

Managing the Transit Network

A Primer on Key Concepts



Introduction

As the integrated, multi-modal transportation authority for Metro Vancouver, TransLink plans and delivers the transit network to help meet the unique transportation needs of this region. This primer speaks to how TransLink manages that network – a key component of the overall transportation system – within the context of the broader strategic goals of the region.

As land use and travel patterns change, so does demand for transit. For example, more frequent transit service may be needed to support population and employment growth in rapidly developing areas; brand new areas of development may require the introduction of completely new services; or a new rapid transit line may mean that nearby bus services need to be adjusted. In some cases, service levels may need to be reduced on a line to better match demand and ensure efficient use of limited resources.

TransLink regularly monitors the transit network to see how people use the various services available to them (bus, SkyTrain, West Coast Express and SeaBus). Based on what we see, we make adjustments to improve both the efficiency and usefulness of the network. We call this task “Managing the Transit Network” and it involves overseeing the service planning process, and developing policy guidelines and performance indicators for transit service in the interest of maximizing personal mobility. This primer deals mostly with the management of bus services in the region, but many of the concepts can be applied to other forms of transit as well.

TransLink’s mandate is to provide a regional transportation system that moves people and goods, while supporting the regional growth strategy, environmental objectives, and the economic development of the region. The region’s goals are outlined in Metro Vancouver’s *Regional Growth Strategy* which was unanimously accepted by all local governments in 2011.

TransLink’s strategic goals are outlined in the region’s long-term transportation strategy, *Transport 2040*. They reflect TransLink’s critical role in managing a balanced transportation system to achieve regional goals for the environment, the economy and our society.

What is Network Management?

Network management involves continuously monitoring and changing elements of the transit network to help the greatest number of people get where they need to go, while maintaining the efficiency and productivity of the network. This may include:

- Designing the transit network.
- Adding new services.
- Changing the structure of existing services (e.g. changing the route a bus line follows).
- Changing the scope or intent of existing services (e.g. moving from peak-only to all-day service, adding service on weekends or evenings).
- Changing access to transit services (e.g. changing where a bus stops).
- Analyzing and reporting on the performance of the overall network.
- Talking with customers and municipalities about changes to transit service.

What is Personal Mobility?

Personal mobility is the core product of transit. It is a measure of how easy it is for an individual to get from where they are to anywhere they may want to go. It can also be expressed as the freedom afforded by transit to move throughout the region without a car. By providing abundant and well-integrated transit, TransLink aims to maximize personal mobility.

How does TransLink make decisions about where to add, change or reduce service when managing the transit network? This is the question this primer will help answer.

These can be difficult decisions, because they involve choosing where to invest limited resources in the transit system. These decisions often revolve around the integration of transit and land use. The level of transit service available to you is not governed by who you are, but largely by the layout and land use characteristics of the area where you live and the places

where you want to go. For this reason, locational decisions made by municipalities, developers, employers and home-buyers have implications on the level of transit service they can expect to receive.

This primer gives insight into the transit planning process, the characteristics of efficient and productive transit service, the themes we think about in designing and evaluating transit lines, and the impact these decisions have on the efficiency and productivity of the overall transit network.

What this Primer Includes

Network Design Objectives: Outlines the three simple objectives we try to meet when designing and managing the transit network. (p. 3)

Challenges in Designing the Transit Network:

Introduces the key constraints, or facts about transit that inform our approach to designing an efficient and productive network. (p. 7)

Network Design Themes: Describes the types of things we think about when designing and managing the network. (p. 7)

Transit Line Design Considerations: Highlights the key elements of an efficient and productive transit service and what we think about when estimating ridership potential, including land use considerations. (p. 12)

Making Transit Service Decisions: Explains how we develop ideas about potential service changes and the process we use to evaluate those projects. (p. 23)

Network Design Objectives

TransLink manages and invests in the regional transit network with the assumption that public transit offers a wide range of benefits to the people who live in Metro Vancouver. For example, public transit:

- Gives residents freedom of personal movement.
- Provides a transportation option for people who cannot drive or do not have access to a car.
- Supports an efficient and sustainable existing urban form, by providing transportation in areas where there are high numbers of people, jobs and activities.
- Encourages efficient and sustainable development, by supporting higher-density development.
- Reduces the region's emissions as people choose to use transit instead of drive.
- Expands the region's economic prosperity by helping people and goods move easily around the region.
- Supports tourism, an important industry in the region's economy.

To achieve all these benefits and more, TransLink pursues three objectives when designing and managing the transit network:



Objective 1:
Maximize Ridership



Objective 2:
Encourage Long-term Ridership Growth



Objective 3:
Provide Access to Transit Service across the Region

All three objectives are important, but we sometimes have to make tradeoffs among them. Making decisions about these tradeoffs is where we usually ask for input and guidance from our partners and the public.

What is Ridership?

Ridership refers to the number of people using a transit service. It is typically measured and reported in passenger boardings. TransLink uses Automatic Passenger Counters to count the number of people getting on (boarding) and off (alighting) our transit vehicles. Combined with our GPS-enabled Automated Vehicle Location System, this gives us data to assess the productivity of our services.

Objective 1: Maximize Ridership

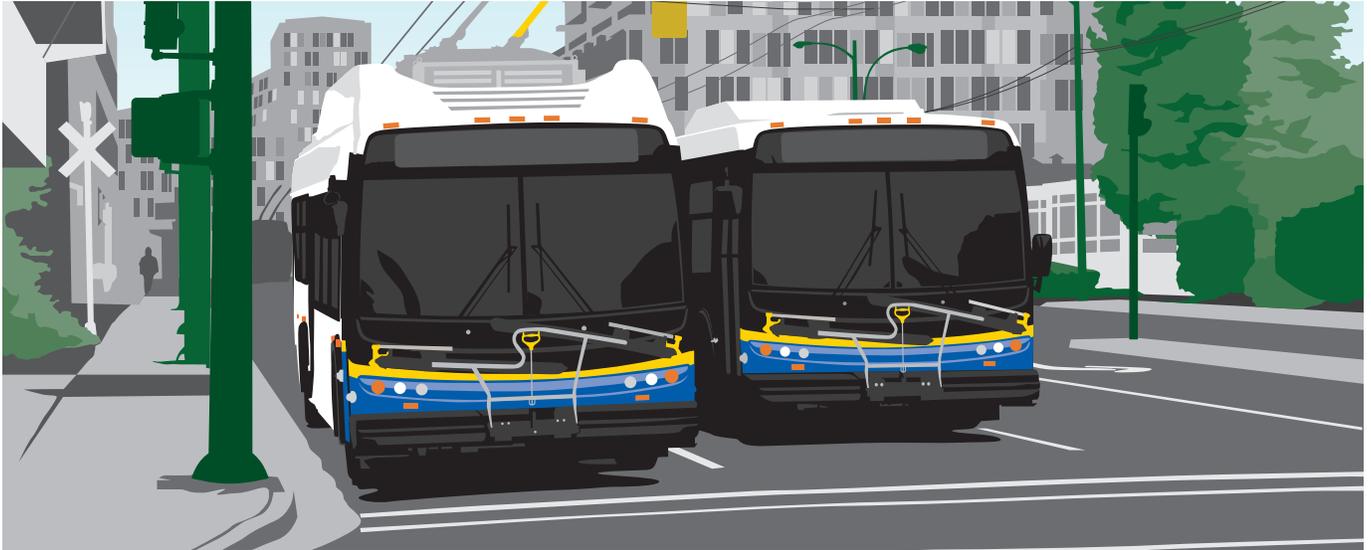


Figure 1 – Maximizing ridership involves meeting existing demand for transit service.

Ridership represents the number of people we take to their destinations each day. We design service to encourage and support the greatest ridership possible. By doing so, we hope to:

- Help the greatest number of people get to where they need to go.
- Contribute to the economic prosperity of the region by helping people and goods move easily through the transit network.
- Optimize fare revenue, which affects the level of service we can provide.
- Make it easier for people to choose transit over driving alone in their cars, which:
 - reduces greenhouse gas emissions and improves air quality
 - allows people to become less dependent on their cars
 - reduces pressure on expensive roads and bridges

Services designed to build ridership tend to target areas and communities that have a large number of people working or living in close proximity, such as a downtown core, an urban centre, or along a well-developed corridor.

TransLink maximizes ridership by:

1. Providing reliable and predictable service.
2. Providing more and/or better service where there is already high ridership or overcrowding.
3. Providing service where there is anticipated to be high ridership, typically where there is some mix of:
 - higher residential or commercial density
 - major activity centres
 - pedestrian networks that make walking easy and pleasant
 - measures that discourage driving, such as limited or expensive parking
4. Using existing transit infrastructure as efficiently as possible, such as transit priority measures, rapid transit lines and bus exchanges.
5. Improving the way people make transit connections so they can reach more destinations in less time.
6. Building and supporting cycling and park and ride facilities that help people access the transit system – allowing people to combine modes to get where they need to be.

Objective 2: Encourage Long-term Ridership Growth



Figure 2 – Encouraging long-term ridership growth involves building capacity to meet future demand for transit service.

To meet the environmental and economic goals of the region, it makes sense to think ahead about how to grow future ridership. We make strategic investments that may not pay off immediately, but gradually grow ridership by supporting transit-oriented development.

Investments in rapid transit infrastructure, for example, are usually long-term ridership investments. Their purpose is not just high ridership on opening day, but rather to support planned higher density growth at and around stations. These become part of a high-ridership network that benefits more people in the future.

There are limits to our ability to invest in service before demand is in place, but we need to consider how such strategic investments support future development and growth in ridership.

TransLink encourages long-term ridership growth by:

1. Providing transit service to major new development areas where we expect strong growth in ridership.
2. Providing frequent, all-day service along key corridors to encourage development of communities whose design makes good use of transit resources.
3. Informing developers and municipalities about the likely service and mobility outcomes of various land use and development options.
4. Limiting service expansion in areas where transit services are unlikely to be efficient or productive, such as remote or hard to serve areas, or where population is unlikely to grow.

Objective 3:

Provide Access to Transit Service Across the Region



Figure 3 – Providing access to transit service across the region involves maximizing the coverage of the transit network and ensuring a basic level of service is available to most people for most kinds of trips.

Part of TransLink’s mandate is to serve the needs of people who depend on transit due to age, disability or other limitations, and to also provide access to transit service across the Metro Vancouver region.

Therefore, we provide a portion of our service where ridership is predictably low. For example, service that runs in very low-density areas, or that must cross large distances to connect distant places, does not generate high ridership. We don’t offer these services expecting high ridership; we provide them to keep the region connected and to include the majority of its neighbourhoods to the greatest degree possible.

That said, when we run service simply to provide a basic level of transit service in an area, it means we are using resources that could be used to meet ridership demand somewhere else. Since fare revenue is directly linked to ridership, these types of “coverage” services, which don’t generate many riders, are some of the most expensive services we operate. TransLink has limited financial resources so we must make difficult decisions about how to meet our mandate of providing transit service throughout the region, while also providing service where demand is greatest and we can expect high ridership. In many cases, we simply can’t provide public transit in a reasonably

efficient way to some low-density, rural, remote or hard-to-reach areas. Instead, people in these areas may have to rely on other modes of transportation. TransLink’s TravelSmart program is designed to help people consider other travel options such as cycling, walking and carpooling.

TransLink provides access to transit service across the region by:

1. Providing basic, low-frequency transit service in areas of lower density where feasible.
2. Ensuring our services are fully accessible to people of all ages and abilities.



For resources and tips about making smart travel choices visit travelsmart.ca

Challenges in Designing the Transit Network

While our goal is to meet the network design objectives outlined in the previous section of the primer, we also have to design services within the context of some basic constraints. These challenges inform the tradeoffs we often make when trying to provide efficient and productive transit service.

Three key facts inform TransLink's approach to designing and managing the transit network:

1. The cost of providing transit service is high. A typical transit line that runs every 15 minutes all day long, seven days a week, can cost as much as \$5 million per year, depending on the length of the route. A service is more expensive to operate as it gets longer, more frequent, or slower since these all require extra vehicles and operators.

2. The cost of providing transit varies based on the geometry of the service. The physical characteristics of a transit service - the roads it travels, the places it stops and its shape and length - have a profound impact on its productivity and cost.

3. Demand for transit varies based on land uses, densities and activity levels. Higher density and active areas with a mix of uses generate greater transit demand and justify higher levels of service.

Network Design Themes

With an understanding of the objectives - and challenges - associated with providing transit service to the Metro Vancouver region, we design the transit network with a few key themes in mind. All the decisions TransLink makes related to network design are informed by these key themes, which integrate our network design objectives with the physical realities of transit service and its costs:

Just as with our network design objectives, we sometimes need to make tradeoffs between these themes as we work in an environment of limited resources.



Network integration



Versatility



Efficiency and productivity



Partnerships and collaboration

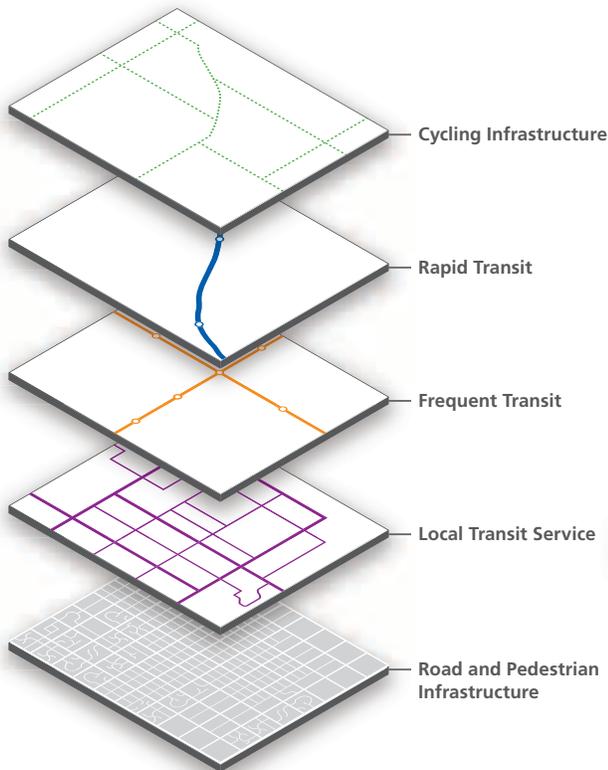


Figure 4 – The components of the transportation network are often managed independently, but it is the complex relationships between them that make the whole network work.

The transit network is more than just the sum of its parts. The usefulness of the network lies in the way all the parts work together, not just how they work individually. A single transit line may be useful for some trips, but it has more value when it is well connected with all the other lines; a passenger can travel along one line but also to anywhere those connecting lines go. TransLink manages the network in a way that takes into account how all the parts – SkyTrain lines, bus lines, and pedestrian or cycling paths – work together to get people where they want to go quickly and efficiently.

Networks, by their nature, require connections. We probably cannot offer a direct one-seat ride from every origin to every destination. A network that tried to do that would not be a network at all. Connective networks overcome the inconvenience of having to make a connection by providing high-frequency service between key points. Even though a person may have to wait for a few minutes at connection

Be a transit network that is greater than the sum of its individual parts, recognizing complexity and interconnectedness between modes and service types



Figure 5 – Good network design considers the full transportation picture and acknowledges interdependencies.

For the best mobility in many directions, locate at connection points.

points, a well-integrated network usually gets people to their destinations faster than a system of direct lines, because overall waiting time is lower. Services radiate in many directions at connection points, which makes them great places to locate major development.

When looking at transit, it's normal to try to take it apart into pieces, evaluating the success or failure of individual lines independently. It's often necessary to do this, but we always remember that it is the network that succeeds or fails. The performance of each line depends in part on the lines with which it connects, not just on its own features.



Be versatile in enabling freedom of movement for a diverse range of people and trips



Figure 6 – The transit network serves people of all walks of life and needs to be versatile enough to meet the needs of many different people for many kinds of trips

The theme of versatility speaks to the goal of developing a transit network that works for most people and trip types. TransLink tries to manage the network so that many different people will find it useful for many kinds of trips. This means providing service at most hours of the day, in all directions. It means providing choice to users between different transit options and making sure services are accessible.

We have to keep versatility in mind because transportation planners often make decisions based on the collective travel patterns of millions of individual trip-making decisions. When looking at the big picture, it is important to also remember the complexity and diversity of motives and preferences of each passenger.

Services that are specialized, or useful to only one group of people usually do not benefit the overall network. So we try to design services that will appeal to many different people making a wide variety of trips.

Specialized transit designed to serve very specific markets is less effective.



Be efficient and productive for the benefit of both TransLink and transit customers



Figure 7 – Network design should coordinate service delivery with demand by providing appropriate service types and frequencies.

TransLink works to provide transit service that is as efficient and productive as possible, within the budget we have. This means we try to match service with demand as much as possible. High ridership generates a greater amount of fare revenue, which in turn helps TransLink provide the highest level of service possible.

Efficient and productive services find the happy medium between over-supply and overcrowding. To reach this medium, we can change the frequency of service, when and how long a particular service is offered (the span of service), the spacing between stops, or the level of priority given to transit (e.g. HOV lanes or signal priority).

By making sure our transit services are efficient and productive, we maximize the amount of service we can provide given limited funding. We strive to offer as much service as possible, but to do this, we must design our network to be as efficient as possible. This entire primer is about that task.

What is Productivity?

Sometimes referred to as effectiveness, productivity is essentially the return-on-investment of a transit service. It is a measure of how much ridership a line attracts relative to the cost of providing the service.

Though we try to keep in mind the principle of versatility to make the transit network useful for many kinds of people and trips, we have to decline service requests that would mean running an expensive service for small numbers of people. In other cases we may even decide to shift resources from services that have low ridership to services that are experiencing overcrowding or pass-ups.

Efficient transit allows us to provide more transit.

Partnerships & Collaboration



Work with partners and stakeholders in the process of planning and delivering transit service to ensure the coordination of land use and transportation planning



Figure 8 – An efficient and productive transit network relies on supportive land use planning. TransLink partners with local governments to ensure a coordinated approach.

Transit ridership doesn't grow simply because we add more service. Development affects ridership demand, which, in turn, supports higher levels of transit service. TransLink works with our municipal partners and other stakeholders to ensure the coordination of land use and transportation planning so that development patterns support an efficient and productive transit network. Metro Vancouver's Regional Growth Strategy uses a transit-oriented land use approach, which promotes growth in urban centres and corridors that are currently or can be well-served by frequent transit. This land use pattern allows transit to provide better mobility and accessibility to destinations by transit.

TransLink supports this "centres and corridors" concept with the Frequent Transit Network (FTN). The FTN is a network where transit comes along at least every 15 minutes throughout the day and into the evening, every day of the week. By placing development along the FTN, municipalities and developers can help create transit-oriented communities - places that, by their design, allow people to drive less and walk, cycle, and take transit more.



For more about transit-oriented communities, check out TransLink's Transit-Oriented Communities: A Primer on Key Concepts available online at translink.ca

For the best mobility and higher levels of accessibility to destinations, locate where transit service is most frequent.

The decisions that influence the urban form of our communities happen at several levels, none of which can function without the others:

- Municipalities are responsible for land use planning and regulation, so they have considerable influence over what will be allowed to be built, and where.
- Developers choose which developments go forward, based on market demand and other considerations within the land use and zoning framework of the municipality.
- Individuals and institutions make decisions about where they want to locate.

As the regional transportation authority for the region, land use decisions are not ours to make, but TransLink partners closely with Metro Vancouver, local municipalities and developers to be part of the process. TransLink works with these partners to coordinate transit network planning and other regional transportation considerations with land use, in support of the regional goal of building a more livable and sustainable region.

Transit Line Design Considerations

In the same way that we refer to our objectives and themes to guide the development of the overall transit network, TransLink considers a variety of characteristics that contribute to the success of individual transit lines. These are applied when designing and evaluating potential services.

In general, a transit line is more likely to have high and sustained ridership – which therefore justifies better investment in service and infrastructure – if it has the following characteristics:

- **Serves areas of strong demand**
- **Has strong anchors at both ends**
- **Is as direct, simple, consistent and legible as possible**
- **Maintains speed and reliability along the entire route**
- **Avoids duplication or competition between transit services**
- **Matches service levels to demand**
- **Has balanced loads in each direction**
- **Experiences an even distribution of stop activity**
- **Has an even distribution of ridership by time of day**

We'll look at each of these in more detail on the pages that follow.

Serve areas of strong demand

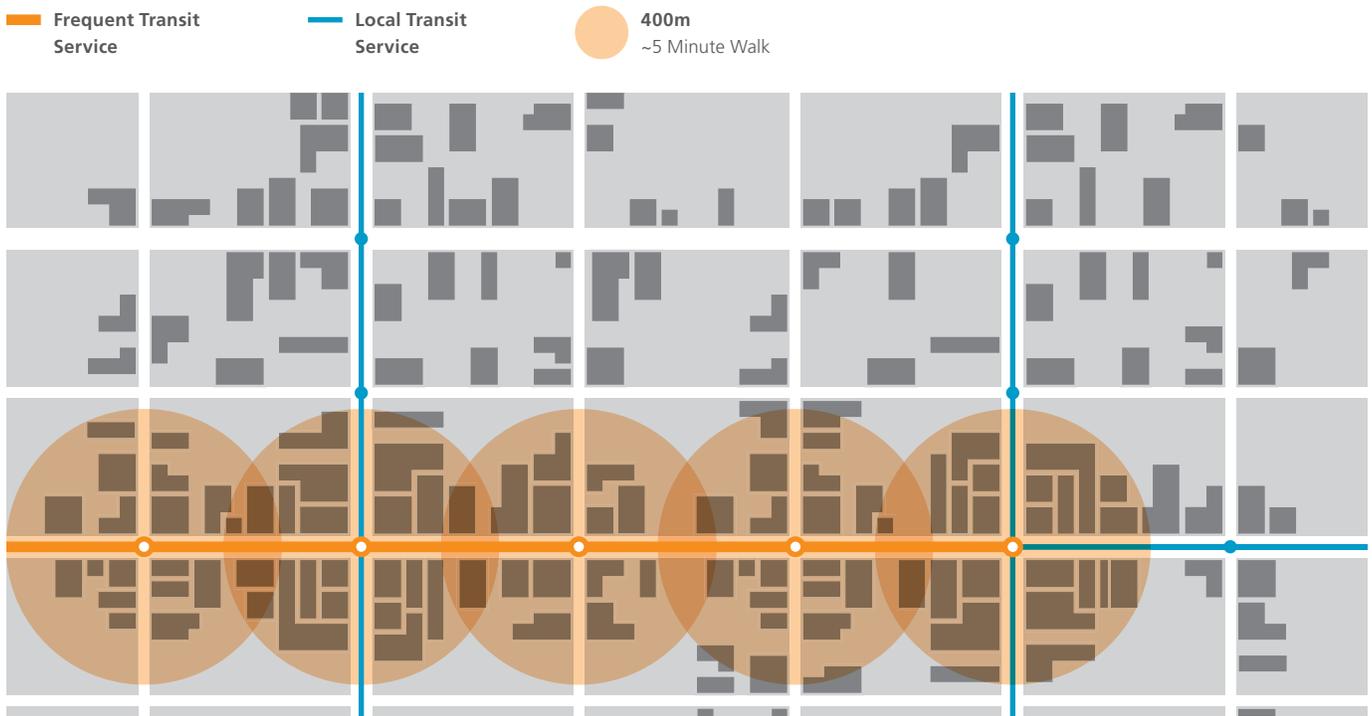


Figure 9 - Areas with higher densities and activity levels support higher frequency transit service.

When TransLink designs a new transit line – or reviews an existing one – we do our best to match transit service to demand. Successful transit services usually connect several areas with high transportation demand, where we know high ridership is likely. These include areas where many people live or work, as well as concentrated activity centres such as shopping centres, universities and hospitals. It also helps if these areas include a diverse mix of uses and building types, which encourages a variety of trip patterns all day long.

Demand for transit also goes up as the convenience of driving goes down. For example, a downtown shopping centre where parking is expensive generates higher transit demand than a suburban one where parking is free.

Have strong anchors at both ends

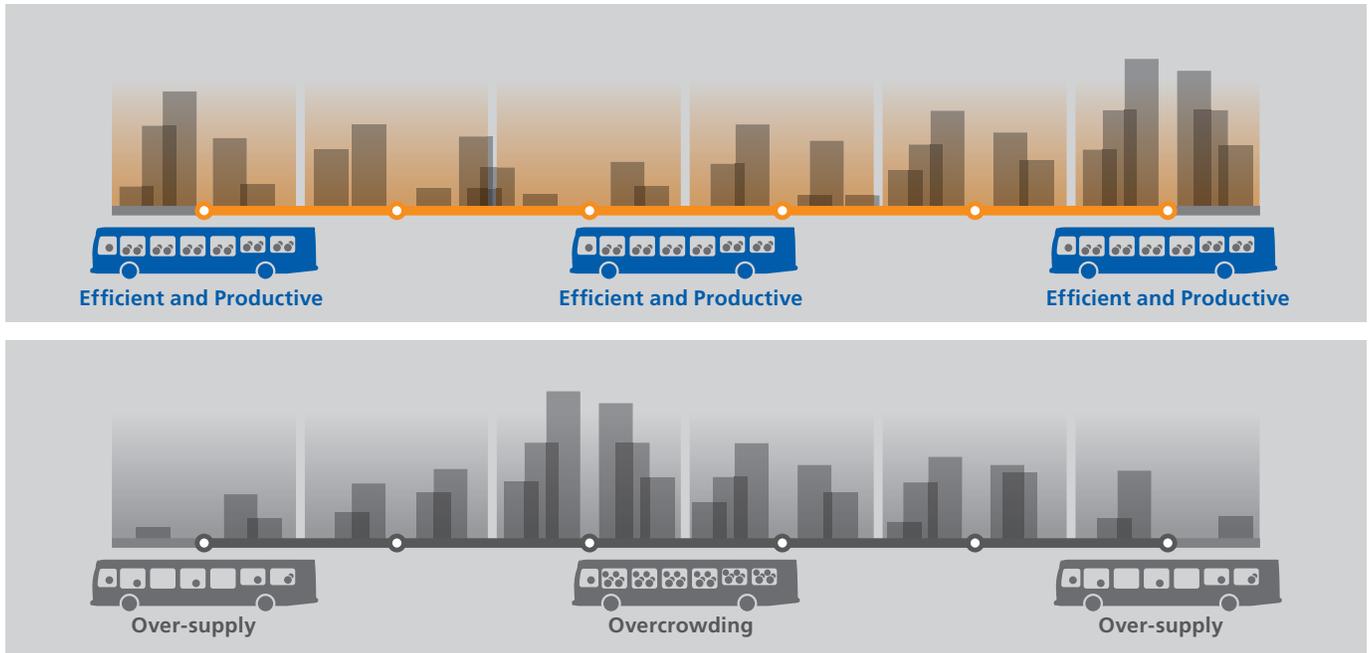


Figure 10 - Transit lines with strong anchors generate ridership in both directions along the entire route, improving productivity of the service.

It is best if demand is especially concentrated at both ends of the transit line. This means that the destinations at both ends need to be places that many people want or need to go. A major bus exchange or rapid transit station, a hospital, and a university are all examples of strong anchors.

If the area served by a transit line has equally high demand, or has demand that is highest toward the centre of the line, the result is an uneven passenger load. Transit vehicles are full at the middle but nearly empty near the ends. All those empty seats are unused capacity that makes the transit system less efficient, and thus less abundant.

A transit line without strong anchors results in low ridership levels at both ends. Therefore, TransLink consciously aims to start and end transit lines at major activity centres or connection points.

Be as direct, simple, consistent and legible as possible

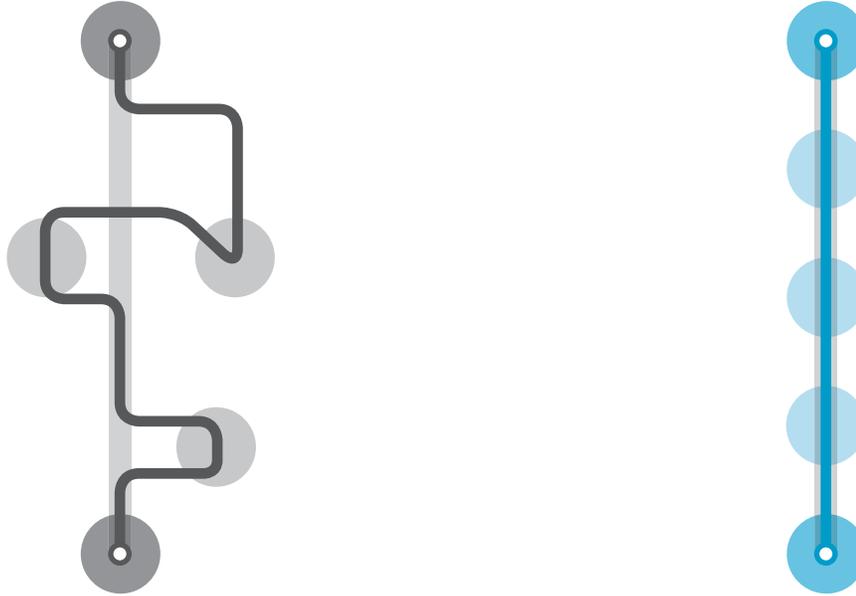


Figure 11 - More direct transit services offer better speed and reliability to customers and are cheaper to operate.

Strong transit lines tend to be as straight as possible given the demand and terrain. An effective transit line should follow a reasonably direct path along most of its length. The straighter the route, the more likely it is that passengers can understand and use the line, and also expect consistent, reliable service. A route that has many turns has more opportunities for

the service to be disrupted along the way. For this reason, TransLink tries to design transit lines to be as direct as possible, with few deviations. Adding deviations to an existing line has a negative impact on existing riders and increases the cost of operating the service, making it difficult for TransLink to justify.

What is Legibility?

Legibility refers to how easy a service is to understand and remember. For service planners, this means designing services that are simple and easy to explain or represent on a map. When combined with other services, they should create a clear transit network that can be easily understood and used for many purposes.

Maintain speed and reliability along the entire route

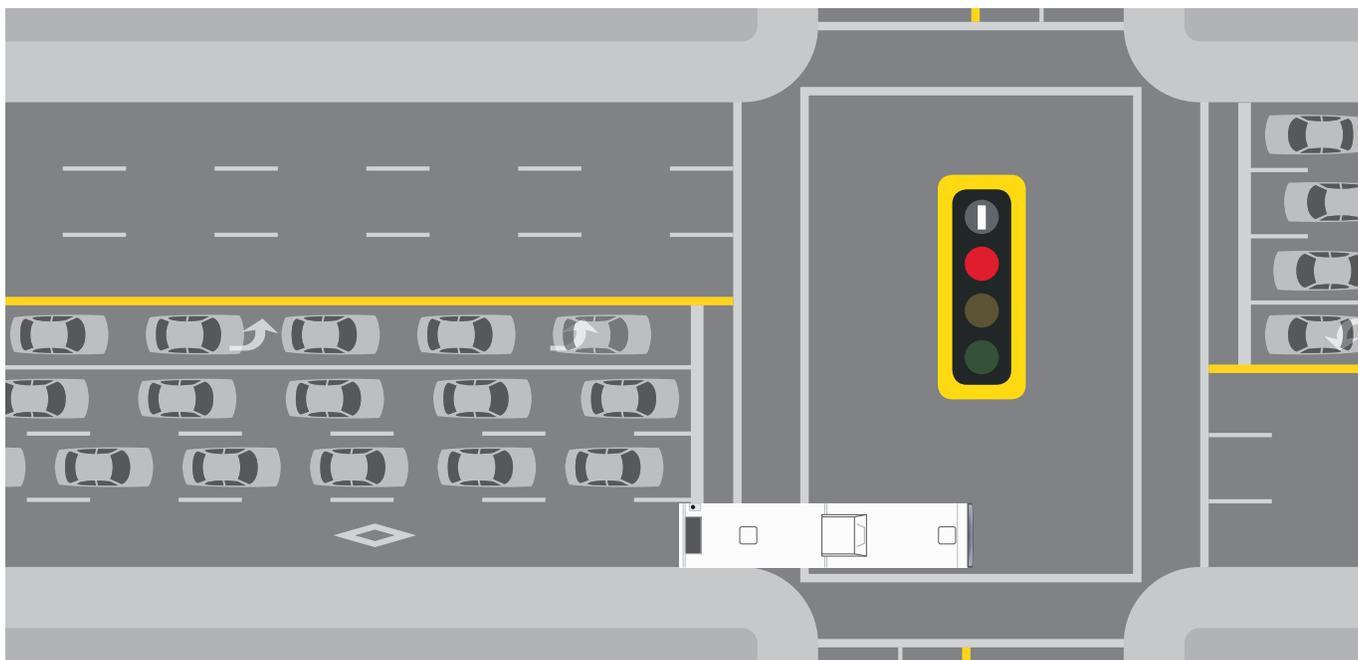


Figure 12 - Measures to improve transit's speed and reliability - such as bus-only lanes or transit signal priority at intersections - make transit more attractive and cheaper to operate.

A successful transit line connects many major destinations along a line that can maintain reasonable speed and reliability. In this way, transit offers a reasonable alternative to the car and the cost of providing the service is reduced, since slower service is more expensive. Delays along the middle of a line – which tends to be where we carry the most people – can undermine the performance, and usefulness, of the entire line. For this reason, TransLink discourages road changes that may impact transit speed and reliability.

How often a transit line must stop is a major factor in determining how fast it runs. This includes stopping at intersections, because of traffic congestion, and at bus stops to let passengers on and off. We can sometimes introduce transit priority measures to address intersection and traffic impacts. Stop spacing (the distance between bus stops along a route) can have a big impact on the speed and reliability of a service. That's why on corridors where there is a lot of demand for longer, faster trips, TransLink will sometimes introduce B-Line or limited-stop service. The resulting speed benefit lies not just in getting the customer to their destination faster, but also in supporting increased frequency. A faster service has a lower operating cost, so a higher frequency (or longer duration) can be achieved at the same cost.

What are Transit Priority Measures?

Transit priority measures refer to any investments in physical or electronic infrastructure that give priority to transit over other traffic. They typically combat two types of transit delay: signal delay (the time that buses spend waiting at traffic lights) and congestion delay (the time that buses spend in traffic waiting to reach an intersection or merge onto a congested road). Examples include:

- Bus-only or HOV lanes on congested roads.
- Traffic signal priority, where approaching buses cause an extended green light or shortened red light.
- Transit priority signal indicators, where a special traffic light (a white vertical bar) allows buses to advance through an intersection ahead of other traffic.
- Bus-only or HOV interchanges, where ramps onto highways are reserved for buses or high-occupancy vehicles.
- Other measures to manage traffic in a way that improves bus operations.

The outcome of successful transit priority measures is usually faster, more reliable service – improving the customer experience.

Avoid duplication or competition between transit services

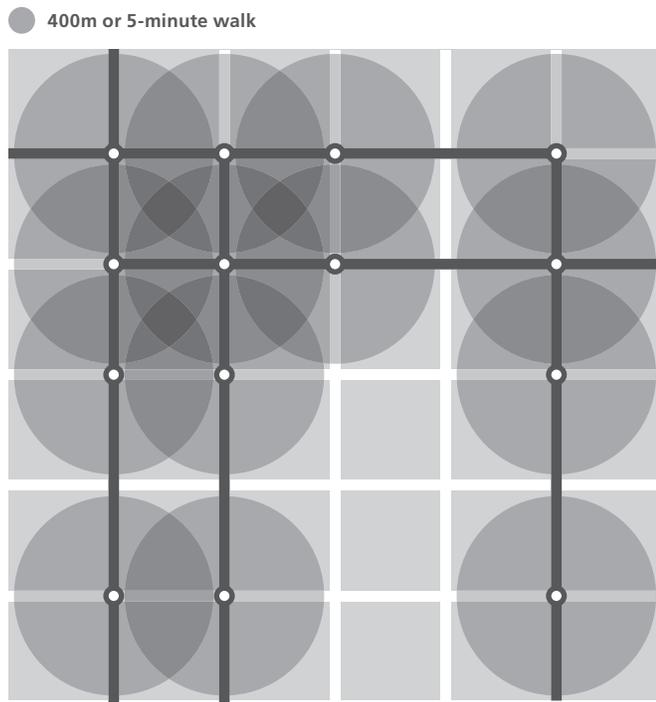


Figure 13 - Ridership is split among overlapping transit services, reducing the productivity of each service.

Transit lines should be far enough from other lines so that they do not compete for passengers. Lines that are close together, or even overlap, will reduce ridership on both lines. TransLink tries to space out parallel transit corridors by about 800m so locations in between are within walking distance while avoiding competition.

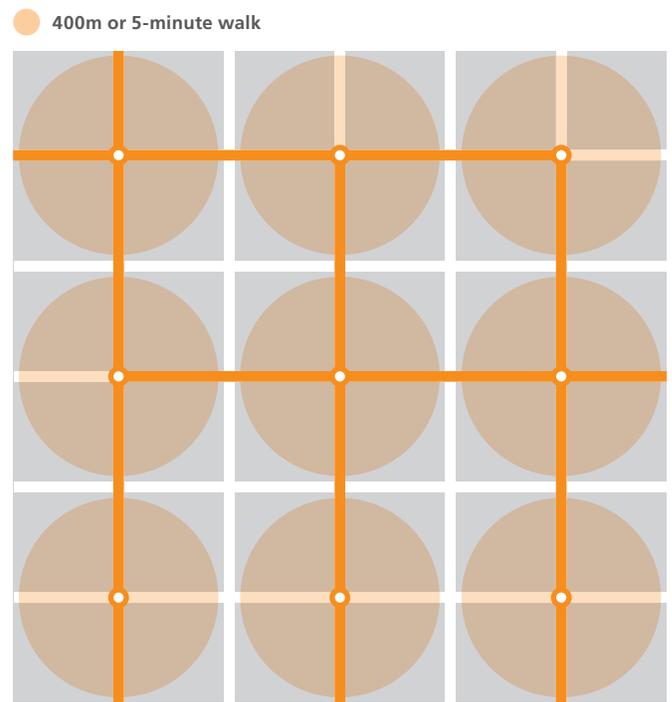


Figure 14 - Well-spaced transit services maximize coverage while avoiding competition between services.

Match service levels to demand

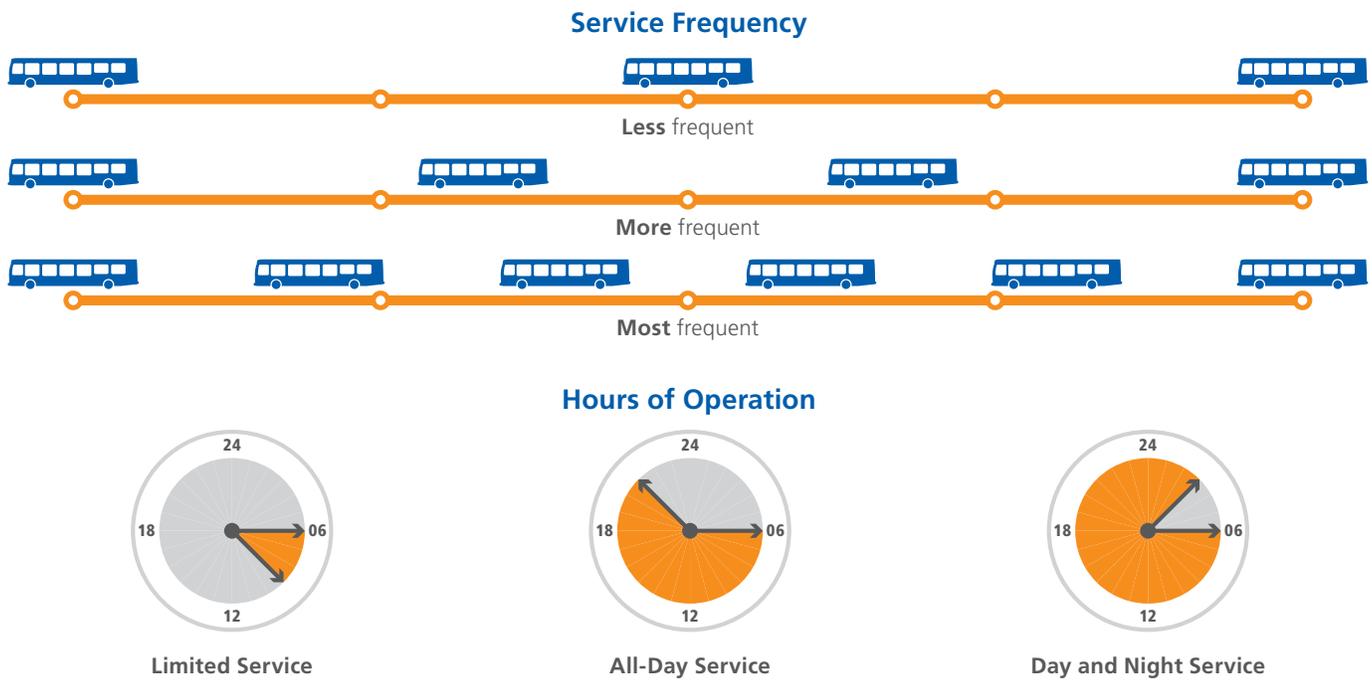


Figure 15 - Services that operate at appropriate times and frequencies to closely match ridership demand are the most efficient and productive.

An effective transit line provides the appropriate level of service to meet demand and encourage people to use it. An example of this might be a line on which buses run often during the day to help get students to school, but less often in the evenings when fewer people are expected to ride it. This type of service meets demand when it is greatest, while also keeping operating costs in check.

The TransLink network is made up of many different types of lines, suited to different people and situations. Our focus is on getting people where they're going, so we think about our service types not by type of line (e.g. bus versus SkyTrain), but by the variables that affect a service's ability to deliver different mobility outcomes. These are:

- **Frequency:** How often the service runs determines how long people have to wait and how easy it is to make transit connections.
- **Span or duration of service:** When and how long the service runs. Some services run only during the peak commute period. At the opposite extreme, some run for most of the night.
- **Stopping pattern:** Closely-spaced stops provide good access but lead to slow operations. Stops that are further apart lead to faster travel. That's why we clearly distinguish local services from Rapid or B-Line services. On some streets we offer both local and B-Line service because the stopping patterns make the lines useful for different trip purposes.
- **Exclusivity of right of way:** Transit priority measures, such as bus-only lanes, or transit priority signals help minimize delays to buses at intersections and along congested roads. An exclusive right of way, where a line is not affected by other traffic, is a distinct feature of SkyTrain, SeaBus, and Bus Rapid Transit. It is the best way to ensure high reliability and consistent speed.

Have balanced loads in each direction



Figure 16 – Transit-supportive land uses help generate ridership in both directions.

The productivity of a transit line is based on the costs of a two-way transit run. This is because a transit service might be very productive in one direction but unproductive the other way. For example, a bus line from a suburban community to a city centre will have a lot of passengers during peak morning hours, but few passengers going the opposite way at that time. This is a problem for transit because we can't run transit vehicles (and drivers) in one direction without also running them back.

A corridor that offers a diversity of land use – and therefore, many different destinations (along the way and at both ends) – will generate ridership in both directions because people have reasons to travel in both directions. On these types of lines, transit vehicles are less likely to be crowded in only one direction and nearly empty in the other. Zoning and other land use decisions that encourage a diversity of uses improves this two-way productivity.

Experience an even distribution of stop activity

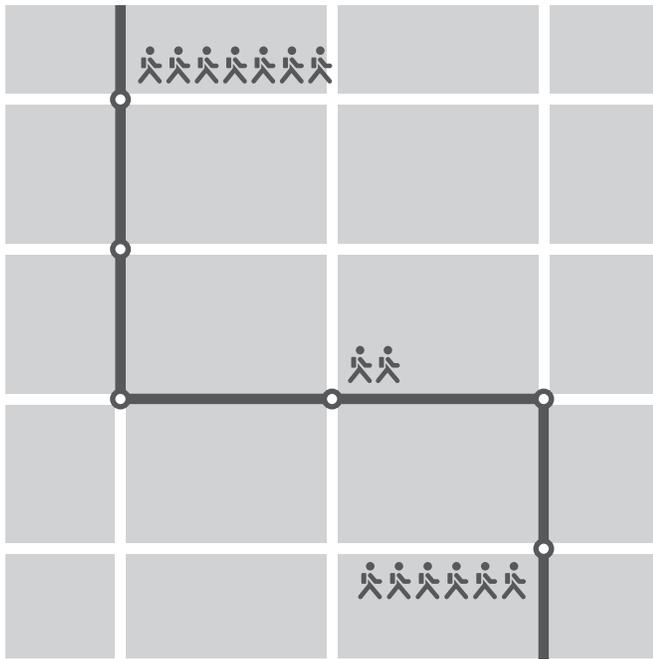


Figure 17 – Majority of activity at few stops.

Transit service is more productive when there are many places along a route to which people want to travel. This occurs when land use decisions have created many destinations along the way, encouraged density and diversity of land use, and fostered a welcoming pedestrian environment.

Activity at many of the stops along a route has several benefits:

1. Passenger turnover – many different passengers can use the same number of seats on a transit vehicle following the route.
2. Reduction in overcrowding and pass-ups (when a transit vehicle is too full to pick up more people at a stop) – space is always becoming available as passengers get on and off at multiple stops.
3. Increased fare revenue – while the cost of providing the service is constant, more people use and pay for it.

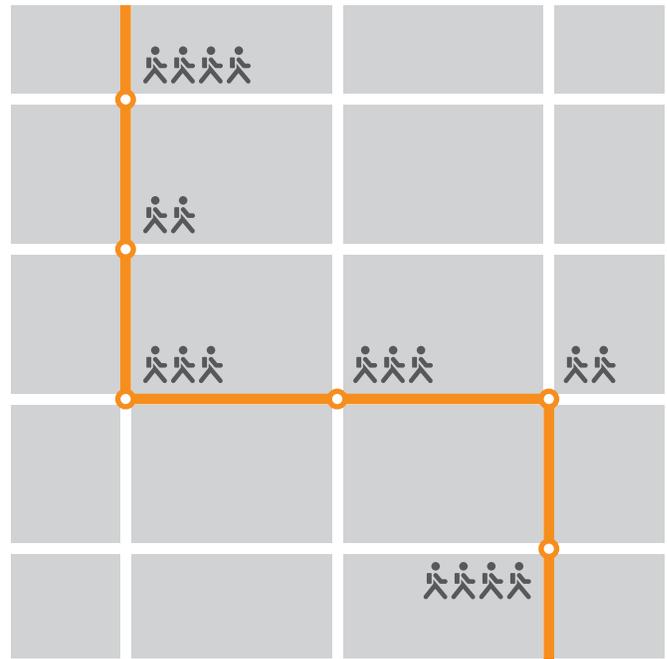


Figure 18 – Activity at many stops.

Services that generate activity at only a few stops tend to experience overcrowding. Passengers board in one direction, filling the transit vehicle. Without destinations along the way, passengers don't get off, which leaves no space for others further along the route.

Have an even distribution of ridership by time of day

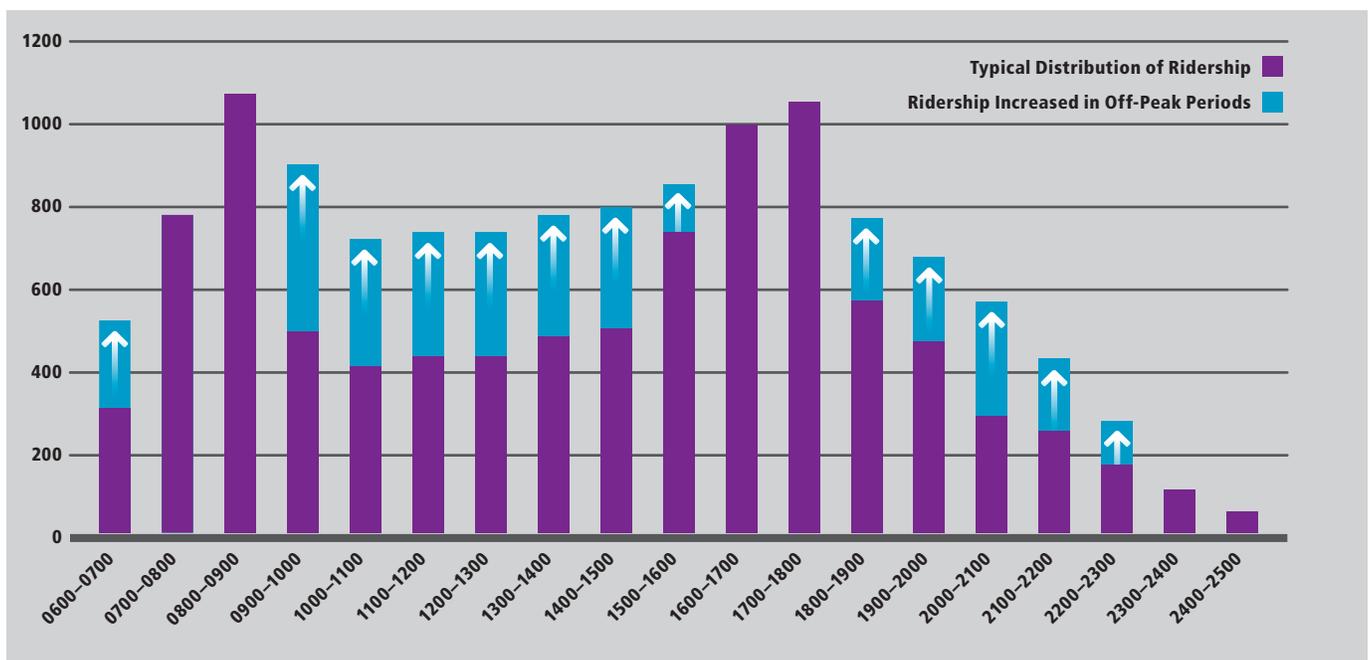


Figure 19 – Transit-supportive land uses help generate ridership during off-peak periods, smoothing out ridership demand.

The majority of trips on transit are taken in the morning or afternoon peak periods, as people travel to and from work or school. This means there are fewer transit trips taken during the middle of the day, evenings or on weekends. This can lead to overcrowded buses during peak periods and empty transit vehicles during off-peak periods.

An efficient transit service generates ridership all day, thereby justifying higher levels of service throughout the day. This is an important requirement for FTN levels of service and is key to making transit a more viable alternative to car ownership.

Making Transit Service Decisions

Responding to Service Requests

TransLink receives requests and suggestions for service changes from a number of sources, many with diverging or competing interests. This is because people use the transit network for different reasons and in different ways. A shop owner or a restaurant worker who works late into the evening may want different types of service, for example, than an office worker or university student.

Ideas for new or changed transit services come to TransLink in many different ways:

- TransLink’s own planning processes, such as Area Transit Plans.
- Land-use planning processes at the regional or municipal level.
- Municipal councils or planning staff who make suggestions based on the needs of constituents.
- Individual or groups of residents around the region who provide direct input on how to better serve their needs.
- Developers who see the benefits of transit access when designing and marketing their projects.

The role of TransLink is to listen to these varying points of view and objectively evaluate the overall costs and benefits of any given service. Where possible, TransLink makes adjustments through ongoing operations planning or through the process of managing the network.

There are many measures with which we evaluate a service change, but preserving and strengthening the overall transit network is always front-of-mind, as well as the objectives, themes and considerations described in this primer.

Evaluating Potential Services

As TransLink evaluates possible projects for changing or adding service, we consider a number of quantitative and qualitative criteria. The process we use – called a multiple account evaluation – considers possible projects from a number of different perspectives. This helps us identify the full range of benefits and impacts of a potential project.

As we evaluate each project, we generally ask four key questions:

Step 1
Should we do it?

Step 2
Can we do it?

Step 3
What should we do first?

Step 4
How do we make it happen?

Step 1

Should we do it?

The first question we ask is whether a proposed service or change is consistent with TransLink's vision, mission and values and whether it supports the objectives and themes of transit network design outlined in this primer.

Some of the questions we try to answer at this stage are:

- Does the proposal support principles related to the design of transit networks and services (e.g. system simplicity, directness, convenience, comfort, reliability, legibility)?
- Would the proposal have a positive impact on system efficiency and/or productivity?
- Would the proposal have an overall positive net benefit for current and future transit customers?
- Is there a land use pattern in place that generates transit demand and supports providing the transit service?
- Would the proposal improve or promote the integration of transit and land use?
- Is this proposal part of a TransLink approved/supported/endorsed plan?
- Would the proposal make better use of existing or future TransLink resources and infrastructure?
- Does this proposal support the Frequent Transit Network?

Step 2

Can we do it?

If a project seems to be something we should do, we determine whether or not it is possible given associated costs, infrastructure constraints, competing demands and expected productivity.

Some of the questions we try to answer at this stage are:

- Is the proposal something that we can actually put into place? For example, are the required turns possible? Are the roads used able to support reliable operations, or are they so congested that we should use them only if transit has priority?
- Will the proposal require additional resources (peak vehicles, annual service hours, vehicle kilometres)?
- Is there enough space at our transit loops and exchanges to operate this service?

Step 3

What should we do first?

Once we have a set of projects that support our goals and objectives (and we know we can put in place), we need to determine which should go ahead first. To decide, especially in complicated cases, we apply a Multiple Account Evaluation (MAE). Based on the results, we try to allocate resources in a way that we reasonably expect will provide the most benefit for the most people at a reasonable cost.

This step involves consultation with municipal partners and the public to make sure we agree on priorities. For each possible project, we look at how it performs within the following MAE “accounts”:



Deliverability

The extent to which a project can be delivered and when (near-term, medium-term, long-term).



Economic growth and development

The extent to which a project supports the economic needs of the region by minimizing impacts to goods movement and improving transit access to activity centres and tourist destinations.



Environment

The extent to which a project helps reduce vehicle emissions and preserve biodiversity.



Financial

The extent to which a project is cost-effective.



Land use

The extent to which a project contributes to building complete, transit-oriented communities, and is supported by an appropriate level of density, diversity of uses, and destinations.



Transportation

The extent to which a project can be expected to grow transit use by providing reliable, attractive and integrated service.



Social and community

The extent to which a project provides safe, secure and accessible transit service while limiting negative impacts to the surrounding neighbourhood and community.

Step 4

How do we make it happen?

The final step in the process is making sure we deliver the identified projects as quickly as possible, while making the best use of available resources. At this point, we design services in detail, including stopping patterns, required vehicles and scheduling. This involves working closely with

TransLink’s operating companies or contractors to make sure the service reflects the original intent of the service change. In this step, we also make sure to communicate the changes to our operators and customers.

Summary

This primer discusses TransLink’s approach to **Managing the Transit Network**, including the objectives we attempt to achieve and the design themes we apply when making decisions about where to add, change or reduce service. It also highlights some of the characteristics of efficient, productive services and describes some of the factors we consider when designing and evaluating potential services.

Network Design Objectives

What we’re trying to accomplish through managing the transit network



Objective 1: Maximizing Ridership



Objective 2: Encouraging Long-term Ridership Growth



Objective 3: Providing Access to Transit Service across the Region

Network Design Themes

What guides us in designing and managing the transit network



Network Integration



Versatility



Efficiency and Productivity



Partnerships and Collaboration

Transit Line Design Considerations

Key features of efficient, productive transit services

- **Serve areas of strong demand**
- **Have strong anchors at both ends**
- **Be as direct, simple, consistent and legible as possible**
- **Maintain speed and reliability along the entire route**
- **Avoid duplication or competition between transit services**
- **Match service levels to demand**
- **Have balanced loads in each direction**
- **Experience an even distribution of stop activity**
- **Have an even distribution of ridership by time of day**

Making Transit Service Decisions

How we evaluate potential projects and the questions we ask ourselves

- **Should we do it?**
- **Can we do it?**
- **What should we do first?**
- **How do we make it happen?**

Making the Land Use – Transportation Connection

Understanding the interdependencies between land use patterns and transit productivity is critically important to achieving our goals as a region. The combined location decisions and land use planning choices made by individuals, institutions and municipalities directly influence the level of transit mobility they can expect.

TransLink is committed to working with our regional and municipal partners, as well as developers and the general public to support the development of transit-oriented communities throughout the region.

This positive “transportation and land use feedback loop” is key to creating communities that are more livable, resilient and sustainable.

Acknowledgements

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