

NO: R236

COUNCIL DATE: November 15, 2010

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## REGULAR COUNCIL

TO: **Mayor & Council** DATE: **November 10, 2010**

FROM: **General Manager, Engineering** FILE: **6520-20 (GH#2)**

SUBJECT: **Sunnyside Heights (Grandview Heights Area #2) Neighbourhood Concept Plan (NCP) - Engineering Servicing and Financial Strategies**

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## RECOMMENDATION

The Engineering Department recommends that Council:

1. Approve the engineering servicing and related financial strategies as documented in this report and as contained in the Sunnyside Heights (Grandview Heights Area #2) Neighbourhood Concept Plan (NCP) as a means of managing the provision of engineering services for development in this NCP area;
2. Authorize staff to include in the City's 10-Year Servicing Plan the Development Cost Charge (DCC)-eligible infrastructure items for drainage, water and transportation services as documented in Appendix I of this report; and
3. Authorize staff to bring forward a new DCC By-law that includes an adjustment to the Highway 99 Corridor area specific DCC rate as part of the next DCC update.

## INTENT

The purpose of this report is to provide:

- Council with an overview of the engineering servicing and related financial strategies for the Sunnyside Heights (Grandview Heights Area #2) NCP; and
- Support the "Sunnyside Heights (Grandview Heights Area #2) – Stage 2 Final Report", which is to be forwarded for consideration by Council at the same meeting as this report is to be considered.

## BACKGROUND

Council approved in principle the Stage 1 Land Use Concept Plan for Sunnyside Heights (Grandview Heights Area #2) at its Regular meeting on July 23, 2007. Staff noted at that time that there were a number of engineering and financial issues to be resolved as part of the Sunnyside Heights NCP - Stage 2 process. The Sunnyside Heights NCP – Stage 2 report has been completed based on the approved Land Use Concept Plan.

## **DISCUSSION**

An engineering servicing analysis and financial plan for the Sunnyside Heights NCP has been completed. Only those works that normally form part of the City's DCC program, such as major trunk sewer and water grid mains, major collector and arterial roads, and major stormwater management infrastructure, are discussed in detail in this report. The report does not address localized site servicing as that servicing will be addressed on a site by site basis by individual development applicants in conjunction with their application approval process as is normal for all development applications in NCP areas. The only exception is the on-site stormwater management controls that will be specified in the NCP for all developments in the NCP and reflect new stormwater best management practices.

### **Water**

The NCP area is partially serviced with small diameter water mains. A new network of distribution mains and pressure reducing stations will be required in the area.

The topography of the NCP requires that two separate pressure zones (142m & 110m) be established. Water supply to the 132m zone that is generally above 70-75m elevation contour will be provided from the existing Grandview Pump Station and feeder mains on 24 Avenue. The pump station and the feeder mains have been designed to allow for their use in servicing this NCP. The lower 110m pressure zone will ultimately be serviced from the Grandview reservoir by way of a proposed 600mm gravity main on 24 Avenue and an existing 500mm gravity feeder main along the 164 Street corridor. The watermain network will be developed to reflect the phasing of development applications.

### **Transportation**

The transportation plan for Sunnyside Heights NCP has been developed based on the guiding principles contained in the City's Transportation Strategic Plan. A modified grid road system will create a liveable urban community.

The proposed modified grid street system takes into account property lines, tree protection, environmental protection and topography. When combined with the network of greenways and public lanes, the road system supports good internal circulation providing residents with safe continuous routes to walk or cycle to schools, parks and other services and facilities in the area. The road network has been designed to provide connectivity and integration with the transportation network in the surrounding areas and supports the reasonable dispersion of traffic throughout the neighbourhood. On-street parking will be permitted on most of the residential streets within the NCP while collector roads like 164 Street and 20 Avenue will provide opportunities for future transit service within the neighbourhood.

The planned road network provides a grid system and level of street connections comparable with other NCPs including East Clayton, Clover Valley Station and Panorama, and establishes block sizes in the range of 100/150m by 200m, which are considered reasonable for development while allowing for a walkable community.

Residential street connectivity and spacing provides for interesting, safe and friendly “place making” public open spaces. Multi-family sites are planned as open communities that blend with the adjacent land uses. Some of the residential local roads are shown as ‘Flex Roads’ to highlight the need for connectivity but allow flexible alignments and/or cross sections to address tree protection or other matters that are important to building a great neighbourhood.

Analysis has shown that the proposed road network will accommodate the projected traffic volumes from the proposed land uses including overall background traffic growth. The NCP area is bounded by three arterial roads: 16 Avenue to the south, 24 Avenue to the north and 168 Street to the east. As identified through the City’s South Surrey Traffic Model, to accommodate the traffic volumes of development in this NCP area and the South of Fraser region, 24 Avenue and 16 Avenue are each planned for widening to a six-lane cross-section in the future. 24 Avenue has already been identified as a future Frequent Transit Network route by TransLink, and the right-of-way width being protected will allow for the implementation of higher order transit service (i.e., Bus rapid transit (BRT), LRT or street car) along this corridor. Four-lane cross-sections on 168 Street and on 20 Avenue west of 164 Street will be sufficient to satisfy projected future traffic demand. The required road allowances will be dedicated to the City as the adjacent lands develop.

### **Sanitary Sewer**

There is no City sanitary sewer system in the NCP area at the present time. The nearest City sewer with capacity is at 160 Street and 24 Avenue, which was sized to receive the sewer flow from this NCP area.

The topography of the area includes a ridge line that runs in an east-west direction at about 24 Avenue with a moderate slope toward the south. The north-eastern “half” of the NCP can be serviced by gravity via a trunk sewer following the slope to the existing sewer invert level at 24 Avenue and 160 Street. The remaining southern and western “half” of the NCP area will be serviced by means of a future pump station located approximately in the 1400 block of 168 Street, which will pump sewage to the north to the sewer at 24 Avenue and 160 Street.

### **Stormwater**

Sunnyside Heights NCP is located within the Fergus Creek watershed. Fergus Creek drains toward the Campbell River and then into Semiahmoo Bay. Fergus Creek is a fish-bearing watercourse with some areas where downstream erosion is evident. In advance of the NCP planning process, the Engineering Department completed the Fergus Creek Integrated Stormwater Management Plan (ISMP). The work associated with developing the ISMP included an investigation of the watershed with the goal of facilitating development while protecting the environment by integrating land use planning with stormwater engineering, flood and erosion protection, and environmental protection. The most significant recommendation from the ISMP was the need for the introduction of enhanced infiltration systems in the NCP, as traditional stormwater detention ponds were not considered to be appropriate in the context of providing significant stream base flow augmentation nor would they address downstream erosion concerns.

In order to achieve urban forms of density in an open watercourse area to meet the needs identified in the ISMP, the stormwater system for Sunnyside Heights NCP will consist of an inter-related set of private (on-site) and public storm water controls including storm water corridors, perforated local storm drains, and landscape-based low impact source controls on individual lots.

### 1. On-Site Stormwater Management Controls

On-site stormwater management controls will be incorporated into each development site within the NCP area. The intent is to maximize infiltration and evapo-transpiration of rainwater. The following table summarizes the required on-site controls by proposed land use.

Land Use	On-Site Stormwater Management Control Requirements
Single-family Residential	<ul style="list-style-type: none"> <li>A minimum 150 mm depth of amended topsoil on pervious (landscape) areas.</li> </ul>
Multi-family Residential, Commercial, and Institutional	<ul style="list-style-type: none"> <li>A minimum 150 mm depth of amended topsoil on pervious (landscape) areas.</li> <li>On-site runoff storage equal to 150 m<sup>3</sup>/ha of gross site area released at a rate of 0.435 L/s/ha or 0.719 L/s/ha dependent on location within the NCP.</li> <li>Water quality treatment for any specific high risk contaminants associated with the site's land use activities</li> </ul>

### 2. Stormwater Corridors

A network of stormwater infiltration corridors distributed across the area varying in width from 5m to 20m is proposed for this NCP area, which differs significantly from traditional stormwater detention ponds.

Stormwater corridors are being proposed as they have the advantage of reducing total runoff volume, which is not achieved by traditional stormwater management techniques. This reduced runoff volume acts to mitigate the potential for downstream erosion.

Stormwater Management Approach	Peak Flow Control	Runoff Volume Control	Water Quality Treatment	Base Flow Augmentation
Detention Pond	yes	no	yes	no
Stormwater Corridors	yes	yes	yes	yes

Approximately 80% of the proposed stormwater corridors are 5m wide, approximately 20% are 10m wide, and only a few segments are 20m wide. This is a refinement of the Fergus ISMP as the stormwater corridors are more practical than the proposed green corridors which concentrated the impact to a few significant corridors that had a proposed width of 40m. Each of the proposed stormwater corridors is identified in the NCP document and can include:

- Bioswales to promote infiltration and provide runoff treatment;
- Sub-surface storage and perforated underdrains to promote infiltration;
- Amended topsoils; and
- Trees.

Stormwater corridors are located throughout the NCP area to capture as much of the runoff as possible and provide volume reduction, peak attenuation, and water quality treatment without the need for traditional detention ponds. In all, approximately 5% of the land area will be used for infiltration corridors.

### 3. Perforated Storm Drains

Perforated storm drain systems will be installed under local residential streets to maximize the potential for stormwater infiltration. A perforated storm drain is laid parallel to the storm sewer pipe tying into the manholes. This storm drain system promotes infiltration during drier months but also conveys runoff during wet weather months when the capacity for infiltration through the perforated pipe is exceeded by the incoming storm water flows.

### 4. Detention Pond Option

Although the proposed infiltration system has clear advantages, there may be limited opportunity within the NCP area to introduce stormwater detention, in place of the infiltration system, and still meet the objectives identified in the ISMP.

A potential location for a detention pond is the southwest corner of 20 Avenue and the existing 164 Street alignment. This detention pond would service an area of 35 ha. The cost difference between the stormwater corridors in this area and the proposed pond is \$0.7 million. Other opportunities to introduce a second pond in this area were also examined, but found to cost more than \$3.0 million more than the stormwater corridor option. As a result, as it is economically feasible to manage stormwater either through corridors or by a detention pond in this area, both options have been provided to allow the greatest flexibility for the future development of this area.

Other opportunities to introduce detention ponds elsewhere in the NCP area were evaluated, but these were found to be cost prohibitive.

## Financial Analysis

A comprehensive financial analysis is included in the NCP engineering report. The following table summarizes the projected DCC revenues and construction costs for the infrastructure needed to provide trunk engineering services to and in the NCP area. The revenues are based on the current DCC rates for each land use category as proposed in the NCP Land Use Concept.

Services	Estimated DCC Revenues	Total Estimated DCC Expenditures	Balance
Sanitary Sewer	\$7,434,000	\$12,523,000	-\$5,089,000
Water	\$4,335,000	\$3,027,000	\$1,308,000
Drainage	\$6,710,000	\$25,203,000	-\$18,493,000
Non-Arterial Streets	\$5,370,000	\$3,674,000	\$1,696,000
Arterial Streets	\$24,576,000	\$13,250,000	\$11,326,000

Appendix I lists the 10 Year Servicing Plan Projects required for this NCP and the DCC-eligible cost component for drainage, water and transportation infrastructure for this NCP area that should be included in the City's 10-Year Servicing Plan.

The arterial DCC balance will be used to assist in funding other road improvements some of which will ultimately be required for and provide benefit to this NCP area, such as the planned future interchanges at 16 Avenue and 24 Avenue, which will be very costly.

### Financing of Sanitary Sewer System

As previously referenced in this report, the NCP area is divided into areas relative to the means by which sanitary sewer service will be provided. *Sanitary Service Area 1*, as illustrated in Appendix II will be serviced by gravity sewers without the need for pumping, while *Sanitary Service Area 2* will be serviced by way of gravity sewers and a pump station and related force main.

This pump station in *Sanitary Service Area 2* will also service other areas surrounding the NCP area, including parts of the Highway 99 Corridor NCP and future development in Grandview NCP Areas #3 and #5. The Pump Station is proposed to be phased to meet present servicing needs with the possibility for efficient capacity upgrades in the future.

After reviewing the DCC contribution from the Highway 99 Corridor NCP based on expected flows, it was determined that a DCC rate adjustment is necessary for the Highway 99 Corridor area in relation to the contributory flows that will be generated by development in that area. As a result, an adjustment to the Highway 99 Corridor area specific DCC rates will be necessary to account for the revised sanitary servicing costs. Staff, as part of the annual DCC review process, are planning to bring forward a new DCC By-law for Council’s consideration by the end of this year.

After factoring the appropriate contributions from the benefitting areas of the Highway 99 Corridor NCP, there is a DCC shortfall in the *Sanitary Service Area 2* of the Sunnyside Heights NCP. To overcome this shortfall it will be necessary for developers in the area to use one of the following tools:

1. A DCC Front-enders Agreement over the entire sanitary service area;
2. A Development Works Agreement over *Sanitary Service Area 2*.

A Development Works Agreement requires the consent of a majority of the owners of the properties located within the benefitting sanitary service catchment area. Based on the net developable area of each of the above-referenced sanitary service areas in the Sunnyside Heights NCP, the value of the Development Works Agreement is estimated as follows:

Sanitary Service Area	Servicing Cost	Total Estimated DCC Revenues	Balance (DWA Value or DCC Adjustment)	Approximate Charge	
				Per Acre	Per Unit <sup>(1)</sup>
1 (upper)	\$1,518,000	\$1,518,000	\$0	\$0	\$0
2 (lower)	\$6,669,000	\$4,135,000	\$2,534,000 <sup>(2)</sup>	\$20,500	\$1,710
Hwy. 99	\$4,336,000	\$1,781,000	\$2,555,000 <sup>(3)</sup>	\$12,775	n/a

- (1) Based on 12 units per acre for comparative purposes
- (2) DWA Value
- (3) DCC Adjustment

The approximate DWA charge detailed above is based on the preliminary boundary between sanitary service areas. A detailed review of this boundary will be undertaken in conjunction with a DWA application and will require more detailed engineering analysis.

If sufficient property owner support is not achieved to proceed with a Development Works Agreement, the front ending developer will have the choice of:

- moving forward with the project and absorbing the short fall;
- re-initiating the voting process with new boundaries; or
- deciding not to move forward with the project.

There are no legislative constraints related to re-initiating a Development Works Agreement vote or the number of times that such a vote can be undertaken.

### **Financing of Stormwater Corridors**

Originally, a stormwater management scheme was proposed that required the dedication of up to 5m of stormwater corridor area along almost all of the streets within the NCP area; however, the development industry has advised that the applicants making such dedications for stormwater purposes should be compensated for these areas so as to equalize the burden across development in the NCP. This will be accomplished by means of an area charge.

As there is the potential to introduce a stormwater detention pond in one sub-area of the NCP, the NCP area has been divided into three drainage service areas. These areas are identified in Appendix III.

By compensating the developers in the area for the stormwater corridors, the value of the DCC drainage expenditures increases from \$6.6 million to \$25.2 million, based on a maximum reimbursement of \$750,000 per acre. To overcome this shortfall developer(s) will be required to “frontend” the stormwater corridors within their development and recover the costs of these corridors through:

1. A DCC Front-enders Agreement for the drainage service area; and
2. A Development Works Agreement for the drainage service area.

A Development Works Agreement requires the consent of the owners of properties within the benefitting service area. Based on the net developable area of each drainage service area, the value of the Development Works Agreement for each area is estimated as documented in the following table:

Drainage Service Area	Stormwater Management Approach	Servicing Cost	Estimated DCC Revenues	Balance (DWA Value)	Approximate DWA Charge	
					Per Acre	Per Unit <sup>(1)</sup>
A (upper)	Stormwater Corridors	\$11,020,000	\$3,411,000	\$7,609,000	\$83,500	\$7,000
B (central)	Detention Pond or Stormwater Corridors	\$7,000,000	\$1,119,000	\$5,881,000	\$122,000	\$10,200
C (lower)	Stormwater Corridors	\$7,183,000	\$2,180,000	\$5,003,000	\$56,500	\$4,700

(1) Based on 12 units per acre for comparative purposes

If the front-ending developer is not successful in achieving sufficient support for a Development Works Agreement, the developer will have the choice of:

- moving forward with the project and absorbing the short fall;
- re-initiating the voting process with new boundaries or owners; or
- deciding not to move forward with the project.

There are no legislative constraints related to re-initiating a Development Works Agreement vote or the number of times that such a vote can be undertaken.

### **Engineering Services Financial Strategy**

As outlined above, the engineering services financial strategy for the Sunnyside Heights relies on a combination of development cost charges, DCC Front-enders Agreements, and Development Works Agreements. These various mechanisms are necessary to finance the required services in order to ensure costs are distributed equitably over the benefitting area, and to minimize the investment that any one developer needs to make.

Although this financial strategy may seem complicated, it is a strategy that is not unique, and one that the City has applied in recent greenfield development areas such as Grandview Heights Area 1 – Morgan Heights, and the Douglas NCP area.

### **Development Phasing**

New development must connect to a City sanitary sewer system. Those properties that can be connected to the City’s sanitary sewer system by gravity (sanitary service area 1) will likely be easier to develop than the properties that require the installation of a pump station (sanitary service area 2).



## **Energy Management**

In addition to the traditional engineering servicing included as part of the Sunnyside Heights NCP, staff have commenced an evaluation of energy management opportunities for all the City's NCP areas. Staff is pursuing the potential to develop a geo-exchange heating system and LED street lighting in this NCP area.

### **1. Geo-exchange Heating System**

Based on a preliminary evaluation it appears that geoexchange heating systems for individual developments in this NCP area are technically feasible and financially viable. Staff will be contacting the development community in this area to provide a copy of the geoexchange report and to alert them to the benefits of the alternative energy sources available in the area.

### **2. Light Emitting Diode (LED) Street Lighting**

LED street lighting is a rapidly evolving technology that offers significant power savings over conventional street lights. The Engineering Department is recommending that all street lights in this NCP area be LED street lights. There is currently about a \$750 premium per lamp for these types of street lights but prices are steadily dropping. The Engineering Department is currently evaluating a number of alternatives and will be able to identify one or more products suitable for installation in short order. Staff will also be exploring opportunities with suppliers to reduce the cost of the LED street lights for installations within this new neighbourhood.

## CONCLUSION

The infrastructure proposed in this report will support the land use proposed in the Sunnyside Heights (Grandview Heights Area #2) NCP. The financial strategy as proposed is in accordance with Council's policy; namely, the "development-pay" principle and requiring each NCP to be financially self-sufficient. Based on the above discussion, the Engineering Department recommends that Council:

- Approve the engineering servicing and related financial strategies as documented in this report and as contained in the Sunnyside Heights (Grandview Heights Area #2) Neighbourhood Concept Plan (NCP) as a means of managing the provision of engineering services for development in this NCP area;
- Authorize staff to include in the City's 10-Year Servicing Plan the Development Cost Charge (DCC)-eligible infrastructure items for drainage, water and transportation services as documented in Appendix I of this report; and
- Authorize staff to bring forward a new DCC By-law that includes an adjustment to the Highway 99 Corridor area specific DCC rate as part of the next DCC program update.

Vincent Lalonde, P.Eng.  
General Manager, Engineering

Appendix I - 10-Year Servicing Plan Projects

Appendix II - Sanitary Service Areas

Appendix III - Drainage Service Areas

JB/JA/JML/jkb/brb

### 10-Year Servicing Plan Projects

The projects listed in the following tables are eligible to be included into the 10-Year Servicing Plan.

#### Drainage

Project	Project Cost	Non-Growth Cost Component	Growth Cost Component (DCC)
Trunks	\$3,546,000	\$0	\$3,546,000
Ditch Erosion Protection	\$63,900	\$0	\$63,900
Bioswale construction in medians	\$917,600	\$0	\$917,600
Stormwater Corridors - Area A	\$3,343,000	\$0	\$3,343,000
Stormwater Corridors - Area C	\$2,027,000	\$0	\$2,027,000
Stormwater Corridors or Detention Pond - Area B	\$1,345,000	\$0	\$1,345,000

#### Water

Project	Project Cost	Non-Growth Cost Component	Growth Cost Component (DCC)
PRV at 17/163	\$75,000	\$0	\$75,000
Circulation PRVs, various locations	\$40,000	\$0	\$40,000
200m of 350mm dia watermain - 167 St: 23 & 24 Ave	\$154,000	\$68,000	\$86,000
200m of 350mm dia watermain - 166 St: 23-24 Ave	\$154,000	\$68,000	\$86,000
200m of 300mm dia watermain - 23 Ave: 167-168 St	\$148,000	\$0	\$148,000
200m of 300mm dia watermain - 21 Ave: 167-168 St	\$148,000	\$0	\$148,000
200m of 300mm dia watermain - 22 Ave: 162 -163 St	\$148,000	\$66,000	\$82,000
100m of 300mm dia watermain - 23 Ave: 161A - 162 St	\$74,000	\$33,000	\$41,000
100m of 300mm dia watermain - 23A Ave: 161A - 162 St	\$74,000	\$33,000	\$41,000
100m of 300mm dia watermain - 162 St: 23A - 24 Ave	\$74,000	\$33,000	\$41,000
100m of 300mm dia watermain - 20A Ave: 165-165A St	\$74,000	\$33,000	\$41,000
100m of 300mm dia watermain - 17 Ave: 167A-168 St	\$74,000	\$33,000	\$41,000

**Sewer**

<b>Project</b>	<b>Project Cost</b>	<b>Non-Growth Cost Component</b>	<b>Growth Cost Component (DCC)</b>
300m of 675mm - 24 Ave:160 St to 161A St (Area 1)	\$459,000	\$0	\$459,000
360m of 375mm - From 22 Ave/163A St to 21 Ave/165 St (Area 1)	\$390,000	\$0	\$390,000
125m of 450mm - From 22 Ave/163A St to 22A/163St (Area 1)	\$148,000	\$0	\$148,000
Sanitary Sewer Upsizing - North Catchment (Area 1)	\$521,000	\$0	\$521,000
100m of 525mm - 168 St: from 14 Ave to 14A Ave (Area 2)	\$164,000	\$0	\$164,000
280m of 375mm - Along BC Hydro ROW from 16 Ave to 17 Ave (Area 2)	\$305,000	\$0	\$305,000
Sanitary Sewer Upsizing - South Catchment (Area 2)	\$436,000	\$0	\$436,000
Grandview South Pump Station and Forcemain (Area 2 Component)	\$3,230,000	\$0	\$3,230,000
Grandview South Pump Station and Forcemain (Hwy 99 Component)	\$4,336,000	\$0	\$4,336,000

**Transportation**

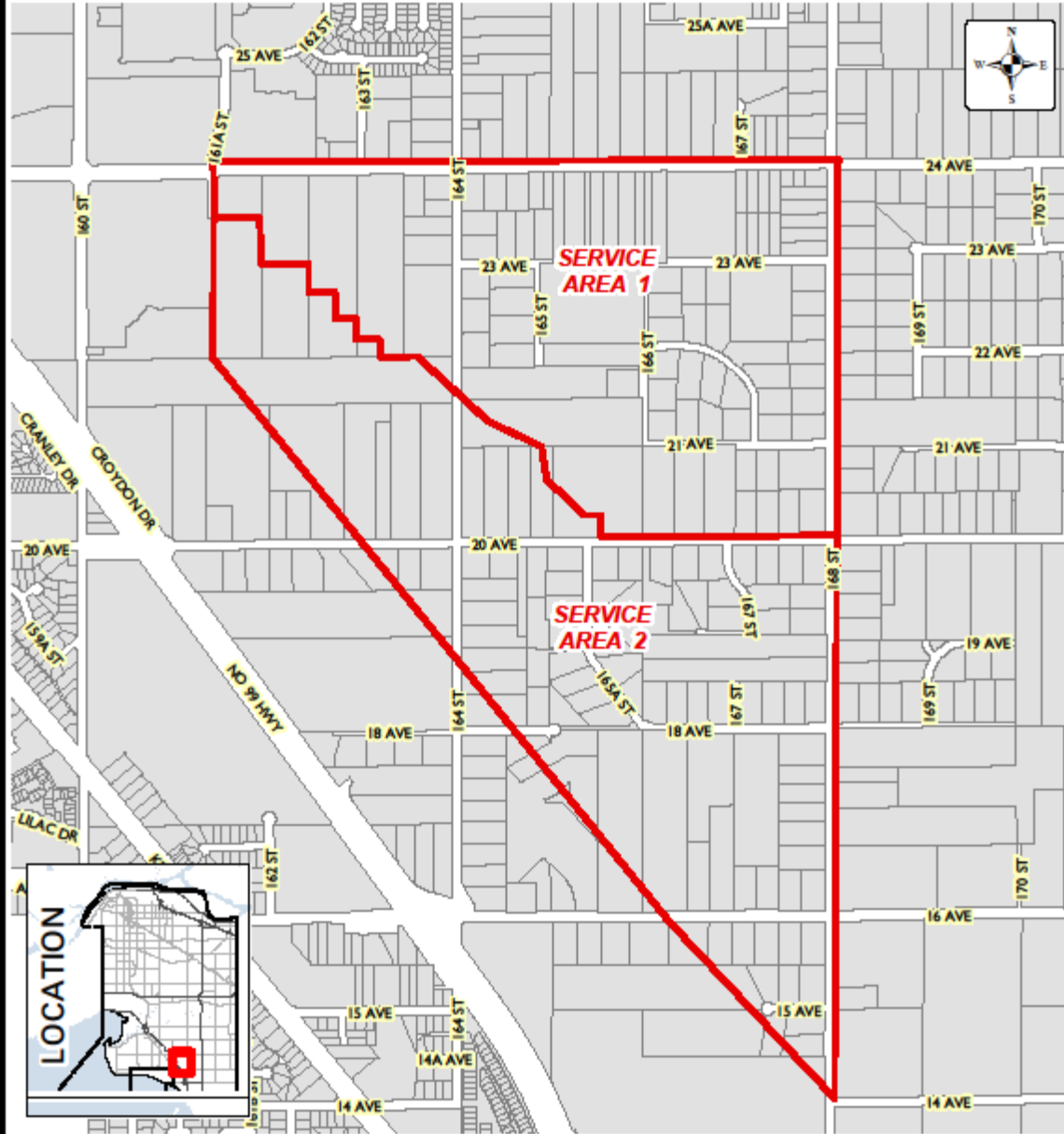
**Arterial**

<b>Project</b>	<b>Project Cost</b>	<b>Non-Growth Cost Component</b>	<b>Growth Cost Component (DCC)</b>
Arterial Widening (to 5 lanes) - 24 Avenue: 162 - 168 Street	\$8,400,000	\$0	\$8,400,000
Traffic Signal - 24 Avenue / 162 Street	\$150,000	\$0	\$150,000
<b>Total</b>	<b>\$8,550,000</b>	<b>\$0</b>	<b>\$8,550,000</b>

**Collector**

<b>Project</b>	<b>Project Cost</b>	<b>Non-Growth Cost Component</b>	<b>Growth Cost Component (DCC)</b>
Traffic Signal - 24 Avenue / 164 Street	\$150,000	\$0	\$150,000
Roundabout - 20 Avenue / 164 Street	\$1,534,000	\$0	\$1,534,000
Traffic Signal - 20 Avenue / 168 Street	\$150,000	\$0	\$150,000
<b>Total</b>	<b>\$1,734,000</b>	<b>\$0</b>	<b>\$1,734,000</b>

# APPENDIX II



Produced by GIS Section: November 4, 2010, AW



## SUNNYSIDE HEIGHTS NCP SANITARY SERVICE AREAS

### 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 lines, legal descriptions and encumbrances must be confirmed at the Land Title Office.

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