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TRANSLINK

MARINE-MAIN FREQUENT TRANSIT CORRIDOR STUDY FINAL REPORT:

NORTH SHORE PILOT CORRIDOR STUDY

October 6, 2017

Metro Vancouver Regional District & TransLink

Contents

1 Introduction

The *Marine–Main Frequent Transit Corridor Study* was a collaborative corridor study co-led by TransLink and Metro Vancouver, in partnership with the City of North Vancouver, District of North Vancouver and the District of West Vancouver; other stakeholders include the Squamish First Nation and the Province of BC (Ministry of Transportation and Infrastructure). The objectives of the study were to identify a high-level service, corridor concept and phasing considerations for transit service in the corridor, as well as a process for monitoring growth and land use performance in the corridor over time. The study had three phases and took place between January 2016 and October 2017.

The *Marine-Main Frequent Transit Corridor Study* was also a pilot study for Metro Vancouver intended to explore more effective integration of corridors into regional planning and monitoring, with an interest in corridors that cross jurisdictional boundaries. The pilot study was undertaken in part to advance work on a Metro 2040 Urban Centres and FTDA policy review.

Numerous plans, including the *North Shore Area Transit Plan* (TransLink, 2012), the *Regional Transportation Investments a Vision for Metro Vancouver* and *Metro Vancouver 2040: Shaping our Future* (*Metro 2040*) have identified the Marine Drive/Main Street corridor as a priority location for growth and intensified transit service. In *Metro 2040,* the Marine-Main corridor is identified as a priority area for compact growth and complete community development, with two Urban Centres and four Frequent Transit Development Areas (FTDAs) situated along the corridor. These focal points for growth include Lonsdale Regional City Centre and Ambleside Municipal Town Centre as well as Lower Capilano-Marine, Marine Drive, East Third, and Lower Lynn Frequent Transit Development Areas (*Metro 2040* growth overlays).

Initiated prior to the confirmation of funding for a B-Line on the North Shore, the *Marine-Main Frequent Transit Corridor Study* looked out to 2030, seeking to identify a level of transit service that fits well with planned growth along the corridor for that time frame. The study advances ongoing efforts to direct growth and integrate land use and transportation planning on the North Shore. It provides partners with information on how to design and plan for corridor growth across municipal boundaries, and to address land use mix, street spacing, multi-modal connectivity, and general street user experience consistency - with future transit investments in mind.

Announced in early 2017, the *2017 Investment Plan – Phase I of the Mayors' Council Plan* confirmed funding for implementation of a B-Line service on Marine Drive/Main Street with service start in 2019. The *Marine-Main Frequent Transit Corridor Study* complements this announcement by defining how transit service and land use patterns will likely change and evolve in the longer term after B-Line service commences. The study also investigates long-term multi-jurisdictional planning considerations that will help ensure that decisions being made now do not preclude opportunities to enhance transit service levels in the future.

This report identifies the study goals, process, findings and outcomes, and the next steps with the goal of documenting the study and highlighting considerations for future corridor studies. The report provides a brief description of the activities the partners undertook in collaboration with consultants

Steer Davies Gleave (SDG). The report's outlines outcomes and findings for transit planning, land use planning, and the future study processes. The report ends with an overview of next steps and concluding thoughts on the corridor planning experience and potential for other sub-regions in Metro Vancouver. The appendices include background information about Metro Vancouver's current growth structuring tools, an overview of how corridor planning can complement those tools and support the objectives laid out in *Metro 2040,* and an overview of opportunities to increase transit mode share through Transportation Demand Management. Attached to this report are the Marine-Main Monitoring Program Plan and a high-resolution version of the Study Area Map.

2 Study Objectives

Objectives

From a North Shore Pilot Corridor Study perspective, the objectives for Metro Vancouver were to:

1. Test new approaches to collaboratively integrate land use and transportation planning across multiple jurisdictions;
2. Support the policy review and enhancement of Frequent Transit Development Areas by monitoring the full corridor between the FTDAs and Urban Centres along the frequent transit network; and
3. Support municipalities in achieving *Metro 2040* objectives by identifying and monitoring a study area buffering the new frequent transit route.

For the Marine Main Frequent Transit Corridor, the study objectives were to:

1. Advance and align high-level service with local, sub-regional, and regional plans, strategies, initiatives;
2. Identify a sketch-level transit service design concept for the corridor;
3. Outline general service and corridor design needs and actions required to support implementation and operation;
4. Define a priority development corridor – buffer around right of way to support ongoing analysis/monitoring; and
5. Identify general growth management, housing, transportation targets and analyze development capacity.

3 Study Process

Study Phases

The study had three phases. The findings and outcomes of each phase are described in Section 5.

Figure 1: The place-based approach was highly collaborative, drawing on local knowledge of transit influencers and neighborhood plans.

Phase 1: Study Area Definition and Policy Context - to collaboratively define the Frequent Transit Corridor geography, influencers, baseline, and planned conditions. This task was led by Metro Vancouver and included the development of a draft study area and supporting maps identifying influencers and pedestrian and cycling networks, which demonstrate the full land use context of the corridor. As the study progressed, the study area boundary was refined; the final revised study area map is shown in Figure 3.

Phase 2: Transit Service Design and Frequent Transit Corridor Concept - to assess corridor needs; create a high-level ridership demand forecast focused on determining ridership potential; identify and evaluate feasible service design options; identify a preferred transit concept; and identify high-level service, corridor design, and phasing considerations. This task was led by consulting firm Steer Davies Gleave (SDG), a recognized expert in developing plans for intensified transit services.

Phase 3: Corridor Monitoring - to confirm the corridor geography and key metrics, outcomes, and process for monitoring growth, land use changes and performance over time. Monitoring land use characteristics in this corridor will allow local governments and Metro Vancouver to observe and measure how land use policies can be effective in supporting transit ridership as well as other shared objectives of building complete, compact communities. The monitoring program (Attachment 2) includes a suite of measures such as housing type, tenure type, employment type, mode share, and walkability index score among others. By monitoring these indicators, local governments will have the data inputs they need to adjust their policies to better support livability and ridership along the corridor.

The monitoring program also helps Metro Vancouver to explore a corridor connecting Urban Centres and FTDAs as part of an ongoing policy review of *Metro 2040*'s Urban Centres and FTDAs. The corridor study area map was confirmed by the partners during the development of the monitoring program and will be used for ordering custom census data (Figure 3). While Metro Vancouver already monitors the performance of Urban Centres and FTDAs, this new geography enables monitoring along the whole corridor. The monitoring program will provide municipalities with data to assess how their Official Community Plans and other land use policies are setting them up for success in achieving our collective regional growth strategy objectives. This approach enables collective responsibility of for performance monitoring in a location where local governments need to work together to coordinate policies to achieve a shared vision for the corridor.

Process Timeline

The study started in early 2016. Phase 1 involved a series of workshops with municipal staff conducted between February and November 2016. The SDG report was completed in January 2017 (Marine-Main Background Review) and April 2017 (Marine-Main Corridor Technical Study). The definition of the Corridor Monitoring Program Plan (Attachment 2) was developed in the summer of 2017 and will be the ongoing responsibility of Metro Vancouver to conduct and report out on every 5 years with annual updates covering a selection of the measures. The study area map was also refined collaboratively in the summer of 2017 (Figure 3). At the conclusion of the study, Metro Vancouver undertook a brief process evaluation exercise involving interviews with study participants to identify how the multi-jurisdictional corridor planning process could be improved for future corridor studies. The findings and outcomes of these activities are detailed in the following sections.

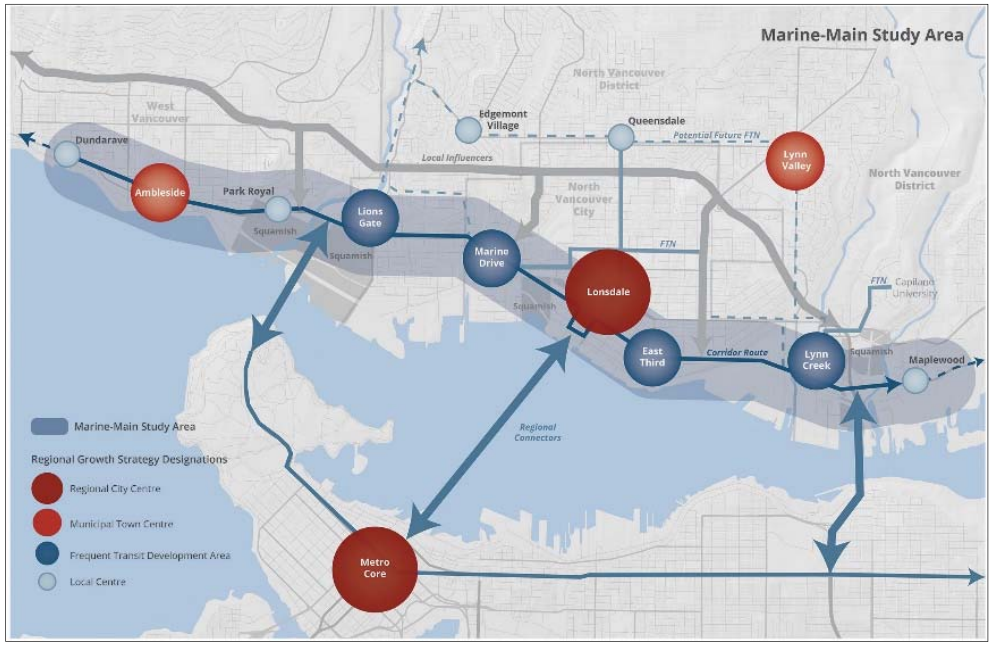


Figure 2: Stylized Marine-Main Study Area Map from early in the process

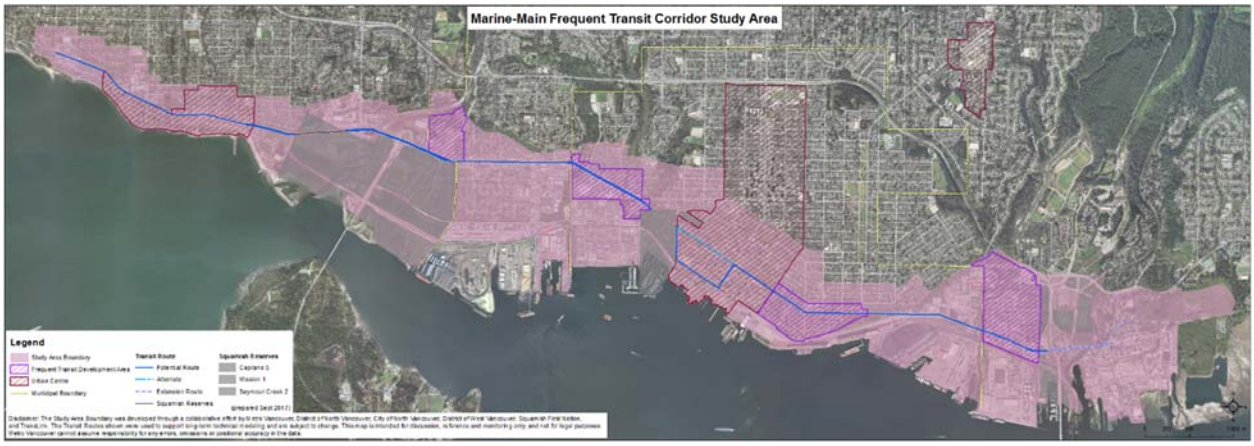


Figure 3: Marine-Main Finalized Study Area Map to be used for monitoring purposes (Larger version in Attachment 1)

4 Study Outcomes and Findings

The findings of the study are divided into three sections:

1. The Frequent Transit Concept Outcomes and Findings (Phase 2)
2. The Transit-Supportive Land Use Planning Outcomes and Findings (Phases 1 and 3)
3. Multi-Jurisdictional Corridor Planning Process Outcomes and Findings (process evaluation)

Frequent Transit Concept Outcomes and Findings

Project Outcomes

Phase 2 of the study provided a technical analysis of the effectiveness of a long list of higher-capacity transit service level options. To assess the ridership potential of the corridor and inform the development of evaluation options the consultant conducted a transportation demand forecast exercise using the Phase 2.0 TransLink Regional Transportation Model (RTM). Assumptions were made so as a *best-case* ridership (ridership potential) could be found with projected short/medium-term population and employment growth, based on growth projected and planned for in the communities' Official Community Plans.

Using a Multiple Accounts Analysis framework, the consultant assessed how different transit service levels would perform against a series of criteria. Based on their analysis, the consultant concluded that the service level the corridor could most likely support looking out to 2030 would be a 'BRT Light' meaning a bus rapid transit service characterized by high-frequency, dedicated stops, on-stop ticketing, high-quality stop amenities, branded vehicles and stops, and improved overall journey time. To achieve the journey time improvements, the consultant recommended the use of lane segregation and transit signal priority measures where feasible. Level-entry all-door boarding with raised curbing would also support improvements to journey time.

Figure 4: High quality stop amenities improve customer experience.

The B-Line commitment and implementation scheduled for 2019 is a significant step toward this longer term potential.

The consultant's technical analysis emphasized the importance of journey time improvements, stop amenity improvements, and integration with Lonsdale Quay and SeaBus, a major destination for a large proportion of anticipated riders who wish to connect with the rest of the Frequent Transit Network (FTN). Integration with other routes makes it easier for customers to make connections, expanding the number of possible destinations available to North Shore riders. Journey time and frequency improvements will support this integration with SeaBus and other connections to the FTN. The added frequency gives the user more flexibility in their schedule - making it simpler for riders to connect seamlessly with other routes without having to rely on a timetable. The improvement in end-to-end journey time will make it faster and more efficient for riders to travel east-west, shaving time off their entire trip – whether they are connecting to other services or not. Providing a higher quality customer environment that is consistent across the

corridor including stop amenities like bus shelters, benches, and customer information makes transit a more comfortable option for riders. These service design elements are important considerations for the North Shore partners.

Phased Implementation Approach

As transit service evolves and ridership grows, investment in these elements would need to intensify; as such, the consultant recommends a phasing strategy for intensifying the degree of right-of-way segregation and service quality over time. The plan also suggests starting with a shorter route and building in extensions to cover a greater area in the longer term as communities to the east grow and densify. Ongoing dialogue and coordination among partner agencies throughout implementation will support the collective vision and ensure that decisions do not impede the long-term performance of this shared corridor.

Transit Findings

1. **Protecting Right-of-Way Width:** Lane segregation requires road right-of-way that is wide enough to separate a lane - or sections of lanes - for transit and other high-occupancy vehicles, leaving less right-of-way for single occupancy vehicles, parking, and other street uses. This is why protecting a wide right-of-way along significant corridors is important in the long run. The *Marine-Main Frequent Transit Corridor Study* helped to illustrate this, encouraging study partners to think about coordinating right-of-way width objectives across the corridor. The study provided an opportunity for local governments to discuss the option to coordinate right-of-way width protection through land-use policy such as setback and parking standards.

Figure 5: Improved frequency, lane segregation, transit priority, and stop amenities can enhance customer experience of bus-based frequent transit.

2. **Service Level:** The study found that, by 2030, the corridor could support a high-frequency bus-based service level, phasing up gradually to a BRT-Light service level. While the implementation of BRT-Light will have some community impact, the planned growth along the corridor is unlikely to warrant the very high level of community impact that a rail-based service would require.

3. **Planned Growth/ Density can be Complemented by TDM:** The identified service level (BRT Light) was projected to have an ultimate capacity utilization of 20-23%, leaving considerable capacity unutilized. Additional Transportation Demand Management (TDM) efforts will help boost ridership by helping to shift the transit mode share, potentially accelerating the ability

to improve service levels. More on how TDM strategies can help grow transit mode share can be found in Appendix C.

4. **Frequency, Connectivity, and Reliability:** can improve customer experience (and therefore ridership) without scaling fully up from bus to rail technology. Lane segregation, transit signal prioritization, and all-door boarding will all improve a bus-based service's journey time and reliability – helping the buses to run on time and get customers to their destinations faster. Added frequency on bus routes allows riders to "hop on and hop off" without needing a timetable. Connectivity improvements to the pedestrian and bike network make it easier and more comfortable for riders to access the service. Improvements to these features can help a bus-based service feel more like a rail-based service without the high cost and community impact.

5. **The Importance of Priority and Segregation:** Since at-grade transit can only move at the pace of the traffic around it, strategies to create segregated lanes for transit and high-occupancy vehicles can improve total transit trip times significantly – making it a more attractive choice for potential riders. Signal priority gives transit vehicles the right to go first at an intersection. Priority and segregation strategies help transit vehicles to run on time, allowing riders to travel at a rate that is competitive with single-occupancy vehicles. Priority and segregation are also hallmarks of higher-order transit modes so these strategies must be built in to the community's transportation and land use plans in advance in order to scale up service levels in the future.

Transit-Supportive Land Use Planning Outcomes and Findings

Figure 6: Transit Signal Priority and Transit Lane Segregation help to improve journey time, avoid "bus bunching," and make transit a competitive alternative to single occupancy vehicles.

In addition to helping the study partners identify a service level the corridor could support in the long term, the study also aimed to help the partners coordinate and understand additional land use actions that would support the future frequent transit service. Although growth and density is an important part of this equation, the study encouraged partners to think beyond the density-ridership relationship and consider other important factors that influence the performance of the corridor such as lane segregation, signal prioritization, right-of-way setbacks, housing and employment mix, affordability, and other elements of a transit-supportive complete community. It has also encouraged partners to consider how corridor performance from a ridership perspective supports complete communities and other *Metro 2040* goals across boundaries.

Land Use Outcomes

Marine-Main Monitoring Program: Hard transit infrastructure creates certainty in the market which spurs development. This effect is easily seen in redevelopment in the areas around SkyTrain stations. The establishment of high-frequency bus transit along the Marine-Main corridor, in conjunction with the municipalities' OCPs and neighborhood plans, will likely continue to fuel the redevelopment activity taking place along that corridor and may augment it.

It is important to monitor the redevelopment process so that municipalities can understand how their land use policies and transportation plans are manifesting on the ground. Good quality data at the corridor level will give municipalities the feedback they need to adjust their policies to ensure their vision for the corridor is achieved. Recognizing that performance measurement programs influence mode choice, the monitoring program has been developed in collaboration with the project partners to consider 'people moving capacity' instead of traditional measures of traffic or vehicle congestion (ie: Level of Service). The monitoring program benefits the region by providing the opportunity to test corridors as a tool for targeting regional growth and the opportunity to collectively monitor progress towards the shared regional vision as expressed in *Metro 2040*.

Metro Vancouver developed a Monitoring Program with study partners that identifies a list of measures to be monitored at the corridor level (Attachment 2). The Monitoring Program includes the corridor study area, a list of measures (Table 1) and a timeline for data collection and reporting.

Table 1: Marine-Main Monitoring Program Indicator Logic Model

Marine-Main *Metro 2040* Monitoring Program Logic Model				
Inputs	Measures (Key Performance Indicators)			
	Activities	**Outputs**	**Outcomes**	**Impact**
Resources Needed	How resources will be used	Units of service resulting from activities	Changed conditions for project partners	Changes in communities/ systems
• *Metro 2040* • Regional Transportation Plan • North Shore Area Transportation Plan • 10 Year Vision • 10 Year Vision Phase 1 funding • SDG Technical Report	• B-Line frequency • B-Line trip time • B-Line span • Land use designation change • Transit-Supportive Housing Policies	• B-Line Daily ridership • B-Line Peak ridership • Dwelling unit growth* • Dwelling Unit Density • Population growth • Employment growth • Retail Development • Office Development • Housing Tenure Mix • Housing Type Mix • Kilometres of bike facility • Employment Types	• B-Line Capacity utilized • Housing + Transportation cost burden • Annual VKT per capita • Population Distribution by Age Group • Household Make-up • Walkability Index • Customer Satisfaction	• Mode share • Percent of regional dwelling unit growth located in corridor • Percent of sub-regional employment growth located in corridor • Income

Study partners have indicated that the monitoring data will be useful for tracking the implementation of OCPs in relation to the corridor. The corridor monitoring program will also support Metro Vancouver's evaluation of how better to integrate complete corridors into regional planning and monitoring. This information is intended to feed into the Metro 2040 Urban Centres and FTDA Policy Review.

Data will be provided by Metro Vancouver, TransLink, and in some cases, partner jurisdictions. Metro Vancouver will take the lead on gathering, analysing, and distributing the data collected. Most of the information will come from a custom census geography, designed to match the Study Area Map (Attachment 1).

Land Use Findings

1. **Value of Monitoring Program:** One of the findings of the *Marine-Main Frequent Transit Corridor Study* is that a monitoring program would be of value to both municipalities and Metro Vancouver. Although the program has not yet begun, staff have stated that the monitoring program will support performance evaluations of Official Community Plans. Metro Vancouver will monitor the corridor for changes in key performance indicators as it will support the implementation of *Metro 2040*. All study partners agree that the monitoring program will support land use and transportation policy and service improvements to the corridor as a whole.

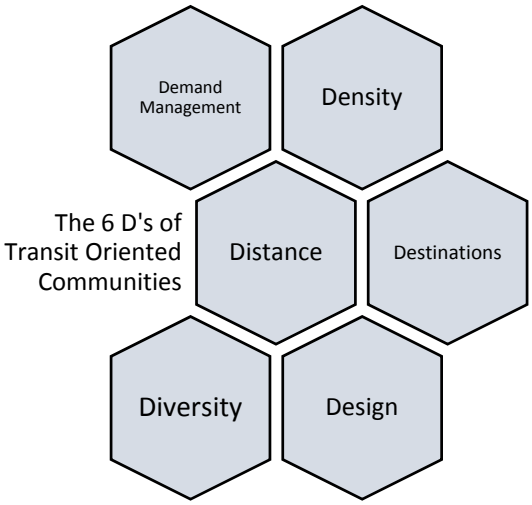


*Figure 7: Two of **any** of the 6 Ds in **combination** is more important for ridership performance than Density alone.*

2. **Building Complete Communities:** The study provided an opportunity for partners to showcase their considerable efforts to build complete and transit-supportive communities, and align local policies and plans with the shared goals of *Metro 2040*. The complete community policies and plans developed by the communities will help support future transit investment while also making the corridor a great place to live and work. This includes aligning multi-modal network plans, considering corridor right-of-way width, planning for housing diversity, siting of major trip generators, and parking demand management strategies.

3. **Planned Growth Supports Bus-based Frequent Transit:** The *Marine-Main Frequent Transit Corridor Study* affirmed that there was strong, compact growth and density planned for the corridor that will support the implementation of a frequent transit service. However, the consultant's projections revealed that while that planned density would contribute to building a ridership base that would support frequent transit, it may not be sufficient to warrant a rail-based service. Given the high degree of community impact that rail-based

service implies, a phased BRT-Light service level is a more supportable service level for this corridor.

4. **Density and Beyond:** One of the significant findings of the study has been the affirmation that density alone is often not sufficient to create the conditions to support higher order transit and create complete communities. While it is well known that density is an important foundation for building the ridership needed to support higher-order transit, there are other contributing factors to strong transit ridership that must also be built into community and land use planning. These factor include the "6 Ds" of Transit Oriented Communities: Destinations, Distance, Design, Density, Diversity, and Demand Management. In established rapidly growing areas, changes in land use (i.e. increasing density) is not the only lever to improve transit ridership – and in some cases is a lesser important mechanism. In fact, often having any 2 of the 6 Ds often proves to be more important than Density alone. Put another way, it isn't sufficient to grow the pool of potential riders, the proportion of residents choosing transit must also grow. By incorporating the 6 Ds into the neighborhood planning process along the corridor, the municipalities can increase the likelihood that the new service will have strong ridership as soon as it is implemented, thereby setting the partners up for success at the corridor evolves to a higher-order transit mode.

Figure 8: Given the importance of right-of-way for lane segregation, the decisions we make about building setbacks today will influence what transit service levels will be possible in the future.

5. **Corridor Studies Support *Metro 2040*:** The study has revealed ways in which the partners can further *Metro 2040* strategies to provide diverse and affordable housing choices and to develop healthy and complete communities with access to a range of services and amenities. Directing growth to a diversity of housing types along frequent transit corridors like the Marine-Main corridor increases the number of transit-proximate housing opportunities for families. Thoughtfully siting key destinations like employers, shopping, schools, and institutions close to frequent transit corridors increases the number of transit-proximate workplaces and amenities that people can access. These efforts support affordability because when more people can do most of their day-to-day travel using transit they save on the costs of owning a car. Consideration of distance and planning for multi-modal travel in the corridor supports community health outcomes by increasing opportunities for active transportation. Demand management strategies support local businesses in the corridor by making the most efficient use of limited parking and roadway space (more on this in Appendix C).

Process Outcomes and Findings

The study partners have long sought to coordinate land use and transportation planning on the North Shore. This corridor study strengthened collaboration even further. The study process was co-designed by the partners with the intention of creating an opportunity for high levels of inter-agency, inter-jurisdictional, and inter-disciplinary dialogue and cooperation. The three-phase process (Study Area Definition and Policy Context, Transit Service Design and Frequent Transit Corridor Concept, Corridor Monitoring) was a place-based approach intended to address the complexity of this specific corridor in the long-term. To evaluate this process itself, Metro Vancouver staff conducted evaluation interviews with participants over the summer of 2017. The evaluation exercise revealed some important outcomes, general findings, and opportunities for improvement should the corridor process be applied to future projects.

Process Outcomes

Relationships and Dependencies: One of the most important outcomes of the study is the strengthened relationship between the municipalities and with the regional agencies. Staff communicated that working together and sharing land use and transportation plans and challenges has deepened trust and strengthened lines of communication among participants. Since the inception of this process, a new North Shore Staff Transportation Committee has been struck to discuss transportation matters of common interest and importance.

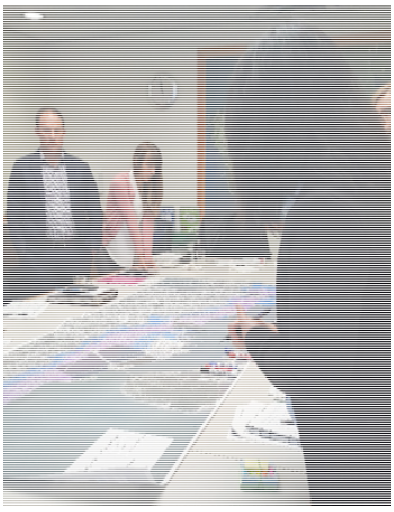


Figure 9: For the frequent transit service to be successful partners needed to recognize the significant land use dependencies between jurisdictions.

Each municipality came to the study table with different ambitions and constraints around density, transit, and traffic mitigation. This made achieving agreement difficult at times, but helped broaden perspectives. The process helped staff see the interdependencies among them when it comes to achieving community ambitions. Partnership, it became clear, is the most effective way forward. Early recognition and communication of the dependencies among jurisdictions to achieve high transit service levels will encourage compromise and creative problem-solving in future studies.

Municipalities are Planning Across Boundaries: Understanding the importance of right-of-way has helped staff continue to consider how they can collectively protect road right-of-way across boundaries to ensure that it will be provide adequate lane segregation to accommodate fast, frequent at-grade transit.

Interdisciplinary Collaboration: The Marine-Main Frequent Transit Corridor study was a forum for engineers, transportation planners, land use planners, and regional planners to come together to share perspectives and learn from each other. Some municipal and regional land use planning staff reported that they appreciated learning more about transit planning and operations. Learning about

what makes frequent transit work in terms of stop amenities, frequency, and travel time was a valuable outcome for many staff who may not regularly engage with public transportation planning. These interdisciplinary perspectives will support the implementation of the Marine-Main B-Line, but will also help to foster a continued integrated approach to land-use and transportation planning. The study complemented regional coordination activities by bringing together staff with different subject matter expertise. The value of bringing staff from different departments and from different jurisdictions together is a significant success of the study.

A Path Towards Implementation: The study is provided a useful and tangible outcome that municipal staff can work from to inform departmental plans and thinking. Although the report was exploratory, it did help to narrow down achievable options and will help broker further conversation about collaborative implementation. It also emphasized the importance of segregation and transit vehicle signal prioritization – breaking down the needs and options by corridor section, showing what kind of speed and reliability improvements could be found at which portions of the corridor.

Figure 10: SDG's growth projections indicated that future ridership would not support the implementation of rail-based frequent transit but would support a high-frequency bus-based service.

Metro Vancouver's Role: Participants expressed that Metro Vancouver's value to the process complemented TransLink's transit-provision and planning role and was most prevalent through convening and facilitation across jurisdictions, assessing land use policy alignment, and performance monitoring. It was felt that Metro Vancouver helped bridge the gap between what is happening at the neighborhood and municipal planning scale and what is happening at the sub-regional, regional, and inter-regional level and enabled a clear intent to integrate land use and transportation for the study from the outset.

Process Findings

Two-Projects in One: The *Marine-Main Frequent Transit Corridor Study* had a dual purpose. On one hand, study partners were planning for the near-term, stitching together FTDAs and Urban Centres to create a cohesive system around the Marine-Main corridor to support a B-Line in the near term. They were also interested in exploring the long-term feasibility of different transit service levels given planned growth.

Figure 11: Corridor studies support transit improvements and complete community objectives even before funding is committed.

Metro Vancouver was also seeking to explore how to better integrate corridors into regional planning and monitoring,

particularly for corridors that stretch across jurisdictional boundaries. Piloting corridors also supports Metro Vancouver's Urban Centres and FTDA Policy Review.

This dual purpose for the study needs to be kept in mind for future corridor studies.

Corridor Studies Are Valuable, Even Prior to Funding Confirmation: The study was undertaken in part to advance work that had culminated in the North Shore Area Transit Plan. Partners wanted to improve their readiness for possible funding by advancing a transit service concept for the corridor, and to better understand the potential for different service levels. Therefore, when the funding for Phase 1 of the 10-Year Mayors' Vision was announced, the partners were more advanced and ready to plan and implement the B-Line for 2019, and are also thinking longer term out to 2030 as they do so.

Value Proposition: Metro Vancouver struggled to identify and establish the value proposition for active municipal participation in the study, delaying its initiation. A more substantial land-use analysis component to the consultant's modelling scope would have helped to clarify Metro Vancouver's growth management role in a corridor study.

Build-In TDM Elements at the Outset: The value of transportation demand management strategies to build the ridership necessary to warrant higher order transit service emerged later in the process revealing itself to be critical to the evolution of a high-capacity transit corridor. In future studies, the exploration of TDM opportunities will be built in earlier in the process, so they can be fully understood and considered throughout the process.

5 Next Steps

Transit Service Implementation

The study provides a framework for development of transit service along the corridor into the future, and work has already begun to prepare for implementation of B-Line service in 2019. Implementation will build upon and extend the ongoing collaboration of project partners involved in the study. The next steps toward service design and deployment will require consideration of the trade-offs involved in service design and development – including service quality, reliability and speed, streetscape right-of-way allocation, impacts on other street users, cost, and more. There is the potential for some investment in transit priority enhancements in 2019, for which funds have been identified regionally in *The 2017 Investment Plan – Phase I of the Mayors' Council Plan (2016)*; implementing these effectively will require collaboration among TransLink, local governments, and other stakeholders.

Monitoring Program

Metro Vancouver is leading efforts to monitor growth and development prior to and following the 2019 B-Line implementation (Attachment 2). Working in collaboration with local governments, a clear, replicable geography has been identified and measures have been selected for ongoing monitoring (Attachment 1). Metro Vancouver will request a custom census run to provide data required to better understand the effectiveness of corridor transportation and land use planning and provide early feedback to the communities on policy and plan performance. The monitoring work will also support Metro Vancouver's policy review of Urban Centres and FTDAs.

Integration with the Urban Centres and FTDA Policy Review

Metro Vancouver's Urban Centres and FTDA Policy Review is an ongoing initiative to review and enhance the region's growth structuring tools and associated policies. The findings from this study are an important input for the policy review, helping Metro Vancouver to understand the potential for more effectively integrating corridors into regional planning and monitoring.

Continuing and Strengthening the Partnership

The interdependencies among the study partners remain critical to the long-term success of the Marine-Main frequent transit corridor. Creating ongoing opportunities for partners to share information and coordinate land use and transportation planning and engineering will go a long way to optimizing the corridor's performance. The study is a promising model for how communities can collectively share responsibility to realize the vision of a corridor where residents can live, work, play, and move efficiently and sustainably.

6 Conclusion

Working together, TransLink, Metro Vancouver, the City of North Vancouver, North Vancouver District, and West Vancouver District, the Squamish First Nation, and the BC Ministry of Transportation and Infrastructure undertook a collaborative corridor study to coordinate the planning and design for land use, growth, and transit along the Marine Drive-Main Street corridor. The partners wanted to identify a high level transit service concept to understand what could be achieved given planned growth. They also wanted to gain an understanding of what actions would need to be taken to prepare for improved transit service on that corridor. All parties were eager to identify strategies that would help improve land use and transit performance across the several jurisdictions. By stitching together a network of 2 Urban Centres and 4 Frequent Transit Development Areas into a corridor study area, the land use elements that support transit ridership and frequency – as well as general livability – can now be monitored, assessed, and enhanced. The study also piloted a multi-jurisdictional approach of better coordinating long-range land use and transportation across jurisdiction boundaries.

The study had three phases: study area definition, transit service design and the development of a frequent transit corridor concept, and the development of a corridor monitoring program. This study was important for the region as it sought to highly coordinate land use and transportation planning across municipal boundaries, necessitating strong inter-agency and inter-disciplinary cooperation. The study asked partners to think long-term in a consistent way regardless of planning horizons at play within each community. In addition, the study has encouraged partners to think beyond the density-ridership relationship and consider other important factors that influence the performance of the corridor such as right-of-way setbacks, parking standards, housing and employment mix, housing tenure, affordability, and other indicators of a transit-oriented, complete community.

The consultant's analysis suggested that by 2030, planned and projected growth on the corridor could support a "BRT Light" transit service level, characterized by high-frequency bus that utilizes lane segregation, transit signal priority, and high-quality stop amenities to improve journey time and customer experience. The consultant recommended phasing up to BRT-Light by the year 2030. Growth along the corridor is unlikely to warrant the high level of community impact that a rail-based service would require. Further, the study found that the projected capacity utilization of all service levels studied was such that additional Transportation Demand Management (TDM) strategies are advisable to build the ridership necessary to ensure a high performing transit route. The consultant recommended a number of TDM strategies that will help grow ridership, support mode shift, and contribute to achieving *Metro 2040*'s other complete community objectives. In addition, many of Metro Vancouver's other policy research initiatives will provide guidance on supporting TDM in this corridor including the 2017 Apartment Parking Study and the Transit-Oriented Affordable Housing Study.

This study was an important pilot study for the region because it tested a corridor process – that was inter-jurisdictional and inter-disciplinary - bringing people together, improving lines of

communication, and highlighting the dependencies among organizations. Transit planners learned more about the complexities of community land use planning. Land use planners learned more about planning for transit service and TDM. Regional agency planners deepened their understanding of the local context and municipal staff began to take on more of a sub-regional perspective. Future B-Line implementation projects may consider the lessons from this study when planning future corridor projects.

In addition to helping ready the jurisdictions for the implementation of new frequent transit investment, the study is allowing Metro Vancouver to better utilize and integrate corridor geographies into planning and monitoring. The corridor geography defined as the catchment area around the transit route will be monitored, helping local governments guide their land use policies to connect across boundaries and help support the creation of smart, healthy, transit-supportive, and complete communities.

7 Appendix A: Policy Background Metro Vancouver Growth Structuring Tools

Urban Centres:

Metro 2040's Urban Centres are intended to be the region's primary focal points for concentrated growth and transit service. They are priority locations for employment and services, higher density housing, and amenities. For many years Metro Vancouver has worked with municipalities to use Urban Centres to direct growth to optimal areas. There are two kinds of Urban Centres: Regional City Centres, and Municipal Town Centres. Municipalities identify Urban Centres in collaboration with Metro Vancouver in their Regional Context Statements. *Metro 2040* targets 40% of Metro Vancouver dwelling unit growth and 50% of employment growth to 2040 to the network of 26 Urban Centres.

Frequent Transit Development Areas (FTDAs):

Frequent Transit Development Areas are additional priority locations to accommodate concentrated growth in higher density forms of development along TransLink's Frequent Transit Network. *Metro 2040* targets 28% of Metro Vancouver's dwelling unit growth and 27% of employment growth to 2040 to FTDAs.

Corridors: Structuring growth along the FTN, across municipal boundaries

Investment in frequent transit can naturally stimulate the development of higher density, complete communities along the length of a corridor. Moreover, that development often stretches across municipal boundaries. Recognizing this, Metro Vancouver is continuing to explore how better to integrate corridors into planning, policy and monitoring to support collective objectives of growing in sustainable way. Structuring growth along corridors also supports complete communities because more day-to-day destinations are "on-the-way," helping residents save time and money by reducing reliance on personal vehicles.

8 Appendix B: Corridor Studies Support the Implementation of *Metro 2040*

Project for Public Spaces defines a corridor as, "a multi-modal transportation network, knit together around a major transportation facility, such as a road or rail line. It encompasses all the surrounding land uses. A corridor links places together like pearls on a necklace."[1] According to Project for Public Spaces, successful corridors exhibit the following attributes:

1. They promote communities' long term goals
2. They offer a variety of land uses
3. They offer a diverse and connected network of transportation choices
4. They provide community destinations
5. They incorporate the vision of communities

While many jurisdictions around the world are working to integrate land use and transportation planning through corridor planning, the Marine-Main corridor study process was developed locally due to the unique governance structure in the region. Corridor studies are of particular interest to Metro Vancouver because they support the implementation of *Metro 2040* in the following ways:

Frequent Transit Corridors are a good place to grow: with 1 million people moving to Metro Vancouver in the next 30 years, it is important to direct growth strategically so that additional people can be accommodated while minimizing sprawling urban development and traffic congestion. Growing along frequent transit corridors optimizes public infrastructure like roadways, bus service, and multi-use pathways by avoiding costly and inefficient branching and deviations. Growing along frequent transit corridors also helps to create great places to live. At the moment Metro Vancouver monitors growth in Urban Centres and FTDAs. Metro Vancouver recognizes that growth may be occurring in transit-oriented locations outside of designated FTDAs and Urban Centres.

> *"A corridor links places together like pearls on a necklace."*
>
> -Great Corridors, Great Communities, Project for Public Spaces

Corridor Planning Supports Local Government Efforts to Focus Growth in Urban Centres and FTDAs: Corridor studies, in conjunction with the implementation of frequent transit, complement municipal efforts to, "encourage office development" (*Metro 2040*, 1.2.6.b.iii), "establish or maintain reduced residential and commercial parking requirements in Urban Centres" (*Metro 2040*, 1.2.6.b.iv) and, "encourage infill development" (*Metro 2040*, 1.2.6.d.v). The provision of compact, complete communities and high frequency transit that is competitive with personal vehicles will make it easier for municipalities to attract office development, reduce parking requirements, and encourage infill

[1] "Great Corridors, Great Communities: The Quiet Revolution in Transportation Planning" Project for Public Spaces, 2008

because skilled workers will want to work there and because businesses will want to relocate there and will be willing to reduce their on-site parking.

Figure 13: With less space dedicated to the storage of personal vehicles, more space can be dedicated to other uses like housing, offices, and shops - bringing everything closer together.

Corridor Planning Supports Economic Development: Developing compact communities and frequent transit along a multi-jurisdictional corridor supports *Metro 2040* Goal 2: "Support a Sustainable Economy." Reducing the number of single-occupancy vehicles and the amount of traffic congestion travelling through a sub-region saves companies money and time in transporting their goods and delivering their services. It also reduces commute time and cost, helping to attract and retain skilled workers. By making transit, walking, and biking competitive with single-occupancy vehicles, there will be less demand for costly employee and customer parking. For industry, a high-frequency transit corridor gets drivers off the highway, improving commercial trucking efficiencies. Corridor studies also support infill and multi-family development, thereby reducing pressure to build housing on scarce industrial lands – supporting *Metro 2040* Strategy 2.2 "Protect the supply of industrial land."

Corridors are Good for the Environment: By supporting the growth of compact mixed-use transit-oriented communities in centres and transit corridors, corridors support Metro Vancouver's Strategy 3.3: "Encourage land use and transportation infrastructure that reduce energy consumption and greenhouse gas emissions, and improve air quality as well as Metro Vancouver's regional targets to reduce greenhouse gas emissions by 33 percent below 2007 levels by 2020." Corridor studies also supports municipal responsibility to identify policies and programs that reduce energy consumption and greenhouse gas emissions and improve air quality through, "community design and facility provision that encourages transit, cycling, and walking" (3.3.4.b).

Corridor Planning Supports Complete Communities: By planning at the corridor level, municipalities are supported in their *Metro 2040* activities of developing, "compact, mixed use, transit, cycling and walking oriented communities," (4.2.4.a) and locating, "community, arts, cultural, recreational, institutional, medical/health, social service, education facilities and affordable housing development in Urban Centres or areas with good access to transit" (4.2.4.b).

Corridor planning supports Goal 1 of *Metro 2040*: "Create a Compact Urban Area" by allowing more residents to do most of their day-to-day travel by foot, bike, or bus - making it easier to go car-free. Without as many cars to park commercial parking requirements can be smaller. With less space being taken up by the storage of personal vehicles, more space can be dedicated to other uses like housing, retail, office, and amenities - bringing everything closer together.

Planning for a consistent public realm and high quality transit service across municipalities and First Nation territories improves connectivity across the sub-region, uniting communities, and enhancing opportunities for the people living along the corridor. A high-quality multi-modal corridor makes it fast and affordable for people to travel to neighboring urban centres to work, shop, participate in cultural life, meet friends, and access community services. This reduces isolation and improves equity – supporting the implementation of *Metro 2040* Goal 4: "Develop Complete Communities."

Developing complete communities along multi-modal corridors supports *Metro 2040* Strategy 4.2 to "develop healthy and complete communities," by making active transportation more accessible to more people. The health benefits of an active lifestyle are well-documented, and by making neighborhoods more walkable and bikeable communities can help more people access those health benefits. For most people a transit trip is an, "interrupted walk," which means that with more people choosing to take high frequency transit instead of driving, more people will also be walking more. Improving walking and biking infrastructure along the corridor will make active transportation more comfortable, and reduce the risk of crash-related injury or death. Furthermore, the compact mixed-use development patterns enabled by corridor planning improves casual surveillance of the public realm, thereby reducing personal security risks of those who choose to walk or bike and supporting the implementation of *Metro 2040* Strategy 5.2, "coordinate land use and transportation to support the safe and efficient movement of vehicles for passengers, goods, and services." Finally, high frequency traffic and compact development mean fewer people need to drive, improving air quality which also benefits health.

Corridor Planning Supports Affordability: Corridor planning supports *Metro 2040* Strategy 4.1 "Provide diverse and affordable housing choices." With better transit, more people can travel without owning personal vehicles. This reduces the household transportation costs by providing savings on financing, depreciation, gas, insurance, and registration (estimated as an average of $10,000 a year by the Canadian Auto Association). It also allows municipalities to reduce or eliminate residential parking minimums, making housing units less expensive to build (saving approximately $20,000-45,000 per structured parking space, Metro Vancouver, 2011). These savings may be passed along to the buyer or renter.

Corridor Planning Supports Housing Diversity: Projects for Public Spaces states that successful corridors, "offer a variety of land uses," and a, "range of housing choices, and retail stores that serve the local community as well as offices and accessible open space" (Great Corridors, Great Communities, p6-7). By building diversity into corridor plans, municipalities can support both *Metro 2040* Strategies 4.1 "Provide diverse and affordable housing choices" and 4.2 "Develop healthy and complete communities with access to a range of services and amenities," both of which emphasize diversity of options. Building a diversity of housing and commercial options means the corridor can meet the needs of more different kinds of

Figure 14: Phasing in a separated cycle track is one TDM strategy Seattle DOT and King County Metro are using to support the implementation of a new BRT-light service along the Roosevelt Corridor. The cycle track replaced one parking lane, rebalancing the road way to be more multi-modal and to improve non-motorized access to transit.

people and it makes the corridor more interesting, useful, and resilient to economic downturns. Offering a diversity of land uses along a corridor also supports ridership goals because people will have reasons to take transit along the corridor all day long, 7 days a week. This reduces peak time congestion, and avoids the risk of running empty buses during off-peak hours – making the route more resilient to budget-related service reductions.

Corridor Planning Supports Mode Shift: Planning at the corridor level considers the movement of people, not vehicles, through a multi-jurisdictional space. In doing so, it rebalances the roadway and attention paid to non-single occupancy (SOV) vehicle modes like transit, walking, and biking. By prioritizing and segregating non-SOV modes in the public right of way, more people will be motivated to change their travel behaviour –opting to walk, bike, carpool, or ride transit more often. This supports *Metro 2040* Strategy 5.1, "Coordinate land use and transportation to encourage transit, multiple-occupancy vehicles, cycling, and walking."

Figure 15: Since almost every transit trip is essentially an "interrupted walk," the more trips taken by transit, the healthier residents will be. Planning for walk and bike access to frequent transit corridors is critical to building ridership.

Corridor Planning Supports Equity: Frequent transit corridor planning expands the number of destinations any given resident can reach efficiently, regardless of income, ethnicity, gender, age, or ability. Prioritizing road space for single-occupancy drivers delivers mobility and the opportunities associated with mobility only to those who are eligible to drive and who can afford to own, operate, and store a personal vehicle. By contrast, prioritizing transit use of the roadway means that anyone who can ride the bus – regardless of age, ability, or income – has access to efficient mobility that respects their time and the opportunities that flow from that mobility. In the words of former commissioner of the New York City Department of Transportation, Jannette Sadik-Kahn, "the rebalancing of the street to favor the most efficient means of travel along it – in this case, buses – is the greatest form of transit equity" (Streetfight, 2016).

Figure 16: Re-prioritizing transit use of the roadway means that anyone who can ride the bus - regardless of age, income, or ability - has access to mobility.

9 Appendix C: Opportunities for Transportation Demand Management

The role that transportation demand management (TDM) strategies can play in improving ridership in conjunction with land use strategies was an important finding of this process. The partners came to understand that planned density along the corridor was necessary for strong ridership, but not necessarily sufficient to get the ridership required to move up to a higher-order transit service mode.

Figure 17: Transportation Demand Management (TDM) uses behaviour-change strategies to build ridership for new transit services.

Complementary TDM strategies the municipalities could consider along the corridor include:

- Parking management tactics help to right-size parking supply;
- Non-motorized access to transit improvements such as cycling and pedestrian safety and connectivity interventions to make transit an easier and safer choice;
- Incentives and other social marketing tactics to raise awareness and motivate change;
- Travel behaviour change campaigns such as motivational interviewing to help residents problem-solve their individual barriers to using transit;
- Employee transportation programs address peak-time traffic challenges;
- School travel planning helps to grow new transit riders from a young age;
- Research shows that certain demographics are more likely to make a mode choice change;
- Market segmentation can be used to identify potential residents;
- Focusing on converting non-commute trips (recreation, social, and errands) to transit or active modes can help grow off-peak transit ridership and strengthen all-day route performance;
- Strategize timing for transportation behavior change opportunities. For example, it can be difficult to convert drivers in established multi-family buildings once the habit has been formed, but TDM programs can be highly successful if they are established when a new multi-family building first opens or when residents first move in.

Growing for Ridership in the Long-Term: The study revealed many approaches that could be taken to build strong transit ridership in the long run. By focusing on mode shift away from single occupancy vehicles towards a multi-modal lifestyle, the chances of having strong transit route performance on the corridor are high. Moreover, the chances of having a complete community with a strong sense of place are even higher. Metro Vancouver's other policy research projects may have some applicability when it comes to directing growth with transit ridership in mind. Some ridership-building approaches include:

- In newly developing areas that are anticipated to see substantial growth, enabling appropriate density and developing a good multimodal network are first steps towards mode shift and establishing ridership, but it is also important to consider other policy levers in the long-term like parking requirements and affordability.
- Embrace "pain points" as opportunities to grow ridership through travel behavior change. Traffic congestion, construction impacts, and over-crowded parking lots, for example, are all opportunities to engage drivers in a travel behavior change programs.
- Employers have a strong influence on shifting mode share. Municipalities may consider working with employers, especially employers relocating to or expanding along the corridor, to help with employee commute options, cycling facilities, parking demand management, and other incentives to choosing to reduce drive-alone trips.

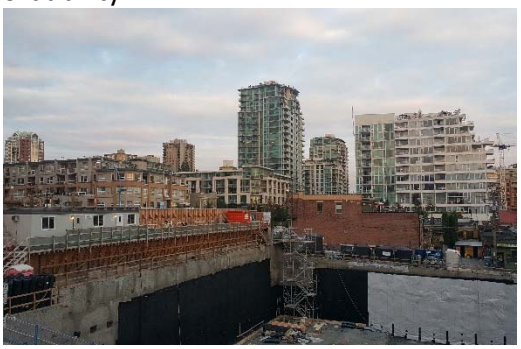
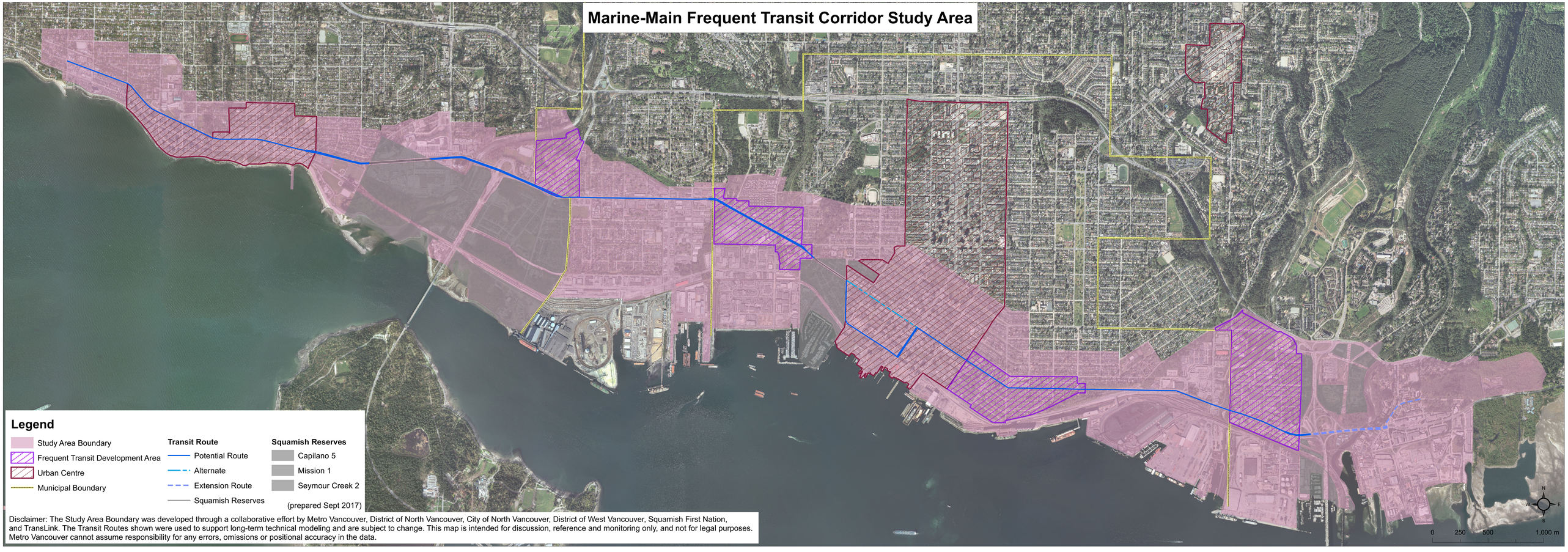


Figure 182: Growing for transit ridership includes right-sizing parking standards and considering the location of new affordable rental buildings.

- Metro Vancouver's 2017 Transit Oriented Affordable Housing Study (TOAH) has identified a number of findings about the relationship between tenure, income, and location as influencers to transit-supportive complete communities.
- The Metro Vancouver 2011 Apartment Parking Study identified the following opportunities for apartment parking near the Frequent Transit Network. These strategies may support transit ridership by removing the induced demand caused by the over-supply of parking:
    - Treat On-Site and Street Parking as a System: Attention should be paid to the availability, type, and relative permanence of street parking and surrounding land uses in association with any reductions to on-site parking requirements.
    - Encourage Parking Supply to Match Demand Near the Frequent Transit Network: The 2011 study found that residential parking supply in strata apartments generally exceeds observed parking demand by 18-35 percent.
    - Encourage Parking Unbundling/Opt-Out: Selling parking stalls separate from apartments or allowing consumers to opt out of a parking stall increases choice and improves housing affordability.
    - Encourage Rental Apartments Near the Frequent Transit Network: Apartment renters generally have lower parking demands than owners.
    - Encourage Expansion of Carshare Programs where Feasible: Municipalities can designate carshare parking spaces along the corridor and can encourage new apartment developments to include designated parking for carshare vehicles.
    - Consider Allowing Amendments to Parking Supply After Pre-Sales: By adapting municipal approval processes to accommodate amendments before construction, the parking efficiency of new apartment developments can be improved.
    - Conduct Regular Post-Occupancy Parking Surveys: Post-occupancy surveys of apartment projects can provide timely information on parking demand in recently-built and fully-occupied apartment developments.

Marine-Main Frequent Transit Corridor Study Area



Disclaimer: The Study Area Boundary was developed through a collaborative effort by Metro Vancouver, District of North Vancouver, City of North Vancouver, District of West Vancouver, Squamish First Nation, and TransLink. The Transit Routes shown were used to support long-term technical modeling and are subject to change. This map is intended for discussion, reference and monitoring only, and not for legal purposes. Metro Vancouver cannot assume responsibility for any errors, omissions or positional accuracy in the data.

Metro Vancouver Corridor Monitoring Program Plan:
Marine-Main Corridor

Introduction

Metro Vancouver is expanding and refining its growth structuring tools to include frequent transit corridors slated for transit service improvement in the 10 Year Vision for Metro Vancouver Transportation. Monitoring the land use change around new frequent transit service will support the integration of growth management and transit service provision across jurisdiction boundaries. The Marine-Main Monitoring Program will monitor and report out on key metrics tracked for the Marine-Main Corridor Study Area (Figure 1) which is slated for a new B-Line service to be delivered in 2019. This monitoring program will be expanded to other corridors.

Goals

There are three goals of the monitoring program:

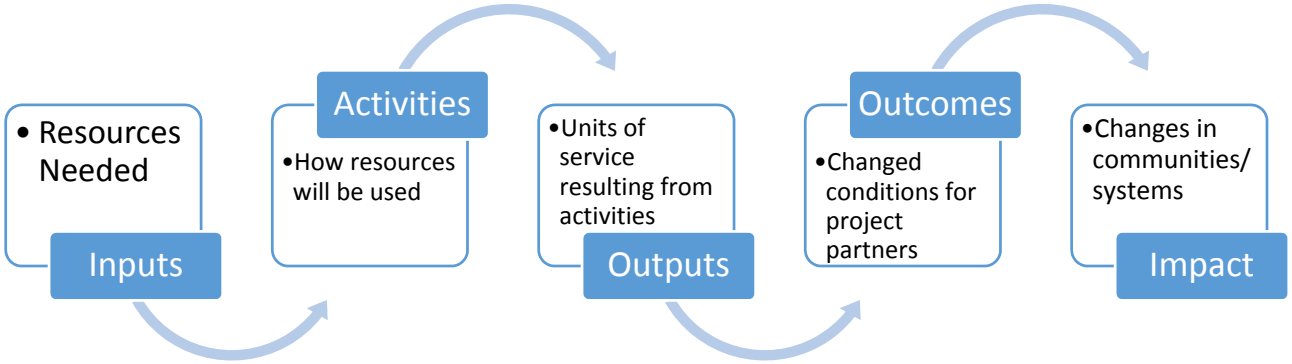
1. Test corridor-based land use and transportation planning and test corridors as a tool for targeting regional growth.
2. Provide data to help partner jurisdictions self-evaluate local policies that are geared towards creating complete, transit-supportive communities.
3. Collectively monitor progress towards the shared regional vision as expounded in Metro 2040.

Monitoring Plan Framework and F

A logic model is a framework for understanding the logical relationships between the current situation, the changes that may be brought about through time, the activities planned to contribute towards this change, the resources needed to put into the effort, and the long-term impact of those changes in the community. Recognizing that the goals listed above are broad, long-term, and are influenced by complex interactions, this monitoring program has selected a diverse list of available measures that represent the five components of achieving these goals: inputs, activities, outputs, outcomes, and impacts (Figure 2). These measures are listed under each component of the logic model in Table 1.

NOTE: the logic model should be interpreted as a high-level model of some of the causal relationships at play in long range growth management and transportation planning; there are many iterative processes and outside influencers not represented this model.

Figure 2: Logic Model



A full list of all measures that will be monitored can be found in Table 2. This list describes the measure, the unit and calculation method, the data source or owner, and collection frequency. It also includes information related to *Metro 2040*, indicating the *Metro 2040* policies associated with each measure. Where possible, the measures have been synched to the *Metro 2040* Performance Measurement program, using the same data sources, timeline, and methodology but reported at the corridor level. This is also indicated in Table 2.

Table 1: Logic Model Measures

Marine-Main *Metro 2040* Monitoring Program Logic Model				
Inputs	Measures			
	Activities	**Outputs**	**Outcomes**	**Impact**
Resources Needed	How resources will be used	Units of service resulting from activities	Changed conditions for project partners	Changes in communities/ systems
• *Metro 2040* • Regional Transportation Plan • North Shore Area Transportation Plan • 10 Year Vision • 10 Year Vision Phase 1 funding • SDG Technical Report	• B-Line frequency • B-Line trip time • B-Line span • Land use designation change • Transit-Supportive Housing Policies	• B-Line Daily ridership • B-Line Peak ridership • Dwelling unit growth* • Dwelling Unit Density • Population growth • Employment growth • Retail Development • Office Development • Housing Tenure Mix • Housing Type Mix • Kilometres of bike facility • Employment Types	• B-Line Capacity utilized • Housing + Transportation • Annual VKT per capita • Population Distribution by Age Group • Household Make-up • Walkability Index • Customer Satisfaction	• Mode share • Percent of regional dwelling unit growth located in corridor • Percent of sub-regional employment growth located in corridor • Income

Monitoring Study Area

The Monitoring Study Area (Figure 1) has been identified in partnership with the partners to reflect the area that may be impacted by the implementation of new frequent transit service and in which we want to monitor progress towards Metro 2040. The Study Area also includes many areas that are planned for growth in the communities' Official Community Plans. In general a 400 metre network buffer (5 minute walk) around the potential stop locations has been established. Extensions of the Study Area boundary beyond the 400 metre buffer were drawn where a partner agency stated there was good evidence that those lands would influence or be influenced by the new B-Line service.

Public Engagement Context

While the Study Area includes two Metro 2040 Urban Centres (Lonsdale Regional City Centre, and Ambleside Municipal Town Centre) and four Frequent Transit Development Areas (East Third, Lower Lynn, Marine Drive, and Lower Capilano-Marine), there are some areas in the Study Area where a neighborhood planning process has not yet been completed. That means that the community may not yet have come together to agree to a plan for growth in these areas. That means that at this time the monitoring study area should not be equated as a singular growth overlay area. However, the partners acknowledge that the new B-Line frequent transit service will naturally have an impact on land use and other elements of complete communities so it is important to begin monitoring efforts now.

Squamish First Nations Reserve Lands

In addition to taking place on First Nations traditional territory, the study area includes Squamish First Nations Reserve lands. Squamish Nation staff participated in the Marine-Main Frequent Transit Corridor Study at the staff level and assisted with the development of the study area boundary. Metro Vancouver acknowledges that sharing monitoring data about these lands for this project is at the discretion of the Squamish Nation. Metro Vancouver welcomes any opportunities to share monitoring data and support coordinated land use and transportation planning on and adjacent to Squamish lands.

Data Sources

The majority of the data will be collected by Metro Vancouver via a custom census request. Some measures will be collected and forwarded to Metro Vancouver staff by partners.

Data that partner jurisdictions will provide include:

- Kilometres of Bike Facility (by Off-Street, On-Street, and Informal)
- Municipal Building Permits (to support estimates of dwelling unit density, affordable units, and dwelling unit growth)
- Final occupancy permits
- Business license counts
- Family-Friendly Housing Policy (yes/no)
- Affordable Rental Housing Policy (yes/no)
- Housing Action Plan (yes/no)
- Urban Design Policy (yes/no)
- Parking management policy (yes/no)

Data that TransLink will provide include:

- Transit Service Frequency
- Transit Service Trip Time

- Transit Service Span
- Capacity Utilized
- Daily Ridership
- Peak Ridership
- Customer Satisfaction

TransLink will provide the above data for the Marine-Main B-Line service only. In addition, a number of measures will be calculated by Metro Vancouver using the TripDiary data provided by TranLink. These are described in the attached Table 1.

Reporting

Data will be reported out for the whole study area corridor and its Urban Centre and FTDA components.

Reporting Timeline

A baseline will be developed using 2011 census data and released in Q4 of 2017. Full reports of all the measures listed in Table 2 will be produced once every 5 years by Metro Vancouver staff following the release of census data. An annual report will be produced for select data available more frequently (listed below).

Annual Reporting

The annual report will include the following measures:

- Land Use Designation Change
- Family-Friendly Housing Policy
- Affordable Rental Housing Policy
- Housing Action Plan
- Dwelling Unit Growth (estimate)
- Population Growth (estimate)
- Transit Service Frequency
- Transit Service Trip Time
- Transit Service Span
- Capacity Utilized
- Daily Ridership
- Peak Ridership

5 Year Reporting

The full report will be compiled and distributed every 5 years following the acquisition of custom census data. Measures included in this report are listed in detail in the attached table (Table 1).

Use and Communication of Data

Metro Vancouver staff will compile, analyze, and report out on the monitoring data. The data will be housed at Metro Vancouver servers. The report will be circulated to project partners for feedback before being published as a hard-copy document and on the Metro Vancouver website. The report will also be presented to partner agencies, the Regional Planning Advisory Committee, the Regional Planning Committee, and the Regional Transportation Advisory Committee.

This monitoring program is of interest to Metro Vancouver's ongoing Urban Centres and Frequent Transit Development Area Review. Should the monitoring program yield significant findings or conclusions these will also be presented to project partners for feedback prior to being incorporated into the review.

If the partners agree that there are findings from the monitoring program that warrant public distribution, the partners will work together to develop a communications and media-relations strategy

that may involve publication in local media, presentations in the broader community, or communication through the planning community.

Monitoring Team

Metro Vancouver staff will conduct the monitoring and reporting work in consultation and with the support of the project partners. Roles and responsibilities of the team are described in Table 3.

Table 3: Roles and Responsibilities of the Monitoring Team Members

Individual	Title or Role	Responsibilities
Heidi Lam	Senior Policy and Planning Analyst	Compiling and analyzing data. Data visualization.
Erin Rennie	Senior Regional Planner	Coordinating the transfer of data to Metro Vancouver. Managing partner relations. Writing report copy.
Terry Hoff	Division Manager, Growth Management and Transportation (Acting)	Project Management and Supervision
Heather McNell	Director Regional Planning (Acting)	Accountable
Matt Craig	Manager of System Plans	Report review. Support with transit data transfer.
Jeff Deby	Project Manager, B-Lines	Implementation of B-Line transit service. Report review. Support with transit data transfer.

Monitoring Budget

Metro Vancouver will pay for the costs of the custom census data run and the costs of acquiring any other special data. Project partners will contribute staff time in gathering and providing the above-mentioned data to Metro Vancouver.

Program Conclusion

The monitoring and reporting will continue indefinitely or until the partners agree to conclude the program. The study area boundaries or measures may be modified with the agreement of the project partners.

Table 2: Detailed List of Measures

Measure	Unit and calculation	Source	Metro 2040 Performance Program?	Collection Frequency	Available at corridor level	*Metro 2040* Policy	Logic Model Category
Land Use							
Land Use Change • Designation Change – RGS • Development Capacity Change - OCP	• Hectares of land under each *Metro 2040* designation within the corridor. • Hectares of land by OCP land use designation.	Metro Vancouver land use designation map and municipal OCP land use maps (and neighborhood plans where available).	yes	Annually	yes	Land Use Designations and Overlays 1.2	Activity
Subregional Growth Shares • Jobs • Dwelling Units	Ratio of jobs and dwelling units in sub-regional General Urban (ha) and corridor geography	Census (Custom)	yes	5 year	Yes	1.2	Impact
Housing Measures							
Population Distribution by Age Group	Proportion of each age group as a percentage of total corridor population	Census	Yes	5 years	Yes	4.1.7.a	Outputs
Household Make-up	Proportion of non-families, families with kids, and families without kids as a proportion of all households	Census	Yes	5 years	yes	4.1.7.a	Outcomes
Housing Tenure Mix	Percentage of renters and owners living within the corridor	Census	Yes	5 years	yes	4.1.7.a	Outputs
Housing Type Mix	Percentage of housing units by type	CMHC Completions and Demolitions and Census	Yes	Annual estimate and 5 year measure	yes	4.1	Outputs
Housing + Transportation Cost Burden	Percent of median household income spent on average Housing+Transportation cost	Census TripDiary	yes	5 year	Yes	4.1	Outcome
Population growth	New residents as a percent of baseline	Census, BC Stats	Yes	Annual estimate & 5 year measure	Yes	1.2.6.b.ii	Output

Measure	Unit and calculation	Source	Metro 2040 Performance Program?	Collection Frequency	Available at corridor level	*Metro 2040* Policy	
Transit-Supportive Housing Policies • Family-friendly housing policy • Affordable rental housing policy • Housing Action Plan • Parking maximum/parking reduction incentive policy • Urban Design Policy	Yes/No measure Displayed as number of jurisdictions with these policies out of 4 jurisdictions	Municipalities	no	Annually	n/a	4.1.1, 4.1.7, 4.1.8 RAHS 1.n	Activity
Dwelling unit growth	New units as a percent of baseline by unit size (number of bedrooms)	Census, BC Stats, CMHC Completions and Demos, Municipalities	Yes	Annual estimate & 5 year measure	Yes	4.1.7.a.ii	Output
Dwelling Unit Density	Average number of dwelling units per hectare of land with a General Urban designation within the corridor.	Census, BC Stats, CMHC Completions and Demos, Municipal Building Permits	yes	5 year estimates		1.2	Outputs
Transportation Measures- Transit							
Transit service frequency	Buses/hour	TransLink	No	Available quarterly	Yes, with manual calculation	5.1.3	Activity
Transit service trip time	Average trip time end to end	TransLink	No	Annual	Yes	5.1.3	Activity
Transit service span	Span of service	TransLink	No	Available quarterly	Yes	5.1.3	Activity
Capacity utilized	Average daily bus capacity used	TransLink	No	Annual	Yes	5.2	Outcome
Daily ridership	Average of total boardings/day	TransLink	No	Annual	Yes	5.2	Output
Peak ridership	Average of total boardings during am peak	TransLink	No	Annual	Yes	5.2	Output
Customer Satisfaction	TBD	TransLink	No	TBD	Yes	5.2	Outcome

Measure	Unit and calculation	Source	Metro 2040 Performance Program?	Collection Frequency	Available at corridor level	*Metro 2040* Policy	
Transportation Measures – Single Occupancy Vehicles							
Resident Mode Share	Percent of trips originating in the corridor by mode	Census, TripDiary	yes	5 year	Yes	5.1	Impact
Annual Vehicle Kilometres Travelled per capita • Corridor residents • Corridor workers	Annual per capita vehicle kilometres travelled for corridor residents and workers.	Census	Yes	5 year	Yes	5.1	Outcome
Transportation Measures - Active							
Walkability Index	Overall Walkability Score	UBC will provide to Metro Vancouver	yes	5 year	yes	5.1.6 1.2.6 f.ii	Outcome
Kilometres of bike facility: • Off-Street Bicycle Route • On-Street Bicycle Route • Informal Bicycle Route	Km	Municipalities	no	5 year	yes	5.1.6 1.2.6. f.ii	Output
Employment Measures							
Employment growth	Percent of sub-regional employment growth located in corridor	Census, NHS	yes	5 year	yes	1.2.1	Output
Retail Development	Number of retail businesses in the corridor (not possible to get employee counts)	Dun and Bradstreet Business Database & Municipalities	Yes	Annually	Yes	1.2.1	Output
Office Development	Percent of office space development locating in the corridor	Metro Vancouver Office Inventory & Municipalities	Yes	Annually	Yes	1.2.1	Output
Business Licenses within the corridor	Number of business licenses within the corridor	Municipalities	No	Annually	Yes	2.1	Output
Employment Types	Total number and growth of employment by sector within the corridor	Census/NHS	yes	5 year	Yes	2.1	Output
Income	Income distribution for residents in the corridor	Census	no	5 year	Yes	2.1	Impact

*All measures include lands within the Urban Containment Boundary only

**All housing measures exclude heritage residential