

NO: R140

COUNCIL DATE: September 14, 2020

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## REGULAR COUNCIL

TO: **Mayor & Council** DATE: **September 10, 2020**  
FROM: **General Manager, Engineering** FILE: **8740-40**  
SUBJECT: **Surrey-Langley SkyTrain Design through Green Timbers**

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## RECOMMENDATION

The Engineering Department recommends that:

1. Council receive this report for information;
2. Approve an optimized four-lane Fraser Highway widening design between 140 Street and 148 Street through Green Timbers, as illustrated/documentated in the attached Appendix "I";
3. Authorize staff to work with TransLink to integrate the optimized four-lane design into the Surrey-Langley SkyTrain Project scope;
4. Authorize staff to work with TransLink to develop the necessary Funding Agreement(s) for including the City Enhancement scopes of work into the Surrey-Langley SkyTrain Project; and
5. Authorize staff to forward the resolution related to this Corporate Report to TransLink.

## INTENT

The purpose of this report is to provide an update on the Surrey-Langley SkyTrain ("SLS") optimized design through Green Timbers Urban Forest ("GTUF") and authorization to work with TransLink to integrate the optimized four-lane widening design with the SLS project ahead of finalizing the reference design by late 2020.

## BACKGROUND

In 1999, Fraser Highway was added to the region's Major Road Network ("MRN") following it being downloaded from the Province to the City, which supports the safe and efficient movement of people and goods across the region. The City and TransLink have joint responsibility in planning the MRN, and while the road remains within the City's jurisdiction, TransLink provides funding for operation and maintenance activities along MRN roads.

In the early to mid-2000's, the City, with funding support from TransLink, invested in excess of \$80 million to complete four-lane widening of Fraser Highway from east of the GTUF to Langley. At the same time, the City completed various studies and functional designs for the GTUF section. This included numerous meetings with the GTUF Advisory Committee (the "Advisory Committee"). While a final cross-section was not determined, the Advisory Committee at that time affirmed their position of agreeing to four-laning, subject to a number of conditions and that it include allowance for rapid transit.

Between 2012 and 2015, TransLink completed a Rapid Transit Alternative Analysis, establishing Light Rail Transit ("LRT") as the technology choice at that time for Fraser Highway. Through this process, a four-lane plus LRT road design was developed that concluded with a proposed 40m wide cross-section that utilized the entire road allowance; however, no further work proceeded as the focus of LRT was King George Boulevard and 104 Avenue.

Since the early planning studies were completed, the City's population has grown from 400,000 to 540,000 residents. Fraser Highway has become the busiest two-lane road in the City, with over 28,000 cars per day.

In December 2019, TransLink developed a Reference Concept Design and Business Case for the project and confirmed that a SkyTrain extension to Langley can be built for a budget of \$3.1 billion, with very favourable ridership forecasts and a benefit-cost-ratio.

On January 30, 2020, TransLink's SLS Project Business Case Summary was approved by the Mayors' Council and was submitted to both the Provincial and Federal Governments for their respective approvals and confirmation of their funding commitments for Stage 1 to 166 Street in Fleetwood.

## **DISCUSSION**

### **Surrey-Langley SkyTrain Reference Design**

TransLink's current reference design includes 16 kilometres of two-way, elevated guideway between King George Station to Langley Centre. Between 140 Street and 148 Street (the GTUF segment), the guideway is generally centre-median running, transitioning to south side running.

TransLink's current design includes SkyTrain plus two existing travel lanes through GTUF. City staff are proposing to integrate City Enhancement works (utility and roadworks from the City's 10-Year Servicing Plan) into the SLS Project ahead of a potential procurement in early 2021. This approach will enable all infrastructure to be delivered simultaneously in a coordinated effort to reduce capital costs and impact on residents, business, environmental areas and traffic. One of the proposed coordinated road works is completing the four-lane widening of Fraser Highway from Whalley Boulevard to 148 Street.

The City has worked with TransLink to optimize a four-lane design, as explained below, to eliminate impacts to the park and minimize impact to trees in the road allowance in the GTUF segment of Fraser Highway. This optimized design considers concerns raised during stakeholder engagement and aims to reduce the road footprint and protect high-value trees along the north side of Fraser Highway. The design is entirely located within the road allowance and does not impact GTUF property.

## Optimized Four-Lane Design Through Green Timbers

As part of the SLS project, TransLink and City staff have worked collaboratively to develop an optimized road cross-section so that there is no impact on the GTUF property while providing the necessary multi-modal transportation needs to reduce the road footprint. Work focused on making data driven, evidence-based design decisions, and as part the process, staff completed:

1. A tree survey of all trees greater than 300mm diameter at breast height above ground (“Bylaw Trees”), the findings of which identified the north side of Fraser Highway as having more trees which are of “higher value”.
2. A confirmation of 2019 traffic counts and patterns, which confirmed Fraser Highway carries 28,000 vehicles per day through GTUF, with significant traffic movements between 96 Avenue and 144 Street, as illustrated in Appendix “II”.
3. Transportation modelling (2025, 2035 and 2045) which confirmed that, even with SkyTrain, the need for four lanes is required by 2025 due to current volumes, growth and future density along Fraser Highway. There are not other feasible corridors that can accommodate this volume. Four-laning will provide a capacity, which meets the City’s long-term horizon.

Utilizing data driven decisions, staff developed 28 cross-sections and used a multiple point allocation method to determine an optimized four-lane road plus SkyTrain design that minimizes impact. This approach considered: traffic volumes; pedestrian and cyclist volumes; transit needs; environmental impact; tree impact; and capital costs.

Results from the multiple point allocation converged an optimized four-lane plus SkyTrain cross-section with a width varying from 22.5m (mid-block) to 27.5m, subject to intersection widening for left-turn lanes including provisions for safer, grade-separated pedestrian and cycling. This cross-section is significantly less than the 40m width originally proposed by LRT. The optimized cross-section is shifted along the south side of the road between 96 Avenue and the 14600 Block, protecting the large number of high-value trees along the north side. Appendix “I” attached to this report illustrates the optimized SkyTrain design that incorporates the optimized four-lane cross-section at three locations:

1. 140 Street to 96 Avenue (14200 Block);
2. 96 Avenue intersection; and
3. 144 Street to 148 Street (14600 Block)

The optimized 22.5m four-lane design only slightly impacts additional Bylaw Trees, relative to TransLink’ base two-lane design, requiring tree removal to accommodate SkyTrain. All of these trees are within the existing road allowance, and there are **no trees within GTUF being impacted by the optimized design**. Furthermore, staff’s optimized design is a significant improvement from the original 40m wide, four-lane LRT design, as it prevents approximately 300-350 Bylaw Trees from being removed within the road allowance.

As part of the transportation modelling, staff have validated that the proposal to widen Fraser Highway from two lanes to four lanes will alleviate significant congestion for over 28,000 vehicles per day. Modelling and analysis have quantified that this congestion and anti-idling reduction equates to an annual reduction of 106 tonnes of greenhouse gases (“GHG’s”), which further aligns with the City’s climate action initiatives. Based on research from Cornell University, the reduction of 106 tonnes of GHG’s equates to the impact of adding 8 acres of mature forest.

## **Consultation with Green Timbers Heritage Society and Stakeholders**

As referenced earlier, stakeholders have been engaged throughout this project by TransLink and the City. In December 2019, staff engaged the Green Timbers Heritage Society (the “Society”) to provide a project update and particularly to seek their input and discuss work on the optimized four-lane cross-sections developed to minimize forest impacts. As a response, the Society has offered their response to the City’s optimized four lane design, as provided in Appendix “III”.

The Society and other stakeholders understand the broader view of the SkyTrain project and the needs of a rapidly growing community to improve transportation. The Society acknowledges the City’s efforts to optimize and narrow the road widening, and to incorporate the works within the SLS, so as to not disturb the forest on multiple occasions. The Society and other stakeholders have expressed further opportunities for enhancing the SLS project such that it incorporates the heritage of the forest, wildlife crossings and noise and light mitigation measures; staff and TransLink will continue to work with the Society in exploring these opportunities.

### **Next Steps**

Staff are seeking to integrate the optimized design into the TransLink SLS Project and negotiate the terms and conditions of a Funding Agreement with TransLink on City-driven project enhancements, in particular the four-lane widening, with realised financial savings to the City. Based on initial discussions, staff and TransLink anticipate the incremental cost to complete the four lanes between 140 Street and 148 Street is \$5.5 to \$6.0 million.

In light of current challenges due to the COVID-19 pandemic, TransLink is anticipated to commence an online SkyTrain Phase 3 Public Engagement in the coming weeks, at which time the updated project design, including the widening through Green Timbers, will be presented to the public with opportunities to provide feedback on other aspects which could be incorporated into the project.

## **SUSTAINABILITY CONSIDERATIONS**

The approval of an optimized four-lane design through Green Timbers supports the objectives of the City’s Sustainability Charter 2.0. In particular, this project relates to the Sustainability Charter 2.0 themes of Built Environment and Neighbourhoods, and Infrastructure. Specifically, the road widening supports the following Desired Outcomes (“DO”):

- Neighbourhoods and Urban Design DO2: Surrey is well-connected within the City and to the rest of the region by fast and efficient public transit and active all-ages-and-abilities transportation infrastructure; and
- Transportation DO11: An integrated and multi-modal transportation network offers affordable, convenient, accessible and safe transportation choices within the community and to regional destinations.

## CONCLUSION

The SLS Project has reached a major milestone with the Mayors' Council approving the Business Case on January 30, 2020. Staff have worked with TransLink to optimize the project design, including the ability to complete SkyTrain plus four-lane widening using an approximate 27.5m optimized cross-section through GTUF entirely within the road allowance, with no impact to GTUF and only an incremental increase in tree loss compared to TransLink's original two-lane design.

Scott Neuman, P.Eng.  
General Manager, Engineering

SBN/MD/cc

Appendix "I" - Green Timbers Cross-Sections

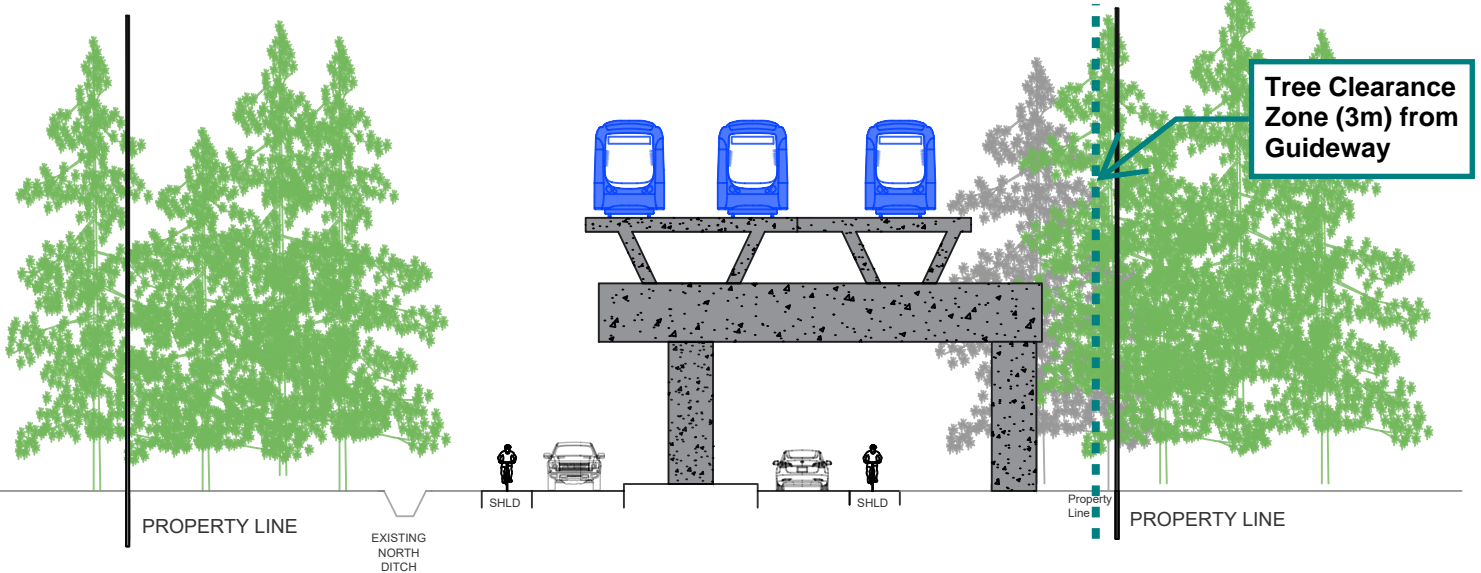
Appendix "II" - 2019 Traffic Counts on Fraser Highway

Appendix "III" - Green Timbers Heritage Society Response to Project Update

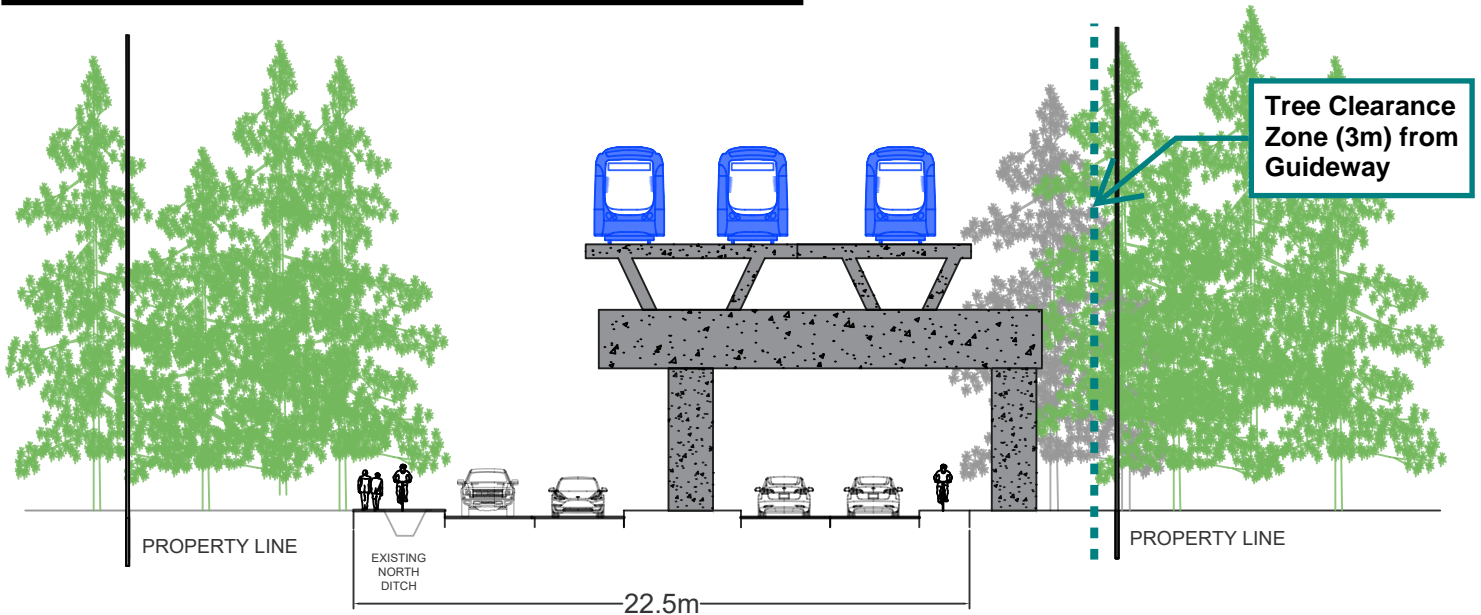
g:\wp-docs\2020\admin\cr\vl2 surrey-langley skytrain design through green timbers.docx  
CLR 9/10/20 5:44 PM

Fraser Highway: 140 Street to 96 Avenue

Original Skytrain Design with 2 Lane (Mid Block)



Optimized Skytrain Design with 4 Lane (Mid Block)



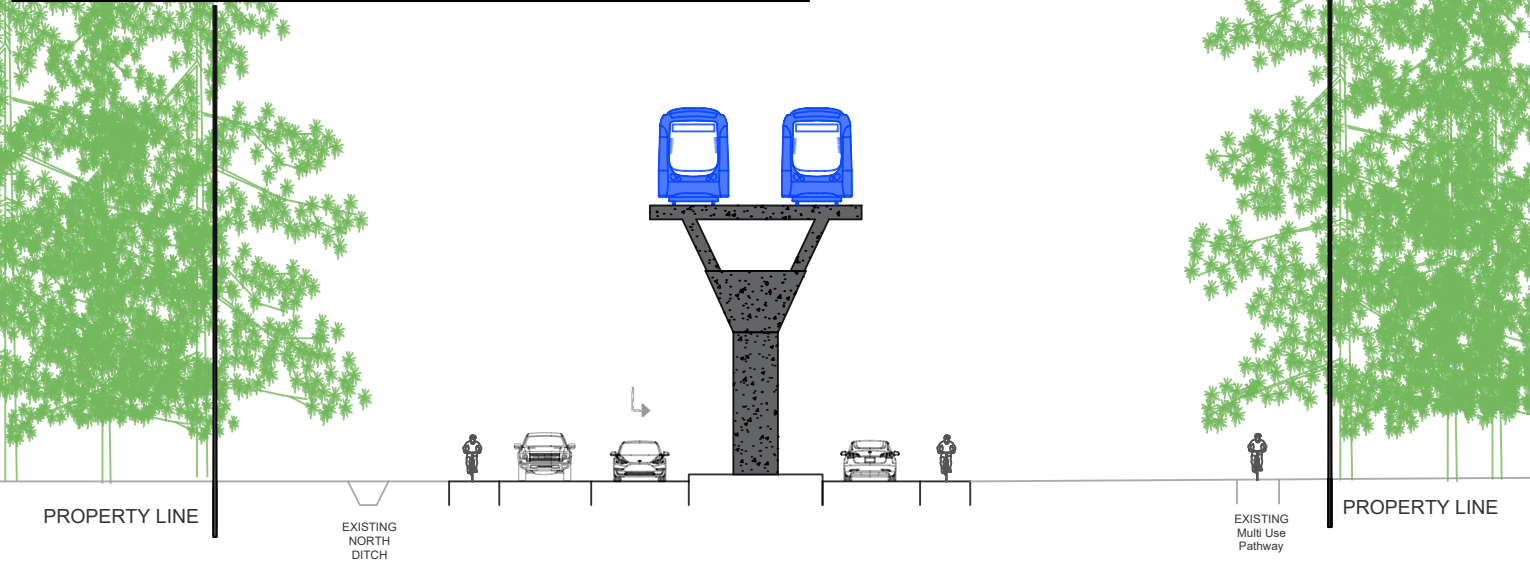
**Fraser Highway:  
140 Street to 96 Avenue  
(14200 block) Eastbound View**

**ENGINEERING  
DEPARTMENT**

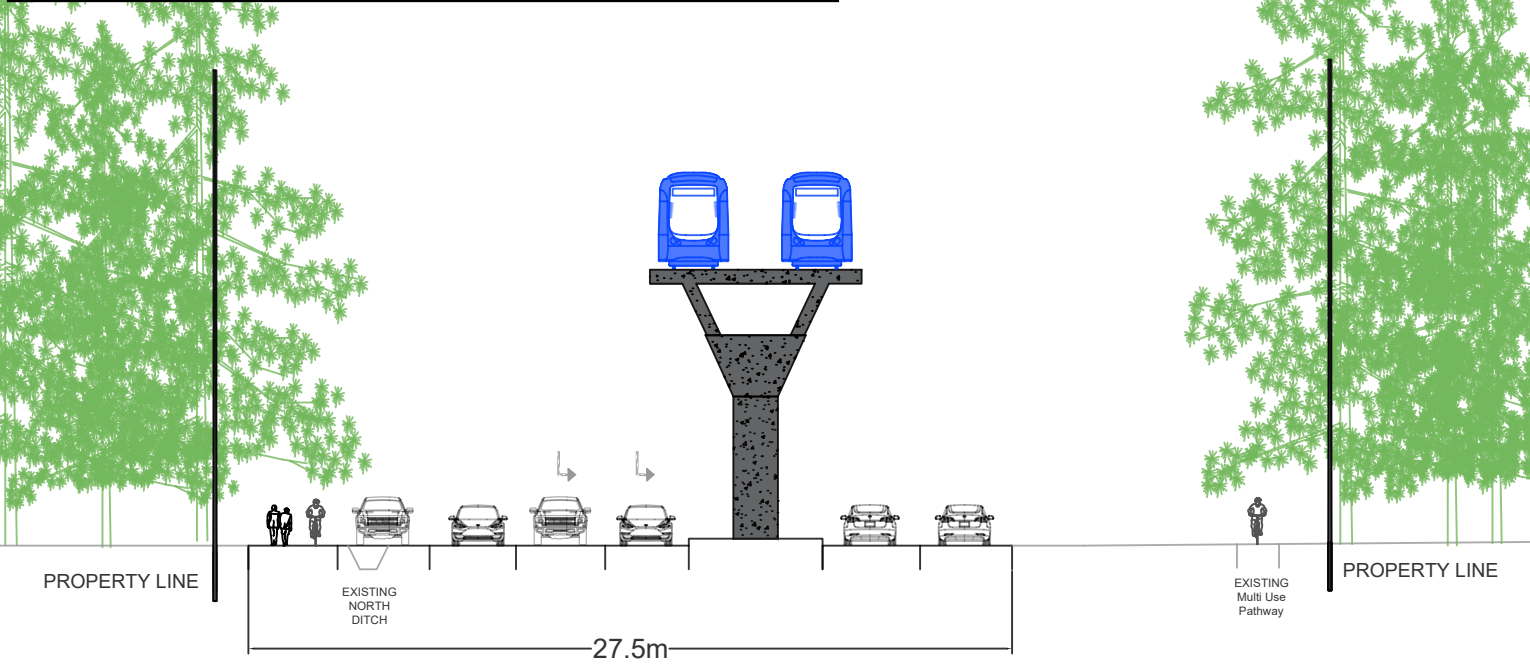
The data provided is compiled from various sources and IS NOT warranted as to its accuracy or sufficiency by the City of Surrey. This information is provided for information and convenience purposes only. Lot sizes, Legal descriptions and encumbrances must be confirmed at the Land Title Office.

Fraser Highway: 96 Avenue Intersection

Original Skytrain Design with 2 Lane (Intersection)



Optimized Skytrain Design with 4 Lane (Intersection)



**Fraser Highway:  
96 Avenue Intersection  
Eastbound View**

**ENGINEERING  
DEPARTMENT**

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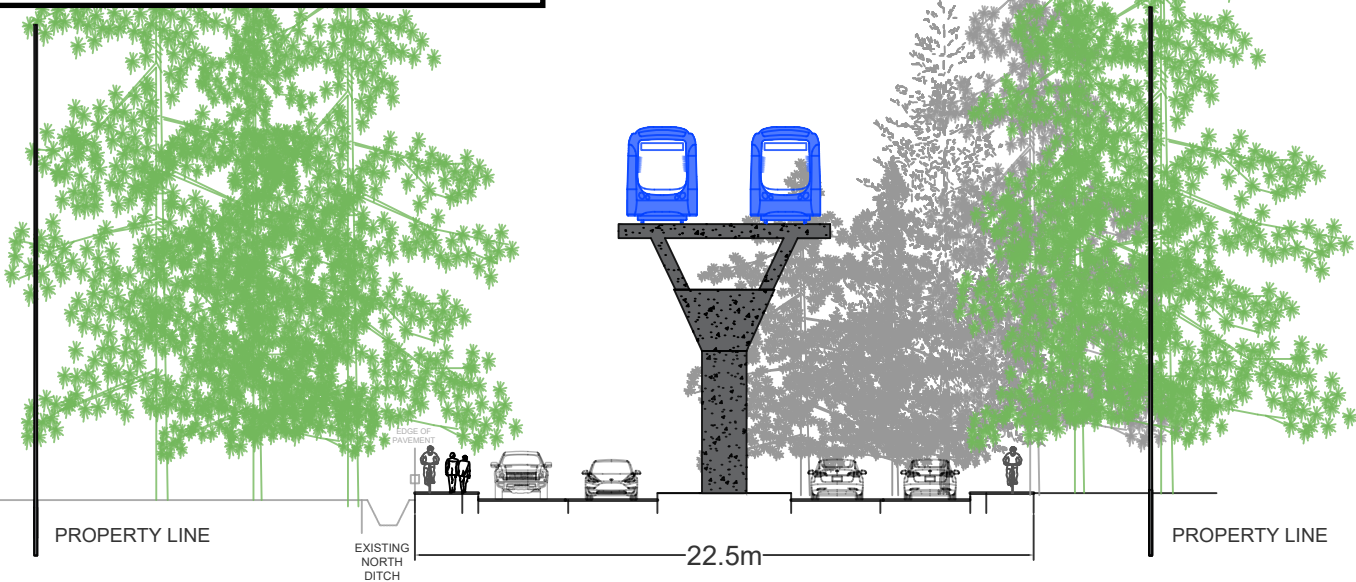
Fraser Highway: 144 Street to 148 Street

Original Skytrain Design with 2 Lane

Tree Clearance Zone (3m) from Guideway



Optimized Skytrain Design with 4 Lane



**Fraser Highway:  
144 Street to 148 Street  
(14600 block) Eastbound View**

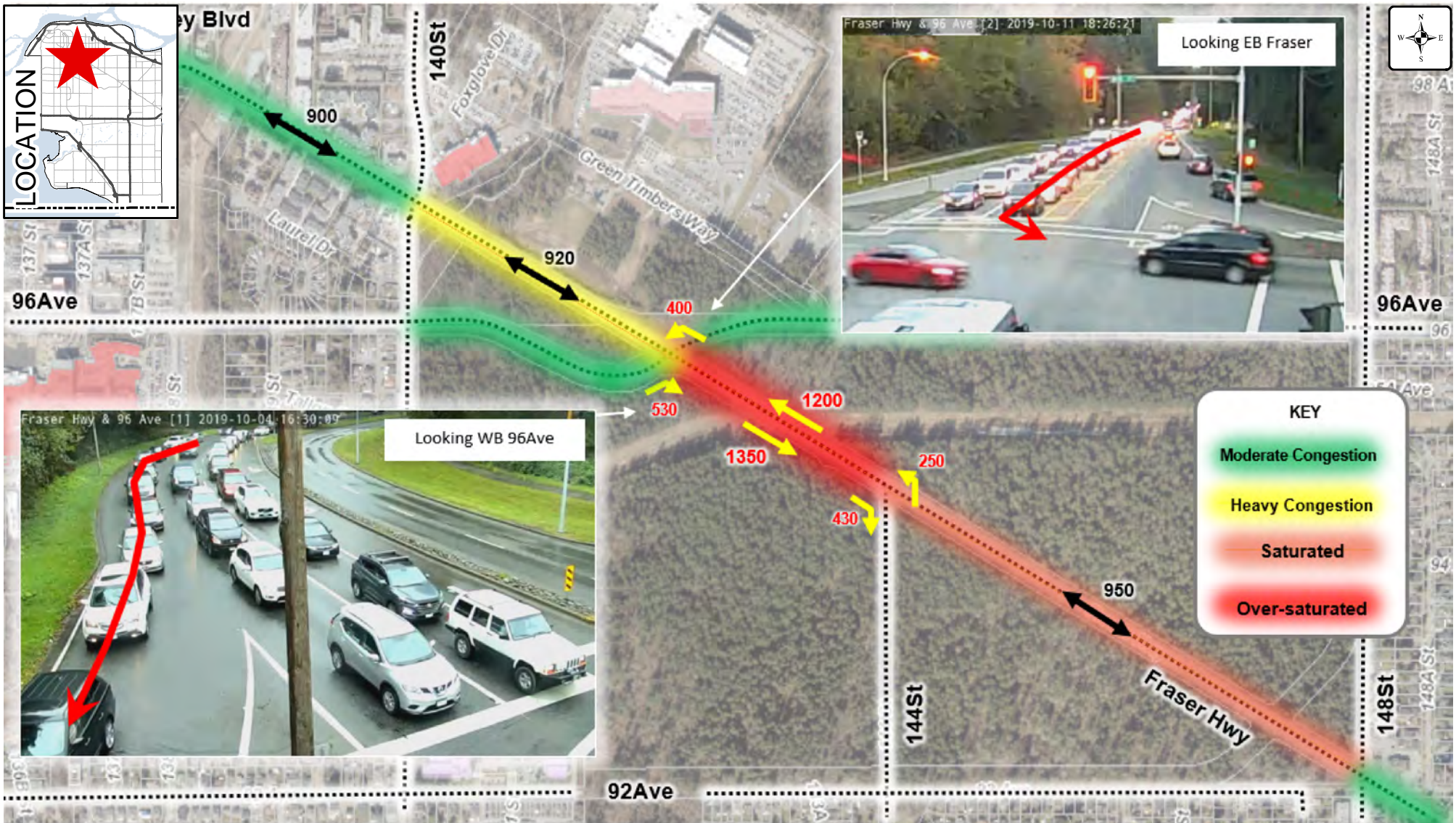
**ENGINEERING  
DEPARTMENT**

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Source: G:\MAPPING\GIS\Maps\Templates\CorporateReport\PS\_Templates\EngRealty\_AerialPhoto\_AP.mxd



# 2019 Traffic Counts on Fraser Highway



Produced by GIS Section: 31-Jan-2020, JJR

Scale: 1:10,000



## Peak Hour Traffic Counts

ENGINEERING  
DEPARTMENT



**Green Timbers Heritage Society**

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[info@greentimbers.ca](mailto:info@greentimbers.ca)

**APPENDIX "III"**

January 13, 2020

Jaime Boan, P. Eng.  
Manager, Transportation  
City of Surrey Engineering Department  
[jaboan@surrey.ca](mailto:jaboan@surrey.ca)

Dear Mr. Boan,

Thank you for meeting with us on Thursday, Dec 19, 2019 to go over some ideas and notional plans for Fraser Highway when the Skytrain goes through. We appreciate the time and effort you and your team has taken to elicit feedback from the Society.

We also understand the information presented was not complete or final.

As we understand it, the City believes it can build four lanes using Translink's planned footprint from 140th to 144th without any extra removal of the forest beyond required for Skytrain, and, by adding an extra 3 metres, four lanes from 144th to 148th. Furthermore, our understanding is that all this will be well within the existing 40 metre road allowance.

The Green Timbers Heritage Society appreciates the effort taken to minimize the road's footprint, but also understands (after all we are citizens too) that there is enormous pressure to increase road capacity.

In general, and realizing these are preliminary ideas, the Society believes the City's road ideas, although not ideal for the long-term viability of the forest from an environmental perspective, are sensitive enough to the challenges of balancing transportation needs with environmental, educational, and recreational uses of the forest and park to merit a cautious approval.

We further understand that this meeting, and this project, was narrowly focussed on Fraser Highway. Although this is useful to keep conversations to the subject at hand, it's important to remember this will affect the Green Timbers Urban Forest as a whole, and as such, it's important to reiterate what's important for the area as a whole.

With this in mind we encourage the Skytrain project as an opportunity to take a broader view of what the City sees as the long-term vision of how vehicular traffic should be moving through this incredible asset. What are the 20-, 50-, or 100-year conceptions for moving people from one side to the other?

Please find attached some considerations to keep in mind with the planned widening, as well as a brief survey of previous plans.

We look forward to the opportunity to provide further input as planning proceeds.

Sincerely,

Don Schuetze,

On behalf of the Directors of The Green Timbers Heritage Society.

## Considerations to keep in mind for planning the widening of Fraser Highway

As a general principle, we think it's self-evident that it's not ideal to run arterial roadways through parks, or areas which are pedestrian- and recreation-focussed. Roads should lead people into parks, not through them. For examples, look at large parks near city centres, and you'll notice they rarely have more than four arterial lanes through them: Stanley Park, Wascana Park, Parc Mt Royal, Central Park, etc.

Putting in the light at 144th at Fraser Highway has increased and slowed down traffic through the park (drive along Fraser Highway during rush hour and this will become immediately apparent).

Although to anyone inching eastward along Fraser Highway during afternoon rush hour will appreciate multiple lanes, no widening of Fraser Highway through the park will solve the problems at 152 Street!

Surrey has recognized the view down Fraser Highway, east from 140th Street, as a Heritage item. Can anything be done to preserve some semblance of this? (see <http://www.surrey.ca/city-services/3242.aspx>)

When constructing the new highway, the engineers will be cutting through over 100 years of history: the Old Yale Road, the Pacific Highway, and probably multiple pavings of Fraser Highway. Would it be feasible to preserve a cross section of this?

There were plans to have some public art at the Jim Pattison station. With the building of a station there, and bearing in mind this is/was a heritage view, there should be an opportunity to create something special at this entrance point to the forest.

## A brief summary of previous plans to widen Fraser Highway through Green Timbers Urban Forest

Over several decades plans have been made to widen Fraser Highway to 4 lanes, as well as closing 144<sup>th</sup> (Archibald Road) from 92<sup>nd</sup> to Fraser Highway. At one point plans were also made to extend 92<sup>nd</sup> to 140 St, and even to close Fraser Highway (1998)! Obviously, plans can change.

In Spring of 2014 the City invited both the Green Timbers Urban Forest Advisory Committee and the Green Timbers Heritage Society for feedback on plans to widen the highway in anticipation of light rail running through the corridor. Consultations planned for 2015, Construction for 2016/17.

21 May 2014 - Jaime Boan, Manager of Engineering Dept, chaired a meeting at City Hall, organized by Sinisa Petrovic. Attending were 4 members of the City's Transportation/Traffic Division of the Engineering Dept, 3 GTHS Directors, and Neal Aven for City Parks. The purpose was the construction of traffic lights on Fraser Hwy at 144<sup>th</sup>. Various studies arranged by City Staff and GTHS recommended closure of 144 north of 92. A list of these studies was given to Mr. Petrovic.

18 June 2014 - GTHS President Ellen Edwards wrote to Vincent Lalonde, City Manager (copy to Owen Croy, Parks Mgr), "to make you aware of 20 years of negotiation on this issue to close 144<sup>th</sup> rather than encourage it..." and included some examples:

- Dec 1992 and July 1998 - Wady Lehmann - "It's an advantage to all - trees, wildlife and traffic movement."
- Fall 1998 - City hired researchers Coast River Environmentalists - recommended that all internal roads be closed.
- June 2000 - Dillon Consulting recommended a pro-active measure that Recreation/Parks/Engineering Depts work together to decommission 144<sup>th</sup> north of 92<sup>nd</sup>.
- June 2000 - Between 1997 and 2000 the GTUF Advisory continually recommended 144<sup>th</sup> closure.
- January 2002 - Keystone Wildlife (hired by City Parks) recommended 144<sup>th</sup> closure.
- Spring 2005 - Peter Maarsman reports that Surrey Engineering/Transp had agreed to close 144<sup>th</sup>.
- June 2007 - GTUF Committee agreed to close 144<sup>th</sup>. This includes Parks staff.
- November 2007 - GTHS Directors all vote to close 144<sup>th</sup>.
- May 2008 - Someone came up with a "new idea" to close 144!

21 May 2014 - City Engineering staff seemed unaware of all above discussions.

17 July 2014 - Frank Bucholtz in the Surrey/North Delta Leader included a Question of the Week: Does Surrey do enough to protect trees? 81% answered no. Mr. Bucholtz opined that the highway should not be 4-laned through the forest.

18 September 2014 - City Engineering/Transportation/Traffic staff met with GTHS Directors and presented planning for the equivalent of six lanes along Fraser Highway: 2 lanes west, 2 lanes east, 2 lanes for LRT, a pedestrian and cycle path, room between lanes and room for utilities. The GTHS recommended preservation of the taller trees on the north side and expansion on the south.

11 December 2014 - The GTHS surveyed opinions from members and public on the plan. Most responses expressed sadness at the loss of green space but realization that the train was also important.