the rapid transit spine of the entire transit network, and the use of BRT technology will allow for easy and affordable expansion as city-wide transit needs increase. LINK: www.winnipegtransit.com

Winnipeg Transit proposed BRT system map.
T 1.2 Region-Wide Transit Information Systems

Real time Transit Information Systems—which identify transit vehicle locations, travel times and arrival times—make transit more attractive to users. Users can plan their activities around transit, and waiting at stations and stops are made easier by the provision of arrival time information. Transit Information Systems should be applied across regional and city-wide transit networks, as transit routes typically cross municipal boundaries.

Actions

- Apply Transit Information Systems on a region-wide basis and disseminate information to transit users through internet websites, television channels, phone-in operator services, ‘Changeable Message’ signage at stations and stops, cell phone text messaging and Personal Data Assistants (PDAs).
- Provide on-vehicle ‘next stop’ information for transit users, in both audio and visual format.
- Develop a regional strategy for transit information implementation. This can be achieved through a regional transit authority, or by mutual agreement between multiple transit agencies operating within the same city-region. Implementation phasing could first involve improved transit schedule information (particularly in lower density areas), followed by upgrading information systems on congested, high frequency corridors.
- Ensure all transit vehicles are equipped with Automatic Vehicle Locator (AVL) systems compatible with the regional Transit Information System.

Central Okanagan Initiatives

Currently there are no supporting policies found in the Central Okanagan context.

Precedents/Best Practices

98 B-Line, Vancouver Region (2001): Real Time Transit Information Systems have been integrated into the new 98 B-Line ‘rapid bus’ alignment connecting Vancouver and Richmond. Each vehicle is equipped with on-board AVL; arrival times are provided.
displayed via Changeable Message signage provided at each of the 23 stations, and ‘next stop’ audio and visual announcements are made on-board B-Line vehicles. LINKS: www.translink.bc.ca/transportation_services/regional_bus/bline.asp; www.ibigroup.com

**Ann Arbor Transportation Authority (The Ride), Ann Arbor, Michigan (1996):**
The Ride recently implemented an ‘Advanced Operating System’ (AOS), which utilizes AVL technology to track transit vehicles in real time and provide accurate arrival information for system users. Currently, bus arrival time information is displayed at key stations, such as the Downtown Transit Centre, via the use of Changeable Message signage. LINK: www.theride.org
T 1.3 Roadways to Accommodate Transit Priority Measures

The use of transit priority measures on regional roadways can significantly increase the effectiveness of transit through increasing average travel speeds and service frequencies.

Transit priority lanes can include bus-only lanes, High Occupancy Vehicle (HOV) lanes, or bus-only/HOV queue jump lanes. These allow buses to by-pass queues at intersections, tunnels or bridges. These lanes are similar to HOV lanes, but usually extend for less than one block.

Reducing transit vehicle delays at intersections along regional transit routes can be accomplished through the use of traffic signal priority systems. These systems allow transit vehicles approaching intersections to extend a green light or shorten a red light, thus ensuring that vehicle progress continues relatively uninhibited along the transit alignment.

Actions

• Transit Priority (bus-only/HOV lanes; ‘bus bulges’):
  – Provide transit priority lanes on existing and/or new regionally significant roadways, where applicable. Highly congested roadways and bridges should take priority.
  – Transit priority lanes can be provided on curb or median lanes, or in appropriate contexts, freeway shoulders. These lanes can be demarcated by special signage, lane striping or physically separated from general-purpose traffic lanes.
  – Transit priority lane use should be restricted to buses, taxis, motorcycles and automobiles with 2 or more passengers (minimum). Freight traffic use should be discouraged.
  – Transit priority lanes should take priority relative to general-purpose traffic lanes in road widenings.
  – Depending on traffic conditions, transit priority lane designation can be full time or limited to peak periods.
  – In situations where peak travel is highly directional, a lane in the under-used, off-peak direction can be reversed and designated as a transit priority ‘contraflow’ lane. This requires special signage, markings and possible physical separation from general-purpose traffic lanes.
  – Utilize ‘bus bulges’ on roadways designated for transit priority. This involves transit stop platforms that extend directly to the lane transit vehicles are using, allowing these vehicles to remain in the traffic stream and enhance average transit speeds.
  – Ensure transit vehicles are given right-of-way over other vehicles along alignments utilizing transit stop ‘pullouts’. Other vehicles are required to yield to transit vehicles as they merge into the traffic stream. This yield requirement is made clear by signage on transit vehicles.
• **Queue-Jumping:**
  - Apply queue-jumping at chokepoints—intersections, bridgeheads and tunnel entrances—on regionally significant transit alignments where transit vehicles are routinely delayed.
  - Integrate queue-jumping facilities with ‘feeder’ transit priority / HOV lanes at bridges and tunnels lacking these facilities.
  - Provide ‘transit-only’ queue-jump signage for right-hand turn traffic lanes (only transit vehicles are allowed to proceed through intersections instead of turning right).
  - Integrate queue-jumping facilities with transit signal priority systems.

• **Traffic Signal Priority:**
  - Configure traffic signal systems for traffic signal priority, especially at intersections where transit vehicles experience delays—along regionally significant roadway based transit alignments.
  - Configure transit vehicles with appropriate on-board technology to signal downstream traffic signals to extend green signals on approach.
  - Integrate with transit priority / HOV lane and queue-jumping facilities, where applicable.

**Central Okanagan Initiatives**

The City of Kelowna OCP contains general policies supporting transit priority lane provision, although there is no mention of specific roadways or areas under consideration for this provision. The RDCO Transportation & Mobility study (TAM) also contains a policy prescribing transportation priority measures that could include transit priority lanes.

Prime locations for transit priority lanes within RDCO include the Highway 97 approaches to the Okanagan Lake Bridge. This could involve the use of highway shoulders as transit priority lanes (leading up to the bridgehead), or the development of HOV lanes in conjunction with the reconstruction of the bridge.
Currently there is only one traffic signal priority facility within the Central Okanagan context (located at the Orchard Park Mall). At this time there are no examples of queue-jumping facilities. However, the TAM does contain policies for additional transit priority measures, potentially involving queue-jumping and traffic signal priority facilities.

**Precedents / Best Practices**

**HOV Lane Development, Trans Canada Highway (TCH), Vancouver Region (1998):** In an effort to simultaneously relieve congestion, new transit priority / HOV capacity and improved travel times for those utilizing the HOV facilities, the TCH was widened from 4 to 6 lanes. One HOV lane was added in each direction, between the highly congested Port Mann Bridge and the Grandview Highway (a distance of 16 kilometres). The addition of HOV lanes has resulted in 7 to 20 minute time savings for HOV lane users, and typical peak period HOV versus Single Occupant Vehicles (SOV) mode split is 25 percent HOV to 75 percent SOV. LINK: [www.th.gov.bc.ca](http://www.th.gov.bc.ca)

**Main Street Transit Priority Corridor, Translink, Greater Vancouver Region (2004):** The Main Street transit corridor is one of the busiest in the Greater Vancouver region, and increasing congestion has subsequently slowed bus travel speeds. Translink, through its Urban Transportation Showcase Program, will upgrade Main Street to better accommodate transit vehicles. A key element of this upgrade are bus bulges – allowing buses to remain in travel lanes when picking up riders, then allowing buses to reenter the traffic flow easily and thus increasing average travel speeds. LINK: [www.translink.bc.ca](http://www.translink.bc.ca)

Main Street – existing transit-supportive corridor to be improved via transit priority measures.
98 B-Line Number 3 Road Bus-Only Lanes, Vancouver Region (2001): Number 3 Road in the City of Richmond is a major arterial in both regional and municipal terms. This segment of the 98 B-Line runs along bus-only lanes situated in the median of Number 3 Road. Coupled with the use of a traffic signal priority system, this exclusive right-of-way offers transit users high frequency, high quality transit service at a much lower cost than conventional rail-based rapid transit.

LINKS: www.translink.bc.ca/transportation_services/regional_bus/bline.asp; www.ibigroup.com

Queue-Jumping

George Massey Tunnel Queue-Jump, Greater Vancouver Region (1998): The George Massey tunnel, located on the Highway 99 freeway, is a regionally significant chokepoint. Frequent delays to transit were experienced at both ends of the tunnel; the recent provision of curbside HOV lanes now allows buses to jump ahead of long lineups to get into the tunnel, significantly reducing transit travel times.

LINK: www.th.gov.bc.ca

Traffic Signal Priority

98 B-Line, Translink, Greater Vancouver Region (2000): The 98 B-Line BRT runs from Vancouver to Richmond, and utilizes a traffic signal priority system for 65 signalized intersections. Infrared transponders aboard BRT vehicles signal receivers at downstream signals to change to green when the bus is behind schedule (conditional transit signal priority). Increased service reliability and average travel speeds have been the result, which in turn has attracted a significant number of new riders.

LINKS: www.translink.bc.ca/transportation_services/regional_bus/bline.asp; www.ibigroup.com
T 1.4 Appropriate Locations for Multi-Modal Transfer Nodes

Multi-modal transfer nodes are major inter-modal transfer points that act as focal points within the regional transportation network. These nodes include stations on major transit alignment(s), bus transfer facilities, Park-and-Ride facilities, Kiss-and-Ride areas, bicycle storage and on-site retail and other services.

Most transfer nodes emphasize transferring from automobile to transit, and thus need to be located in low-density areas in order to provide extensive Park-and-Ride lots.

Multi-modal transfer nodes should also be located near major, high volume roadways in order to minimize driving distances and congestion, and maximize transit ridership.

Actions

- Where possible, Park-and-Ride and Kiss-and-Ride facilities should be located at or near the end points of rapid transit alignments, and/or at junctions with major roadways.
- Identify priority areas for multi-modal transfer nodes in regional land use and transportation plans, and municipal OCPs.

Central Okanagan Initiatives

Both the new Westside OCP and WTCSP contain policies that call for locating a multi-modal transfer area, in the form of a bus exchange, on the periphery of the Westbank Town Centre.

Precedents / Best Practices

Coquitlam Central West Coast Express Station, City of Coquitlam, Vancouver Region (1995): This multi-modal transfer node combines a 550 space Park-and-Ride lot with a commuter rail station (West Coast Express), a 40 stall Kiss-and-Ride, 8 bike lockers and a major bus loop. 14 bus routes currently converge on this node, and its location adjacent to the high volume Lougheed and Barnet Highways maximize both transit and commuter rail ridership. LINK: www.westcoastexpress.com

Irvine Transportation Centre (ITC), City of Irvine, Los Angeles Region (2003): The ITC is a major multi-modal transfer node within Orange County, developed around an existing MetroLink commuter rail alignment and designed for the future accommodation of an LRT station (CentreLine) and possibly other rail technologies. The ITC will be surrounded by 4,000 Park-and-Ride stalls contained in parking structures. Currently located in a low-density landscape of open space, office parks and shopping centres, the ITC is ideally located to become the focal point for new TOD development—part of a larger initiative to redevelop the adjacent El Toro Marine Corps Air Station into Irvine’s ‘Great Park’. The ITC is also located near a very high volume freeway, Interstate 405, maximizing the amount of potential Park-and-Ride users. LINK: www.octa.net
L 1.1 Urban Growth Boundaries to Constrain Sprawl

To encourage compact, transit-supportive regional development patterns, urban growth boundaries can be used to define the extent of development over the long term. The use of boundaries can constrain scattered sprawl development in rural areas that cannot be served by transit at a reasonable cost, and encourage more compact regional development. However, the use of boundaries must also be undertaken in concert with policies directing regional growth into compact or transit-supportive growth areas, or sprawl growth will continue within the boundary.

Another important factor to consider regarding designating boundaries involves ensuring a ready supply of land is available for development at all times to ensure an efficient land market. Designating overly restrictive boundaries, which contain insufficient land area for development or intensification over the planning period, can lead to excessive land prices and lack of choice in the market. Conversely, designating excessively large urban boundaries will reduce incentives to develop at higher densities.

**Actions**

- Designate urban growth boundaries (in regional plans) that are sufficiently large to accommodate new development, at transit-supportive densities, over a long planning period.
- Designate all land outside of the boundary as undevelopable ‘preserves’. This includes all viable agricultural land, open space, parks and natural habitat.
- Emphasize infill development and intensification within existing growth sinks (centres and corridors) and other urban areas over new development at the urban fringe (within the boundary).
- Ensure appropriate municipal zoning and infrastructure investments are in place or planned to support transit-supportive growth within the growth boundary.

**Central Okanagan Initiatives**

No jurisdictions within the Central Okanagan support explicit growth boundary policies. However, all regional plans, OCPs and neighbourhood plans support in principle the need to preserve the Agricultural Land Reserve (ALR). Since viable ALR land is generally considered off limits to development and surrounds most municipalities within the study area, it can be considered similar to a growth boundary, as described by this Guideline.
Precedents / Best Practices

Boulder Region, Colorado (1959): Intent on not allowing rapid growth to impact the surrounding mountain environment, Boulder designated the ‘Blue Line’ growth boundary in 1959. This prohibited water and sewage service above a certain elevation, providing a valuable first step in preserving hillsides from sprawl growth and encouraging more compact development. Today, Boulder is a famous example of Smart Growth in a smaller regional context for its beautiful surroundings and a vibrant, transit-supportive urban form. LINK: www.ci.boulder.co.us

Portland Region, METRO (1973): In 1973 an Urban Growth Boundary (UGB) was created surrounding the Portland region to protect farmland and natural areas from development. The UGB has been periodically expanded since growth inside the UGB took the form of sprawl and more space was thus needed for development. However, the UGB is now a critical component of Region 2040, a regional plan calling for more transit-supportive development within the UGB. The ultimate aim of Region 2040 is to intensify existing development within the UGB and minimize any boundary enlargements. LINK: www.metro-region.org

Region 2040 UGB (Source: Calthorpe & Fulton, 2001)
L 1.2 Designate Growth Concentration Areas Within the Region

An effective method of constraining sprawl growth and concentrating development involves the use of growth concentration areas. Applied at the regional or municipal levels, growth concentration areas can encourage higher density, mixed-use development around major existing and planned transit systems, which in turn can boost ridership, utilize existing infrastructure more efficiently and place more people near employment.

Growth concentration areas and urban growth boundaries should also be applied concurrently, primarily to slow the rate in which developable area within the boundary becomes fully built out.

Actions

• Identify growth concentration areas within regional land use plans, with consideration given to efficiently servicing these areas with rapid transit and protecting environmentally significant lands.
• Encourage the majority of regional growth to occur in growth concentration areas, via regional and municipal planning policy.
• Established transit-supportive areas, and areas undergoing rapid growth within the region, should take priority for growth concentration area designation.

Development within growth concentration areas should be transit-supportive.

Central Okanagan Initiatives

The RDCO Growth Management Plan (GMP), Westside OCP and the WTCSP all advocate concentrating growth in existing built up areas. The City of Kelowna OCP designates a distinct hierarchy of ‘urban centres’ for growth concentration, the majority of which are located in existing built up areas.
Precedents/Best Practices

Livable Region Strategic Plan (LRSP), Greater Vancouver Regional District (1995): One of the LRSP’s primary goals is to develop a more compact region through the use of a Growth Concentration Area (GCA). The GCA contains the more mature, transit-supportive municipalities of Vancouver, Burnaby and New Westminster, as well as rapidly growing suburban municipal communities of Surrey and Coquitlam. The GCA also follows the form of the regional rapid transit system in order to maximize the amount of residents within easy access to high speed, high quality transit. The GCA has attracted 67 percent of the regional population, very close to the established target of 70 percent.

LINK: www.gvrd.bc.ca

LRSP–GCA highlighted in white (Source: GVRD, 1995).
L 1.3 Higher Density, Mixed-Use Growth in Regional/Sub-Regional Centres

Regional growth centres served by transit should be higher density, mixed-use ‘complete communities’. Higher density, mixed-use development is a crucial factor behind improving transit ridership, which in turn justifies service frequency upgrades and results in a more cost-effective regional transit system.

Higher density development, within walking distance of transit, places larger numbers of potential users adjacent to transit—adding to the likelihood that these individuals will use transit for their everyday needs.

Concentrating mixed-uses into defined areas concentrates trip destinations, thus making it more convenient to use transit since one trip can serve a variety of purposes. Mixed-uses also promote more uniform and directionally balanced levels of ridership along transit routes, allowing more frequent service to be provided.

Transit-supportive growth within centres and corridors can also be encouraged through the use of various economic incentives and development regulations favouring this kind of development. Developers should be encouraged to undertake transit-supportive projects through incentives and favourable regulations, otherwise new transit investments may not be complemented by new appropriate development.

Actions

• Encourage a variety of residential, retail, employment, entertainment, cultural, recreational, educational, institutional and civic uses within centres and corridors.

• Match densities with expected level of transit service:

<table>
<thead>
<tr>
<th>Service</th>
<th>Minimum Residential Density Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus, 1 hour service</td>
<td>10 units per hectare (conventional sprawl)</td>
</tr>
<tr>
<td>Bus, ½ hour service</td>
<td>17 units per hectare (minimum TOD density)</td>
</tr>
<tr>
<td>Bus, 10 minute service</td>
<td>37 units per hectare</td>
</tr>
<tr>
<td>Rapid Transit, 5 minute</td>
<td>60+ units per hectare</td>
</tr>
</tbody>
</table>

• Encourage the highest densities at focal points within the transit system—at downtowns or sub-regional centres, multimodal transfer points or convergence points of two or more high frequency transit alignments.

• Strengthen existing centres by directing new development into these areas.

• Larger centres and corridors served by rapid transit should be composed of 5 to 15 percent public (civic/recreational) uses, 30 to 70 percent of commercial and employment uses and 20 to 60 percent of residential uses.

• Smaller centres and corridors served by conventional (or rapid) transit should include 10 to 15 percent public uses, 10 to 40 percent commercial and employment uses and 50 to 80 percent residential uses.
• Ensure built form within centres is pedestrian-friendly, since transit users are pedestrians at both ends of their trips (see Guideline TL 4.1).

• Ensure municipal OCPs support transit-supportive growth within designated centres.

• Relevant jurisdictions (transit authorities and regional and municipal governments) should provide economic incentives for transit-supportive development, such as lower development levies and density bonusing for TOD/transit-supportive development projects.

• Relevant jurisdictions should also fast-track the approval process for TOD/transit-supportive projects. This can save developers money and spur them and their financiers to pursue more similar projects.

• Relevant jurisdictions should also consider the use of location-efficient housing pricing policies, such as lower property taxes in transit-supportive areas, and location-efficient mortgages that reward homeowners choosing to live in more transit-supportive areas.

Central Okanagan Initiatives

Encouraging higher density, mixed-use growth in designated regional and municipal centres is supported in the GMP and the OCPs of Kelowna, Westside and the WTCSP.

Policies supporting higher densities and mixed-uses in designated growth areas, such as town centres, are found in the Kelowna, Westside and Peachland OCPs, and the KDP and WTCSP. While there is little policy explicitly supporting higher densities near transit, the fact that transit services are found in the town centres of all of the relevant municipalities indicates that the existing OCP and other plan policies support this Guideline.

Precedents/Best Practices

**TOD Guidelines, City of San Diego, California (1993):** The City of San Diego encourages bus-served TODs to contain average densities between 30 and 44 units per hectare, while those served by LRT should average between 44 and 62 units per hectare. [LINK: www.sannet.gov/planning/](http://www.sannet.gov/planning/)
Planning & Design for Transit, Tri-Met, Portland Region (1993): Tri-Met, a regional transportation authority, requires average densities of 44 units per hectare for bus served TODs, and 64 units per hectare for LRT-served TODs.
LINK: www.tri-met.org

Higher residential density options—‘point tower and townhouse podium’, low-rise townhouses, small lot single detached houses.

Metrotown & Collingwood Village, SkyTrain Expo Line, Greater Vancouver Region (1985–): Metrotown Town Centre and Collingwood Village are both located on the Expo SkyTrain alignment, and exhibit higher density, mixed-use built forms. However, they differ significantly in size and concentration/proportion of mixed-use activity. Outside of the Metropolitan core, Metrotown is the largest and most diverse RTC within the Greater Vancouver region, containing a mix of uses typically found in a larger, ‘downtown’ transit-served centre. Containing significant office and civic floorspace, Metrotown has grown around a 1 million square foot regional shopping mall, and also contains a significant amount of residential development. Conversely, the smaller Collingwood Village contains a lower proportion of commercial and office uses relative to residential uses, yet is still high enough to support the resident population and transit ridership.
LINKS: www.gvrd.bc.ca/livablecentres/index.html; www.city.vancouver.bc.ca/commsvcs/currentplanning/urbandesign/index.htm

Collingwood Village
2. City

The following Guidelines are to apply on a generalized basis within individual municipalities. For example, the Guidelines provide direction for locating TOD development within the city, the design of city street networks to provide easier transit routing, and diversifying large single use areas.

These Guidelines also intend to inform basic policy elements in Official Community Plans (OCPs) that support integrated transportation and land use planning, necessary not only for the development of coordinated regional visions, but also to ensure the development of transit-supportive solutions at the neighbourhood and local scales.

The City-Scale Guidelines include:

- TL 2.1 Encourage TOD on Transit Alignments
- T 2.1 Appropriate Transit Service Frequencies & Technology
- T 2.2 Ensure Street Networks Are Continuous
- T 2.3 City-Wide Bicycle Networks
- L 2.1 New Large Retail & Office Concentrations Within Designated Centres
- L 2.2 Diversify & Intensify Large Single Land Uses
TL 2.1 Encourage TOD on Transit Alignments

New or upgraded transit investments can encourage substantial new growth along alignments, and this new growth should take the form of Transit-Oriented Developments (TODs) located around transit stations. This not only provides increased ridership into the transit system, it allows growth to be directed into higher density, mixed-use areas. Multiple TOD sites along individual transit alignments can coalesce into significant transit-supportive corridors, or form/reinforce ‘growth backbones’ of centres.

The built form character of TODs should reflect transit mode and capacity. Rail based transit—offering higher frequency, higher capacity service—might justify the development of high-density, high-rise or ‘vertical’ built forms. Conversely, TODs on lower frequency and capacity bus routes may develop at more modest densities and low-rise or ‘horizontal’ built forms.

Actions

• Develop TODs at designated locations (within centres and defined corridors), on city-wide transit alignments:
  – Potential sites include empty parcels within existing transit-supportive areas, abandoned/redundant industrial sites (brownfields), shopping malls—either failing or redevelopment feasible—(greyfields) and low-density commercial strips.

• Ensure site and scope of TOD is appropriate for existing transit mode:

<table>
<thead>
<tr>
<th>Mode</th>
<th>TOD Intensity &amp; Built Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus</td>
<td>Minimum transit-supportive densities if service frequencies are longer than 10 minutes apart; built form tends to be two to three storeys. Developer interest nominal.</td>
</tr>
<tr>
<td>BRT, GLT</td>
<td>Higher densities, above 37 units per hectare, and potential for high-rise development if service frequencies are less than 10 minutes apart. Developer interest may rise if prospect of upgrading technology to rail.</td>
</tr>
<tr>
<td>LRT</td>
<td>Higher densities, above 37 units per hectare, and high-rise development if service frequencies are less than 7.5 minutes apart. Developer interest high due to permanence of rails—could result in significant high-density, high-rise development.</td>
</tr>
<tr>
<td>ALRT, Subway</td>
<td>Highest densities, above 75 units per hectare, and high-rise development due to high-frequency service (less than 5 minute headways during peak periods). Developer interest highest due to permanence of rails and high quality transit service.</td>
</tr>
<tr>
<td>Commuter Rail</td>
<td>Lowest densities given that service frequencies are tied to peak periods and are typically more than 10 minutes apart. Low-rise development likely, and the Park-and-Ride nature of commuter rail tends to reinforce lower density, conventional suburban development. However, higher densities and a more vertical built form are possible if the commuter rail station is also a major multi-modal hub and/or is located in an existing transit-supportive area.</td>
</tr>
</tbody>
</table>
• Identify potential sites for TOD development in OCPs and rezone these sites accordingly to attract developer interest.

• Define the built form character of TODs in neighbourhood plans, contained within municipal OCPs.

• Integrate, where possible, elevated guideways and stations into built form. This might involve placing buildings underneath guideways located on one side of the street, forming complete street walls.

Central Okanagan Initiatives

Currently there are no supporting policies found in the Central Okanagan context.

Precedents/Best Practices

Citygate & Collingwood Village TODs, City of Vancouver (1990-2004): Two TODs of note, Citygate and Collingwood Village, have been developed along the SkyTrain Expo Line in Vancouver over the past decade, and are a testament to the City of Vancouver’s dedication to integrated transit and land use planning and quality urban design. Both are very high-density TODs; both contain at least 5 high-rise towers set on 4 to 6 storey ‘podium blocks’ containing ground level retail and services. Citygate, located at the Main Street/Science World station, contains 1,000 housing units; Collingwood Village contains 2,800 units, set within a more family-oriented context. It is also important to note that both sites were formerly industrial and were rezoned for transit-supportive development.

LINK: www.city.vancouver.bc.ca/commsvcs/currnetplanning/urbandesign/index.htm

Citygate TOD, City of Vancouver (Source: Bosa Development Corporation, 2004).
**Linbergh Centre, Atlanta Region (2000):** Lindbergh Centre, a suburban TOD, is located on the regional heavy rail line (MARTA) and exhibits a built form and intensity appropriate to the high-speed and capacity transit service (10 minute headways). Featuring 6 high-rises on a 20 hectare site, the TOD design mixes together 954 residences with 33,000 square metres of retail space and 270,000 square metres of office space. LINK: carterusa.com

**Orenco Station TOD, Westside MAX Line, Hillsboro, Portland Region (2001):**
The Orenco Station TOD was developed on a greenfield site on the regional fringe, following the opening of the new Westside MAX LRT extension from downtown Portland to the Town of Hillsboro. The TOD itself has been a very successful venture for the developer, and the level of transit usage by Orenco residents is among the highest in the region. Furthermore, other greenfield sites along the Westside MAX are now also being developed in a more transit-supportive manner, relative to other new development located away from the LRT alignment.
LINK: www.orencostation.com
T 2.1 Appropriate Transit Service Frequencies & Technology

As outlined in TL 1.1 and T 1.1, transit networks should be hierarchically composed of differing service levels and technology components that are integrated into a single regional operation. However, these differing levels of service and technologies should directly respond to ridership levels along transit routes within these networks – typically a function of land use characteristics and the quality of the pedestrian environment along these routes – in order to conduct transit operations in the most cost-effective manner. Furthermore, levels of service and technologies can also occur in anticipation of planned land use changes and improvements in walkability, in order to act as a catalyst to drive these changes.

Actions

- Tailor transit service levels and technologies to land use characteristics and quality of the pedestrian environment (level of residential and employment density, degree of mixed-use, ease of safe movement for pedestrians – the higher the better) [Guideline L 1.3, TL 4.1]. Typical service levels and technologies can include:
  - 5–10 Minute Service Frequency, Rapid Transit (BRT, GLT, LRT, ALRT, Subway and Commuter Rail): Require residential densities above 60 units per hectare, high degree of mixed-use and highly walkable environments near most transit stations and stops along any particular alignment. BRT, GLT and LRT could function cost effectively within these conditions. ALRT and subway alignments typically require higher densities, mixed-use complexity and walkability. Commuter rail alignments may only operate in peak periods, and/or with lower service frequencies (10 to 20 minute headways).
  - 10–20 Minute Service Frequency, Conventional Bus: Require residential densities above 37 units per hectare, along with some mixed-uses and walkable environments near most stops. Mixed-uses might only be found at significant stops or at the intersection of two or more transit alignments.
  - 20–30 Minute Service Frequency, Conventional Bus/Shuttle Bus: Require a minimum residential density of 17 units per hectare, mixed uses at select stops (in the form of small neighbourhood centres – composed of a small
collection of services or a corner store) and a basic degree of walkability (easy access to transit from residential areas). Due to lower densities, smaller shuttle buses (containing 20 to 30 seats) with smaller operational costs can be used to service these areas more cost effectively.

- **30 Minute + Service Frequency, Shuttle Bus:** Low-density, single use areas can be serviced more efficiently with smaller shuttle buses, given lower ridership and long winding alignments.

- **On-Demand, Dial-a-Ride, Shuttle Bus / HandiDART:** Smaller transit vehicles can be deployed in any land use context for HandiDART purposes. In areas of residential densities lower than 17 units per hectare, little mixed-use and poor pedestrian environments, on demand or Dial-a-Ride service brings transit vehicles right to transit users homes via requests made by telephone or internet. Can be coupled with real time information systems and AVL (Guideline T 1.2).

- **Ensure transit service plans reflect transport and land use goals outlined in municipal OCPs.**

**Central Okanagan Initiatives**

As discussed in Guideline T 1.1, the Central Okanagan region is currently serviced by a BC Transit network (the Kelowna Regional Transit System), composed of high frequency conventional bus transit, local feeder buses and community shuttles / HandiDART. According to KELTrans 2016—the Official Transit Plan for the Central Okanagan—the expansion of the existing transit network is to include ‘rapid bus’ service between designated town centres (including downtown Kelowna, South Pandosy, Orchard Park and Rutland). This new rapid bus service is now a more appropriate option along Central Okanagan alignments with the highest ridership relative to the existing conventional bus transit.

**Precedents / Best Practices**

**King George Highway Busway, City of Surrey (in place by 2013):** This planned transit upgrade is intended to introduce rapid transit into the King George Highway corridor, the primary arterial in Surrey (with areas of high-density / mixed-use development), in a cost effective manner. This form of rapid transit would be much more affordable than any SkyTrain extension, and would offer a level of service and convenience for transit users appropriate for this heavily traveled and populated corridor. New transit infrastructure, such as exclusive bus lanes and transit priority measures, could also entice more transit-supportive development into the corridor and provide the context for future rail-based rapid transit upgrades. [LINK: www.translink.bc.ca/files/pdf/plan_proj/10year_project.pdf]
T 2.2  Ensure Street Networks Are Continuous

Street systems should be designed comprehensively so they provide direct access across the city while connecting neighbourhoods together. Connected streets, particularly collectors and arterials, should allow transit vehicles to experience fewer detours, thus increasing average travel speeds and reducing trip lengths. Streets that permit direct and efficient routing for transit vehicles also reduces the costs for transit operators and result in a more comfortable ride for passengers.

Hierarchal transit systems should also be matched to road hierarchies. High frequency and volume services should be confined to arterial roadways, and lower frequency and volume services should operate primarily on collectors and local streets, tying into higher frequency services at arterials (Guideline T 1.1).

Actions

• Ensure comprehensive planning of street systems is undertaken at the city-scale, to enable neighbourhoods to be linked together with direct, transit-compatible streets.
• Ensure the street systems of new developments (TOD or otherwise) integrate into existing street network contexts, and that provision is made to maintain direct transit routing.
• Define city-wide street system requirements in municipal OCPs and transportation plans.

Central Okanagan Initiatives

The new Westside OCP, WTCSP and BNP all support the development of more continuous street networks, although these policies are more aimed at creating more pedestrian-friendly environments. However, these policies nevertheless can still assist in developing more direct transit routing.
**Precedents/Best Practices**

**Merced Villages, City of Merced, California (1993):** With a population of 56,000 in 1993 and continuing to grow at a rapid pace, the City of Merced commissioned the Merced Villages Plan to accommodate 75,000 more residents in a transit-supportive form. Nine new TOD villages were located north of the original town site, organized around extensions of existing arterial roads. This created a pattern of one TOD village per 640 acre section, bounded by the arterial extensions and cross streets. The resultant grid pattern provides direct and efficient routing for bus transit, with transit stops and TOD cores located on these arterials and cross-streets.

LINK: www.calthorpe.com

Merced Villages—nine TODs located north of existing town (Source: Calthorpe, 1993).
T 2.3 City-Wide Bicycle Networks

Biking serves as a viable alternative to driving and accessing transit, as well as a popular recreational activity, provided there is a logical and coherent system of convenient bike routes across municipalities and the region.

Actions

- Bicycle routes should connect centres/TOD cores together, along with important destinations such as transit stations and stops, commercial and employment areas, parks, schools and community facilities.
- Multiple routes should converge on transit stop/commercial core areas within centres and TOD cores, and radiate out into low-density residential areas.
- Designate bikeways on streets, lanes or paths, designed for either exclusive or ‘shared’ use with motor vehicles. Types of bikeways include:
  - **Type I – Bike Path or Trail:** Exclusive and/or independent bikeways running along greenways, open space corridors and/or designated trails. One-way paths/trails should be 1.5 metres wide and two-way 2.4 metres wide.
  - **Type II – Bike Lane Facility:** Dedicated bikeway lanes, 1.2 to 1.5 metres wide (one-way), along the edges of major streets and marked with 20 centimetre wide striping and ‘bicycle lane’ symbol. Solid stripping denotes right-of-way segregation and broken striping denotes conflict zones at intersections and vehicle turning/merging lanes. Type II facilities can also be expanded into ‘bike box’ configurations at intersections, allowing more space for queuing cyclists on high volume routes.
  - **Type III – Shared Street:** Bicyclists and motor vehicles share the same lanes (with a widened curb lane) or entire street right-of-way, dependent on motor vehicle volume. This scenario is ideal for small residential streets within TODs/transit-supportive areas. Widened curb lanes should be a minimum of 4 metres wide.
- Designate city-wide bicycle routes within municipal transportation plans and OCPs.
- Ensure buses provide storage racks for bicycles.

Type I 'urban' bike path, City of Vancouver. Type II bike lane, City of Vancouver (Source: PBiC, 2004).
Central Okanagan Initiatives

Extensive, high quality bicycle networks are already present within the Central Okanagan, as the Kelowna bicycle network is one of the largest in North America (for a city of its size). Policies supporting the development of bicycle networks and bikeway facilities are found in the Kelowna, Westside and Peachland OCPs, and the WTCSP.

Precedents/Best Practices

**City-Wide Bicycle Network, City of Vancouver (1997):** The City of Vancouver has developed an extensive bicycling network in support of OCP policies calling for a reduction in automobile dependence and reinforcement of transit and the public realm. This network utilizes Type I, II and III bikeways within city designated greenways, along the waterfront and seawall, along local, ‘bicycle priority’ streets and along busy downtown commuter routes. This network connects to major destinations within the city, and provides cyclists timely, convenient and safe routing. LINK: [www.city.vancouver.bc.ca/engsvcs](http://www.city.vancouver.bc.ca/engsvcs)

Type II bike lane facility and ‘bike box’ at intersection (Source: City of Vancouver, 2004).
L 2.1 Locate New Large Retail & Office Concentrations Within Designated Centres

The location of trip generating facilities, such as regional shopping centres or large employment facilities, can have a significant impact on transit usage. Thus it is imperative that they are concentrated into designated, city-wide growth centres served by transit, rather than being dispersed across the landscape.

Larger numbers of transit users can then directly access these uses, in turn increasing the attractiveness of transit and boosting ridership on existing transit alignments. Furthermore, this intensification can justify transit frequency and technology upgrades.

**Actions**

- Encourage larger scale employment and retail uses to locate primarily in transit served growth centres and corridors, which include a mix of higher density housing and other retail and employment activities.
- Employment and shopping facilities located in transit-supportive centres can be developed with reduced parking requirements. This will act as a further incentive for customers and employees to use transit rather than private automobiles.
- Ensure resultant built form is pedestrian-friendly (Guideline TL 4.1).
- Designate appropriate locations for large retail and employment areas in municipal OCPs.

**Central Okanagan Initiatives**

Locating new retail and office concentrations in designated centres is supported by the Kelowna and Westside OCPs, and the WTCSP.

**Precedents/Best Practices**

**Central City, City of Surrey (2003):** Recently recognized as the world’s best business centre by Marche International des Professionnels de l’Immobilier (MIPIM), Central City consists of a 25-storey office tower and an architecturally impressive podium base containing Simon Fraser University (Surrey campus). The project adds almost 1 million square feet of office space within Surrey City Centre, which is well served by over $500 million worth of rapid transit infrastructure, yet underachieves in terms of appropriate densities, land use mix and pedestrian-friendliness. Central City is fully integrated into the former Surrey Place shopping mall and is located adjacent to an existing SkyTrain station, creating a new focal point for the further transit-supportive intensification of the area.

**LINK:** www.centralcity.ca
L 2.2 Diversify & Intensify Large Single Land Uses

Large single land uses, such as shopping malls and office parks located along transit alignments, should be allowed to redevelop into higher density, mixed-use forms. These sites could become the focus of new TOD sites, which in turn will place more people closer to transit and make it more viable to access these sites by transit.

Actions

- Where appropriate, intensify single-use areas around transit stations and stops via these design tactics:
  - Subdivide superblocks into smaller, finer grained street and block patterns; large parking lots surrounding single land uses, such as shopping malls, are preferred places to begin this process.
  - Infill new blocks with mixed-uses and multi-storey mixed-use buildings, and integrate with existing land uses and the buildings that house them.
  - Consider development located above existing transit stations or stops, or in the case of elevated stations and guideways, development that directly integrates into these elements, either by filling the space under guideways or stations, or integrating guideways or stations into mixed-use structures.
  - Redirect displaced parking capacity to structured, underground and on-the-street parking on newly created streets (within subdivided superblocks).
  - Ensure new built form is pedestrian-friendly (Guideline TL 4.1).

- Municipalities can facilitate redevelopment interest and action through hosting multi-stakeholder workshops or ‘charrettes’ that consider redevelopment options.

- Redesignate/rezone single land uses for transit-supportive redevelopment in neighbourhood plans and municipal OCPs.

- Municipalities and transit authorities should explore joint development opportunities (development above transit stations, or directly integrating stations into new development).

Existing mall can be intensified into higher density, mixed-use and pedestrian-friendly environments.
Central Okanagan Initiatives

This Guideline is explicitly supported by the KDP, via a policy calling for the higher density, mixed-use redevelopment of a large school site adjacent the existing Queensway Exchange and other downtown Kelowna transit routes.

Precedents/Best Practices

**Clackamas Town Centre Concept Plan, Clackamas County, Portland Region (2000):** Clackamas Town Centre is one of the largest regional malls in the Portland region, and was used as a case study to show how a standard shopping mall surrounded by parking lots could be intensified and diversified into a walkable, mixed-use town centre. Organized around a future LRT station, the concept involves the subdivision of mall parking lots into highly walkable street and block patterns reminiscent of downtown Portland, with the blocks filled with streetfronting, mixed-use buildings. One mall is retained and incorporated into this new urban fabric, while the other is demolished and replaced with housing, retail and office uses.

LINK: www.calthorpe.com

Clackamas Town Centre—before and after (Source: Calthorpe & Fulton, 2001).
3. Neighbourhood

These Guidelines outline the necessary elements of existing transit-supportive areas and individual TODs—at the scale of the neighbourhood—defined in this document by a 5 to 10 minute walk (400 to 800 metres) from edge to transit stop. This is the range of distance most pedestrians are willing to walk to access transit, and is the accepted standard for defining the spatial limits of transit-supportive areas and TODs.

The Neighbourhood-Scale Guidelines include:

- TL 3.1 New TOD to Be Consistent With Built Form & Neighbourhood Contexts
- T 3.1 Walkable Street & Path Networks
- T 3.2 Multi-Modal Transfer Nodes Evolve Into Transit-Supportive Areas
- T 3.3 Reduce Parking Standards Near Transit
- L 3.1 Locate Trip Generating Land Uses Around Transit Stations & Stops
- L 3.2 Locate Highest Densities Around Transit Stations & Stops
TL 3.1 New TOD to be Consistent With Built Form 
& Neighbourhood Contexts

A key factor in TODs achieving market and community acceptance involves the ‘look and feel’ of the TOD built form. The higher densities of TODs are sometimes difficult to accept in established neighbourhoods, especially within those with a significant single detached housing stock. Thus, TODs should strive to reflect and/or complement surrounding built form contexts.

Actions

• Before a TOD design process is undertaken in an established neighbourhood context, a built form inventory of the surrounding areas should be undertaken. This inventory can then guide TOD design, and should include:
  – Identification of ‘Paths’ & ‘Networks’: Street and pedestrian system and character and other relevant flows like water;
  – Identification of Built Form ‘Vernacular’: Scale, building typology and architectural style; and
  – Identification of ‘Themes’: Identify ‘nodes’ of activity, cultural and physical ‘landmarks’ and ‘districts’ of distinct built form, cultural expression or natural habitat.

• TOD built form should reflect or complement adjacent built form. Considerations include:
  – Lot sizes;
  – Heights;
  – Density and massing;
  – Setbacks;
  – Architectural style;
  – Street and pedestrian system; and
  – Urban design composition (neighbourhood scale).

• TOD design, whether in greenfield or infill contexts, should reflect local built form, historical, cultural and natural context.

• Municipal authorities can develop neighbourhood-specific urban design guidelines, requiring complementary form of development and sensitive density design within established areas.

Central Okanagan Initiatives

Although currently there are no supporting policies found in the Central Okanagan context, the Kelowna, Westside OCPs and KDP contain parallel policies that require new development to be sensitive to existing built form and neighbourhood contexts.
Precedents / Best Practices

**Arbutus Village, City of Vancouver (1998):** Located adjacent to the Broadway B-Line rapid bus alignment, Arbutus Village TOD was developed on a former brewery site within a predominantly single detached home neighbourhood. While representing a significant increase in residential density, the 4 to 7 storey built form—consisting of townhouses and walk-up apartments—reflects the height, building massing and architectural style of the former brewery. The projects' streetfronting apartments have been mirrored across the street by subsequent, non-project development. Consequently, the TOD was accepted by the community and was a market success, while representing a good example of sensitive intensification along a major transit corridor.

LINKS: www.ibigroup.com; www.city.vancouver.bc.ca/commsvcs/currentplanning/urbandesign/index.htm

Arbutus Village built form – compatible with adjacent neighbourhood (Source: Concert Properties, 2003).
T 3.1 Walkable Street & Path Networks

Quick, direct and convenient pedestrian paths are necessary elements for TODs and transit-supportive cityscapes. The street and block system, regardless of design, should allow for direct pedestrian routing to transit stops and central mixed-use core areas to ensure the majority of walking trips within transit catchments are between 5 and 10 minutes in length.

This typically involves grid-based systems, comprised of interconnected streets and paths (sidewalks) bounding short, narrow blocks. This highly walkable environment provides for more direct and convenient routes for pedestrians relative to conventional curvilinear, cul-de-sac systems. This, in turn, can make transit an attractive alternative to the automobile due to easy accessibility.

Cul-de-sacs are to be generally discouraged. However, they are still a popular element of neighbourhood design for both residents and developers, particularly in low-density residential areas, given they discourage through traffic and are highly marketable. Cul-de-sacs are also required in neighbourhoods with significant topography. Given this context, care must be taken to ensure that cul-de-sacs and winding street networks remain ‘porous’ to pedestrians to ensure quick and direct access to transit and neighbourhood services. This could involve paths connecting cul-de-sacs to arterials and other cul-de-sacs, along with direct paths that provide up/down slope ‘shortcuts’ through winding street networks.

Actions

• Ensure street and path networks within 400 to 800 metres from transit stops are continuous and grid-based. For areas with significant topographical and land use constraints, a ‘modified grid’ system can be utilized. This involves street networks that follow or avoid topography, yet still provide for multiple, interconnected streets and short blocks. Back alleys can also double as pedestrian paths.

• Ensure blocks measure no more than 200 metres long on one side, to ensure street and block patterns remain walkable and porous. Ideally, intersections should occur every 80 to 180 metres.
• Provide direct mid-block pedestrian paths through blocks (or through buildings that cover the majority of blocks), where block lengths over 200 metres are unavoidable. These paths should be paved, possess clear, direct sightlines, and be well-lit at night to enhance pedestrian safety.

• A continuous sidewalk network should accompany street networks to provide safe and direct routes for pedestrian travel.

• Cul-de-sacs can be utilized where necessary, yet should have paths connecting to other streets. Existing cul-de-sacs can be ‘retrofitted’ over the long term through converting residential lots and/or utility corridors to paths and/or parks, and connecting to other cul-de-sacs or arterial/collector roads served by transit.

• Wherever possible, ‘short cut’ paths should be utilized to cut though winding street networks.

Central Okanagan Initiatives

General policies supporting walkable street and path networks are supported in all the relevant OCPs, and also in the BNP and WTCSP.

Precedents/Best Practices

East Clayton, City of Surrey (2003): East Clayton is to become a model of a ‘more sustainable’ community design within the GVRD. A key element of this design involves a built form that is highly walkable and encourages more transit use, since the community is to be served by a BRT alignment. The street and path network is grid-based, complete with short and regular street spacings and a trail system that provides direct connections between community destinations. The street network also employs fewer cul-de-sacs than other developments in the area, and many of these cul-de-sacs are directly connected to other streets and greenways via pathways. LINK: www.city.surrey.bc.ca
Orenco Station TOD, Hillsboro, Portland Region (2000): Orenco Station TOD is structured around a modified grid street and block pattern, resulting in a collection of square, elongated and irregular block configurations, complete with rear lanes. The largest of these blocks measures approximately 150 metres in length by 70 metres in width; the majority of other blocks are shorter yet remain similar in width. These blocks are easy to walk around due to short widths and rear lane paths. The net effect is a highly ‘porous’ and walkable TOD, where 75 percent of dwellings located within 400 metres of the mixed-use core are within an actual 5 minute walk.

LINK: www.orencostation.com
T 3.2 Multi-Modal Transfer Nodes Evolve Into Transit-Supportive Areas

Multi-modal transfer nodes with large Park-and-Ride facilities are typically located in low-density suburban locations that maximize transfers from automobile and feeder buses to rapid transit.

Transfer nodes should be designed with the intent that they will evolve from an early emphasis on automobile/transit transfers to primarily facilitating transit/transit and pedestrian/transit transfers. As surrounding neighbourhoods grow, transfer stations should also concurrently densify and become more diversified. Furthermore, multi-modal transfer nodes can also become the centre of neighbourhood intensification schemes, perhaps involving TOD development around the node.

Actions

- Avoid designing multi-modal transfer nodes that encourage significant further development of low-density automobile dependent sprawl. Node design should allow for evolution into built forms that support adjacent transit-supportive development or become centres of new TODs. This could involve:
  - Ensuring streets into, out of and within transfer nodes match up with adjacent street systems to provide continuity and enable the development of fine-grained, walkable street patterns at the neighbourhood scale; and
  - Reserve future street rights-of-way within Park-and-Ride areas, to facilitate future subdivision of parking lots into street and block patterns allowing higher density development.

- Retail, residential and employment uses should be encouraged to develop immediately adjacent or within transfer nodes, and along transit routes leading to nodes. Within nodes, Park-and-Ride lots can be subdivided to accommodate new land uses and/or improved transit facilities. Displaced parking can then be accommodated in parking structures and underneath mixed-use buildings.

- Priority should be placed upon ensuring new development within transfer nodes are designed to gradually replace and reduce the parking supply at the node and increase transit usage (via walking/cycling-to-transit trips and transit-to-transit trips).

Multi-modal transfer nodes should evolve into transit-supportive areas.
• Ensure resultant built forms are pedestrian-friendly (Guideline TL 4.1).

• Where appropriate, designate multi-modal transfer nodes as future transit-supportive development sites in neighbourhood plans and municipal OCPs. Rezone lands around these nodes to support this development, where appropriate.

Central Okanagan Initiatives

The KDP specifically supports the evolution of the area surrounding the Queensway Exchange, including higher density, mixed-use and pedestrian-friendly development.

Precedents/Best Practices

Colma Station Specific Area Plan, City of Daly, San Francisco Region (1993):
This specific TOD plan proposed to redevelop underutilized land around the Colma BART (Bay Area Rapid Transit) station into a more transit-supportive built form. The station itself was originally intended to be a multi-modal transfer point, surrounded by a large parking structure and bus exchange terminal. However, this arrangement cut off the station from the surrounding urban fabric and created an unfriendly pedestrian environment. The plan integrates the new development into the existing multi-modal transfer node, allowing easy pedestrian access from both the new TOD and the surrounding neighbourhoods. LINK: www.calthorpe.com

Colma Station Specific Area Plan--BART station in blue (Source: Calthorpe, 1993).
T 3.3  Reduce Parking Standards Near Transit

Parking standards within TODs/transit-supportive areas should be modified to reflect proximity to high frequency transit service, pedestrian-friendly built forms and a mix of uses.

Generally, parking standards should be reduced to encourage increased transit use, and parking on large surface lots should be discouraged. Instead, parking should be redirected to structured, underground and on-the-street parking facilities.

Actions

• Based on site specifics, parking standards can follow these ranges:
  – Office: 2 to 3 spaces per 100 square metres;
  – Retail: 3 to 4 spaces per 100 square metres; and
  – Light industrial: 1 to 2 spaces per 100 square metres.
• Consider the use of parking space maximums rather than minimums.
• Retail, office and entertainment uses can share parking capacity through joint parking facilities.
• Emphasize short term on-the-street parking in pedestrian-friendly areas. This helps retail viability on core commercial streets and can absorb a significant portion of parking within individual TODs.
• Limit the size of surface parking lots, and locate these lots behind or beside buildings, complete with ‘orchard’ landscaping where possible.
• Design the layout and configuration of parking lots to accommodate future redevelopment into more intense built forms (Guideline L 2.2).
• Accommodate surface parking in underground and above ground structured parking lots. Where possible, above ground structures should be integrated into mixed-use buildings.
• Ensure above ground structures are designed in a pedestrian-friendly manner (Guideline TL 4.1) and ground level, street edge uses (such as retail) should be allowed within these structures where applicable.

• Define parking requirements, including allowing joint-use and reduced parking, in the municipal zoning bylaws.

• Eliminate free parking or raise existing parking fees to encourage increased transit use.

Central Okanagan Initiatives

Policies supporting reduced parking requirements in town centres (and hence near transit) are found in the Kelowna and Westside OCPs. More detailed parking requirement policies are contained in the KDP, WTCSP and the BNP design guidelines.

Precedents/Best Practices

**West Hyattsville Transit-Oriented Development Strategy, Washington, D.C. Region (2003):** This strategy calls for new TOD development around a local Metrorail (heavy rail) station, complemented by a 25 percent reduction in parking requirements relative to existing standards. This reduction is based on the belief that the TOD will require less parking spaces because of increased transit use, reduced vehicle use and shared parking schemes.

LINK: www.mncppc.org/cpd/PDFs/WestHyatts/TODStrategy.pdf
L 3.1 Locate Trip Generating Land Uses Around Transit Stations & Stops

As outlined in Guideline L 1.3, land uses likely to be major trip generators—such as office or civic buildings, recreational facilities, retail centres or high-density residential uses—should be located around designated transit stations and stops located within TODs, or existing transit-supportive centres and areas.

Locating convenience retail establishments directly adjacent to transit stations and stops, where appropriate, can make transit more attractive to users. This is due to an easier ability for transit users to ‘trip chain’, where goods and services can be accessed in conjunction with transit trips. Certain retail establishments, such as coffee shops, can also provide attractive and comfortable waiting areas for transit users. Concentrations of retail activity around stations and stops also creates a vibrant pedestrian environment and provides valuable ‘eyes on the street’ surveillance of the transit station or stop area.

Actions

- Concentrate trip generating land uses in ‘core areas’ adjacent to designated transit stations and stops. Not all transit stops may be appropriate locations for trip generating land uses.
- A minimum of 1,000 square metres of retail space should be located adjacent to transit stations and stops.
- Combine with high-density residential and employment uses to create compact, mixed-use cores within existing transit-supportive areas and TODs.
- Compact, mixed-use core areas should occupy at least 10 percent of transit-supportive/TOD area.
• Locate retail stores, service shops and restaurants around at-grade transit stations and stops, where appropriate. These can include:
  – Cafés/coffee shops;
  – Restaurants, fast food and otherwise;
  – Pubs and bars;
  – Convenience stores;
  – Pharmacies;
  – Newspaper/flower vendors;
  – Dry cleaners; and
  – Grocery stores (at higher capacity transit stations).

• Land uses frequented by or housing transit dependents, such as the elderly and mobility-impaired, should also be directly adjacent to transit stations and stops.

• Locate new transit stations or stops at locations where concentrations of trip generating land uses already exist.

• Designate core commercial areas and define relevant zoning, permitting a mix of uses around transit stations and stops in neighbourhood plans and municipal OCPs.

• Zone areas immediately adjacent to appropriate transit stations and stops to accommodate the retail uses listed above. (Note: Not all transit stops along bus routes—where stop locations are close together—may be appropriate for retail activities.) Generally, retail establishments or concentrations should be located about one kilometre apart to ensure retail viability.

The new Salt Lake City Intermodal HUB Terminal places retail space within a multimodal hub, directly adjacent to conventional bus, LRT and commuter rail stations.

Central Okanagan Initiatives

Locating trip generating land uses in core areas (and thus around transit) is supported by the Kelowna and Peachland OCPs, and the BNP, BNP design guidelines and the WTCSP.
Precedents/Best Practices

Lindbergh Centre, Atlanta Region (2000): The ‘main street’ of this TOD, containing numerous retail and entertainment uses, leads directly to the MARTA rail station entrance. Major trip generators, including a hotel and a Bell South office concentration containing over 3,600 jobs, also anchors this street and provides an excellent context for generating significant ridership along this portion of the MARTA system. LINK: www.carterusa.com

LinK: www.carterusa.com

Commercial Drive Station, SkyTrain Millennium Line, City of Vancouver (2000): Located where the new Millennium SkyTrain Line meets the existing Expo SkyTrain Line, the Commercial Drive station contains a number of retail establishments, including cafés, fast food restaurants and specialty retail. These are located in a mixed-use building containing office uses on the second storey, and are connected to the station entry point by a small covered square. This collection of retail has reinforced the open air market character of Commercial Drive; it provides easy access to convenience retail for transit users and has reinvigorated a previously underutilized SkyTrain station area. LINK: www.translink.bc.ca
L 3.2  Locate Highest Densities Around Transit Stations & Stops

Guideline L 1.3 outlined minimum average densities to support viable transit service within TOD boundaries, but core areas around transit stops should contain the highest densities—to maximize the number of potential transit users with direct access to transit.

Suggested Actions

• Locate the highest residential densities within 200 metres of transit stations or stops, appropriate to type of transit technologies, service frequency and built form/built form context:

<table>
<thead>
<tr>
<th>Transit Technology</th>
<th>Density According to Distance From Transit</th>
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<tbody>
<tr>
<td>Rapid Transit</td>
<td>75 units per hectare: &lt; 200 metres</td>
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<tr>
<td></td>
<td>60 units per hectare: 200 to 400 metres</td>
</tr>
<tr>
<td></td>
<td>30 units per hectare: &gt; 400 metres</td>
</tr>
<tr>
<td>Conventional Bus</td>
<td>60 units per hectare: &lt; 200 metres</td>
</tr>
<tr>
<td></td>
<td>17 to 30 units per hectare: 200 to 400 metres</td>
</tr>
<tr>
<td></td>
<td>NA: &gt; 400 metres</td>
</tr>
</tbody>
</table>

• Integrate residential densities into the mixed-use cores surrounding transit stations and stops (Guideline L 3.1).

• Define density requirements for transit-supportive and TOD areas in neighbourhood plans and municipal OCPs.

Conceptual TOD design, with highest densities around transit.
Central Okanagan Initiatives

Higher densities in core areas are key policies within the KDP, the WTSCP, the BNP and the BNP design guidelines. This Guideline is also supported by the Kelowna, Westside and Peachland OCPs.

Precedents/Best Practices

Newport Village, City of Port Moody, Greater Vancouver Region (2004): The highest residential densities within Newport Village, in the form of high-rise towers, are not only located within the core area of the TOD, but are also directly adjacent to the existing 98 B-Line alignment. This not only places a high concentration of potential riders near rapid transit, it also anticipates the potential upgrade of the B-Line to rail-based rapid transit along Guildford Way or along nearby Lougheed Highway.

LINK: www.bosadev.com

Newport Village Site Plan—higher density towers adjacent to the Guildford Way B-Line route (Source: Bosa Development Corporation, 2004).
4. Local

The Local Guidelines consider local elements within neighbourhoods and how they should be treated to facilitate effective transit and provide transit-supportive contexts.

The Transportation Guidelines apply to the local street and localized areas on the street. Land Use Guidelines apply to individual blocks and the built form within these blocks.

The emphasis is on the pedestrian, since transit users are pedestrians at both ends of their trips. Careful attention is paid to ensuring pedestrian convenience and safety to and from transit services, since it is a major factor in determining transit viability. This, in turn, will impact the viability of transit at the scale of the neighbourhood, city and ultimately the region.

The Local-Scale Guidelines include:

TL 4.1 Create Pedestrian-Friendly Built Forms
TL 4.2 Utilize Crime Prevention Through Environmental Design (CPTED) Tactics
T 4.1 Local Streets to Be Narrow & ‘Calmed’
T 4.2 Sidewalk Widths Appropriate for Pedestrians
T 4.3 Transit Stations & Stops to Meet the Needs of All Transit Users
T 4.4 Transit Station & Stops As Identifiable Icons
L 4.1 Public Spaces Adjacent to Transit Stations & Stops
L 4.3 Encourage Mixed-Use Buildings
L 4.4 Provide Architectural Variety
TL 4.1 Create Pedestrian-Friendly Built Forms

From the perspective of pedestrians, streets are most desirable and comfortable when they offer feelings of enclosure. When pedestrians walk down a street that is well defined by buildings, objects and/or trees fronting the street, they feel like they are in an ‘outdoor room’, considered a ‘positive’ space. Since transit users are pedestrians at both ends of their trips, positive pedestrian spaces make transit a more attractive alternative.

Conversely, streets that offer poor or no enclosure are less desirable and can even be hostile to pedestrians, who can feel isolated, bored and even unprotected. Undesirable or hostile pedestrian environments usually result in low ridership, since few pedestrians are willing to walk within these environments.

It is also important to ensure that buildings lining retail streets provide varied, narrow and continuous ‘storefronts’ at ground level, to provide an interesting pedestrian experience, direct pedestrian access to these buildings and ‘eyes on the street’ surveillance. Streets with long expanses of blank walls are uninviting and can deter pedestrian activity.

Suggested Actions

- Ensure streetwall height (as defined by buildings, objects or trees) to street width (right-of-way) ratios to create positive pedestrian spaces in higher-density, mixed-use contexts such as downtowns, commercial centres and TOD cores. Ratios of 3 to 1 through to 1 to 3 are considered ideal; ratios below 1 to 6 result in negative spaces.

- Ensure buildings directly front streets in mixed-use cores and around transit stops, via zero or shallow setbacks (0 to 3 metres) from the street right-of-way. At-grade parking, if provided, should be at the rear of these buildings (Guideline T 3.3). Setbacks from the street right-of-way should reflect sidewalk widths appropriate to pedestrian volume and the nature of mixed-use activity.
• Setbacks in residential areas should range from 2.5 metres to 6 metres from the street right-of-way. Shallower setbacks (2.5 to 4.0 metres) should be used for streetfronting apartments and lane-served townhouses and single detached dwellings.

• Ensure buildings directly fronting streets exhibit varied and interesting frontages. A desirable storefront width is typically 10 metres, with a minimum transparent area (windows and doors) of 40 percent in the storefront façade.

Bow Valley Land Use Competition, Calgary AB

• Storefront variety can be achieved through narrow lots, multiple frontages per block or partitioning long blank walls with windows, doors and/or architectural detailing.

• Use street trees or objects to frame street rights-of-way with poor or no spatial definition, or significant gaps in the streetwall.

• Define FSRs, site coverages, setbacks and frontages conducive to pedestrian-friendly built form, in municipal zoning bylaws.

Pedestrian-friendly environments at street level.
• Develop urban design plans to provide detailed guidance for the design of local streetscapes.
• Integrate an urban design review board into the development permitting process, to ensure local scale development proposals adhere to urban design plans.

Central Okanagan Initiatives

No one plan specifically prescribes streetwall to street-width ratios, yet policies contained within the Kelowna and Westside OCPs, the BNP and BNP design guidelines, and the WTCSP all favour the development of pedestrian-friendly environments. The majority of these policies favour streetfronting buildings (minimum setbacks), narrow lots and varied frontages.

Precedents / Best Practices

City of Vancouver (1990): In the early 1990s, the City of Vancouver mandated new high-rises to not only setback from the street, but also rise from 2 to 6 storey ‘podium base’ buildings that directly line the street. This built form creates positive spaces for pedestrians by keeping building height to street-width ratios below 3 to 1, while reducing shadowing and view obstructions. LINK: www.city.vancouver.bc.ca/commsvcs/currentplanning/urbandesign/index.htm

Orenco Station TOD, Town of Hillsboro, Portland Region (2000): The mixed-use core of Orenco Station is organized around a short ‘main street’, directly bordered by mixed-use buildings containing narrow ground floor storefronts with apartments above. This street is a popular pedestrian destination due to the high level of interest provided by numerous varied storefronts, and also its ‘feel’ as a positive pedestrian space, created by a 1 to 2 building height to street-width ratio. LINK: www.orencostation.com
TL 4.2 Utilize Crime Prevention Through Environmental Design (CPTED) Tactics

Safety and a sense of personal security are essential components of transit station and stops and surrounding built form design. New developments should take into consideration CPTED tactics, in order to enhance transit user safety, reduce vandalism and discourage mischief and petty crime.

While many of the guidelines contained within this compilation already contain elements of CPTED, it is important to illustrate a complete summary of tactics that should be utilized when integrating transportation and land use planning.

Suggested Actions for Station & Stop Architects

- Maximize opportunities for natural surveillance.
- Provide unobstructed and transparent sightlines to exits and destinations.
- Foster territoriality and a sense of ownership.
- Prevent hiding places within station design.
- Provide natural and artificial lighting to all areas frequented by pedestrians.

Recommended illuminance values are as follows:

<table>
<thead>
<tr>
<th>Area Type</th>
<th>Illumination (Foot Candles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Spaces, Mixed-Use Cores</td>
<td>2.0</td>
</tr>
<tr>
<td>Residential</td>
<td>1.0–1.5</td>
</tr>
<tr>
<td>Industrial</td>
<td>0.4</td>
</tr>
<tr>
<td>Parking lots</td>
<td>1.8</td>
</tr>
<tr>
<td>Bus stops</td>
<td>1.5–2.0</td>
</tr>
<tr>
<td>Transit Station Platforms</td>
<td>5.0 at loading areas, 2.0 elsewhere</td>
</tr>
</tbody>
</table>

- Require supervised use of amenities, including washrooms, telephone and bicycle lockers.
- Provide walls and surfaces coated with anti-graffiti coating, and ensure anti-graffiti measures are included in transit operation plans.
- Require the use of CPTED tactics in all public places and areas frequented by pedestrians, in neighbourhood plans and municipal OCPs.
- Ensure CPTED tactics are complemented by on-site security measures, including transit police and regular surveillance of transit stations and stops and surrounding areas (Park-and-Ride/Kiss-and-Ride) by transit authority personnel, police or private security.
- Utilize Closed Circuit Television (CCTV) camera surveillance in strategic areas (Guideline T 4.3) to discourage crime.
Central Okanagan Initiatives

The use of CPTED tactics is directly identified in policies within the Kelowna OCP and the KDP, as well as the BNP design guidelines.

Precedents / Best Practices

**Metrorail System, Washington D.C. Region (1972):** Designed with CPTED principles at the outset, underground Metrorail stations have high, vaulted ceilings and open floor plans. Arches are used instead of pillars for support in order to maintain clear sightlines across station platforms. Niches and dark spaces were discouraged in the station design process, and currently 298 uniformed transit ‘cops’ regularly patrol station platforms and surrounding areas, including parking lots and bus loops. [LINK: www.wmata.com](http://www.wmata.com)

**Commercial Drive SkyTrain Station, City of Vancouver (2000):** Safety and a sense of personal security were primary themes in the design of this SkyTrain station. Employing CPTED tactics, emphasis was placed on ensuring opportunities for natural surveillance were optimized, and developing clear sightlines through station areas and platforms.

[LINK: www.city.vancouver.bc.ca/commsvcs/guidelines/CD-1/C003.pdf](http://www.city.vancouver.bc.ca/commsvcs/guidelines/CD-1/C003.pdf)

Transparent walls, narrow support columns and an open design concept allows for clear sightlines across SkyTrain station areas.
T 4.1  Design Local Streets to Be Narrow & ‘Calmed’

Narrow and ‘calmed’ local streets are characterized by reduced pavement widths and traffic calming ‘devices’ that encourage automobile traffic to slow down and/or proceed with caution. These measures can make streets safer for pedestrians and more livable for residents through less vehicle noise and ‘through’ traffic. Narrower pavement widths can also reduce capital costs and storm water runoff problems.

**Actions**

- Design local streets according to these pavement widths:
  - 7 to 8.5 metres wide for two travel lanes and one parking lane; 
    500–1,800 Annual Daily Traffic (ADT) count appropriate.
  - 10 to 12 metres wide for two travel lanes and two parking lanes; 
    500–3,000 ADT appropriate.
  - 4 metres wide for rear lanes.

- The following traffic calming devices reduce traffic speed: speed bumps, speed tables, raised intersections and crosswalks, traffic circles, on-the-street parking and narrowed or ‘bulb out’ intersections.

- The following traffic calming devices reduce volumes: full street closures, half street closures (allowing traffic access or egress only at specific points) and diagonal diverters.

- Traffic calming measures, except corner bulges, should not be applied to local streets used by local transit services.

- Update municipal street and right-of-way standards to allow narrower street widths.

- Adopt traffic calming tactics for city-wide application in municipal transportation plans.
Central Okanagan Initiatives

Traffic calming measures are supported by the KDP, WTCSP, BNP and the BNP design guidelines.

Precedents / Best Practices

Traffic Calming, City of Vancouver (1995): In response to increasing traffic speeds and automobiles cutting through residential neighbourhoods, the City of Vancouver implemented a city-wide traffic calming program. Using devices such as traffic circles, intersection chokers or ‘bulb outs’, speed bumps and tables, raised crosswalks, lane deflectors and street closures has reduced traffic volumes, speeds and through traffic within ‘calmed’ neighbourhoods.

LINK: www.city.vancouver.bc.ca/engsvcs

Skinny Streets, Portland Region (1998): The City of Portland and other municipalities within the Portland Region, including Hillsboro, Gresham and Tualatin, have instituted ‘skinny streets’ programs. Local streets are designed to reflect existing traffic volumes and range between 6.1 metres wide (two-way street, parking on one side) to 9.7 metres wide (two way street, parking on both sides). The narrowest streets offer a single travel lane and parking on one side, forcing cars to slow down and pull aside to allow oncoming cars to pass, making streets safer and quieter for residents.

LINK: www.trans.ci.portland.or.us/trafficcalming/devices/Devices.htm

East Clayton Neighbourhood, City of Surrey (2000): The City of Surrey allowed narrower local streets, relative to other local streets within the municipality, to be developed for the East Clayton Neighbourhood. This was based on the premise that narrower pavement widths could slow down and calm automobile traffic, and reduce road building expenditures and storm water runoff volumes into the headwaters of the Serpentine and Nikomekl Rivers. Typical pavement width on local streets (two travel lanes, one parking lane) is 8.6 metres wide.

LINK: www.city.surrey.bc.ca
T 4.2 Sidewalk & Path Widths Are Appropriate for Pedestrian Traffic Levels

Pedestrian comfort and convenience is crucial to the success of any transit system. Sidewalks and paths, whether directly servicing a transit station or within a TOD, should be wide enough to easily accommodate two-way pedestrian traffic. The width of these facilities should also reflect existing and/or anticipated pedestrian volumes—a function of density, mixed-use intensity and level of transit service.

Actions

- Sidewalk widths should be appropriate to location and pedestrian volumes (minimums):
  - Local residential streets—1.5 metres;
  - Low-intensity commercial streets—3 metres;
  - Moderate-intensity commercial streets—4 metres; and
  - High-intensity commercial streets—5 metres.

- Path widths should be appropriate to location and pedestrians (minimums):
  - Natural areas and minor park paths—1.5 metres;
  - Major park paths—3 metres;
  - Mixed pedestrian and bicycle paths—4 metres; and
  - Seawall, boardwalks and wharfs—5 metres.

- Ensure all sidewalks and paths contain a minimum 1.5 metre-wide ‘throughway zone’, designated exclusively for pedestrian travel and unencumbered by street furniture or other obstructions.

- Ensure paths that may be used for emergency vehicles conform to minimum width standards as prescribed by municipal by-law.
- Update municipal street and right-of-way standards to allow for adequate sidewalk space.
- Develop OCP policy requiring continuous sidewalks on all streets with significant pedestrian traffic.
- Define sidewalk requirements in urban design and neighbourhood plans.

Central Okanagan Initiatives

This Guideline has general policy support (in terms of supporting adequate sidewalk provision) in the Kelowna OCP, the KDP, WTCSP, the BNP and the BNP design guidelines. Sidewalk widths are not explicitly detailed in any of the policies.

Precedents / Best Practices

Planning & Designing for Pedestrians, SANDAG, San Diego (2002): SANDAG, San Diego's regional planning agency, produced guidelines in an effort to promote the development of more walkable environments across the San Diego region. The guidelines provide excellent detail concerning sidewalk configurations and pedestrian lighting levels and provide inviting and interesting streetscapes for pedestrians. They also double as TOD guidelines (since TODs require pedestrian-oriented design), and reflects SANDAG's commitment to encouraging TOD development along existing and planned LRT alignments.

T 4.3 Transit Stations & Stops to Meet the Needs of All Transit Users

Transit stations and stops must be designed with safety and convenience in mind for all transit users, especially regarding accessibility for the elderly and mobility-impaired, and become essential elements of any pedestrian-friendly environment.

Weather protection is a key consideration in at-grade and elevated station and stop shelter design, since effective protection of transit users from precipitation, sunshine or wind can greatly increase the attractiveness of any transit stop.

Below or elevated ground stations should be designed to provide clear sightlines, bright lighting and many opportunities for informal and formal surveillance.

Lack of attention to this requirement can significantly impact ridership—unsafe and non-functional transit stations and stops will not maximize transit trips or encourage automobile drivers to give up the relative comfort and security of their vehicles.

Actions

- Transit stations and stops should be designed with these principles in mind:
  - Location:
    - Transit stations and stops should be located where possible on well-illuminated streets with sidewalks, streetfronting buildings, ground floor, mixed-use activity and passive surveillance opportunities.
  - Connectivity:
    - Direct and convenient connections should be provided from the sidewalk to the station or stop ‘platform’, and from the platform to the loading and unloading doors. The platform should be designed to comfortably accommodate anticipated trip loadings. At-grade shelters and platforms can also be integrated into the design of buildings, provided the building is adjacent to the street and the transit stop is in front of the building.
  - Adequate Capacity:
    - Station or stop platform must be large enough to comfortably accommodate anticipated boarding or alighting numbers.
    - Adequate seating and refuge area must be provided to accommodate anticipated elderly or mobility-impaired numbers.
  - Weather Protection:
    - At-grade or elevated stations or stops in mild climates, whether wet or dry, should provide shelters with overhead protection
    - Shelters located in regions or local areas experiencing very cold temperatures and wind chill should be fully enclosed in glass or other materials, and heated when passengers are present.

Bus stop seating area, City of Vancouver.
– Safety:
  ◦ Clear sightlines should exist between waiting transit users, drivers of transit vehicles and automobiles and other pedestrians.
  ◦ Bright night lighting is essential in any transit station or stop.
  ◦ At-grade, enclosed transit shelters should have at least two doorways for added security, and should have transparent sides for visibility and informal surveillance opportunities.
  ◦ Designated waiting areas, under CCTV surveillance, should be utilized in stations to improve safety for late night users.
  ◦ Transit personnel, or transit police, can also be deployed in underground and elevated stations to provide additional surveillance.
  ◦ Shelters and waiting areas should be surfaced in non-slip, level and well-drained materials.
  ◦ Tactile warning strips should be provided along walkways and stop platforms adjacent to streets or guideways to help the visually impaired.
  ◦ Locate Kiss-and-Ride facilities directly adjacent to transit stations and stops, providing direct pedestrian connections to platforms or station entrances.
  ◦ Ensure pedestrian connections from Park-and-Ride lots or structures to transit stations or stops are direct and well illuminated.
  ◦ Where possible, locate commercial uses within sight of Park-and-Ride and Kiss-and-Ride pedestrian connections, to provide ‘eyes on the street’ surveillance opportunities.

– Accessibility & Convenience for Elderly & Mobility-Impaired:
  ◦ Multiple changes at-grade should be avoided at any transit station or stop; platforms should be flat. In the case of elevated or underground stations, elevators and ramps must be provided.
  ◦ Seating should be fixed and should include armrest to assist individuals in lowering and raising themselves.

– Identifiability:
  ◦ Any station or stop should be clearly identified with legible, coherent signage.
  ◦ Signage indicating direction to transit stations and stops should be placed within transit-supportive areas to assist in wayfinding.
– Transit Information:
  ° Transit stations and stops should display route and schedule information in a legible and understandable manner.
  ° Where possible and appropriate, incorporate real time transit information in a manner that is easily accessible, legible and understandable to all transit users.
  ° Transit stop-based real time transit information can take the following forms:
    · ‘Changeable Message’ LED readouts with voice over;
    · Video screens with voice over; and
    · Phone access to transit controllers, with accompanying digital display.

– Bicycle Storage:
  ° Bicycle parking for Bike-and-Ride commuters must be provided at transit stations and stops, including 10 to 20 bicycle lockers—necessary not only for preventing bike theft, but vandalism.

Central Okanagan Initiatives

This Guideline is supported by BC Transit regulations for transit stop design, and the WTSCP recommends the provision of shelters at transit stops.

Precedents / Best Practices

**Northwest Corridor BRT, Metro Transit, Minneapolis/St. Paul Region (2002):** Cold winter weather, along with harsh wind chill factors, can make transit use unattractive within the Minneapolis/St. Paul region—consequently transit station and stop design reflect these realities. The conceptual station design for the proposed Northwest Corridor BRT alignment provides a good example, using glass enclosed shelters to provide refuge from wind, and large roofs to keep platforms and outside seating areas free of snow and ice. LINK: www.metrocouncil.org/transit/northwest_01.htm

**SkyTrain, Greater Vancouver (1985):** ‘Designated waiting areas’ are provided at all SkyTrain stations to enhance user safety. These areas, which include seating, are situated to line up with the doorways of SkyTrain vehicles—providing quick and direct access for users from these areas. These areas are also actively monitored by SkyTrain controllers via CCTV, and emergency telephones are also provided nearby. These measures intend to boost user confidence that SkyTrain stations are safe and that they are less likely to be threatened or bothered if platforms are being actively monitored. LINK: www.translink.bc.ca
T 4.4 Transit Stations & Stops As Identifiable Icons

It is imperative that transit station and stop shelters are designed as recognizable ‘icons’ that are not only easily seen by transit users, but also transit vehicle drivers. This elevates the visibility of transit stops in the landscape, assists in transit user wayfinding and communicates the importance of transit as a local point of neighbourhood access and egress.

Actions

• Transit shelter design along particular routes should convey a common design language—conveying and reinforcing the ‘identity’ of the route.

• Integrate transit shelter design with local or city-wide signage and/or wayfinding themes.

• Transit shelter design should complement existing or planned streetscape design themes.

• Where appropriate, transit stations and stops should clearly demarcate ‘fare paid’ areas.

• Transit stations and stops should have easily identifiable marker poles and platform treatments that clearly demarcate station or stop locations and platforms for transit vehicle drivers and transit users.

• Transit shelter design standards should be developed by municipalities and transit authorities for transit routes, with the flexibility to develop unique design themes for particular routes.
Central Okanagan Initiatives

Currently there are no supporting policies found in the Central Okanagan context.

Precedents/Best Practices

98 B-Line, Translink, Greater Vancouver (2002): The 98 B-Line stations are of a distinctive architectural design, creating easily recognizable icons for transit users and operators alike. This design creates a distinct identity for the route, as stations are identical along the route. Station platform areas are also demarcated with yellow tactile strips, similar to platform treatments at SkyTrain rapid transit stations.

LINKS: www.ibigroup.com; www.translink.bc.ca

98 B-Line Transit Shelter Design—easily recognizable and common design theme.
L 4.1 Public Spaces Adjacent to Transit Stations & Stops

Public spaces, such as village greens, squares and civic buildings, provide a public focus for TODs and existing transit-supportive areas. They are elements critical to the livability of higher density neighbourhoods and should reinforce commercial and residential uses by acting as neighbourhood meeting and recreation areas.

These public space elements should be located adjacent to transit stations and stops, within the core areas of TODs or established transit-supportive areas. These spaces will help to create vibrant, pedestrian-friendly core areas, yet active, mixed-use buildings must surround them and provide direct and safe connections to transit.

Actions

- Village greens should be between 0.5 to 1.5 hectares in size, animated with active and passive recreational opportunities and seating/meeting areas.
- Transit squares should be designed to be pedestrian-friendly, using appropriate paving materials, building height to square width ratios and active, narrow frontages (Guideline L 4.1).
- Squares should not exceed 20 metres in width. Lengths can certainly be longer.
- Village greens and squares should be lined by core area buildings, where possible, and provide direct access to transit.
- Civic/community-oriented buildings, including government offices, police stations, post offices, daycares, libraries and recreation centres should be located adjacent to greens and squares.
- Accentuate greens and squares with public art and water features.
- Define public space design guidelines in neighbourhood and urban design plans.

Garrison Woods, City of Calgary – Central Green

Outdoor public space – Commercial Drive SkyTrain Station, Vancouver.
Central Okanagan Initiatives

This Guideline, in terms of developing public spaces, is widely supported across the Central Okanagan by the Kelowna and Westside OCPs, the KDP, BNP design guidelines and the WTCSP. This plan in particular contains detailed policies regarding the development of a new public square within the town centre. However, it remains to be seen if this public space will be related to transit stops or exchanges.

Precedents/Best Practices

Cornell Community, City of Markham (1999): The first phase of the Cornell community was developed around a 1 hectare village green, located directly adjacent to a transit stop and lined on its eastern edge by a multi-storey, mixed-use building. The green is also surrounded by housing and contains a playground and ample lawn space. The green is a popular destination as a safe community ‘meeting place’, due to its recreational amenity, easy surveillance from surrounding uses and adjacent retail services including a café and a convenience store.

LINK: www.cornellvillage.ca

Cornell Village green and mixed-use neighbourhood centre (Source: Petroff Partnership Architects, 2004).
L 4.2 Encourage Mixed-Use Buildings

Mixed-use buildings contain a mix of residential, retail, service, office, studio and live/work uses under one roof. Mixed-use buildings can be located near transit stations and stops and within pedestrian-friendly, mixed-use areas of all scales. These buildings can be significant generators of pedestrian activity on streets, and provide the ‘eyes on the street’ surveillance necessary for safe pedestrian environments.

**Actions**

- Encourage retail and service commercial activities to locate on ground level floors of mixed-use buildings, allowing for necessary entry space for uses located on above floors.
- Ensure ground level building depths exceed 20 metres to ensure viability of retail activities.
- Office and residential uses should be located above ground level.
- Encourage pedestrian-friendly built form contexts for mixed-use buildings—streetfronting buildings/shallow setbacks (Guideline TL 4.1).

Example mixed-use building—elevation and section (Source: Calthorpe, 1993).

- Encourage mixed-use buildings in neighbourhood and urban design plans.
- Allow appropriate zoning for multi-storey mixed-use buildings in transit-supportive/TOD areas.
Central Okanagan Initiatives

Mixed-use buildings are supported by specific commercial zoning by-laws and within the Kelowna and Westside OCPs, along with the WTCSP and BNP.

Precedents / Best Practices

Newport Village TOD, City of Port Moody (1996): Newport Village is essentially a new mixed-use centre for the Port Moody’s new civic and arts precinct, providing a mix of commercial and institutional uses with higher density housing. The ‘main street’ is comprised of 3 to 4 storey mixed-use buildings directly fronting the street; retail services are offered at ground level, with walk-up apartments above. The presence of these buildings, set within an intimate, positive space, helps to create a vibrant pedestrian environment that has become a very popular destination.

LINK: www.bosadev.com
L 4.3 Provide Architectural Variety

The built form of transit-supportive and TOD areas are defined by common elements, such as minimum setbacks, higher density FSRs and maximum frontages. The architectural characteristics of buildings and their façades, street furniture and building materials should also speak a common language—yet within this language architectural variety should be pursued. This will not only create more interesting streetscapes for pedestrians, it also provides for architectural expression—a critical element of public life and its spaces.

Actions

• Building designs should provide as much visual stimulus as possible and exhibit unique character, yet should not present a radical departure from surrounding built form or façade.

• Develop an architectural theme for districts within transit-supportive areas, through the use of common façade treatments, entry features, signage, materials, colors and street furniture style.

• Discourage the use of corporate signage that is out of scale with existing or planned themes.

• Encourage LEED®-certified (Leadership in Environmental & Energy Design) building designs.

• Architectural variety, along with architectural theming, can be defined through neighbourhood and local urban design plans.

Consistent signage promotes an identifiable theme and variety within this theme. Common façade elements create unified and identifiable streetscapes.
Central Okanagan Initiatives

The development of architectural themes and policies prescribing the limits of variation within these themes, are included in the Kelowna and Westside OCPs. More detailed policies are found in the KDP, WTCSP, the BNP and the BNP design guidelines.

Precedents/Best Practices

**Jackson-Taylor Revitalization Strategy, City of San Jose, San Francisco Region (1993):** This strategy called for the TOD-based redevelopment of an industrial property located on a new BART extension, involving new mixed-use buildings and a range of housing types. The architectural theme and façade details of these housing types, including single detached homes and walk-up apartments, are defined in the strategy document. This definition allows for architectural variety within the project, yet contains this variety within a theme that respects the built form and architectural detailing present in the adjacent neighbourhoods.

LINK: [www.calthorpe.com](http://www.calthorpe.com)

Appendix: TOD Characteristics Checklist

This TOD Characteristics Checklist provides a brief yet detailed overview of specific elements of TOD, as distilled from the preceding series of Guidelines. This checklist can be utilized either as a design and planning template for new TOD, or as a useful 'yardstick' to evaluate the transit-supportiveness of existing cityscapes and neighbourhoods.

Primary

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Detail</th>
</tr>
</thead>
</table>
| **Interconnected Streets** | – Street system based on grid layout, converging at centre of TOD.  
– Maximum street spacings: 200 metres apart.  
– Avoid curvilinear streets and cul-de-sacs.  
– Use alleys for garage/service access, where appropriate. |
| **Compact Development** | – Minimum average residential density: 17 dwelling units per hectare.  
– Preferred average residential density: 37 dwelling units per hectare. |
| **Mixed Land Uses** | – TODs should contain 20 to 80 percent residential uses, 20 to 70 percent commercial and employment uses and 5 to 15 percent public uses (civic or recreational).  
– Allow for a mix of housing types, including single detached homes, townhouses and apartments.  
– Locate schools at the edges of TODs. |
| **Pedestrian-Friendliness** | – Sidewalks and trails should be continuous throughout TODs.  
– Minimum sidewalk and trail widths: 1.5 metres.  
– Preferred sidewalk widths: residential – 1.5 metres; low-intensity commercial – 3 metres; high-intensity commercial – 5 metres.  
– Crosswalks: raised; different paving materials; use with intersection ‘bulb-outs’ and median refuges (see Narrow & Calmed Streets).  
– Integrate CPTED into TOD design. |
| **Natural Open Space** | – Conserve and integrate natural areas, such as open space amenities, into TOD design for active and passive recreational use.  
– Consider Low Impact Development (LID) practices, such as alternative stormwater management, to reduce development impacts to natural open space.  
– Respect natural habitat; provide buffer zones. |
| **Public Realm/Public Buildings** | – Provide village greens, 0.5 to 1 hectare in size, or squares with a maximum width of 20 metres adjacent to transit stations.  
– Integrate greens and squares into TOD commercial centres/corridors.  
– Locate public buildings adjacent to greens and squares.  
– Accenuate greens, squares and streets with public art, water features and terminating vistas. |
| **Commercial Core** | – Concentrate trip generating land uses in commercial ‘core areas’ adjacent to transit stations.  
– Core areas should occupy at least 10 percent of total TOD area.  
– Locate a minimum of 1,000 square metres of retail space adjacent to transit stations.  
– Combine retail with high-density residential and employment uses in core areas. |
| **Transit Station** | – Locate at centre of TOD.  
– Multimodal capability: Kiss-and-Ride, Park-and-Ride and bus transfer facilities, bike storage, direct pedestrian connections to TOD core and residential areas.  
– Design station to provide for all users; provide weather protection. |
### Secondary

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Smaller City Blocks</strong></td>
<td>- Blocks should not be longer than 200 metres.</td>
</tr>
<tr>
<td></td>
<td>- Provide mid-block pedestrian crossings for blocks over 200 metres long.</td>
</tr>
<tr>
<td></td>
<td>- Preferred block depths: 60 to 75 metres.</td>
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<tr>
<td><strong>Mixed-Use Buildings</strong></td>
<td>- Allow retail and service commercial activities to locate on ground-level floors of multi-storey buildings.</td>
</tr>
<tr>
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<td>- Buildings should have narrow storefronts; typical width ~10 metres, with a minimum transparent area of 40 percent in the storefront façade.</td>
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<tr>
<td><strong>Architectural Variety</strong></td>
<td>- Building designs should exhibit unique character, yet not radically depart from surrounding built form or façade.</td>
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<td>- Develop a common architectural theme: common façade or fenestration treatments, entry features, signage, materials, colors and furniture style.</td>
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<td>- Encourage LEED®-certified (Leadership in Environmental &amp; Energy Design) building designs.</td>
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<tr>
<td><strong>Narrow &amp; Calmed Streets</strong></td>
<td>- Design streets to be narrow: 3 metre-wide travel lanes; 2.5 metre-wide parking lanes.</td>
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<tr>
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<td>- Alleys should be 5 to 6 metres wide.</td>
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<td>- Use traffic calming measures to slow speeds: speed bumps, speed tables, raised intersections and crosswalks, traffic circles, on-the-street parking and narrowed or ‘bulb-out’ intersections.</td>
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<tr>
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<td>- Use traffic calming measures to reduce traffic volumes: full street closures, half street closures and diagonal diverters.</td>
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<tr>
<td><strong>Street Facing Buildings</strong></td>
<td>- Use building height (streetwall) to street width ratios of 3 to 1 through 1 to 3 to create positive pedestrian spaces in higher-density, mixed-use contexts such as downtowns, commercial centres and TOD cores.</td>
</tr>
<tr>
<td></td>
<td>- Ensure buildings directly front streets in mixed-use cores and around transit stops, via zero or shallow setbacks (0 to 3 metres) from the street right-of-way; setbacks from streets should reflect appropriate sidewalk widths.</td>
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<td>- Setbacks in residential areas should range from 2.5 metres to 6 metres from the street right-of-way. Shallow setbacks (2.5 to 4.0 metres) should be used for streetfronting apartments and lane-served townhouses and single detached dwellings.</td>
</tr>
<tr>
<td></td>
<td>- Avoid ratios below 1 to 6. This will result in negative spaces.</td>
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<tr>
<td></td>
<td>- Use street trees or objects to frame streets where there is poor or no spatial definition, or significant gaps in the streetwall.</td>
</tr>
<tr>
<td><strong>Reduced Parking Standards</strong></td>
<td>- Parking requirements should follow these ranges (spaces per 100 square metres): Office – 2 to 4; Retail – 3 to 5; Light Industrial – 1 to 3.</td>
</tr>
<tr>
<td></td>
<td>- Retail, office and entertainment uses can share parking capacity.</td>
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<td>- Allow on-the-street parking.</td>
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<td>- Limit the size of surface parking lots, and locate behind buildings and landscaping, where possible.</td>
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<tr>
<td><strong>Bicycle-Friendly Streets &amp; Bicycle Storage</strong></td>
<td>- Bicycle routes should converge on transit stations and commercial core areas, radiate out into low-density residential areas and connect to other TODs.</td>
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<td>- Designate bikeways on streets or trails designed for either exclusive or ‘shared’ use with motor vehicles.</td>
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<td>- Provide bicycle parking for ‘bike-and-ride’ commuters at transit stations, typically 10 to 20 bicycle lockers.</td>
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<td>- Provide bike racks for shopping, school and recreational destinations within TODs.</td>
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<td><strong>Market Acceptance</strong></td>
<td>- TOD design, whether in greenfield or infill contexts, should reflect local built form, historical, cultural and natural contexts.</td>
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<td>- In established neighbourhood contexts, use sensitive density integration tactics that reflect local built form and housing typologies.</td>
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</table>
Characteristic Detail

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– Provide mid-block pedestrian crossings for blocks over 200 metres long.

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  - Office – 2 to 4; Retail – 3 to 5; Light Industrial – 1 to 3.
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market acceptance
– TOD design, whether in greenfield or infill contexts, should reflect local built form, historical, cultural and natural contexts.
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IBI Group is a multi-disciplinary consulting organization offering services in four areas of practice: **Urban Land, Facilities, Transportation and Systems.**

We provide services from offices located strategically across the United States, Canada, Europe, the Middle East and Asia.