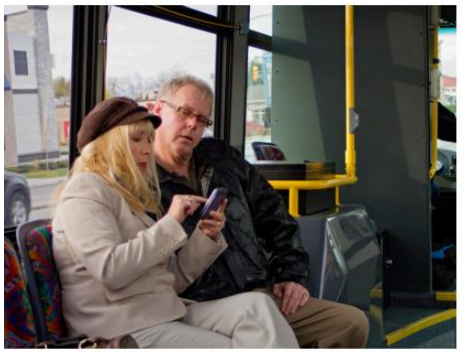
TRANSIT future
actionplan

Transit Service Guidelines

Central Okanagan Region



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INTRODUCTION

What are Transit Service Guidelines?

As part of the ongoing management of the conventional transit network, Transit Service Guidelines contain useful tools to facilitate service planning decisions and to measure how well the transit system is progressing towards achieving its goals. There are three key components to the Central Okanagan Region's Transit Service Guidelines.

Design Guidelines

The design guidelines identify the broad characteristics of effective transit service and infrastructure design. Since effective transit service design is often context dependent, these service design guidelines have been separated into core and coverage areas.

Service Standards

Service standards identify the recommended minimum service levels for transit services by service layer and the minimum characteristics for considering transit service expansion to new areas.

Performance Guidelines

Performance guidelines identify transit service performance targets for the Kelowna Regional Transit System. These guidelines include system-wide performance targets as well as route-specific targets separated by service layer.

Purpose

As part of the ongoing management of the transit network, the Transit Service Guidelines have been developed as a tool to help make service planning decisions and measure how well a transit system is progressing towards achieving its vision, goals and targets in the Central Okanagan. The information summarized in this document is intended to be revisited and updated over time based on the evolving conditions, expectations and performance of the transit system.

This document is meant to achieve the following purposes:

1. To ensure resources are used effectively and that an acceptable level of service quality is provided to the customer
2. Along with the Transit Future Plan, to provide a consistent and fair approach for guiding investments in existing and new transit services

This is one of the tools that will be used by BC Transit, the local partners, and the Operating Companies to guide the allocation of resources for transit services. In combination with the strategic objectives and policies of BC Transit and the local partners, these guidelines will be used to assess and improve existing transit services and to determine the feasibility of new transit services.

These Transit Service Guidelines build upon the basic performance standards included within the Central Okanagan Transit Future Plan. These guidelines were developed to better enable the Kelowna Regional Transit System to meet the goals outlined in the 2012 Central Okanagan Transit Future Plan including:

- Attracting new riders
- Delivering operational excellence
- Improving transit sustainability

Further, these Transit Service Guidelines were developed with the following key principles and themes:

- Moving people more efficiently
- Enable access for all
- Connecting urban centres

Although all three of these themes are important, they are often in conflict with one another. Transit Service Guidelines can help public officials make informed, transparent, and consistent decisions about how best to allocate resources when faced with trade-offs between objectives.

PUBLIC ENGAGEMENT

The development of the Transit Service Guidelines was highly collaborative and included BC Transit, the Central Okanagan District, the local governments of the City of Kelowna, District of Lake Country, City of West Kelowna, Westbank First Nation and the District of Peachland, transit system staff, the public, and representatives from a wide array of stakeholder organizations.

The Transit Service Guidelines engagement process was combined with the Transit Future Action Plan project, and the process was designed to reach riders and non-riders alike. Members of the public were engaged in the process to ensure that the final Transit Service Guidelines reflect the needs and priorities of the community.

A summary of the key findings from the public engagement process are included in the Transit Future Action Plan Phase 2 Engagement Summary Report.

DESIGN GUIDELINES

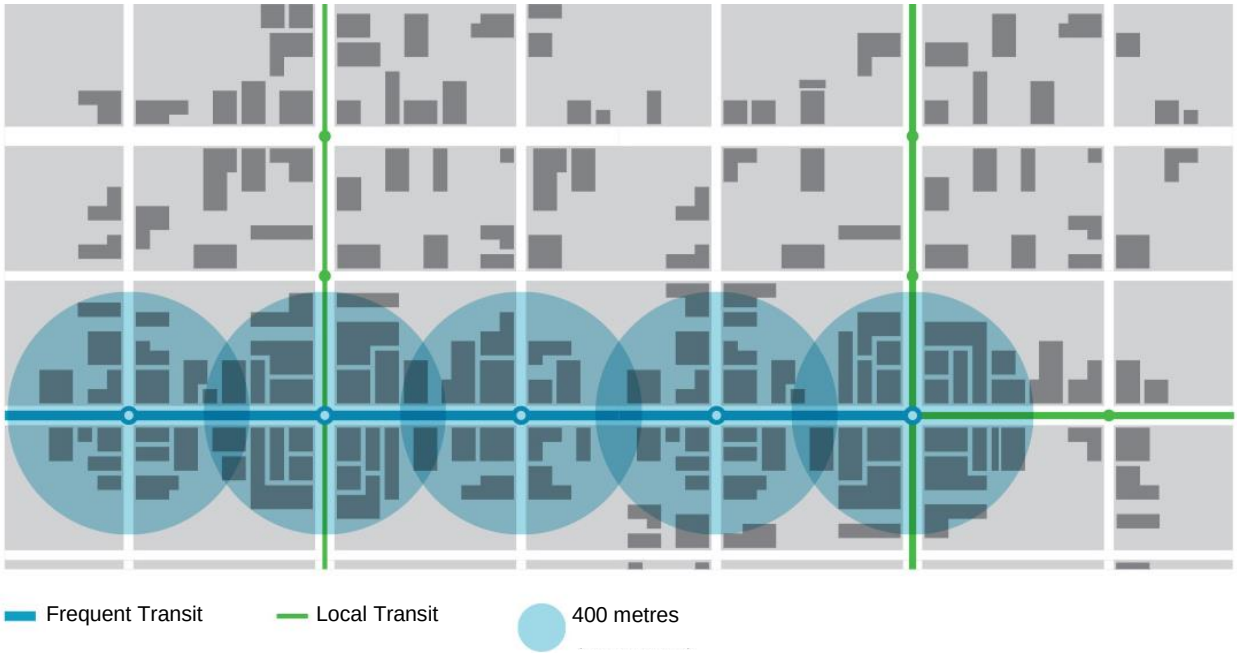
These service design guidelines provide broad design considerations for developing effective transit services and within the Central Okanagan Region. Although certain transit service design considerations can be applied within any context, other design considerations are most effective within specific contexts shaped by surrounding land uses, density, and road network design; consequently, aspects of the service design guidelines have been categorized into Core and Coverage areas.

Service Design Guidelines

Integrated Land Use and Transportation Planning Principles

There is a strong relationship between transit and land use. Transit-supportive land use is critical for the success of the transit system and, conversely, transit (especially fixed-corridor, high-quality transit service) can help to attract and support higher-density, mixed-use development. Therefore, land use planning and transportation must be integrated in order to best serve people, as illustrated in *Figure 3*.

Figure 3: Transportation Planning and Land Use Integration



For example, higher-density developments can better support transit because a greater number of potential transit users are located within walking distance of a transit stop, thus maximizing the potential transit customer base and leading to increased ridership. A transit stop in an area with a density of 1000 people per square kilometer[1] would have approximately 500 potential customers within a 400-

[1] Characterized by a low-density neighbourhood of detached single-family residences

metre walking distance, while a transit stop in an area with a density of 5,000 people per square kilometer[2] would have approximately 2,500 potential customers within a 400-metre walking distance.

Some examples of how integrated land use and transportation planning can be achieved in the Central Okanagan region include:

- **Ensure new residential development in the region, especially in the Transit Core, is medium- to high-density infill development, in order to be able to serve more people with transit more efficiently.**
- **Develop non-residential density**: Employment and other non-residential destinations can be much more efficiently served by transit when they are located together, particularly for the Transit Core.
- **Develop mixed-use sites**: Combining people and amenities, especially in medium- and high density developments, will enable efficient access by preferred modes of transportation like transit, walking, and cycling. Providing transit access to and from these concentrated areas can reduce single-occupancy vehicle dependence in the Central Okanagan region.

Core and Coverage Areas

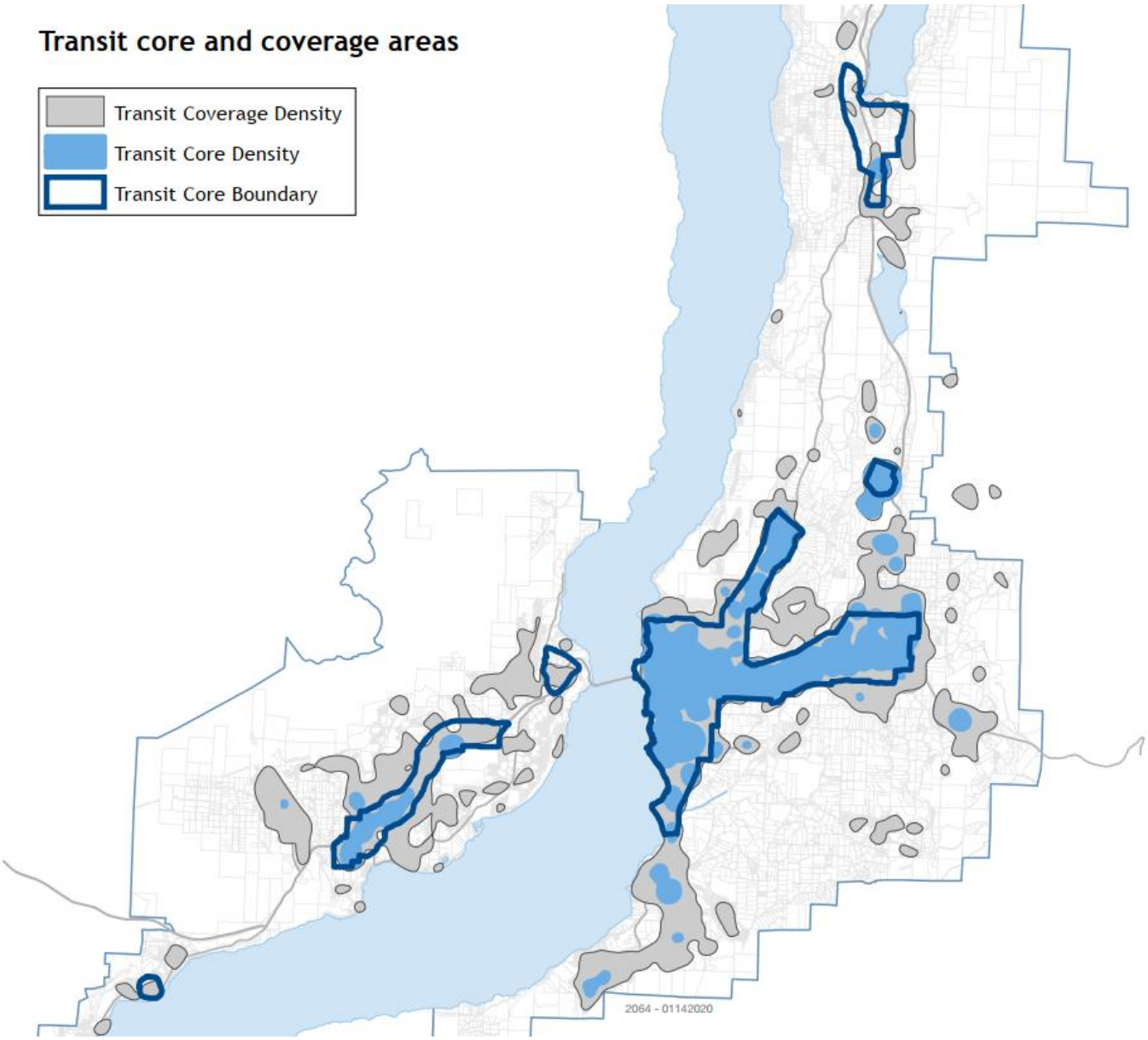
Effective transit service design depends on the context of the community they operate within. Some of these contextual factors include the surrounding land uses and density. For that reason, the service design guidelines have been separated into Core and Coverage areas (Figure 1).

- **Transit Core Area:** These are areas of the region where transit is most efficient, competitive, and sustainable. The Transit Core is defined as contiguous areas with concentrations of activity above 3,000 residents and jobs per square kilometer, which is high enough to support more frequent transit service throughout the day. The Transit Core areas are primarily served by the Rapid Transit and Frequent Transit Networks. That being said, for accessibility reasons, local nodes or lower density corridors within the Core Area could still be served by the Local Transit Network.

- **Transit Coverage Area:** These are areas outside the Transit Core which are unlikely to generate high ridership but where some level of service may be warranted to connect riders to the core or provide basic mobility for residents who depend on transit. For planning purposes, potential coverage areas are defined as contiguous areas outside of the Transit Core with concentrations of activity above 1,000 residents and jobs per square kilometer, which is BC Transit's minimum threshold for recommending fixed-route transit service. Additionally, these coverage areas should have road and pedestrian infrastructure that enables safe access and efficient operation of any proposed transit service. The Transit Coverage area is primarily served by the Local Transit Network and Targeted Services.

[2] Characterized by a medium-density neighbourhood with a mix of low-rise and medium-rise apartments

Figure 1 – Transit Core and Coverage Areas in the Central Okanagan[3]



[3]The Transit Core and Coverage Areas map was originally produced for the Central Okanagan Transit Future Action Plan, and through that process, the Transit Core Boundary was developed. The Transit Core Boundary was developed around areas meeting the Transit Core density threshold, but modified slightly to account for existing service levels and to ensure it accommodated a large enough contiguous area and reflected areas of the community in which development was being focused. This revised map shows the original Transit Core Boundary along with an update of the areas meeting the density thresholds for Core and Coverage based on the recent development context within the Kelowna Region (2020 data for City of Kelowna and 2016 Census data for the regions outside City of Kelowna).

Guiding Principles for Core Transit Network Design

- Routes should be direct, consistent, and easy to remember. This improves the speed and efficiency of them as well as making customer wayfinding easier.
- Routes should have strong ‘anchors’ or centres of activity at both ends. This can help balance ridership in each direction and reduce the amount of buses operating with limited passengers.
- Service should be bi-directional, with large one-way loops being avoided wherever possible. Deviations from corridors shorter than 200 meters are also discouraged.
- Routes should be designed to a grid pattern where the street network allows. Grids increase the connectivity of the transit network and make it easier to access all destinations, not just a central hub.
- Routes should connect residents to centralized amenities within a neighborhood or community, and transit trips between neighborhood centres should be transit-accessible by no more than one transfer.

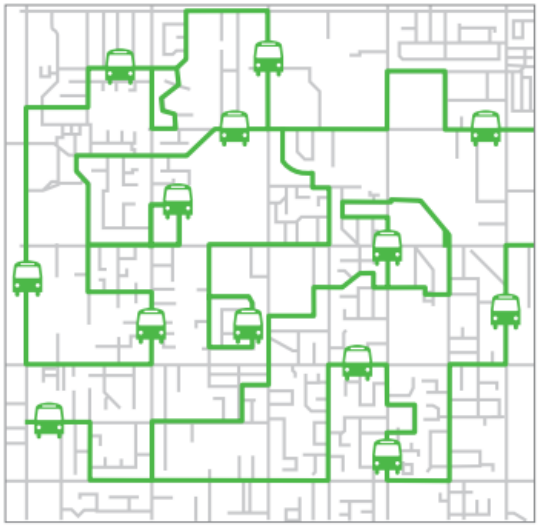
Guiding Principles for Coverage Transit Network Design

- Routes should be reasonably direct, remaining on arterial and collector streets and avoiding local streets, cul-de-sacs and parking lots wherever possible.
- Routes should be as direct, consistent, and easy to remember as possible. This improves the speed and efficiency of them as well as making customer wayfinding easier.
- Routes should attempt to connect to centres of activity. This can help increase ridership on the service.
- Routes should connect directly into the Core Transit Area to provide access to the frequent or rapid transit network.

Guiding Principles for Regional and Interregional Transit Network Design

- Routes should be direct, consistent, and easy to remember. This improves the speed and efficiency of them as well as making customer wayfinding easier
- Routes should have strong ‘anchors’ or centres of activity at both ends. This can help balance ridership in each direction and reduce the amount of buses operating with limited passengers.
- Routes should connect directly into the Core Transit Area to provide access to the frequent or rapid transit network.
- Routes should have limited bus stops, with stops placed at key, accessible locations to facilitate connections to the broader transit network.

Infrequent, Coverage Service



Frequent, Direct Service

On-Time Performance Principles

Transit schedules should provide the most reliable service possible. In the event that service is consistently unreliable, one of the following measures should be undertaken to address the issue:

- The best strategy to deal with on-time performance issues is to schedule running times that are reflective of actual operating conditions. This means that schedules should be built in consideration of known delays. Additional strategies include:
    - Regular system monitoring to enforce balanced and consistent intervals between trips
    - Additional on-street supervision to monitor transit schedules
    - The coordination of passenger loads to avoid poor departure spacing of buses and overcrowding.
    - When all-mode traffic volumes warrant it, the implementation of traffic signal priority and transit-only lanes or queue jump lanes at congested intersections can also help to reduce the variability in running times and balance headways to reduce the occurrence of bunches and gaps in service.
- The recovery time is a planned time allowance between the arrival time of a just-completed trip and the departure time of the next trip in order to allow the route to return to schedule if traffic, loading or other conditions have made the trip arrive late. Recovery time is a concept that is included in all transit scheduling and, on average, best practice is to include approximately 12-15% recovery time across a whole transit system.

Infrastructure Design Guidelines

Design principles for transit facilities should conform to the BC Transit Infrastructure and Design Guidelines, as well as the federal and provincial guidelines for transportation and transit infrastructure. Guidance in this section is condensed from that detailed within the BC Transit Infrastructure Design Guidelines which should be reference for more complete information.

Bus Stops

Bus stops and facilities for waiting passengers should include a hard-surfaced landing/waiting area and be universally accessible in urban areas. In rural areas, universal bus accessibility should be based on request. Local governments are responsible for continuous improvement of on-street passenger facilities, including the provision of bus benches, shelters, lighting, waste receptacles, and route/schedule information where warranted.

- Bus stops should be located in areas that are safe to board and alight passengers – ideally near intersections to minimize walking distances to transit. Bus stops should be convenient to major activity centres and transfers to other forms of transportation. Bus stop should be located on the far-side of intersections where feasible, with mid-block stops at key centres of activity. Far-side bus stops help with service reliability and safety, as fewer pedestrians are likely to cross in front of the bus. Near-side bus stops may be considered where high transfer volumes to and intersecting bus route that services a far-side stop on the cross street occur.
- Direct pedestrian and cycling connections should be provided to bus stops via sidewalks, pathways and crosswalks, with curb ramps and barrier-free access.
- Bus stops should be located on the far side of crosswalks, or at least 20m in advance of a crosswalk.
- Adequate sight distances should be achieved for motorists approaching the bus stop as well as transit passengers crossing the road from the bus stop. Passenger amenities at transit stops can enhance the quality of service for customers and can also have a significant impact on attracting new users.
- Bus stop should be located to minimize duplication of coverage along routes. Placing stops further apart increases the speed and reliability of transit service as well as reduces maintenance costs. While the initial walk to the bus stop may be slightly longer, the net result is a service which is quicker for everyone.
- All bus stops should be universally accessible, with additional amenities such as shelters, seating, and bicycle storage provided according to passenger volumes.
- Where possible, transit routes and bus stops should be generally within:
  - 400m walking distance of 90% of the residences
  - 250m of all medium and high-density residential developments
  - 250-300m for stops on a route with greater than 10% grade
  - 150m walking distance of all designated senior's residences and major institutional facilities (e.g. trip-generating educational, healthcare and religious developments)

Bus Stop Spacing

Transit stops should be spaced along a corridor at an appropriate interval. In urban areas, this is typically between 300m - 400m. Transit stops that are spaced too closely together lead to slower transit trips and higher transit stop maintenance costs, while stops that are too far apart limit passenger access to the system. Outside the urbanized area, bus stops should be limited to major activity centres and trip generators such as residential concentrations. Bus stop intervals should be limited on select type of service. Table 1 provides the appropriate standard for each service type.

Table 1 - **Service Type and Appropriate Stop Intervals**

Service	Stop Interval
Rapid Transit	• Limited stops at key locations. Stops are typically spaced 800m to 2km apart. • Ideally, Rapid Transit stops should meet a minimum node density of 5,000 activity units within a 400m buffer.
Frequent Transit (Transit Core Area)	Frequent stops along a corridor, 300-500 meters apart.
Local Transit (Transit Coverage Area)	Frequent stops along a corridor, 250-300 meters apart. Gradient > 10%, 250-300 meters apart.

Transit Shelters

Transit shelters can improve the customer experience and overall visibility and perception of the transit system. Shelter are however not warranted at all bus stops and consideration must be given to the cost to provide and maintain them

A transit shelter may be considered for installation at stops when any of the following criteria are met:

- The bus stop experiences a high volume of boardings
- The bus stop is a major connection point to other modes of transportation
- The bus stop is exposed to regular inclement weather
- The installation of a transit shelter could encourage increased ridership

Transit Exchanges and Park & Rides

Transit exchanges are typically located within the activity centres of the community in order to maximize transit accessibility, efficiency and visibility. When properly planned and designed, transit exchanges can become effective multi-modal exchanges and pedestrian-oriented sites. Transit exchanges should include weather protection, seating, transit route and schedule information, bicycle parking and other amenities as shown in the passenger amenities section below.

Park & Ride sites should be located in suburban and semi-rural areas to provide residents who live in areas with limited or no transit service an access point to higher-quality transit services. Below, the basic functional requirements for transit exchanges and Park & Ride facilities are described:

Site requirements:

- Sites with no significant safety concerns, which provide for direct and safe pedestrian access, and which minimize the interaction between buses and general traffic on adjacent roads;
- Sites that can be accessed safely and efficiently, avoiding traffic congestion and queuing;
- Sites that provide high visibility to pedestrians, motorists and others, minimizing personal safety concerns for transit passengers using the terminals in evenings and at other off-peak times; and
- The sites must be located to minimize additional transit routing and costs.

Physical requirements

- As a minimum, all platforms should be built to accommodate standard 12m buses.
- All corridors that operate high capacity buses (e.g. double-deckers, articulated buses) should enable prescribed overhead and horizontal clearances.
- Buses must be able to arrive and depart from platforms independently.
- Passenger facilities should include:
  - Passenger amenities, including weather protection, seating, illumination, and bicycle storage
  - Universal Accessibility to all areas of the facility
  - Wayfinding signage and information
- Transit terminals should also incorporate Transit Operator washrooms.
- In addition, Park & Ride sites should include parking for automobiles, bicycles and bus stops for transit access.

Transit Priority Measures

Fast, frequent, and reliable transit service grows ridership, but slow, infrequent, and inconsistent service discourages ridership. In mixed traffic, transit is limited by the prevailing traffic conditions and will be delayed by any factors that delay all other traffic. Within these operating conditions, transit priority measures are often required for transit to avoid delays and operate more reliably.

Transit has the highest capacity for moving people in a constrained space and when prioritized, has the potential to stem the growth of vehicle congestion and ultimately upgrade the performance of limited street space. This in turn reduces public infrastructure expenses while aiding in controlling transit operating costs.

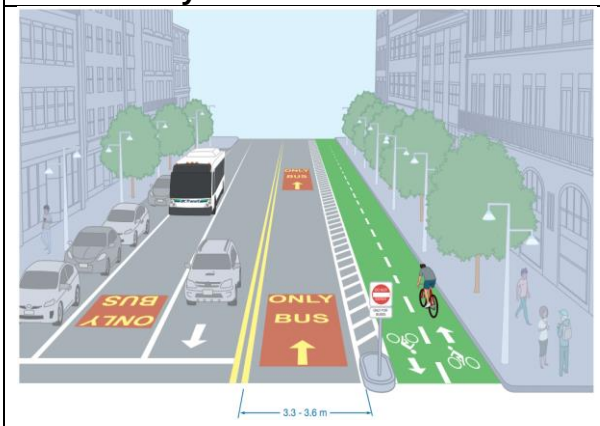
Transit priority is a term used to refer to a variety of physical and operational improvements designed to give transit vehicles and their passengers varying degrees of priority over general vehicle traffic. Transit priority measures can be:

- Regulatory, such as “Yield to the Bus” regulations and signage;
- Operational, such as retiming traffic signals to respect observed transit travel times on the corridor and the large number of passengers on transit vehicles comparted to private vehicles; and
- Physical, such as exclusive transit ways, intersection queue-jumpers, bus bulges, and transit signal priority measures.

Table 2 – Transit Priority Measures

Signal Priority Measures
 Transit signal priority can include active and passive measures to improve transit reliability and reduce travel times. Transit signal priority (TSP) consists of various forms of active priority measures that modify traffic signal timing or phasing when transit vehicles are present. TSP can be structured conditionally or unconditionally. Conditional TSP grants priority when buses meet certain conditions including running late or carrying large passenger loads. Unconditional TSP grants priority to all buses regardless of operating conditions. TSP is most effectively applied to intersections where signals are a major source of delay, whether due to signal phase lengths or traffic volumes. For TSP to work, transit vehicles must be able to reach the signal by making use of a dedicated lane or an otherwise clear travel lane with managed traffic volumes. A passive transit priority strategy includes transit signal progression. Transit signal progression is a pre-timed or passive transit signal approach which sets signal progressions to realistic travel speeds for transit operating on the corridor. It is applied on streets with high volumes of transit vehicles that operate in mixed traffic or dedicated transit lanes.

Lane Priority Measures



Transit lanes delineate space within the roadway as exclusive, either full-or part-time and are designated by signs and markings sometimes permitting limited use by other vehicles. They are applicable on corridors with moderate to high transit volumes where buses are delayed by congestion or curbside activities.

Transitways physically separate a portion of the street for exclusive use by transit at all times. Corridors with consistently low transit travel speeds and high transit volume are candidates for transitways facilitating creation of an open Bus Rapid Transit system.

Lane priority measures are combined with transit signal priority measures which together contribute significantly to reliable, attractive transit service.

Queue-Jumper Lanes at Key Areas of Congestion

Queue jump lanes combine short dedicated transit facilities with a dedicated transit signal or signal priority to allow buses to easily enter traffic flow in a priority position. They can be applied at intersections with near-side, far-side or without bus stops.

Queue jump lanes are applied on signalized streets with low or moderately frequent bus routes on corridors with high peak hour traffic volumes but relatively low right turn movements. On corridors with greater transit frequencies and high passenger volumes, lane priority measures in conjunction with signal priority should be considered.

Determining the most appropriate transit priority measures for a problem intersection requires careful consideration and analysis of all modes that utilize the right of way.

Since the Transit Future Plan, the Central Okanagan region implemented its first transit priority measures as part of the RapidBus project. The priority measures are in place in both Kelowna and West Kelowna and include signal priority along Highway 97 between Elliott Road and Edwards Road, and a 2+ High Occupancy Vehicle lane along Highway 97 initially between Hwy 33 and Pandosy and extending to Sexmith Road in 2018. Given the anticipated increase in traffic volumes and congestion, additional transit priority measures will be needed to maintain or improve operating speeds, which will keep cost down and help to improve ridership. The type of priority measure implemented should match the particular needs of the intersection or corridor.

Since the Transit Future Plan, the following additional transit priority measures have been established within the Kelowna Regional Transit System:

- Two queue jump lanes are in place at intersections along Lakeshore Road in Kelowna today aiding buses serving near-side stops at these locations to bypass queued vehicles when departing the stops.
- Throughout the City of Kelowna, transit signal priority equipment is in place at many signalized intersections, and this equipment is controlled through a Central Management System used by both emergency services and transit vehicles.
- Today, a significant portion of the vehicles in the conventional fleet are outfitted with TSP equipment.

Table 3 below outlines some standards for prioritizing future transit priority measures within the Kelowna Regional Transit System.

Table 3 – Transit Service Type and Transit Priority Measure Standards

Service Type	Priority	Standards
Rapid Transit	Operational	Transit is given signal priority along the full corridor at intersections, particularly buses running late or carrying large passenger loads.
	Physical	Transit lanes in areas of significant congestion or when there are a significant number of well-utilized buses operating along a corridor. Queue-jumper lanes at key areas of congestion.
Frequent Transit	Operational	Transit signals are optimized to benefit transit Transit is given signal priority in areas of congestion or when there are a significant number of well-utilized buses along a corridor.
	Physical	Queue-jumper lanes at key areas of congestion. Consideration for transit lanes in areas of significant congestion or where a significant number of well utilized buses operate along a corridor.
Local Transit	Operational	Transit signals are optimized to benefit transit is given signal priority at key delay points.
	Physical	Not required.

SERVICE STANDARDS

Service standards define minimum levels of transit service desired to meet community needs. They are specific to a particular transit system and the communities it serves. Service standards can apply to existing services or to identify when service should be considered for new areas.

A key benefit of transit service guidelines is that they guide local governments and BC Transit staff in determining and managing community expectations regarding the level of transit service to be provided. They also inform decisions regarding system design such as whether to provide new service or increase or decrease existing service. They can also be helpful for existing customers and residents to better understand the decision-making process for the transit system.

Service standards should be considered within the context of performance guidelines to help prioritize improvements throughout the system.

Standards for Existing Service

Service standards for existing service can include a number of factors including service span, frequency, bus stop spacing, and walking distance to bus stops. The Central Okanagan Region's transit service standards have been broken down according to the four layers of service defined within the Transit Future Plan.

Primary Network
Rapid Transit Network (RTN)
RTN service is designed to move high volumes of passengers between major regional destinations along key transportation corridors. The level of investment in RTN infrastructure, technology, vehicles and service levels combine to significantly increase system performance. RTN services utilize an exclusive or semi-exclusive right-of-way with limited stop service.
Frequent Transit Network (FTN)
The FTN provides key corridors with a convenient, reliable and frequent transit service. The FTN will carry a large share of the transit system's total ridership and for this reason justifies capital investments in transit priority, a high level of transit stop amenities and corridor branding.
Secondary Network
Local Transit Network (LTN)
The LTN is designed to connect neighborhoods to local destinations and to the RTN and FTN.
Targeted Services
Targeted Services are a collection of transit services which include handyDART, regional, express, and rural transit services (including flex-route, dial-a-bus, and demand-responsive services).

Service Span

This section defines the existing, medium-term, and the long-term Transit Future Plan service span targets by service type (Table 4). Service span extensions, particularly those beyond these standards, should be considered when productivity of the first or last hour of service is greater than the average for that route.

Table 4 - Service Span Standards

Service Type	Period	Existing	Medium-term	Long-term
Rapid Transit Network	Weekday	5:30am – 1:00am	5:00am – 1:00am	5:00am – 1:00am
	Saturday	7:00am – 2:30am	6:00am – 2:30am	5:00am – 2:30am
	Sunday	7:30am – 11:00pm	6:30am – 12:00am	5:00am – 1:00am
Frequent Transit Network	Weekday	6:00am – 11:00pm	5:00am – 1:00am	5:00am – 1:00am
	Saturday	7:30am – 1:00am	6:00am – 1:00am	5:00am – 1:00am
	Sunday	8:00am – 10:30pm	6:30am – 12:00am	5:00am – 1:00am
Local Transit Network (Ridership)	Weekday	Based on demand	7:00am – 9:00pm	6:00am – 12:00am
	Saturday	Based on demand	7:00am – 9:00pm	7:00am – 12:00am
	Sunday	Based on demand	8:00am – 8:00pm	8:00am – 8:00pm
Local Transit Network (Coverage)	Weekday	Based on demand	7:00am – 8:00pm	6:00am – 9:00pm
	Saturday	Based on demand	Based on demand	Based on demand
	Sunday	Based on demand	Based on demand	Based on demand

Service Frequency

This section defines the minimum suggested route frequency targets by service type, subject to meeting performance standards (Table 5). Investments to increase service frequencies beyond these minimum standards should be considered when required to alleviate identified passenger load issues, when route performance indicates the route is performing 25 per cent above the target for the routes class, or to strategically develop the network.

Table 5 - Service Frequency Standards

Service Type	Period	Existing (Peak Service)	Medium-term (Peak Service)	Long-term (Peak Service)
Rapid Transit Route	Weekday	15 minute	10 minute	10 minute
	Saturday	30 minute	15 minute	15 minute
	Sunday	30 minute	30 minute	15 minute
Frequent Transit Route	Weekday	15 minute	15 minute	10 minute
	Saturday	15 minute	15 minute	15 minute
	Sunday	30 minute	30 minute	15 minute
Local Transit Route (Ridership)	Weekday	Varies	30 minute	30 minute
	Saturday	Varies	Based on Demand	30 minute
	Sunday	Varies	Based on Demand	30 minute
Local Transit Network (Coverage)	Weekday	Varies	60 minute	30-60 minute
	Saturday	Varies	Based on Demand	60 minute
	Sunday	Varies	Based on Demand	60 minute

Introducing Service to New Areas

Effective transit service depends largely on the land uses and density of the communities it serves. These service standards identify when it makes sense to provide a new transit service and what type of service is appropriate given the characteristics of the community it is serving.

When considering transit service expansion to newly developed areas, certain minimum density targets should be met to ensure that the proposed service has a reasonable likelihood of meeting the minimum performance guidelines for effective service (Table 6, Figure 2). Other factors can also influence potential ridership, so these minimum density targets should be considered within the context of other factors including local demographics, topography, road network characteristics, and the location of the proposed service area in relation to the broader network.

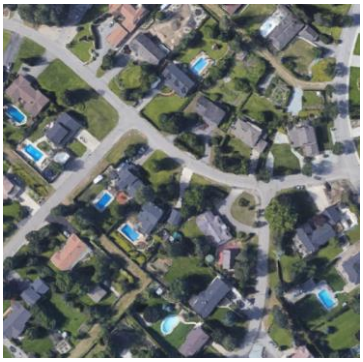
The minimum density targets in this table can also help inform when new types of service could be considered for an area that is already served by transit. For example, these average corridor density thresholds can help rationalize transitioning a local route to a frequent route or layering a limited-stop, rapid route over an existing frequent route.

Table 6 - Service Expansion Guidelines[4]

Service Type	Average Corridor Density[5] (Activity Units / km^2)
Rapid Transit Route	5,000
Frequent Transit Route	4,000
Local Transit Route (Ridership)	2,000
Local Transit Route (Coverage)[6]	1,000 - 1,500

Figure 2 – Examples of Average Corridor Density

Local Transit Route Corridor Density



Frequent or Rapid Transit Route Corridor Density

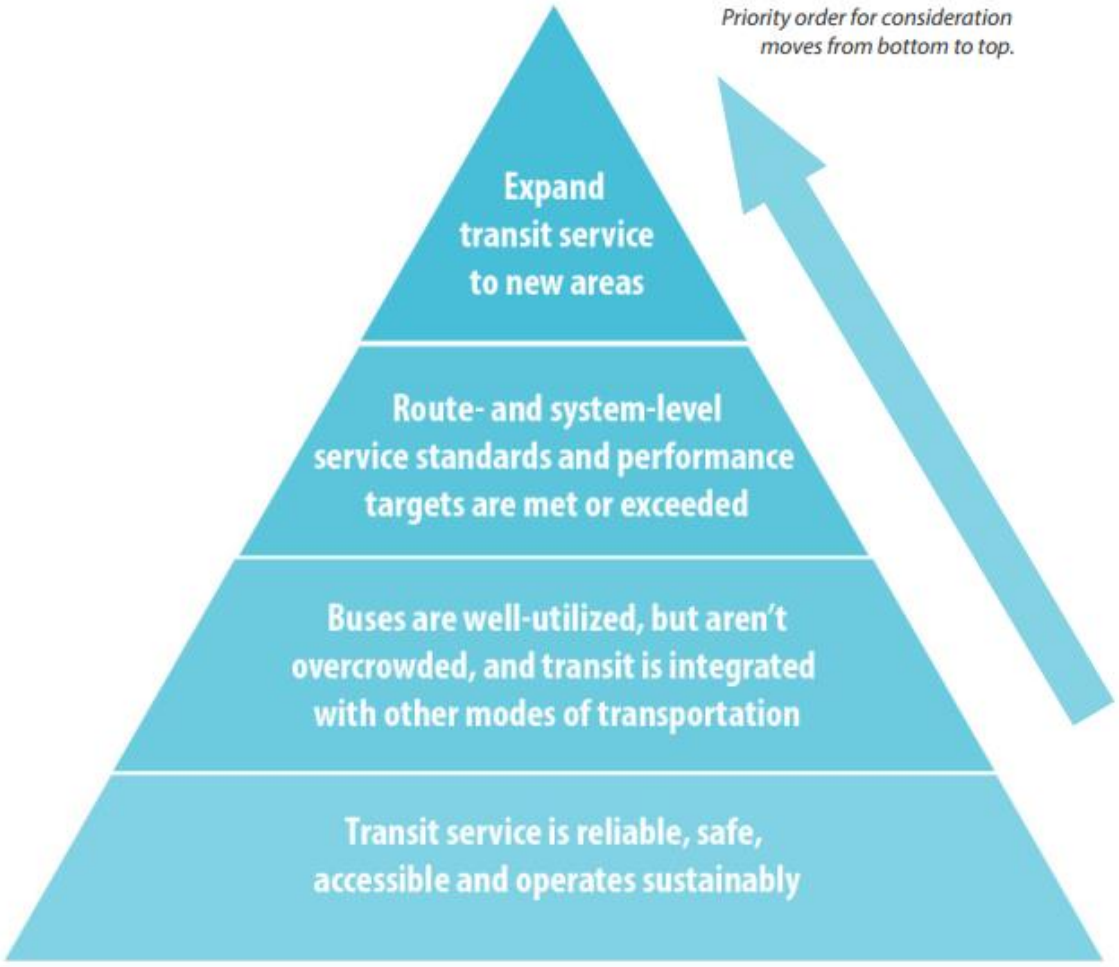
[4]The density threshold for the Transit Core Area within Kelowna was set at 3,000 activity units per square kilometer, which is lower than the density threshold recommendation for new Frequent or Rapid Transit services. This discrepancy recognizes that there are generally transitional density zones at the fringe of a core area where either a frequent or local transit service could be supported.

[5] Average corridor density is the average number of residents, jobs, and students per square kilometer calculated within a 400 meter buffer of a proposed route.

[6] Although the minimum corridor density for local coverage service is set at 1,000 activity units per square kilometer, routes are more likely to meet minimum performance guideline targets at closer to 1,500 activity units per square kilometer and above.

Although the transit network may need to expand to serve new areas as the region grows, it is important to first ensure that the existing transit system is performing effectively. Figure 3 provides a visual outline of the recommended approach for prioritizing transit service expansion. Only when the bottom levels are operating at a satisfactory rate should the next level be considered as an area for resource investment.

Figure 3 – Approach to Transit Service Improvement Priorities



PERFORMANCE GUIDELINES

Performance guidelines define numerical thresholds and targets for a particular system and its routes and services. Working in tandem with service standards, performance guidelines are a tool that can be used to evaluate existing services, identify trends in performance and, based on this evidence, determine how service and supporting features should be changed to improve the effectiveness and efficiency of the system.

System Level Performance Guidelines

The purpose of monitoring system wide performance is to identify trends in system performance and compare the performance of the transit system with other peer transit systems. This can be particularly useful when identifying system wide impacts of major investments in the transit network, such as the ongoing development of the Frequent Transit Network. Table 7 identifies the system-level performance guidelines for the Kelowna Regional Transit System.

Table 7 - Kelowna Regional System Level Performance Guidelines

Measure	Target
Rides per service hour	35
Cost per passenger trip	$2.85[7]
Cost recovery	35%

Customer Satisfaction Performance Guidelines

For transit, customer satisfaction is important for retaining and growing ridership, while also promoting a more positive image of transit within a community.

Since 2014, a customer satisfaction survey has been conducted every two years in the Kelowna Region. This survey asks customers to rate their level of satisfaction with various aspects of the Kelowna Regional Transit System, and one of the questions asks customers for their overall level of satisfaction with the transit service.

This overall customer satisfaction metric has fluctuated from 63 to 77 per cent in previous surveys. If customer satisfaction falls significantly below expectations, it increases the importance of reviewing the details of the customer satisfaction results to understand how resources can be targeted within the system moving forward.

Measure	Target
Customer Satisfaction	75%

[7] This metric was set at $2.50 in the 2012 Transit Future Plan. The new metric accounts for a 2% annual inflation rate between 2012 and 2019.

Route Level Performance Guidelines

Route level performance guidelines gives a detailed indication of how individual components of the transit system are performing. This analysis allows observations of the impact of service changes and investments made in the past and identifies future opportunities for strategic investment or reinvestment.

The route level performance guidelines have been broken down according to the four layers of service defined within the Transit Future Plan. These route-level performance guidelines include targets for the number of rides per service hour and the percentage of trips operating on time (Table 8). For the purposes of these guidelines, a trip is on time if it departs no more than three minutes late and no more than one minute early.

Table 8 - Performance Guidelines

Service Type	Boardings per Service Hour	On-time Departures[8] (%)
Rapid Transit Network	45	70%
Frequent Transit Network	45	70%
Local Transit Network (Ridership)	25	70%
Local Transit Network (Coverage)	15	80%
Targeted Services	20	70%

Coverage local transit routes that meet the minimum average corridor density for new routes but fail to meet the minimum rides per service hour guidelines could be candidates for an alternative, custom transit service design including options for flex-routing, on-request service, or other demand-responsive service options (see Appendix A).

[8] Proportion of trips that depart within 1 minute early and 3 minutes late of the scheduled departure time at each timing point.

PERFORMANCE MANAGEMENT CYCLE

How Will These Guidelines Be Monitored?

Annual Performance Review Process

These guidelines can be used by BC Transit, local partners, and the Operating Company to assist in adjusting and improving transit services on an on-going basis and as an aid in developing future transit plans.

BC Transit will provide analysis on an annual basis of how the transit system is performing at both a system- and route-level as part of its yearly, system-specific Annual Performance Summary (APS) reporting process. The APS process will be used to develop service improvement proposals for consideration by local partners that may be implemented during regular service change schedules which typically occur two to three times per year.

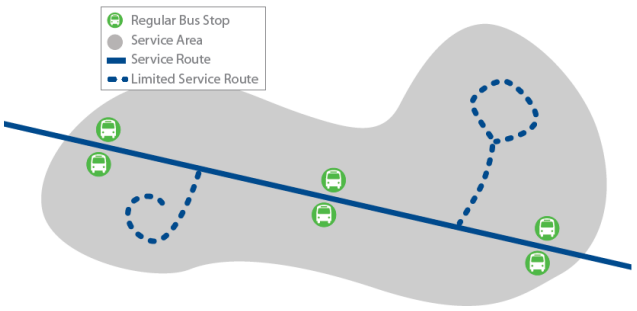
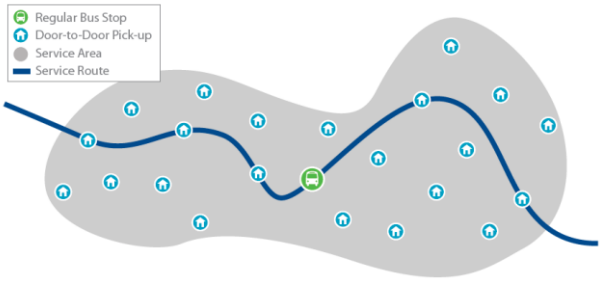
This monitoring can be supplemented as required through future Transit Future Action Plans, Local Area Transit Plans, and Service Change Plans, during which additional analysis may be performed to support these comprehensive planning processes.

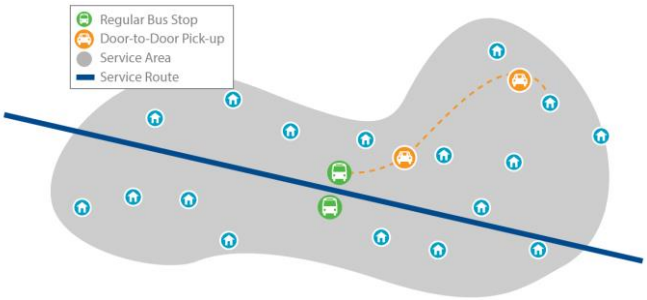
For a service to be efficient and productive, a balance should be achieved between oversupply and overcrowding. A number of measures can help establish this equilibrium including the following:

- Implement transit priority
- Change frequency or service span
- Vehicle type allocation
- Change bus stop spacing
- Targeted marketing/corridor branding
- Bus route and network changes
- Reduce/increase coverage

APPENDIX – CUSTOM SERVICE OPTIONS

Table 9 – BC Transit Custom Transit Service Design Options

Flex-route transit: Like Conventional transit, flex-route buses follow a fixed route and fixed schedule. The difference is that buses can deviate from the route to pick up or drop off passengers at nearby destinations. Usually, passengers requesting a deviation must call in advance for service. For the majority of users who do not require a deviation from the route, a flex-route service is no different than Conventional transit. They board and alight at designated bus stops along the route, at scheduled times.	
On-Request: These services also follow fixed schedules or trip windows, but buses do not follow a fixed route. Instead, drivers determine their own route within a defined service boundary as required to pick up and drop off passengers who have requested service in advance. Buses may also stop at specific designated bus stops at scheduled times without the need for any advance requests for service. These bus stops are typically located at popular destinations such as shopping centres, community centres and downtown locations. Some on-request services provide "curb-to-curb" service, while others pick up and drop off passengers at "request stops." Curb-to-curb service means passengers are picked up and dropped off at the curb in front of their home or destination. Request stops are designated bus stops located throughout an area; when a passenger requests a pick up, he or she walks to the nearest request stop to meet the bus. Returning passengers are dropped off at the request stop nearest their destination.	

Demand-Responsive: Unlike Conventional, Flex-route, and On-Request services which operate at fixed times, demand-responsive transit services such as handyDART operate only in response to requests for service. Service is provided only when and where it is requested. If no service is requested at a particular time or in a particular area, no service is provided. • **handyDART:** A type of demand-responsive transit, handyDART is door-to-door service for customers with physical or cognitive impairments who cannot independently use the Conventional transit system some or all of the time. • **Taxi Saver** – For times when the handyDART system is unavailable, the Taxi Saver Program provides registered handyDART passengers with subsidized taxi service, giving them the flexibility to coordinate their own trips. • **Taxi Supplement Program** – The Taxi Supplement Program enables the handyDART operator to book trips in taxis when the regular vehicle(s) is unavailable, either because of capacity issues or because the trip cannot be accommodated in a timely manner.	

Although these services are not available under the BC Transit model, additional mobility alternatives exist for neighbourhoods with density too low to support conventional transit (or with underperforming existing conventional transit services):

- Ridesharing through Transportation Network Services companies (app-based ride-hailing)
- Car-pool or van-pool programs
- Car, bike, or e-scooter sharing programs

These options can help address the first and last-mile challenge associated with conventional public transit.