

NO: R158

COUNCIL DATE: July 26, 2021

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**REGULAR COUNCIL**

**TO: Mayor & Council** **DATE: July 21, 2021**

**FROM: General Manager, Engineering** **FILE: 1721-011/11**

**SUBJECT: Award of Contracts 1721-011-11 and 1721-011 C1  
84 Avenue Corridor between King George Boulevard and 140 Street and  
Associated Park Improvements**

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**RECOMMENDATIONS**

The Engineering Department recommends that Council:

1. Receive this report for information;
2. Award Contract No. 1721-011-11 to Tybo Contracting Ltd. in the amount of \$15,524,250.00 (including GST) for the 84 Avenue corridor between King George Boulevard and 140 Street and associated park improvements;
3. Set the expenditure authorization limit for Contract No. 1721-011-11 at \$17,000,00.00 (including GST and contingency);
4. Award Consultant Construction Agreement No. 1721-011 C1 to Aplin & Martin Consultants Ltd. in the amount of \$682,500.00 (including GST) for the related engineering construction services;
5. Set the expenditure authorization limit for Contract No. 1721-011 C1 at \$750,000.00 (including GST and contingency); and
6. Authorize the General Manager, Engineering to execute Contracts 1721-011-11 and 1721-011 C1.

**INTENT**

The intent of this report is to obtain approval to award the construction contract and engineering construction services contract for the 84 Avenue corridor project between King George Boulevard and 140 Street and associated park improvements (the "Project").

**BACKGROUND**

On May 31, 2021, Council approved Corporate Report No. R111; 2021 (attached as Appendix "I") for the detailed design and tendering for the Project, as illustrated on the map attached to this report as Appendix "II".

## SCOPE OF WORK

### Construction Contract

The construction package related to this Contract consists of road, cycling and pedestrian pathways, and park enhancements at the locations listed in the following table and illustrated in Appendix “II”:

Map Reference Number	Project #	Project Description	Location
1	R-7065	Arterial New Construction	84 Avenue: King George Boulevard to 140 Street
2	R-18936	Traffic Signal Upgrade	84 Avenue and 140 Street
3	R-18935	Traffic Signal Upgrade	84 Avenue and King George Boulevard
4	R-11748	Bear Creek Crossing	84 Avenue at Bear Creek
5	R-18937	King Creek Crossing	84 Avenue at King Creek
6	R-7065	Bear Creek Park Enhancements (parking lot expansion, wetland habitat, 83A Avenue access)	Wetland pond and trails
7	W-19168	300mm diameter water main	84 Avenue: King Creek to 140 Street

The Contract permits construction from 7:00 a.m. to 10:00 p.m., Monday through Friday, in compliance with the *Surrey Noise Control Bylaw, 1982, No. 7044*. The Contract includes an option for contractors to work 24-hours a day, seven days a week for portions of work not adjacent to the strata property at King George Boulevard and 84 Avenue.

The Contract work is expected to start in August 2021 and be completed by September 2022.

### Engineering Construction Services

The engineering construction services consisting of contract administration and field inspection services including civil work inspection by Aplin & Martin Consultants Ltd., and environmental, structural, geotechnical, and arborist field inspection services from other consultants who will be retained as sub-consultants through the engineering construction services contract with Aplin & Martin Consultants Ltd.

### Tree Impact

Based on the detailed design, the Project will require removal of approximately 63 Bylaw size trees (measured at least 30 centimetres diameter at breast height), with 55 being Alder and Cottonwood trees. 53 By-law size trees will require removal for the road (within existing road allowance and/or below powerlines), while 10 require removal to accommodate the associated park improvements.

To offset the trees removed, the City will plant all trees at a 3:1 ratio within the project area which exceeds the *Surrey Tree Protection By-law, 2006 No. 16100*.

## **BC Hydro**

The City and BC Hydro have been working collaboratively in the delivery of the Project. BC Hydro has completed their initial technical review of the Project in relation to their transmission infrastructure and BC Hydro is of the opinion modifications are required to raise their transmission lines at an estimated cost of \$7 million. The City has undertaken an independent consultant review of the of the project in relation to the BC Hydro infrastructure and has found BC Hydro's infrastructure may need to be raised to accommodate large transport trucks.

84 Avenue is not a designated truck route within the City of Surrey and transport trucks should not be utilizing this road. As part of the project, the City and its independent consultant developed a proposed operational approach that includes installing "truck prohibited" and "low clearance / electrical hazard" road signage on 84 Avenue, at King George and 140 Street, along with other height detection measures to inform travelling motorists and prohibit over height vehicle from using this road.

BC Hydro has provided the City with conditional approval for the Project based on the transmission lines being modified; however, both parties are continuing discussions on potential modifications that may or may not be required for the Project. In the interim, the proposed operational approach for 84 Avenue does not increase risks to the public and provides time for BC Hydro to complete their final assessment and modifications of their transmission lines, if required.

## **Regulatory Approvals**

The environmental assessment identified a small wetland area located between Bear Creek and King Creek that will be partially disturbed by the road area. The area impacted is localized and a mitigation and enhancement plan has been developed by the City's independent Qualified Environmental Professional. The enhancement plan includes creation of a large wetland pond south of 84 Avenue, near the existing parking lot, which would introduce environmental and biodiversity enhancements. The proposed wetland enhancement area will be significantly larger size than the existing localized wetland area disturbed as it is designed to compensate for the entire 84 Avenue corridor project.

Furthermore, there are two salmon-bearing Class A watercourses located along the road alignment, Bear Creek and King Creek. The road design includes an estimated 35m long clear span bridge over Bear Creek to ensure the creek is undisturbed and facilitate wildlife passage for large mammals. A large 3.0m wide by 1.8m high box culvert is proposed across King Creek with fish passage features to protect both fish and wildlife passage.

The enhancement plan and proposed creek crossings will fully mitigate project impacts. Applications are anticipated to be submitted to Provincial and Federal regulatory agencies by early August. Construction work will proceed in areas outside of the environmentally sensitive areas until approvals from the Provincial and Federal regulatory agencies are received.

## TENDER RESULTS

Tender invitations were extended to contractors who were pre-qualified under the City's Request for Expression of Interest prequalification process. Tenders for the subject Contract were opened on July 20, 2021 with the following results:

<i>Contractor</i>	<i>Tendered Amount with GST</i>	<i>Corrected Amount</i>
1. Tybo Contracting Ltd.	\$15,524,250.00	No Change
2. Lafarge Canada Inc.	\$17,290,761.92	No Change
3. B&B Heavy Civil Construction Ltd.	\$17,424,600.00	No Change
4. Mainland Infrastructure Canada Inc.	\$17,959,013.34	No Change
5. Jacob Bros. Construction Inc.	\$20,851,898.55	\$20,851,898.84

The Engineer's (Aplin and Martin Consultants Ltd.) pre-tender estimate was \$17.5 million, including GST.

## EVALUATION

The City's consultant reviewed the tender submissions for accuracy and completeness. There was one arithmetic error that had no bearing on the outcome of the tender process. All submissions included the required 10% bid bond and were signed and sealed on the Tender Form.

The low bidder, Tybo Contracting Ltd., has provided a Consent of Surety for a Performance Bond and a Labour & Materials Bond, and agreed to complete the work by September 2022, as stipulated in the Contract. Tybo Contracting Ltd.'s past performance on similar work has been satisfactory. They have no outstanding legal claims against the City. It is recommended that Tybo Contracting Ltd. be awarded Contract No. 1721-011-11.

## SUSTAINABILITY CONSIDERATIONS

The 84 Avenue corridor supports the objectives of the City's Sustainability Charter 2.0. In particular, this project supports the Sustainability Charter 2.0 themes of Built Environment and Neighbourhoods, and Infrastructure. Specifically, this project supports the following Desired Outcomes ("DO"):

- Neighbourhoods and Urban Design DO<sub>2</sub>: 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;
- Transportation DO<sub>11</sub>: An integrated and multi-modal transportation network offers affordable, convenient, accessible and safe transportation choices within the community and to regional destinations; and
- Natural Areas, Biodiversity and Urban Forest DO<sub>2</sub>: Surrey actively protects, enhances and restores its natural environment and habitats.

## FUNDING

Funding for this Contract is available in the approved 2021 Transportation and Utilities Budget, including the unforeseen \$3 million in park and environmental enhancements and \$2 million for landfill soil disposal.

Scott Neuman, P.Eng.  
General Manager, Engineering

VJ/cc

Appendix "I" – Corporate Report No. R111; 2021

Appendix "II" – Map of Locations – Contract No. 1721-011-11

[https://surreybc.sharepoint.com/sites/ENG.Administration/WP\\_Docs/2021/Admin/CR/Award of Contract 1721-011-11 84 Avenue Corridor between King George Boulevard and 140 Street and Associated Park Improvements/Award of Contract 1721-011-11 84 Avenue Corridor between KGB and 140 St and Associated Park Improvements \(07212021\) VL Edits - Redlined.docx](https://surreybc.sharepoint.com/sites/ENG.Administration/WP_Docs/2021/Admin/CR/Award%20of%20Contract%201721-011-11%2084%20Avenue%20Corridor%20between%20King%20George%20Boulevard%20and%20140%20Street%20and%20Associated%20Park%20Improvements/Award%20of%20Contract%201721-011-11%2084%20Avenue%20Corridor%20between%20KGB%20and%20140%20St%20and%20Associated%20Park%20Improvements%20(07212021)%20VL%20Edits%20-%20Redlined.docx)

NO: R111

COUNCIL DATE: MAY 31, 2021

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## REGULAR COUNCIL

TO: Mayor & Council

DATE: May 27, 2021

FROM: General Manager, Engineering

FILE: 1721-011/01

SUBJECT: 84 Avenue Public Engagement and Preliminary Design

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## RECOMMENDATION

The Engineering Department recommends that Council:

1. Receive this report for information;
2. Authorize staff to proceed with detailed design of 84 Avenue between King George Boulevard and 140 Street along with related enhancements to Bear Creek Park;
3. Authorize staff to proceed with detailed design of 'Option A' with a cycling and pedestrian pathway adjacent to the north side of 84 Avenue and along the south side of the Bear Creek Park Reservation area, generally between King Creek and 140 Street; and
4. Authorize staff to proceed with tendering for the construction of 84 Avenue between King George Boulevard and 140 Street, along with improvements to Bear Creek Park, upon completion of detailed design.

## INTENT

The intent of this report is to inform Council of the public engagement and preliminary designs completed with respect to the 84 Avenue project between King George Boulevard and 140 Street and to obtain approval to proceed with the detailed design and subsequent procurement for the construction of 84 Avenue between King George Boulevard and 140 Street and Bear Creek Park improvements, as illustrated on the map attached to this report as Appendix "I".

## BACKGROUND

On March 8, 2021, Mayor and Council authorized staff to commence with engineering services for the field investigation, preliminary design and public engagement of 84 Avenue between King George Boulevard and 140 Street, immediately south of the Bear Creek Park Reservation Area.

The City recently concluded community engagement for 84 Avenue between King George Boulevard and 140 Street. This report provides a summary of the feedback received during the public engagement, which focused on providing information to the public while also seeking input regarding the 84 Avenue corridor plans and amenities for Bear Creek Park.

Furthermore, the City recently undertook field investigations that included geotechnical work, environmental site reviews of aquatic and terrestrial habitats, contaminated soils review of historical landfill areas, topographical surveys, tree survey measuring and an archaeological overview. This information has informed the development of preliminary designs for the project, as well as the alignment of the road and overall footprint, and has accurately established the actual environmental impacts and mitigation plans for the project.

## **DISCUSSION**

Since 2009, the City has grown by over 100,000 residents and severity of traffic collisions and congestion is becoming increasingly worse. The City has limited east-west arterial roads, particularly in the central portion of the City where there are only two continuous arterial roads, 64 Avenue and 88 Avenue, connecting Newton to Fleetwood and Cloverdale. This represents a crucial gap in the City's transportation network. Other east-west arterial roads remain unconstructed, such as 72 Avenue which terminates at the Agricultural Land Reserve boundary, and 80 Avenue whose alignment would transverse 13 environmentally sensitive watercourse crossing between 140 Street and 152 Street.

Between 2005 to 2009, various options have been explored to improve road safety, traffic congestion and connectivity between Fleetwood and Newton. The extension of 84 Avenue was the recommended alternative for reducing traffic congestion and improving safety, as it had the highest benefit-cost ratio and provided the most optimal balance from a traffic, safety, park, environmental and financial perspective.

### **Public Engagement Process**

The engagement efforts involved discussions with stakeholders, such as Surrey Environmental Partners, White Rock and Surrey Naturalists Society, ICBC, HUB Cycling, BC Hydro, the Ministry of Environment, the adjacent properties abutting the project area. Furthermore, staff provided a project overview to the Agriculture, Environment and Investment Advisory Committee on April 14, 2021.

Staff also undertook online engagement with the broader public to inform the public regarding the project and receive input from the public on the project plans. A broad-based notification approach for the online engagement and project survey was undertaken involving:

- Development of a dedicated 84 Avenue corridor webpage launched on March 10, 2021;
- Launch of a project survey which was available from April 26 to May 19, 2021;
- Issue Consultation Newsletter (April 28, 2021) and Your City newsletter (May 13, 2021);
- Installation of four project boards (installed April 29, 2021) near the project location;
- Advertisements on RedFM (broadcasted from May 7 to May 16, 2021), and an interview with staff about the project on RedFM (May 5, 2021);
- Project information issued through City Social Media (Twitter/Facebook/ Instagram); and
- ~3,000 postcard mailout (dated May 6, 2021) to properties surrounding the project.

The City received earned media from a number of media outlets which have reported on the project and project survey, with articles in the Surrey-Now-Leader, Daily Hive Buzz Feed, and broadcasts on the CBC and RedFM. The articles were balanced, fact-based and represented the interests of residents, while providing the City opportunity to describe the project and the proposed plans.

### Summary of Engagement Feedback, Survey Responses and Key Findings

The City issued a project survey which provided facts regarding the project and an overview of the planned improvements and road alignment in order for residents to be informed of the project prior to undertaking the survey.

Feedback was sought, and received, on the road design, cycling and pedestrian connections, improvements for park access and parking, and environmental enhancements opportunities. The survey also included open-ended comment boxes for the public to provide additional feedback.

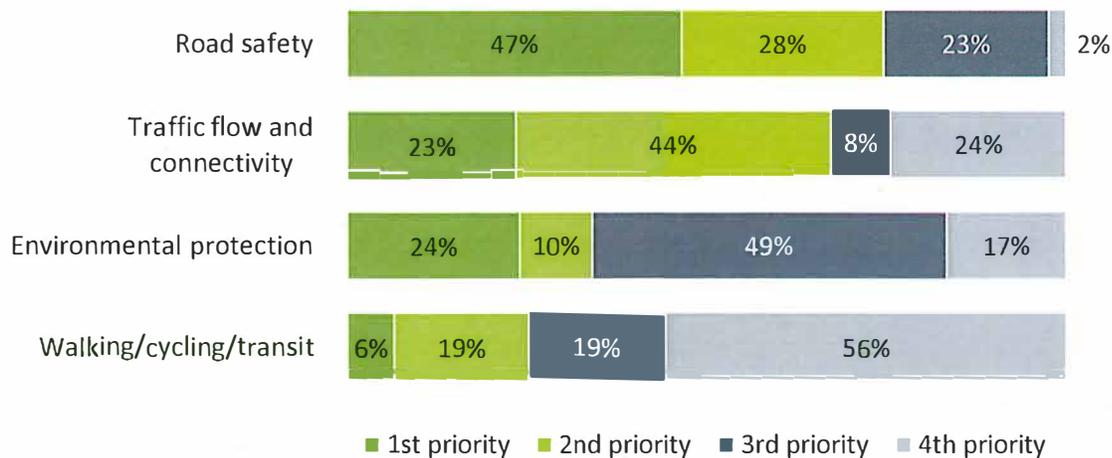
The project survey received over 3,142 responses and was successful in reaching the City's diverse population, commuters and park users, with the following demographics:

- 95% of the respondents live in Surrey (37% in Newton, 29% living in Fleetwood/Cloverdale and the remainder living throughout the City);
- 48% of the respondents were under the age of 44;
- 69% drive in and around Bear Creek Park weekly;
- 57% walk in and around Bear Creek Park monthly; and
- 60% visit Bear Creek Park monthly.

A copy of the Engagement Summary Report is provided in Appendix "II", with a summary provided herein this report.

### Road Design Principles

Respondents were requested to rank the following design principles to assist staff with prioritizing and balancing interests on the project. The design principles are ranked in order of priority based on the survey responses as summarized below:



70% of respondents selected road safety and traffic flow and connectivity as their number one priority, versus 30% of respondents who identified environmental protection and walking/cycling/transit as their first priority.

Respondents were also requested to provide feedback on certain design elements of the project. These questions were asked because initial engagement with stakeholders identified that these elements have trade-offs with respect to the overall width of the project and resulting environmental impact. The following results are the preferred option(s) from the public:

- 46% of respondents prefer separate cycling and walking, with landscaped boulevards, compared to 35% who prefer combining cycling/walking to minimize the footprint;
- 57% of respondents support street lighting to safely illuminate the road and paths, compared to 19% who prefer low level lights to minimize light intrusion in the park;
- 54% of respondents prefer a median with landscaping, in comparison to 29% who preferred no median to minimize the project footprint; and
- 40% of respondents prefer on-street parking along 84 Avenue and expansion of the parking lot on 140 Street, whereas 38% prefer decentralized parking within the park.

The responses above generally align with the prioritized road design principles selected by the respondents wherein the majority of respondents selected the safer travel options over the smallest project footprint. This feedback has guided staff in the development of the preliminary designs, which are discussed further in this report.

### Park Improvements and Environmental Considerations

The survey also requested respondents to provide feedback and prioritize improvements to Bear Creek Park that could be delivered as part of the 84 Avenue corridor project. Respondents prioritized the park amenity improvements they would like to see delivered as part of the project in the following order:

1. Walking trails;
2. Public seating;
3. Dog off-leash areas; and
4. Public art.

A summary of the main themes of feedback received from respondents of the survey and from the key stakeholders of the project are discussed below to help illustrate common areas of concern, and to clarify key issues raised which the City has addressed as part of the preliminary designs for the project.

### Open-Ended Comments Received

The survey contained the following an open-ended question which gave residents an opportunity to provide feedback in a written form.

A number of respondents used this question as an opportunity to explicitly state their support or opposition for the project:

- 76% of all survey respondents did not express an opinion of support nor opposition;
- 16% of all survey respondents (496 respondents) explicitly stated opposition the project; and
- 8% of all survey respondents (242 respondents) explicitly stated support the project.

Most of the respondents who explicitly stated opposition to the project were part of the 24% who selected environmental protection as their number one priority for the project, whereas almost all of the respondents who explicitly stated support for the project were part of the 70% of respondents who chose either road safety or traffic flow and connectivity as their top priority.

### 84 Avenue Petition in Support

As of the date of when the public engagement closed, May 19, 2021, the City’s Legislative Services Division in the City Clerk’s Office received a hardcopy petition. The petition was signed by 500 residents who are supportive of the project. Of the 500 residents who signed in support of the project, 451 are located within Surrey, 48 are within Delta and one resides in Langley.

Staff cross-referenced the majority of addresses on the petition with the postal codes of the 242 survey respondents who explicitly expressed support for the project and found no overlap nor duplication.

### **84 Avenue Corridor Traffic and Safety Analysis**

Throughout the engagement, residents asked questions and sought clarity on traffic impacts/distribution and road safety that may occur as a result of the new 84 Avenue corridor.

### Estimated Traffic Impacts of 84 Avenue Extension

84 Avenue between 120 Street and Fraser Highway is classified as an arterial road, with two missing road segments (124 Street to 128 Street and King George Boulevard to 140 Street). The existing road operates as a collector road, with single travel lanes in each direction.

Staff have recently developed high level traffic modelling forecasts for the following land-use / population timelines and scenarios to assess the impacts of the 84 Avenue extension.

1. 2017 baseline condition;
2. 2035 without a continuous 84 Avenue, including Surrey-Langley SkyTrain (“SLS”); and
3. 2035 with continuous 84 Avenue (includes SLS).

The estimated traffic volumes on a few select road segments are summarized in Table 1.

**Table 1 – Traffic Modelling Forecasts**

Road Segment	Daily Traffic Volumes / AADT (vehicles/day)*				
	2017 (ex. network)	2035 (w/o 84 Ave)	2035 (with 84 Ave)	2017 vs 2035 (w/o 84 Ave)	2035 vs 2035 (with 84 Ave)
88 Ave: 128 St to 132 St	26,500	28,500	28,300	7%	-1%
88 Ave: KGB to 140 St	30,100	33,500	25,500	11%	-24%
88 Ave: 144 St to 148 St	30,300	34,200	33,200	13%	-3%
84 Ave: 120 St to 124 St	9,100	12,900	13,800	42%	7%
84 Ave: KGB to 140 St	0	0	16,800	-	-
84 Ave: 144 St to 148 St	10,800	10,500	14,300	-2%	36%

\* Traffic volumes are for individual road segments and cannot be summed together to represent a cumulative total across all segments nor area.

As indicated in Table 1, in 2035, 84 Avenue is forecasted to have 14,000 to 17,000 vehicles per day, which is on the border of a two-lane or four-lane arterial; however, with adequate intersection design and limited crossing intersections, a two-lane road is likely sufficient for a 20-year timeframe.

The proposed extension of 84 Avenue would provide a much-needed east-west arterial connection between Newton and Fleetwood. It would reduce volumes on 88 Avenue between King George Boulevard and 140 Street. Comparing the 2035 scenarios, there would be a slight increase (7%) in traffic along 84 Avenue near 120 Street and a more moderate increase east of 140 Street (36%).

### Collision Data Overview

In BC, there are two main sources of traffic collision data (police and ICBC) and each data set is compiled for a specific purpose and has its strengths and weaknesses. Best practices in road safety have continually improved by adapting and shifting the focus from historically examining “total collisions” to a focus on “injury collisions”, and more recently to “killed and serious injury” (2019), as aligned with the City’s Vision Zero. This demonstrates the use of data-driven, evidence-led approach to focus resources in alleviating the most harm as it relates to loss of life and life altering injuries.

Since police data only captures those collisions that are attended by police (there is no requirement for police attendance at every collision in BC), this data source does not include all collisions and, on its own, is not reliable as a measure of intersection safety performance.

In contrast, ICBC collision data is comprehensive because basic insurance from ICBC is mandatory and all collisions resulting in a claim are captured. As a result, staff use ICBC collision data for analysis purposes and undertake significant work to enhance the ‘raw’ ICBC data.

Between 2009 and 2019, ICBC statistics show there has been 2,158 collisions at the intersection of 88 Avenue and King George Boulevard; 1,091 of these collisions have resulted in people killed or injured. Between 2015 and 2019 alone, the total number of “killed and injured” was 568, very consistent with the previous 5 years. Table 2 below illustrates the ICBC data for the City’s worst ten intersections, based on “killed and injured”, as obtained from ICBC’s publicly available website.

Table 2 – ICBC “Killed and Injured” Collision Data

The screenshot shows the 'ICBC reported crashes' dataset interface. It includes a navigation bar with options like 'Open data licence', 'Caveats', 'Data dictionary', 'ICBC reported crashes dataset', and 'How to use'. Below the navigation bar, there is a 'Show Breakdown by...' dropdown menu set to 'Road Location Description'. The main table displays the following data:

	2015	2016	2017	2018	2019	Grand Total
88 AVE & KING GEORGE BLVD &..	113	117	110	122	106	568
72 AVE & KING GEORGE BLVD &..	91	101	108	116	87	503
120 ST & 72 AVE	84	86	116	122	85	495
154B ST & 88 AVE & FRASER H..	80	87	101	70	88	426
64 AVE & KING GEORGE BLVD &..	73	67	92	102	78	412
96 AVE & FRASER HWY & GREE..	72	85	56	91	95	399
152 ST & FRASER HWY & TURNI..	73	76	85	76	66	376
104 AVE & 152 ST	61	73	80	83	75	372
76 AVE & KING GEORGE BLVD &..	86	73	56	79	68	362
128 ST & 88 AVE	63	74	75	70	68	350

This data validates the intersection of 88 Avenue and King George Boulevard as being the worst intersection in Surrey with an average rate of one collision every two days and one killed or injured every four days.

88 Avenue and King George Boulevard Intersection Improvement History

In 2015, the City implemented safety measures at 88 Avenue and King George Boulevard. The 2015 safety measures have provided a combined safety improvement and reduction in the number of “killed and injured” in the north and southbound directions from 61 to 10 (over a five-year period). However, the intersection has still experienced a net increase in “killed and injured” due to an increase in injury collisions for other turning movements at the intersection.

In March 2021, the City completed tertiary signal heads and yellow backerboards for all approaches. Research shows these safety measures are anticipated to reduce the overall number of people killed or seriously injured in collisions by 2%.

The City has been seeking to implement protected left turns on 88 Avenue in the west and eastbound directions, as these movements have an average of 36 “killed and injured” over a five-year period. However, due to high traffic volumes, traffic analysis indicates the protected left turns would result in vehicles “spilling over” beyond the left-turn bays, resulting in a travel lane on 88 Avenue being frequently obstructed and a higher risk of rear-end collisions.

**Estimated Safety Impacts of 84 Avenue Corridor**

Methods used by Transportation Engineers in estimating traffic and safety conditions are complex, as they are impacted by human and social behavior, with reliance on international best practices and research, and estimates provided are representative of anticipated outcomes and trends rather than precise predictions.

### Total Collision Modelling

In 2005, TSi Consulting (“TSi”) completed comprehensive traffic and collision modelling for the area surrounding Bear Creek Park. Their detailed traffic modelling analyzed a series of road and intersection alternatives aimed at providing congestion and safety relief at the intersection of King George Boulevard and 88 Avenue. TSi’s study included total collision modelling, at both intersection and road segments, on all arterial roads around Bear Creek Park including King George Boulevard, 140 Street, 88 Avenue, 84 Avenue and 80 Avenue. TSi’s results are cumulative and consider the entire road network system and do not focus solely on one intersection.

TSi’s collision modelling indicated that the extension of 84 Avenue would result in a reduction of 170 collisions over a five-year period at the intersection of 88 Avenue and King George Boulevard, while moderately increasing the number of collisions at the intersection of 84 Avenue and King George Boulevard. TSi’s report concluded the extension of 84 Avenue is anticipated to result in a net, overall cumulative reduction of 95 collisions (over a five-year period).

The intersections of 84 Avenue/King George Boulevard and 84 Avenue/140 Street are planned to be re-designed as part of the project. As part of the design, targeted safety improvements that prioritize safety for all road users will be integrated into the design to mitigate potential increases in collisions.

### Killed and Seriously Injured Evaluation

As noted above, the extension of 84 Avenue would significantly reduce traffic volumes on 88 Avenue at King George Boulevard, which would allow the City to implement fully protected left turns on 88 Avenue (east and westbound), which is anticipated to be completed in 2022, to further reduce severe collisions while mitigating the impact of congestion and reducing risk of rear-end collisions.

Based on research and the results of 2015 safety measures, the addition of protected left turns on 88 Avenue could reduce “killed and injured” collisions for these turning movements by 90%, equating to approximately 35 over a five-year period.

### Combined Safety Reduction Estimates

Overall, the proposed 84 Avenue extension is estimated to result in 95 to 130 fewer total collisions with 35 less “killed and injured” persons (over a five-year period) on the roads around Bear Creek Park.

## **84 Avenue Preliminary Design, Corridor Impacts and Planned Enhancements**

### 84 Avenue Corridor Design

Consistent with public engagement survey results, the preliminary designs provide for efficient movement of traffic while protecting the safety of residents travelling by vehicle, bicycle, and walking; while minimizing impacts to the surrounding environment. The following elements have been incorporated in the preliminary designs for the 84 Avenue corridor and a layout of the preliminary design, including road, cycling and pedestrian pathways, and park enhancements described throughout this report is illustrated in Appendix “III”. :

- *Two travel lanes on 84 Avenue:* Two travel lanes (one in each direction) are sufficient on 84 Avenue to meet the anticipated 2035 traffic volumes, with the intersections at both King George Boulevard and 140 Street being designed to accommodate left-turn and right-turn lanes to provide efficient intersection movements. Bridge and wildlife crossings of Bear Creek and King Creek will be designed to accommodate four lanes of travel, with cycling/walking, in the event future traffic volumes necessitate changes. The vehicular travel lanes of the road will be within portions of the existing road allowance, existing statutory rights-of-way and underneath the BC Hydro transmission power lines.
- *Protected left turns on King George:* As part of the intersection design with 84 Avenue, protected left turns will be designed for northbound and southbound traffic on King George Boulevard to achieve a 90–100% efficiency in eliminating left-turn collisions.
- *Cycle paths and walkways:* Separated cycling and pedestrian paths will be provided between King George and 140 Street and will connect to park paths. The paths will transition to multi-use paths where constraints exist. Portions of the paths will extend south of 84 Avenue, to connect to planned trail expansions, as well as north of 84 Avenue through the Bear Creek Reservation Area (permitted under the Reservation Bylaw) to connect existing trails and increase access to the park.
- *Medians and Boulevards:* Narrow, vegetated landscaping will be incorporated into both roadside boulevards and medians, with the height of the vegetation limited to the BC Hydro requirements. This will provide environmental benefits and enhance the aesthetic experience for users.
- *Lighting:* Decorative street lights will be added to increase safety for motorists, cyclists and pedestrians. Higher illumination will be provided at intersection and crosswalk locations, where there are higher risks for collisions, and lower-level lighting will be utilized where possible to minimize light intrusion into the park.
- *Design for speed management:* Speeds are a fundamental factor in crash severity. Road design will include curb bulges, and pedestrian activated crossings, to help reduce travel speeds and provide for safer pedestrian crossings.

### Environmental Impacts and Enhancements

Geotechnical, hydrogeological and environmental assessments were recently completed along the proposed alignment. These assessments revealed the characteristics of the 84 Avenue alignment vary.

There are two salmon-bearing Class A watercourses located along the road alignment, Bear Creek and King Creek. The road design includes an estimated 40m long clear span bridge over Bear Creek, to ensure the creek is undisturbed and facilitate wildlife passage for large mammals. A large box culvert (approximately 2.1 – 3m width) will be designed across King Creek, with fish passage features, to protect both fish and wildlife passage.

Areas of Bear Creek Park and the 84 Avenue corridor are located on historical residential and soil landfill areas. Contaminated soils, resulting from the landfill, were extensively observed during the field investigation and predominately located between west of Bear Creek and King Creek. The contaminated soils and materials observed consisted of municipal solid waste (broken glass, plastic bags, and metal pieces), automotive parts (old tires, rusted vehicle parts) asphalt debris and rubble.

Furthermore, groundwater quality indicated leachate impacts, resulting from groundwater moving through the residential landfill areas. As part of the detailed design, staff will strive to design the road and pathways to minimize ground disturbance and develop plans to adequately dispose of contaminated soils and leachate water that is encountered as part of the project.

The environmental assessment identified a small wetland area located between Bear Creek and King Creek that will be partially disturbed by the road area. The area impacted is localized to the road footprint and a mitigation and enhancement plan is being developed by the City's independent Qualified Environmental Professional. The environmental enhancement plan includes creation of a large wetland pond south of 84 Avenue, near the existing parking lot, which would introduce environmental and biodiversity enhancements. The proposed wetland enhancement area will be significantly larger size than the existing localized wetland area disturbed. Furthermore, approximately 3,700 square metres of invasive plant removal and re-planting the riparian area along King Creek will be undertaken to further enhance the watercourse. The environmental enhancement plan will fully mitigate project impacts and be submitted to Provincial and Federal regulatory agencies for approval.

#### Tree Impact and Park Pathways

Based on the preliminary design, the road and proposed park enhancements will require removal of approximately 90 Bylaw size trees (measured at least 30 centimetres diameter at breast height), with 75 being Alder and Cottonwood trees as summarized in Table 3. Of the 90 trees, approximately 50 require removal for the road (within existing road allowance and/or below powerlines) while 40 require removal to accommodate cycling and walking paths (within Bear Creek Park Reservation Area), generally located between King Creek and 140 Street as illustrated as 'Option A' in Appendix "III". As identified in Appendix "II", 69% of survey respondents identified walking trails as the top priority for park amenity enhancements which is supported by 'Option A'. Cycling advocates support the option of a direct, continuous cycling connection, while environmental stakeholders do not. Staff support 'Option A' with multi-use cycling/walking path on the north side of 84 Avenue, as it will provide much needed safe and more direct connectivity for cyclists and pedestrians. Recognizing the conflicting opinions, staff's proposed 'Option A' has a narrowed multi-use cycling/walking path to limit the impact to 40 trees. As part of detailed design, staff will review 'Option A' alignment with the Parks, Recreation & Culture Department and an arborist to determine if additional trees can be retained.

Should Council not see the merits of 'Option A', a second option has been developed. 'Option B' includes providing cycling and walking primarily along the south side of 84 Avenue to mitigate tree impacts within the Reservation Area. This option would connect the existing pathway to routes south to 83A Avenue and 140 Street. 'Option B' would be less desirable because it is less direct, less safe due to multiple crossings of 84 Avenue, would require upgrades to the existing trails and additional cycling paths along 140 Street.

To offset the trees removed, the City will plant trees at a 3:1 ratio within the project area which exceeds the *Surrey Tree Protection By-law, 2006 No. 16100*.

**Table 3 – Bylaw Tree Summary**

Tree Species	Existing	Total Removed	Retain
<b>Deciduous Trees</b>			
Alder	69	37	32
Cottonwood	65	38	27
Bigleaf Maple	1	0	1
Paper Birch	2	0	2
Apple	1	1	0
Bitter Cherry	1	0	1
Oak	1	0	1
Pin oak	8	5	3
Cascara	11	6	5
<b>Coniferous Trees</b>			
Austrian Pine	8	0	8
Western redcedar	11	3	8
<b>Total (for Option A)</b>	178	90	88
<b>Total (excl. Alder/Cottonwood)</b>	44	15	29
<b>Total Replacement Trees</b>		270	

Archaeological Overview

Staff retained an independent consultant to complete an archaeological review for the 84 Avenue corridor. Based on the preliminary archaeological review and desktop study, the archaeological overview did not identify any known heritage sites within the 84 Avenue corridor and given the past landfill activities the archaeological potential is considered low.

BC Hydro Requirements

Staff completed a preliminary technical assessment of 84 Avenue in conjunction with BC Hydro to ensure the road corridor maintains a safe clearance from the overhead power lines. The preliminary assessment indicates that segments of the road corridor may be 1-2 metres vertically too close to the overhead power lines. Due to the presence of contaminated soil along the alignment, it may be more feasible to modify BC Hydro infrastructure to establish the required vertical clearances rather than lower the road profile which may increase the excavation and disturbance of the contaminated soils.

Staff are currently evaluating options with BC Hydro to improve the vertical clearances. Options being considered include re-tensioning the power lines to limit the line sag, replacement of electrical conductors with a 'low-sag' conductors or raising/adding new structures.

Adjacent Properties

Construction of 84 Avenue between King George Boulevard, along with the park improvements and wetland, will be located within lands that are under the ownership or rights-of-way in favour of the City.

The two notable private properties that are located along the 84 Avenue corridor is the Bear Creek Church property located at 8383 - 140 Street and the Strata Property located at 13630 - 84 Avenue. The preliminary designs developed for the 84 Avenue corridor project maintains access and minimizes impacts to these properties.

Staff have had two meetings with the Bear Creek Church Property and the property will continue to have full movement access from 84 Avenue as it currently has today.

Staff have had an impromptu meeting with representatives of the Strata property. The existing access to the Strata property from 84 Avenue will be restricted to right-in and right-out as staff are unable to safely accommodate full movement access from 84 Avenue sightlines, given the road profile. The Strata property has an existing driveway access from King George Boulevard that would allow full movement access to the Strata property from King George Boulevard. This existing access is currently gated and can be opened by the Strata property should they desire full movement access from King George boulevard.

Staff will continue discussions with Bear Creek Church and Strata Property through the development of the detailed designs for the project.

### **Bear Creek Park Amenity Enhancements**

As part of the 84 Avenue corridor project the following park improvements will be included:

- New wetland habitat pond with pedestrian paths and look-out points;
- Approximately 200 additional parking stalls will be added for park users attending larger special events, which will decrease problems associated with patrons historically parking in neighbouring residential areas. Consistent with the engagement survey, the majority of the parking will be accommodated along 84 Avenue and expansion of the parking lot along 140 Street (south of 84 Avenue), with minor opportunities sought for the decentralized lots around the park;
- New signal at 83A Avenue and 140 Street to improve access to the park;
- Approximately 2.6 kilometres of new cycling and walking paths (Option A); and
- Public art incorporated with the Bear Creek Bridge and retaining walls.

### **Next Steps and Project Timing**

Information gathered from the public engagement meeting will be used to further refine the project plans as staff prepare the detail designs for the 84 Avenue corridor project. The anticipated project schedule moving forward is as follows:

<b>Project Schedule for 84 Avenue (King George Blvd to 140 St)</b>	
Detail Design	June to July, 2021
Regulatory Permitting	Underway
Contract Award ( <i>subject to Council approval</i> )	July 2021
Construction Commencement	Summer 2021
Construction Completion	September 2022

## FUNDING

The preliminary estimated costs of the 84 Avenue corridor and park improvements is provided in the table below:

Description	Estimated Cost
84 Ave Corridor: King George Blvd to 140 St	\$12,250,000
Bear Creek Park Enhancements (parking lot expansion, wetland habitat, 83A Ave access)	\$2,000,000
Environmental remediation of existing landfill	\$1,500,000 to \$2,500,000
Potential BC Hydro Modifications	TBD
<b>Total Estimated Cost (excl. BC Hydro)</b>	<b>\$15,750,000 to \$16,750,000</b>

The City's Engineering 10-Year Servicing Plan (2021-2030) has an estimated budget of \$13 million for the 84 Avenue project between King George Boulevard and 140 Street. Based on park enhancements and unforeseen conditions, such as environmental remediation and potential modifications to BC Hydro infrastructure, staff estimate the project's construction cost to be approximately \$16-17 million, excluding BC Hydro relocations if required.

As part of detailed design, staff will prepare an updated construction cost estimate, confirm BC Hydro requirements and confirm available funding within the 2021 Transportation budget prior to bringing forward a contract award for Council's consideration.

## SUSTAINABILITY CONSIDERATIONS

The 84 Avenue corridor supports the objectives of the City's Sustainability Charter 2.0. In particular, this project supports the Sustainability Charter 2.0 themes of Built Environment and Neighbourhoods, and Infrastructure. Specifically, this project 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;
- Transportation DO11: An integrated and multi-modal transportation network offers affordable, convenient, accessible and safe transportation choices within the community and to regional destinations; and
- Natural Areas, Biodiversity and Urban Forest DO2: Surrey actively protects, enhances and restores its natural environment and habitats.

## CONCLUSION

On March 8, 2021, Mayor and Council authorized staff to commence with engineering services for the field investigation, preliminary design and public engagement of 84 Avenue between King George Boulevard and 140 Street.

Public engagement was successful with 3,142 residents responding to an on-line survey in which 70% of respondents selected road safety and traffic flow/connectivity as their top priorities for this project. The engagement results helped shape the preliminary design for 84 Avenue and the complimentary environmental enhancements and park improvements.



Scott Neuman, P.Eng.  
General Manager, Engineering

SN/VJ/cc

Appendix "I" – 84 Avenue: Between King George Boulevard and 140 Street  
Appendix "II" - Project Survey and Report  
Appendix "III" – Conceptual Plan of 84 Avenue Road Design

<https://surreybc.sharepoint.com/sites/ENG.Administration/WP Docs/2021/Admin/CR/Final CRs/May 31/84 Avenue Public Engagement and Preliminary Design.docx>

**Note: Appendices available upon request**

# 84 Avenue: King George Boulevard to 140 Street

