Transport 2021 Revisited:

Background Report for Transport 2021 Symposium

Prepared for TransLink

PSN Planning Solutions Network

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Key Findings

Context and Process

The vision of a less car-dependent, compact region to protect and enhance livability in the region has endured and the key "drivers" of Transport 2021 are similar to present day issues. The institutional structure of T2021 with close collaboration between the region's local governments and the Province was one of the project's key strengths. Elected representatives at the local, regional and provincial level were committed to regional plan-making and joining up land use and transportation planning. Plans themselves can be important "change agents". Transport 2021 was a bold and innovative plan setting the region on a course away from "business and ususal" and toward Livable Region Strategic Plan objectives. Transport 2021 made a compelling case for a regional approach to transportation planning in close coordination with growth management planning and laid the foundation for the creation of the GVTA.

Keeping the Plan Current and Responding to Changing Conditions

A very specific long range investment plan such as Transport 2021 requires careful monitoring to determine if plan assumptions are valid, growth patterns achieved, TDM implemented, and planned revenues streams are available. T2021 provided targets for many performance parameters thus laying the foundation for a robust monitoring program. The necessary monitoring was not carried out and the Plan was not adjusted as conditions changed. Transport 2040 was adopted in 2008 but did not provide an implementation plan. Over time, T2021 ceased to be a blueprint for both the Province and TransLink. The base plans produced in recent years do not have the benefit of the long term regional framework and this is the main task of the RTS Implementation Plan.

Significant Progress Has Been Made

Significant progress has been made in reversing the decline in transit mode share. The Transport 2021 transit mode split target for 2006 has been achieved. While T2021 suggested ambitious transportation demand management measures designed to also be significant revenue streams, these did not materialize and funding for transportation supply (both roads and transit) came from a variety of other sources. Land use patterns, while not unfolding entirely according to compact region objectives, have generally been transit- oriented in most parts of the region.

Charting a Course for the Future

Compared to long range target mode splits in the RTS Strategic Framework, the targets in Transport 2021 for 2006 and 2021 were relatively modest and were the product of transportation modeling outcomes. Turning modest gains into major gains in mode share for transit, walking, and cycling in the coming decades will take partnership action on all three fronts- supply, demand and land use. This was well articulated in T2021 and remains true today: *" We believe that a broad, sustained campaign must be mounted, using both incentives and penalties to re-shape the demand for travel. Selectively building new transportation capacity is but one aspect of our plan. Our proposals are interdependent and mutually supportive."*

1 Introduction

In 1991, the Province of British Columbia and the Greater Vancouver Regional District (GVRD) embarked on a joint two-year strategic transportation planning process. The result was a Long Range (to 2021) Transport Plan and Medium Range (to 2006) Plan, which were approved by the GVRD Board in 1993 and adopted as part of the Livable Region Strategic Plan in 1996.

In 2008, The TransLink Board endorsed a new long range plan called Transport 2040. This was a broad framework only and did not include an implementation plan. In July, 2013 the TransLink Board of Directors endorsed the Regional Transportation Strategy (RTS) Strategic Framework. The next task is to create the RTS Implementation Plan, using the Strategic Framework as an overall guide.

Transport 2021 offers lessons for today's RTS and its forthcoming implementation plan as to process, content and delivery. Accordingly, the purpose of this report is to provide background information for the September 23, 2013 Symposium titled ***Transport 2021 Revisited: Lessons for TransLink's Regional Transportation Strategy.*** Specifically this paper:

1) outlines the context for Transport 2021 in the early 1990s
2) examines the degree to which quantitative targets of Transport 2021 has been achieved to date
3) documents the extent to which planned measures have been implemented
4) draws lessons for the preparation of the Regional Transportation Strategy Implementation Plan

2 Context of Transport 2021

Transport 2021 continued a process which began almost two decades earlier. The project's origins can be traced to the GVRD's 1975 *Livable Region Proposals*, which was updated in 1996 on the basis of public goals established in the 1990 *Creating Our Future Program*. Through that visioning effort, the region clearly turned away from the concept of Greater Vancouver having a single business core surrounded by mainly residential, auto-dependent suburbs. The goals emerging from the *Creating Our Future Program* were to:

1) focus growth into pedestrian and transit-oriented regional town centres - six of them - Metrotown, New Westminster, Whalley (Surrey City Centre), Coquitlam, Richmond and Lonsdale
2) keep downtown Vancouver as the metropolitan core
3) re-balance jobs and housing, to let people live closer to work and cut the need to travel
4) create a "Green Zone" comprising lands better suited for non-urban development, thereby creating an urban containment boundary
5) reverse transportation priorities so decisions are made to favour walking, cycling, public transit, goods movement, and then the automobile
6) reduce by 50% total polluting emissions into the air by the year 2000.

In the early 1990s, BC Transit was responsible for transit for the whole province, assisted by "regional transit commissions" of local mayors in Greater Vancouver and the Capital region. The Ministry of

Transportation and Highways made all decisions on regional/road infrastructure, which at that time included not only the major provincial highways in the region but also the secondary highways such as the Lougheed and Fraser Highways. The GVRD carried out regional transportation planning (as well as regional land use planning) but was not responsible for implementation. [1]

In the late 1980s, the Province led regional transportation planning processes in the economic development regions into which British Columbia was divided. Dubbed "Freedom to Move," these planning processes engaged local governments in developing plans, which for most parts of the province were essentially roads plans for the provincial highway system. The exercise in the South Coast region was led by Michael O'Connor, the CAO of the GVRD, who had recently served as Project Director for the construction of what is now known as the Expo Line. The Freedom to Move plan for the South Coast region was almost instantly rejected by local elected representatives as being too road-oriented.

In 1989, O'Connor left the GVRD to become President of B.C. Transit, and a few months later he was replaced by Ben Marr, who had been a highly respected provincial deputy minister. The provincial Deputy Minister of Highways, Vince Collins, saw Marr's appointment as an opportunity to make another attempt to develop a long-range transportation plan for Greater Vancouver and invited the GVRD and its members to be partners in this process. Its formal objective was:

"*based on the GVRD's Creating Our Future action plan,*
its Regional Strategic Plan and
the mission statements of the Ministry of Transportation and Highways and B.C. Transit,
to recommend, by the end of 1993,
a long-range transportation plan for Greater Vancouver,
with associated policies, demand management measures and priorities for transportation investment."

The project was guided by a Steering Committee of senior staff officials from provincial and local governments. The Steering Committee was chaired by Ben Marr, GVRD Regional Manager and comprised nine municipal administrators and representatives from various provincial agencies and departments, with observers from the federal government and neighbouring regions.

The Planning team comprised staff members from GVRD, Ministry of Transportation and Highways, BC Transit, and the City of Vancouver. Some five staff worked full time, with six more provincial and regional staff seconded part time. The project office was co-located with the GVRD Strategic Planning Department. All GVRD member municipalities interfaced directly with the project through an Engineering Liaison Committee chaired staff from the South Coast Region MoTh. The GVRD Communications Department provided staff support in consultation and outreach.

[1] It was not until 1999 that a regional transportation planning and implementation agency was established—the Greater Vancouver Transportation Authority, or TransLink. It was given planning, funding and operating responsibilities for all modes of public transit, for transportation demand management and for a Major Road Network - the latter excluded numbered freeways intersecting the region, which remained a provincial responsibility.

The two-year budget for the Plans, funded equally by the Province and Region was $850,000, which paid for contracted personnel, consultants for certain working papers, public opinion polling, and communications and outreach direct costs. Excluded were the time costs of seconded personnel and dedicated office space donated by the GVRD. The GVRD, MoTH and BC Transit split equally the $300,000 additional cost of the 1992 travel survey to update the EMME/2 traffic model.

The project delivered its Long Range Plan in July 1993 with the Medium Range Plan following in October. The Plans were addressed jointly to the Minister of Transportation and Highways (Art Charbonneau and later Jackie Pement) and to the Chair of the GVRD , Gordon Campbell. The GVRD Board subsequently endorsed the Transport 2021 Long Range Plan, which became the transportation component of in the Livable Region Strategic Plan adopted in 1996.

While neither of the two Transport 2021 plans were formally endorsed by the Province, many of the Province's subsequent actions (notably infrastructure investments and a some transport-related taxation and user pay measures) have aligned with Medium and the Long Range Plans. However, some of these actions (for example in the staging and configuration of rapid transit lines) were not sequenced according to Transport 2021 Medium Range Plan recommendations.

Issues of the Day

The Executive Summary of Transport 2021 Long Range Transportation Plan explained the key issues of the day to be addressed by the Plan:

> *…The desire for greater choice in mode of transport—meaning strategic expansion of public transit, and creating walking- and bicycling-oriented communities—is a recurring theme in public meetings and opinion polls. …However, the region is becoming more, not less, dependent on cars, and the system's performance is deteriorating.*
>
> *Surveys also show that homes and jobs are dispersing into the suburbs. ..Such an increasingly diffuse pattern is awkward for conventional public transit to serve effectively; transit performs best along high-volume corridors, where transit vehicles can be reasonably full while offering frequent, convenient service and connections.*
>
> *Public transit's percentage share of travellers has declined since 1985…Computer simulations of the trend over the next 30 years point to a further 80% growth of peak period travel (by all modes), with the number of car trips growing by a projected 86%. Public transit will continue to lose ground. If congestion is to be held at bay, large scale road construction will be necessary.*
>
> *The total amount of local air pollutants being emitted from vehicles is dropping and will continue to do so until about 2005 due to better technologies and enforcement of standards. Later, even cleaner engines and fuels will have to be employed to keep emissions down. Emissions of the greenhouse gas carbon dioxide will rise.*

The Plan identified three key goals for the regional transportation system:

- to move people and goods effectively, efficiently, safely and reliably. It must adapt and expand to serve the region's changing population...and it must do so at affordable cost.
- to provide transportation equitably to a diverse population (30% of whom are either too old or too young to drive); and
- to help reduce its negative impacts on the region's livability (e.g. to limit urban sprawl and land consumption, preserve green space, limit congestion and traffic intrusion into local neighbourhoods, and cut air and noise pollution).

Public Process

Many of the consultation events combined Livable Region Strategic Plan proposals and Transport 2021 proposals. The public discussion was framed around growth management challenges facing the region and the choices in direction the region could take. There were many innovative outreach techniques such as cable TV "town halls programs" a display at the Pacific National Exhibition, forums, newspaper inserts, opinion surveys, etc. The GVRD Board members spent hundreds of hours at Board and committee meetings considering the analysis and plan proposals.

Brief Plan Outline

Significant land use and TDM measures were intended to shape development into denser, more compact communities located in the inner and central parts of the region. Increased transit demand resulting from the TDM measures would be met through significant transit investment. In the transmittal letter Ben Marr, the Chair of the Transport 2021 Steering Committee wrote: *" We believe that a broad, sustained campaign must be mounted, using both incentives and penalties to re-shape the demand for travel. Selectively building new transportation capacity is but one aspect of our plan. Our proposals are interdependent and mutually supportive."*

Revenues from transportation demand management measures alone were expected to yield $1.1 billion a year ($ 1.47 billion in 2013). The capital cost of the plan was some $10 billion ($14.3 billion in 2013) over the 20 year period. By way of comparison, TransLink's annual budget is approximately $1.3 billion and taxation makes up about two-thirds of its revenue sources (largely fuel tax and property tax.)

Both the Medium Range and Long Range Plans were built around four key policy levers.

- **Control land use:** Transport 2021 was intended to serve and support the compact urban structure featured in the Livable Region Strategic Plan combined with changes to neighbourhood planning to encourage walking and cycling. It was acknowledged that the land uses measures would take time to have their impact but a framework for coordinated planning in a 'sustained fashion over several decades' was essential to the success of Transport 2021.
- **Apply transport demand management (TDM) measures:** This lever included a variety of techniques to change travel behaviour, encourage off-peak travel, high occupancy vehicles, and apply financial levers such as tolls, gas taxes, and parking management.
- **Adjust transport service levels:** Service levels included speed, convenience, and frequency of service. This lever suggested that allowing congestion to deteriorate for single occupant vehicles

was a practical method of promoting transit and carpools. It was suggested this lever be used cautiously.

- **Supply transport capacity where needed:** This lever assumed all three levers above are deployed and supply included rapid transit routes, regional bus routes, transit priority, hov lanes, and an expanded road network, mostly in outlying areas.

3 Summary of Plan Performance Based on Targets

Both the Medium Range and Long Range Plan provided a number of key transportation performance targets. The time horizon to accomplish the Medium Range targets was 2006 and the Long Range Plan was 2021. Table 1 compares the latest Trip Diary (2011) to T 2021 targets for 2006 and 2021[2].

Key Findings related to Number of Trips and Mode Splits

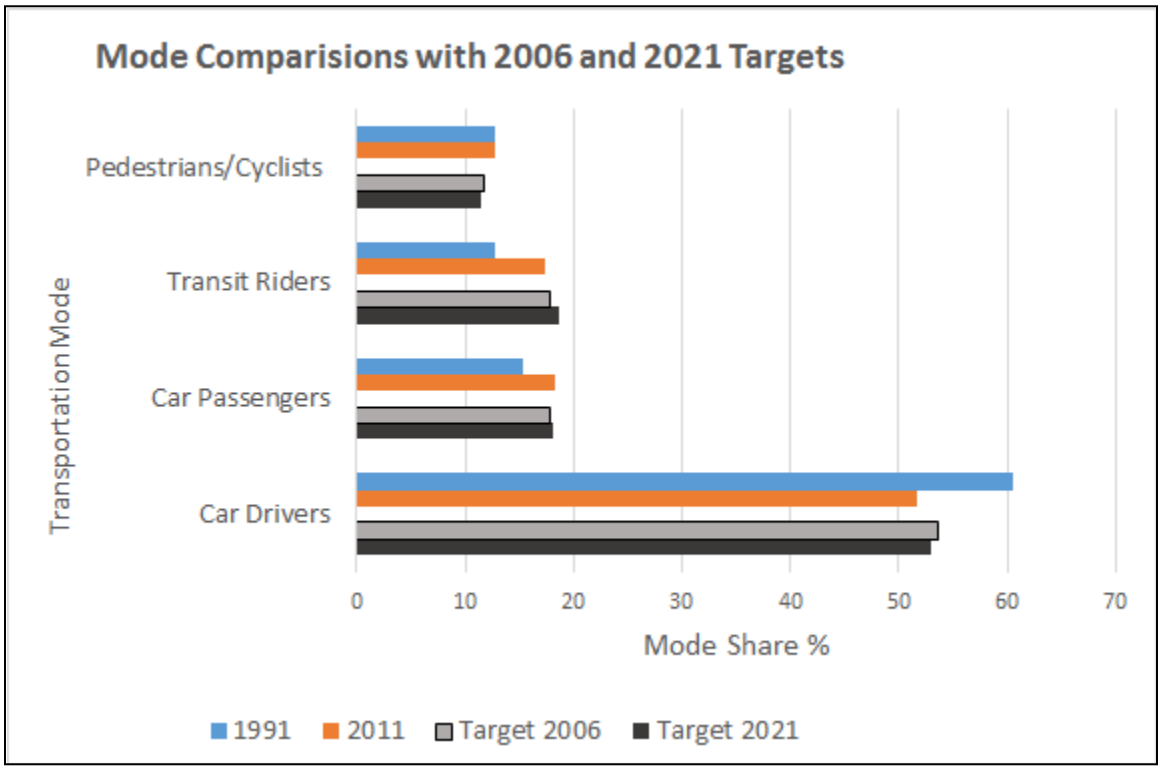
- the total number of trips by all modes in the morning rush hour (for trips ending between 7.30 am to 8.30 am) exceeds the T2021 target for 2006 by about 8% but is roughly on target compared to 2021 targets.
- the percentage of car drivers fell sharply from 1991 to 2011 and at 51.7% is lower than the T2021 targets for 2006 and 2021
- the percentage of car passengers in 2011 also exceeds 2006 and 2021 targets, at 18.3%
- the percentage of transit riders rose significantly between 1991 and 2011 and has **reached T2021 published target of 17% for 2006** and is one percentage point shy of 2021 target of 18%
- the percentage of pedestrians/cyclists travelling in the morning rush hour has stayed the same between 1991 and 2011 (12.8%) and exceed the 2006 and 2021 target
- the share of pedestrian/cycling /transit trips in 2011 has reached the target for 2021
- for the six regional town centres in total (Lonsdale, Richmond, New Westminster Metrotown, Surrey City Centre, Coquitlam) transit mode split in 2011 was 20% , 3 percentage points short of 2006 target
- the downtown peninsula achieved a target mode split of 55% in 2011, already surpassing the 2021 target of 49%
- for the 2011Trip Diary, mode splits for the am peak period (6am to 9am) were not significantly different than the peak hour

[2] There are two issues with comparing the 1992 and 2011 Trip Diary results: 1. The 1992 survey recorded travel behaviour only during the AM peak period (6-9am) while the 2011 Trip Diary was based on all trips in a 24 hour period 2. the 1992 survey was conducted over the phone while the 2011 survey was conducted online and through mail-back. Phone interviews have generally been shown to produce lower trip rates and smaller walk/cycling mode shares than online/mail-back studies. Sample sizes were similar for both surveys.

Table 1a: Mode Splits in Morning Rush Hour (Trips ending between 7.30 am and 8.30 am) 1991 and 2011 Actual Mode Splits Compared to Transport 2021 Targets

Mode	1991 Actual	2011 Actual	2006 Target (T2021)	2021 Target (T2021)
Car Drivers	60.0%	51.7%	53.6%	52.9%
Car Passengers	15.4%	18.3%	17.8%	18.1%
Transit Riders	12.8%	17.3%	17.8%*	18.6%*
Pedestrian/Cyclists	12.8%	12.8%	11.8%	11.4%

*The published targets were 17% for 2006 and 18% for 2021 but actual model output was as shown in this table



Mode Splits in Morning Rush Hour (Trips ending between 7.30 am and 8.30 am) 1991 and 2011 Actual Mode Splits Compared to Transport 2021 Targets

Table 1b: Transport System Targets from Medium Range Plan (2006) and Long Range Plan (2021) Compared with 2011 Trip Diary

Transportation System Criteria	Actual 1991	Actual 2011	Target 2006	Target 2021	Over/Under Target 2006 to Actual 2011	Over/Under Target 2021 to Actual 2011
Person Trips in Morning Rush Hour ending between 7.30 am to 8.30 am						
Total by all modes	390,000	607,000	506,000	700,000	+47,000	-93,000
As car drivers	230,000	314,000	300,000	370,000	+14,000	-56,000
As car passengers (non-drivers)	60,000	110,000	100,000	120,000	+ 10,000	-10,000
As transit riders	50,000	105,000	100,000	130,000	+5,000	-25,000
As pedestrians/cyclists	50,000	78,000	60,000	80,000	+18,000	-2,000
As cyclists to work only (not school)	4,000	8,000	12,000	na	-4,000	na
Transit's Share of Person Trips ending in Morning Rush Hour between 7.30 am to 8.30 am						
To downtown peninsula*	37%	55%	45%	49%	+10%	+6%
To 6 regional town centres	13%	20%	23%	30%	-3%	-10%
Within region overall	13%	17%	17%	18%	equal	-1%

Notes: Transport 2021 Medium Range and Long Range Plans, Data for 2011 , 2011 Metro Vancouver Regional Trip Diary Survey, 2013

Key Findings related to Transit Accessibility

Transport 2021 also provided important performance targets related to transit accessibility and the region has performed well in relation to both bus route proximity and rapid transit proximity as shown in Table 2.

- the proportion of the population within 400 metres of a bus route is 89%, only 1% shy of the 90% target for both 2006 and 2021.
- 21% of the population and 24% of the dwelling are within one kilometre of a rapid transit station (including the Evergreen Line) compared to T2021 target of 25% of residents to be within one kilometre of a rapid transit station by 2006

Table 2: Transit Availability Measures from Medium Range Plan (2006) Compared with 2011 Trip Diary

Transportation Availability Measures	Actual 1991	Actual 2011	Target 2006	Target 2021	Over/Under Target 2006 to Actual 2011	Over/Under Target 2021 to Actual 2011
Rapid Transit (route km)	**23**	**99**	**83**	**78***	**-5km**	**-21km**
Percentage of **population** less than 400 metres of bus route	**87%**	**89%**	**90%**	**90%**	**-1%**	**-1%**
Percentage of **population** less than one kilometre of rapid transit line	**8%**	**21%**	**25%**	**30%**	**-4%**	**-9%**
Percentage of **dwellings** less than 400 metres of bus route		**90%**				
Percentage of **dwellings** less than one kilometre of rapid transit line		**24%**				

*Notes: Transport 2021 Medium Range and Long Range Plans, Data for 2011 , 2011 Metro Vancouver Regional Trip Diary Survey, 2013and TransLink GIS analysis *Includes all SkyTrain lines including the Evergreen Line presently under construction and alignment as of August 2013.*

Observations on Modelling

All of the targets in T2021 were based on model findings. What can we conclude about already reaching the 2006 mode split target by 2011 in the absence of planned transportation demand management measures? This is a very difficult question to answer and is probably a combination of action and inaction on all four levers. It can be concluded that transit supply was more or less provided as planned for 2006. Road supply is behind schedule for some segments such as the South Fraser Perimeter Road. The Port Mann bridge/Hwy #1 was not part of the Plan. The mode splits for the Downtown Peninsula, New Westminster and Metrotown are exceeding targets while Surrey City Centre and Coquitlam City Centre are below target. Fuel prices combined with economic conditions and lifestyle changes has led to reductions in automobile use.

It is interesting to note that the target mode splits for 2006 and 2021 did not vary much at 17% and 18%, although a one percentage mode split gain meant an extra 25,000 transit riders by 2021. The reasons for this flat lining of targets are most likely that the transportation demand management and significant land use changes were expected to already have taken place by 2006. So the expected changes were planned to occur relatively early in the region and then stabilize during the plan period. Also, there was full expectation that the model would be refreshed and updated regularly which did not happen. In the preparation of the Implementation Plan, it will be important to identify where, when and how significant changes in mode split are likely to happen.

It is likely that the modeled land use scenarios were exaggerated in order to provide meaningful differences among the scenarios, meaning that the "compact region" was unrealistically compact, especially for the rate of change in North Surrey/North Delta. This area for example grew by almost 150,000 between 1991 and 2011 but still fell far short of compact region population distribution targets.

The reliability of models has been subject to debate for a number of reasons: the difficulty of predicting travel behavior and the impacts of pricing, the lack of a dynamic means of dealing with land use change, the difficulty in modeling walking and cycling trips etc. However, it does not mean modeling is not worthwhile but probably what is more important than the absolute values of model output is what the model uncovers across different scenarios and how this can inform policy making for supply, demand and land use.

4. Evaluation of Success with the Four Plan Levers

4.1 Control Land Use

While Transport 2021 was being developed, the GVRD was taking steps towards developing a new regional plan. Regional planning jurisdiction had been taken away from regional districts in 1983 by the provincial government. The GVRD Board decided that they would build support for regional planning through a regional dialogue on possible futures for the region and this work dovetailed with Transport 2021. In 1995, the Province enacted the regional growth strategies legislation and restored regional planning jurisdiction to regional districts in BC. Shortly after enactment of the provincial legislation, in 1996 the Minister for Municipal Affairs, deemed the Livable Region Strategic Plan to be a regional growth strategy.

Three alternative land-use patterns were developed for the Greater Vancouver region for the year 2021:

Current Trends Option

The Current Trends Option described a pattern of land use that could result if the projected growth in housing demand followed its historical trends within current municipal plans. Under this growth option, over half of the population growth in the next 30 years would be added in a corridor extending eastward from Surrey to Chilliwack**.** About one-quarter of the growth would be accommodated in the Burrard Peninsula and the Northeast Sector.

Fraser North Option

The Fraser North Option would focus growth on the north side of the Fraser River to ease the development pressure on agricultural land and other green spaces located on the south side of the Fraser River. Under this growth option, 60% of the population growth would be accommodated in the Fraser North area and the Northeast Sector.

Compact Metropolitan Option

The Compact Metropolitan Option attempted to contain urban growth within the central urbanized portion of the region - Vancouver, Burnaby, New Westminster, Northeast Sector, North Delta and North Surrey. See Table 2 for targeted population distribution.

The Compact Metropolitan Option was selected as the preferred option. By focusing the region's growth and clustering population and jobs in the Metro Core and six regional activity centres, sited along transport corridors, people would have an opportunity to live close to work, thus reducing auto-dependence and long-haul commuting.

Analysis of Population Distribution

Transport 2021 projected a Metro Vancouver population of 2.2 million by 2006 and 2.74 million by 2021. The 2006 population forecast in T2021 was higher than the actual population in 2006. However, the forecast for 2021 is very similar to current Metro Vancouver forecasts provided in the adopted Regional Growth Strategy.

As shown in Table 3 below, the patterns of actual growth show mixed results compared to compact region targets. Vancouver/Burnaby/New Westminster and North Surrey/Delta were targeted to receive 75% of the region's population growth by the year 2021. As of 2011, 64% of regional growth has occurred in this area. Compared to other city regions in North America, capturing 64% in inner and middle established areas of the region is, however, a very impressive result.

In absolute terms, the high growth areas have been North Surrey/North Delta with an increase of 148,081 from 1991 to 2011 and Vancouver /UEL with an increase of 140,123. North Surrey/North Delta has achieved a 21% share of the region's growth compared to the target of 30%. The Southern Region/Langleys have grown by 132,555, considerably above target. The Northeast Sector, as of 2011, has fallen short of compact region target accounting for 11% of growth, rather than the targeted 20%.

One of the key directions of Transport 2021 was to limit growth and commuting in the Fraser Valley Regional District. While growth has been higher than envisioned in compact region, the increase in growth in the FVRD is much lower than forecast for the "business as usual" options.

Overall densities in the region have increased from 17.7 people per hectare in 1991 to 25.6 people per hectare in 2011. (Metro Vancouver Regional District calculation based on area within 2011 RGS Urban Containment Boundary).

Table 3: Actual Population Distribution Compared to Medium Range Plan Projections for 2006

Sub-Region	Population 1991	Population 2006	Population 2011	Target share of growth (1991-2006)	Actual Share of Growth 1991 to 2006 (Share of growth)	Actual Share of Growth 1991 to 2011 (Share of growth)
North Surrey/North Delta	232,267	332,470	380,348	+30%	19.5%	21%
Burnaby/New Westminster	202,443	261,348	289,194	+16%	11.5%	12%
Northeast Sector	140,178	197,524	218,788	+20%	11.2%	11%
North Fraser Valley	59,758	84,818	94,017	+6%	4.9%	5%
North Shore	158,277	179,089	184,875	+2%	4.0%	4%
Vancouver	477,748	590,243	617,871	+9%	21.9%	20%
Richmond	126,624	174,461	190,473	+5%	9.3%	9%
South Fraser Valley	na	na	na	+3%	na	na
Southern Region/Langleys	205,207	296,630	337,762	+8%	17.8%	19%
Metro Vancouver TOTAL	1,602,502	2,116,583	2,313,328	100%	514,081	710,826

Employment Distribution

Employment targets were provided for different subregions than population targets for 2021 as shown in Table 4. Generally employment distribution is trending in the direction of the targets with a decrease in Vancouver in the regional share. Delta/White Rock/Surrey still have a long way to go to meet the 2021 distribution and there are more jobs than expected in the Langleys partly as result of higher population levels than forecast. Between 1991 and 2011 only 16% of job growth occurred in Vancouver. Delta, White Rock, Surrey captured 34% of job growth between 1991 and 2011.

The importance of job location on the performance of the transportation system and mode choice was a key issue in the preparation of the 2011 Regional Growth Strategy. Burgeoning office parks and big box retailing locating away the frequent transit network resulted in fewer jobs concentrated in Urban Centres. The Regional Growth Strategy has ambitious targets for the future concentration of jobs in Urban Centres and along the Frequent Transit Corridors. It targets 50% of job growth in Urban Centres and 27% in Frequent Transit Development Areas.

Table 4: Actual Employment Distribution Compared to 2021 Compact Metro Scenario Share

Sub-Region	Employment 1991	Employment 2006	Employment 2011	2021 Compact Metro Scenario share	Actual Share of Growth 1991	Actual Share of Growth 2011
North Shore	59,025	64,815	65,325	3%	7%	6%
Vancouver	332,610	343,475	366,905	29%	41%	36%
Burnaby, New Westminster	120,090	136,840	143,955	15%	15%	14%
Northeast Sector	44,330	63,785	65,710	11%	5%	6%
Richmond	85,530	106,860	109,035	8%	11%	11%
Delta, White Rock, Surrey	113,165	170,965	186,120	25%	14%	18%
Maple Ridge, Pitt Meadows	16,965	23,375	23,595	1%	2%	2%
Langleys	34,585	55,035	59,335	3%	4%	6%
Fraser Valley	na	na	na	na	na	na
Metro Vancouver TOTAL	806,300	965,150	1,019,980	1,459,900	806,300	1,019,980

Land Use Policy Guidance from Transport 2021

The Medium Range Plan contained specific guidance on the use of transportation investment to shape the pattern of growth:

- *"Where governments make transportation investments aimed at helping to shape land use, they should be aware that strength of the shaping effect is not well understood. Despite this uncertainty, transport investments should be made within the medium-term horizon with the goal of shaping land use (see Appendix 1 for list of Medium-Range supply recommendations.*
- *The land use shaping effects of transportation improvements mean that governments should give priority to those investments which improve the accessibility of the inner suburbs (meaning priority growth area for the compact region option) to and from each other as opposed to making early improvements in accessibility for longer-distance commuting*
- *Governments should dovetail transportation investment and land use and hold in reserve major capital decisions which require dovetailing with land use plans until it becomes clear that the appropriate land use policies are very likely to be put in place."*

The Long Range Plan contained a number of policies related to controlling land use. Many of the policies addressed the need for a regional land use plan and many of these policies have been implemented through the completion of the Livable Region Strategic Plan and more recently the Regional Growth Strategy adopted by the Metro Vancouver Board in 2011.

Key Findings Related to Controlling Land Use

- The RGS responds to most of the recommended land use policies and provides a much more predictable regional land use pattern compared to the situation in the early 1990s.

- However, an issue of uncertainty is the location of future employment which is a key determinant of mode choice. Modelling for the RTS Implementation Plan should put emphasis on different employment scenarios.
- Population and employment in the Langleys and South Surrey is significantly higher than planned- this raises the issue of what transportation supply and demand management measures are needed to provide for this distribution without promoting accelerated growth in these areas.
- The excellent performance of the Metro Core in terms of mode split shows the potential for Urban Centres. What conditions are necessary to significantly improve mode splits to Surrey Metro Centre and Regional City Centres? Not all Regional City Centres are of equal priority and the RGS flags the importance of the accelerated development of Surrey Metro Centre to bring jobs and services closer to the population South of the Fraser.

4.2 Transportation Demand Management (TDM) Measures

Transportation Demand Management was the second policy lever proposed by Transport 2021. A variety of measures were recommended, including both incentives and disincentives to support a behavior shift from single occupancy vehicles (SOV) to carpooling, transit, cycling, and/or walking. Although understood to not be a complete solution, it was recognized that TDM could postpone capital investment and reshape travel demand to boost transit and carpool use. These proposed policies and initiatives included:

Incentives

- Encourage telecommuting by devising a framework of fiscal incentives, justified on the basis of saved or postponed infrastructure investments that would otherwise be required
- Encourage medium-sized and large employers to help cut vehicle trips to their worksites
    - A regional agency should provide support through information and public awareness campaigns, a regional ride-share match-up program, and other advisory services
    - Governments should leave participation in trip reduction programs voluntary
- Install high-occupancy vehicle lanes and give buses traffic priority on the street

Disincentives

- Increase and broaden parking charges (50% increase from 1991 levels of CBD parking charges and increases in all-day parking charges in regional town centres)
- The Province should increase fuel prices through higher fuel taxes (a 50% increase in the real price of fuel)
- Introduce bridge tolls as a first step to a more general road pricing scheme
    - The Province should introduce road pricing measures or tolls structured to reduce congestion, provide clearer price signals to users for the costs they incur and impose on others, and to raise revenue for transportation improvements; the Province should not

remove tolls unless it is clear that the external costs of the auto have been otherwise accounted for and are recognized by the user

- The Province should direct toll revenues to system-wide transportation improvements, including transit/HOV improvements, rehabilitation of deteriorating facilities and construction of new facilities

Implemented Incentives

TransLink and its partners have been successful in partial implementation of many of the TDM measures outlined in 2021, however most of the measures have not been implemented to the degree necessary to affect real change in the region. The TDM measures implemented have also been primarily from the incentive side, with weak implementation from the disincentive side. TransLink has faced significant opposition to many planned TDM measures, such as regional wide parking pricing and a vehicle levy.

TransLink implemented an Employer Pass program (a discounted pass program for eligible commuters), which, by 2007, had over 240 companies and 15,000 employees signed up. The Employer Pass program encouraged employers to help cut vehicle trips to their worksites. TransLink recently announced that they would be terminating this program, largely for equity reasons.

The TravelSmart program has provided support through information and public awareness campaigns. Pilot Travel Smart programs in several neighbourhoods produced significant shifts in mode shift. TransLink has provided support to the Jack Bell Ride-Share program. The proposed incentive initiative of encouraging telecommuting by devising a framework of fiscal incentives was not implemented.

One area of demand management that was not included in Transport 2021 is post-secondary institutions. Students make up a significant proportion of trips, especially in the morning peak period. The U-Pass Program has produced very significant TDM results. For example, according to the U-Pass Final Review, transit ridership at UBC has increased by 63% since the implementation of the U-Pass, 37% of UBC students reported that they have been able to avoid buying a car as a result of the U-Pass and 69% have been able to reduce their reliance on a car due to the pass. U-Pass programs are reinforced through a reduction in parking and/or significant increases in parking charges. Although U-Pass programs have resulted in a decrease in pedestrian, cycling and car pooling trips, the significant gains in transit use, reduced congestion, emissions and cost associated with automobiles, reduced need for parking etc provide considerable benefits to the regional system and users.

Table 5: Transportation Demand Measures in T2021 Compared to Existing Measures

Measure	T 2021 Policy	2021 Projected Annual Revenue In 1992$ and 2013$	2012 Actual Annual Revenue
Fuel prices	50% increase in the real price of fuel.(Fuel price increases exceeded the 50% and rose by 65% from 1991 to 2012)		
Fuel tax	Doubling of the fuel tax	$483 million ($705 million in 2013 dollars)	$330.8 million ($0.17 cents per litre)
Parking Rights Tax	50% increase in commuter parking charges in the CBD and $3 per day in Regional Town Centres concurrent with improved transit access. (CBD prices likely increased by over 50%. Regional Town Centres generally have limited supply of commuter parking but little or no pricing on retail parking spaces)	$65 million($95 million in 2013 dollars)	$51.6 million
Parking Site replacement Tax		n.a.	$18 million
Bridge Tolls	24 hour tolls on all major bridges into the Burrard Peninsula. A toll of $2.00 each way was suggested which equals $3.00 in 2013 dollars. (There are tolls on Golden Ears and Port Mann)	$540 million ($788 million in $2013)	Golden Ears - $39 million Port Mann xxx -

Implemented Disincentives

Fuel Pricing

Though not specifically stated as policy, Transport 2021 suggested a 50% increase in the real price of fuel. TransLink receives 0.17 cents a litre on fuel. The 1991 gasoline price in 2012-dollars was $0.82.The 2012 gasoline price in 2012-dollars was $1.35. This equates to a 65% increase in price in real terms between 1991-2012, exceeding the 50% increase suggested by Transport 2021. However, the impact of price increases has been partly mitigated through increasing fuel efficiency.

Fuel volumes purchased in the region shows a definite downward trend in recent years. This is likely due to a combination of factors: price would have some impact on dampening consumption but it is difficult to quantify. Other factors include increased fuel efficiency in newer vehicles, fuel purchases

outside the region , changing demographics and changing lifestyles favouring sustainable modes. As noted in Transport 2021, fuel taxes are a blunt instrument with regard to transportation demand management but an important revenue source.

Bridge Tolls

As noted above. Transport 2021 requested the Province to introduce system road pricing or comprehensive bridge tolls. This has not occurred, however, bridge tolls have been introduced on Golden Ears (a TransLink facility) and the Port Mann bridge.

Parking Charges

The GVTA legislation enabled TransLink to collect all parking sales tax revenue in the region. Since the legislation was enacted, TransLink has raised the parking sales tax to its limit of 21%.

Key Findings Related to Transportation Demand Management

- Overall, the planned TDM measures were not implemented to the degree that was recommended in Transport 2021, and thus the impact has been less than predicted and the revenue stream much more modest
- T2021 expected that by 2021 many urban regions around the world would have implemented system tolls or widespread facility tolling- this has not been the case so far although there are many more tolling schemes now than in 1991.

4.3 Adjust Transport Service Levels

Adjusting service levels was the third policy lever proposed, and was meant to support the proposed land use controls and TDM measures. Service levels mean the speed, convenience, frequency of service, comfort and other qualities of a journey, other than price. Adjustments can support travel behavior shifts caused by land use and TDM measures, or it can further push users in the desired direction.
It was recognized in Transport 2021 that although a High Occupancy Vehicle (HOV) system existed, the supply of mixed-use road capacity was too high to make separate HOV lanes attractive through time savings. Thus, it was suggested that the level of congestion should be allowed to rise to entice people to carpool or use transit. This has proved a difficult policy lever to manage. Some municipalities have, however, adopted policies of not providing any additional space for single occupant vehicles and have planned for accommodating growth in trips through increases in transit, pedestrian and cycling trips.

4.4 Supply Transport Capacity

Both the Medium Range and Long Range Plans contained very specific transit and road projects. Maps 1 and 2 on the following pages show the planned and completed projects for each Plan. Appendix 1 documents the status of projects. The following policies guided supply decisions.

- Add high quality, fast and frequent transit services linking regional town centres and improve local transit service in designated urbanized areas in the compact metropolitan area
- Use a variety of local transit services, including para-transit and flexible-route transit services, to serve demand for different time periods and different markets
- Existing roadway capacity should be re-allocated to maximize people carrying capacity, not vehicle carrying capacity
- Where congestion is not serious and where operationally feasible, the governments should provide HOV capacity by removing mixed traffic or parking lanes from the existing system; where this is not operationally feasible, it will be necessary to construct new HOV facilities
- New capacity on regional and inter-regional roads should be provided in the form of HOV facilities; opening-up HOV lanes in the off peak should be considered
- Governments and transit providers should facilitate the transfer of passengers between long haul transport (eg airport and ferries) and regional transit services by non-auto modes

Transit Provision

Rapid transit and the term Intermediate Capacity Transit System (ICTS) was used interchangeably and referred to rail as well as bus in its own right of way. All projects identified in the Medium Term options have been built or are under construction except for rapid transit connecting Central Broadway to the rest of the system. The recommended order and configuration of rapid transit lines was not followed nor was the recommended timing. The Coquitlam connection was scheduled for completion by 2006. The Long Range Plan contains the Surrey rapid transit lines to Guildford and Newton. Some transit priority measures have not been implemented as envisioned.

Despite high growth in outlying areas, such as the Langleys and South Surrey, the target for the number of people within 400 metres of a bus route has been achieved. The 2006 target for the number of residents with one kilometre of rapid transit is close to the planned target.

Road Networks

On regional road networks, many of the identified facilities were built or are under construction now, including the South Fraser Perimeter Road. The major deviation from the Plan was the widening of Hwy#1 and the Port Mann Bridge.

Key Findings Related to Transportation Supply

- T2021 was very specific on transit and road improvements, identifying facilities required and timeline as well as approximate costing
- a large proportion of planned supply investments (road and transit)have been implemented
- transit priority for buses did not take place to the degree envisioned by the Plans

5. From Plan-Making to Implementation

When the Plans were completed, there was no regional entity responsible for implementing the Plans. The creation of the GVTA did not occur until six years after the completion of the Plans. The Long Range Plan's final chapter titled " What Commitments Are Required- By Whom?" stressed the need for cooperation between provincial and local governments.

> *Unprecedented levels of cooperation and coordination will be required to implement this plan successfully. Because the policies are interdependent, it will be important that each group be able to act with confidence that partner groups are committed to parallel supporting actions.*
>
> *The long-range plan does not recommend what mechanisms should be used to achieve the plan, but it does list the main items on which a commitment is required from the main parties.*
>
> *For **local governments**, the most important commitment is to make coordinated changes to local community plans and zoning practices to manage and shape the location of growth within the region. In addition, the local road network for which they are responsible will have to be developed in accordance with the plan.*
>
> *For the **Province of B.C.** the most important actions are to commit to develop the transportation system to support the proposed Livable Region Strategy , to introduce transportation demand measures (including "sticks" or penalties) and to supply management at the region-wide level.*

The Medium Range Plan Phasing was shown in the following diagram. There are a few key points about this phasing:

Apply Transportation Management: The order of implementation actions was to begin public communications immediately as well as the "carrot" measures. Polciy development on the "stick" measures was meant to begin immediately and the bridge tools and gas taxes were to be introduced beginning in the late 1990s. It was expected that most tolls/pricing systems would be in place by 2006.

Supply New and Enhanced Facilities: Supply measures were to begin immediately for both roads and transit expansion. All rapid transit lines were to be in place by 2006 except the extensions to Guildford and Newton.

Monitor and Plan: A regular monitoring program was assumed to keep the Plans current and adjust as needed.

The Plan stated that tolls and taxes should be clearly dedicated to transportation improvements to improve the acceptability of the measures to the public. They also recommended that a package approach to link road, bridge, and transit improvements in a single corridor would further assist public acceptance and behaviour change.

Medium Range Plan Phasing	1995	2000	2005
1. Advance Growth Management			
Advance partnership agreement mechanism to dovetail land use and transportation plans	Policy developmen		
2. Apply Transportation Demand Management			
Mount public communications program	Public communications and education program on transport policy.		
Introduce incentives (carrot measures)	Rideshare, v'pool facilitation, empl. trip red'n programs, telecommuting promotion		
Introduce disincentives (stick measures)	Policy development	Parking management, gas taxes, bridge tolls.	
3. Supply New and Enhanced Facilities			
Pre-construction activities	Feasibility, functional and design studies, property acquisitions.		
Ongoing minor improvements	Continue road rehab work & fixing safety, network continuity and maintenance probs		
Enhance existing transit system	Improve bus service throughout service area. Place SuperBus on major corridors.		
Low- capital projects	Bridgehead priority, excl. bus lanes, access management		
Local transport initiatives	Local arterial road expansion in concert with population growth.		
Major capital projects on stream		New major road (HOV) and transit (ICTS) links on stream.	
4. Monitor and Plan			
Demand management tasks	TDM leadership: coord. of TDM impler		
Land use monitoring tasks	Land use data collection and monitoring.		
Land use plan review		Review	Review
Local government growth management	Agreements on + maintenance of reg'l land use plan thru individual zoning decisions		
Transport monitoring tasks	Transport data collection and monitoring.		
Travel survey update		Survey	Survey
Provincial government financing tasks	Revenue collection, financing and partnership/joint venture agreements.		
Transport planning: Medium-range Plan Review	Review	Review	Review Review Review
Long-range Plan Review		Review	Review

Appendix 1: Tracking Progress on Specific Medium-Range and Long-Range Plan Investments

●= fully implemented, ◑= partially implemented, ○= not implemented

Map No.	Recommended Project	Medium Range Project (2006)	Long Range Project (2021)	Comments
	Rapid Transit Supply (ICTS)			
na	Provide additional SkyTrain vehicles to accommodate the anticipated increase in transit demand over the next 30 years	●		
3	Provide a rapid transit link between New Westminster and Coquitlam Town Centre	●		Link not constructed as planned. Construction of the Evergreen project will link Coquitlam Town Centre with New Westminster
2	Provide a rapid transit link between Lougheed Municipal Centre to the Vancouver Broadway business district to connect with Richmond line	◑		The Millennium Line, completed in 2002, links Columbia Station in New Westminster to Commercial Broadway and VCC Clark Station. Service to Vancouver Broadway business district was not implemented.
1	Construct a Vancouver-Richmond rapid transit line	●		Construction of the Canada Line was completed in 2009, linking the Vancouver CBD with Richmond and YVR. YVR link not in original plan
5	Construct new rapid transit extensions from Surrey City Centre east to Guilford Municipal Town Centre		○	The Surrey rapid transit lines were included in the Long Range Plan only
4	Construct new rapid transit extensions from Surrey City Centre to Newton Municipal Town Centre and Surrey City Hall		○	The Surrey rapid transit lines were included in the Long Range Plan only

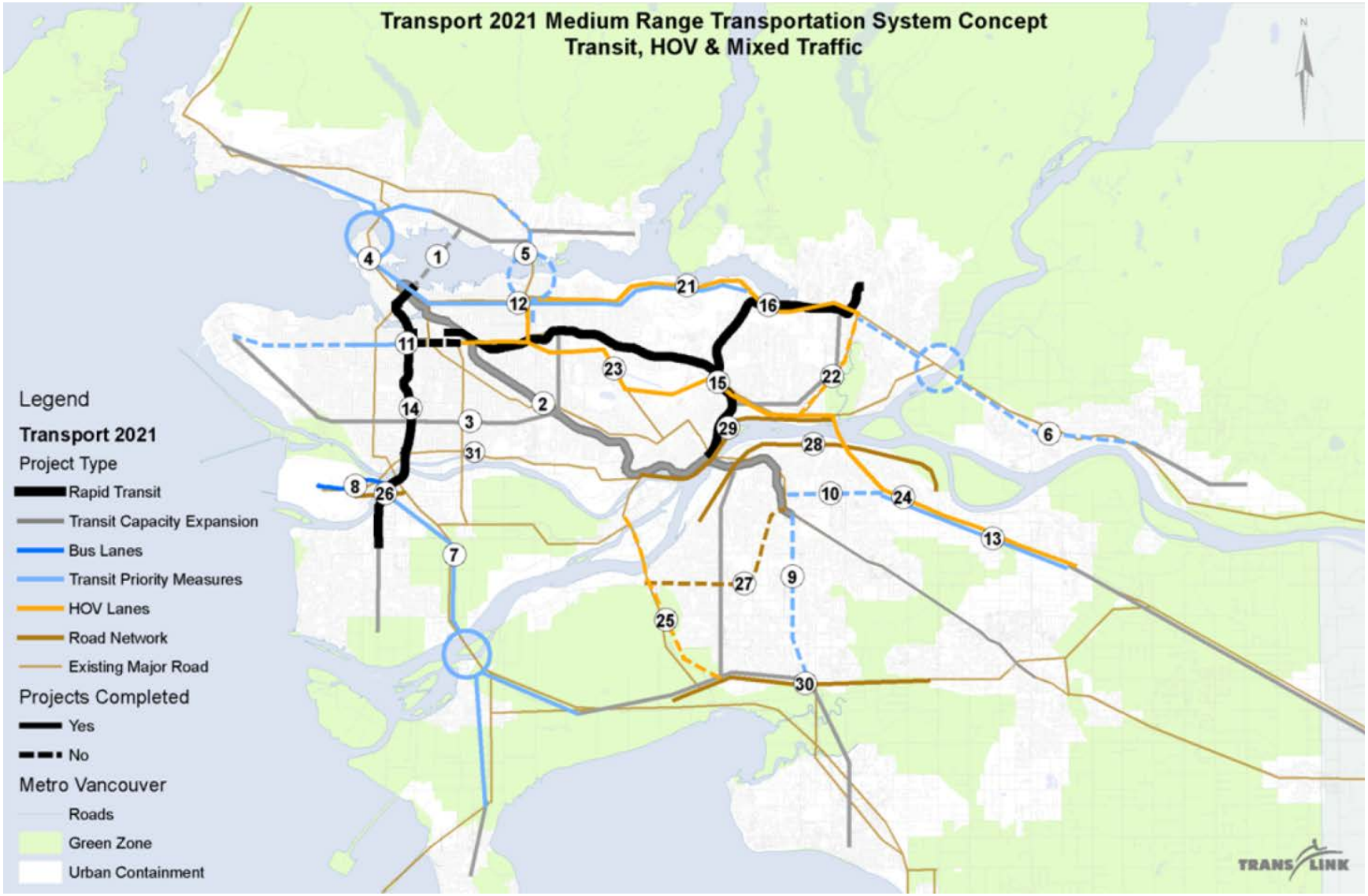
Map No.	Recommended Project	Medium Range Project (2006)	Long Range Project (2021)	Comments
	Provide Bus Lane Supply:			
7	Along the Hastings corridor between Vancouver CBD and North Burnaby	●		Peak hour bus lanes between Vancouver CBD and North Burnaby
6	Along the Broadway corridor from UBC to Vancouver-Richmond rapid transit line	◑		All buses have a designated bus lane in the morning and afternoon peak periods from Arbutus to Commercial Drive
8	In the Trans Canada Highway corridor from 200th Street to Guildford Municipal Centre	●		The new Port Mann bridge was completed in 2012 and includes bus lanes from the Carvolth Park & Ride to Lougheed SkyTrain Station
9	Across the Middle Arm of the Fraser River to connect Vancouver International Airport to the Richmond rapid transit	●		The Canada Line was extended to YVR to connect it with the Vancouver CBD and Richmond
10	Across the Main Arm of the Fraser River to connect Maple Ridge to the Trans Canada Highway	●		The location of this connection, the Golden Ears Bridge, was shifted to connect Pitt Meadows with Highway 1.
	Apply Bus Priority:			
11,12	Across the Burrard Inlet at the First Narrows and Second Narrows bridges	◑		The Lion's Gate (Fist Narrows) Bridge has bus priority lanes on the approach to the bridge; the Ironworkers' (Second Narrows) Bridge does not have bus priority
13	Across the Pitt River to connect Fraser North to Coquitlam Town Centre	◑		Frequent bus service exists over the Pitt River Bridge to connect Port Haney with Coquitlam
MR 9	From Surrey City Centre south to Newton and Surrey Municipal Hall	◑		There is currently only 1 queue jumper for the entire transit route at 96 Avenue. Two other queue jumpers are being planned for completion in 2014 as part of the the King George/104 Avenue B-Line service: at 76 Ave and 88 Ave.

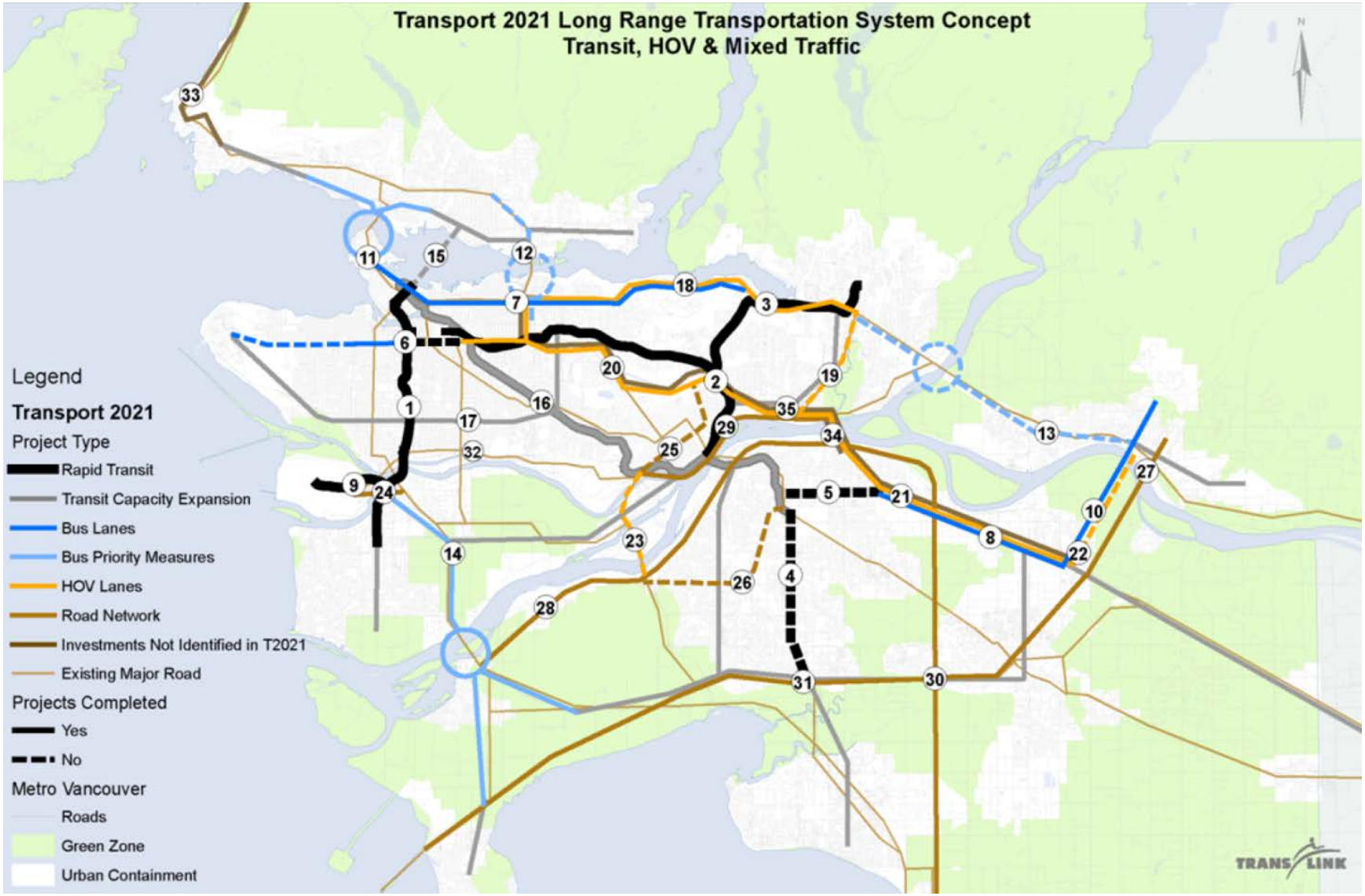
Map No.	Recommended Project	Medium Range Project (2006)	Long Range Project (2021)	Comments
MR 10	From Surrey City Centre east of Guildford Municipal Centre	○		No transit priority measures have been planned or implemented between Surrey City Centre and Guildford Town Centre.
14	Across the South Arm of the Fraser River in the vicinity of Hwy 99 to connect Ladner to Richmond	●		Highway 99 bus only lanes on northbound and southbound entries to the George Massey Tunnel
	Other Additional Transit			
15	Add SeaBus capacity across the Burrard Inlet	○		Additional SeaBus capacity has not been implemented
	Increase main-line and feeder bus coverage and service hours	◑		Approximately 70-80% of the bus routes proposed in Transport 2021 have been implemented and service hours have increased
	Provide HOV Lane Supply			
21	In the vicinity of the Barnet-Hastings corridor to connect the Northeast Sector to Boundary Road	●		The provincial government provided HOV lane supply on the Barnet - Hastings corridor
22	In the Lougheed Corridor to connect Highway 7 to the Trans Canada Highway	○		Improvements were made along Lougheed, but these did not include HOV lanes
23	In the Trans Canada Hwy and Grandview Highway corridor to connect the Cape Horn Interchange to Clark Drive	●		Trans Canada Hwy has HOV completed with the Port Mann Bridge project
24	In the Trans Canada Hwy corridor to connect 200th Street to the Cape Horn Interchange	●		Trans Canada Hwy has HOV completed with the Port Mann Bridge project
25	Across the Fraser River at or in the vicinity of the new river crossing between Maple Ridge and Surrey		○	There is no HOV lane supply on the Golden Ears Bridge connecting Pitt Meadows and Surrey
26	Across the North Arm of the Fraser River at or in the vicinity of the Alex Fraser	○		Improvements were made to the Queensborough Bridge, but no HOV lanes were built

Map No.	Recommended Project	Medium Range Project (2006)	Long Range Project (2021)	Comments
	Bridge to the Queensborough Bridge corridor			
	Provide Other Road Connections			
28	Provide and improved Moray Channel Bridge and associated roadway improvements- Hwy 99 to the Vancouver International Airport	●		The provincial government built a new bridge that connects with Hwy 99
28	Improve north-south connections from Pattullo Bridge and Marine Way to Trans Canada and Lougheed highways	○		The North Fraser Perimeter Road was not completed
29	Improve road access from Hwy 91 at Nordel Way to the Surrey City Centre	○		The provincial government did not construct an overpass
30	Provide a new river crossing over the Main Arm of the Fraser River from Fraser North to Fraser South	●		Golden Ears Bridge was constructed
31	Improve east-west connection from Hwy 17/99 to Hwy 15/1 (South Fraser Perimeter Road)	●		The South Fraser Perimeter Road is under construction by the provincial government
32	Improved east-west connection Southeast Port Road to Mary Hill Bypass/Hwy 1 to Queensborough bridge/Marine Way	◑		The provincial government portion of the North Fraser Perimeter Road has been completed and additional improvements with the Port Mann Bridge project
33	Improve Hwy 15 from Trans Canada Hwy to the U.S. border	●		The provincial government has completed this- a border infrastructure project
34	Provide east-west hwy connection from Hwy 17 to Trans Canada Hwy (South Fraser Perimeter Road	●		The South Fraser Perimeter Road is presently under construction by the provincial government

Map No.	Recommended Project	Medium Range Project (2006)	Long Range Project (2021)	Comments
	Provide new arterials and widen existing arterials to serve development	◑?		Too vague to evaluate

Source: TransLink analysis. Map numbers refer to numbers on Long Range Plan unless otherwise indicate


Transport 2021 Medium Range Transportation System Concept
Transit, HOV & Mixed Traffic
Legend
Transport 2021
Project Type
Rapid Transit
Transit Capacity Expansion
Bus Lanes
Transit Priority Measures
HOV Lanes
Road Network
Existing Major Road
Projects Completed
Yes
No
Metro Vancouver
Roads
Green Zone
Urban Containment
TRANSLINK


Transport 2021 Long Range Transportation System Concept
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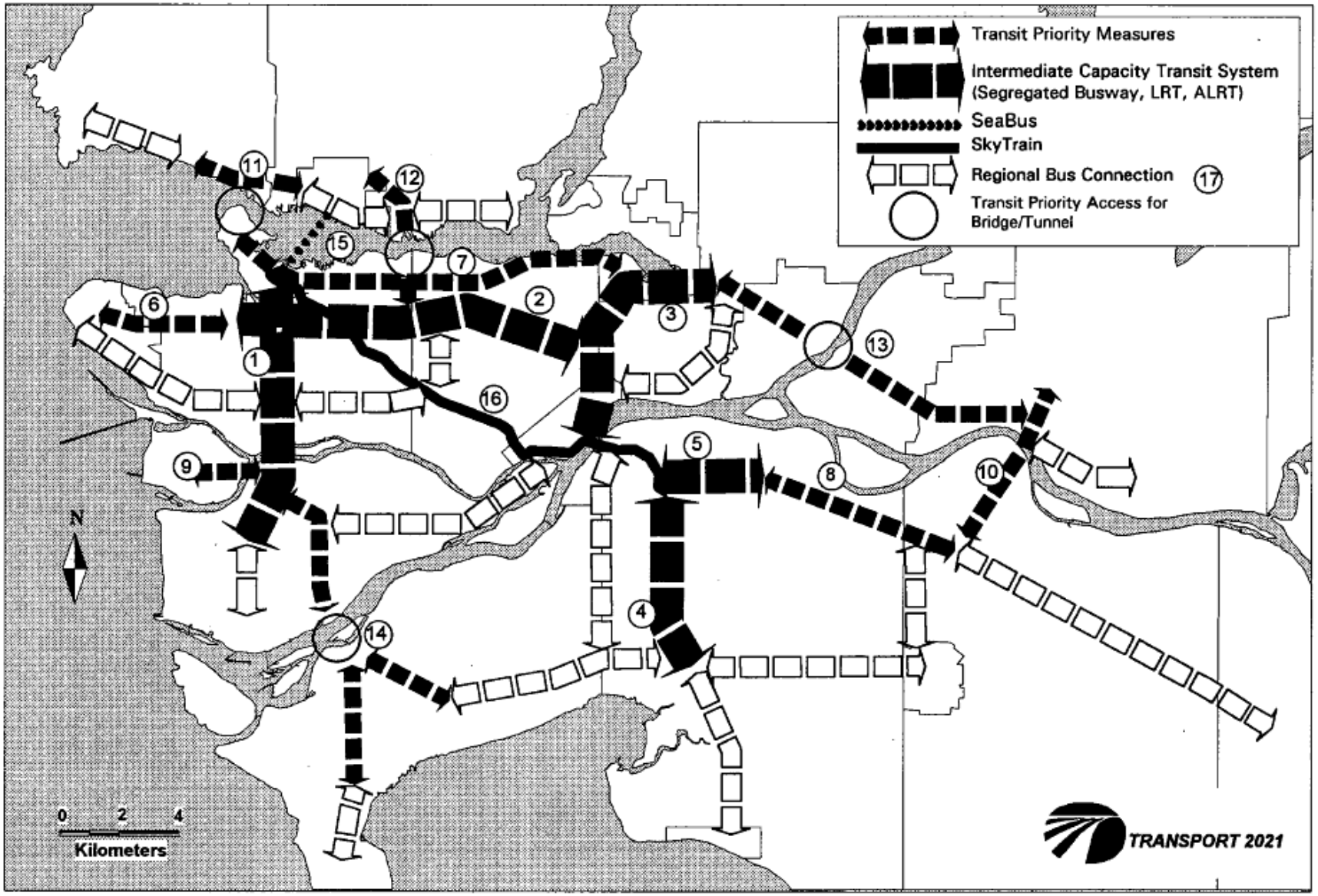
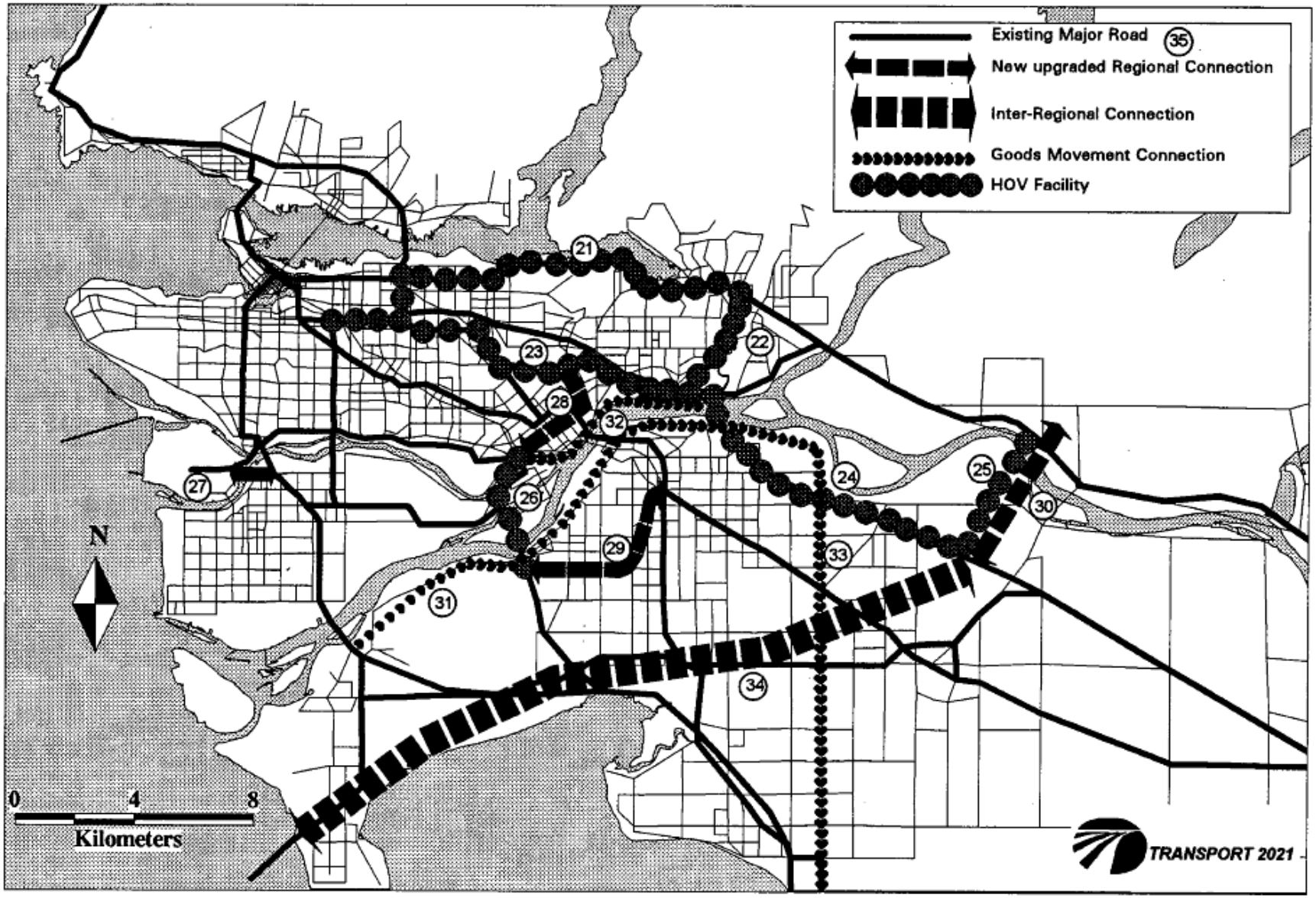
Bus Priority Measures
HOV Lanes
Road Network
Investments Not Identified in T2021
Existing Major Road
Projects Completed
Yes
No
Metro Vancouver
Roads
Green Zone
Urban Containment
TRANSLINK

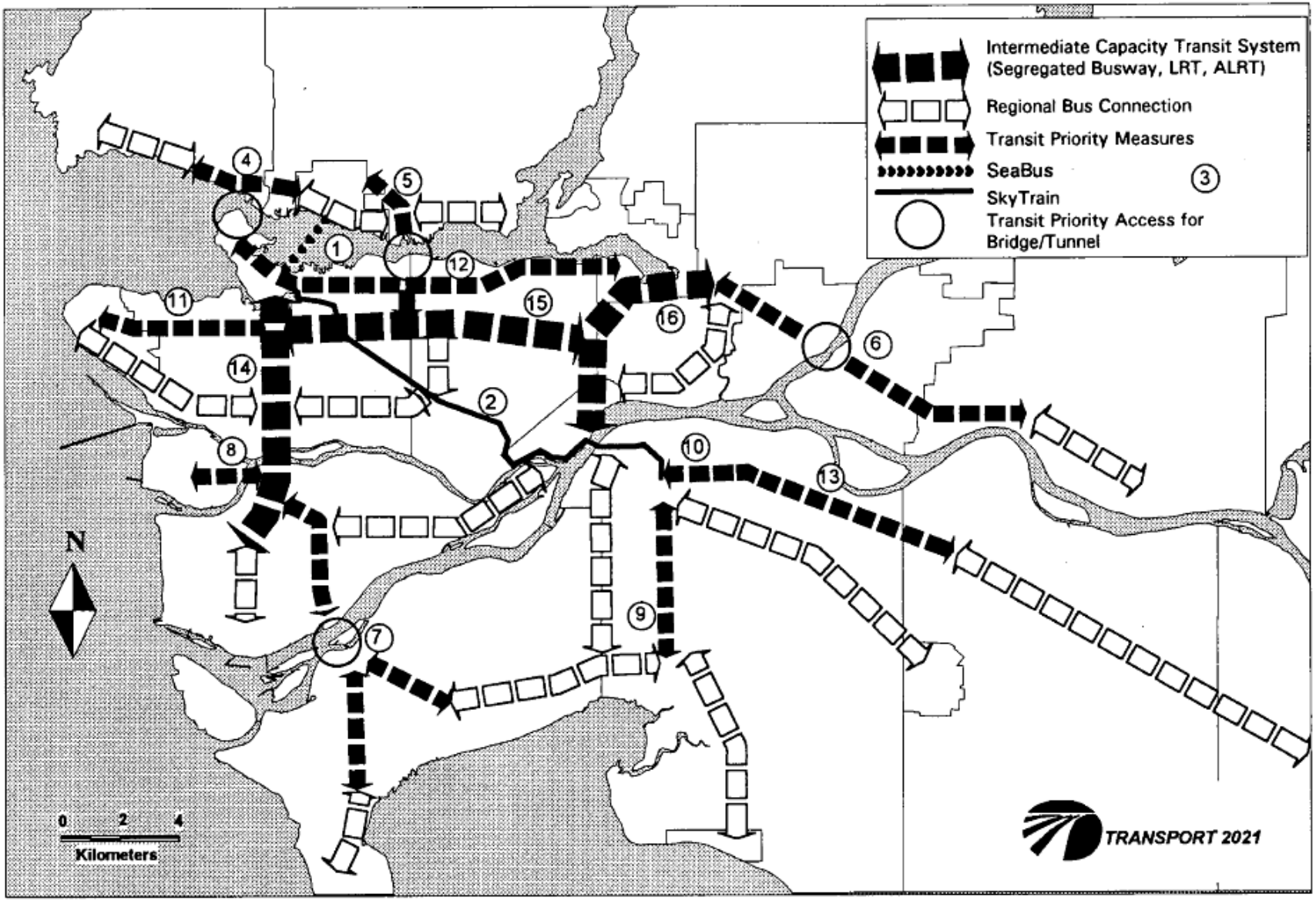
Map #1
Long Range Transportation System Concept - Transit



Map #2
Long Range Transportation System Concept - HOV and Mixed Traffic



Medium-Range Transportation System Concept - Transit



Medium-Range Transportation System Concept - HOV and Mixed Traffic