

NO: **R079**

COUNCIL DATE: **May 4, 2020**

REGULAR COUNCIL

TO: **Mayor & Council**

DATE: **April 30, 2020**

FROM: **General Manager, Planning & Development**
General Manager, Engineering
General Manager, Parks, Recreation & Culture

FILE: **6520-20 (GH#4 NCP)**

SUBJECT: **Redwood Heights Neighbourhood Concept Plan - Stage 2 Final Report**

RECOMMENDATION

The Planning & Development Department, the Engineering Department, and the Parks, Recreation & Culture Department recommend that Council:

1. Receive this report for information;
2. Approve the final (Stage 2) Redwood Heights Neighbourhood Concept Plan and its associated engineering servicing and financial strategies as documented in this report and attached as Appendix "I";
3. Authorize staff to bring forward amendments to Schedule D of the "Surrey Road Classification Map (R-91)" and Schedule K "Surrey Major Road Allowance Map" of *Subdivision & Development By-law, 1986, No. 8830* in order to reflect the road network illustrated in Appendix "II";
4. Authorize staff to bring forward bylaw amendments as documented in Appendix "III" to *Surrey Official Community Plan Bylaw, 2014, No. 18020* in order to align related figures and land use designations within the Redwood Heights Neighbourhood Concept Plan with those in the Official Community Plan, and authorize the City Clerk to introduce the necessary Official Community Plan amending bylaws for the required readings and to set a date for the related Public Hearing;
5. Approve amendments to *Surrey Zoning By-law, 1993, No. 12000* in order to include amenity contributions for the Redwood Heights area based upon the density bonus concept, as documented in Appendix "IV", and authorize the City Clerk to introduce the necessary *Surrey Zoning By-law, 1993, No. 12000* amending bylaws for the required readings and to set a date for the related Public Hearing;
6. Authorize staff to incorporate the Development Cost Charge-eligible infrastructure related to water, stormwater, sanitary sewer, transportation, and parkland acquisition for the Neighbourhood Concept Plan in the next edition of the City's 10-Year Servicing Plan and Parkland Acquisition Program;

7. Authorize staff, as part of the next edition of the City's 10-Year Servicing Plan and Parkland Acquisition Program, to bring forward amendments to *Surrey Development Cost Charge Bylaw, 2018, No. 19478* in order to establish area-specific Development Cost Charge rates for this Neighbourhood Concept Plan area, as described in this report; and
8. Approve amendments to *Development Application Fees Bylaw, 2016, No. 18641* in order to require the payment of additional application fees, which allows for the repayment of the costs incurred in preparing the Neighbourhood Concept Plan for the Redwood Heights area, as documented in Appendix "V".

INTENT

The intent of this report is to seek Council approval of the Stage 2 Redwood Heights Neighbourhood Concept Plan ("NCP"). The Redwood Heights NCP includes changes to land uses, parks and open space network, biodiversity conservation areas, road and transportation network, engineering servicing strategy, and introduces a financing strategy in order to ensure the necessary delivery of community amenities and engineering infrastructure for an estimated 6,000 new residential units.

BACKGROUND

In 2003 Council identified Grandview Heights as an area of the City that would be suitable for new development. The area is designated as General Urban within the Regional Growth Strategy ("RGS") and is located within the Urban Containment Boundary ("UCB"). Land within this designation is intended for residential neighbourhoods and centres, supported by shopping, services, institutions, recreational facilities, and parks.

A General Land Use Plan ("GLUP") was approved in 2005 to serve as an overall guide for land use, servicing, and development in the Grandview Heights area. It also identified the NCP approach to plan future Grandview neighborhoods.

Since the approval of the Grandview Heights GLUP, three NCPs have been completed in the area: Area # 1 (Morgan Heights, 2005), Area # 2 (Sunnyside Heights, 2010), and Area # 5A (Orchard Grove, 2011). Urban development within these NCP areas is well underway, with most approved plan areas built out, under application, or in development.

On January 28, 2020 the Surrey School District announced the acquisition of a new school site within the Redwood Heights NCP. This new school site is reflected within the final NCP document attached as Appendix "I".

Plan Area

The Redwood Heights NCP Plan Area (the "Plan Area", the "Plan") is in east Grandview Heights (Appendix "I"). It is bounded by the Agricultural Land Reserve ("ALR") to the north and east, 20 Avenue and the existing Redwood Park Estates subdivision to the south, and 176 Street / Highway 15 to the west. The Plan Area measures approximately 210 hectares (520 acres) over 92 existing properties.

The Plan Area is currently designated "Suburban-Urban Reserve" in *Surrey Official Community Plan Bylaw, 2014, No. 18020* (the "OCP") and is zoned in parts A-1 (General Agriculture), A-2 (Intensive Agriculture), and RA (One Acre Residential).

Plan Initiation

On September 14, 2009, Council adopted the recommendations of Corporate Report No. R175; 2009, which authorized the preparation of a Stage 1 Land Use Plan for Grandview Heights Area # 4 (“Redwood Heights NCP”). The report included the approval of a Terms of Reference to guide the planning process. It also shared the results of background studies undertaken to provide context to the planning process, including an environmental study, heritage study, commercial market study, transportation study, and an Integrated Stormwater Management Plan (“ISMP”).

Within the report, Council also approved an amendment to draft an agreement between the City and a landowners’ group within the Plan Area regarding the preparation of an NCP. The owners’ group was established as a subset of property owners who petitioned Council to advance the preparation of the NCP.

Land Use Planning Process

The Plan was developed over several years using a comprehensive two-stage planning process. It combines thorough community and stakeholder consultation along with evidence-based planning. An integrated, multi-stakeholder approach was supported by the establishment of a Citizen’s Advisory Committee (“CAC”). The CAC was formed and met regularly throughout the NCP planning process in order to provide advice and comment. In addition to CAC meetings, the consultation process included public open houses, surveys, interagency meetings, landowner meetings, City advisory committee meetings, and youth engagements.

Stage 1 Planning Process

The planning process began on May 12, 2010 with a kick-off public open house. This event provided participants with an overview of the planning process and information regarding the establishment of the CAC.

There were 18 meetings of the CAC over the course of the planning process. The CAC included a cross-section of property owners from within the NCP area, as well as representatives from adjacent neighbourhoods, and three citizens at large. The CAC provided regular feedback on the development of the NCP, including the vision, planning principles, and land use options developed through broader public and stakeholder consultation.

A second public open house was held on May 3, 2011, where participants were invited to provide input on planning principles and a draft vision for the NCP. Participants also provided input on three preliminary land use options for the area. This culminated in the preparation of a vision that describes the desired future state of the Plan Area. The final vision for the Redwood Heights NCP is described as follows:

Redwood Heights is a healthy, sustainable and livable village with a diversity of housing types, interconnected transportation choices and local amenities that serve a population of different ages and lifestyles.

Building on this vision, staff coordinated with the CAC and various stakeholders to develop a draft Stage 1 Plan. A third public open house was held on February 6, 2013 in order to provide opportunity for public review and feedback on the draft Plan and preliminary servicing strategy.

On October 7, 2013, Council adopted the recommendations of Corporate Report No. R201; 2013 and approved the draft Stage 1 Redwood Heights Land Use Concept. Council also authorized staff to proceed with all necessary actions associated with the preparation of the Stage 2 components of the NCP.

For this NCP, an agreement with the landowner's group stipulated that before starting the Stage 2 planning process, the owner's group would pay all costs associated with the detailed servicing studies required to complete the Stage 2 component.

Stage 2 Planning Process

On March 23, 2015, Council adopted the recommendations of Corporate Report No. R045; 2015 which authorized staff to amend the existing landowner's agreement for the preparation of the Stage 2 planning process. This included costs associated with the planning and design of required utilities. The amended agreement outlined that the City would front end the Stage 2 planning process and recover costs through a future surcharge on development applications within the NCP area. This will be administered through a *Development Application Fees Bylaw, 2016, No. 18641* (the "Fees Bylaw").

In early 2015, staff awarded consulting services for engineering components of the Stage 2 NCP. It was anticipated that the work would be completed by 2016. During the transportation review, the consultant and staff discovered potential impacts related to the provincial transportation network. This required Ministry of Transportation and Infrastructure ("MoTI") review and approvals and delayed the completion of the Stage 2 NCP. MoTI approval and review was specifically related to the introduction of a new signalized intersection at 26 Avenue and 176 Street / Highway 15 in order to accommodate the traffic generated from the NCP.

On March 6, 2018, a modified Stage 2 Land Use Plan was presented at a fourth and final public open house. The purpose of the open house was to illustrate refinements of the draft land use concept and transportation plan, design and development guidelines, and servicing / financial strategy.

A summary of the feedback received at this open house is attached as Appendix "VII".

Following the open house, additional refinements were made to the Plan. The final Plan reflects input that was received through consultation, as well as more recent school site acquisitions and additional watercourse and wetlands assessments that were undertaken.

A summary of changes from the draft Stage 1 Plan to the final Stage 2 Plan are illustrated in maps contained within Appendix "VIII".

DISCUSSION

The final Redwood Heights NCP, attached as Appendix "I", reflects the community vision developed and refined through the planning process. It incorporates land use and servicing refinements that are reflective of input received through consultation, as well as discussions with the CAC, interagency meetings, and other stakeholders, and a detailed engineering, transportation, and servicing review.

Plan Overview (Stage 2 NCP)

The Redwood Heights neighbourhood is envisioned as a complete community and urban village, with a focus on environmental conservation and stewardship and transit supportive development. Its social, economic, and environmental sustainability will be supported by:

- The protection of a significant biodiversity hub and two habitat corridors in order to ensure continued wildlife movement and habitat protection and enhancement as the neighbourhood grows.
- A mixture of housing types serving a diversity of household demographics, including single detached houses, semi-detached houses, lower-density cluster housing, townhouses, rowhouses, and low-rise apartments.
- Safe and convenient multimodal travel options supported by an inter-connected, modified grid of streets, protected cycling facilities, multi-use pathways, and walkways.
- Transit-supportive densities near 24 Avenue that are designed to accommodate Frequent Transit Network (“FTN”) bus service in the short-term, and protection for Rapid Bus or rapid transit in the longer term.
- Shopping for everyday needs within walking distance of most homes, supported by a neighbourhood commercial centre and a smaller neighbourhood commercial node.
- Active living and outdoor recreation within a 10-minute walk of all households, supported by a series of accessible neighbourhood parks, greenways, and trails.
- Employment opportunities close to home in the commercial nodes and the nearby Campbell Heights industrial area, located approximately 1.6 kilometres east of the Plan Area.
- Assuring streams and wetlands and their riparian areas are protected for fish and fish habitat, in perpetuity.

Land Use Designations

The Plan recognizes the need to develop a compact, sustainable, and livable community. It concentrates higher density land uses around a neighbourhood commercial centre near 24 Avenue and 178 Street. Densities gradually transition towards the periphery of the Plan Area and the ALR. In doing so, the draft Plan maintains a diverse arrangement of housing types, while also protecting key environmental areas through habitat and riparian protection areas.

The following land use designation descriptions - including intended form, character, and use - define future land uses that the City will encourage over time. Together, they illustrate how future development will fit together and where the City expects growth to occur.

Residential Uses

The Redwood Heights Land Use Plan, attached as Appendix “IX”, includes over 86 hectares (214 acres) of land designated for primarily residential land uses. This includes eight different

residential types, including single- or two-family dwellings, ground oriented multiple family dwellings, and higher density multi-family development.

These residential land use designation areas are summarized in the table below, along with their associated density range, typical ownership tenure, building forms, maximum building heights, amount of designated area, percentage of residential designation, and estimated number of dwelling units.

Land Use Plan Designation	Residential Transition	Cluster Residential	Detached Residential	FLEX: Detached Residential or Multiple Residential	Semi-Detached Residential	Multiple Residential	Townhouse Residential	Low-Rise Residential
Density Range	Up to 4 UPA	Up to 25 UPH (10 UPA)	Up to 30 UPH (12 UPA)	Up to 55 UPH or 22 UPA	Up to 37 UPH (15 UPA)	Up to 55 UPH (22 UPA)	Up to 75 UPH (30 UPA)	Up to 2.0 FAR
Typical Ownership	Fee Simple (Freehold)	Strata	Fee Simple (Freehold)	Free Simple or Strata	Fee Simple (Freehold)	Strata or Fee Simple	Strata	Strata or Rental
Typical Building Forms	Larger suburban detached lots	Mix of detached, attached, and townhouses	Narrow / wide front or rear loaded detached lots	Single detached lane served lots or townhouses	Small semi-detached lots with shared party walls	Wider / larger townhouses	Narrower / smaller townhouses and rowhouses	Stacked townhouse and / or apartments
Maximum Building Heights	30 ft.	30 ft.	30 ft.	30 to 36 ft.	31 ft.	31 to 36 ft.	43 ft.	Four- to six-stories
Total Area	5.9 hectares (14.7 acres)	12.4 hectares (30.7 acres)	12.7 hectares (31.4 acres)	3.0 hectares (7.5 acres)	1.9 hectares (4.8 acres)	22.8 hectares (56.4 acres)	19.7 hectares (48.8 acres)	7.9 hectares (19.7 acres)
% of Residential Area	7%	14%	15%	4%	2%	26%	23%	9%
Projected Avg. # Units	44	145	377	113	71	987	1,342	1,378
Projected Avg. Population	196	1,092	1,678	281	178	2,467	3,355	2,894

Commercial and Mixed-Uses

The NCP designates just over 4.6 hectares (11.4 acres) for mixed residential / commercial uses. This combined area accounts for just over 2% of the total NCP area. These include a “Mixed-Use Commercial Village” area at 24A Avenue between 177 Street and 178 Street, and a smaller “Neighbourhood Commercial Node” on the south side of 24 Avenue at the corner of 182 Street. Development within these designations is intended as multi-family apartment housing with

ground-oriented commercial. The Mixed-Use Commercial Village area will allow building heights of up to six-storeys, while the Neighbourhood Commercial Node allows building heights up to five-storeys. A detailed description of the mixed-use designations is included within the NCP document.

Land Use Plan Designation	Mixed Use Commercial Village	Neighbourhood Commercial Node
Density Range	Up to 2.0 FAR	Up to 2.0 FAR
Typical Building Forms / Types	Ground floor commercial with residential or office above. 100% underground parking.	Ground floor commercial with residential or office above. Residential parking underground.
Building Heights	Four- to six-storeys	Up to five-storeys

Development within the central Mixed-Use Commercial Village area can accommodate approximately 15,000 square metres (162,000 square feet) of commercial space. Envisioned commercial uses include a small anchor store (20,000 to 30,000 square feet), such as a drug store or grocery store, and additional space for smaller shops and service commercial outlets.

The smaller Neighbourhood Commercial Node area can accommodate approximately 1,000 square metres (11,000 square feet) of commercial space, envisioned as smaller commercial retail units and offices (1,000 to 4,000 square feet).

It is estimated that the neighbourhood Mixed-Use Commercial areas will provide between 160 and 220 jobs within the NCP.

Institutional Uses

Institutional designations within the NCP include:

- A centrally located public elementary school site near 26 Avenue and 180 Street.
- A planned private Catholic secondary school owned by the Roman Catholic Archdiocese of Vancouver near 182 Street and 24 Avenue.
- The existing Science of the Soul worship and retreat centre near 177 Street and 28 Avenue.
- Surrey Fire Hall # 14, at 20 Avenue and 176 Street.

It is estimated that the existing and proposed institutional areas will provide between 260 and 300 jobs within the NCP.

Parks and Natural Areas

The land use concept also includes parks and natural area designations which identify areas for active and passive park use and environmental preservation. This is discussed in greater detail later in this report.

Growth Projections

Growth projections have been prepared based on the above land uses. Based on current residential and market demand projections, Redwood Heights is expected to build-out with 5,905 dwelling units (including secondary suites). Based on a ratio range of between 2.1 – 3.0 persons per dwelling unit (depending on housing type), and an additional 1.45 persons per projected secondary suites in single family designated areas, the NCP is estimated to have a future build-out population of over 13,500 residents, representing a 2.6% increase in the City's population.

The resulting average population density for the neighbourhood is approximately 62 residents per gross hectare (26 units per net hectare). This density is similar to the Sunnyside Heights NCP, which was also planned at approximately 62 residents per gross acre (27 units per net acre); however, Redwood Heights is 20% smaller in area than Sunnyside Heights, allowing for a higher percentage of multiple residential building dwellings and retention of more overall green space.

School Projections and Planning

The Redwood Heights NCP falls within the existing East Kensington Elementary catchment. East Kensington Elementary is located within the ALR at 28 Avenue and 184 Street, outside of both the Plan Area and the UCB. As a result, the Surrey School District is unable to expand the school to meet the future needs of the area. A new 3.7-hectare (9.1 acre) future elementary school site has been identified in the NCP, which will be large enough to support a school and sports field.

The Surrey School District purchased the new school site in the Redwood Heights NCP in January 2020, with allotted funding allowances from the province. The construction of the new school will be considered as part of the Surrey School District's 2020 Capital Plan, for review and approval by the Ministry of Education.

The new elementary school will supplement East Kensington's enrolment, and construction is anticipated before growth surpasses existing capacity. The future operation of the existing East Kensington Elementary school will be reviewed and approved by the Surrey School Board. It is assumed that, at this time, East Kensington Elementary will continue to operate as an elementary school and service the Redwood Heights neighbourhood.

Due to East Kensington Elementary's location in the ALR and distance from most housing in the Plan Area, additional sidewalk infrastructure would not be typically planned for nor effective at encouraging walking for that distance. As such, most trips to East Kensington Elementary will continue to be by car. This is likely to result in a period of congestion around East Kensington Elementary until the new school is built, and the school catchment areas are adjusted.

Student Projections

The Surrey School District estimates that between 569 and 584 students from the NCP area will be enrolled in the public-school system by 2027. This number is anticipated to grow to between 778 and 945 students by 2032. The future demand for a new elementary school will be met by a new 605-seat capacity school (anticipated for 80 Kindergarten students and 525 students from grades 1 through 7) scheduled to come online during the mid-2020s, combined with the existing capacity of East Kensington Elementary.

The projections are based on the approximate buildout timelines of the NCP, where 95% of the neighbourhood is built out by 2035. The Surrey School District model assumed a 63% participation rate in public school, which is the average participation rate in the Grandview Area, and assumes existing choice program(s) remain at East Kensington Elementary.

Parks and Recreation

New neighbourhood parks, biodiversity conservation areas, riparian areas, and landscape buffers amount to approximately 49 hectares (121 acres), or just under 22%, of the total NCP. An estimated net area of 30.3 hectares (74.9 acres) of new parkland, including biodiversity conservation areas, will need to be purchased using Parkland Development Cost Charge (“DCC”) funds, which include a levy for purchasing lands identified in the Biodiversity Conservation Strategy (“BCS”). The remainder of greenspace is riparian area and landscape buffers that are expected to be conveyed to the City as undevelopable lands at the time of development.

Neighbourhood Parks

There are eight new neighbourhood parks covering 12.3 hectares (30.4 acres) of land within the NCP. Neighbourhood parks provide local park amenities to serve immediate residents and are planned to be within walking distance (10 minutes) of all new homes. New parks will be designed through engagement with future residents of the NCP; however, typical neighbourhood park amenities may include playgrounds, passive lawn and open space, sports courts, pathways / trails, and benches / picnic tables.

The largest neighbourhood park is located adjacent to the proposed elementary school site, north east of the Mixed-Use Commercial Village. This park, having an area of 3.4 hectares (8.5 acres), will provide active outdoor recreation opportunities for the neighbourhood, including potential sports fields, and will function as a local gathering place for neighbourhood events.

The other seven parks range in area from about 0.9 hectares (2.2 acres) to 1.6 hectares (4 acres) and are located within a short walk of most homes. These parks will accommodate play areas for children and provide opportunities for the residents to access green spaces. Three of the neighbourhood parks are located adjacent to future detention ponds and riparian areas, which will enhance the natural character of these parks.

Redwood Park

In addition to the neighbourhood parks within the NCP, Redwood Park is a large City level park located immediately south of the NCP. The City has plans for its expansion by acquiring additional lands in the vicinity of 176 Street and 20 Avenue. In the future, Redwood Park will provide sports fields and other active park amenities, which will complement its existing natural areas and passive recreation uses.

Wildlife Hub & Corridors

As identified in the City’s BCS, a large biodiversity hub and two biodiversity corridors are located within the NCP. These natural area parks are key habitat areas and critical regional components of the BCS. They are intended to protect the existing forested upland areas and preserve watercourses that contain fish or support fish habitat. When established, they will form a large biodiversity hub and habitat corridor in the core of the neighbourhood, to support wildlife habitat and movement.

Biodiversity Preserves and Habitat Corridors are identified within the *Parks, Recreation & Culture Strategic Plan 2018-2027* as natural areas that contain limited active park amenities, although they may support pathways that connect the broader community. Amenities within these natural area parks may include reforestation and re-naturalization areas, passive pathways and forest trails, and informational and interpretative signage, as well as benches, rest areas, and viewpoints.

Trails, Pathways, and Greenway Network

The pathway and greenway network within the NCP connect to three designated City greenways within the broader Grandview Heights community. These include the Grandview Heights Greenway along 24 Avenue, the Oliver Greenway along the ALR boundary, and the Redwood Heights Greenway along 176 Street / Highway 15. In addition to these, the NCP will accommodate new trail and pathway opportunities along the edge of the wildlife corridors, and adjacent to several riparian areas. These will provide seating areas, signs, and trail markers at key points, and offer significant views out to the ALR. Pathways along the edges of designated riparian areas are key to providing public access to nature.

Purchase of Parkland

Acquisition of lands identified as “Parkland” in the NCP can commence following Council adoption of the Plan. The City, through the Realty Services Division, will negotiate with landowners if and when they choose to sell or redevelop. Lands will be valued at the time of acquisition as though they were not Parkland and were designated as the underlying land use, which is consistent with all acquisitions by the City.

Transportation Network

The transportation network for Redwood Heights (Appendix “II”) follows the guiding principles outlined in the City’s Transportation Strategic Plan and supplementary plans, including the City’s Transportation 2050 submission, Walking Plan and Cycling Plan. In addition, it is consistent with the *Highway and Traffic By-law, 1997, No. 13007* and other City policies and practices regarding traffic operation.

Based on these documents, the proposed transportation network focuses on providing a finer grained, interconnected, and continuous street grid that integrates efficiently into the surrounding area. In doing so, the network promotes frequent transit service, cycling and pedestrian connectivity, and compact neighbourhood development.

The grid road network’s spacing and block size is comparable with other recently approved NCPs, like West Clayton. Typical block sizes are smaller where densities are higher and closer to future transit service, commercial uses, and schools, and where there is a greater need for walkability and distribution of traffic. In those areas of the NCP where there is lower density or significant barriers, such as creeks, block sizes tend to be larger with fewer road connections. The road network considers property lines, environmental protection, topography, and adjacent land uses.

Road Classifications

Arterial Road

The only arterial road within the NCP area is 24 Avenue. 24 Avenue, from Highway 99 to 192 Street, is planned to be constructed to a four-lane arterial standard with a right-of-way (“ROW”) protected for future widening to six lanes to accommodate transit priority measures to support FTN service levels and future rapid transit, as the ROW is planned to be maintained at 37.0 m curb side. This ROW width can also accommodate higher orders of transit priority, including median exclusive corridor transit lanes in the long-term.

Two other arterials, 32 Avenue and 184 Street, border the NCP area and will help service the anticipated growth in the area. Significant road improvements are already planned for 32 Avenue in response to increased traffic from the Campbell Heights Local Area Plan to the east, and the Grandview Heights area to the west. Major road improvements along 184 Street are planned as part of the engineering servicing strategy of this NCP, in anticipation of growth over time.

Collector Roads

New planned collector roads include 26 Avenue, 178 Street, 180 Street, 182 Street and portions of 177 Street. These collectors will service the area by distributing traffic to arterials and the adjacent highway network. All collector roads within the NCP will accommodate on-street parking, two lanes of traffic, protected cycling facilities, treed boulevards, and sidewalks on both sides of the roads. The width of the travel lanes will be designed to be able to accommodate future transit routes. Roundabouts are planned at key collector to collector intersections, while signals will be introduced at collector to arterial intersections.

Local Roads

Most local roads will accommodate on-street parking, two lanes of traffic, treed boulevards, and sidewalks on both sides of the roads. Specific local residential roads are designated as “Flex Roads” to ensure connectivity, while allowing for adjustments to their alignment and / or cross-section. A unique “high street” is planned within the proposed Mixed-Use Commercial Village north of 24 Avenue in order to accommodate higher pedestrian volumes and special events, and to have on-street parking. Unique road cross-sections are also envisioned adjacent to designated wildlife corridors and environmentally sensitive areas. Wildlife supportive cross-sections minimize road impacts to environmental protection areas by reducing road requirements, such as curb side parking.

The NCP local road network protects the ability to provide future local road connections into adjacent suburban areas. Specifically, the road network can integrate and accommodate future development of the “reserve” area southeast of the NCP.

176 Street / Highway 15

176 Street / Highway 15 is the western border of the NCP and is under the jurisdiction of the MoTI. Collector and local road connections to 176 Street / Highway 15 are anticipated to be limited to right-in / right-out access, except for 26 Avenue. This intersection was identified as one of the main east-west connections through the NCP and is proposed to have a full turning movement signalized intersection with 176 Street / Highway 15, in order to improve connectivity disperse traffic, and minimize congestion at 24 Avenue and 176 Street / Highway 15.

Given that 176 Street / Highway 15 is under the jurisdiction of the MoTI, a new signalized intersection requires their review and approval. MoTI expressed concerns that introducing two traffic signals along 176 Street / Highway 15 (the conversion of the pedestrian signal at 20 Avenue,

and a new traffic signal at 26 Avenue) would increase delays to traffic on this major goods movement corridor between the Pacific Highway Border Crossing and three Provincial Highways: Highway 1, Highway 10, and Highway 17. MoTI also noted that a new signal at 26 Avenue would create a block spacing of 400 metres from 24 Avenue, which is below their desired 800 metre spacing. The southbound uphill grades for trucks to accelerate from along the 2600-block of 176 Street / Highway 15 are also a concern for MoTI, should a signal be installed.

Noting the above concerns, the City undertook a traffic analysis to support the request for the new 26 Avenue signal. Through this analysis it was demonstrated that a signal at 26 Avenue would improve corridor travel times along 176 Street / Highway 15, as it reduces the amount of congestion and delays at the 24 Avenue and 32 Avenue intersections. Unfortunately, due to uncertainty over timing and implementation of the signal, MoTI were unable to provide formal approval of the new intersection through this Plan. Staff will continue to work with MoTI to develop a Memorandum of Understanding (“MOU”) that outlines the consideration of future traffic signals along 176 Street / Highway 15 and the thresholds that would trigger such implementation.

As part of the NCP consultation process, the Country Woods Residents’ Association also identified concerns with the full movement access for the NCP at 176 Street / Highway 15 and 26 Avenue. Staff confirmed with the Country Woods Residents’ Association that while the new signal will provide neighbourhood connection between 164 Street to 184 Street, the timing of the signal implementation is subject to the development and growth rate of the Plan Area.

On-street Parking

Until minimum average passenger demand levels are reached on 24 Avenue that are consistent with TransLink’s Transit Service Guidelines for implementation of FTN service, the NCP area is anticipated to have lower transit mode share and a corresponding higher auto mode share. This will result in a period with higher auto ownership and greater parking demands.

The NCP road network density and provision for on-street parking on both sides of local and collector roads is anticipated to significantly help in addressing the parking demand until the transit service levels are increased. Along with the mix of land uses provided and updated parking requirements for single family homes and townhouses, it is anticipated that there will be a greater utilization of off-street parking and, therefore, a reduced demand for on-street parking. This slight reduction in demand is currently being observed in the Sunnyside Heights NCP, and should help to minimize the issues that arose in other plan areas, such as East Clayton.

Transit Service

Transit service has been provided on 24 Avenue since 2012, with Route 531 “White Rock Centre / Willowbrook” operating from White Rock Centre (Semiahmoo Town Centre) to Langley Centre. The current route has limited service hours and frequency. Fortunately, as part of the South of Fraser Area (“SoFA”) Transit Plan, service is ultimately expected to increase with development throughout Grandview and Campbell Heights. It has already been identified as a candidate for future FTN service levels, with 15-minute (or better) frequency until 9:00pm, seven days a week. With the transit supportive densities planned all along the corridor and its central location in Grandview Heights, a 37m road allowance is being protected along 24 Avenue to facilitate long-term potential for Rapid Bus.

In addition, the internal network of collector roads provides several bus routes options for future local neighbourhood service. Staff will work closely with TransLink for the broader Grandview Heights bus network as part of a future update of the SoFA Transit Plan and identifying Rapid Bus and / or Rapid Transit through the update on the Regional Transit Strategy: Transport 2050.

Walking and Cycling

The grid road network provides for continuous pedestrian and cycling connectivity throughout the NCP. All roads within Redwood Heights are planned to provide sidewalks on both sides, with separation from traffic provided by wide boulevards able to sustain large street trees. Arterial and collector roads will have one-way protected cycling facilities (commonly referred to as cycle tracks) on both sides of the road.

In addition to the on-street pedestrian and cycling network, several greenways and pathways are planned to further improve connectivity throughout Redwood Heights. The walking and cycling network will support safe and comfortable routes within the community, will help to reduce the need for residents to drive to shops, services, and school, and will support access to future transit service in the area.

Most new walking and cycling infrastructure within the plan will be delivered through new development. This includes new sidewalks, multi-use pathways, and cycling facilities (on collector roads). All new walking and cycling infrastructure will meet contemporary construction standards and will reflect the road cross-sections outlined in this plan.

Utilities and Servicing

Redwood Heights NCP is a relatively undeveloped area with little to no utility infrastructure networks currently in place. The Plan will increase development intensity and population and will require significant improvements to utility infrastructure including water, sanitary, and drainage (stormwater) systems.

Stormwater

The NCP area generally drains north-east to Justin Brook and several smaller tributaries, most of which flow into Justin Brook downstream. Justin Brook and the NCP area are located within the Erickson Creek watershed, which drains to the Nicomekl River through various open channels and streams within the ALR.

An ISMP was completed for the Erickson Creek watershed in 2010. The ISMP provides guidance on protecting the natural environment while also accommodating urban development. Taking into consideration the recommendations from the ISMP, the proposed servicing strategy consists of conventional community-based Best Management Practices (“BMP”) and Low Impact Development (“LID”) measures.

The proposed community based BMPs include four stormwater detention ponds that reflect the connectivity of the current “pre-development” drainage system and the topography of the land for constructability. The eight ponds that were originally proposed in the Stage 1 Plan have been consolidated into four ponds in this Stage 2 Plan, in order to reduce the City’s long-term costs associated with pond maintenance.

An overview of the proposed pond locations to support development of the NCP area is illustrated in Appendix “X”.

An assortment of LID measures is proposed for the NCP area, including infiltration trenches, bioswales, and rain gardens on road boulevards. LID measures are designed to encourage infiltration from smaller, more frequent storm events. They are not intended to replace drainage infrastructure that services major storm events. Based on land use, on-site LID measures are also required by developments in order to promote on-site infiltration of rainwater.

Infrastructure Phasing

The initial development in the NCP area will require the extension of stormwater infrastructure and LID measures. Developments that drain to a detention pond are required to secure the complete land requirement for the ultimate detention pond in the name of the City, as well as secure funding for construction of the ultimate detention pond, in advance of their development and in order to be considered for interim onsite detention.

Lowland Drainage

The proposed stormwater servicing strategy will maintain the flood patterns in the downstream agricultural lands, as well as preserve critical aquatic habitat by reducing erosion during rainfall events. With the measures described above, stormwater generated by development in the NCP area will be mitigated prior to discharge to the City’s lowlands. The servicing approach is in alignment with the Serpentine and Nicomekl Strategic Plan for Lowlands Flood Control, which includes flood control standards based on the Agriculture and Rural Development Subsidiary Agreement (“ARDSA”) criteria.

Lands Immediately Adjacent to the NCP Area

There is a small pocket of land immediately south of the NCP, bounded by 179 Street to 180 Street and 22 Avenue to 23A Avenue, which elected to not be included in the NCP. To avoid future infrastructure improvements within the NCP area, should redevelopment of this pocket occur in the future, the infrastructure to service this area has been sized to accommodate a similar level of development as included in the NCP.

Sanitary

There is currently no community sanitary sewer system in the NCP area. Individual properties rely on on-site, in-ground systems for sewage treatment and disposal.

To service the NCP area, a network of gravity sewers and a new pump station is required (Grandview Heights East pump station). The pump station will be located on the south side of 32 Avenue in the 17400-block. In general, the proposed sewer system is designed to flow by gravity toward the northeast boundary of the NCP area, where the wastewater is collected by a trunk sewer which will convey the flow to the Grandview Heights East pump station. This station will pump the flow south to the future extension of the Grandview Heights Interceptor Phase 3, at about 2800-block, east of 172 Street.

An overview of the proposed sanitary sewer infrastructure needed to support the development of the NCP area is illustrated in the map attached as Appendix "XI".

Infrastructure Phasing

The initial development in the NCP area will be required to extend sanitary sewer infrastructure to their site. Any development within the NCP area requires the construction of the Grandview Heights East pump station, force main, and the extension of the Grandview Heights Interceptor Phase 3.

Lands Immediately Adjacent to the NCP Area

To avoid future infrastructure upgrades, the proposed sanitary sewer system has been sized to accommodate properties outside the NCP boundary that are serviceable by gravity. A similar level of development as included in the NCP was used to estimate wastewater flows from these properties.

Water

The NCP area is partially serviced with municipal water through small diameter mains, with the remaining properties serviced by private ground water wells. The existing water infrastructure does not have enough capacity to service the NCP area. A system of new feeder mains, pressure reducing stations, and distribution water mains will be required to support the proposed land uses and densities within the NCP area. The proposed water feeder and distribution network will allow for the phased development of the area.

The topography of the area requires that three separate pressure zones be established. Lands located at higher elevations of the NCP area, primarily the south-west part of the NCP, will be serviced by a high-pressure zone (142 m). To service the 142 m pressure zone, a new high-pressure feeder main is required from the existing Grandview Pump Station, located on 24 Avenue near 166 Street, which has adequate capacity to service the NCP.

The eastern and central part of the NCP will be serviced by an intermediate pressure zone (110 m), which will be supplied by a new low-pressure feeder main fed from the existing Grandview Reservoir located adjacent to the Grandview Pump Station.

Lands located in the north, at lower elevations, will be serviced by a 90 m pressure zone, which will be fed from the intermediate pressure zone through a system of pressure reducing stations.

The installation of the low-pressure feeder main directly from the Grandview Reservoir will bypass the Grandview Pump Station and reduce pumping and energy costs. It will also eliminate the need for pump station upgrades.

An overview of the proposed water infrastructure to support the development of the NCP area is illustrated in the map attached as Appendix “XII”.

Infrastructure Phasing

The initial development in the NCP area will be required to extend water infrastructure to their site. The high-pressure feeder main from the Grandview Pump Station will service all three pressure zones in the early stage of the NCP development. Once the high-pressure feeder main is near capacity, the low-pressure feeder main will be required. The separate low-pressure and high-pressure feeder mains will allow for phased development of the major water infrastructure.

Lands Immediately Adjacent to the NCP Area

To avoid future infrastructure upgrades, the proposed water infrastructure has been sized to accommodate properties outside the NCP boundary that are serviceable by the proposed feeder mains. A similar level of development as included in the NCP was used to estimate water demands from these properties.

Plan Implementation

Engineering Infrastructure Financing

The cost of servicing improvements is calculated based on the anticipated impacts of the location, type, and intensity of planned future development. Servicing costs are recouped through DCCs, which generally reflect developers’ proportional share of public services relative to their projects’ estimated servicing needs.

Estimated Infrastructure Revenues and Costs

The water, sanitary sewer, storm sewer, and transportation infrastructure required to support development in the NCP area is expensive. The following table summarizes the projected DCC revenues and construction costs for each of the major infrastructure systems that will be needed to support build-out of this NCP area.

Service	Estimated DCC Revenues	DCC-Eligible Costs Attributable to the NCP Area	DCC Surplus / Shortfall
Water	\$10,110,000	\$13,630,000	-\$3,520,000
Sanitary Sewer	\$14,570,000	\$17,850,000	-\$3,280,000
Drainage	\$10,110,000	\$65,750,000	-\$55,640,000
Arterial Roads	\$60,410,000	\$54,160,000	\$6,250,000
Non-Arterial Roads	\$14,060,000	\$13,790,000	\$270,000

The cost to provide the necessary water, sanitary sewer, and drainage infrastructure to support development in the NCP area exceeds the expected DCC revenues from development.

The DCC revenues are based on the 2020 DCC rates that were endorsed by Council on February 10, 2020 as part of Corporate Report No. R017; 2020. The 2020 DCC rates, anticipated to take effect on May 15, 2020, include a 1% municipal assist factor for all DCC-eligible costs attributable to the NCP area for each asset type, as follows:

Service	Municipal Assist Factor	Cost of the Municipal Assist Factor
Water	1%	\$101,100
Sanitary	1%	\$145,700
Drainage	1%	\$101,100
Arterial Roads	1%	\$604,100
Non-Arterial Roads	1%	\$140,600

Included in these costs are road improvements that will be necessary for the development of this NCP, but that will also benefit development outside of this NCP area. In this regard, the NCP has only been burdened with a proportionate share of the total costs related to the road improvements.

The four drainage ponds in the NCP area require the acquisition of land, which makes up approximately 73% of the overall drainage costs. The land costs are based on an average land acquisition cost of \$2,500,000 per acre, as recently estimated by the Realty Services Division.

Estimated Biodiversity Conservation Strategy Costs

The cost to acquire BCS lands identified in the NCP area is estimated at \$112,500,000 based on an average acquisition cost of \$2,500,000 per acre. An area-specific levy is proposed for purchasing identified BCS lands.

Recommended Infrastructure Funding Strategy

The revenue shortfall as documented above will necessitate the introduction of additional levies to support development of this NCP area. An analysis of multiple options was undertaken to determine the preferred approach to address this shortfall. Given that there is a DCC funding shortfall for water, sanitary sewer, and drainage infrastructure, as well as for the acquisition of BCS lands in the NCP area, it is recommended that:

1. An area-specific DCC rate be established as the means to pay for water and sanitary sewer infrastructure, and for the acquisition of the BCS lands in the NCP area.
2. The Citywide DCC rate be used as the means to pay for arterial and non-arterial roads infrastructure, and for Parkland Acquisition in the NCP area.
3. A combination of the current Citywide DCC rate, along with Development Works Agreements (“DWA”) to recover any DCC funding shortfall, be used as the means to pay

for the drainage infrastructure, including stormwater detention ponds, to service this NCP area.

Land Use	Proposed DCC Rate for Each Component							TOTAL
	Citywide DCC Rate				Area-specific DCC Rate			
	Arterial	Non-Arterial	Parks	Drainage	Sewer	Water	BCS Lands	
SF (per lot) (RF, RF-13)	\$18,969	\$4,409	\$9,889	\$3,542	\$4,855	\$3,707	\$30,599	\$75,970
SF Small Lot (per lot) (RF-10, RF-SD, RM-23)	\$17,273	\$4,015	\$9,005	\$2,090	\$4,063	\$3,103	\$25,608	\$65,157
RM-10, RM-15, and RM-30 (per sq. ft. of DU)	\$7.13	\$1.66	\$9.07	\$1.33	\$2.16	\$1.65	\$13.64	\$36.64
RM-45 and RM-70 (per sq. ft. of DU)	\$9.28	\$2.16	\$9.24	\$0.93	\$2.98	\$2.27	\$18.76	\$45.62
Commercial (ground floor) (per sq. ft. of BA)	\$7.05	\$1.64	\$0.00	\$2.30	\$1.35	\$1.03	\$8.49	\$21.86

An area-specific DCC rate was explored as a means to address the drainage funding shortfall; however, given that the cost of each stormwater detention pond varies and the DCC revenues generated by the benefiting area of each stormwater detention pond varies, the area-specific DCC approach would result in some front-ending developers not having the opportunity to fully recover their investment. As such, using a combination of the Citywide DCC rate and DWAs to recover any DCC funding shortfall as the means to pay for the stormwater detention ponds servicing this NCP area will provide the opportunity for each front-ending developer to fully recover their investment. This is a common funding approach that has been applied to support the construction of infrastructure in other NCP areas where the DCC funding was insufficient to fully fund the required works, including detention ponds in the East Clayton NCP area.

Implementation of the Recommended Infrastructure Funding Strategy

It is recommended that any engineering infrastructure projects identified in this NCP be added to the next update of the 10-Year Servicing Plan and associated DCC Bylaw, which is anticipated to occur in 2021. The timing of the next 10-Year Servicing Plan update is not expected to impact future development applications, as applications are not anticipated to be at the point of executing servicing agreements and paying DCCs prior to the next DCC update in 2021.

Land Consolidation Strategy

Lot consolidation requirements prevent the creation of land remnants which are undevelopable based on proposed land use designations. They also ensure equitable distribution of road dedication and construction costs across properties, and in some cases ensure development does not adversely impact existing residents.

Several areas of the NCP have been identified for lot consolidation, as outlined within the final plan document. If land consolidation is proven not to be possible during the development process, a developer in these areas must demonstrate that the development potential of the excluded property is not compromised, and share any required road construction costs or land dedications equitably amongst properties shown in the land consolidation area. This is consistent with the City’s application review process and policies, which are followed in other NCP areas such as West Clayton and Sunnyside Heights.

NCP Design Guidelines

The Redwood Heights NCP contains general design guidelines for residential and mixed-use areas, as well as several existing development permit areas. The purpose of design guidelines is to achieve a pedestrian-friendly, high quality, and cohesive urban realm that is consistent with the principles and objectives of sustainable development.

Issues addressed by the design guidelines include the relationship of buildings to streets in mixed use commercial areas, building relationships to riparian and parkland areas, built form and character, landscape buffers, special interfaces along natural areas, as well as interfaces adjacent to the ALR edge. It is anticipated that all development will correspond with the design guidelines outlined with the plan document.

In the case of single-family residential development in new subdivisions, approved building schemes will be required to control housing designs. Where single-family developments are in designated Development Permit Areas (Steep Slopes, Farm Protection, or Sensitive Ecosystems), as well as for any multiple unit residential development, design guidelines will be implemented through the review and approval of a Development Permit.

Development Permit Areas

Development Permit Areas (“DPA”) for Form and Character will apply to all future multiple residential, mixed-use, commercial, and institutional buildings.

Farm Protection Development Permits will be required for all lots within 50 metres of the ALR edge.

Steep Slope Development Permits will be required for all lots within or adjacent to slopes greater than 15%.

Sensitive Ecosystem Development Permits will be required for all riparian areas, as well as lands within or 50 metres from the Green Infrastructure Network (“GIN”) hub and corridor lands identified in the BCS.

Sensitive Ecosystems Development Permit Area

Redwood Heights contains lands identified for the protection of the natural environment, its ecosystems, and biological diversity. Surrey’s GIN DPA applies to these, as identified in the BCS. During the NCP planning process, the ultimate location of these hub and corridor areas have been refined and adjusted.

It is recommended that, as part of a future OCP update report, the necessary bylaw amendment changes to the Surrey OCP Sensitive Ecosystem DPAs map, related to the Redwood Heights GIN corridor, be adjusted for consistency with the Redwood Heights NCP.

Official Community Plan Amendments

The Redwood Heights area is currently designated “Suburban-Urban Reserve” in the OCP. It is recommended that the necessary bylaw amendment changes to the OCP land use designations related to the Redwood Heights NCP land use plan proceed following the approval of the Redwood Heights NCP.

Appendix “III” illustrates the required amendments from “Suburban-Urban Reserve” to a mix of “Urban”, “Multiple Residential”, “Commercial”, and “Conservation and Recreation” in the OCP land use designations, in accordance with the Redwood Heights NCP Land Use Concept designations.

Community Amenity Contributions

In accordance with City policy to address the impacts of growth, all development proposals at the time of rezoning or building permit issuance will be required to make a monetary contribution toward the provision of new community amenities. These include needs identified within the Plan Area, as well as broader Community and Citywide amenities.

Plan Area-specific amenity needs include the development of new parks and open spaces, as well as population related improvements to police protection, fire protection, and library services. Community and Citywide needs include new capital facilities, affordable housing, and public art. Contributions to Community and Citywide needs are in addition to the identified Plan Area-specific Community Amenity Contributions.

Monetary contributions toward police and fire protection and library materials will offset the capital costs of providing these services to new development and are applied on a standardized basis in all secondary plan areas. Monetary contributions toward parks and open space development is based on an estimate of the capital costs of these improvements for this NCP area. The total estimated cost is divided by the average anticipated number of dwelling units (and acreages in the case of non-residential development) to ensure an equitable contribution.

The Community Amenity Contributions noted above are payable upon subdivision for single-family subdivisions or upon issuance of building permits for multiple residential development and other uses. The sustainable design and dual function of certain infrastructure and amenities within the NCP have been considered in calculations, such as biodiversity hubs and storm water management systems, which are considered important components of both the passive recreation system and the storm water management strategy.

The following table provides a summary of the applicable secondary plan area Community Amenity Contributions (per dwelling unit or hectare / acre) and the estimated revenue the City can expect to receive from the Redwood Heights NCP area, based on 2020 rates.

Redwood Heights Community Amenity Contribution Rates			
	Per Unit Contribution All Residential	Per Acre Contribution All Non-Residential	Anticipated Total Revenue at Build Out
Police Protection	\$80.52 per dwelling	\$483.12 per acre	\$430,975.25
Fire Protection	\$347.89 per dwelling	\$2,087.34 per acre	\$1,862,046.44
Parks & Open Spaces	\$2,509.26 per dwelling	n/a	\$13,146,013.14
Library Materials	\$181.17 per dwelling	n/a	\$949,149.63
Capital Projects	\$1,000 per dwelling	n/a	\$5,239,000
Affordable Housing	\$1,000 per dwelling	n/a	\$5,239,000
Total contribution (per unit or per acre)	\$5,022.61 per dwelling	\$2,570.46 per acre	n/a
Anticipated Total Revenue	n/a	n/a	\$26,866,184.46

The above-noted per unit Community Amenity Contributions are derived from estimated average densities in the residential designations and the number of dwelling units anticipated (excluding secondary suites). Community Amenity Contributions are paid before subdivision approval for single-family and duplex developments, and before building permit issuance for multi-family or non-residential developments.

Community Amenity Contribution rates noted above may increase on an annual basis based on either the Consumer Price Index or market condition adjustments, as appropriate. Capital Project Community Amenity Contributions are also set to increase to \$2,000 per unit after December 31, 2021 as part of phasing schedule established in *Surrey Zoning By-law, 1993, No. 12000* (the “Zoning By-law”).

To enact the Secondary Plan contribution requirements, Schedule G of the Zoning By-law will need to be amended to add Redwood Heights NCP to the list of secondary plan areas where Community Amenity Contributions are collected.

The proposed amendments to Schedule G of the Zoning By-law are attached as Appendix “IV”.

Operational and Maintenance Responsibilities

The development of the NCP area will increase the total length of infrastructure that the City is required to operate, maintain, and, eventually, replace. Increases to the City's major infrastructure categories are as follows:

Infrastructure Type	Existing Inventory	Increase to Inventory	Increase to Inventory (%)
Sewer mains	1,595 km	27.3 km	1.7%
Water mains	1,862 km	25.6 km	1.4%
Drainage mains	1,955 km	6.5 km	0.3%
Local, Collector, and Arterial Roads (centreline length)	1,750 km	24.7 km	1.4%

The average build-out population estimate of 13,500 persons in the Plan Area represents a 2.6% increase in the City’s population. The infrastructure needed to support this increase in population results in the City’s infrastructure inventory increasing by 0.3 to 1.7%; therefore, the added infrastructure to support development is positively balanced when compared against the increase in population.

Recovery of NCP Preparation Costs

Several consultants were retained to assist with the preparation of the Redwood Heights NCP, including heritage, environmental, commercial, transportation, financial, and engineering service studies. The total cost of consultant services to the City was \$587,926.59. It is recommended that the Fees Bylaw be amended to provide for the recovery of these NCP preparation costs through the payment of application surcharge fees at time of development application.

It should be noted that the considerable amount of staff time devoted to this NCP is not recovered through this surcharge process. A per unit surcharge fee will be based on the anticipated median of 5,239 units and will result in a per unit fee of \$112.22 for residential uses and a \$1,122.00 per hectare rate for non-residential uses. Should the actual number of proposed units fall below the number anticipated on any site, the applicant will be required to make up the shortfall in the surcharge fee to ensure the City’s NCP preparation costs are fully recovered.

The proposed amendments to Section 9 of the Fees Bylaw which require the payment of additional application surcharge fees in order to recover the costs of preparing the NCP for Redwood Heights NCP are documented in Appendix “V”.

SUSTAINABILITY CONSIDERATIONS

The work of this project supports the objectives of the City’s Sustainability Charter 2.0. In particular, this work relates to the Sustainability Charter 2.0 themes of Built Environment and Neighbourhoods, Economic Prosperity and Livelihoods, Ecosystems, Education and Culture, Health and Wellness, and Infrastructure. Specifically, this project supports the following Desired Outcomes (“DO”):

- Neighbourhoods and Urban Design DO1: Surrey is comprised of distinct, diverse and compact neighbourhoods and Town Centres, with an engaging public realm.
- 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.
- Neighbourhoods and Urban Design DO4: Surrey’s neighbourhoods are safe, accessible, well-connected, walkable and bike friendly.

- Neighbourhoods and Urban Design DO6: Land is used efficiently and sensitively, and development minimizes the impacts on the natural environment, viewscales, agricultural land and urban wildlife.
- Economy DO6: Efficient land use and well-managed transportation infrastructure are in place to attract businesses and support a thriving economy.
- Natural Areas, Biodiversity and Urban Forest DO1: Parks, natural areas, urban forests and habitat corridors are interconnected throughout Surrey and the region, creating healthy places for people and wildlife.
- Green Infrastructure DO11: Surrey's Green Infrastructure Network is an essential and integrated component of the City's infrastructure, providing essential ecosystem services as well as places for recreation, conservation and rejuvenation.
- Green Infrastructure DO12: Surrey protects ecosystem services and manages natural assets in order to build resilience and adapt and thrive in a changing climate.
- Learning DO5: Surrey's educational institutions and libraries are integrated into the community and have sufficient capacity to accommodate residents as well as attract people from other areas.
- Wellness and Recreation DO6: Residents participate in a wide range of recreation and leisure opportunities.
- Wellness and Recreation DO8: Residents feel a sense of belonging and connectedness and have opportunities for social interaction in their neighbourhoods and community.
- All Infrastructure DO4: Ecosystems and natural assets are an essential part of the community's infrastructure system.
- 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

Redwood Heights was identified as a suitable area for growth within the 2005 Grandview Heights General Land Use Plan. It is designated as General Urban within the Regional Growth Strategy, which is intended for residential neighbourhoods and centres, supported by shopping, services, institutions, recreational facilities, and parks.

The Redwood Heights NCP is the outcome of a comprehensive, phased land use planning process that included a thorough community and stakeholder consultation program. A staff project team, supported by several consultants and a Citizens' Advisory Committee, developed the Plan in consultation with residents, property owners, community groups, external agencies, utility companies, and development industry representatives. Careful consideration was made to ensure the Plan conserved sensitive ecosystems, addressed housing affordability and supply, provided for new schools and amenities, supported transit expansion and ridership, and was serviced in a financially responsible manner.

The result is a land use plan and engineering servicing strategy that responds to community input and is consistent with the policy framework of the OCP and the Sustainability Charter. The Redwood Heights NCP will create a compact, sustainable, and livable community with a diverse offering of housing types, interconnected transportation choices, and local amenities that serve all

residents. The Plan presents a significant best practice in biodiversity conservation and management through the introduction of a biodiversity conservation Development Cost Charge and the acquisition and management of significant natural areas. The Surrey School District has also acquired the Plan-proposed school site in advance.

It is advised that Council support the recommendations of this report.

Original signed by
Jean Lamontagne
General Manager, Planning & Development

Original signed by
Scott Neuman, P.Eng.
General Manager, Engineering

Original signed by
Laurie Cavan
General Manager, Parks, Recreation & Culture

/PK/MK/NA/SW/DM/ss/cc

Appendix "I"	Redwood Heights NCP Document (Final)
Appendix "II"	Proposed Road Network and amendments to Schedule D of the "Surrey Road Classification Map (R-91)" and Schedule K "Surrey Major Road Allowance Map" of <i>Subdivision & Development By-law, 1986, No. 8830</i>
Appendix "III"	Proposed Amendments to <i>Surrey Official Community Plan Bylaw, 2014, No. 18020</i>
Appendix "IV"	Proposed Amendment to Schedule G – Community Amenity Contribution of <i>Surrey Zoning By-law, 1993, No. 12000</i>
Appendix "V"	Proposed Amendments to <i>Development Application Fees Bylaw, 2016, No. 18641</i>
Appendix "VI"	Redwood Heights Plan Area
Appendix "VII"	Redwood Heights Engagement Summary – Final Plan Survey
Appendix "VIII"	Proposed Pond, Road, and Parkland Location Changes
Appendix "IX"	Redwood Heights Stage 2 Land Use Concept
Appendix "X"	Proposed Stormwater Servicing Network
Appendix "XI"	Proposed Sanitary Servicing Network
Appendix "XII"	Proposed Water Servicing Network

Redwood

Redwood Heights

Neighbourhood Concept Plan



Redwood Heights Neighbourhood Concept Plan
APPROVED BY COUNCIL May 4, 2020

Planning and Development, Engineering, and Parks, Recreation and Culture
City of Surrey, 13450 104 Avenue Surrey, British Columbia V3T 1V8

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WHAT KIND OF COMMUNITY DO WE WANT TO BE?

Today, community building is about ensuring the success of our residents and our community now and into the long-term future. One of the main challenges for cities is to become smarter and be able to respond cohesively to the ongoing effects of climate change.

At the same time, we need to accommodate new residents while maintaining the level of amenities and services needed by all. We are facing increased demand for housing, energy, infrastructure and recreational, health and social programs. Growth brings more greenhouse gas emissions, congestion and waste. It also puts pressure on our local natural systems.

The planning of our neighbourhoods must take these factors into account. We must plan and grow sustainably to create healthy, resilient and livable communities. We will do this by greening our neighbourhoods, protecting sensitive ecosystems, encouraging transit and active transportation and planning our communities and buildings to be more compact and efficient.

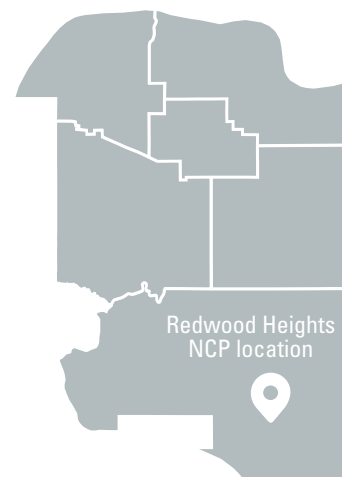


Plan Summary

Redwood Heights Plan Highlights

Redwood Heights Neighbourhood Concept Plan

The Redwood Heights Neighbourhood Concept Plan (NCP) is a comprehensive strategy to guide the development of a new community in Grandview Heights. The plan presents a vision of a compact, environmentally friendly, and sustainable community. It was developed through extensive public and stakeholder consultation, with support from the Redwood Heights Citizen's Advisory Committee (CAC), City staff and project consultants.

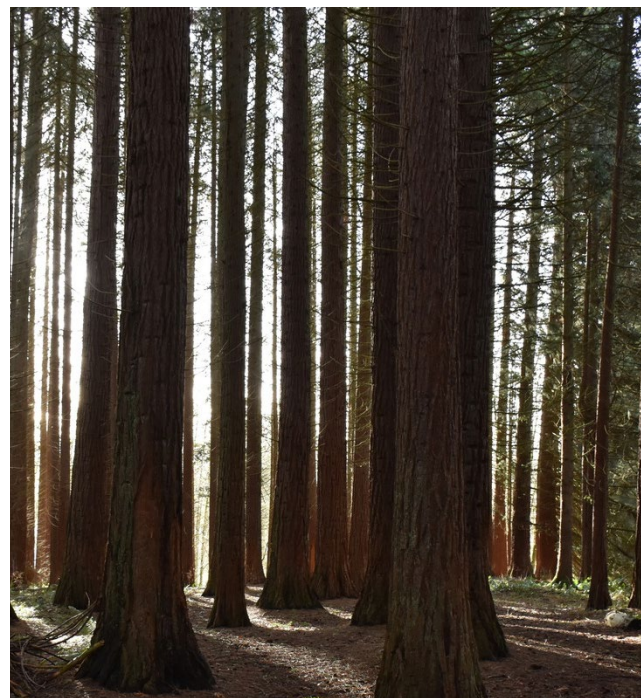


How Will the Plan Impact the Neighbourhood?

The plan presents a framework for the comprehensive development of the Redwood Heights neighbourhood. It will guide the development of new housing for residents, shops, and new employment, paths and new community amenities. It also presents a clear strategy for the protection and preservation of key wildlife habitat and sensitive ecosystems.

What's a Land Use Plan?

Land use plans designate what can be built and where. They guide the height, use, and look of new buildings, as well as locations and funding for new streets, parks, and other public services.

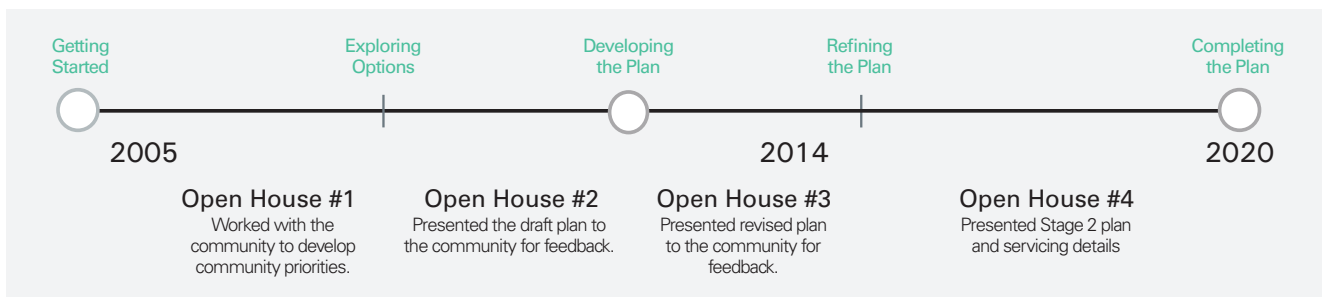


Redwood Heights NCP | Summary

Public Engagement

We conducted an integrated multi-stakeholder engagement process with a broad range of residents and stakeholders. A Citizen's Advisory Committee (CAC) made up of a cross-section of property owners in the plan area was formed. We worked with the community and CAC members to identify and prioritize land use planning principles and decisions.

14 Years of Engagement



4 Ways Stakeholders Were Notified

- MAILER
- WEBSITE
- NEWSPAPER
- SOCIAL MEDIA

4 Ways Stakeholders Participated

- PUBLIC OPEN HOUSES
- EMAIL & PHONE CONVERSATIONS
- SURVEY
- 1 ON 1 MEETINGS

Redwood NCP | Summary

Growth Objectives

The vision for Redwood Heights as a healthy, sustainable and livable village will be achieved by:

Protecting Natural Areas



An extensive parkland and green infrastructure network made up of hubs, corridors, and sites will:

- Protect environmentally sensitive areas such as wetlands, riparian areas and forested areas.
- Provide community and neighbourhood scale parks within walking distances of residents.

Providing Local Amenities



A central mixed-use commercial village and neighbourhood commercial node will:

- Support walkability within the Plan Area; and,
- Encourage a “Complete Community” with employment, entertainment, and services close to home.

Enhancing Housing Diversity



Areas of higher density development located around the neighbourhood centre and in close proximity to a future frequent transit corridor will:

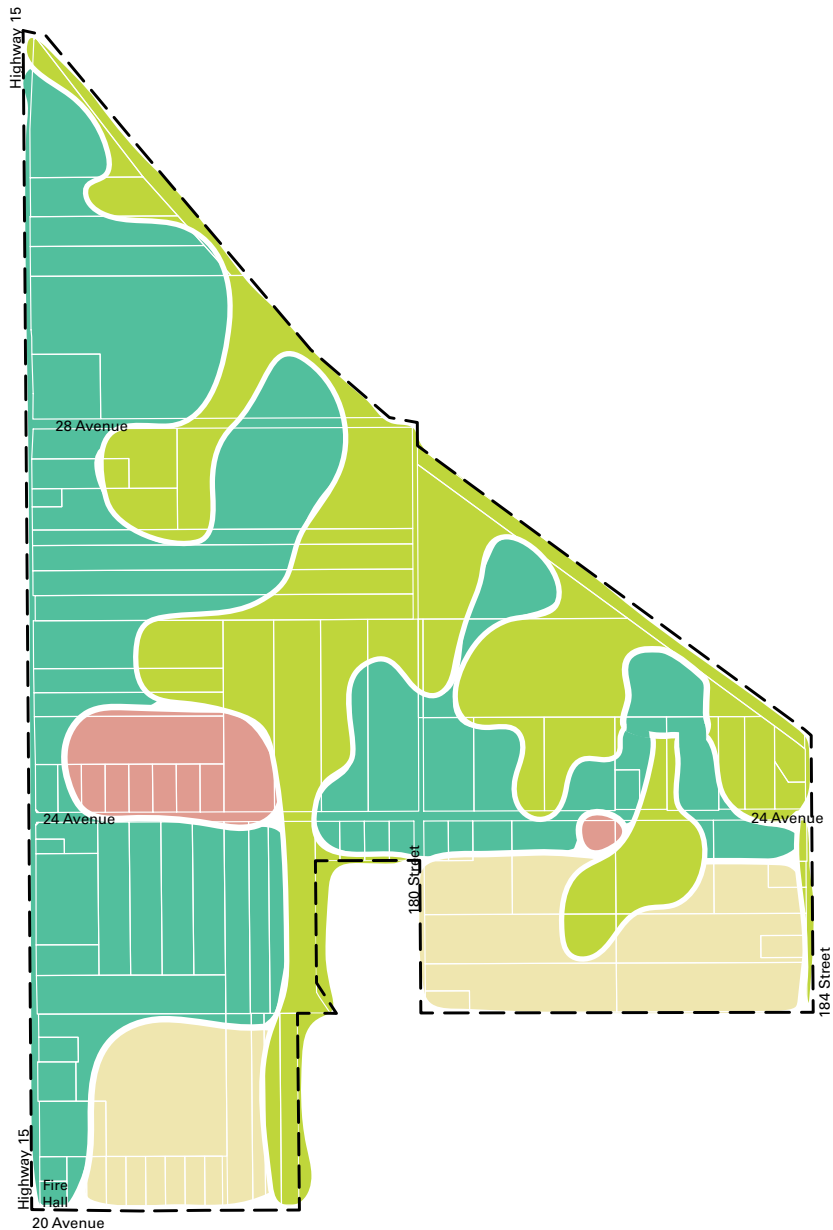
- Improve the balance of housing types and affordability; and,
- Focus new housing within walking distance of amenities and public transit.

Interfacing with Rural Neighbours



Single family lots at the Plan Area’s southern interface will:

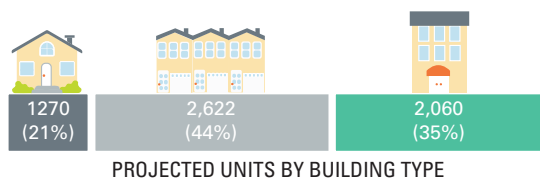
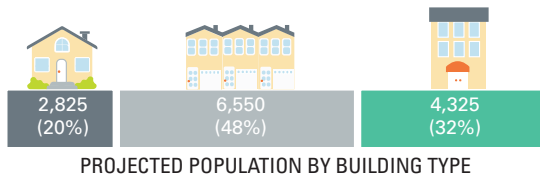
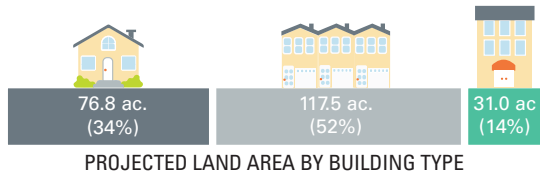
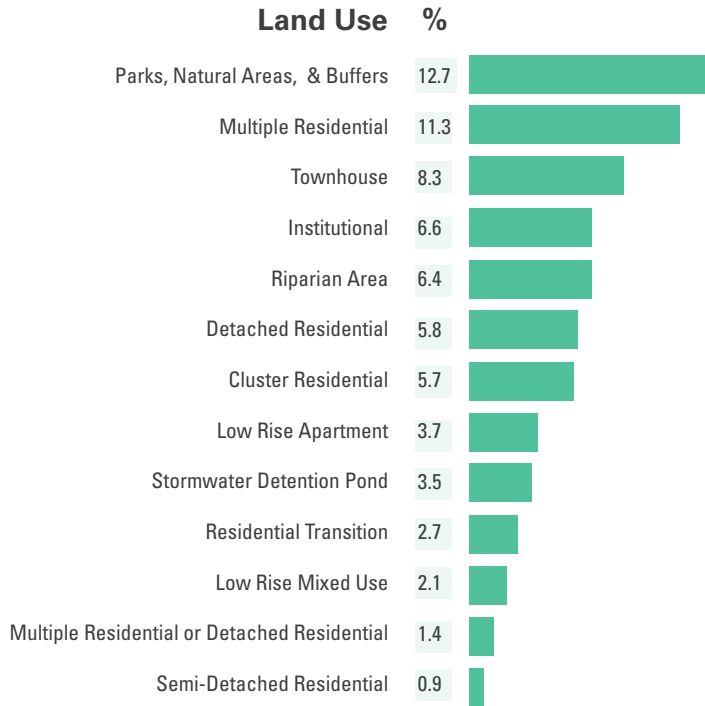
- Provide valued single family housing;
- Transition with the existing rural lots in the Redwood Park Estates area.



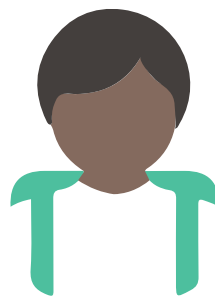
Redwood Heights NCP | Summary

Growth Projections

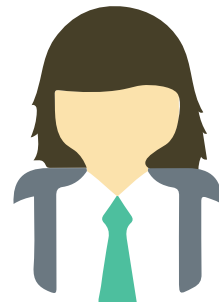
The NCP provides for an average of 5,300 dwelling units and is estimated to support a future build-out population of over 13,500 people. Approximately 1,223 - 1,615 students will be enrolled in public schools at full build out of the NCP area.



PROJECTED ELEMENTARY AND SECONDARY STUDENTS AT FULL NCP BUILD OUT



809 - 1,069



414 - 546

Redwood NCP | Summary

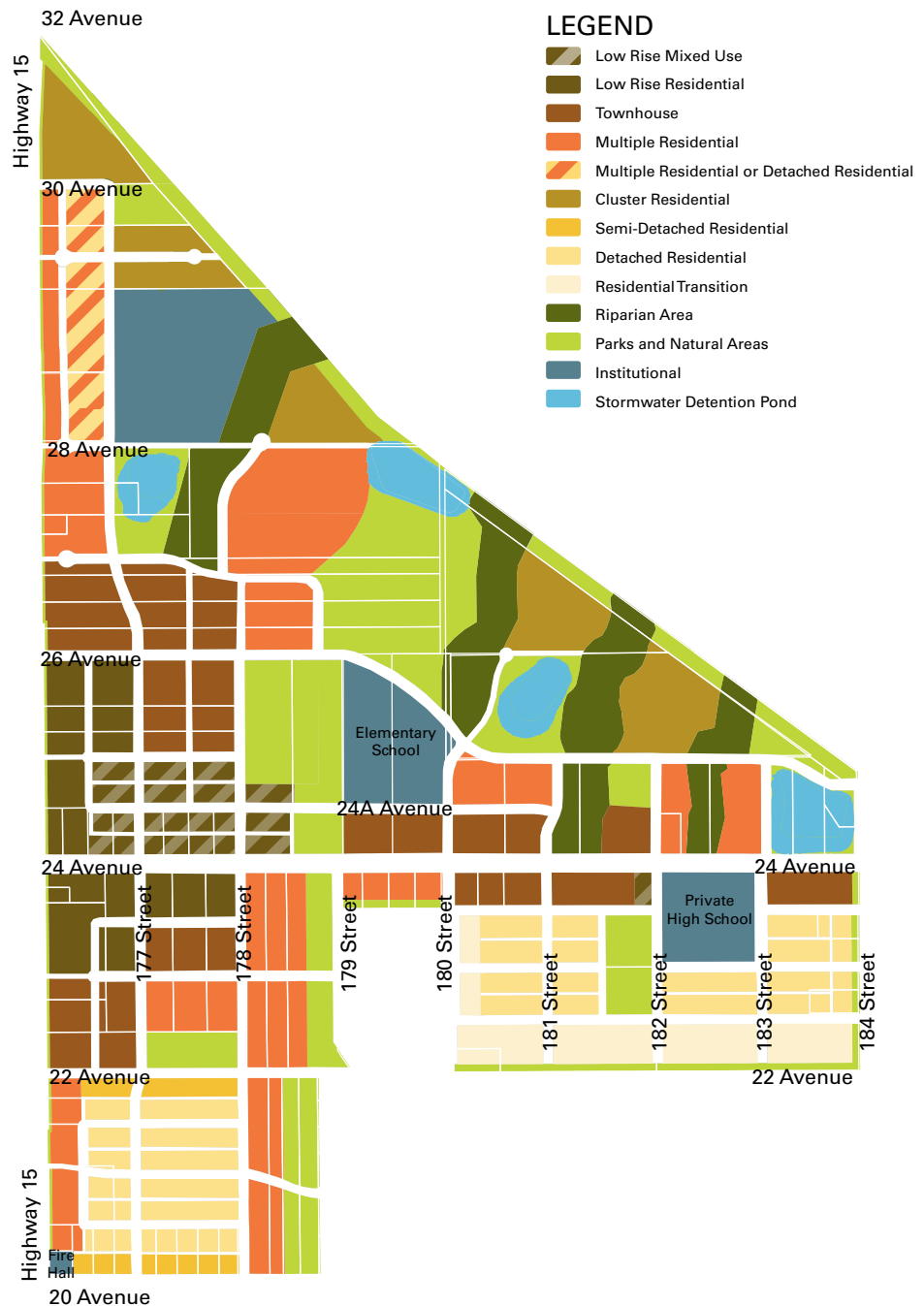
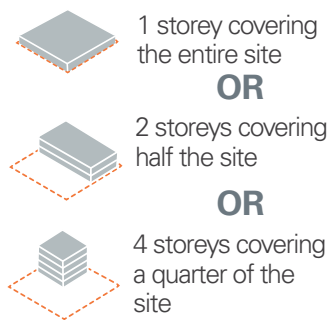
Land Use Strategy

This land use plan shows where and how land uses fit together to create a coordinated plan. Corresponding land use designations includes example images and summary descriptions for the different types of land uses that can occur within the plan area.

WHAT IS FAR?

Floor Area Ratio (FAR) is a measure of density. It is a ratio of the building's floor area divided by the site's area. FAR alone does not determine a building's height.

For example, a building with 1 FAR could have...



Redwood Heights NCP | Summary

Land Use Designations

Low Rise Mixed Use



Low rise apartments with ground-oriented commercial space.

DENSITY RANGE

Up to 2.0 FAR

TYPICAL HEIGHTS

5-6 storeys

TYPICAL OWNERSHIP

Strata or Rental

Low Rise Residential



Multi-family housing with ground-oriented units at base.

DENSITY RANGE

Up to 2.0 FAR

TYPICAL HEIGHTS

4-6 storeys

TYPICAL OWNERSHIP

Strata or Rental

Townhouse Residential



Ground oriented townhouses

DENSITY RANGE

Up to 75 UPH (30 UPA)

TYPICAL HEIGHTS

13.0 m.

TYPICAL OWNERSHIP

Strata

Multiple Residential



Wider/larger townhouses or row houses

DENSITY RANGE

Up to 55 UPH (22 UPA)

TYPICAL HEIGHTS

9.0 - 11.0 m.

TYPICAL OWNERSHIP

Strata or Fee Simple

Semi-Detached Residential



Duplex or lower density fee-simple row housing.

DENSITY RANGE

Up to 37 UPH (15 UPA)

TYPICAL HEIGHTS

9.5 m.

TYPICAL OWNERSHIP

Fee Simple (Free Hold)

Cluster Residential



Mix of detached single family, detached, and multiple residential cluster to protect natural areas.

DENSITY RANGE

Up to 25 UPH (10 UPA)

TYPICAL HEIGHTS

9.0 m.

TYPICAL OWNERSHIP

Strata or Fee Simple

Detached Residential



Narrow/wide front or rear loaded detached houses.

DENSITY RANGE

Up to 30 UPH (12 UPA)

TYPICAL HEIGHTS

9.0 m.

TYPICAL OWNERSHIP

Fee Simple (Free Hold)

Residential Transition



Larger suburban detached lots.

DENSITY RANGE

Up to 10 UPH (4 UPA)

TYPICAL HEIGHTS

9.0 m.

TYPICAL OWNERSHIP

Fee Simple (Free Hold)

Institutional



Public and private community spaces such as churches, universities, schools, museums, libraries and community centres.

Riparian Area



Areas that are adjacent to ditches, streams, lakes, and wetlands. Riparian areas play a critical role in supporting fish habitat and a range of vegetation.

Parks and Natural Areas



The planning of new parks will ensure that riparian areas and significant biodiversity hubs and corridors are protected and all future residents will live within a 10 minute walk of a park.

Stormwater Detention Pond



Stormwater storage facilities will be generally placed near the downstream point of every catchment to service as much of the catchment as possible.

Redwood NCP | Summary

Street Network

The transportation strategy builds on existing infrastructure to deliver a comprehensive finer grain road network. It is based on the City's Transportation Strategic Plan and supplementary plans, including the Walking Plan and Cycling Plan. It provides an open, connected, and continuous street network that supports cycling and pedestrian connectivity, transit service, and compact neighbourhood development.



Redwood Heights NCP | Summary

Bicycle & Pedestrian Network

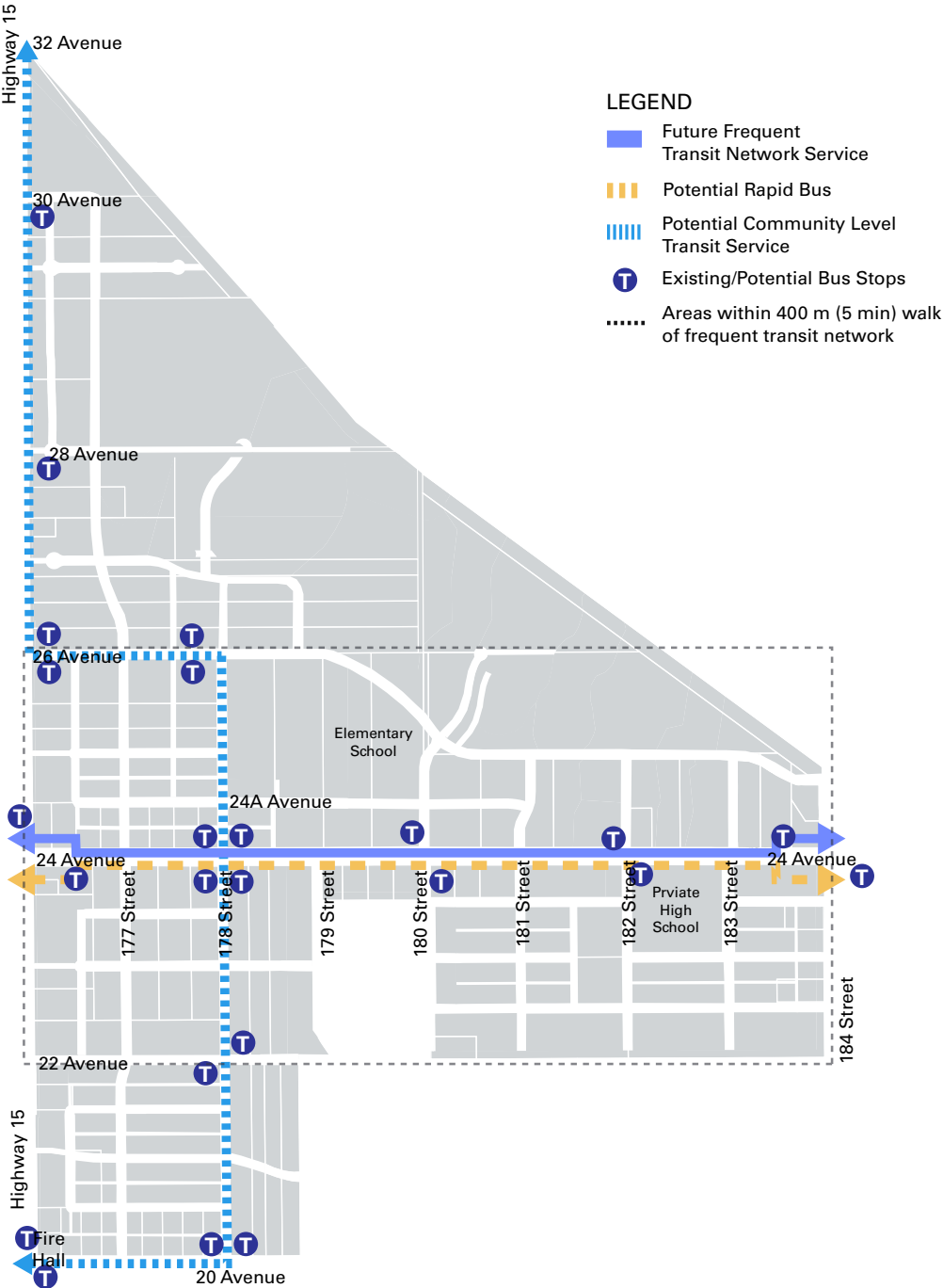
Pedestrian infrastructure is planned throughout the plan area and will be delivered largely through new development as well as through City capital projects. This includes sidewalks, multi-use pathways, street lighting, pedestrian crossings, and cycling facilities. Multi-use pathways will provide connections to and from parks within the plan area. All new walking and cycling infrastructure will reflect the road cross sections outlined in the plan.



Redwood NCP | Summary

Transit Network

The transit plans for Surrey are guided by TransLink’s South of Fraser Area Transit Plan (SoFA TP). The SoFA TP identified 24 Avenue as a potential candidate for future Frequent Transit Network service. Looking beyond 2031 and with the ultimate build out of the entire Grandview Heights area, 24 Avenue is a good candidate for future Rapid Bus.



Redwood Heights NCP | Summary

Parks & Open Space Strategy

Parks and natural areas are essential to the overall health and wellness of residents. Providing access to high quality parks is crucial to support daily life, active lifestyles, and opportunities for social interaction. The plan delivers eight new active park sites, along with a large biodiversity hub and central biodiversity corridor that links to Redwood Park. All streams and riparian areas will be conveyed to the City to be protected as natural area parkland.



Introduction

I Why a plan for Redwood?

In 2003 the City identified the Grandview Heights area as being suitable for new development. Redwood Heights is the eastern most neighbourhood in the broader Grandview Heights community. The Redwood Heights plan will guide future neighbourhood development, provision of amenities and services, and the preservation of biodiversity hubs and corridors.

PAGE	SECTION
xii	The Plan Document
xiii	Policy Context



THE PLAN DOCUMENT

The plan is organized into the following sections:

-  **1. Background** provides an overview of the planning context and process.
-  **2. Plan Framework** outlines the vision and objectives.
-  **3. Land Use** outlines each land use and associated design guidelines.
-  **4. Transportation** outlines new road connections and active transportation initiatives.
-  **5. Parks & Natural Areas** identifies parks, natural areas and outlines development considerations.
-  **6. Utilities** details infrastructure improvements to support development.
-  **7. Implementation** outlines policies and financing required to build out the plan.

What's a land use plan?

Land use plans designate what can be built and where. They guide the height, use, and look of new buildings, as well as locations and funding for new streets, parks and other public services.

How will the plan improve the neighbourhood?

Many public facilities and services are used daily by residents. These include community centres, cultural spaces, childcare facilities and libraries. When new development and rezoning occurs in an area with a land use plan, developers must make contributions to help fund these amenities. They are also required to upgrade sidewalks and other infrastructure.

POLICY CONTEXT

Community planning and development in Surrey is conducted and administered within a series of plans, policies and by-laws. These include the Metro Vancouver Regional Growth Strategy, Surrey Official Community Plan, Neighbourhood Concept Plans, the Zoning By-law, as well as several other City by-laws and Provincial regulations.

Within the hierarchy of plans, the Official Community Plan (OCP) must conform to the Metro Vancouver Regional Growth Strategy while all the other Plans and By-Laws must conform to the OCP.

Metro Vancouver Regional Growth Strategy

Redwood Heights is identified as a 'future growth area' within the Metro Vancouver Regional Growth Strategy. The NCP area is projected to receive nearly 4.7 - 9.0% of Surrey's residential unit growth and 1.4 - 1.7% of the population growth as part of the Region's Plan by 2041.

Surrey's Official Community Plan

At the initiation of this plan, the area was designated 'Suburban-Urban Reserve' in the City's Official Community Plan (OCP). Land within this designation is intended to support the retention of Suburban land uses in areas where future urban development is expected and is subject to City Council initiation and approval of a Neighbourhood Concept Plan.

Grandview Heights General Land Use Plan

In 2005, Surrey City Council approved the Grandview Heights General Land Use Plan (GLUP). It provided a concept for future neighbourhoods in Grandview Heights including parks, schools, businesses and residential land uses.

Redwood Heights Neighbourhood Concept Plan

In 2009, Council adopted the recommendations of Corporate Report No. R175; 2009, which authorized the preparation of a Stage 1 Land use Plan for Grandview Heights Area #4 (Redwood Heights NCP).

The Official Community Plan

"The City of Surrey will continually become a greener, more complete, more compact and connected community that is resilient, safer, inclusive, healthier and more beautiful."

The OCP identifies five long-term sustainability goals to help address the challenges of urban growth, climate change and demographic shifts:



Accommodate population growth by maximizing the efficient use of urban land while minimizing the impacts of change in existing neighbourhoods.



Protect and Enhance Habitat Features and Connectivity to support the rich variety of species in Surrey, particularly those that are at risk, threatened, or endangered, and to facilitate species movement.



Improve the balance of local jobs to population in order to reduce commuting time, traffic congestion, and greenhouse gas emissions while reducing the burden of property taxes on residential properties by diversifying the local tax base.



Reduce automobile reliance by re-orienting land use patterns to include higher density, mixed use developments with access to transit, cycling and walking.



Promote a compact urban form that supports transit and renewable district energy infrastructure while reducing costly infrastructure extensions and avoiding development in environmentally sensitive areas.



Serve the needs of the City's population by providing housing diversity and community programs to support all ages and socio-cultural groups.

Section 1

I How We Got Here

BACKGROUND

PLAN
FRAMEWORK

LAND USE

TRANSPORTATION

PARKS &
NATURAL AREAS

UTILITIES

IMPLEMENTATION

The Redwood Heights Neighbourhood Concept Plan (NCP) was developed through extensive public and stakeholder consultation, with support from the Redwood Heights Citizen's Advisory Committee (CAC), City staff and project consultants. The intent of the plan is to guide the development of a compact, livable, and sustainable community.

PAGE	SECTION
2	1.1 Plan Area
4	1.2 Environment
4	1.3 History
6	1.4 Community Profile
6	1.5 Planning Process



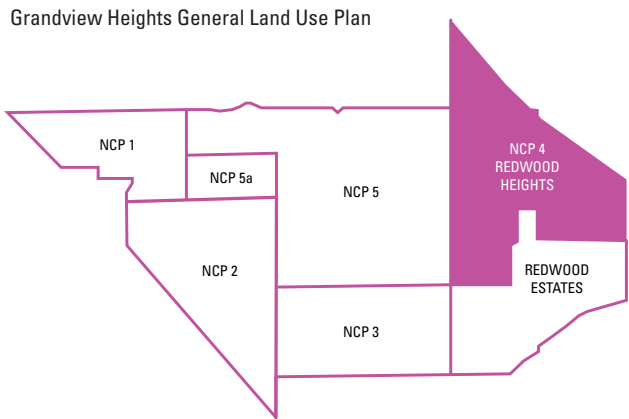
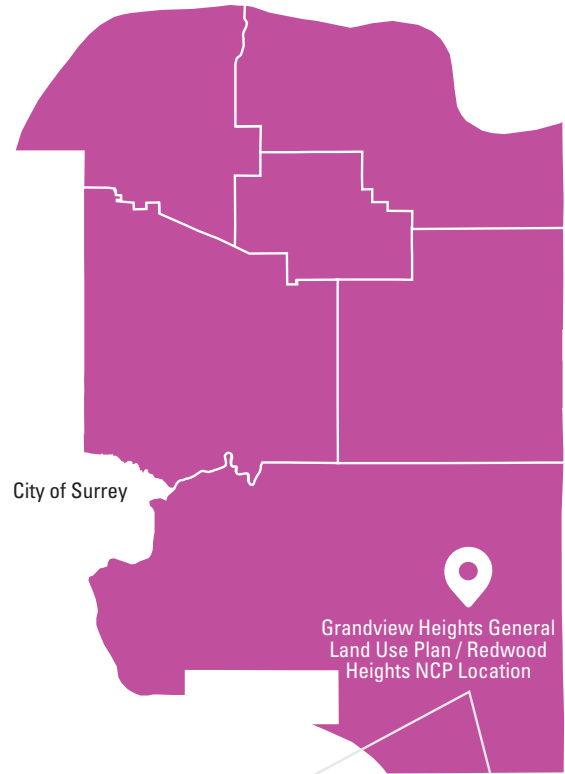
1.1 PLAN AREA

Redwood Heights is located at the easterly end of the Grandview Heights community. It is bounded by the Agricultural Land Reserve (ALR) to the north and east, 20 Avenue and the existing Redwood Estates to the south and 176 Street (Highway 15) to the west.

The area is primarily made up of large acreage and rural lots, between one and 40 acres, zoned A-1 (General Agriculture), A-2 (Intensive Agriculture) and RA (One Acre Residential). There are also some parcels zoned CD (Comprehensive Development).

A portion of the historic Great Northern Railway right-of-way, now owned by the City, is located between 180 Street and 184 Street boundary at the toe of the slope along the ALR boundary.

It has an area of approximately 210 hectares (519 acres) and included 92 properties at plan initiation.



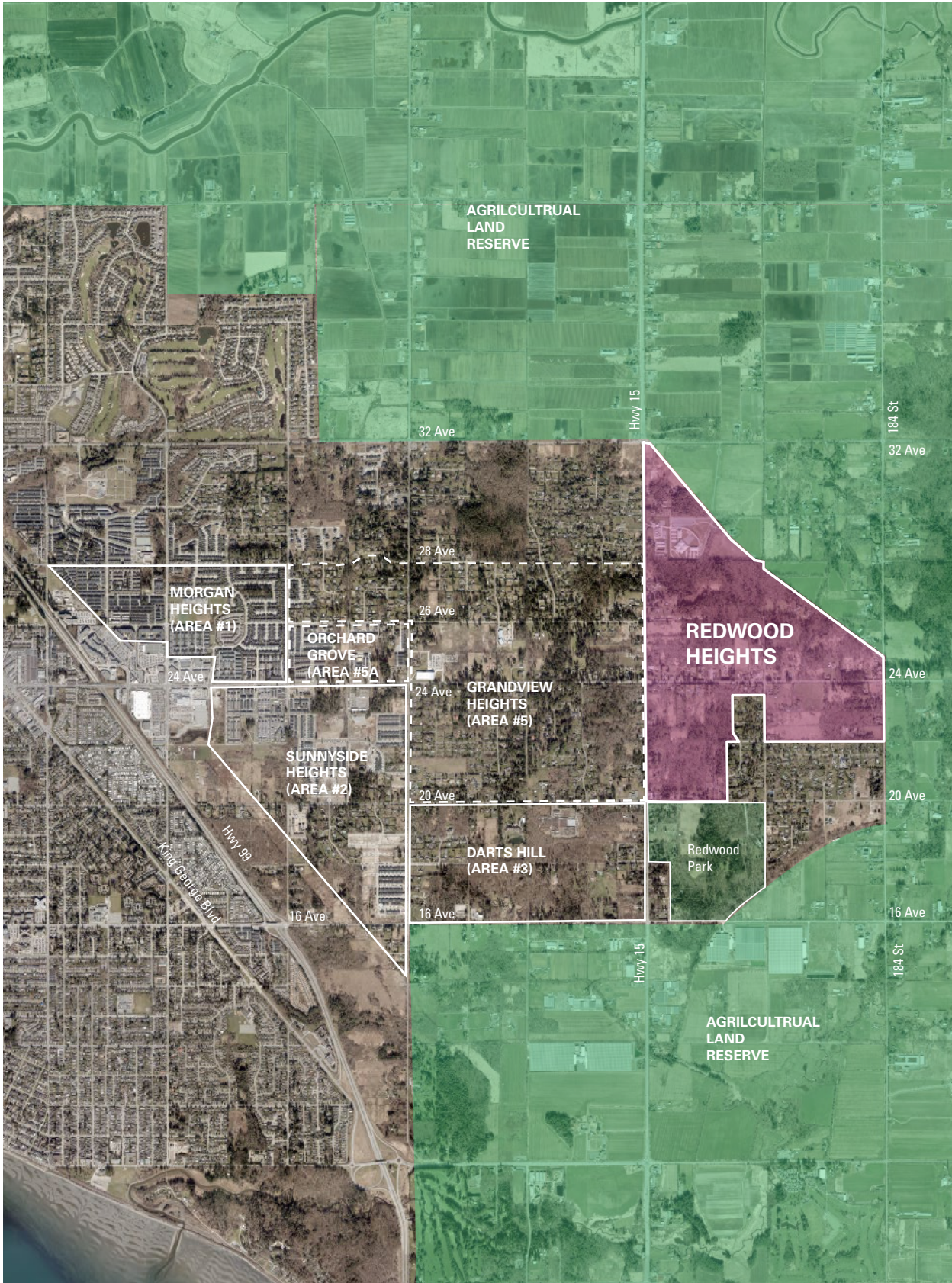


Figure 1.1 Redwood Heights Context Map



1.2 GEOGRAPHY & ENVIRONMENT

Redwood Heights is generally characterized by north-easterly slopes ranging from 5% to 15%, with the steepest slopes in the north-east adjacent to the ALR. A number of ravines and creeks bisect the area, draining from the uplands to the lowlands within the ALR.

A significant portion of the area between 24 Avenue and 28 Avenue is identified as a Biodiversity Hub in the City's Biodiversity Conservation Strategy (BCS). A north-south Biodiversity Corridor is also identified within the BCS, linking this area with Redwood Park to the south (See Figure 1.2). These areas are relatively intact natural hubs and corridors of woodland that provide valuable wildlife habitat and support fish habitat in tributaries to Erickson Creek.

The NCP is located in an area of Surrey called the Campbell Upland which gives the neighbourhood its distinct topography. These were more open areas, with scattered groves of spruce and hemlock, intermixed with cedar, alder and birch. Grassy areas, usually fairly swampy, were combined with heavy underbrush of hardhack, willow, crab-apple, and a variety of shrubs and reeds.

The area features significant stands of second growth forest which generally consists of red alder and big-leaf maple mixed with coniferous trees. The area also features a number of old fields consisting of grasses and sedges intermixed with shrubs. The dominant shrub covers are deciduous species such as hardhack, Himalayan blackberry, or planted crops. This vegetation is found in areas previously logged in the early 20th century.

1.3 HISTORY

FIRST NATIONS TRADITIONAL TERRITORY

The area in which Redwood Heights is located is the traditional territory of a small Halkomelem speaking group of the Snokomish First Nation. Their territory included the shores of Boundary Bay, and the drainage basins of the Serpentine, Nicomekl and Campbell Rivers. They intermarried with the Semiahmoo First Nation, shared a weir site near the mouth of the Campbell River, and a common hunting territory. Shortly before 1850 the Snokomish People were almost entirely wiped out by a smallpox epidemic.

EARLY SETTLEMENTS

Early European settlement in Grandview Heights began with David Brown, who arrived in Surrey from Ontario in 1878 and took up residence at the corner of the Clover Valley and North Bluff Roads (176th Street and 16th Avenue). Pioneering families followed and expanded logging and agricultural opportunities. In 1886, a logging railway was built east through Grandview Heights to support the expansion of logging and agricultural activity.

When the New Westminster and Southern Railway was completed in 1891, the logging railway was extended and linked east of Hall's Prairie Road. In 1910, The Royal City Planning Mills owned three quarter-sections of Redwood Heights, an indication of the importance of the area for timber supply. They established an operation east of Elgin, near the Nicomekl River, to log the areas south of Kensington Prairie. The Royal City Planning Mills, Brunette Mills, and later, the Campbell River Timber Company, all operated in the area, the last as late as 1927.

As the timber was depleted and the area cleared for settlement, farming began in earnest. The Pacific Coast Highway opened South Surrey up to small-agricultural and non-agricultural residential settlement in the 1920s. Quarter sections were subdivided into holdings of only a few acres. Some of these small farms still exist today.



LEGEND

- BCS Hub and Corridor
- Waterbody
- Class A Channel
- Class AO Channel
- Class B Channel
- Class C Channel
- Wetland
- Potential Wetland

Figure 1.2 BCS Hub and Corridor and Watercourses



1.4 COMMUNITY PROFILE

In 2020 the Redwood Heights area had a population of approximately 300 residents, with 92 rural and suburban residences. The population density for the area was estimated at approximately 0.2 residential units per hectare (0.6 persons per acre).

The demographic profile of the area is to change dramatically as the plan area builds out.

1.5 PLANNING PROCESS

This plan was developed using a five step, two stage land use planning process (Figure 1.3), combining thorough community and stakeholder consultation with evidence based analysis. The best available information was gathered through consultation, research, study and other sources, to support a systematic and rational approach to land use planning.

The Stage 1 planning process began in 2010 with preliminary public consultation. The Stage 1 plan was adopted by Council in October 2013. In 2015 the Stage 2 process was initiated, although delayed due to transportation impacts related to the Provincial transportation network. The final Stage 2 plan was endorsed by Council in early 2020.

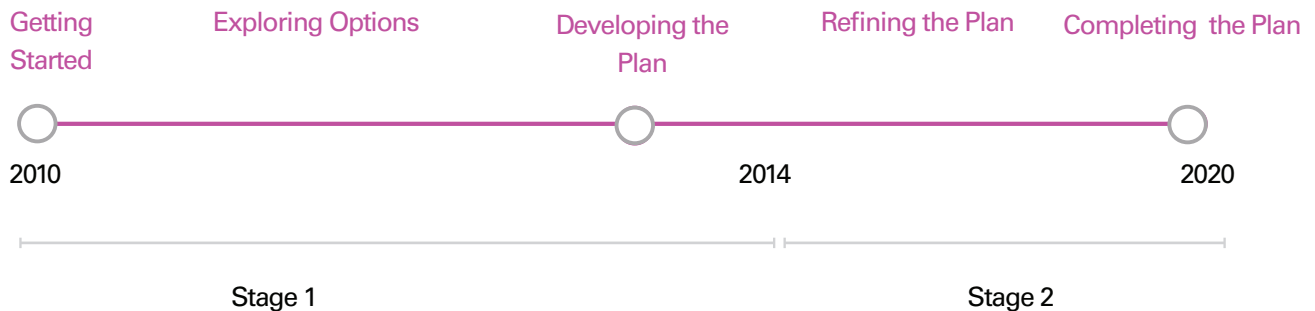


Figure 1.3 NCP Planning Process

1.5.1 Overview

PUBLIC CONSULTATION

An integrated community and multi-stakeholder approach was used to identify and prioritize land use planning principles and decisions. Efforts were taken to ensure a broad range of residents and stakeholders across the plan area and broader geography of Grandview Heights and Surrey were consulted. Engagement activities included open houses, online surveys, workshops, one-on-one meetings, interagency meetings, and advisory committees.

CITIZEN'S ADVISORY COMMITTEE

A Citizens' Advisory Committee (CAC) was formed and met regularly to provide advice and comments on the Plan as it was developed. The CAC included a cross-section of property owners from within the plan area, representatives from adjacent neighbourhoods, and citizens at-large representing the broader interests of the City.

PUBLIC OPEN HOUSE MEETINGS

Public open houses were held to gather broad public input throughout the NCP process, as follows:

- **May 12, 2010 - Open House #1**, to commence the NCP planning process and establish a Citizen's Advisory Committee;
- **May 3, 2011 - Open House #2**, to provide an opportunity for input on a draft vision and planning principles, and preliminary land use options for the area;
- **February 6, 2013 - Open House #3**, to review and provide input on the Stage 1 preferred land use plan and the preliminary servicing strategy; and
- **March 6, 2018 - Open House #4**, to review and provide input on the Stage 2 land use concept, transportation plan, design and development guidelines, and servicing/financial strategy.

INTER-AGENCY MEETINGS

Several meetings were held with an Inter-agency Committee comprised of representatives from utilities, third parties, Metro Vancouver, TransLink, and Provincial ministries (including the Agricultural Land Commission/Ministry of Agriculture and the Ministry of Transportation and Infrastructure). Regular meetings also took place with staff of the Surrey School District to ensure coordinated planning for schools in the area.

CITY ADVISORY COMMITTEES

At various stages throughout the planning process presentations to provide updates and receive ongoing feedback were made to the Agriculture & Food Security Advisory Committee (AFSAC), Heritage Advisory Commission (HAC), Development Advisory Committee (DAC), Environment & Sustainability Advisory Committee (ESAC), and the Transportation and Infrastructure Committee (TIC).

YOUTH ENGAGEMENT

A youth engagement exercise was hosted at a pre-teen dance at the South Surrey Recreation and Arts Centre, gathering feedback from more than 75 youths who participated in various activities. In addition, youth and young adults were consulted at the public open houses.

NAMING OF THE NCP

During the third open house, people were asked to identify a preferred name for the NCP area. Based on feedback from the public meeting and the CAC, "Redwood Heights" was selected as the name for this NCP Area. The iconic Redwood Park which is adjacent to the NCP area was significant in relation to this name along with the Surrey tradition of naming upland areas as "heights".



TIMELINE AND KEY MILESTONES

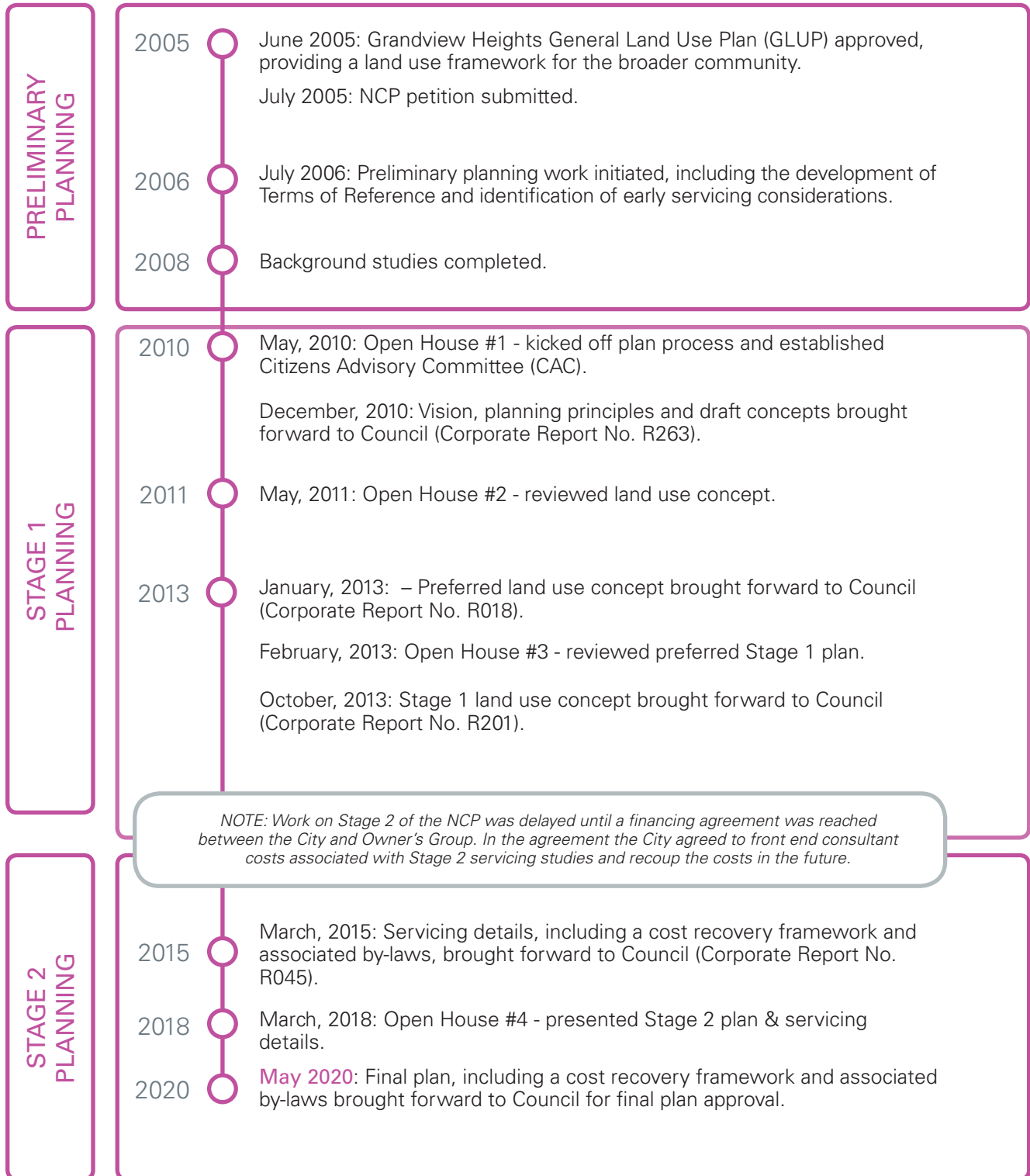


Figure 1.4 Timeline and Key Milestones

1.5.2 Background Studies

Background studies were undertaken to identify opportunities and challenges, providing context for the planning process. Studies included an environmental assessment and tree canopy survey, commercial market assessment and urban design and place-making study.

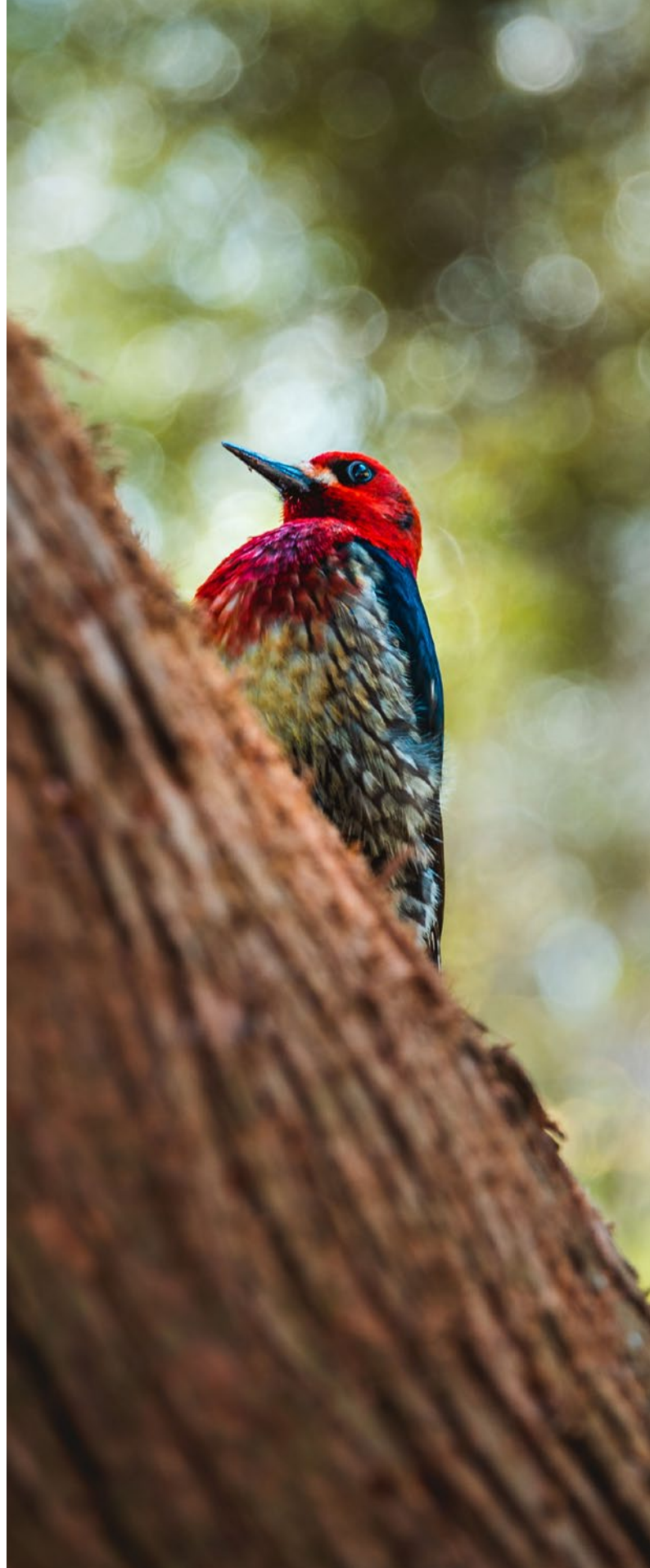
ENVIRONMENTAL ASSESSMENT & TREE SURVEY

In 2008, Madrone Environmental Services completed an environmental assessment and tree survey for the Grandview Heights community, including Redwood Heights. The objective of the study was to identify, classify, and inventory the significant environmental features and tree stands in the area. The study also provided recommendations for the preservation of important environmental features and sensitive ecosystems through development.

Since the completion of the report, changes have been made to the Water Sustainability Act and Riparian Areas Protection Regulation. In light of changes to both pieces of legislation, Dillon Consulting completed a wetland inventory and watercourse assessment and reviewed previous environmental assessments in the area. The Dillon report further informed future land uses in the area to ensure proposed developments are compliant with Provincial legislation and based on the most up to date environmental conditions.

COMMERCIAL MARKET ANALYSIS

Coriolis Consulting completed a study to estimate market demand for additional commercial development in Grandview Heights. Findings of the report suggested that the area could support one more major supermarket and some smaller commercial centres scattered throughout the neighbourhood. This additional commercial space could range from 200,000 to 400,000 square feet of retail and service space.



Section 2

I The Big Picture

BACKGROUND

PLAN
FRAMEWORK

LAND USE

TRANSPORTATION

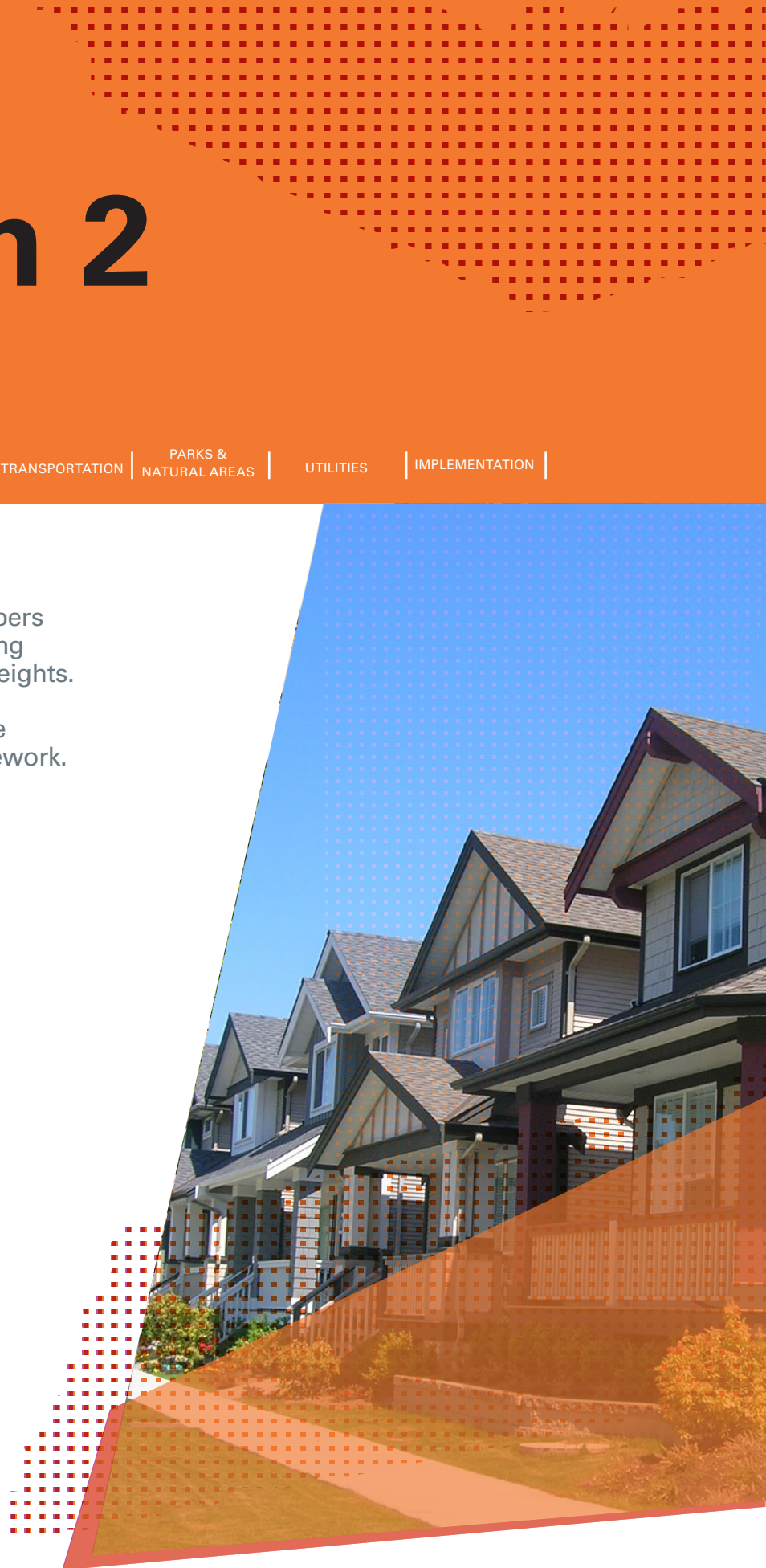
PARKS &
NATURAL AREAS

UTILITIES

IMPLEMENTATION

Stakeholders and community members helped develop and refine the guiding elements and vision for Redwood Heights. The input and objectives captured throughout the planning process are reflected in the following plan framework.

PAGE	SECTION
11	2.1 Community Vision
12	2.2 Planning Principles
14	2.3 Key Features
18	2.4 Growth Projections
19	2.5 Growth Concepts





2.1 COMMUNITY VISION

PLANNING THEMES

The foundation of the Redwood Heights plan is based on three key planning themes that emerged during community and stakeholder consultation:

THEME 1: A model neighbourhood for livability and habitat preservation.

THEME 2: A plan that can be practically implemented.

THEME 3: A diverse community with exceptional and unique character.

PLANNING VISION

“Redwood Heights is a healthy, sustainable and livable village with a diversity of housing types, inter-connected transportation choices and local amenities that serve a population of different ages and lifestyles.”

Redwood is centred on a mixed use commercial village that is easily accessible by cycling and walking and offers a range of commercial services, community amenities and vibrant gathering places.

The neighbourhood is characterized by its cherished natural areas and parks that provides ample outdoor spaces and protection of critical natural systems and wildlife habitat. The neighbourhood’s relationships with surrounding communities is respectful and works to preserve and enhance the area’s overall natural assets, fostering a unique sense of place.

Redwood is designed with innovation and quality to foster a place that is a happy and healthy ‘home’, embodied with community pride and spirit. The neighbourhood is a place that is safe and welcoming.”





2.2 PLANNING PRINCIPLES

The following planning principles were developed to guide the implementation of this plan to ensure that resulting development is supportive of the vision of a healthy, sustainable and livable community.

HOUSING PRINCIPLES

1. Provide homes for a varied demographic and affordability range (seniors, young families, empty nesters, etc.).
2. Higher densities will be located near community amenities and services, within proximity to future transit services.
3. Development will foster a cohesive neighbourhood design through the implementation of urban design guidelines (see Section 3)
4. Transition density along the edge of the rural residential and agricultural areas.

TRANSPORTATION & MOBILITY PRINCIPLES

1. Cycling and walking opportunities will be prioritized to support active living and a healthy neighbourhood.
2. A finer grid road network will provide multiple choices for getting around enhancing connectivity.
3. Focused development density will support improved public transit.
4. Multi-modal connections will link the neighbourhood to adjacent communities and destinations (e.g. Redwood Park).
5. The former Great Northern Rail alignment around the edge of the neighbourhood will be converted into a regional greenway.
6. The transportation network will prioritize Vision Zero principles with a Safe Systems approach.

ENVIRONMENTAL PRINCIPLES

1. Biodiversity corridors and green spaces should be continuous and located in areas that best support & enhance biodiversity.
2. Maximize the amenity of riparian areas by providing adjacent public pathways.
3. Water courses will be protected with appropriate riparian setbacks and conveyed to the City for preservation and management.
4. Transitions (landscaping, buffering) will be provided along the edge of the Agricultural Land Reserve in keeping with Surrey Development Permit Guidelines.
5. A tree management, preservation and enhancement strategy will be incorporated into future developments.
6. The overall form of development will be compact to ensure land resources are used responsibly and efficiently.
7. Development will enhance biodiversity values through the use of landscaping that employs native plant species and the reestablishment of natural habitat.
8. Preserve or enhance natural view corridors.

COMMUNITY PRINCIPLES

1. Development will foster a safe community by being responsive to principles of Crime Prevention Through Environmental Design (CPTED).
2. Central gathering places will provide opportunities for neighbourhood celebrations, social interaction, place making and public art.
3. Neighbourhood parks should be provided within walking distance of all residents.
4. Parks should be located off busy arterial roads wherever possible.
5. Commercial areas should be easily accessible, within walking distance of most residences, and integrated with the community to contribute to neighbourhood placemaking.
6. A new elementary school site will be accessible from local or collector roads and have frontage on at least two roads.

SERVICING PRINCIPLES

1. The neighbourhood will be serviced to full urban standards in an efficient manner consistent with the overall servicing plan for the area.
2. Incorporate sustainable Low Impact Development standards (LID) and best management practices in the design of the neighbourhood where appropriate.
3. Ensure the overall storm water management system protects existing streams and downstream agricultural lowlands.
4. There will be neutral drainage impacts on the adjoining agricultural lands.



2.3 KEY FEATURES

There are a number of key features that will define the look and feel of the Redwood Heights community as it develops. These include:



Housing Variety: A range of housing including single family, townhouses and 4-6 storey apartment buildings.



Transit Focus: Transit supportive land uses and densities adjacent to roads where transit services are expected.



New School: A new public elementary school and potential private high school.



Mixed Use Commercial Village: A main street commercial village and a smaller neighbourhood node.



New Parks, Biodiversity Hub & Corridor: Eight new park sites and a network of natural areas to protect the existing watercourses and establish a large natural biodiversity hub and corridors.



Distinct Design Elements: Place-making elements including a gateway feature into the neighbourhood and special design features in the mixed-use commercial areas.



Active Transportation Network: Walking, cycling, and other active transportation modes will be facilitated by a network of cycling facilities and multi-use pathways to and from destinations and connecting to transit.

Figure 2.1 Key Features

2.4 GROWTH CONCEPT

PROTECTING NATURAL AREAS

An extensive parkland and green infrastructure network made up of hubs, corridors, and sites will:

- Protect environmentally sensitive areas such as wetlands, riparian areas and forested areas.
- Provide community and neighbourhood scale parks within walking distances of residents.

PROVIDING LOCAL AMENITIES

A central mixed-use commercial village and neighbourhood commercial node will:

- Support walkability within the Plan Area; and,
- Encourage a “Complete Community” with employment, entertainment, and services close to home.

ENHANCING HOUSING DIVERSITY

Areas of higher density development located around the neighbourhood centre and in close proximity to a future frequent transit corridor will:

- Improve the balance of housing types and affordability; and,
- Focus new housing within walking distance of amenities and public transit.

INTERFACING WITH RURAL NEIGHBOURS

Single family lots at the Plan Area’s southern interface will:

- Provide valued single family housing;
- Transition with the existing rural designated lots in the Redwood Park Estates area.

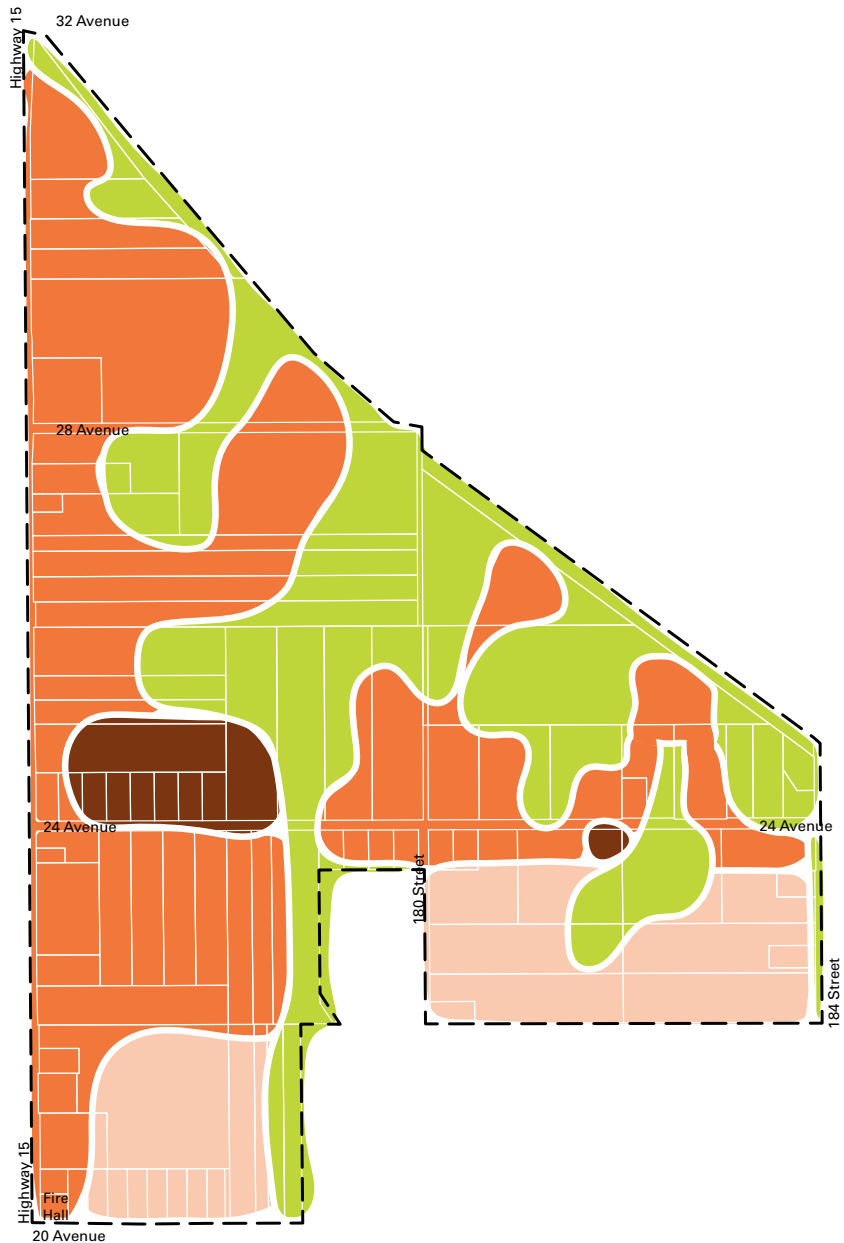


Figure 2.2 Growth Concept

2.5 GROWTH PROJECTIONS

2.5.1 Population and Unit Projections

The NCP includes 91 hectares (225 acres) of future residential land and 4.45 hectares (11 acres) of land where residential units are allowed above commercial within mixed-use development. Together these designation areas account for about 42% of the gross NCP Area.

The NCP provides for an average of 5,300 dwelling units. Redwood Heights is estimated to support a future build-out population of over 13,500 people, based on a ratio of between 2.1 - 3.0 persons per dwelling unit (depending on housing type), and an assumed 1.45 persons per projected secondary suites in single family designated areas. This forecasts an average density of around 25 people per gross acre for the NCP, which is similar to the overall density of the adjacent Sunnyside Heights NCP area.

Redwood Heights is expected to account for approximately 22% of the population growth in Grandview Heights.

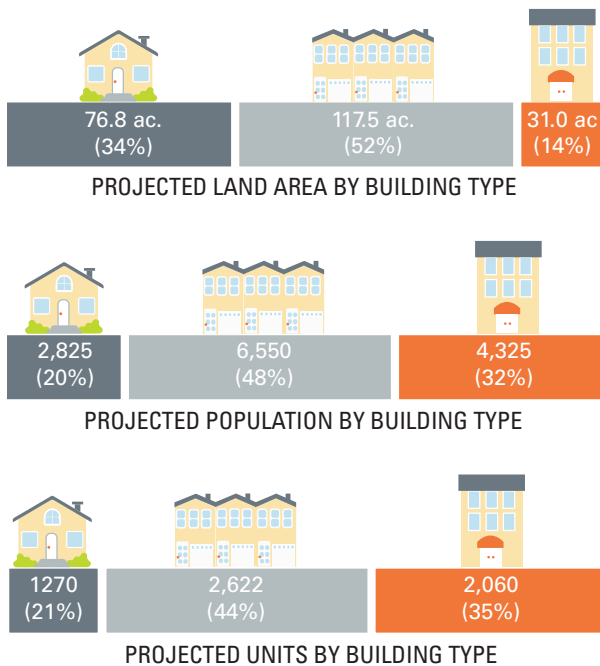


Figure 2.3 Projected Population and Units by Building Type

2.5.2 Student Projections

It is estimated that between 809 - 1,069 elementary students and 414 - 546 secondary students will be enrolled in the public school system from the NCP area once it's fully built out. The future demand for a new elementary school will be met by a new 80 / 525 capacity (nominal) school.

Student projections within the NCP are based on the highest number of units estimated and approximate build-out timeline, assuming 95% build-out by 2035. The School District model assumed a 63% participation rate in public school, which is the average participation rate in the Grandview Area, and assumes existing programs remain at East Kensington Elementary. Projections also take into account the impact of students attending choice programs in the District (i.e. French Immersion, Montessori, etc.).

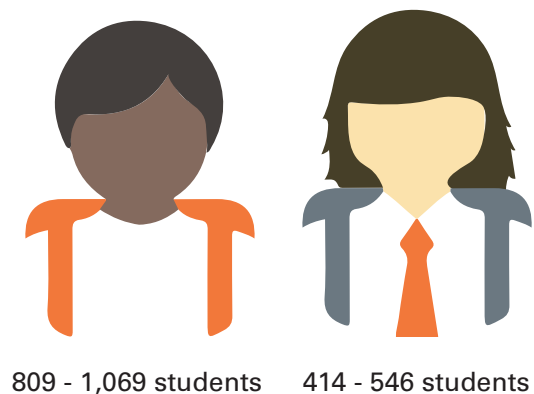


Figure 2.4 Projected Elementary and Secondary Students

2.5.3 Employment Projections

The NCP includes 4.45 hectares (11 acres) of mixed-use/commercial designations, including a main street commercial village and an ancillary neighbourhood commercial node. This accounts for about 2.1% of the NCP area. The larger main street commercial village area can accommodate approximately 11,150 square metres (120,000 square feet) of commercial space including a small (20,000-30,000 square foot) anchor store such as a drug store or grocery store and additional space for smaller retail shops and service commercial outlets. The smaller neighbourhood commercial node can accommodate approximately 1,000 square meters (11,000 square feet) of commercial space including small commercial retail units and offices (1,000-4,000 square feet).

It is estimated that these commercial and mixed-use areas will provide between 160 to 220 jobs within the NCP. Additional existing and proposed institutional uses, including future schools, will provide an additional 262 to 306 jobs.



REDWOOD HEIGHTS STAGE 2 - LAND USE CONCEPT PLAN PROJECTIONS

Land Use	Hectares (Acres)	Average Projected Residential Units	Average Projected Population	Average Projected Secondary Suites	Average Projected Secondary Suite Population	Total Average Projected Units including Suite Units	Total Average Projected Population with Suites
Institutional	14.4 ha (35.6 ac)	0	0	0	0	0	0
Residential Transition	5.9 ha (14.7 ac)	44	132	44	64	88	196
Cluster Residential	12.4 ha (30.7 ac)	245	736	245	356	491	1,092
Detached Residential	12.7 ha (31.4 ac)	346	1,037	346	501	691	1,538
Semi-Detached	1.9 ha (4.8 ac)	71	178	0	0	71	178
Flex (Multiple Residential or Detached Residential)	3.0 ha (7.5 ac)	113	281	0	0	113	281
Multiple Residential	24.6 ha (60.8 ac)	1,218	3,045	0	0	1,218	3,045
Townhouse	17.9 ha (44.4 ac)	1,220	3,051	0	0	1,220	3,051
Low Rise Apartment	7.9 ha (19.7 ac)	1,378	2,894	0	0	1,378	2,894
Mixed Use Apartment	4.6 ha (11.4 ac)	682	1,432	0	0	682	1,432
TOTAL	105.3 ha (260.2 ac)	5,317	12,786	635	921	5,952	13,706

Table 2.1 Land Use Concept Plan Projections / *Calculations are based on the average projections

Section 3

| How We Grow

BACKGROUND

PLAN
FRAMEWORK

LAND USE

TRANSPORTATION

PARKS &
NATURAL AREAS

UTILITIES

IMPLEMENTATION

The land use strategy reflects the vision and principles of the plan, providing direction on the form and character of Redwood Heights as it grows. Land use designations guide where and how homes, shops, pathways, parks, and natural areas fit together to create a complete community. Council, staff and residents expect future development to correspond with this concept plan.

PAGE	SECTION
20	3.1 Urban Design Strategy
25	3.2 Land Use Strategy
29	3.3 Mixed-Use Designations
31	3.4 Residential Designations
44	3.5 Other Land Use Designations
46	3.6 Urban Transition Areas
53	3.7 Active Residential Frontage Areas

3.1 URBAN DESIGN STRATEGY

3.1.1 Neighbourhood Design

The development of Redwood Heights will be the result of careful planning and thoughtful design. A coordinated neighbourhood design will promote a high quality of life for residents while protecting natural features and habitat.

Land Uses have been developed to foster a compact transit-supportive urban form where environmental habitat and landscapes are preserved and integrated throughout Redwood Heights. Parks, natural areas, and pathways will provide opportunities for recreation and active transportation while enhancing wildlife connectivity.

New development will recognize and integrate the unique natural and pastoral landscape. Form and character will be guided by urban design guidelines outlined within each land use designation. All development should adhere to the following general neighbourhood design guidelines:

DESIGN

The overall design of the neighbourhood will draw from a foundation of environmental preservation and integration.

1. Foster cohesive neighbourhood design through respectful integration of common design styles and complementary transitional scales.
2. Architectural design will reflect the natural heritage of Redwood Heights through the use of natural materials such as wood, brick, and stone.
3. Common architectural and landscape elements should complement the surrounding environment.
4. Visual interest along streets should be provided with active building frontages, landscaping, and high quality building details.
5. The City's Biodiversity Design Guidelines will be integrated into buildings and landscaping.
6. Development will prioritize native species of plants and trees (e.g. Douglas Fir, Big Leaf Maple, and Red Alder), including significant native conifer plantings within on-site landscaping.
7. On-site stormwater management will consider natural drainage to minimize risk and flooding.
8. Contemporary architecture with traditional forms and materials is encouraged.





BUILDING SITING, HEIGHT, AND MASSING

1. Existing natural features should be preserved and integrated within development.
2. Site buildings in a manner that is sensitive and responsive to the existing local ecology.
3. Provide generous setbacks to include natural features, landscaping, and trees.
4. Create enjoyable, functional open spaces that take advantage of natural light.
5. Buildings should optimize views towards streets and public spaces as well as existing natural landscape features.
6. Promote neighbourhood safety and sociability by designing for overlook and activity along streets, pathways, and natural areas.
7. Reduce scale and design lower floors of multi-storey residential buildings to be in scale with the pedestrian environment.
8. Thoughtful placement of doors, windows, decks, and patios should maintain privacy of adjacent dwellings.



BUILDING MATERIALS

1. Use materials that reduce energy use and waste while maximizing the life of the building.
2. Whenever possible, local and regional native and natural materials (e.g. stone and wood) that are durable should be used.
3. Structural expression is encouraged using mass timber.
4. Colour palettes should be inspired by the region's existing natural environment.



3.1.2 Gateway and Entrance Treatment Area Requirements

Contribute to the unique neighbourhood character with special design treatment along 24 Ave at the Mixed Use Commercial Village and Commercial Node.

Development in these areas should incorporate the following design features:

- “Landmark” buildings with signature architecture, enhanced massing, height, and public realm features that defines the intersection;
- Unique building corner features that create a strong presence onto the streetscape;
- Public art;
- Pedestrian ornamental lighting;
- Coordinated streetscape furniture (i.e. benches, bike racks etc.);
- Coniferous trees accentuating immediate gateway area;
- Ornamental tree grates, such as with ‘Redwood Heights’ text embedded; and,
- Specialty paving such as coloured stamped asphalt and/or concrete.





Figure 3.1 Gateway and Entrance Treatment Area





3.1.3 Five and Six Storey Development Requirements

Low rise mixed-use and residential developments with building heights greater than 4 storeys are required to demonstrate design feasibility through the following analysis:

SERVICING STUDY

A servicing feasibility study to demonstrate that municipal services (water, sanitary sewer, storm drainage, roads and fire suppression) can accommodate the proposed development.

TRAFFIC IMPACT ASSESSMENT

A traffic study to address pedestrian and vehicular movements of the proposed development, including off-street parking arrangements and ingress/egress to the site.

GEOTECHNICAL STUDY

A geotechnical study to demonstrate that the site is suitable for the proposed development.

SUSTAINABLE DEVELOPMENT SUMMARY

A summary outlining sustainable and energy efficient building practices and technology being used.

VIEW IMPACT ANALYSIS

A view impact analysis to reduce impact on views down road corridors, and to and from the ALR.



3.2 LAND USE STRATEGY

Future development and land uses will define the look and feel of Redwood Heights and contribute to the ultimate sense of place of the neighbourhood. Mixed land uses are centered on a main street (24A Avenue) commercial village which is supported by apartment residential and street level commercial. A range of housing, transitioning in density away from 24 Avenue, provides variety in unit types and tenure. Densities along 24 Avenue and new collector roads will support more frequent transit service.

A new elementary school and community level park are centrally located to serve the broader neighbourhood and offer community amenities within walking distance of the highest density residential areas. A biodiversity corridor adjacent to the school provides key north-south habitat connectivity through the plan area, linking Redwood Park to a protected biodiversity hub in the central north portion of the plan area. These areas also support portions of a neighbourhood-wide greenway and pathway network which encourages active transportation and links to additional new parks and natural areas across Redwood Heights.

Low Rise Mixed Use



Low rise apartments with ground-oriented commercial space.

DENSITY RANGE

Up to 2.0 FAR

TYPICAL HEIGHTS

5-6 storeys.

TYPICAL OWNERSHIP

Strata or Rental

Low Rise Residential



Multi-family housing with ground-oriented units at base.

DENSITY RANGE

Up to 2.0 FAR

TYPICAL HEIGHTS

4-6 storeys.

TYPICAL OWNERSHIP

Strata or Rental

Townhouse Residential



Ground oriented townhouses.

DENSITY RANGE

Up to 75 UPH (30 UPA)

TYPICAL HEIGHTS

13.0 m.

TYPICAL OWNERSHIP

Strata

Multiple Residential



Wider / larger townhouses or row housing

DENSITY RANGE

Up to 55 UPH (22 UPA)

TYPICAL HEIGHTS

9.0 - 11.0 m.

TYPICAL OWNERSHIP

Strata or Fee Simple

Semi-Detached Residential



Duplex or lower density fee-simple row housing.

DENSITY RANGE

Up to 37 UPH (15 UPA)

TYPICAL HEIGHTS

9.5 m.

TYPICAL OWNERSHIP

Fee Simple (Free Hold)

Cluster Residential



Mix of detached single family, detached, and multiple residential cluster to protect natural areas.

DENSITY RANGE

Up to 25 UPH (10 UPA)

TYPICAL HEIGHTS

9.0 m.

TYPICAL OWNERSHIP

Strata or Fee Simple

Detached Residential



Narrow / wide front or rear loaded detached houses.

DENSITY RANGE

Up to 30 UPH (12 UPA)

TYPICAL HEIGHTS

9.0 m.

TYPICAL OWNERSHIP

Fee Simple (Free Hold)

Residential Transition



Larger suburban detached lots

DENSITY RANGE

Up to 10 UPH (4 UPA)

TYPICAL HEIGHTS

9 m.

TYPICAL OWNERSHIP

Fee Simple (Free Hold)

Institutional



Public and private community spaces such as churches, universities, schools, museums, libraries and community centres.

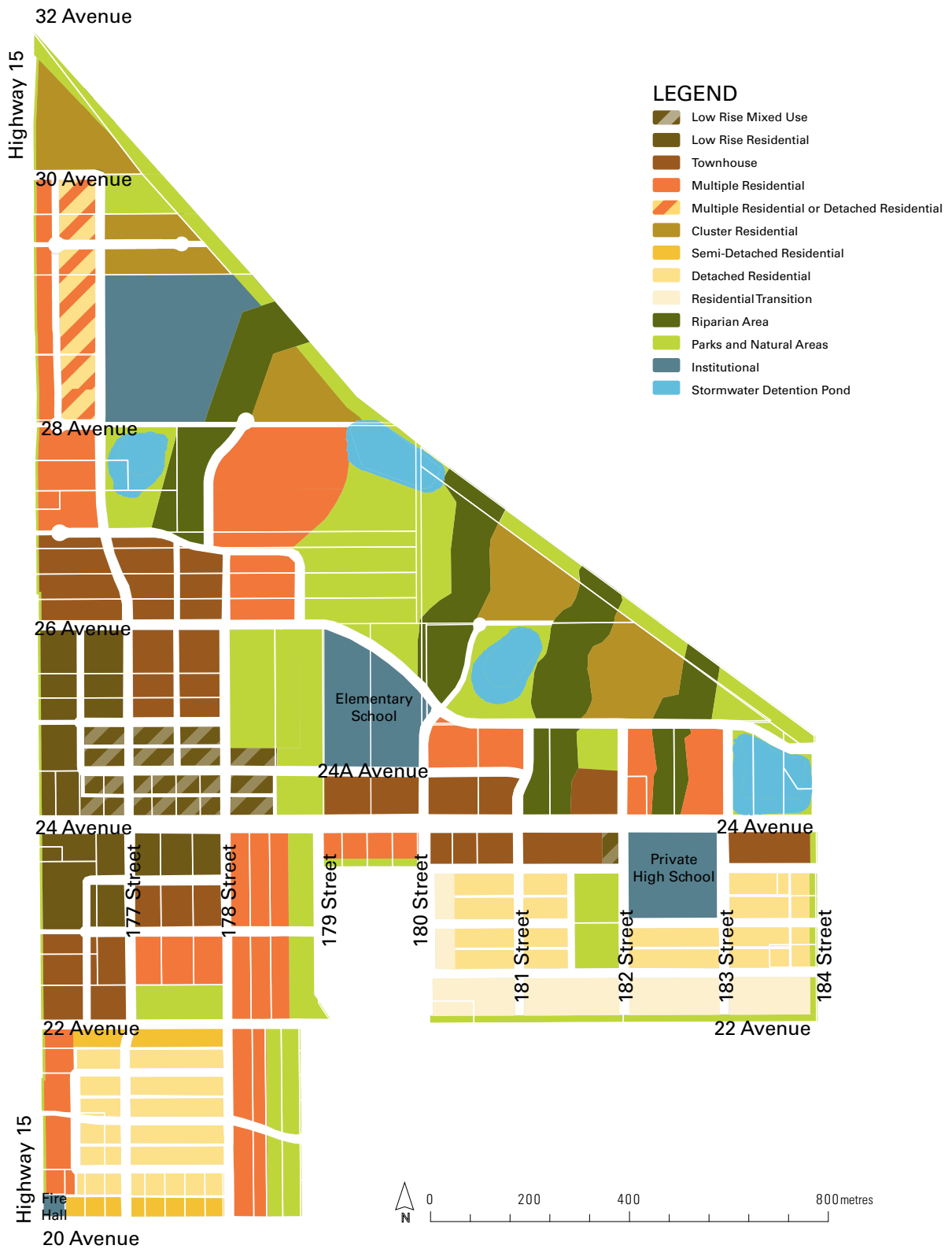


Figure 3.2 Land Use Map

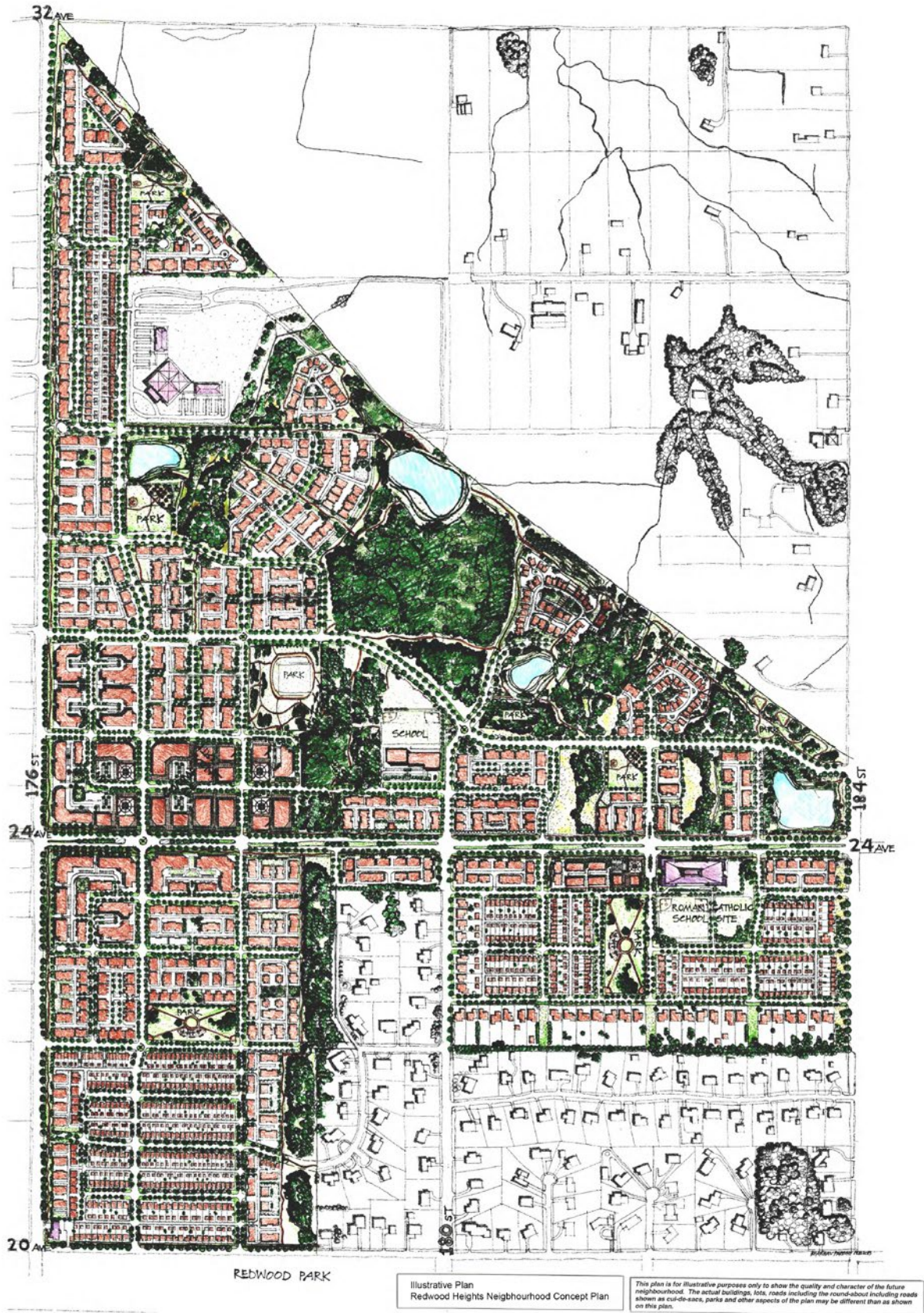


Figure 3.3 Graphic Illustration of Redwood Heights at Full Build Out

LAND USE DESIGNATION SUMMARY










Land Use Plan Designation									
	Residential Transition	Cluster Residential	Detached Residential	FLEX: Detached or Multiple Residential	Semi-Detached Residential	Multiple Residential	Townhouse Residential	Low Rise Residential	Low Rise Mixed Use
Typical Density	Up to 10 UPH (Up to 4 UPA)	Up to 25 UPH (10 UPA)	Up to 30 UPH (12 UPA)	Up to 30 or 55 UPH (Up to 12 UPA or 22 UPA)	Up to 37 UPH (15 UPA)	Up to 55 UPH (22 UPA)	Up to 75 UPH (30 UPA)	Up to 2.0 FAR	Up to 2.0 FAR
Typical Ownership	Fee Simple (Free Hold)	Strata or fee simple	Fee Simple (Free Hold)	Fee Simple or Strata	Fee Simple (Free Hold)	Strata or Fee Simple	Strata	Strata or Rental	Strata or Rental
Typical Building Forms	Larger suburban detached lots	Mix of detached single family, attached, and multiple residential cluster to protect natural areas	Narrow/wide front or rear loaded detached houses	Single detached lane served houses or townhouses	Duplex or lower density fee-simple row housing	Wider/larger townhouses or row housing	Ground oriented townhouses	Low rise apartments with ground oriented units at street level	Low rise apartments above ground oriented commercial
Typical Heights	9.0 m.	9.0 m.	9.0 m.	9.0 - 11.0 m.	9.5 m.	9.0 - 11.0 m	13.0 m	4-6 Storeys	5-6 Storeys
Total Area	5.9 ha (14.7 Acres)	12.4 ha (30.7 ac)	12.7 ha (31.4 ac)	3.0 ha (7.5 ac)	1.9 ha (4.8 ac)	24.6 ha (60.8 ac)	17.9 ha (44.4 ac)	7.9 ha (19.7 ac)	4.6 ha (11.4 ac)
% of Residential Area	2.7%	5.7%	5.8%	1.4%	0.9%	11.3%	8.3%	3.7%	2.1%

Table 3.1 - Residential Land Use Designation Summary



3.3 MIXED-USE DESIGNATIONS

Two commercial mixed-use areas are designated in the plan: a central mixed-use commercial village along 24A Avenue, between 177 Street and 178 Street, and a smaller neighbourhood commercial node area at the 24 Avenue and 182 Street.

The mixed-use village is the primary centre for Redwood Heights and will support a variety of uses such as a grocery store, neighbourhood pub, restaurant, drug store, financial institution, and other commercial retail/office uses.

The neighbourhood commercial node will supplement the mixed use village to provide commercial uses within walking distance of the surrounding neighbourhood.

Both the mixed-use village and commercial node will provide public plazas as publicly accessible open space (Refer to Figures 3.1 and Section 5.4)



DEVELOPMENT PARAMETERS:

	Type 1: Mixed Use Commercial Village	Type 2: Neighbourhood Commercial Node
Intent	Community servicing retail, commercial and office with the option for residential on upper floors.	Neighbourhood serving ground-oriented commercial with the option for apartments above.
Typical Zone	C-15, RM-45, RM-70, CD	C-5, RM-45, RM-70, CD
Typical Density	Up to 2.0 FAR	Up to 2.0 FAR
Maximum Height	Up to 6 storeys	Up to 5 storeys; 4 storeys adjacent to residential uses
Typical Lot Coverage	50% +	30-50%
Parking	Underground parking	All resident parking spaces underground. No parking is permitted in the front of the building.
Cellular Infrastructure	Locate roof top equipment – HVAC Units, antennas, etc – so that it is not visible from the adjacent streets or public spaces. Provide screening when necessary. Screening should be designed to be integrated into the building form (e.g. adjacent or on top of the elevator overrun) and constructed of a material complementary to the building architecture.	
Note	Commercial at grade, residential or office above. Rezoning and development permit applications should include a minimum development area not less than 2.0 ha (4.9 ac). A smaller minimum development area will be considered only where adjacent properties are developed or under application. The first application should provide an overall comprehensive development plan. Building design and site layout should be included in the overall comprehensive development plan.	

DESIGN GUIDELINES

Form & Massing	<ul style="list-style-type: none"> • Buildings on 24A Avenue should reinforce the vision for a commercial ‘high street’ to anchor village retail. • Signature buildings should define the intersections, serving as the entrance to the village core and to mark the arrival at the centre of Redwood Heights. • Laneways should be in the middle of blocks to separate back-of-house activities from the commercial frontage reserved for the street interface. • A system of publicly accessible pedestrian spaces (pedestrian corridors, small plazas, etc.) should be integrated into private development. • Ensure commercial viability with a minimum commercial retail unit depth of 11 m, and convenient access to loading and garbage, separate from residential. • Sensitive height and massing should be considered for buildings adjacent to the future elementary school. • Set back above the fourth storey or design upper storeys to reduce the impact of visual bulk.
Building Interface	<ul style="list-style-type: none"> • Front primary commercial and retail frontages towards the street. • Locate anchor tenant(s) with their entrances facing onto the ‘high street’ and adjacent intersections. Anchor tenants should not dominate the street frontage, instead smaller retail units should share street frontage onto the ‘high street’. The majority of storefronts on the ‘high street’ should be small scale commercial with individualized storefronts. • Avoid locating back-of-house activity towards the street. • Buildings should have entries flush with the sidewalk for ease of access between the retail space and the street. • Retail and restaurant uses should occupy the ground floor of mixed-use buildings, with offices, commercial or residential uses on upper floors. • Residential and associated indoor amenity spaces can not be located on the ground floor except for lobby entrances. • Integrate outdoor seating areas into the overall design of the village. • Locate entries to mixed use multi-family residential lobbies on non-retail street if available, with entries flush with the adjacent sidewalk. Grade transitions should be internalized inside the lobby. Where entries to residential uses must occur within a retail streetscape, the frontage must be minimized, yet distinguished from the commercial treatment. • Provide street facing commercial development at minimum setbacks. • Street-fronting building facades, balconies and floor edges, should be flush with the ground floor, except that the uppermost storey for buildings with more than 4 storeys, should be set back. • Where there is no commercial retail at grade, include two storey townhouse expression for residential units at grade on street interfaces. • Provide continuous weather protection along all commercial frontages with a minimum projection of 1.5 m. Canopies may not project over the property line. • Ground level residential units should include porches and stairs with weather protection over top. Direct access from the porch to the adjacent sidewalk should be provided. Each ground level residential unit should set its floor elevation between 0.6 m to 1.2 m above the adjacent sidewalk level
Setbacks	<ul style="list-style-type: none"> • Setbacks in the commercial area should be a minimum of 2.0 metres to create an intimate neighbourhood feel and allow for protection (awnings). • Building floors should not encroach into the setbacks along the streets, neither ground level nor above.
Materiality & Detailing	<ul style="list-style-type: none"> • Use contemporary architectural forms treated in traditional building materials (such as, brick, high quality masonry, wood and glass). • Feature fabric awnings (not vinyl) to create a less formal appearance. Awnings should have slope (approximately 30 degrees) generally consistent between properties. • Have storefronts that feature different design elements and materials and are not simply comprised of an aluminum storefront glazing system. Colonnades or overly deep recessed glazing should be avoided.
Signs	<ul style="list-style-type: none"> • Primary retail signage should be simple fascia signs. • Emphasize variety and interest for pedestrians, include attractive pedestrian scale under canopy suspended signage. • Back-lit sign boxes are not supported.



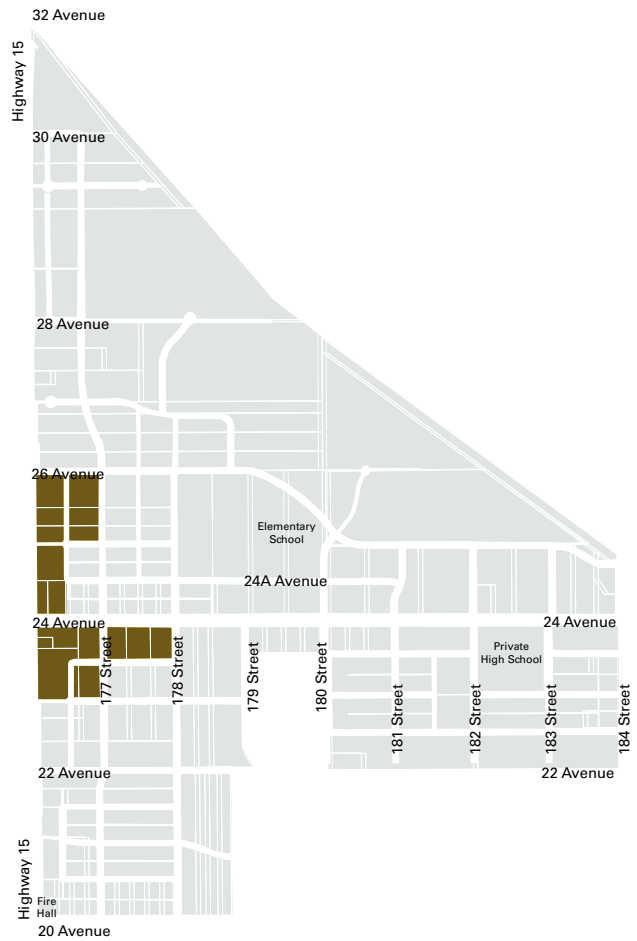
3.4 Residential Designations

3.4.1 Low Rise Residential

Areas of higher density development are generally located around the neighbourhood centre, in close proximity to a future frequent transit corridor along 24 Avenue, and adjacent to Highway 15.

The highest density areas are envisioned as six storey apartment buildings adjacent to the main street commercial village.

Development within this designation adjacent to the Mixed Use Commercial Village may be suited for at-grade retail at key intersections and along key street frontages.



DEVELOPMENT PARAMETERS:

Intent	Low rise apartment buildings with related amenity spaces. In combination with the apartment buildings, some ground-oriented stacked townhouses may also be permitted subject to comprehensive development.
Typical Zone	RM-45, RM-70, CD
Typical Density	Maximum FAR of 2.0
Typical Coverage	35-45%
Maximum Height	Up to 6 storeys
Parking	Resident parking spaces should be provided as underground parking or as parking within the building envelope. No parking should be visible from the street or permitted in the front of the building of a multiple unit residential building.
Cellular Infrastructure	For apartment buildings 4 storeys or greater locate roof top equipment – HVAC Units, antennas, etc – so that it is not visible from the adjacent streets or public spaces. Provide screening when necessary. Screening should be designed to be integrated into the building form (e.g. adjacent or on top of the elevator overrun) and constructed of a material complementary to the building architecture.
Note	Walkability and pedestrian access are key considerations. Provide a range of unit sizes from 1-3 bedrooms.

DESIGN GUIDELINES

Form & Massing	<ul style="list-style-type: none"> Contemporary architecture with traditional forms and materials are encouraged. Site buildings to achieve privacy and enjoyable open space between them. Buildings should be separated by at least 20 m between front and rear view faces and 8.0 m between side faces. Visually scale down buildings to a length of 50 metres. Add scale and visual interest at street level by articulating the building facade or changing building cladding material. If applicable, step back above the fourth storey or design the upper storeys to reduce the impact of visual bulk where interfacing with lower density area.
Building Interface	<ul style="list-style-type: none"> Design lower floors to be in scale with the pedestrian environment. Where facing the public realm, provide a two to three storey visual exterior expression of townhouses at the base of the building to engage and create street life. Frame development sites with built edges against all streets. Extended porches and recessed entries should be used to articulate facades and reinforce residential character. Non-active uses such as indoor amenity rooms and service spaces should be located away from street interfaces of any prominent frontage. Indoor and outdoor amenity areas should be located together to ensure they can be used at the same time.
Setbacks	<ul style="list-style-type: none"> Provide a minimum street frontage setback of 5.0 m to incorporate landscaping, natural features and trees. Provide additional building setback and landscaped buffering along Hwy 15 in keeping with Section 3.6 Urban Transition Areas (Transition 3.6.1). Front yard fencing is discouraged, however; if proposing, set back at least 1.0 m from the property line and pair with layered landscaping in front. Fencing should be no more than 0.9 m in height.
Materiality & Detailing	<ul style="list-style-type: none"> Materials should vary from building to building to provide variation and diversity in the streetscape. Limit the number of materials used within a single building. Use simple window configurations.

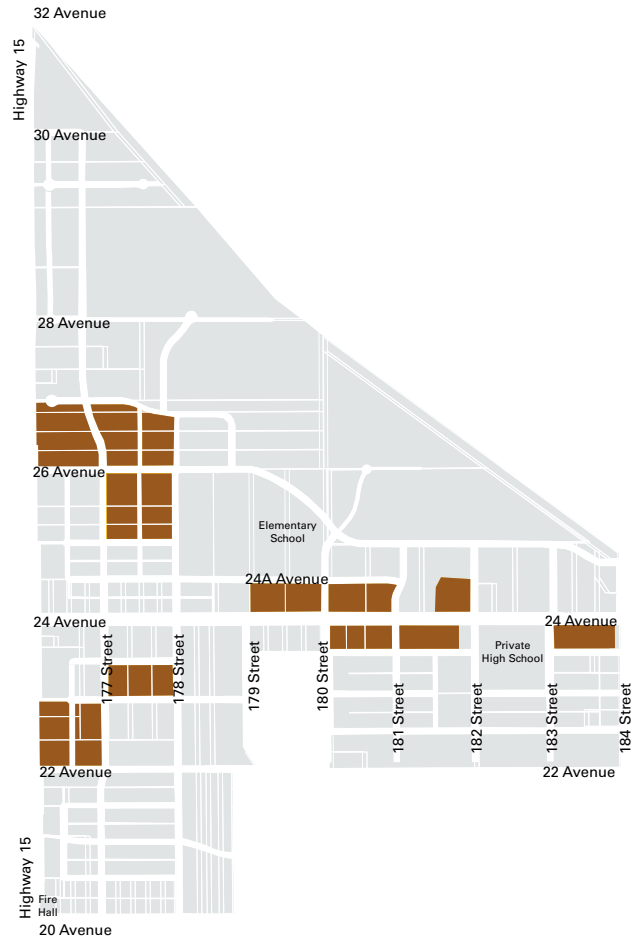
** Refer to the OCP Guidelines for Form and Character Development Permits. Where there is a conflict between NCP and OCP guidelines, the NCP's Guidelines take precedence.*

*** Street level commercial may be considered within this designation where adjacent to the Mixed Use Commercial Village. In such cases, consideration may also be given to the design parameters and guidelines within the Low Rise Mixed Use designation.*



3.4.2 Townhouse Residential

This designation is intended to accommodate urban townhouses in areas adjacent to major roads and around the mixed use commercial village. Typical developments consist of attached buildings that house multiple ground-oriented dwelling units with shared indoor and outdoor amenity spaces.



DEVELOPMENT PARAMETERS:

Intent	Ground-oriented multiple residential townhouse buildings and related amenity spaces developed in accordance with a comprehensive design.
Typical Zone	RM-30.
Typical Density	Maximum FAR of 1.0. Up to 75 UPH (30 UPA)
Parking	Vehicle access restricted to a rear lane.
Note	Homes adjacent to Highway 15 will be separated by a 15 metres (50 ft) wide landscaped buffer to mitigate impacts from the highway traffic.

DESIGN GUIDELINES

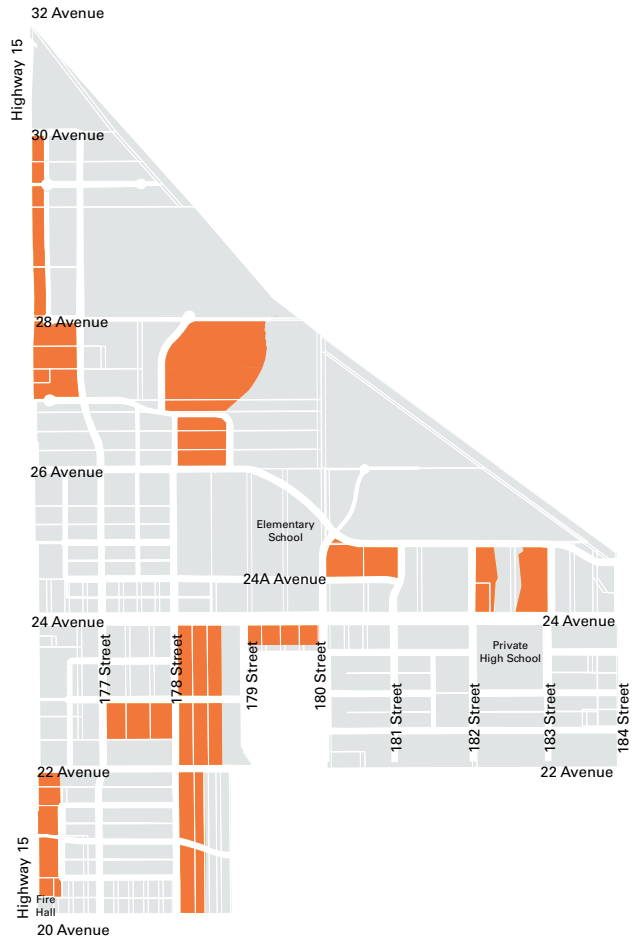
Form & Massing	<ul style="list-style-type: none"> • Simple traditional architecture with verandas and porches are encouraged. • Minimum 3 attached units; maximum of 6 units per building, to create a comfortable neighbourhood scale. • Roof top decks are encouraged. • Extended porches and recessed entries should be used to articulate facades and reinforce residential character. • Design lower floors to be in scale with the pedestrian environment. • Reduce scale by visually receding upper storeys. • Vertical expression and identification of individual units should be emphasized while reinforcing a unified character.
Building Interface	<ul style="list-style-type: none"> • A separate entry porch to each unit should be expressed at the street level with weather protection over each entrance. • Corner units with street frontage should equally treat all street exposed sides as a primary facade, showing articulation, windows and doors. Avoid blank walls, while maximizing window opportunities. • Pairing of doors and shared porches is discouraged, in favour of split doors and separated roof overhangs. • Front doors and porches should face the street with steps leading straight to the street (not turned). • Individual entrances should be complemented with landscaping including a tree. • Shrubs and low hedges should be used in lieu of front yard fencing. If fencing is proposed, set fencing back 1.0 metre beyond the sidewalk and provide landscaping in front. Low fences (0.9 m height) between units will be permitted. • Avoid raised front yards. If necessary, they will only be permitted if associated retaining walls are faced with high quality materials in character with the architecture of the building and landscaping is provided. Required landscaping includes a minimum of 1.0 metre of irrigated landscaping directly in front of the base (sidewalk adjacent) and 0.5 metres of irrigated landscaping at the top of the retaining wall, in front of any fencing or guard rails. Retaining walls are limited to 0.6 metres in height. Tiered landscaping will be required for any retaining wall interfaces over 0.6 metres in height. • Avoid placing balconies directly above the porch to retain the sense of entry at ground level. • Active living spaces, such as living, dining rooms and kitchens, should face the street with overlooking windows at grade. Private bedrooms should be located on upper floors or away from unit frontages. • Main floor elevations should be set between 0.6 to 1.2 metres above the adjacent sidewalk grade. Step main floor elevation between units to follow the sidewalk grade.
Setbacks	<ul style="list-style-type: none"> • Provide a minimum street frontage setback of 5.0 m to incorporate landscaping, natural features and trees. • Provide additional building setback and landscaped buffering along Hwy 15 in keeping with Section 3.6 Urban Transition Areas (Transition 3.6.1). • Provide 1.5 - 2.0 m driveway aprons to include trees along drive aisles between garages. • There should be at least one tree in each individual unit's yard.
Materiality & Detailing	<ul style="list-style-type: none"> • Building materials should be durable and of high quality. • Design of buildings should encourage noise mitigation strategies such as building orientation, the number and locations of windows, dense landscaping, and construction details such as triple-glazed windows and sound barrier insulation. • Use simple, thoughtful detailing including intentional transitions between materials. • Historic details such as brackets and gable vents are discouraged.
Signs	<ul style="list-style-type: none"> • Freestanding signs are discouraged. Incorporate address into architectural landscape features.

** Refer to the OCP Guidelines for Form and Character Development Permits. Where there is a conflict between NCP and OCP guidelines, the NCP's Guidelines take precedence.*



3.4.3 Multiple Residential

This designation is intended to accommodate medium density townhouses and fee simple row houses. Townhouses and rowhouses provide an affordable alternative to detached housing. Two different types of development will be considered within this designation.



DEVELOPMENT PARAMETERS:

	Type 1	Type 2
Intent	Low density, ground-oriented strata townhouse buildings and related amenity spaces which are to be developed in accordance with a comprehensive design.	Fee simple attached row housing on lots contained in a multiple residential building with sharing party walls.
Typical Zone	CD based on RM-15 or RM-30	RM-23.
Typical Density	Up to 55 UPH (22 UPA)	Up to 55 UPH (22 UPA).
Typical Height	11 m.	9.5 m.
Typical Lot Width		6.3 m.
Parking	No tandem parking spaces permitted. Parking access only from strata lane.	Parking garages in the rear of lot with access provide by public lane.
Typical Floor Area		140 sm (1,500 sf).
Note	Homes adjacent to Highway 15 will be separated by a 15 metres (50 ft) wide landscaped buffer to mitigate impacts from the highway traffic.	Homes adjacent to Highway 15 will be separated by a 15 metres (50 ft) wide landscaped buffer to mitigate impacts from the highway traffic.

DESIGN GUIDELINES

Form & Massing	<ul style="list-style-type: none"> • Simple traditional architecture with verandas and porches are encouraged. • Minimum 3 attached units; maximum of 6 units per building, to create a comfortable neighbourhood scale. • Roof top decks are encouraged. • Extended porches and recessed entries should be used to articulate facades and reinforce residential character. • Design lower floors to be in scale with the pedestrian environment. • Reduce scale by visually receding upper storeys. • Vertical expression and identification of individual units should be emphasized while reinforcing a unified character.
Building Interface	<ul style="list-style-type: none"> • A separate entry porch to each unit should be expressed at the street level with weather protection over each entrance. • Corner units with street frontage should equally treat all street exposed sides as a primary facade, showing articulation, windows and doors. Avoid blank walls, while maximizing window opportunities. • Pairing of doors and shared porches is discouraged, in favour of split doors and separated roof overhangs. • Front doors and porches should face the street with steps leading straight to the street (not turned). • Individual entrances should be complemented with landscaping including a tree. • Shrubs and low hedges should be used in lieu of front yard fencing. If fencing is proposed, set fencing back 1.0 metre beyond the sidewalk and provide landscaping in front. Low fences (0.9 m height) between units will be permitted. • Avoid raised front yards. If necessary, they will only be permitted if associated retaining walls are faced with high quality materials in character with the architecture of the building and landscaping is provided. Required landscaping includes a minimum of 1.0 metre of irrigated landscaping directly in front of the base (sidewalk adjacent) and 0.5 metres of irrigated landscaping at the top of the retaining wall, in front of any fencing or guard rails. Retaining walls are limited to 0.6 metres in height. Tiered landscaping will be required for any retaining wall interfaces over 0.6 metres in height. • Avoid placing balconies directly above the porch to retain the sense of entry at ground level. • Active living spaces, such as living, dining rooms and kitchens, should face the street with overlooking windows at grade. Private bedrooms should be located on upper floors or away from unit frontages. • Main floor elevations should be set between 0.6 to 1.2 metres above the adjacent sidewalk grade. Step main floor elevation between units to follow the sidewalk grade.
Setbacks	<ul style="list-style-type: none"> • Provide a minimum street frontage setback of 5.0 m to incorporate landscaping, natural features and trees. • Provide additional building setback and landscaped buffering along Hwy 15 in keeping with Section 3.6 Urban Transition Areas (Transition 3.6.1). • Provide 1.5 - 2.0 m driveway aprons to include trees along drive aisles between garages. • There should be at least one tree in each individual unit's yard.
Materiality & Detailing	<ul style="list-style-type: none"> • Building materials should be durable and of high quality. • Design of buildings should encourage noise mitigation strategies such as building orientation, the number and locations of windows, dense landscaping, and construction details such as triple-glazed windows and sound barrier insulation. • Use simple, thoughtful detailing including intentional transitions between materials. • Historic details such as brackets and gable vents are discouraged.
Signs	<ul style="list-style-type: none"> • Freestanding signs are discouraged. Incorporate address into architectural landscape features.

** Refer to the OCP Guidelines for Form and Character Development Permits. Where there is a conflict between NCP and OCP guidelines, the NCP's Guidelines take precedence.*



3.4.4 Semi-Detached Residential

Semi-detached areas are proposed on the north side of 20 Avenue across from Redwood Park, and on the south side of 22 Avenue. Development within this designation may include a mix of duplex and manor homes. Each dwelling should have separate, individual lane access with front doors facing the street. Two different types of development will be considered within this designation.

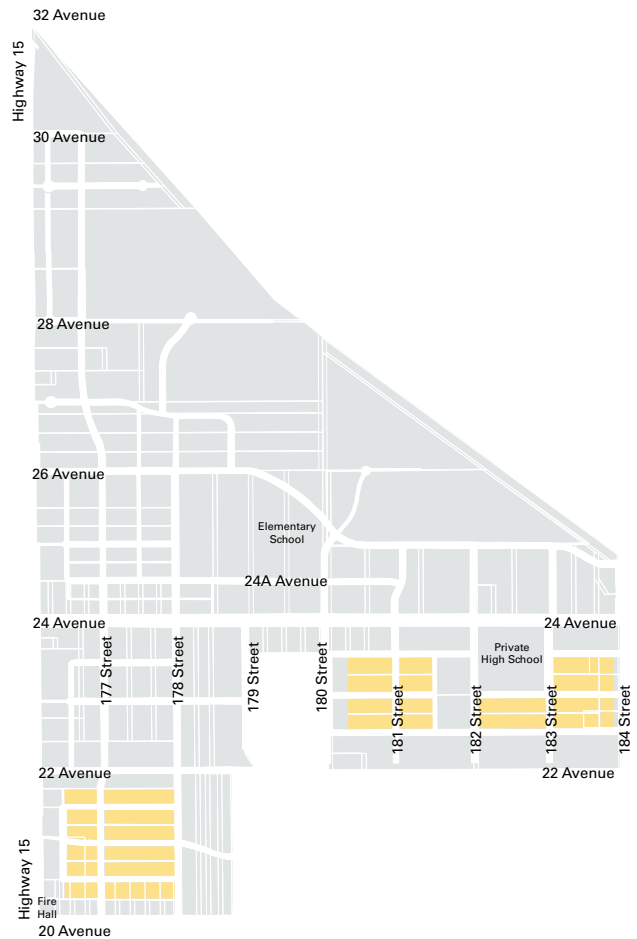


DEVELOPMENT PARAMETERS:

	Type 1	Type 2
Intent	Fee-simple semi-detached residential buildings joined by a common party-wall.	Multi-unit strata units such as manor homes on urban lots.
Typical Zone	RF-SD	Site Specific Comprehensive Development Zone
Typical Density	Up to 37 UPH (15 UPA)	Up to 37 UPH (15 UPA)
Typical Height		9.5 m
Typical Lot Size	265 sm.	550 sm.
Typical Lot Width	7.2 m (9.0 m if double garage provided)	18 m
Maximum # of Attached Units in a Row	2 - 3	4 connected strata dwelling units within a building in accordance with a comprehensive design.
Parking	A driveway is permitted only from a lane.	A driveway is permitted only from a lane.
Note		No more than 10% Type 2 developments permitted as part of a comprehensive development site.

3.4.5 Detached Residential

This designation is intended for detached family homes on urban sized lots. Secondary suites or laneway housing is allowed for a maximum of two dwelling units per lot. At least 50% of lots should be TYPE 1 (lane served) within this designation.



DEVELOPMENT PARAMETERS:

	Type 1	Type 2
Intent	Single family dwellings on small rear accessed narrow urban lots.	Single family dwellings on front accessed urban lots.
Typical Zone	RF-10	RF-13
Typical Density	Up to 31 UPH (12 UPA)	Up to 28 UPH (11 UPA)
Typical Lot Width	Minimum 9.0 m for rear loaded.	Minimum 13.4 m for front loaded lots.
Typical Max Floor Area	217 sm. [2,335 sf.]	265 sm. [2,860 sf.]
Parking	Driveway permitted only from rear lane	Driveway encouraged from rear lane but is permitted to local roads. Collector road driveway access should be avoided and Arterial access is not permitted.



3.4.6 Cluster Residential

This designation is intended to accommodate development of ground-oriented housing on large sites in the form of single-family dwellings, duplexes or low intensity townhouses. Buildings are encouraged to have pastoral and farmhouse features to reflect the existing surrounding character by incorporating elements such as front porches, verandas, gable roofs, and split rail fences.

In all cases, substantial public open space will be set aside within the development site in accordance with a comprehensive design. Three different types of development will be considered within this designation.

For all three types, gross density is considered when a minimum of 35% of the site area is provided as mature vegetation, ravines, biodiversity hubs or corridors worthy of preservation, through contributions of open space conveyance as public park and/or as landscaped buffer.



DEVELOPMENT PARAMETERS:

	Type 1	Type 2	Type 3
Intent	Accommodate detached dwellings or duplexes on single lots with a minimum of 35% of open space set aside for landscaped buffers and environmental features.	Accommodate single family homes on urban sized lots with a minimum of 35% public open space set aside within the subdivision.	Accommodate ground-oriented townhouses with open space (35-50%) and/or a combination of low-density single family housing and amenity spaces developed in accordance with a comprehensive design as opposed to a fee simple subdivision.
Typical Zone	CD based on RC, RF, RF-G or RM-D	CD based of RF-G, RF, or RF-13	CD based on RM-10, RM-15, RC
Typical Density	Up to 15 UPH (6 UPA)	Up to 20 UPH (8 UPA)	Up to 25 UPH (10 UPA)
Typical Lot Size	Varies	375 sm. (4,000 sf.) for a maximum of 50% of lots in the plan	325 sm., Bare Land Strata Lot
Typical Lot Width	Varies	13.4 m	9.0 m - 13.4 m
Typical Lot Depth		28 m - 30 m	27 m - 30 m
Parking	Driveway access from public street or strata road	Driveway access from public street or strata road	Driveway from strata road

CLUSTERING AT DIFFERENT DENSITIES ON A GROSS SITE AREA OF 10 ACRES

Gross Site Density in Units Per Gross Acre (UPGA)	% of Open Space	Net Developable Land in acre	% of Public Road Requirement *	Resulting Net Density in Units Per Net Acre (UPNA) **	Probable Building Forms
6	35%	7	15	8	Larger Single Family lots in combination with RF and RM-D form.
	40%	6	15	10 (11.8)	Single Family lots in a combination of RF, RF-G and RM-D lots and/or row houses
	50%	5	15	12 (14.1)	Single Family lots in a combination of RF-G and RF-13 lots and/or row houses
8	35%	7	15	10	Single Family lots in small RF and RF-13 form.
	40%	6	15	13.3 (15.7)	Single Family lots in a combination of RF-13 and/or row houses
	50%	5	10	16 (17.8)	Single Family lots in RF-10 or in a combination of RF-10, and RF-SD semi-detached lots and row houses.
10	35%	7	15	12	Single Family lots in combination with RF-13, RM-D lots.
	40%	6	10	16.7 (18.5)	Single Family lots in a combination of RF-10 lots, RM-10 lots
	50%	5	0	20	Possibly developed as semi-detached row houses and townhouse development in a combination of RM-10, RF-SD, and RM-15 lots.

* Assuming 15% of the remaining site area needs to be dedicated for public road for single family subdivisions. If a combination of single family lots and other forms of attached housing is contemplated, the road requirement is reduced to 10%.

** Net density is based on the net developable site area. Where public roads are dedicated for single family subdivision, a net density based on the net site area excluding public road dedication is provided in brackets “()”.

Table 3.2 - Cluster Residential Density Transfer Formula and Building Forms



INTENT

Cluster Housing designation will preserve significant environmental features and open space by providing flexibility in land use and the siting of buildings. This designation enables the redistribution of development potential from one location to another on the same site, while supporting community development, agricultural buffers, urban planning and environmental management goals.

DENSITY TRANSFER AREA

The following areas should be prioritized for inclusion as Density Transfer areas:

- Biodiversity Hubs & Corridors;
- Areas used to provide Agricultural Land Reserve (ALR) buffers;
- Non-riparian ecologically significant areas;
- Steep Slopes (>15% Slope);
- Utility Right-of-Ways;
- Clusters of significant trees that have noted arboriculture values; and,
- Significant view shed areas.

The following areas or land uses may not be counted as a part of designated density transfer areas:

- Areas covered by any structures or buildings;
- Public road rights-of-ways;
- Strata lanes;
- Property setbacks and private front or backyard areas; and,
- Streamside protection setback areas as prescribed in the City of Surrey Zoning Bylaw.

DEVELOPMENT SUBMISSION

The boundaries of designated density transfer areas should be clearly delineated on plans, including subdivision plans, rezoning plans, and marked in the field with signage during construction approved by the Planning and Development Department. The intent is to distinguish these areas from private or common property.



CLUSTER RESIDENTIAL DEVELOPMENT POLICIES

POLICY 1

Cluster residential density will apply to gross site area before dedications (e.g. ALR buffer), except road dedications and other undevelopable areas as defined in the City of Surrey Zoning bylaw which will be deducted from the developable area.

POLICY 2

The minimum parent parcel size for cluster housing is 4 hectares/10 acres, unless it can be demonstrated that development located on a smaller site can be designed to properly reflect the site topography, preserve environmental features and trees, provide suitable site access, and achieve the minimum target of 35% for natural open space.

POLICY 3

Cluster housing should include a mix of unit sizes and types, including single, duplex, triplex, and quadplex under a strata-type development.

POLICY 4

Sites downslope of a proposed detention pond facility may be considered in a bare land strata form. Bare land strata's may also be considered in circumstances that reduce the need for gridded roadways for an environmentally sensitive area, and allows for more opportunities for on-site drainage management. The siting of units should reflect the location of existing trees, environmental features and watercourses, which are to be illustrated in the site design. Bare land stratas are not essential however, for single detached units, provided they form part of a comprehensive development plan.

POLICY 5

Cluster housing areas should be developed under a comprehensive development (CD) zone with special regulations to reflect the purpose of the cluster housing concept that identifies amounts of developable and open space areas.

POLICY 6

All cluster housing developments require development permits to reinforce design and

environmental objectives. A cluster housing development application will include a site assessment analysis by a qualified professional(s), who will identify potential environmentally sensitive areas to be protected.

POLICY 7

Density transfer areas may be "community space" and conveyed to the City. Uses may include passive or active recreation, community gardens, or rainwater management facilities that meet all design, construction, maintenance, and public safety requirements set forth by the City of Surrey.

POLICY 8

At least 75% of designated open green space should be contiguous, with no portion less than 20 meters wide.

POLICY 9

The amount of green space preservation required should generally increase with land use density, because of the feasibility of protecting open space and to offset the cost of development. In lower density cluster designs (less than 10 units per acre), different techniques such as clustering homes into small groups may be used. In higher density designs (10 units per acre), small lot zoning and multiple family dwellings can be used to intensify development. This may be more appropriate in specific locations such as near roads, on flatter slopes, and away from the ALR or environmentally sensitive features. Densities in the cluster designations should meet the intent of the formula and building forms outlined in the Table 3.2.

POLICY 10

Where there is required biodiversity conservation on a subject property, the provisions of the Sensitive Ecosystem Development Permit Area should apply.

POLICY 11

Provide a minimum 11 m building setback and landscaped buffering along Hwy 15 in keeping with Section 3.6 Urban Transition Areas (Transition 3.6.1).



3.4.7 Residential Transition

This designation is intended to accommodate a lower density suburban residential transition. It is specific to the plan's southern interface with the Redwood Park Estates rural area. Three different types of development will be considered within this designation.



DEVELOPMENT PARAMETERS:

	Type 1	Type 2	Type 3
Intent	Suburban sized detached lots of one-half acre or larger.	Smaller suburban sized detached half acre lots, with substantial public open space set aside within the subdivision.	Detached small suburban lots, where lot size may be reduced with substantial public or strata held open space set aside within the subdivision.
Typical Zone	RH	RH-G, CD	RQ
Typical Density	Up to 5 UPH (2 UPA)	Up to 5 UPH (2 UPA)	Up to 10 UPH (4 UPA)
Typical Height	9.0 m. 2-2½ storeys	9.0 m. 2-2½ storeys	9.0 m. 2-2½ storeys
Typical Lot Size	2,000 sm.	1,120 sm.	775 sm.
Lot Width	Minimum 30 m	Minimum 24 m	Minimum 20 m
Parking	Driveway from public street	Driveway from public street	Driveway from public street
Note	Provide 10 m wide landscape buffers on private property adjacent to Redwood Rural Estates to enhance the edge transition.	Provide 15 m wide park land adjacent to Redwood Rural Estates to enhance the edge transition.	Flexibility in the minimum residential lot size may be considered to encourage the retention of open space to provide 20 m wide parkland corridor adjacent to Redwood Rural Estates.

3.5 OTHER LAND USE DESIGNATIONS

3.5.1 Institutional

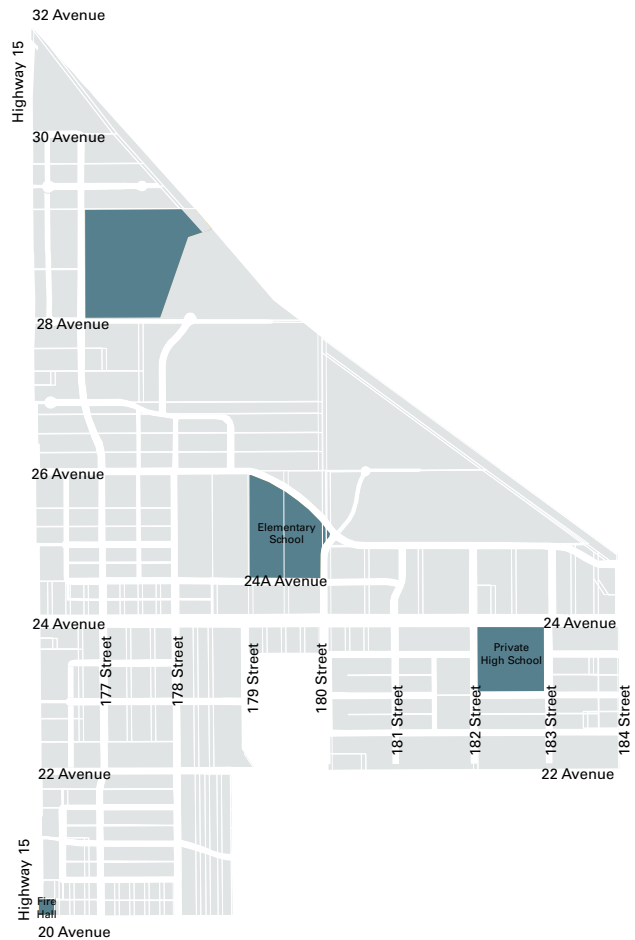
Institutional and civic uses support the social, educational, recreational, and cultural foundation of a community. A range of institutional and civic uses include a retreat centre, Fire Hall and an elementary school.

Redwood Heights falls within the existing East Kensington Elementary catchment. East Kensington Elementary is located within the Agriculture Land Reserve, outside of the plan area and the urban growth containment boundary. As a result, the School District is unable to expand the school to meet the future need of the Redwood Heights neighbourhood.

To meet future needs a 3.5 hectare (8.6 acre) elementary school site has been identified. The new school will supplement East Kensington's capacity. Any future changes to the existing East Kensington School will be reviewed and approved by the Surrey School Board. It is assumed that it will continue to operate as an elementary school.

DEVELOPMENT GUIDELINES

Institutional and civic uses will integrate the City's Biodiversity Design Guideline features into the development of new buildings, landscapes, and infrastructure. Schools will be sited to prioritize safe pedestrian access and a positive street presence.



Institutional designations include the following:

- A centrally located elementary school near 26 Avenue and 178 Street;
- A site owned by the Roman Catholic Archdiocese of Vancouver, planned for a Catholic secondary school;
- The existing Science of the Soul worship and retreat centre, planned to be retained; and
- The existing Civic Fire Hall at 20 Avenue and 176 Street.

3.5.2 Parks, Natural Areas, Riparian Areas and Wetlands

PARKS & NATURAL AREAS

The Parks and Natural Areas designation outlines the locations of new and existing parks, as well as key landscape buffers.

An interconnected principle that will guide the planning of new parks and natural spaces is the goal of delivering parks that are within 500 metres or a 10 minute walk of all future residents.

RIPARIAN AREAS & WETLANDS

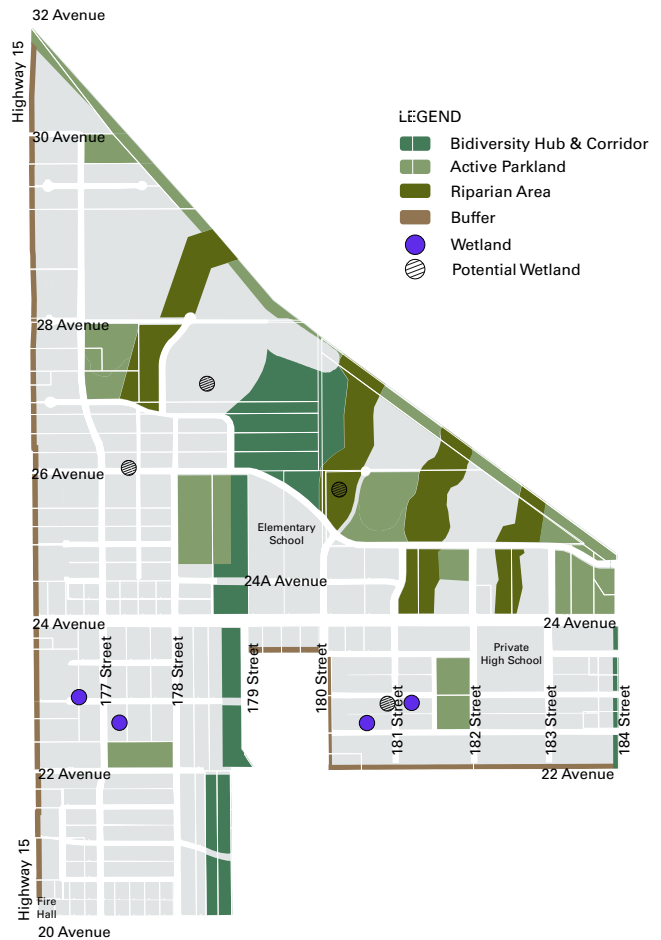
Riparian areas will be conveyed and managed as habitat corridors to protect fish and fish habitat. Some riparian areas will have public paths along their outer edges to provide opportunities to enjoy nature.

LIGHTING

Light pollution can profoundly reduce biodiversity in protected areas. Invertebrates, birds, mammals, fish, amphibians, plants and reptiles are all negatively impacted by the effects of light pollution. Given that light pollution can cause a measured 80-90% reduction of biodiversity in riparian areas, it is critical that development mitigates the negative impact on vulnerable natural areas.

Development near natural areas will adhere to the following lighting requirements:

1. Do not use blue-tinted LED lighting. Use yellow, orange, or red-tinted (warm) lighting which has less negative impact on wildlife.
2. Reduce light pollution and bleeding of light by
 - Using timed lighting;
 - Directing light to where it needs to go; and,
 - Spacing light sources appropriately
3. Do not use soft lighting along the sides of buildings that are adjacent to natural areas.



3.6 URBAN TRANSITION AREAS

Special interface cross-sections have been developed to accommodate unique design consideration for areas adjacent to riparian areas, agricultural edges, habitat corridors, landscape buffers, and along hillsides.

These unique transition areas are intended to maximize the amenity of public land and natural areas, while also respecting the sensitivity of agricultural uses and existing residential areas.

New development is expected to conform to these urban transitions identified and illustrated in figures 3.4 - 3.9



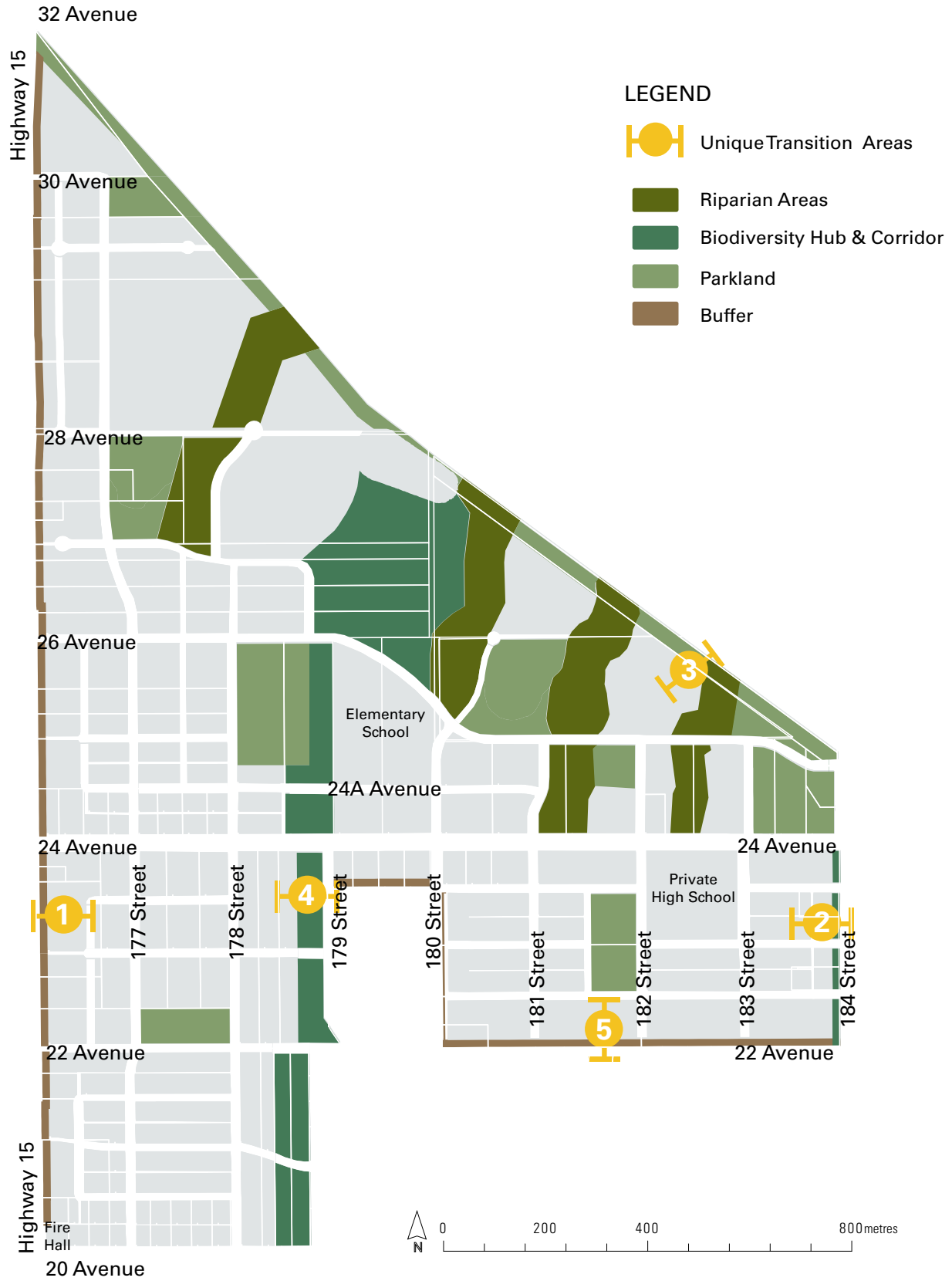


Figure 3.4 Unique Urban Interface Areas

3.6.1 Transition 1

Transition 1 is intended to support a multi-use pathway and boulevard adjacent to Highway 15. It includes a 10 metre road corridor with a 4.0 metre multi-use pathway and treed boulevard. Additional landscaped buffering should be located between the new property line and future development. Development will fund noise reduction features such as berms or walls as required (on private property).



TRANSITION 1 - HIGHWAY 15

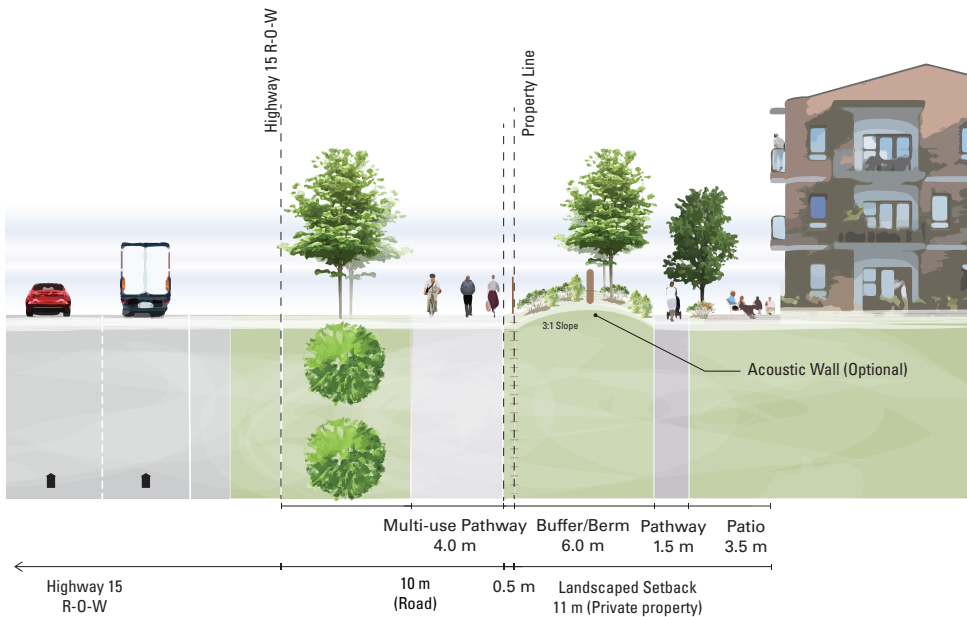


Figure 3.5 Transition 1 - Highway 15



3.6.2 Transition 2

Transition 2 is intended to create a landscaped buffer to lands adjacent to the ALR along 184 Street. The resulting 20 m parkland buffer will be landscaped with natural vegetation and trees.



TRANSITION 2 - 184 ST ALR BUFFER

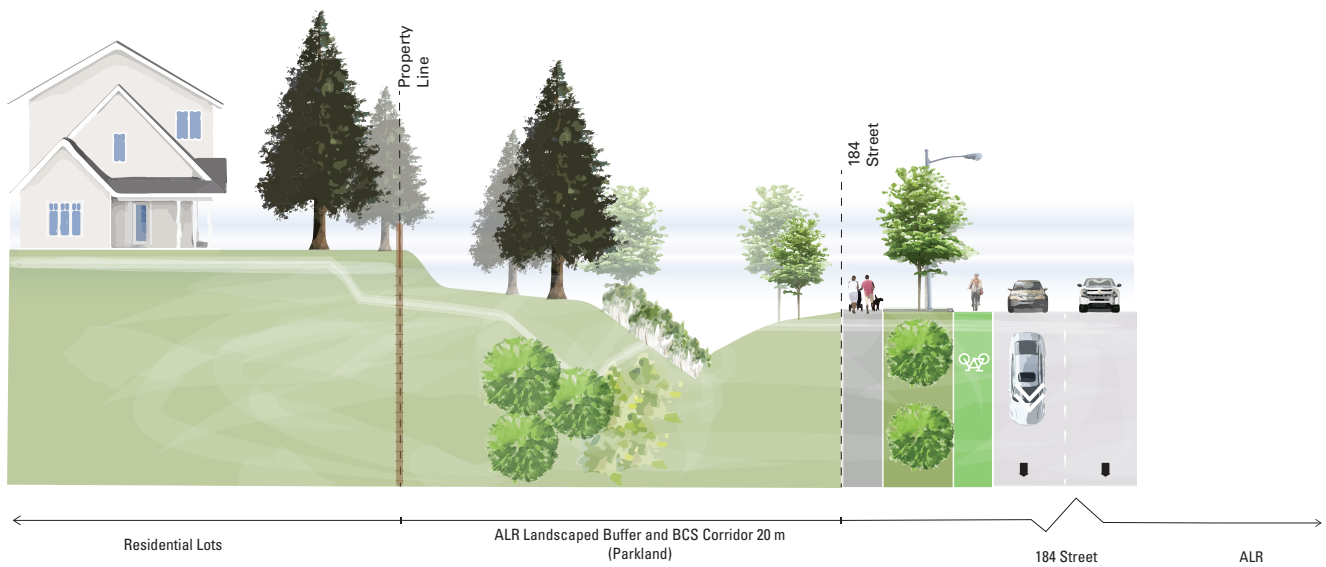


Figure 3.6 Transition 2- 184 St ALR Buffer

3.6.3 Transition 3

Transition 3 is intended to create a landscaped buffer to lands adjacent to Great Northern Railway Park & ALR Boundary. The resulting buffer includes a total of 40 m of natural area parkland, inclusive of a 10 m greenway supporting a multi-use pathway.



TRANSITION 3 - GREAT NORTHERN RAILWAY PARK & ALR BUFFER

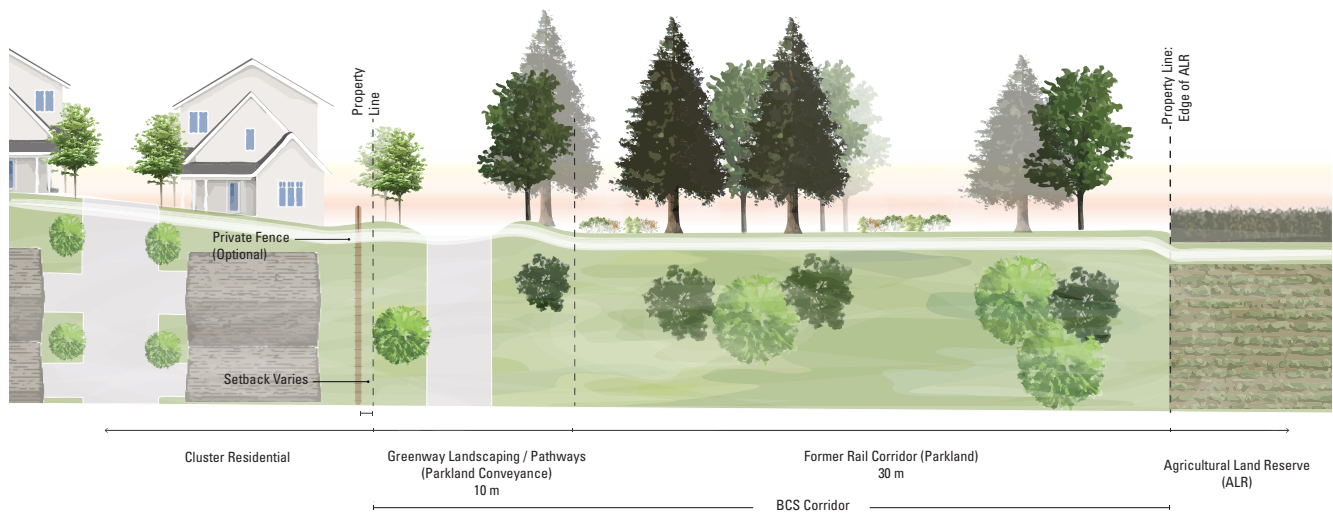


Figure 3.7 Transition 3 - Great Northern Railway Park & ALR Buffer



3.6.4 Transition 4

Transition 4 is intended to support a significant biodiversity corridor through the neighbourhood. It applies to all development adjacent to the corridor. The transition includes a 10 m greenway supporting a multi-use pathway, located adjacent to the biodiversity corridor.



TRANSITION 4 - BIODIVERSITY CORRIDORS ADJACENT TO REDWOOD ESTATES

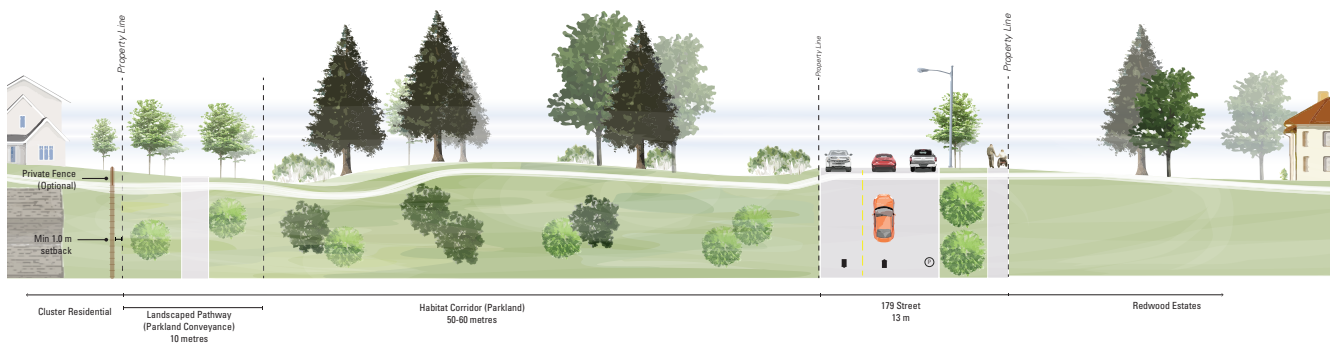


Figure 3.8 Transition 4 - Biodiversity Corridors Adjacent to Redwood Estates

3.6.5 Transition 5

Transition 5 is intended to create a landscaped buffer to lands adjacent to Redwood Estates. It provides natural area transition between higher density development in Redwood Heights and the existing rural area to the south.



TRANSITION 5 - REDWOOD ESTATES INTERFACE

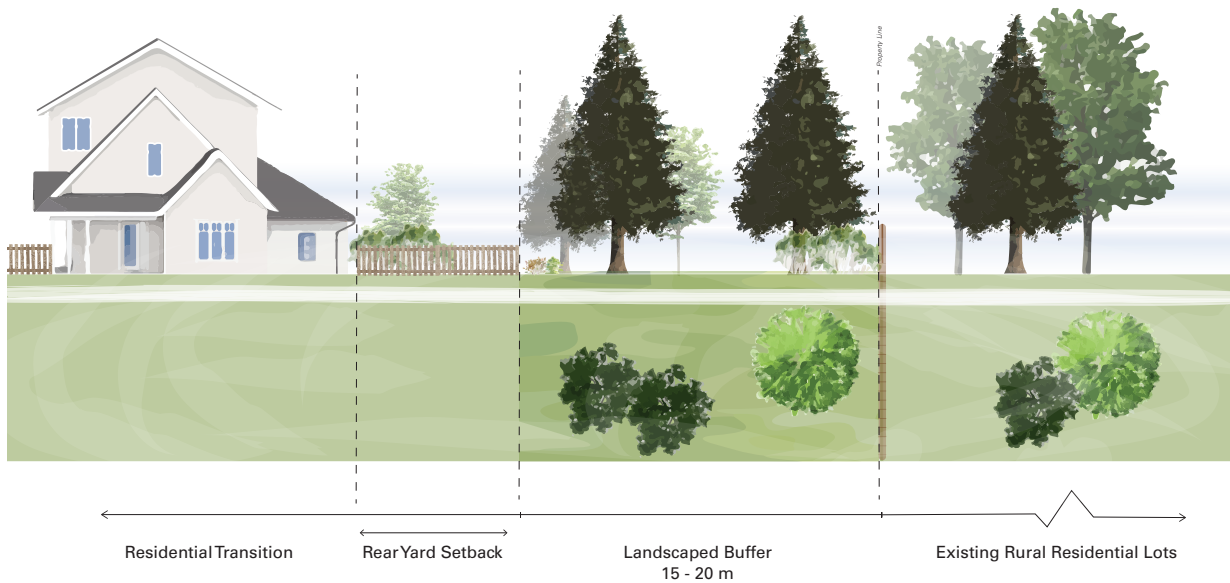


Figure 3.9 Transition 5 - Redwood Estates Interface



3.7 ACTIVE RESIDENTIAL FRONTAGE AREAS

A number of key public spaces have been identified as locations requiring active residential frontage. These requirements promote public safety and access to nature while encouraging a vibrant public realm.

Frontage is the manner in which a building orients towards and meets the public realm. Thoughtful placement of front-facing doors, windows, porches and balconies promote “eyes on the street”, creating a sense of safety while encouraging pedestrian activity.

New development in these areas are expected to conform to these cross-sections.



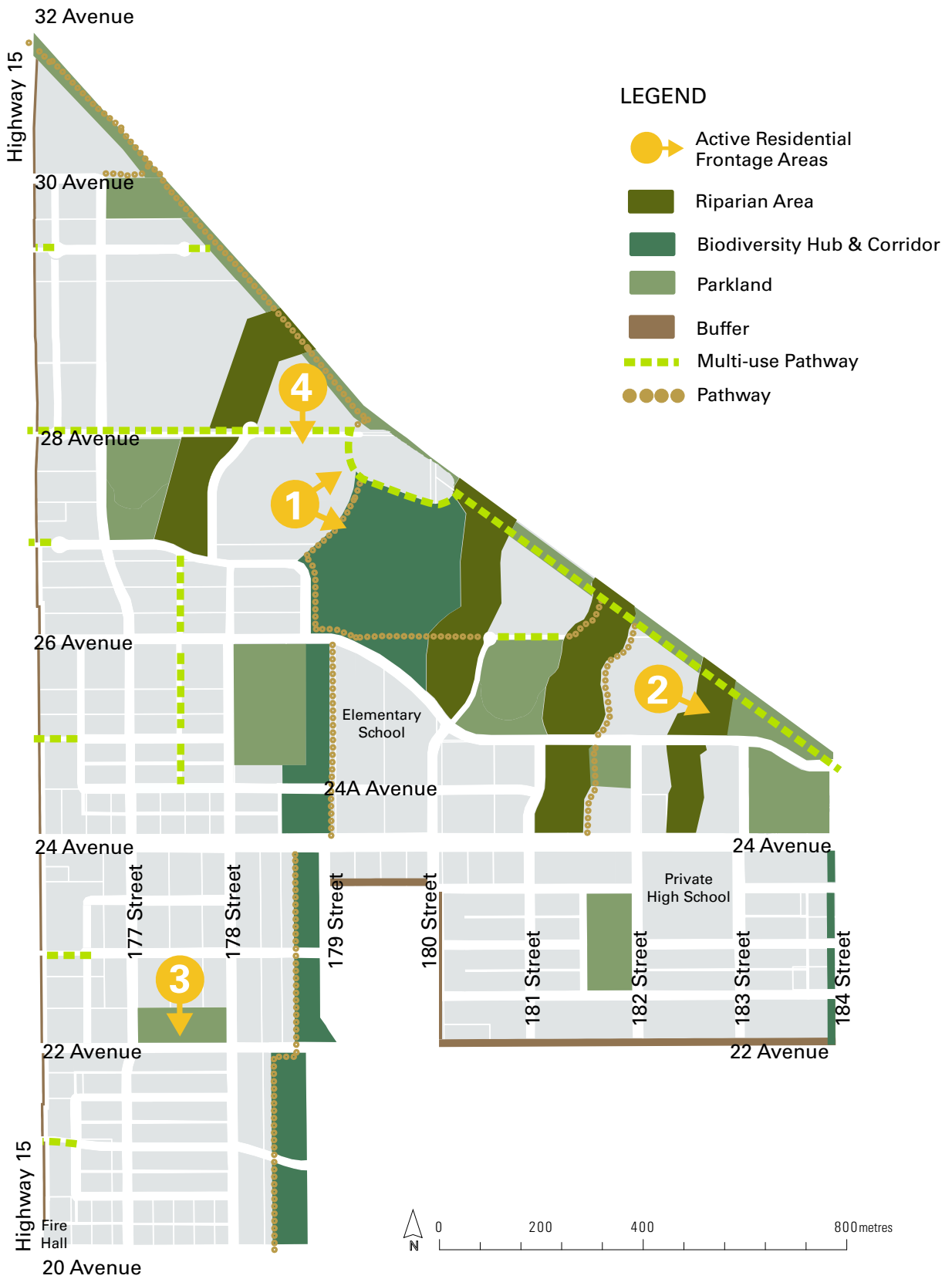
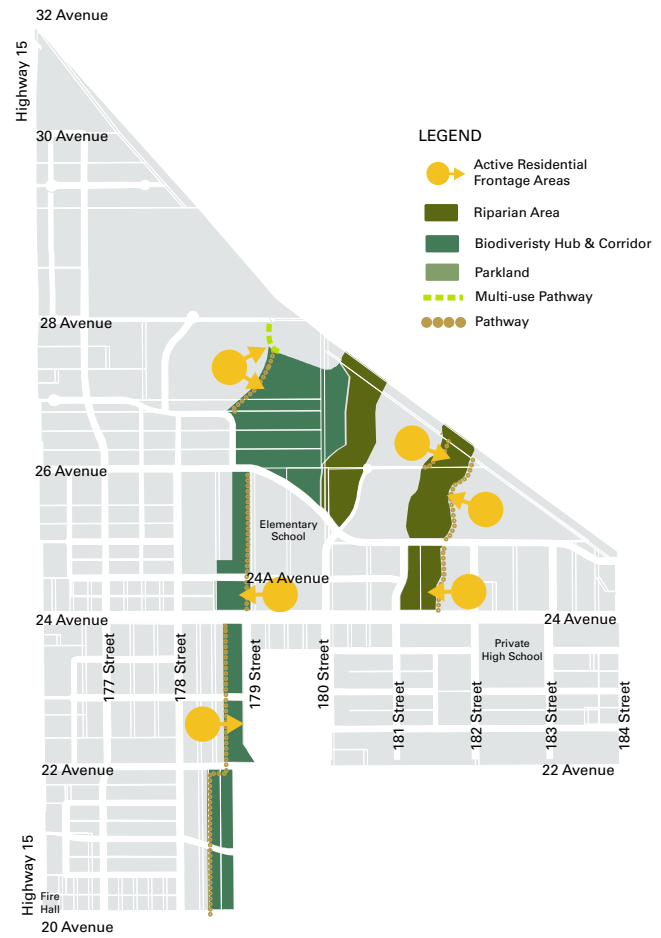


Figure 3.10 Active Residential Frontage Areas

3.7.1 Active Frontage 1

Apply Active Frontage 1 to developments adjacent to natural and riparian areas where a park pathway is identified.

Development should front onto the pathway with front-facing doors, windows, and porches. Private fencing (optional) should be permeable, no higher than 0.9 m, and located on private property set back a minimum of 1.0 m from the property line with layered planted landscaping in front.



ACTIVE FRONTAGE 1 - NATURAL & RIPARIAN AREAS WITH PUBLIC PATHWAY

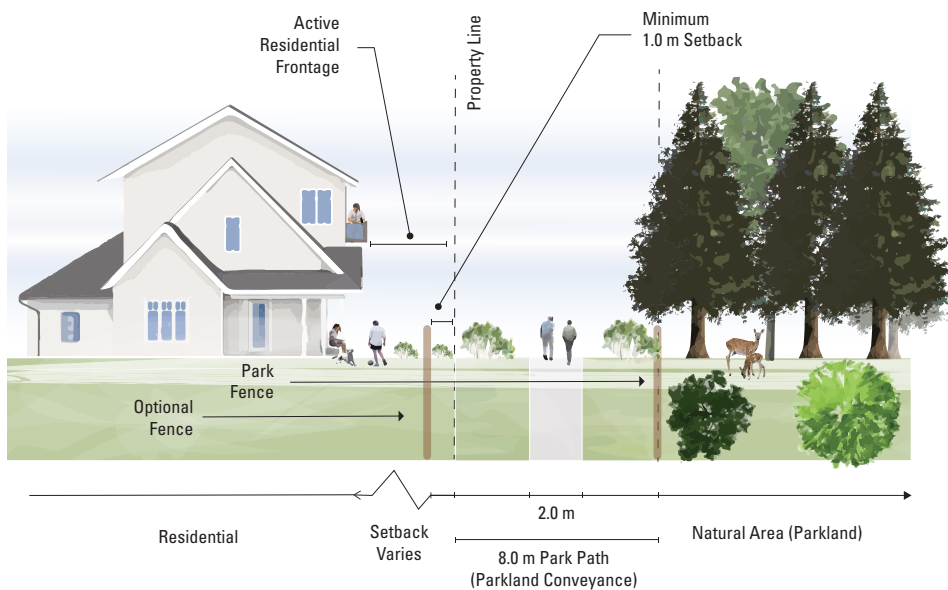


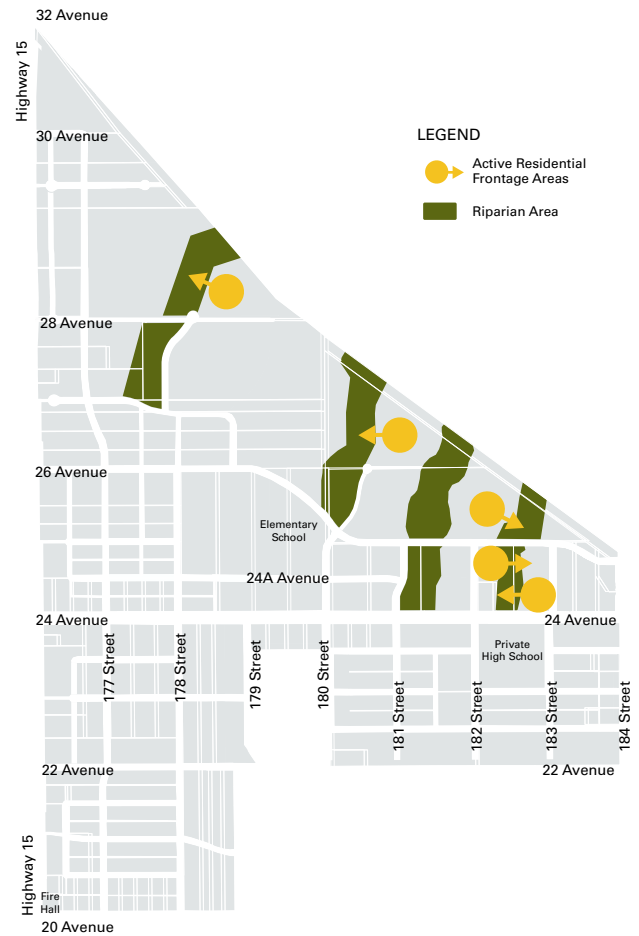
Figure 3.11 Active Frontage 1 - Natural & Riparian Areas with Public Pathway

3.7.2 Active Frontage 2

Apply Active Frontage 2 to areas adjacent to riparian areas where a public pathway is not identified.

Cluster Residential development in the form of stratified multiple residential is encouraged to provide a minimum 1.8 m pathway on private property setback 0.5 m from the riparian areas.

Development should front onto the Riparian Area with front facing doors, windows, active rooms, and porches. Private fencing (optional) should be permeable and no higher than 0.9 m, setback 1.0 m away from the walkway.



ACTIVE FRONTAGE 2 - RIPARIAN AREAS WITHOUT PUBLIC PATHWAY

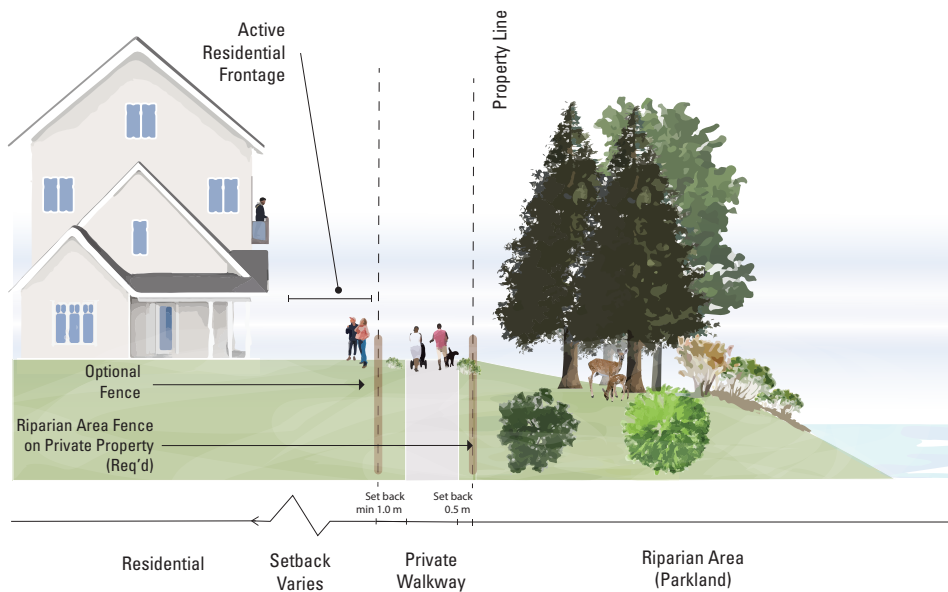


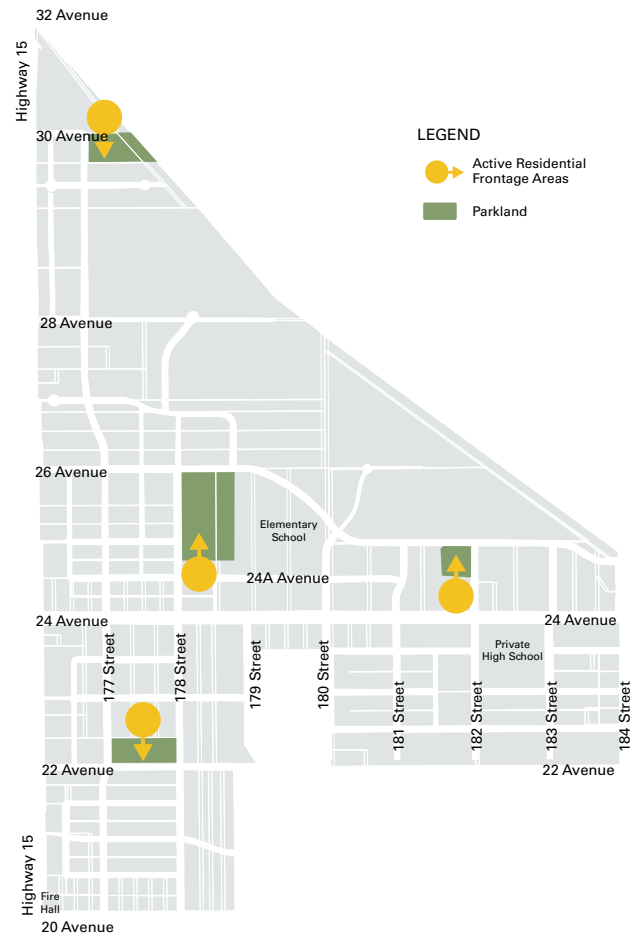
Figure 3.12 Active Frontage 2 - Riparian Areas Without Public Pathway



3.7.3 Active Frontage 3

Apply Active Frontage 3 to areas adjacent to active parkland.

Development should front onto active parkland with front facing doors, windows, active rooms, and porches. Private fencing (optional) should be permeable, no higher than 0.9 m, and located on private property set-back a minimum of 1.0 m from a required on-site pathway with layered planting/landscaping in front. Development should provide frontage pathway along the park interface located on private property with no fence between the path and parkland.



ACTIVE FRONTAGE 3 - AREAS ADJACENT TO ACTIVE PARKLAND

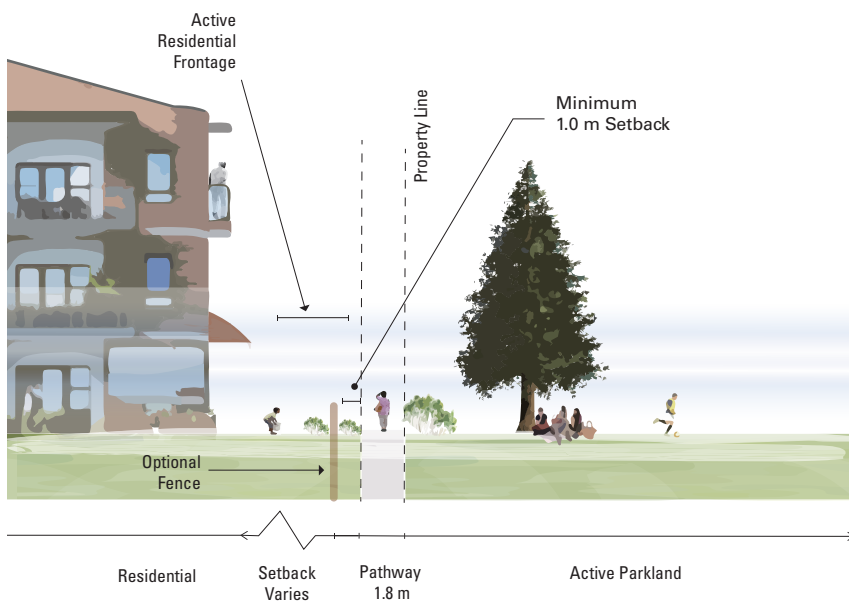


Figure 3.13 Active Frontage 3 -Areas Adjacent to Active Parkland

3.7.4 Active Frontage 4

Apply Active Frontage 4 to areas adjacent to dedicated multi-use corridors.

Development should front, where possible onto the multi-use pathway. Corridors include a 4.0 m multi-use pathway with 3.0 m treed boulevards on either side.

Private fencing (optional) should be permeable, no higher than 0.9 m and located on private property setback a minimum of 0.5 m from the pathway dedication.



ACTIVE FRONTAGE 4 - AREAS ADJACENT TO 10 m MULTI-USE CORRIDORS



Figure 3.14 Active Frontage 4 - Areas Adjacent to 10 m Multi-use Pathways



Section 4

I How We Get Around

BACKGROUND

PLAN
FRAMEWORK

LAND USE

TRANSPORTATION

PARKS &
NATURAL AREAS

UTILITIES

IMPLEMENTATION

The transportation network provides an open, connected and continuous street grid that integrates efficiently into the surrounding area. The network promotes cycling and pedestrian connectivity, transit service, and compact neighbourhood development.

PAGE	SECTION
60	4.1 Existing Conditions
62	4.2 Planned Street Network
64	4.3 Typical Road Sections
70	4.4 Unique Street Typologies
77	4.5 Active Transportation
80	4.6 Transit
82	4.7 Traffic Control Management
84	4.8 Cost & Financing



4.1 EXISTING CONDITIONS



Figure 4.1 Existing Road Network

EXISTING ROAD NETWORK

The existing road network in Redwood Heights was developed to serve the rural and suburban land uses. There are predominantly large lots without a significantly developed local road network and existing traffic relies on a few key roadways.

Neighbouring areas to the north and east are within the Agricultural Land Reserve where the road network is limited to local roads that service farm land. Existing arterial and collector roads within the area are described below:

- **Highway 15 (Pacific Highway)** is a four lane Provincial highway along the western boundary of Redwood Heights that connects Highway 1 in the north, to the Pacific Highway (Truck) border crossing in the south.
- **24 Avenue** is an east-west arterial road that connects Grandview Heights with the Semiahmoo Peninsula to the west, and Campbell Heights and Township of Langley to the east. A future interchange at Highway 99 and 24 Avenue, will enhance connectivity for the area.
- **184 Street** is a north-south arterial road along the eastern boundary of the plan area. It currently connects from 0 Avenue at the international border to the south, and to 80 Avenue to the north.
- **20 Avenue** is a two-lane east-west collector road at the southern boundary of the plan area. Currently, the road terminates at Hwy 99 to the west. Ultimately 20 Avenue will be connected to King George Boulevard and the rest of the Semiahmoo Peninsula with a planned overpass of Highway 99. To the east, 20 Avenue connects to 184 Street and serves the rural and suburban properties in the area.

TRAFFIC VOLUMES

Traffic volumes in Redwood Heights have experienced significant growth between 2006 and 2016 due to residential and employment growth east and west of the plan area. Specifically, 24 Avenue and 32 Avenue have experienced a high percentage of traffic increase (69% and 32% respectively), as these roads act as important east west connections between Highway 99, South Surrey, and the Township of Langley.

WALKING AND CYCLING NETWORKS

The existing local roads within Redwood Heights do not currently have sidewalks or formal cycling infrastructure and were constructed to previous rural road standards that did not require sidewalks at the time.

Arterials like 32 Avenue and 24 Avenues currently have very limited gravel shoulders and are ultimately planned to be upgraded through City capital projects.

TRANSIT NETWORK

There is currently one transit service, Route 531, which runs along 24 Avenue through the plan area, and connects White Rock to the west and the City of Langley (Langley Centre and Willowbrook Mall) to the northeast.



4.2 PLANNED STREET NETWORK



Figure 4.2 Transportation Strategy

GRID NETWORK




The road network for Redwood Heights will integrate into the existing and planned road network for the broader Grandview Heights community. It will follow the principles of the City's Transportation Strategic Plan, and provide a finer grid road pattern that enhances connectivity.

The network provides multiple route options to increase network resiliency and reduce overall vehicular congestion, while improving walkability, access to transit, and emergency response time. In general, the Redwood Heights road network consists of 200 metre by 100 metre blocks. Areas with higher densities and commercial designations, where walkability and traffic distribution is more important, typical block sizes are in the range of 80 metres by 150 metres.







Due to the amount of environmentally sensitive areas within the plan, the grid road network has been modified to maximize conservation efforts. Other constraints that factored in the road network include the ALR along the north boundary of the plan, designated school sites, topography (e.g. slopes), and proximity to anticipated signalized intersections.

ROAD CLASSIFICATIONS

The road network for the plan area is classified into a number of typologies

-  **Arterial Highway** - Highway 15 (176 Street) is under the jurisdiction of the Ministry of Transportation and Infrastructure (MoTI). It is an inter-regional transportation corridor that connects the Pacific Highway Truck Crossing to Highway 10, Highway 1, and Highway 17.
-  **Arterials** - Multi-modal roads that are the principle intra-city and regional corridors and connects Surrey's 5 communities to each other and the rest of the Metro Vancouver region. They are planned to accommodate higher volumes, transit, and act as designated truck routes where identified.
-  **Collectors** - Multi-modal roads that provide connections between neighbourhoods and within communities. They can also provide direct access to properties and accommodate

transit. They frequently accommodate on-street parking with some exceptions.

-  **Locals** - Provide the principle access to property and connections to the Collector and Arterial road network and accommodate on-street parking.
-  **Commercial High Street** - Provides an interface for an activated ground oriented retail street that will include on-street parking and consideration for unique features.
-  **Flex Streets** - Designed with the intent of a local road but may have variable alignments and cross sections that preserve natural areas, or accommodate topographical challenges as long as the principle of the road connection and intersection locations remain.
-  **Pedestrian Streets** - Roads for non-motorized active uses to provide added neighbourhood connectivity.
-  **Local Road BCS Crossings** - Roads with a unique and minimized cross section in order to limit impacts to the natural protection areas.
-  **Lanes** - Provide vehicle access to underground parking or lane served residential as well as service access for commercial.



4.3 TYPICAL ROAD SECTIONS

OVERVIEW

Generally, all roads within the plan area will follow the City's Engineering Design Criteria and Supplementary Standard Drawings.

The City's Vision Zero: Safe Mobility Plan identifies a vision where there are zero killed or seriously injured using a Safe Systems Approach. Roads should be designed to reduce the risk of crashes occurring and reduce the severity of an injury, should a collision occur. These safety features include separating different kinds of road users, as well as traffic moving in different directions or at different speeds.

This is also consistent with a Complete Streets approach to road design to ensure that all roads will accommodate safe multmodal transportation for all users.

4.3.1 Arterial Roads

The foundation of the road network is based on a central east-west arterial spine (24 Ave), as well as a supporting adjacent north-south arterial (184 St).

24 AVENUE

The role of 24 Avenue is significant for both Redwood Heights and all of Grandview Heights. It is one of only three east west arterials, along with 32 Avenue and 16 Avenue, that spans the South Surrey area and connect Township of Langley, Campbell Heights, Grandview Heights, Semiahmoo Peninsula, and White Rock.

Due to its regional connectivity and transit supportive land uses, 24 Ave is planned to accommodate dedicated curb side bus lanes. This will support both planned Frequent Transit Network service and potential high order transit service of Rapid Bus. It will include 1.8 metre wide one-way protected cycling facilities that will form part of the Grandview Heights Greenway.



ARTERIAL - 24 AVE INTERIM 4 TRAVEL LANES (37 m CROSS-SECTION)

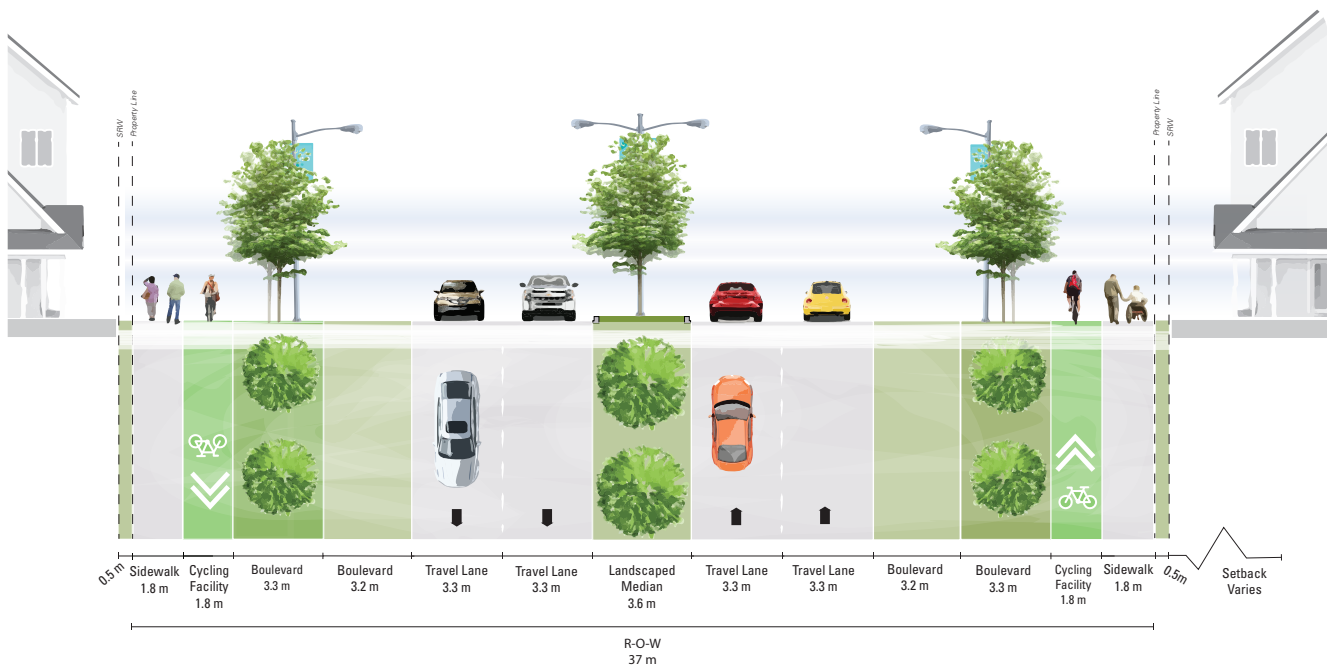


Figure 4.3 Arterial - 24 Avenue Interim 4 Travel Lanes (37 m Cross-section)

ARTERIAL - 24 AVE ULTIMATE CURBSIDE BUS LANES (37 m CROSS-SECTION)

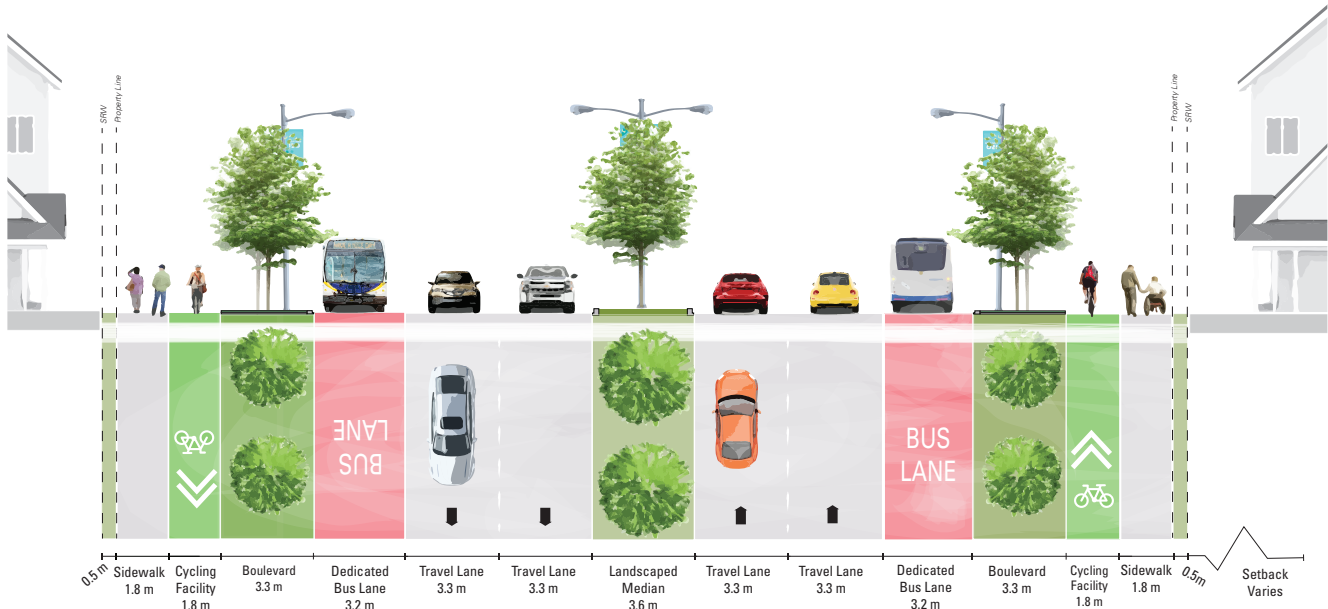


Figure 4.4 Arterial - 24 Ave Ultimate Curbside Bus lanes (37 m Cross-section)

24 AVENUE WILDLIFE CROSSING

Central to the plan area is a critical corridor connecting Redwood Park in the south with the protected biodiversity hub and ALR lands in the north. It will be a minimum of 50 m wide with limited public access. There will be special design cross section including a wildlife underpass where this corridor crosses 24 Avenue. The underpass will be a 1.0 metre high x 3.0 metre wide specialized culvert to support small animal crossing. Refer to Section 5.3 for additional details.

184 ST & 32 AVENUE

Both of these arterials are within and/or bordering the ALR and will serve as alternate parallel corridors to Highway 15 and 24 Avenue respectively. Both roads are protected for widening to the Rural Arterial Standard with four travel lanes, a landscaped median, and active mode facilities.



ARTERIAL RURAL STANDARD - 32 AVE/184 ST (30 m CROSS-SECTION)

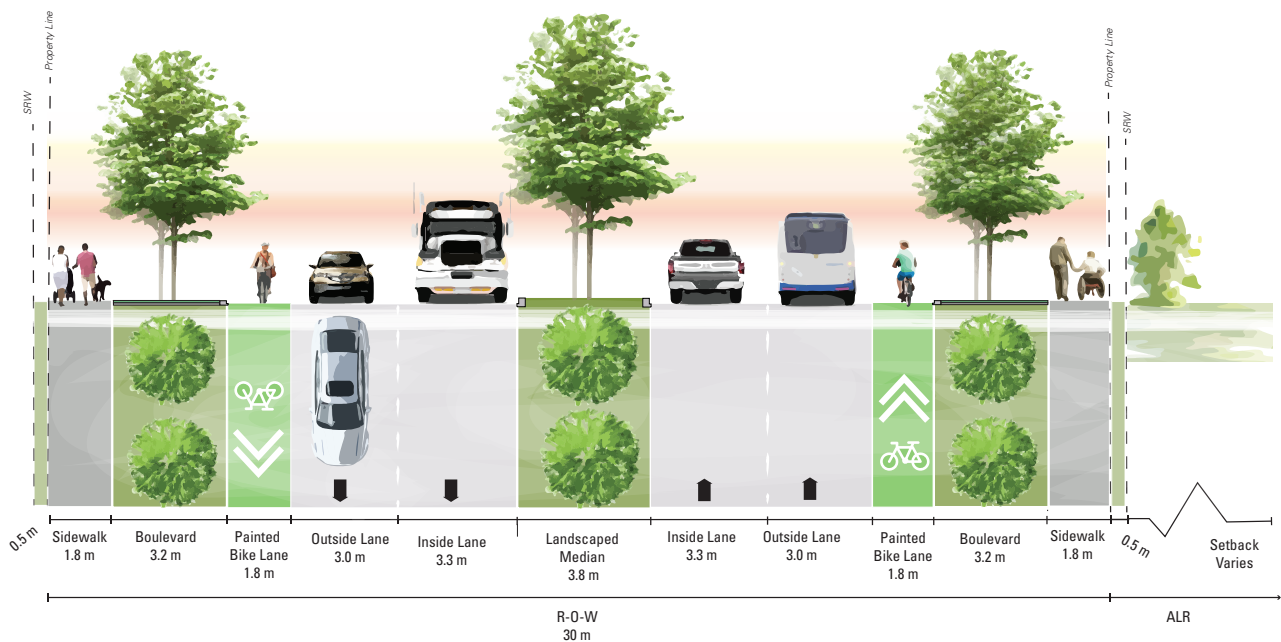


Figure 4.5 Arterial Standard - 32 Ave/184 St 30 m Cross-section

4.3.2 Collector Roads

The road network will also introduce several new collector roads, including: 26 Avenue; 177 Street; 178 Street; and 182 Street.

Collectors will typically require a 24 m road allowance standard unless special standards are noted. The road will be constructed to a Complete Streets standard which will include sidewalks, separated cycling facilities, parking both sides and curb bulges at intersections.



STANDARD COLLECTOR 24 m CROSS-SECTION

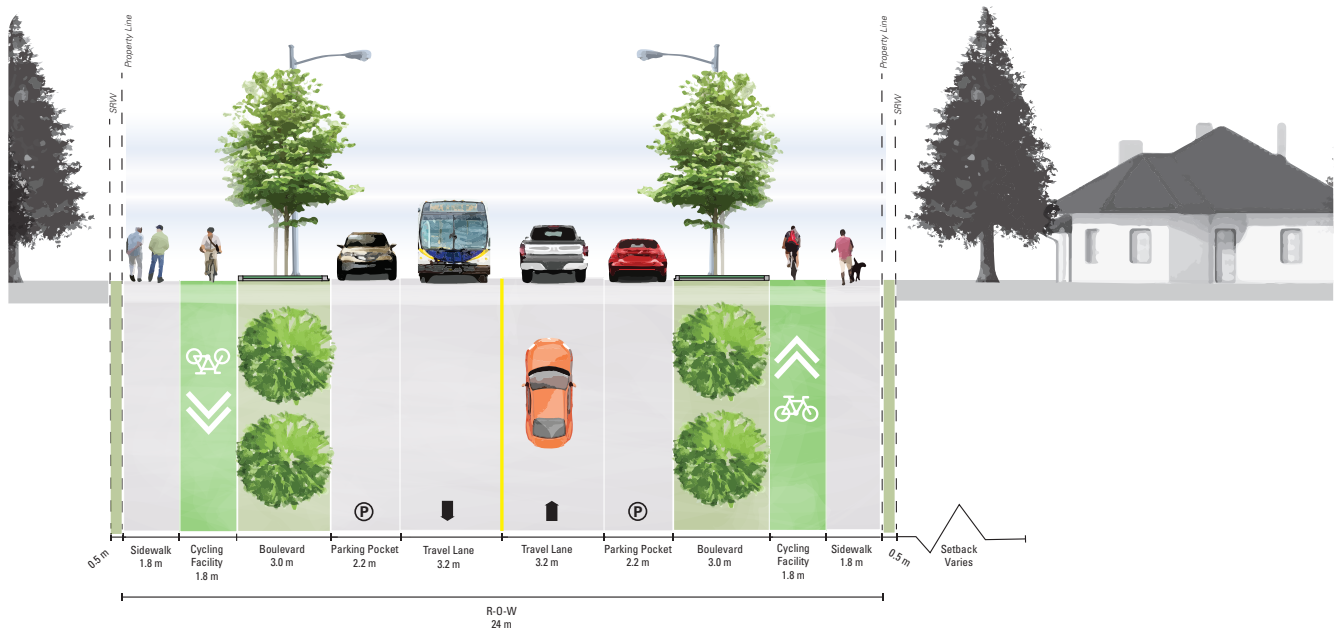
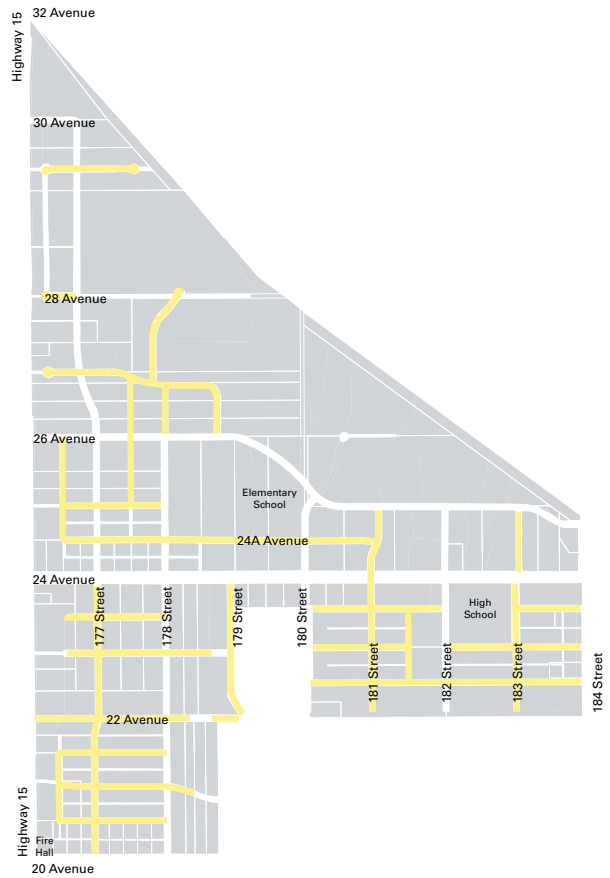


Figure 4.6 Standard Collector Road 24 m Cross-section

4.3.3 Local Roads

An extensive network of local roads compliment the collector and arterial road network to complete the road grid. Typical local roads will be a 20 m wide road allowance with 10.5 m pavement and parking on both sides with two way operations.

All roads will have sidewalks on both sides and curb bulges at intersections.



STANDARD LOCAL 20 m CROSS-SECTION

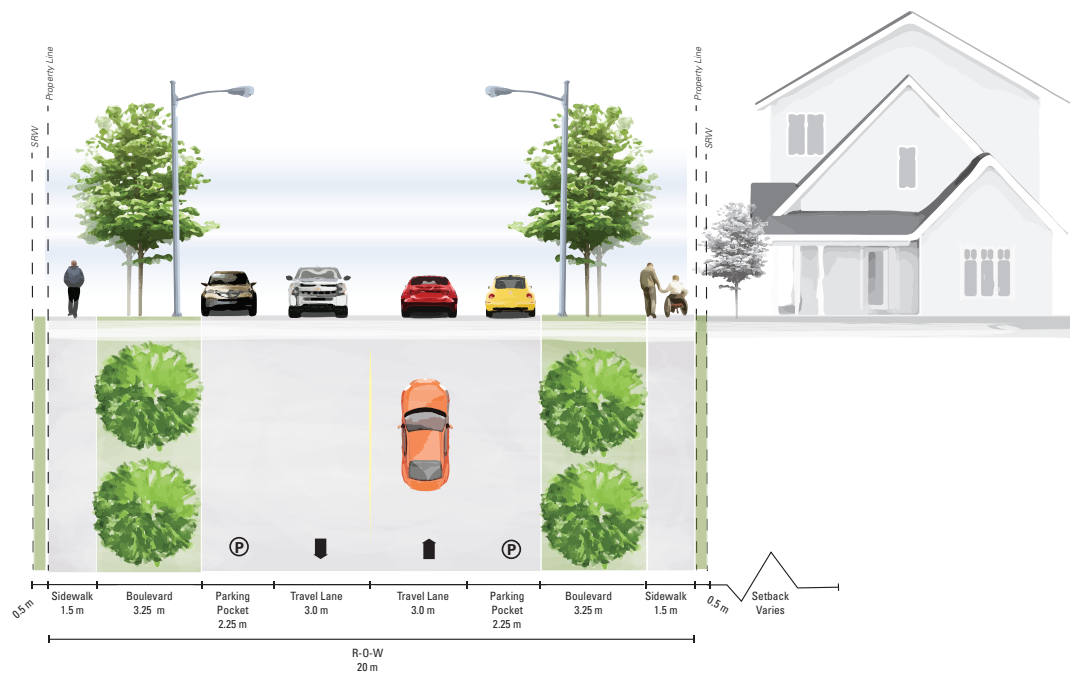


Figure 4.7 Standard Local Road 20 m Cross-section

4.4 UNIQUE ROAD SECTIONS

A number of unique cross-sections have been developed for Redwood Heights and are described in tables and illustrated on the following pages.

These unique street typologies exist where roads intersect biodiversity corridors, parkland, and within the mixed use commercial village



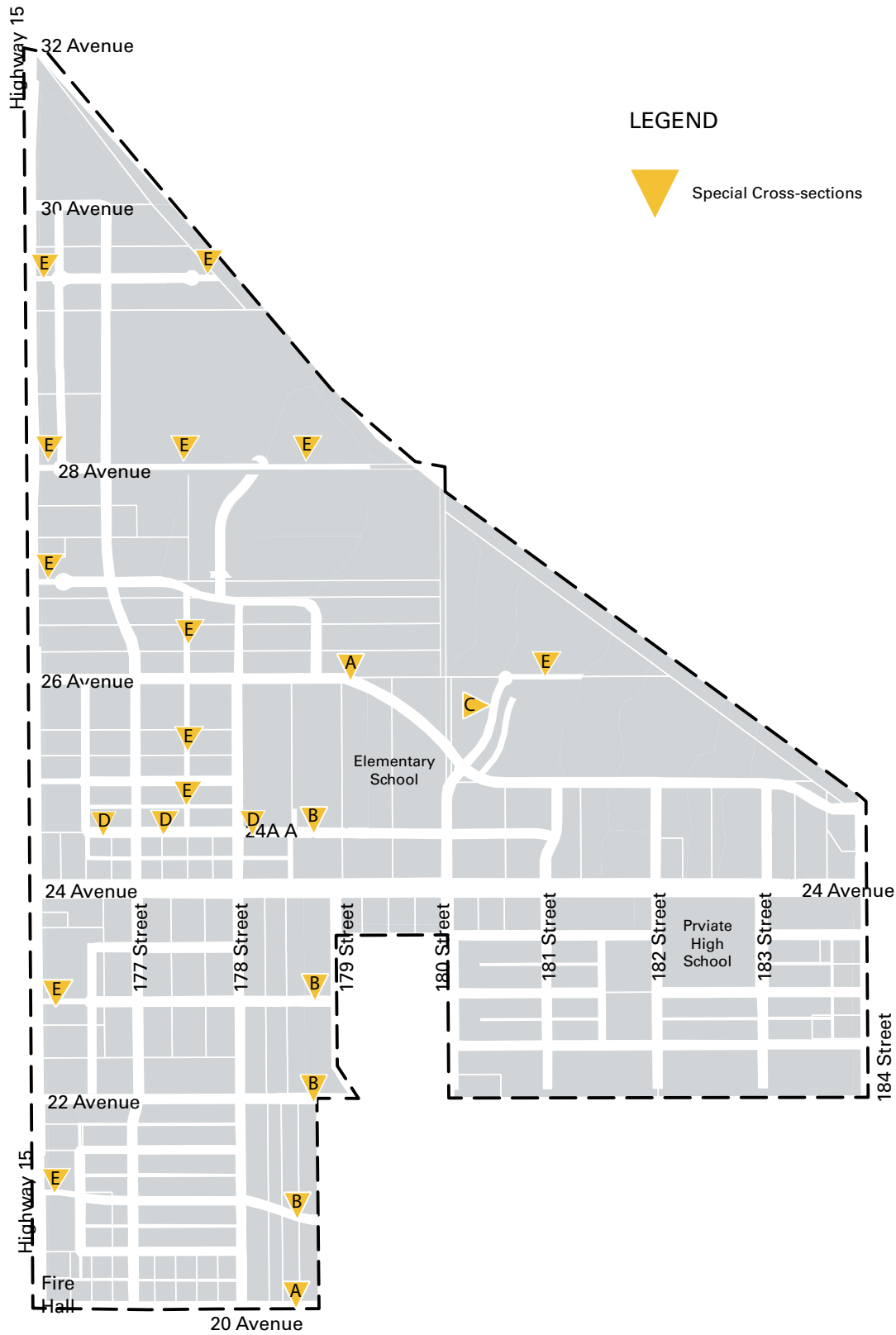


Figure 4.8 Special Cross-sections

4.4.1 Unique Street Section A

This is a modification to a standard collector road, to be used where it crosses a BCS corridor.

Dedication	17.8
SROW	0.5 m on both sides
Pavement Width	6.6 m
Parking	None
Sidewalks	1.8 m on both sides
Boulevards	2.0 m on both sides



UNIQUE STREET SECTION A - 17.8 m COLLECTOR BCS ROAD CROSSING

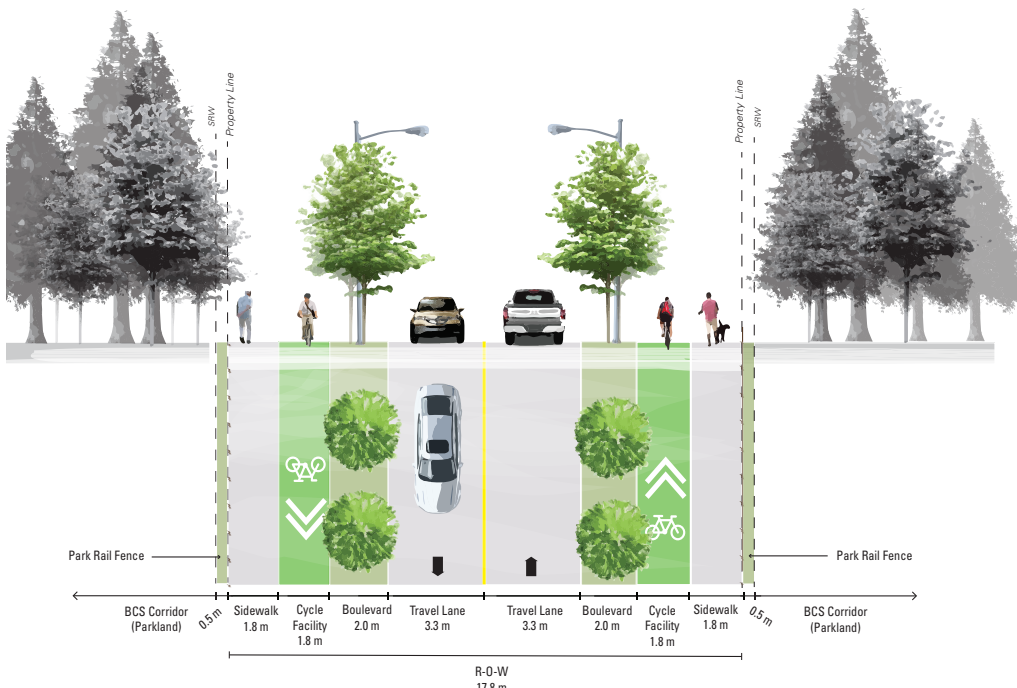


Figure 4.9 Collector BCS Road Crossing - 17.8 m Cross-section

4.4.2 Unique Street Section B

This is a modification to a standard local road, to be used where the road crosses a BCS corridor.

Dedication	13.6 m
SROW	0.5 m on both sides
Pavement Width	6.6 m
Parking	None
Sidewalks	1.5 m on both sides
Boulevards	2.0 m on both sides
Street Lighting	Both sides



UNIQUE STREET SECTION B - 13.6 m LOCAL BCS ROAD CROSSING

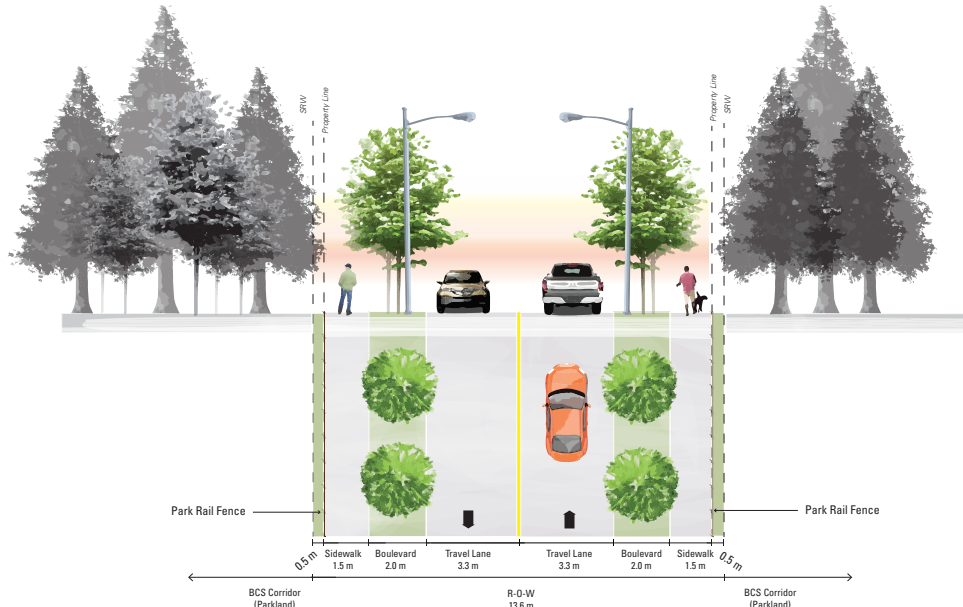
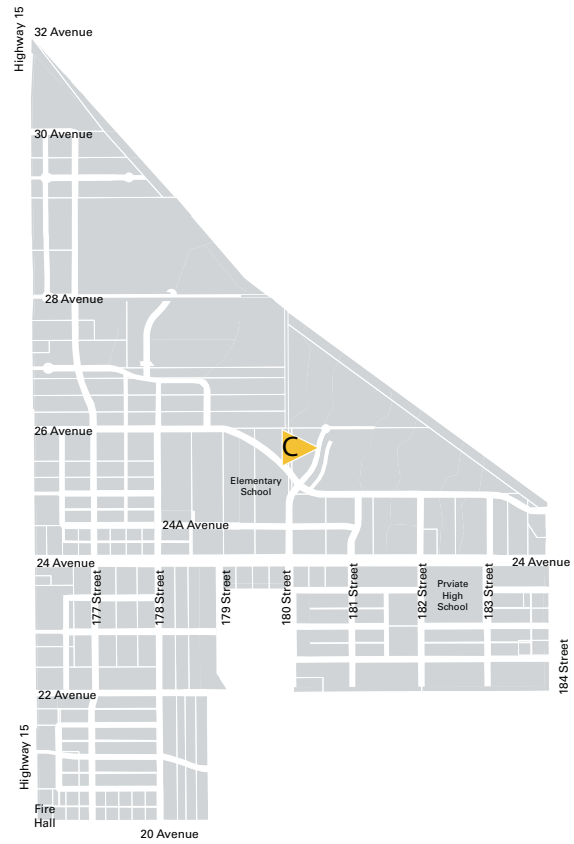


Figure 4.10 Local BCS Road Crossing 13.6 m Cross-section

4.4.3 Unique Street Section C

This is a modification to a standard local road, to be used where the road parallels a biodiversity corridor. All boulevard features are eliminated on one side to minimize biodiversity impacts with 8.25 m pavement. Full road construction cost are to be absorbed by cluster development.

Dedication	13 m
SROW	0.5 m on both sides
Pavement Width	8.25 m
Parking	One Side
Sidewalks	1.5 m on one side
Boulevards	3.25 m on non-park side
Street Lighting	One side



UNIQUE STREET SECTION C - 13 M LOCAL ROAD ADJACENT TO BCS CORRIDOR

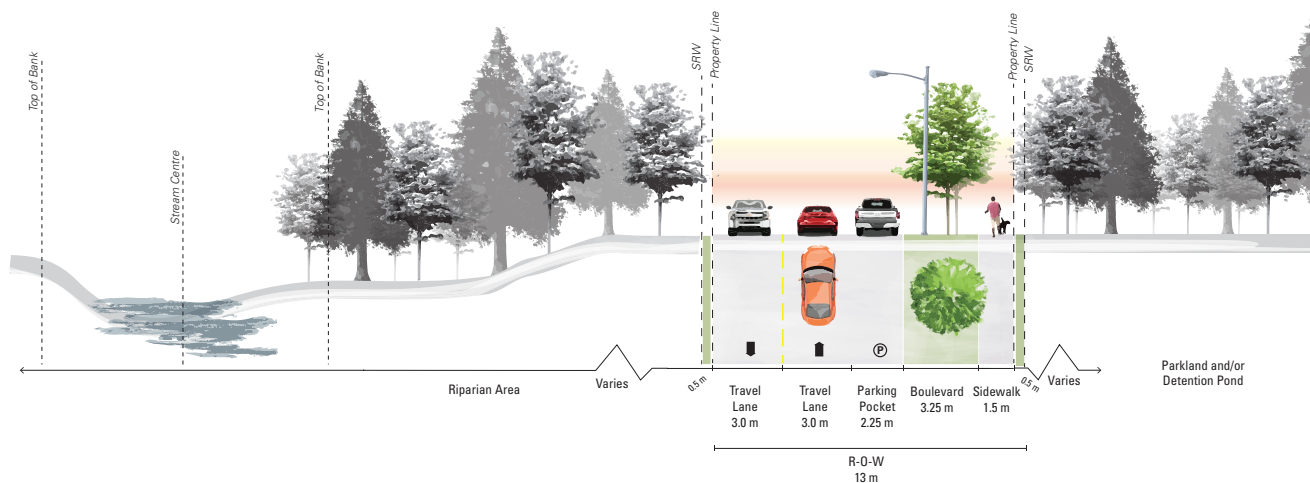


Figure 4.12 Local Road Adjacent to BCS Corridor 13 m Cross-section

4.4.4 Unique Street Section D

This is a modification to a standard local road, to be used in the Mixed-Use Commercial Village area as a High Street standard. Boulevard is an urban condition with protected trees. Planted curb bulges at all intersections. Adjacent buildings are set back 2.0 m to accommodate on-site weather protection and allow for retail supporting street furniture.

Dedication	20 m
SROW	0.5 m on both sides
Pavement Width	11.6 m
Parking	Parallel parking on both sides
Sidewalks	2.0 m on both sides (Structural soil under sidewalk)
Boulevards	2.5 m on both sides, hard surfaced with treed planting pockets (Structural soil under hard surface)
Street Lighting	Pedestrian lighting on both sides



UNIQUE STREET SECTION D - 24A AVE COMMERCIAL VILLAGE HIGH STREET

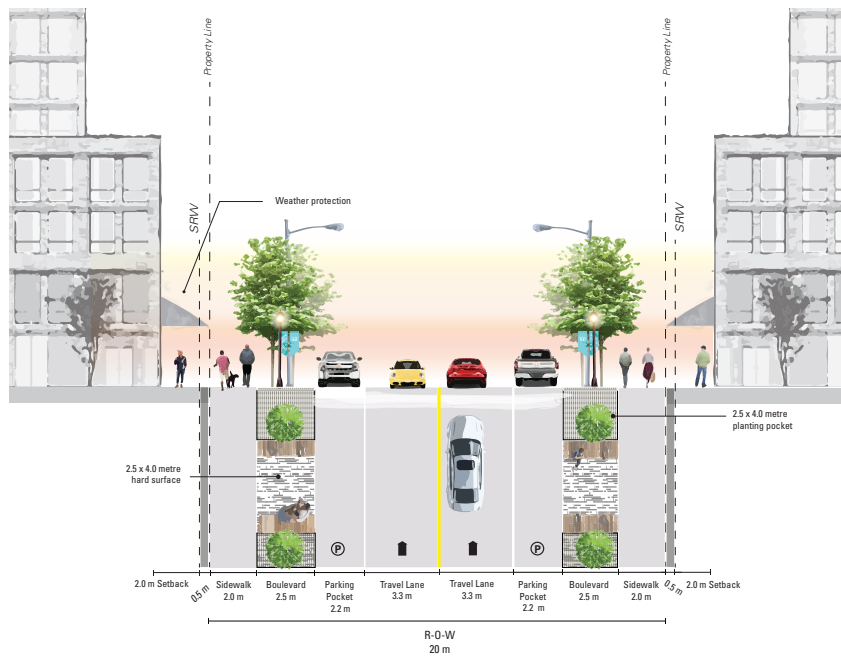


Figure 4.13 24A Ave Commercial Village High Street with Parking 20 m Cross-section

4.4.6 Unique Street Section E

This is a pedestrian-only street that accommodates a paved pathway, lighting, and grassed boulevards with trees.

Dedication	10 m
SROW	n/a
Pavement Width	n/a
Parking	n/a
Multi-use Pathway	4.0 m
Street Lighting	Pedestrian lighting on both sides (except where adjacent to parkland)



UNIQUE STREET SECTION E - 10 M PEDESTRIAN STREET



Figure 4.14: 10 m Pedestrian Street



4.5 ACTIVE TRANSPORTATION

WALKING NETWORK

As per the City's Engineering standards, all roads identified within the Redwood Heights NCP are planned to support safe and comfortable routes for pedestrians and to promote walking. The following features will be implemented within the NCP:

- All roads will have either concrete sidewalks on both sides of each road and/or asphalt multi-use pathways.
- Sidewalks and multi-use pathways are separated from vehicle traffic by boulevards with trees.
- 1.5 m sidewalks on both sides of local roads
- 1.8 m sidewalks on both sides of Arterial and Collector Roads.
- Enhanced sidewalks (2.0 m or greater) in areas of high pedestrian demand (e.g. adjacent to schools or commercial areas).
- Construction of the sidewalk and protected cycling facility on 24 Ave in conjunction with adjacent development (in advance of Capital Construction of ultimate road)
- Enhanced pedestrian street lighting along identified multi-use pathways.
- Off-street multi-use pathways of sufficient dedication (minimum 8.0 - 10 m) to maintain sight lines, accommodate street lighting, and comply with Crime Prevention Through Environmental Design (CPTED) principles.
- Encouraging lane access for single family lots with protected cycling facilities on their frontage to minimize the number of driveway crossings.
- Where appropriate, curb bulges at all intersections to narrow pedestrian crossing distances.
- With the grid road network system and diverse land use the plan area will result in a highly walkable neighbourhood with most people in the plan area being within a 10 -15 minute walk of transit, parks, schools, and retail areas.

CYCLING NETWORK

Protected Cycling Facilities (Cycle Tracks)

The City is moving towards a standard that replaces on-street bike lanes on both sides of arterial and collector roads with one-way protected cycling facilities (commonly referred to as cycle tracks). The City's Vision Zero Safe Systems approach for road design identifies that providing separation for cyclists from vehicles reduces the severity of collisions as cyclists are a vulnerable road user. This approach is consistent with the Complete Streets approach to road design to provide physically separated cycling facilities. This approach facilitates an attractive and safe corridor for cyclists of all ages and abilities.

As a result all Collector and Arterial roads will ultimately have one-way protected separated cycling facilities. Where cycling facilities intersect, protected intersection design will allow for full movement turns for cyclists.



Multi-Use Pathways

A multi-use path network has also been developed, and will provide off-street cycling connections. Multi-use pathways are asphalt and shared by cyclists, pedestrians, and other forms of non-motorized transport. In addition to paralleling streets, a diagonal pathway is also planned along the northeast ALR boundary. Off-street path designs include street lighting and either one or two boulevards, to maximize safety and security in keeping with Crime Prevention Through Environmental Design (CPTED) principles.

The Multi-use pathways will compliment protected cycling facilities and provide a comprehensive cycling network that will allow for the whole plan area to be within approximately a 10 -20 minute bike ride. Additionally these facilities will accommodate new micro-mobility technology solutions such as electric assist bike and scooters.



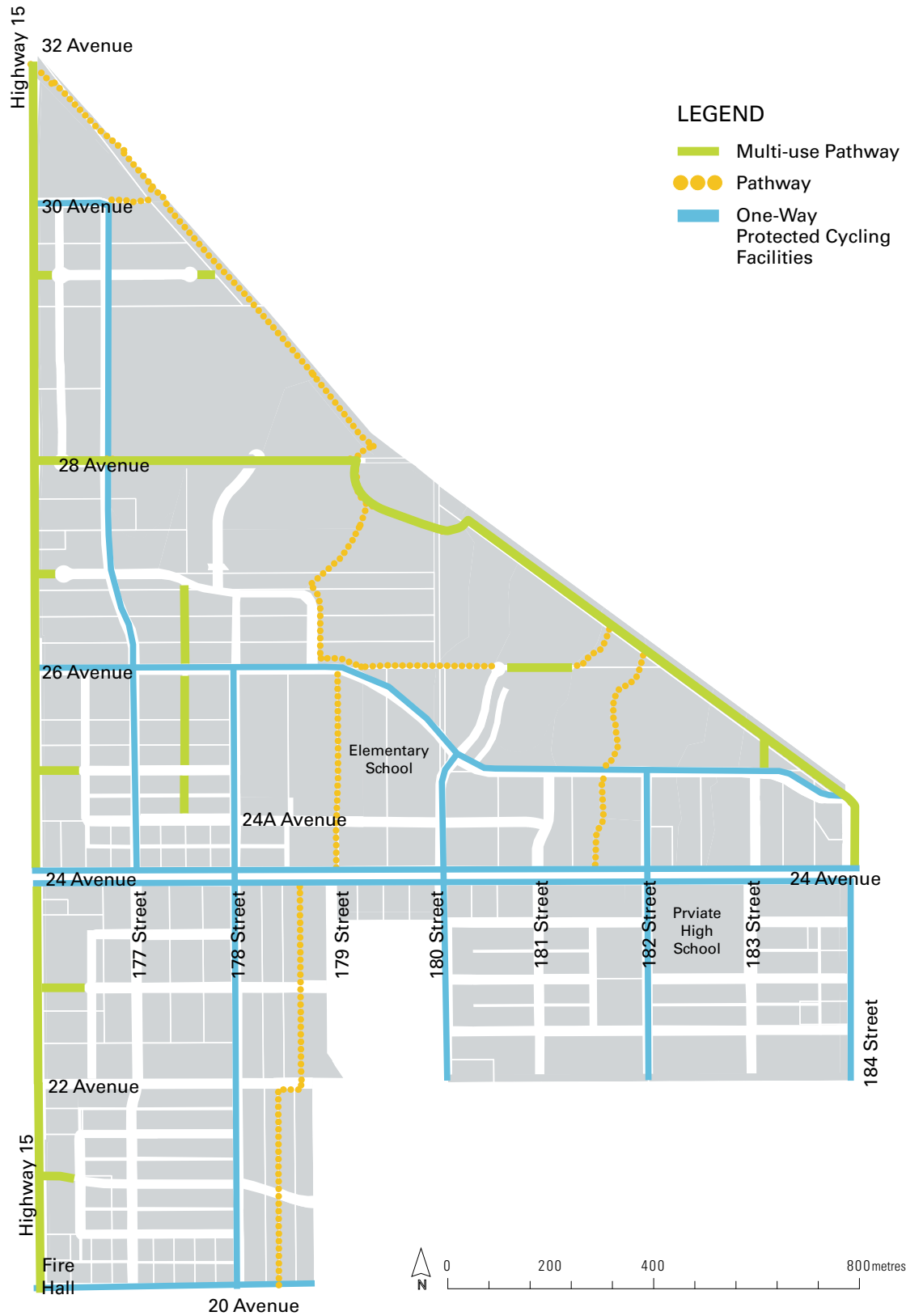


Figure 4.15: Bicycle and Pedestrian Network

4.6 TRANSIT

24 Avenue

The transit plans for Surrey are guided by TransLink’s South of Fraser Area Transit Plan (SoFA TP). The SoFA TP, developed in 2007, was a plan for transit service up to 2031. The plan first identified the need for transit service in the emerging Grandview Heights area which led to the introduction of Route 531 with service from White Rock Centre (Semiahmoo Town Centre) to Langley Centre via 24 Avenue.

The SoFA TP identified that due to the central location of 24 Avenue along with the planned growth in the area, 24 Avenue would also be a good candidate for future increases in service levels up to the Frequent Transit Network (FTN). The FTN provides a minimum of 15 minutes frequency from 6:00 am Monday to Friday, 7:00 am Saturday, and 8 am Sundays and Holidays until 9:00 pm.

Looking beyond 2031 and with the ultimate build out of the entire Grandview Heights area, 24 Avenue is a good candidate corridor for a higher order of transit service including Rapid Bus. The corridor is consistent with TransLink’s Service Guidelines for Demand Oriented Service that identify the 6Ds which are:

- **Destinations:** There are major destinations anchoring and along the corridor, which include Semiahmoo Town Centre, Campbell Heights and Langley Centre.
- **Distance:** A well connected street network that is highly walkable and has a high intersection density exists along the corridor. All of the land use plans along 24 Avenue maintain the principles of the grid road network with 100m by 200m block spacing.
- **Design:** The corridor is multi-modal. 24 Avenue is planned for sidewalks and cycling facilities inviting all active modes of transportation.
- **Density:** There is transit supportive densities along the corridor. The highest intensity of multi-family residential is located within 800m (10 minutes) walking distance of 24 Avenue.
- **Diversity:** There is a mix of land uses along the corridor. 24 Avenue already has residential, commercial, employment, and institutional

throughout Grandview and Campbell Heights.

- **Demand Management:** Transit oriented measures are used to discourage unnecessary driving. Considerations for parking relaxations along corridor will be provided on a case by case basis. In consideration of this, 24 Avenue will be protected for future dedicated curb side bus lanes with the existing 37 metre wide road allowance. Ultimate stop locations for a potential Rapid Bus service will be determined in the future once it is identified in a future TransLink Investment Plan

Community Level Service

With numerous collector roads serving the area and a need for north south service protection for a potential route on 20 Avenue, service along 178 Street and 26 Avenue is planned for. This service could ultimately connect Sunnyside Heights with Redwood Heights and potentially extend north to Cloverdale in the future.

Potential Stop Locations

Existing and potential stop locations along with the routing options are identified in figure 4.16.



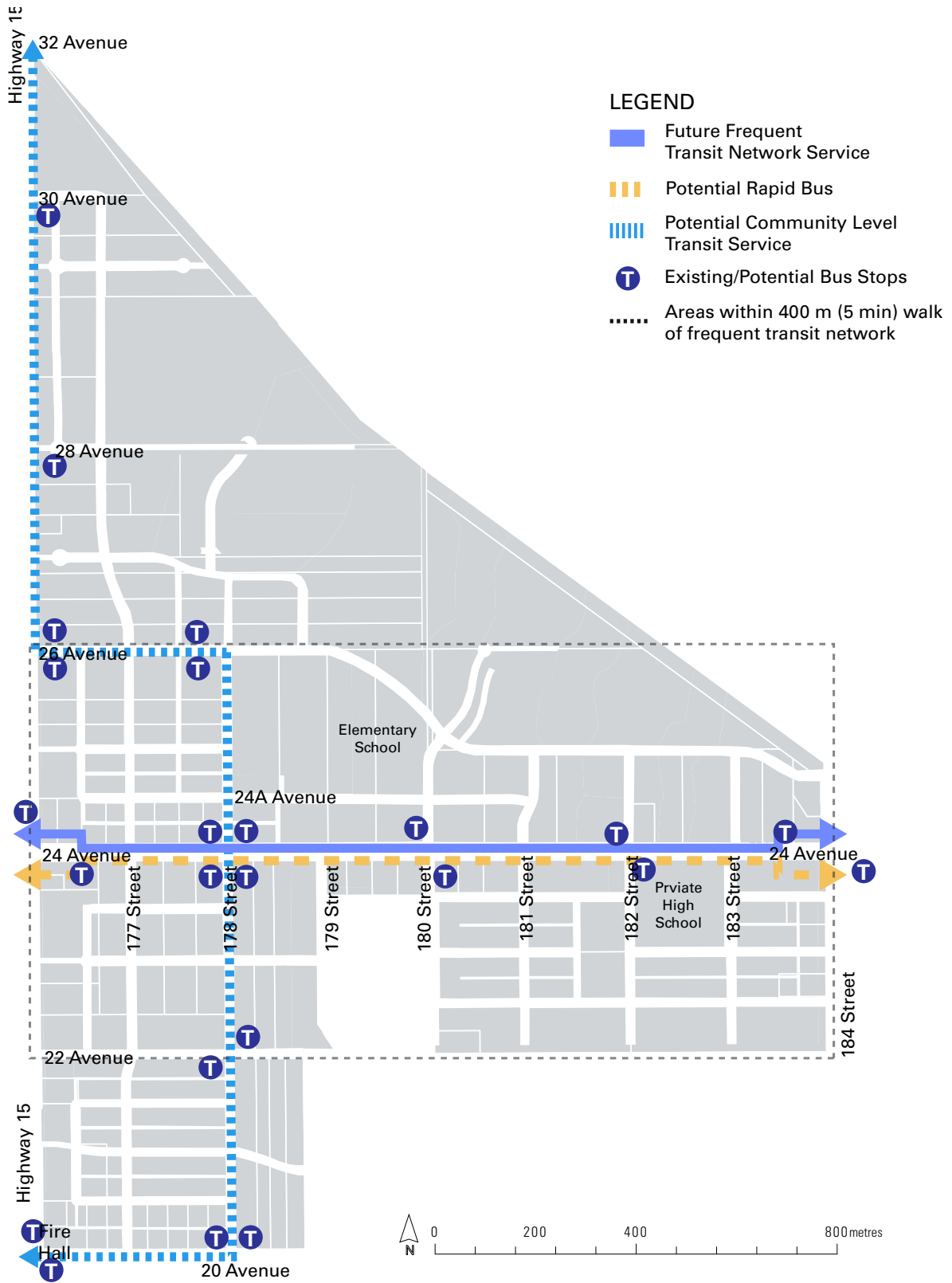


Figure 4.16 Transit Network

4.7 TRAFFIC CONTROL MANAGEMENT

SIGNALIZED INTERSECTIONS

Consistent with typical practice, traffic signals are planned at all arterial-arterial and arterial-collector intersections. The traffic signals are typically installed on an engineering warrant basis which includes a criteria of traffic volumes, pedestrian demand, and safety assessments. The typical spacing for signalized intersections on the main arterial of 24 Avenue is roughly every 400 metres (two blocks) with one additional signal at 177 Street. This is standard signalized intersection spacing and can easily be coordinated through the City's Traffic Management Centre.

ROUNDBABOUTS

Single lane roundabouts are planned at the collector-collector intersections as they reduce the number and severity of potential collision points at intersections and therefore satisfy the Vision Zero Safe Systems approach to Road Design. Roundabouts also have the added benefit of being generally more efficient. Roundabouts will generally be installed when the required land is secured through adjacent development and when warranted.

ACCESS RESTRICTIONS

Left turning movements will be restricted at highway-local and arterial-local intersections where traffic controls are not anticipated and consistent with the City's Design Criteria requirements for access management. Right turns into and out of the local road will be permitted to improve overall safety and efficiency of these intersections.

HIGHWAY 15 AT 26 AVENUE

The City envisions the need for a traffic signal at the intersection of Highway 15 and 26 Avenue to facilitate turning movements. 26 Avenue is an important collector road for Redwood Heights and will act as a critical alternate route to 24 Avenue for circulation and distribution of traffic throughout the neighbourhood.

As Highway 15 is within the jurisdiction of the Ministry of Transportation and Infrastructure (MoTI), the proposed signalized intersection of 26 Avenue and Highway 15 was brought forward for their review. MoTI indicated that their practice was for signalized intersections no closer than every 800 metres and to avoid signals on steep grades due to higher truck volumes.

In support of the review for the intersection traffic modeling, analysis was conducted on future transportation network scenarios both with and without this intersection. The analysis results indicated that the signalization of 26 Avenue at Highway 15 provided an overall benefit to the surrounding network by improving travel times along the Highway 15 corridor as it relieved congestion (and number of turning movements) at both the 24 Avenue and 32 Avenue intersections.

MoTI has currently indicated that they will review the installation of a signalization intersection in the future. In consideration of the benefits to both the plan area and the Highway corridor, the signal is proposed at this intersection in the future.





Figure 4.17: Traffic Control Management

4.8 COSTS & FINANCING

Tables 4.1 and 4.2 provides details of the DCC-eligible projects and estimated costs.

ARTERIAL ROADS - DCC-ELIGIBLE TRANSPORTATION SERVICING COSTS

Arterial Road	Unit Price	Quantity	Portion to Redwood Heights	Cost to Redwood Heights
24 Avenue, 168 Street to Highway 15 (interim 4 lane)	\$6700/metre	1600 metres	50%	\$5,360,000
24 Avenue, Highway 15 to 184 Street (interim 4 lane)	\$6700/metre	1600 metres	100%	\$10,720,000
24 Avenue, 184 Street to 188 Street (interim 4 lane)	\$6700/metre	800 metres	50%	\$2,680,000
24 Avenue, Wildlife Crossing	\$2500/metre	40 metres	100%	\$100,000
184 Street, 16 Avenue to 22 Avenue	\$9500/metre	1200 metres	100%	\$11,400,000
184 Street, 22 Avenue to 25 Avenue	\$9500/metre	600 metres	100%	\$5,700,000
184 Street, 25 Avenue to 32 Avenue	\$9500/metre	800 metres	100%	\$7,600,000
32 Avenue, 168 Street to Highway 15	\$9500/metre	1600 metres	50%	\$7,600,000
20 Avenue / Highway 15 Traffic Signal (modification)	\$300,000	1	100%	\$300,000
24 Avenue / Highway 15 Traffic Signal (modification)	\$300,000	1	100%	\$300,000
26 Avenue / Highway 15 Traffic Signal (addition)	\$300,000	1	100%	\$300,000
24 Avenue / 177 Street Traffic Signal	\$300,000	1	100%	\$300,000
24 Avenue / 178 Street Traffic Signal	\$300,000	1	100%	\$300,000
24 Avenue / 180 Street Traffic Signal	\$300,000	1	100%	\$300,000
24 Avenue / 182 Street Traffic Signal	\$300,000	1	100%	\$300,000
24 Avenue / 184 Street Traffic Signal	\$300,000	1	100%	\$300,000
25 Avenue / 184 Street Traffic Signal	\$300,000	1	100%	\$300,000
20 Avenue / 184 Street Traffic Signal	\$300,000	1	100%	\$300,000
TOTAL				\$54,160,000

Table 4.1 DCC-Eligible Transportation Servicing Costs - Arterial Roads



NON-ARTERIAL ROADS - DCC-ELIGIBLE TRANSPORTATION SERVICING COSTS

Non-Arterial Road	Unit Price (\$/m)	Quantity	Portion to Redwood Heights	Cost to Redwood Heights
20 Avenue, Highway 15 to 184 Street	\$1,600	1600 metres	50%	\$1,280,000
26 Avenue, Highway 15 to 184 Street	\$1,600	1600 metres	100%	\$2,560,000
177 Street, 24 Avenue to 30 Avenue	\$1,600	1200 metres	100%	\$1,920,000
30 Avenue, Highway 15 to 177 Street	\$1,600	200 metres	100%	\$320,000
178 Street, 20 Avenue to 26 Avenue	\$1,600	1200 metres	100%	\$1,920,000
180 Street, 20 Avenue to 22 Avenue	\$1,600	400 metres	50%	\$320,000
180 Street, 22 Avenue to 25 Avenue	\$1,600	600 metres	100%	\$960,000
182 Street, 22 Avenue to 25 Avenue	\$1,600	600 metres	100%	\$960,000
20 Avenue / 180 Street Traffic Signal	\$300,000	1	100%	\$300,000
20 Avenue / 178 Street Roundabout	\$650,000	1	100%	\$650,000
26 Avenue / 177 Street Roundabout	\$650,000	1	100%	\$650,000
26 Avenue / 178 Street Roundabout	\$650,000	1	100%	\$650,000
25 Avenue / 180 Street Roundabout	\$650,000	1	100%	\$650,000
25 Avenue / 182 Street Roundabout	\$650,000	1	100%	\$650,000
TOTAL				\$13,790,000

Table 4.2 DCC-Eligible Transportation Servicing Costs - Non-Arterial Roads

Section 5

| Keeping it Green

BACKGROUND

PLAN
FRAMEWORK

LAND USE

TRANSPORTATION

PARKS &
NATURAL AREAS

UTILITIES

IMPLEMENTATION

Parks in Surrey are planned and designed through the lens of various plans, strategies and policies. These include the Parks, Recreation and Culture Strategic Plan, the Biodiversity Conservation Strategy (BCS) and Parks Design Guidelines along with various sub-plans and strategies including dog off-leash areas, playgrounds, natural areas and greenways.

PAGE	SECTION
87	5.1 Overview
89	5.2 Parks
90	5.3 Natural Spaces
96	5.4 Plazas



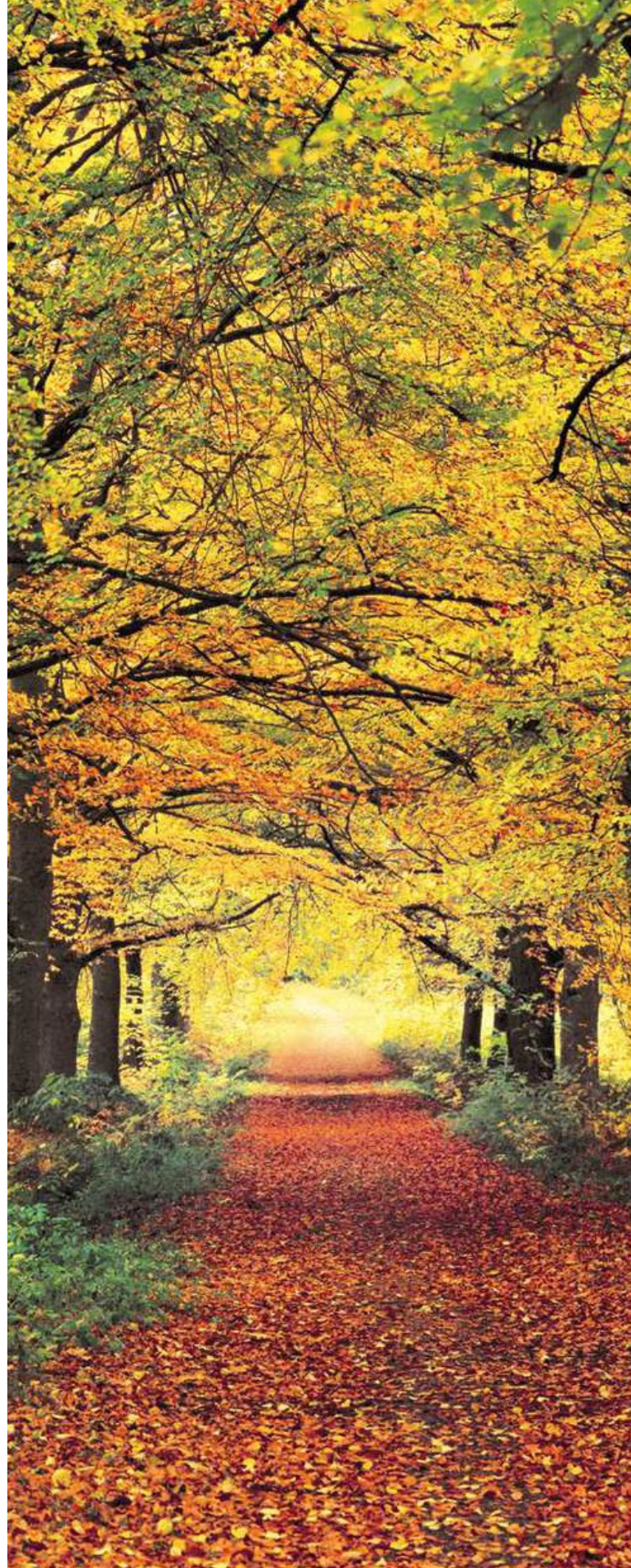
5.1 Overview

Within Redwood Heights, there are two foundational principles that guide the planning of new parks and natural spaces.

1. To deliver local, neighbourhood parks for all future residents within a 10 minute walk (500m). This ensures everyone has access to public open space for relaxation, play and exercise in their day to day lives.
2. To protect the riparian areas and significant biodiversity hubs and corridors identified in the BCS that run through Redwood Heights connecting Redwood Park to the ALR lands to the north.

The Redwood Heights plan delivers on both of these principles through a comprehensive parks and natural areas network (Figure 5.1). The network features eight new active park sites, along with a large biodiversity hub and a central north-south linear biodiversity corridor that links to Redwood Park. Park sites have been located adjacent to riparian areas, stormwater ponds and BCS areas to maximize opportunities for nature connectivity. All streams and riparian areas will also be conveyed to the City, to be protected and maintained as natural area parkland and biodiversity corridors.

Together, these parks, open spaces, stormwater ponds and landscape buffers total 49.10 hectares (121.32 acres) of green space. Publicly accessible space on private property (such as corner plazas) are in addition to this.



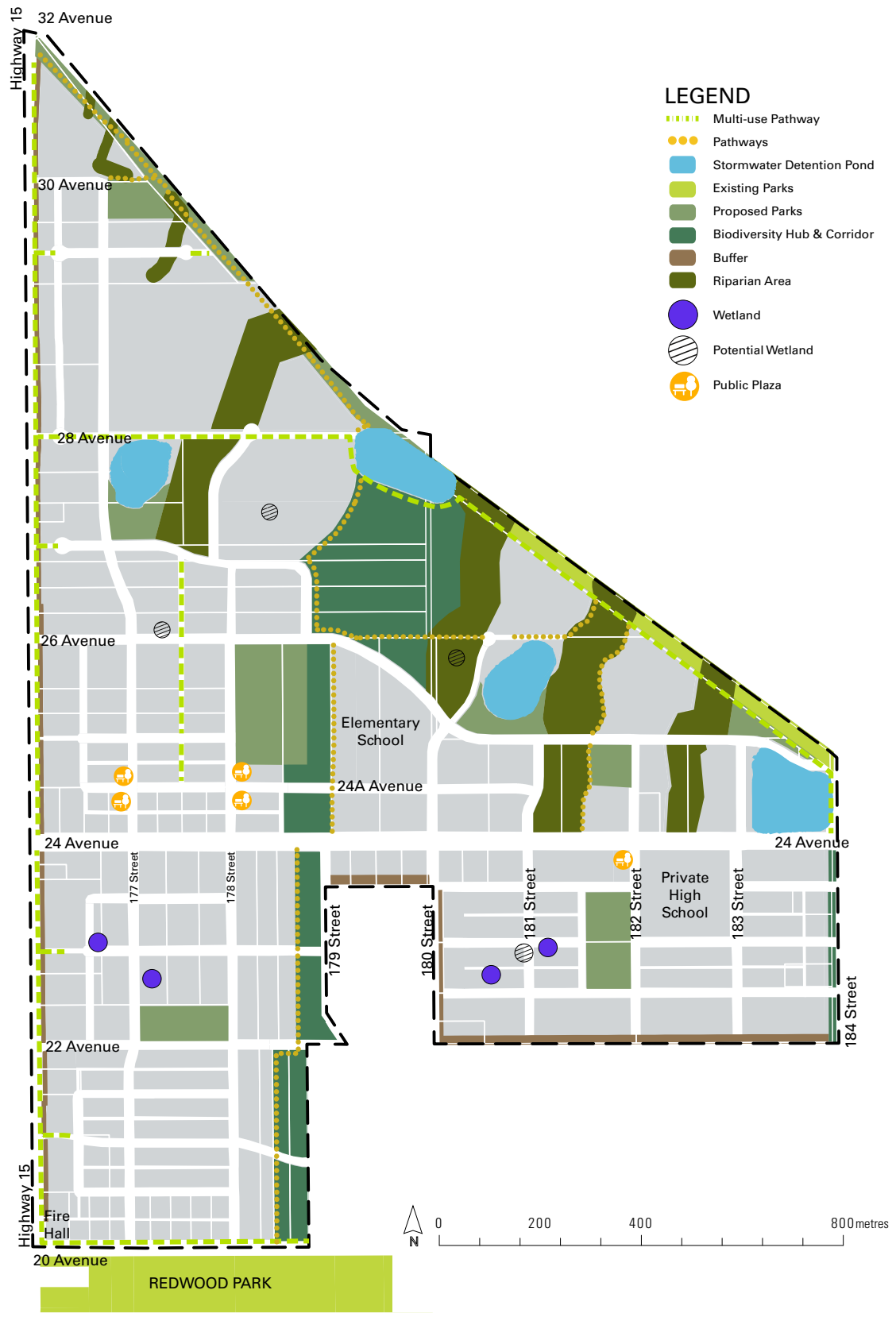


Figure 5.1: Parks and Open Space Strategy

5.2 Parks

COMMUNITY & NEIGHBOURHOOD PARKS

Community level parks provide a variety of amenities that attract residents from outside of their immediate neighbourhood, serving the broader community. The park at 26th Ave and 177 St is the largest park in Redwood Heights at 3.04 hectares (7.51 acres) and most central to the mixed-use village core of the area. It will likely contain active amenities, such as sports field(s), sports court(s), a playground, paths and seating opportunities. It will also be the feature gathering location for celebrations and active uses in the community.

Neighbourhood parks are typically smaller local parks that serve the open space needs of local residents and include amenities such as playgrounds, paths and seating, while in some cases also doubling as the location for detention ponds and protection of riparian areas. The plan will deliver several new neighbourhood parks to ensure that all future residents live within close proximity of parkland.

PARK DESIGN GUIDELINES

Successful parks are the result of meaningful consultation with neighbours and thoughtful planning and design. A key component of this design success is the interface with adjacent roads and private spaces. Development adjacent to parkland should positively contribute to design and function of each park by complying with the following guidelines:

GUIDELINE 1:

Development adjacent to, or across the street from all parks and public pathways should apply CPTED design principles such as unit orientation, clear sight lines, active rooms and windows facing public spaces. Adjacent commercial or retail developments should provide active frontage and avoid loading or other 'back of house' functions adjacent to public space.

GUIDELINE 2:

Multi-family development adjacent to parkland should orientate the front of units and incorporate main entry doors facing onto parkland. The private

development should have a walkway on its property line to provide access to its parkland fronting units. Shrubbery to delineate private property is preferred over fencing. Fencing is discouraged, but if required, will be no more than 0.9 m high, visibly open and setback at least 1.0 m from the property line with landscaping in front of the fencing.

GUIDELINE 3:

Development should meet the existing natural grade of parkland. If retaining walls are required adjacent to parkland, they must be entirely on private property including any underpinning with all necessary setbacks required for maintenance of private property, such as machinery access.

GUIDELINE 4:

If rights of way for servicing or any other access (temporary or permanent) are required through existing or future parkland, compensation for the access and cash in lieu for the restoration re-planting are required, to Parks standard.

GUIDELINE 5:

Any development adjacent to an existing or future park must submit an arborist report including the first 15 m of land within the park and report on all trees 8.0 cm Diameter at Breast Height (DBH) or greater. Removal of any tree on parkland requires advanced written approval from the Parks Division.

GUIDELINE 6:

If any of the detention ponds that are adjacent to existing parkland are relocated through the development process, the equivalent park area outside the footprint of the detention pond must also be relocated or reallocated through the pond relocation process.

5.3 Natural Spaces

Redwood Heights is characterized as one of Surrey's most ecologically significant areas, with substantial mature forest, fish bearing creeks and a variety of wildlife habitat. Primary environmentally sensitive features identified within the NCP area include: a biodiversity hub and corridors, watercourses and riparian areas.

The proposed plan protects approximately 18 hectares (45 acres) of GIN land including approximately 50% of Hub H, an important hub in the BCS. The plan also protects the two aforementioned BCS corridors, which will be managed as natural area parkland.

There will be impacts on environmentally sensitive areas that require mitigation through the implementation of this plan. Development will abide by all required regulations, by-laws and policies, including the guidelines outlined within the plan.

The proposed underground piping for water, sanitary, and stormwater servicing will be mostly located within the proposed road network to minimize impact to natural areas. Underground utilities that are proposed along or across biodiversity corridors will be installed with minimal impact and with appropriate natural restoration to maintain functions as biodiversity corridors.

BIODIVERSITY CONSERVATION STRATEGY

The City's Biodiversity Conservation Strategy (BCS) was adopted in 2014 with the goal to preserve, protect and enhance Surrey's most sensitive biodiversity, an interconnected system of natural areas and open space, known as the Green Infrastructure Network (GIN). Protecting land within the GIN will provide long-term benefits to both wildlife and people.

Within the plan GIN area, north of 24 Avenue, is a large intact forest with mature trees of significant size, known as Hub H. Hub H contains terrestrial, riparian and stream habitat including conifer and mixed forest stands and Justin Brook, a fish-bearing creek.

The central terrestrial hub identified by the BCS is one of the most important in the City in terms of its biodiversity and ecological value. The protected hub

will be approximately 14.2 ha (35 acres) in size in conjunction with the adjacent riparian areas. There will be limited public access in order to prioritize wildlife habitat protection and enhancement while still allowing for some educational and passive access to the area.

WETLANDS & WATERCOURSES

While there have been several assessments of wetlands and watercourses within Redwood, recent amendments to the Provincial Water Sustainability Act and Riparian Areas Protection Regulation required further analysis to ensure compliance with changes to Provincial legislation.

In December 2019, Dillon Consulting conducted an updated review and identified major wetland features and watercourses. However, it's important to note that the inventory identified conditions as of December 2019 and may not be comprehensive. Furthermore, ongoing changes to environmental conditions may impact existing channels and wetlands. As such, a Qualified Environmental Professional may be required to conduct further detailed review to identify and assess existing wetlands and watercourses, and the presence of potential wetlands and watercourses in accordance with current regulations prior to development.



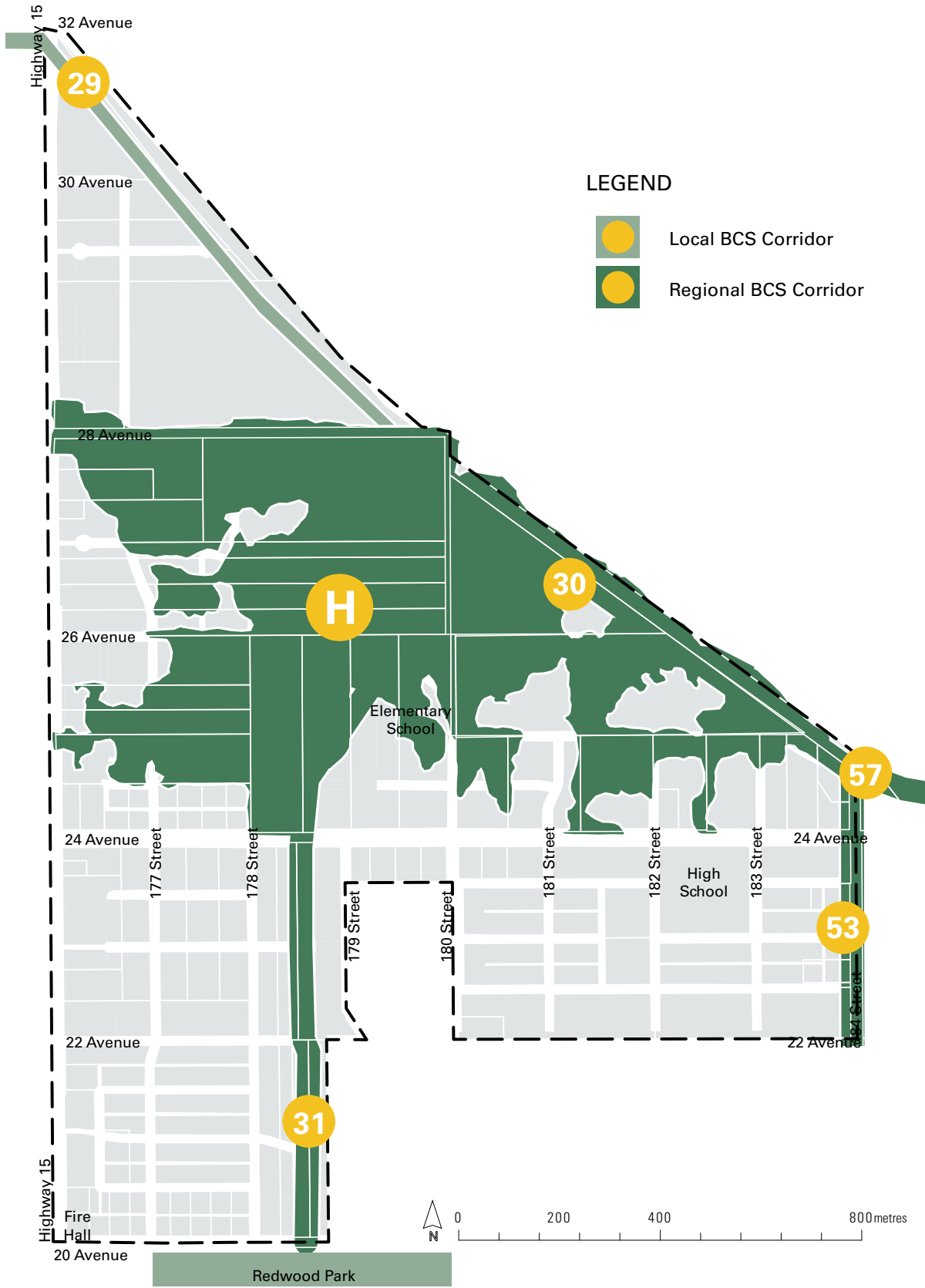


Figure 5.2 BCS Hubs and Corridor Areas



Figure 5.3 Wetlands and Watercourses

BIODIVERSITY CORRIDORS

Biodiversity corridors, as identified within the BCS, are intended to protect the intrinsic value of natural areas with a focus on ensuring habitat connectivity between larger ecosystems. Central to the plan area is a critical corridor connecting Redwood Park in the south with the protected biodiversity hub and ALR lands in the north. It will be a minimum of 50 m wide with limited public access. There will be special design cross sections where it crosses roads including a wildlife underpass crossing under 24 Avenue.

A second biodiversity corridor runs along the northern edge of the NCP, within the old railroad right of way and is primarily existing parkland. Riparian areas will also be conveyed and managed to protect fish and fish habitat values. Some riparian areas will have public paths along the outer edge, providing important off-street pedestrian connections while allowing for residents to engage and explore natural spaces in their neighbourhood.

Both biodiversity hubs and corridors will be managed as natural area parkland with a strong focus on habitat enhancement and protection.



WILDLIFE CORRIDOR CROSSING GUIDELINES

The following design elements should be considered for all wildlife crossing areas:

1. Wildlife Signage – to notify of typical wildlife that may be present in the area.
2. Fencing – drift fencing to direct wildlife to a crossing structure or location.
3. Road x-section – Review opportunities to narrow the road to minimize crossing distance. If typical road has a centre median, reposition median to the edges to minimize overall crossing distance.
4. Lighting – LED street lighting should be a light frequency tuned to minimize negative effects on wildlife.
5. Curbs – roll over curbs should be implemented to allow small mammals and amphibian to cross easier.
6. Wildlife crossing culverts – Fisheries culverts should be oversized to accommodate wildlife at low flows. Dry culverts should be installed to facilitate wildlife movement under the roadway.
7. Vegetation planting – plant native vegetation to provide maximum cover on either side of the road.
8. Trees – plant trees which provide large overhanging branches across the roadway to allow birds, insects and arboreal animals (e.g. squirrels) easy access limb to limb
9. Wildlife passage under 24 Avenue will be facilitated by a wildlife culvert for small mammal crossings with ultimate design influenced by Surrey’s Biodiversity Design Guidelines under development in 2020 (See Figure 5.4).

24 AVE WILDLIFE UNDERPASS CONCEPT (37 m CROSS-SECTION)

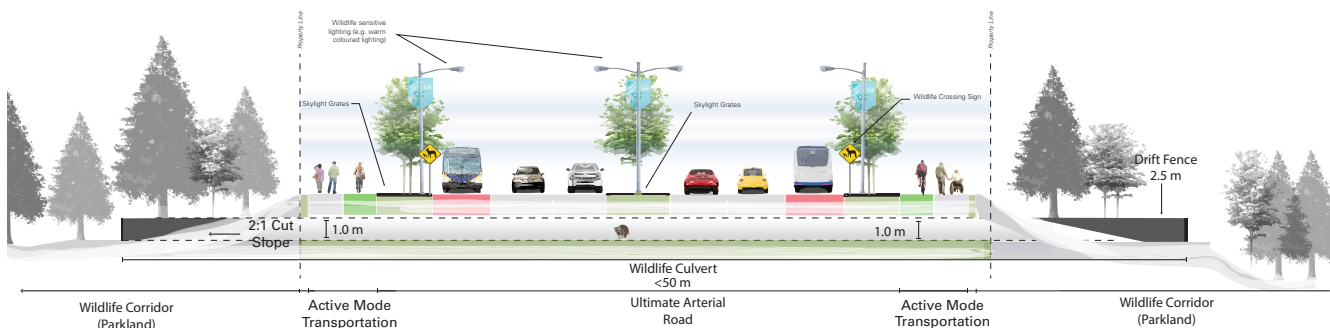


Figure 5.4 24 Ave Wildlife Underpass Concept

ENVIRONMENTAL GUIDELINES

The topography of the NCP slopes steeply northeast to low lying agricultural land, including several creek ravines. Most of the water flowing down this slope is conveyed to Erickson Creek, which flows out to the Nicomekl River.

The following environmental guidelines should be in effect in Redwood Heights:

GUIDELINE 1

Identified environmental features, including watercourses, treed areas, and open field habitat should be conserved and protected through Streamside Protection Areas and/or other conservation designations. Where the GIN runs through private property, the provisions of the Sensitive Ecosystem Development Permit Area should apply.

GUIDELINE 2

Recreation trails or pathways are encouraged adjacent to natural areas, provided the ecological integrity is not adversely affected by trail development and use. Significant tree removal must be avoided and additional native vegetative planting may be required.

GUIDELINE 3

Public access will be limited to sensitive natural areas where access is deemed detrimental to habitat integrity and viability.

GUIDELINE 4

Active park sites and community facilities are encouraged adjacent to conservation areas provided they do not adversely affect ecological integrity or viability.

GUIDELINE 5

Trees should be protected and preserved in accordance with the City's Tree Protection Bylaw.

GUIDELINE 6

All creeks within the NCP are protected by applicable streamside protection and enhancement areas.

GUIDELINE 7

All protected riparian areas should be conveyed at no cost to the City, through development, for their long term protection and management.

GUIDELINE 8

Where removal of natural vegetation through development is unavoidable, and approved by the City, on-site landscaping should predominantly use native species.

GUIDELINE 9

Control of sedimentation and erosion in runoff should be required during the construction of new development, in accordance with the City's Erosion and Sediment Control Bylaw.

GUIDELINE 10

All development applications should be reviewed with the intent of protecting and maintaining the environmental integrity and viability of natural features.

GUIDELINE 11

Installation of the sanitary trunk sewer, proposed at the base of the northeastern slope adjacent to the ALR, should minimize impact to natural watercourses through the use of trenchless construction technology. For utilities crossing Justin Brook, impact should be minimized by securing the pipes to the bridges that cross over the watercourse.

GUIDELINE 12

Construction of stormwater detention ponds should limit disturbance to the adjacent watercourses and limit the removal of forest vegetation. Any disturbed areas will be restored and enhanced through the planting of native species.

GUIDELINE 13

Integrate and implement approaches outlined in the City-wide Biodiversity Design Guidelines.

GUIDELINE 14

Prior to development a Qualified Environmental Professional should identify and assess wetlands and watercourses, as well as the presence of potential wetlands and watercourses, in accordance with current regulations.



5.4 Plazas

Plazas contribute to the livability of the public realm by encouraging social interaction and activity. Their central locations are fundamental to their intent as urban community gathering spaces.

Similar to parks, plazas require a strong program of use and design concept. Careful thought should be given to a plaza's principal function and its relationship with the adjacent public realm (i.e. streets, public parks), activities and architecture. Individual plazas function best as part of a hierarchy of open spaces within the neighbourhood open space network. Plazas should be delivered as publicly accessible open space through private development. Plaza design guidelines include:

GUIDELINE 1

Plazas should be a minimum of 100 sm.

GUIDELINE 2

Layout and site design should be planned comprehensively within identified sites to complement and extend public streets, pathways and parks, while also achieving maximum solar access.

GUIDELINE 3

Open space should be designed to serve specific functions and activities for adjacent buildings and support uses such as outdoor seating, eating and play.

GUIDELINE 4

Provide clear street visibility to indicate the space is public, and to encourage street activity and public safety. Avoid screening or blocking off the plaza from the street.

GUIDELINE 5

Grade at street level to avoid retaining walls, stairs and ramps in order to provide clear access for all.

GUIDELINE 6

Take advantage of distant views to mountains, agricultural land, and other landmarks wherever possible.

GUIDELINE 7

Plazas should be linked to surrounding open spaces, as well as interior spaces such as lobbies and adjacent retail, to create a more useful, dynamic, and coherent urban environment.

GUIDELINE 8

Integrate landscaping with shade trees and durable planting to soften the hardscaping. In-ground planters should be used instead of raised planters. Furthermore, rain gardens should be incorporated into the curb bulges at the Mixed-Use Village.

GUIDELINE 9

Plazas should maximize seating opportunities and comfort, including:

- opportunities for sitting walls, steps, planters, and feature edges;
- seating oriented to views, amenities or attractions;
- variety of seating types with opportunities for universal accessibility;
- comfortable seating with character elements (e.g. wood) seat backs and armrests; and,
- opportunities for weather protection, specifically sun and rain.

GUIDELINE 10

Plazas should be furnished with a variety of amenities to encourage public usage and to create a sense of liveliness and excitement. Key amenities can include bike racks, drinking fountains, tables and chairs, games and public art.

GUIDELINE 11

Successful plazas are generally characterized by multiple activity generators, such as adjacent food and retail outlets, as well as entertainment, which attracts users and encourages socializing and relaxation. Provide infrastructure for events (e.g. electrical outlets, water supply and lighting) and to facilitate activity.

GUIDELINE 12

Plazas delivered as publicly accessible open space within development should be oriented towards multi-family outdoor amenity space at 50% ratio.

Section 6

| The Nuts and Bolts

BACKGROUND

PLAN
FRAMEWORK

LAND USE

TRANSPORTATION

PARKS &
NATURAL AREAS

UTILITIES

IMPLEMENTATION

Future population growth in Redwood Heights will require improvements to utility infrastructure, including water, sanitary and drainage systems.

PAGE	SECTION
98	6.1 Existing Drainage
99	6.2 Drainage Design Criteria & Analysis
104	6.3 Proposed Drainage System
117	6.4 Existing Sanitary
117	6.5 Sanitary Design Criteria & Analysis
120	6.6 Proposed Sanitary System
128	6.7 Existing Water System
128	6.8 Water Design Criteria & Analysis
132	6.9 Proposed Water System



6.1 EXISTING DRAINAGE

The Redwood Heights NCP area is approximately 210 hectares in size and is located within the Erickson Creek watershed.

Stormwater in the area generally flows north east towards Erickson Creek which drains through the ALR to the Nicomekl River. The ALR begins at the north east border of the NCP area and is sensitive to flooding caused by increased flow rates and volumes.

The NCP area is currently comprised of single family residential lots, many of which are over one acre in size. The land has significant grass and tree cover, promoting rainwater capture, infiltration, and natural attenuation of flows. There is minimal drainage infrastructure within the study area. Local drainage is accomplished by roadside ditches with driveway culverts and intermittent stormwater pipes that convey flow to the various watercourses.

Drainage flows north east towards Justin Brook and several smaller tributaries, most of which flow into Erickson Creek. A floodbox and pump station outfall arrangement located downstream within the agricultural lowlands conveys flows into Nicomekl River.

SOIL CONDITIONS

The NCP Stage 1 and Erickson Creek Integrated Stormwater Management Plan (ISMP) indicate that the soils in Redwood Heights generally consist of peat underlain by clay deposits, which are often saturated. Infiltration of annual rainfall and stormwater on a mid to large scale was not deemed feasible. Investigations in the NCP Stage 2 confirmed these findings.

As part of NCP Stage 2, geotechnical exploration was conducted to confirm soil and groundwater conditions and infiltration potential. Surface organics and fill were encountered to a depth of 0.6 m, with stiff silt mixed with trace sand and gravel below. Groundwater was not encountered in the 1.5 m deep test pits. Percolation tests were conducted in the silt layer of all test pits, yielding an average percolation rate of 1.5 mm/hr, which were reported as typical for stiff silt. This is generally considered low permeability and, therefore, poor infiltration capacity. As a result, full infiltration is not a viable option for the NCP area.

The presence of a thick layer of organics at the surface indicates potential for significant rainfall capture and low surface runoff rates. The low permeability layer beneath indicates that there is little deep aquifer percolation. It is expected that the organic layer absorbs water and provides a subsurface flow path for water to gradually reach a point of seepage or discharge into a receiving water course. This is known as base flow or interflow and is an important component of the area's hydrology.

Future development will likely strip the organics layer in favour of the more structural soil, but with less permeability. This will interrupt the existing rainfall capture and interflow patterns which will require mitigation to protect downstream infrastructure, agricultural lands, streams / channels, and aquatic habitat. Approaches that retain rainwater from smaller rainfall events and simulate the interflow process, such as Low Impact Development techniques, should be included as part of the overall drainage servicing strategy for Redwood Heights.

6.2 DESIGN CRITERIA & ANALYSIS

Design criteria and targets for peak flow conveyance, runoff rate control, and runoff volume control were obtained from the City's 2016 Design Criteria Manual, the Erickson Creek ISMP, and the NCP Stage 1 Plan. Further hydraulic analysis was completed under the NCP Stage 2 using advanced modeling software. A control point was established for each catchment at its downstream point of discharge. These points were used to compare pre and post development flow rates and volumes.

6.2.1 Conveyance

The City requires that the minor, piped systems have a minimum capacity for the 5-year return period flow. The 100-year return period flow is allowed to surcharge to the surface as long as there is an adequate surface flow route to a safe discharge point.

Having the potential for in-ground basements requires the minimum basement elevation to be at least 0.3 m above the 100-year hydraulic grade line, which precludes the possibility of using a surface flow route for the 100-year flow. A piped system must be designed to have capacity for the 100-year return period flow and a minimum depth of cover of 2.5 m to allow for in-ground basements for single family dwellings in the Redwood Heights NCP area.



6.2.2 Runoff Rate

Future development will increase impervious area, thus increasing peak runoff rates as well as runoff volume. Increased runoff rates have the potential to overload downstream infrastructure and conveyance channels and cause flooding during the peak of a storm event. Controlling the peak runoff rate is typically accomplished by temporarily storing runoff in a pond during peak flows and slowly releasing it.

The runoff rate targets for the Redwood Heights NCP were established using the City's Design Criteria Manual, as being the more stringent of:

- Control the 5-year post-development flow to 50% of the 2-year post-development rate, or
- Control the 5-year post-development flow to the 5-year pre-development flow rate.

Both criteria were applied to the 1, 2, 6, 12, and 24-hour duration storms for the given return periods. For this analysis, pre-development conditions refer to existing conditions as recommended as a basis of comparison in the Erickson Creek ISMP. It was found that the first criterion and the 24-hour duration storm were limiting for all catchments. A design concept was chosen to satisfy all criteria.

Stormwater storage facilities (detention ponds) are designed as wet ponds using an active storage depth of 1.5 m and a permanent water depth of 1.5m, as per the City's Design Criteria. The maximum side slopes of 4:1 are used for this design to minimize the total footprint area required for the pond.

Ponds are generally placed near the downstream point of every catchment to service as much of the catchment as possible. Not all areas will be serviced by a pond; areas not serviced are assumed to generate uncontrolled runoff. The ponds in such catchments will, therefore, over-detain the rest of the catchment so that the overall release rate meets the required target. In such instances, any development located downstream of a detention pond cannot proceed prior to construction of the upstream pond.

Minimizing any increases in flooding of the sensitive ALR lands directly downstream of Redwood Heights was a design consideration. The summer and winter storms in the BC Agricultural and Rural Development Subsidiary Agreement (ARDSA) criteria were simulated under pre-development and

post-development conditions and results tabulated to confirm that downstream infrastructure will be able to handle the post development flows.

Pre-development and post-development runoff rates from single event storms were obtained by computational modeling. Table 8.1 presents results for the design criteria listed above. The control points listed are shown in Figure 8.1. It should be noted that the proposed drainage servicing changes the catchment area of each control point. However, this will not cause deleterious effects on the creeks as the post development runoff rates at each control point are adequately controlled to the original pre-development level.

EXISTING DRAINAGE

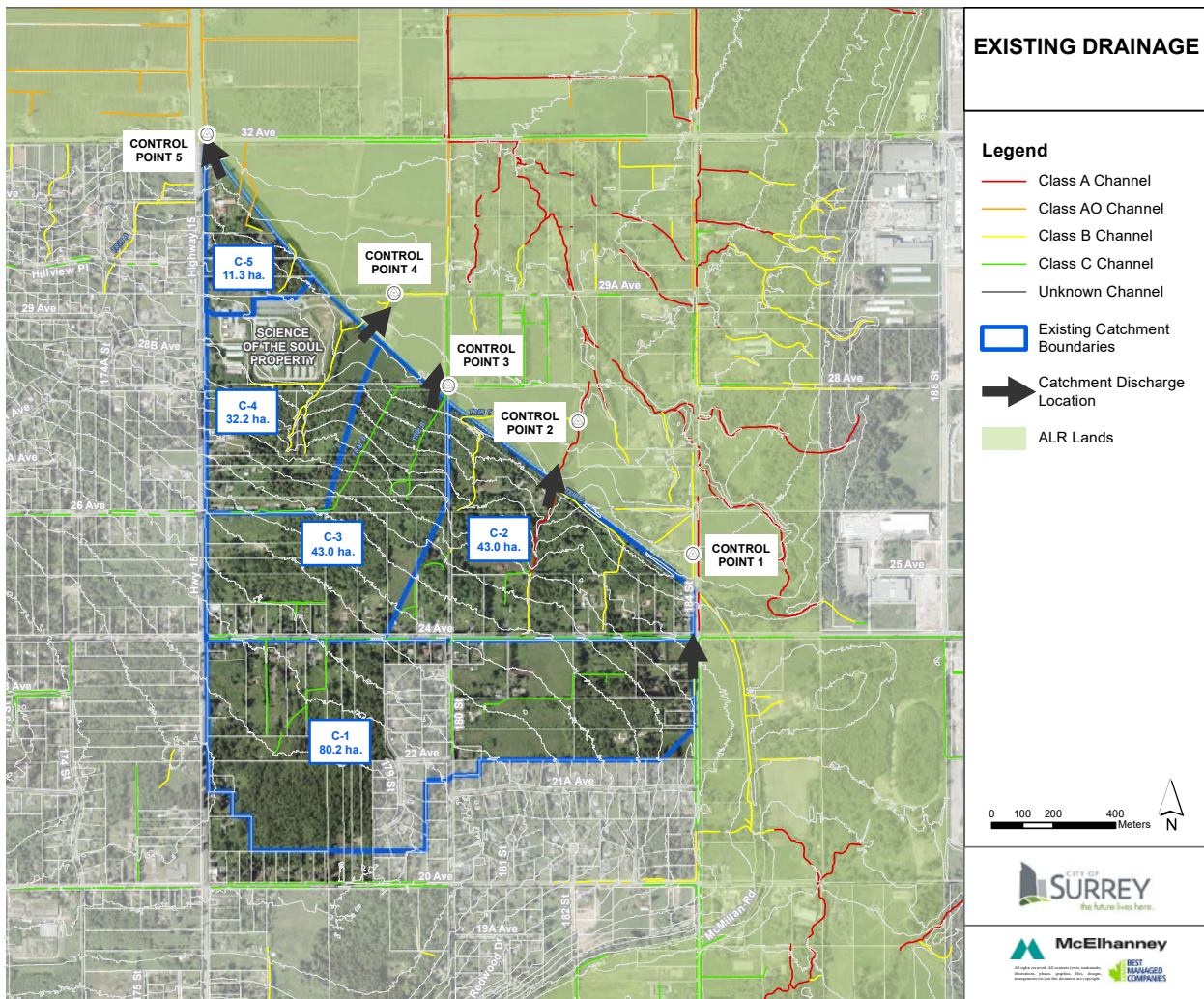


Figure 6.1: Existing Drainage

RUNOFF RATES

Control Point	5 Year Pre- development Runoff		50% 2 Year Post-development Runoff		100 Year Pre-development Runoff
	Area (ha)	Flow Rate (L/s)	Area (ha)	Flow Rate (L/s)	Flow Rate (L/s)
1	80.2	970	74.9	352	1910
2	43.0	670	45.9	209	1140
3	43.0	540	44.8	155	1060
4	32.2	420	36.6	143	810
5	11.3	170	14.6	78	300

Table 6.1 Runoff Rates

6.2.3 Runoff Volume

Development will convert a significant area of existing pervious and absorbent ground to impervious and unabsorbent surfaces. This will cause an increase in runoff volume and a decrease in infiltration. Increased runoff volume can increase erosion in downstream channels, pose a flooding risk to downstream agricultural lands, and place additional demand on farmland drainage infrastructure. Decreasing infiltration also reduces summertime baseflows in downstream channels which has a negative impact on its ecosystem.

The Erickson Creek ISMP and NCP Stage 1 completed a water balance model to estimate the fraction of annual rainfall that produces runoff. The results indicate that 29% of annual rainfall currently produces runoff while 15% infiltrates and the remainder evapotranspires. Under post-development conditions, there is limited capability to retain significant vegetation cover and evapotranspiration. As a result, 71% of the total annual rainfall volume is required to infiltrate in the post-development scenario as determined by computational hydrologic modeling using recorded rainfall data.

NCP Stage 1 recommended several low impact development (LID) strategies for meeting the runoff volume target. The most practical are 450 mm of topsoil and other absorbent landscaping, disconnected roof leaders, permeable paving, infiltration swales, and infiltration trenches.

Infiltration swales and trenches were designed and modeled with an underflow designed to take the LID from full to empty within 3 to 4 days after the storm ends. This will allow the storage capacity of the LIDs to be available to capture volume from subsequent rainfall events while providing a slow release of runoff that mimics base flows. As a result, nearly every storm will have a significantly reduced runoff volume.

6.2.4 Methodology

Hydrologic and hydraulic modeling was carried out with PCSWMM software. Various inputs to the model were required, as presented in Table 6.2. Soil parameters were chosen based on the geotechnical investigation as well as information presented in the Erickson Creek ISMP and the NCP Stage 1. A conservative infiltration rate was chosen to account for clogging that may reduce infiltration rates over time.

Impervious Manning's Number	0.013
Pervious Manning's Number	0.035
Impervious Depression Storage (mm)	1.5
Pervious Depression Storage (mm)	7
Zero Impervious Depression Storage (%)	0
Green-Ampt Conductivity (mm/hr)	1.2
Green-Ampt Suction Head (mm)	239
Green-Ampt Initial Moisture Deficit (frac)	0.091

Table 6.2 Hydrologic and Hydraulic Modeling Inputs

6.2.5 Single Event Modelling

Single event modeling was used to assess the performance of the proposed conveyance and detention infrastructure in safely passing the 100-year flow without surcharging and controlling the 5-year flow to the established target. The winter and summer ARDSA storms were modeled to assess flooding impact on downstream agricultural lowlands.

Design storms were obtained from the City of Surrey's Design Criteria Manual for the Municipal Hall station. The 2, 5, and 100-year return period and 1, 2, 6, 12, and 24-hour duration storms were used to assess the performance of the proposed design.

A detailed hydrologic and hydraulic model was created with sub-catchments representing various areas within each major catchment. Trunk sewers were modeled to confirm pipe sizes and slopes to convey the required flow and sewer depths and grades were reviewed to confirm alignments, basement potential and congruency with sanitary sewer alignments.

6.2.6 Continuous Simulation

Continuous simulation was used to prepare a water balance analysis to assess the performance of the specified LIDs to reduce runoff volume by infiltration and evapotranspiration.

A geotechnical investigation indicated an average percolation rate of 1.5 mm/hr based on 4 test holes within Redwood Heights. A factored and conservative value of 1.2 mm/hr, characteristic of sandy clay, was specified to model the infiltration capacity over the site.

Monthly evapotranspiration averages obtained from Environment Canada were used to model evapotranspiration losses from the catchment. Hourly rainfall data collected between 1963 and 1999 for the Municipal Hall station was used in the continuous simulation.

A catchment level water balance model was developed to represent the post-development major catchments. On-lot and off-lot LIDs were applied to this model to confirm that volume reduction targets were achieved.

Water that exited the model via a LID underdrain was counted as runoff and did not count towards volume reduction. Runoff was routed through on-lot LIDs and then through off-lot LIDs as appropriate, bearing in mind that not all runoff will be intercepted by a particular LID.



6.3 PROPOSED DRAINAGE SYSTEM

The proposed drainage system is specified to achieve the targets and criteria to mitigate and reduce the impacts to downstream infrastructure and habitat by reducing discharge rates and volumes. Catchment sizes and boundaries are kept as similar to existing as possible in order to maintain current flow patterns. The main components comprising the drainage system proposed for the Redwood Heights NCP include:

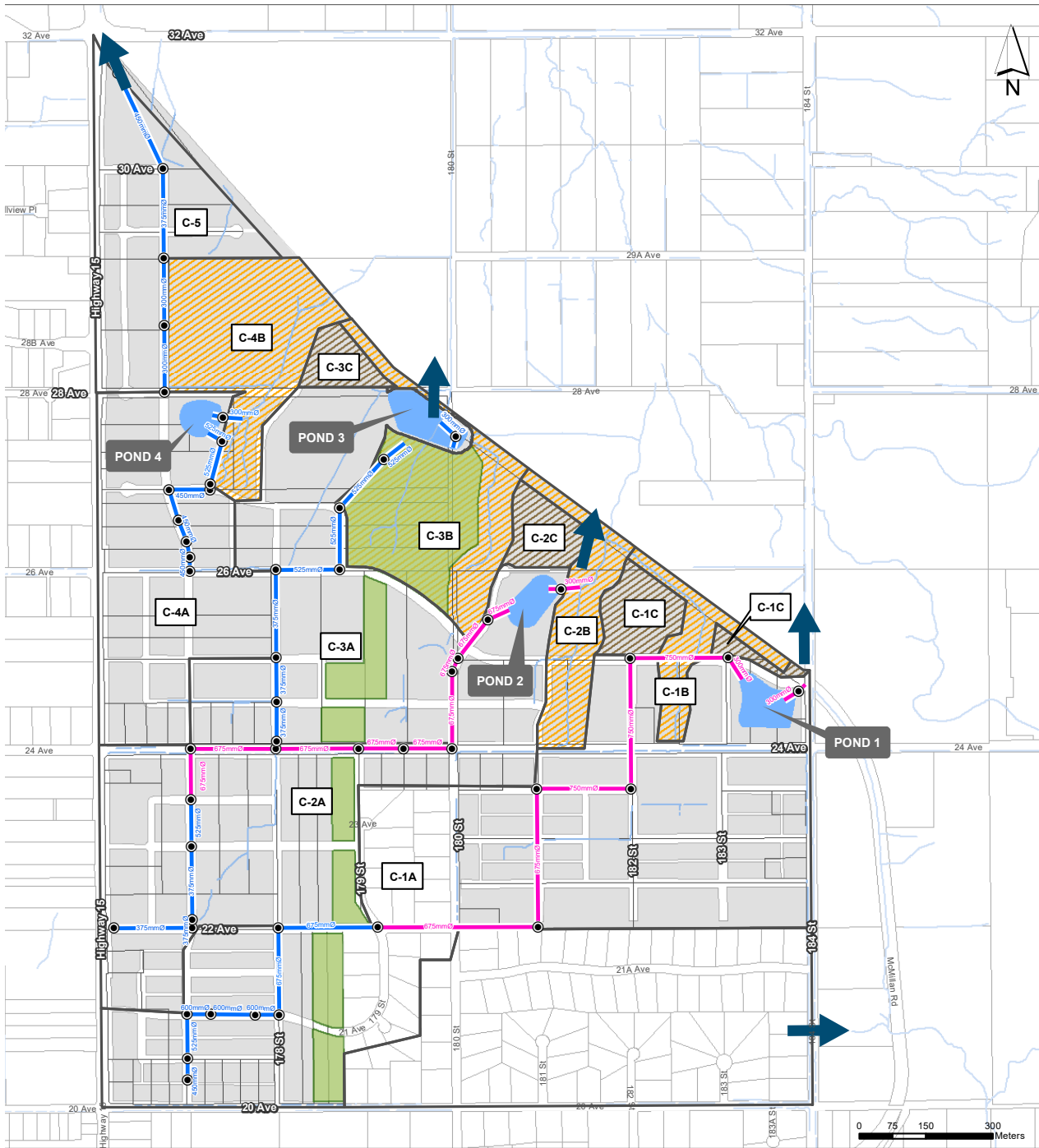
- Underground storm sewer system to collect and convey runoff from the various lots proposed within the neighbourhood;
- Detention ponds to control post-development flows to established rates for the 5-year return period; and
- Low impact development (LID) measures located throughout the development to provide stormwater retention in order to meet runoff volume targets.

The proposed drainage system for the NCP area has 5 drainage catchments and 4 detention ponds, as shown in Figure 6.2.

POND INFORMATION SUMMARY

Pond #	Pond Catchment Area (ha)	Pond Volume (m3)	Unit Storage (m3/ha)	Area at High Water Level (ha)	5-year Release Rate (m3/s)
1	68.8	14,000	205	1.15	0.32
2	38.3	8,500	221	0.73	0.18
3	29.1	11,200	384	0.93	0.03
4	23.8	5,900	247	0.53	0.10

Table 6.3 Pond Information Summary



PROPOSED DRAINAGE

- Proposed Manholes
- ➔ Catchment Discharge Location
- ▨ Area to Maintain Existing Drainage Pattern
- Water Course
- ▨ Developable Property not Controlled by a Pond
- Proposed Local Sewer
- ▭ Proposed Catchment Boundaries
- Proposed Trunk Sewer
- ▭ Wildlife Hub



Figure 6.2 Proposed Drainage

6.3.1 Runoff Rate Control

Runoff rates from Redwood Heights will be controlled by detention ponds for the majority of the areas, with the exception of Catchment 5 and several areas downstream of proposed ponds that will be controlled through the use of on-lot and off-lot LIDs. All detention ponds will be designed as wet ponds to promote stormwater treatment through settling of suspended solids during and between rainfall events.

Some catchments contain properties that are unable to drain to the detention pond and will, therefore, discharge uncontrolled into the receiving water course. Over-detention will be used to compensate for uncontrolled runoff so that the total runoff rate meets the requirement.

Some catchments also contain areas designated as riparian or wildlife hubs which are not designated for development. Table 6.3 shows the area of each catchment and Figure 6.2 shows the catchment areas, proposed pond locations, control points, and areas not serviced by a pond.

CATCHMENT 1

Catchment 1 has 72.4 ha of developable land and will drain into a Class B ditch on the west side of 184 Street. Control Point 1 is located in this ditch immediately downstream of the NCP boundary. Pond 1 will require a total storage volume of 14,000m³ and will control approximately 68.8 ha of Catchment 1. The remaining 3.6 ha will run off uncontrolled so that the total peak runoff rate from the 5-year 24-hour storm will be less than 352 L/s.

Control Point 1 drains 74.9 ha of developable and riparian area. Catchment 1 contains 12 ha of land that was not included in the NCP area, but will drain to Pond 1. For design purposes, this land was assumed to be a mix of park, residential, and commercial property with an average imperviousness of 65%.

CATCHMENT 2

Catchment 2 has 40.7 ha of developable land and will drain into a Class A watercourse called Justin Brook which passes through Control Point 2 just downstream of a confluence with a Class B water course. Pond 2 will require a total storage volume of 8,500m³ and will control approximately 38.3 ha of Catchment 2. The remaining 2.4 ha will run off uncontrolled so that the total peak runoff rate from

the 5-year 24-hour storm will be less than 209 L/s. Control Point 2 drains 45.9 ha of developable and riparian land.

CATCHMENT 3

Catchment 3 has 31.0 ha of developable land and will drain into Tributary B which is a Class C channel that passes through Control Point 3. The west fork of Tributary B will be diverted to a proposed piped stormwater system on 26 Avenue to accommodate development. The piped flow will then drain to the east fork of Tributary B, which then flows northward to the proposed detention pond for the catchment. Tributary B has insignificant aquatic habitat so eliminating a portion of the watercourse has little environmental impact.

Pond 3 will require a total storage volume of 11,200m³ and will control runoff from the approximately 29.1 ha of Catchment 3, while the remaining 1.9 ha will run off uncontrolled. Pond 3 will over-detain the runoff from the 29.1 ha to compensate for the uncontrolled 1.9 ha. The total runoff rate from Catchment 3 during the 5-year 24-hour storm will be less than 155 L/s. Control Point 3 drains 44.8 ha of land including the developable land and the riparian areas for the remaining water courses and wildlife hub. Flow from Catchment 3 will contribute to Justin Brook, a Class A watercourse further downstream.

CATCHMENT 4

Catchment 4 will drain into Tributary A which is a Class B channel and passes through Control Point 4. Runoff from Catchment 4 is controlled by Pond 4 which requires a total 5-year storage volume of 5,900m³ and is constrained to release runoff from the 5-year 24 hour storm at 143 L/s.

The Science of the Soul property (2932 176 Street) north of Pond 4 and west of Tributary A is also in the tributary; it currently has a stormwater control. It is recommended that any future development on the Science of the Soul property be mandated to control their own runoff rate and volume to the current values.

The riparian area around Tributary A will maintain pre- development conditions and will therefore not require any control. Catchment 4 is 23.8 ha which

does not include the Science of the Soul property or the riparian area as these areas will not be routed to the proposed detention facility. Control Point 4 drains a total of 36.6 ha.

CATCHMENT 5

Control Point 5 is located in the ditch system directly downstream of Catchment 5 as shown on Figure 8.2. Catchment 5's area of 14.6 ha is too small to be serviced by a pond. As a result, Catchment 5 will have extra LIDs sufficient to control the runoff rate and volume. All pervious area is required to have a minimum of 450mm of top soil. Single family units should have disconnected roof leaders to encourage mitigation of runoff by the top soil. Additionally, infiltration trenches will be installed in the road right-of-way with 1.0m wide trenches in front of each lot and extending the length of the lot. This will be in addition to the 12% road right-of-way trench that is recommended for the NCP area. The trench should have 450mm of drain rock with the underdrain invert 100mm above the trench invert. Typical details of the road right-of-way LIDs are shown in Figure 6.3 and Figure 6.4. These controls produce a 1:5-year post-development runoff rate of 77 L/s.

Outlets from each pond will be controlled with a flow control manhole as per City of Surrey Supplemental Standard Detail D10. Outfalls into natural channels will use headwalls and energy dissipation where necessary to avoid erosion around the headwall.



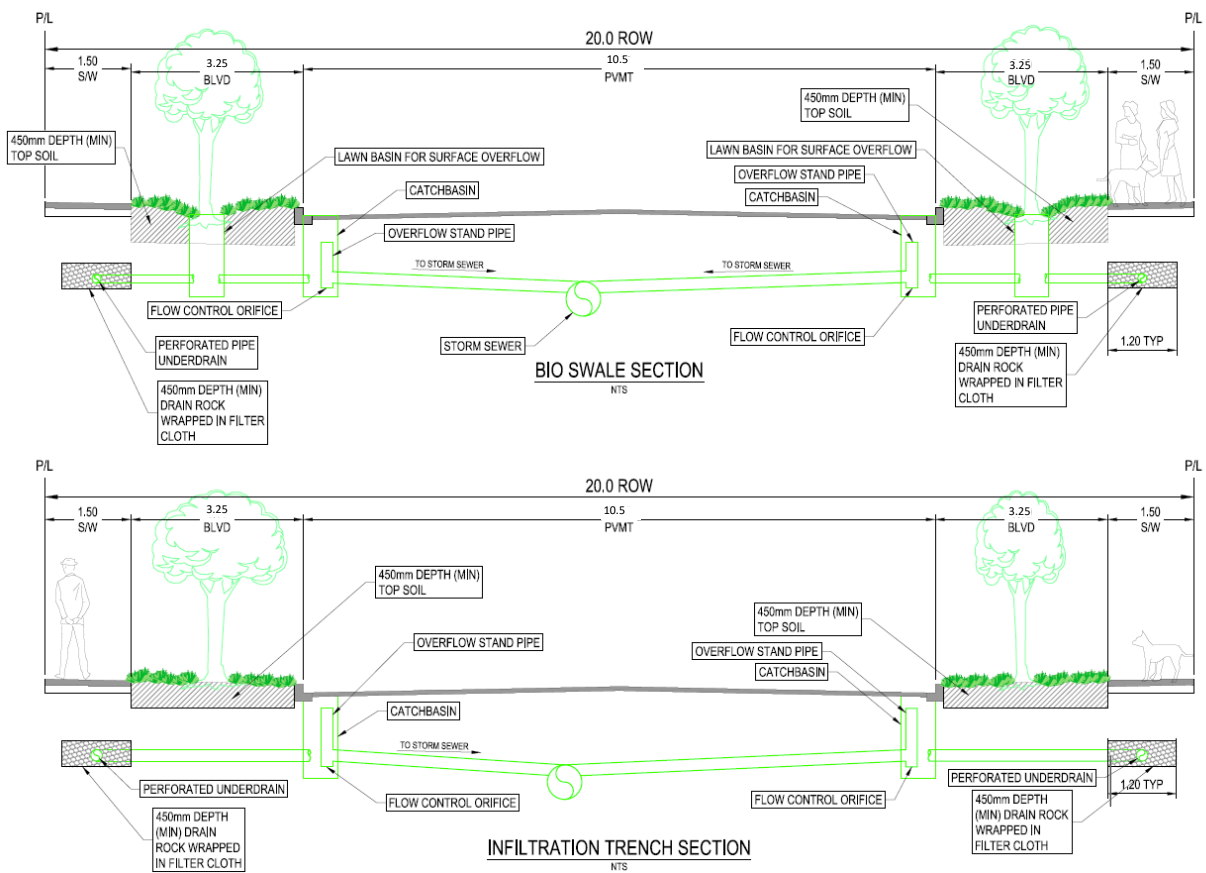


Figure 6.3 20 M Road Right-of-Way Bioswale & Infiltration Trench Cross-sections

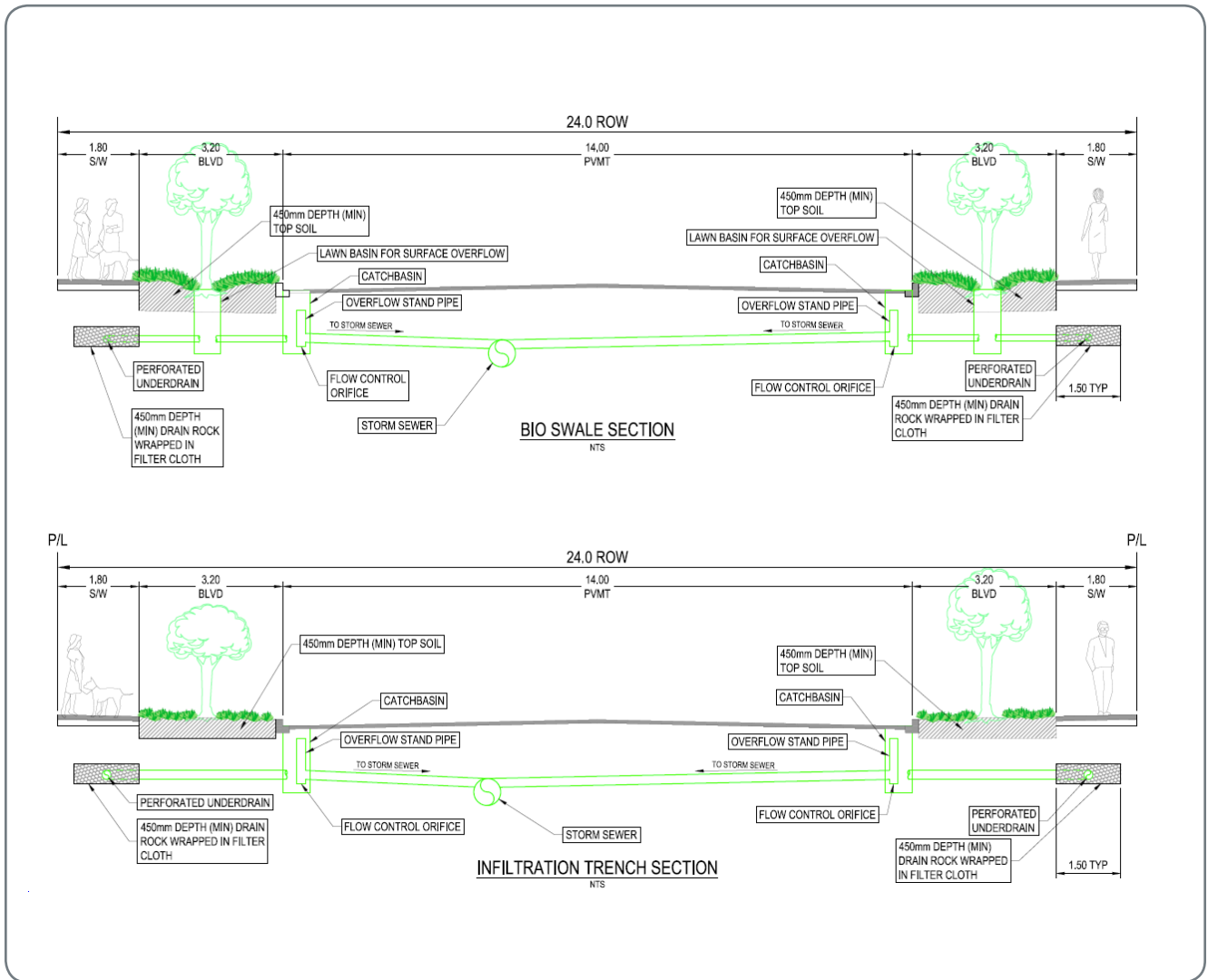


Figure 6.4 24 M Road Right-of-Way Bioswale & Infiltration Trench Cross-sections

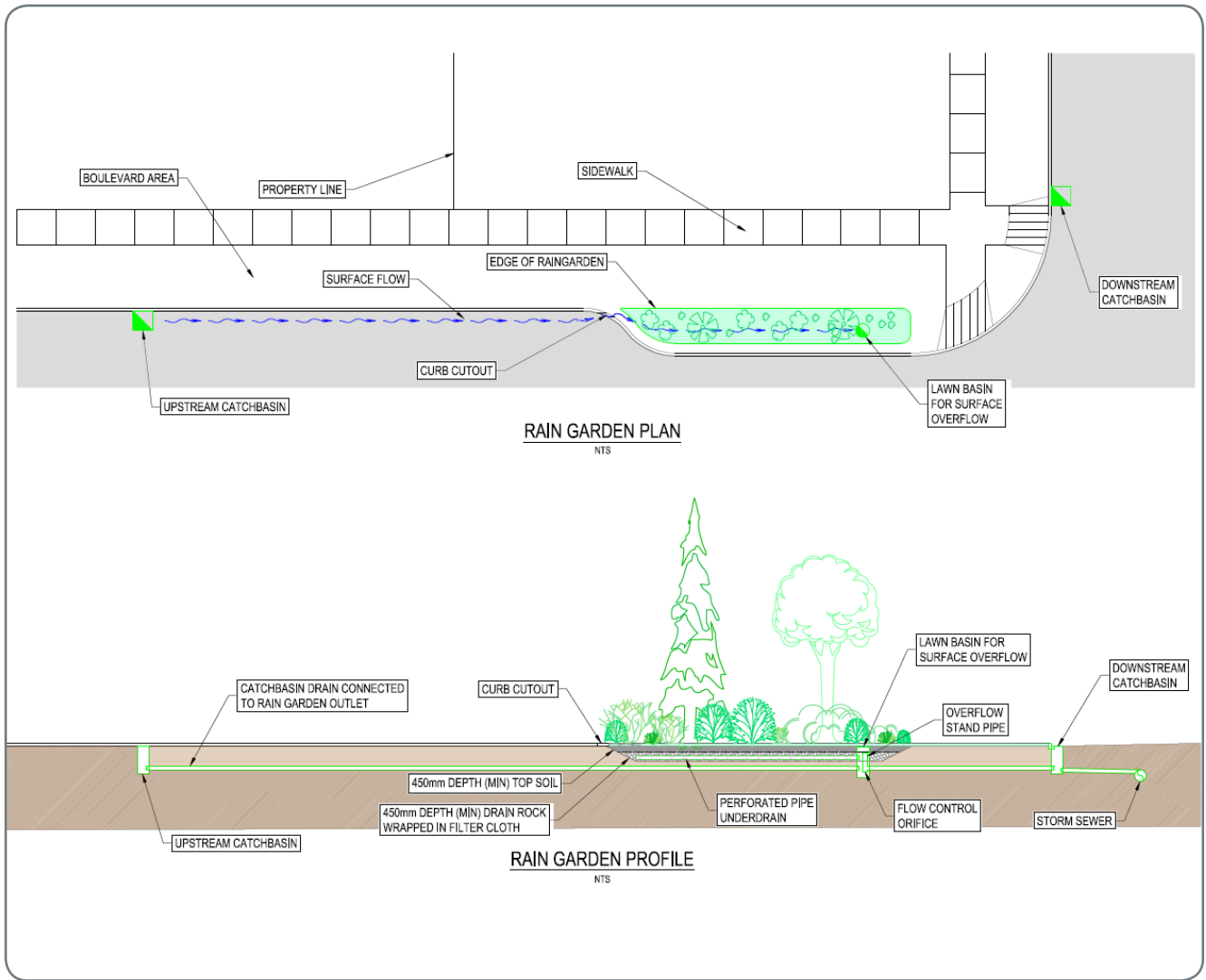


Figure 6.5 Rain Garden LID Details

6.3.2 Runoff Volume Control

Flow duration curves were obtained for each control point under pre-development and post-development conditions. These curves indicate a substantial reduction in the duration of flow rates for catchments controlled by a detention pond and LIDs as well as equivalent performance for Catchment 5.

LIDs were design by water balance modelling using PCSWMM software as described in Section 6.3.1. The exact percentages were obtained by an iterative analysis to match post-development runoff coefficients to the pre- development value of 0.29, as reported in the Erickson Creek ISMP. The proposed design specified LIDs conservatively to account for clogging and loss of function that will occur over time.

ON LOT LIDS

Absorbent landscape consists of minimum 450mm top soil and is required for all pervious areas within all properties and right of ways. Single family houses are also required to have disconnected roof leaders such that roof runoff will drain onto pervious area and have the opportunity to infiltrate.

Multifamily developments are required to have an area of infiltration trench, bioswale, or rain garden equal to 7% of the total development area. All pervious and impervious areas are to be directly connected to the infiltration trench, bioswale, or rain garden. For example, a 0.5 ha townhouse development could satisfy these criteria with a 350 sq. m rain garden. The rain garden should be as per Metro Vancouver's Stormwater Source Controls Design Guidelines (as amended from time to time) and receive runoff from the whole site, including roof leaders. The outlet of the rain garden should include an underdrain and surface overflow to the storm sewer. The underdrain would be orifice controlled such that the rain garden would be drained from full to below the underdrain within 3-4 days.

Commercial, industrial, institutional, and school properties are required to have an area of infiltration trench, bioswale, or rain garden equal to 12% of the total property area. All pervious and impervious areas are to be directly connected to the infiltration trench, bioswale, or rain garden. Typical details of a rain garden are shown in Figure 6.5. Provisions must be made to minimize clogging and maintain

infiltration capacity such as an oil / grit separator upstream of the rain garden or trench. The design recommendations of the Metro Vancouver Stormwater Source Control Design Guidelines are to be followed for sizing such a unit. Maintenance of on lot infrastructure will be the responsibility of the property owner.

For example, a 1 ha shopping center could satisfy these criteria with a 1,200 sq. m bioswale located along the downstream edge of the parking lot. The bioswale should receive runoff along its entire length from the whole site. The outlet should include an underdrain and surface overflow to the storm sewer. The underdrain should be orifice controlled such that the rock layer would be drained from full to below the underdrain within 3-4 days.

A summary of the required LID for each zone is provided in Table 6.4.

ROAD LIDS

ROW LIDs may include any combination of rain gardens, roadside swales, and infiltration trenches. The total area of road ROW LIDs must be minimum 12% of the road ROW area. All pervious and impervious surfaces must be directly connected to the LID such that no uncontrolled runoff enters the piped system.

For example, a 20m wide road ROW can satisfy these criteria with two 1.2 m wide infiltration trenches, one on each side. Catch basin leads should be fitted with an orifice and stand pipe such that flow from the catch basin to the storm sewer is controlled. This will allow water to backup into the infiltration trench and provide storage as well as infiltration. Small events will mostly infiltrate with little flow passing through the orifice. Large events will saturate the drain rock layer and engage the overflow stand pipe to prevent flooding of the paved surface.

In Catchment 5 (where LIDs are required to control runoff rate and volume) an additional 1.0m wide infiltration trench is required to control runoff from the residential properties. This additional trench is not to be located on private property. This trench may be substituted by equivalent area of bioswale or rain garden. Typical sections of each off-lot LID



option can be found in Figure 6.3, 6.4 and 6.5.

RESULTS

The runoff coefficients from pre-development, post-development with no improvements, and post-development with improvements are summarized in Table 6.5.

As shown, the LID infrastructure significantly reduces the runoff coefficient to below pre-development levels. This was done to account for the reduced functionality of the LIDs as time progresses. Developing the Redwood Heights NCP area without drainage improvements would increase runoff volumes and rates which would cause significant damage to the downstream conveyance, aquatic habitat, and ALR lands. The management strategy presented in this document will serve to mitigate this effect and control runoff rates and volumes to near or below pre-development levels.

The proposed drainage infrastructure for the NCP will maintain flood patterns in the downstream ALR lands as well as preserve critical aquatic habitat by reducing erosion during all rainfall events. The LIDs and ponds will control both runoff rate and volume such that downstream will experience lower flow rates and velocities than currently experienced. The proposed infrastructure will also promote a healthy aquifer by maintaining inputs into the groundwater table.

MAINTENANCE

Any private and road right-of-way LIDs, such as underground infiltration systems, rain gardens, and bioswales would generally require some maintenance to keep the systems operational. Maintenance would consist of cleaning of the connecting catch basin and lawn basin sumps along with collection of accumulated debris within bioswales and rain gardens. Regular street sweeping of gutters and curb-cuts at the inlet of rain gardens is recommended.

CONVEYANCE

A conventional storm sewer system is proposed for runoff collection and conveyance in this neighbourhood. A trunk sewer and local sewer system was designed for each major catchment to convey runoff from the 100-year storm to detention

facilities located in each catchment. Trunk sewers are defined as a storm sewer servicing over 20 ha of land; sewers with smaller catchments are local sewers.

The trunk sewer of Catchment 1 conveys flow from the south west portion of the NCP area and across a portion of land not currently slated for development. The trunk sewer is entirely in the proposed road right-of-way. In Catchment 3, pond 3 is located inside the wildlife hub; however, this should not impact the wildlife hub function. The majority of impact will occur during construction; it is recommended that an erosion and sediment control plan be prepared to protect and isolate undisturbed areas and restore affected areas as needed. The rest of the trunk sewers are expected to be entirely within the road right-of-way, not conflicting with other utilities, and approximately 2.5m deep.

Figure 6.6 shows the stormwater control plan based on the proposed drainage system.

LID REQUIREMENTS BY LAND USE

Land Use	LIDs Required
Half Area Residential	450mm top soil on all pervious areas
Single Family Residential	450mm top soil on all pervious areas
Single Family Residential	450mm top soil on all pervious areas
Multiple Family Residential	450mm top soil on all pervious areas and infiltration trench, bioswale, and/or rain garden equal to 7% of the total property area
Commercial and Industrial	450mm top soil on all pervious areas and infiltration trench, bioswale, and/or rain garden equal to 12% of the total property area
Institutional	450mm top soil on all pervious areas and infiltration trench, bioswale, and/or rain garden equal to 12% of the total property area

Table 6.4 LID Requirements by Land Use

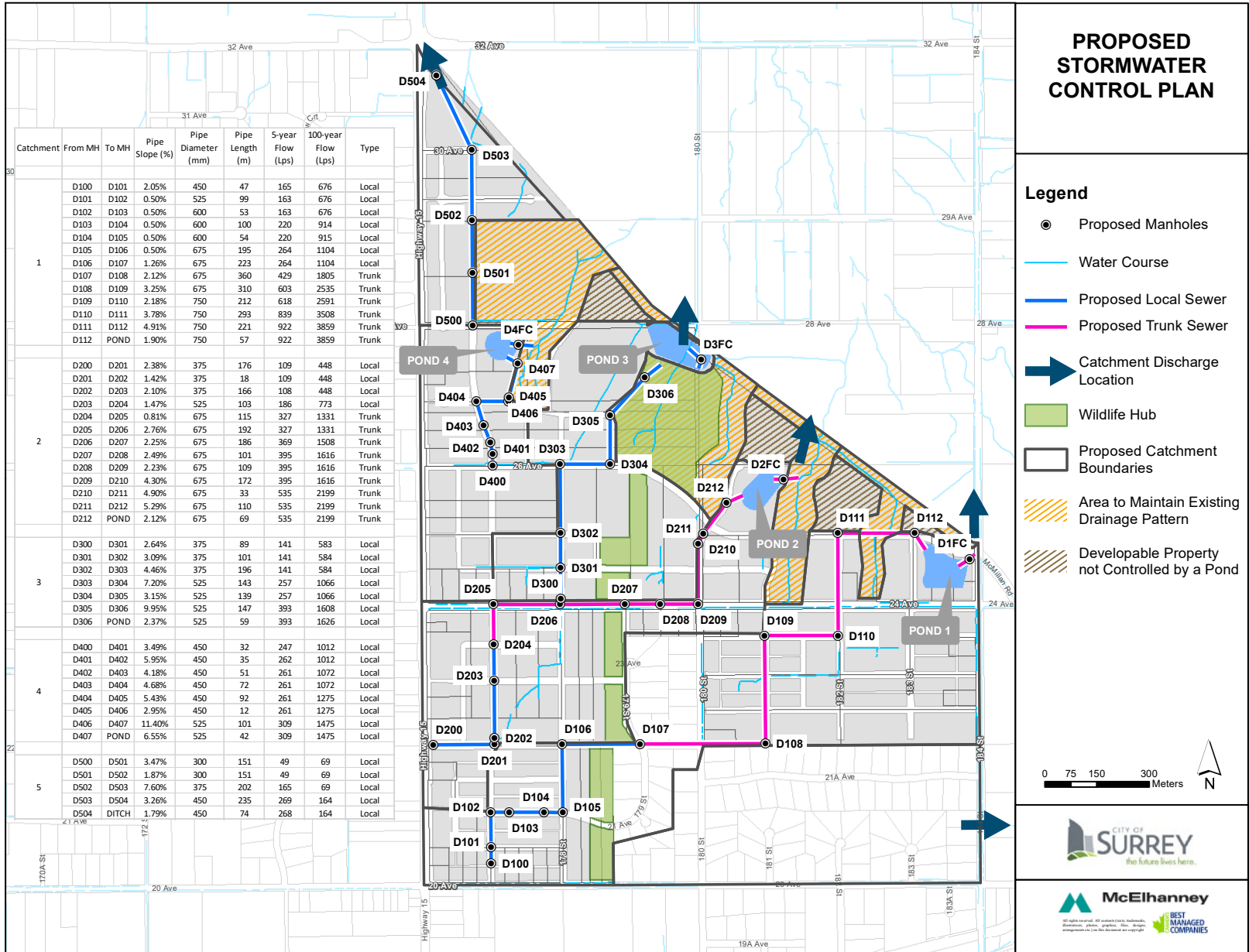
RUNOFF COEFFICIENTS

Scenario	Pre-development	Post-development (No Improvements)	Post-development (With LIDs)
Runoff Coefficient	0.29	0.90	0.19

Table 6.5 Runoff Coefficients



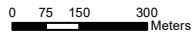

Figure 6.6 Proposed Storm Water Control Plan




PROPOSED STORMWATER CONTROL PLAN


Legend

- Proposed Manholes
- Water Course
- Proposed Local Sewer
- Proposed Trunk Sewer
- Catchment Discharge Location
- Wildlife Hub
- Proposed Catchment Boundaries
- Area to Maintain Existing Drainage Pattern
- Developable Property not Controlled by a Pond




the future lives here.



McElhanney

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6.3.3 Flood and Erosion Control

Increased impervious area typically results in increased peak runoff rates and runoff volumes that can cause significant damage to downstream aquatic habitat. Increased flow rates cause increased velocities in natural channels so that loose sediment can be eroded away. This can cause bank destabilization and failure, decreased habitat, and the potential for large woody debris to enter the stream. Maintaining runoff rates and volumes to existing channels mitigates this risk. Reducing flow volumes reduces the duration of high flows and further protects downstream channels from significant erosion. These measures also reduce the risk of flooding in the sensitive downstream agricultural lands.

To quantify the impact of the proposed development to the potential for flooding, summer and winter ARDSA storms were modeled under pre-development and proposed conditions. The results can be seen in Table 6.6.

As shown in Table 6.6 there is significant reduction in total discharge rates and a slight reduction to marginal increase in runoff volumes to the downstream system during the summer and winter storms. There are several active erosion sites downstream of, but none within, the NCP area, as indicated in the Erickson Creek ISMP.

6.3.4 Water Quality

The use of wet ponds and LID's has benefits for stormwater quality. LID's such as bioswales, rain gardens, and infiltration trenches can provide water quality benefits through settling-out of suspended solids in storage zones of such LID's and through reduction of water volume through absorption, evapotranspiration and infiltration.

Literature and analysis undertaken in past studies have shown reported similar benefits to LIDs with respect to removal of total suspended solids. Furthermore, the proposed detention ponds will also provide water quality benefits as they will incorporate a permanent water level to allow both dynamic and quiescent settling of suspended solids. The detention ponds should be optimized during detailed design to provide water quality benefits. Examples include maximization of retention time of runoff, prescription plantings to promote water quality, and use of submerged outlets for trapping floatable debris. These water quality benefits will allow for healthy streams and ecosystems.

10YEAR MUNICIPAL HALL STORM RUNOFF RATE AND VOLUME

Catchment / Control Point	Winter Pre-development (L/s)	Winter Post-development (L/s)	Summer Pre-development (L/s)	Summer Post-development (L/s)	Winter Pre-development (m3)	Winter Post-development (m3)	Summer Pre-development (m3)	Summer Post-development (m3)
1	200	344	300	271	8,590	6,280	5,580	3,493
2	560	296	730	150	24,250	27,690	15,780	16,309
3	730	464	910	416	32,300	31,121	21,020	15,039
4	770	403	1,180	294	32,630	41,056	21,210	24,094
5	1,320	603	1,550	432	60,030	68,254	39,060	39,980
Total	3,580	2,110	4,670	1,563	157,800	174,401	102,650	98,915

Table 6.6 10 Year Municipal Hall Storm Runoff Rate and Volume

6.3.5 Cost & Financing

Table 6.7 presents a Class 'D' cost estimate for stormwater management infrastructure that services more than 20 ha, including trunk sewers and detention ponds. Please note that costs were not calculated for Catchment 5 as it is less than 20 ha. Land acquisition costs are based on \$2,500,000 per acre.

CLASS 'D' COST ESTIMATE FOR DRAINAGE INFRASTRUCTURE

Catchment	Item	Cost
1	Trunk Sewer	\$2,986,560
	Pond	\$5,170,600
	Land Acquisition (5.92 ac)	\$14,800,000
	SUB-TOTAL	\$22,957,160
2	Trunk Sewer	\$2,152,260
	Pond	\$2,858,900
	Land Acquisition (4.77 ac)	\$11,925,000
	SUB-TOTAL	\$16,936,160
3	Pond	\$3,788,350
	Land Acquisition (4.34 ac)	\$10,850,000
	SUB-TOTAL	\$14,638,350
4	Pond	\$1,812,250
	Land Acquisition (3.76 ac)	\$9,400,000
	SUB-TOTAL	\$11,212,250
	TOTAL	\$65,743,920

Table 6.7 Class 'D' Cost Estimate for Drainage Infrastructure

6.4 EXISTING SANITARY

There is no existing municipal sanitary sewer infrastructure within the Redwood Heights NCP area. The properties in the NCP area currently use private septic tanks and septic fields for wastewater.

The NCP area slopes in a southwest to northeast direction with the highest point located at 2100 block and Highway 15 at an elevation of approximately 91 metres. The lowest point is at the intersection of Highway 15 and 32 Avenue with an elevation of approximately 2 to 3 metres. As shown in Figure 6.7, all the properties in the NCP area can be serviced within the same sanitary catchment area.

6.5 DESIGN CRITERIA & ANALYSIS

The NCP area will require the construction of a sanitary sewer system to service future residential and commercial growth. As part of the Stage 2 study, a system of gravity local and trunk mains is proposed, taking into consideration future peak sewage flows. These mains will convey sewage to a pump station adjacent to 32 Avenue and approximately 340m west of 176 Street. The sewage pump station will direct sewage flow to the Grandview Heights Interceptor Phase 3 via a force main. This section discusses the design criteria and analysis for the proposed sanitary system.

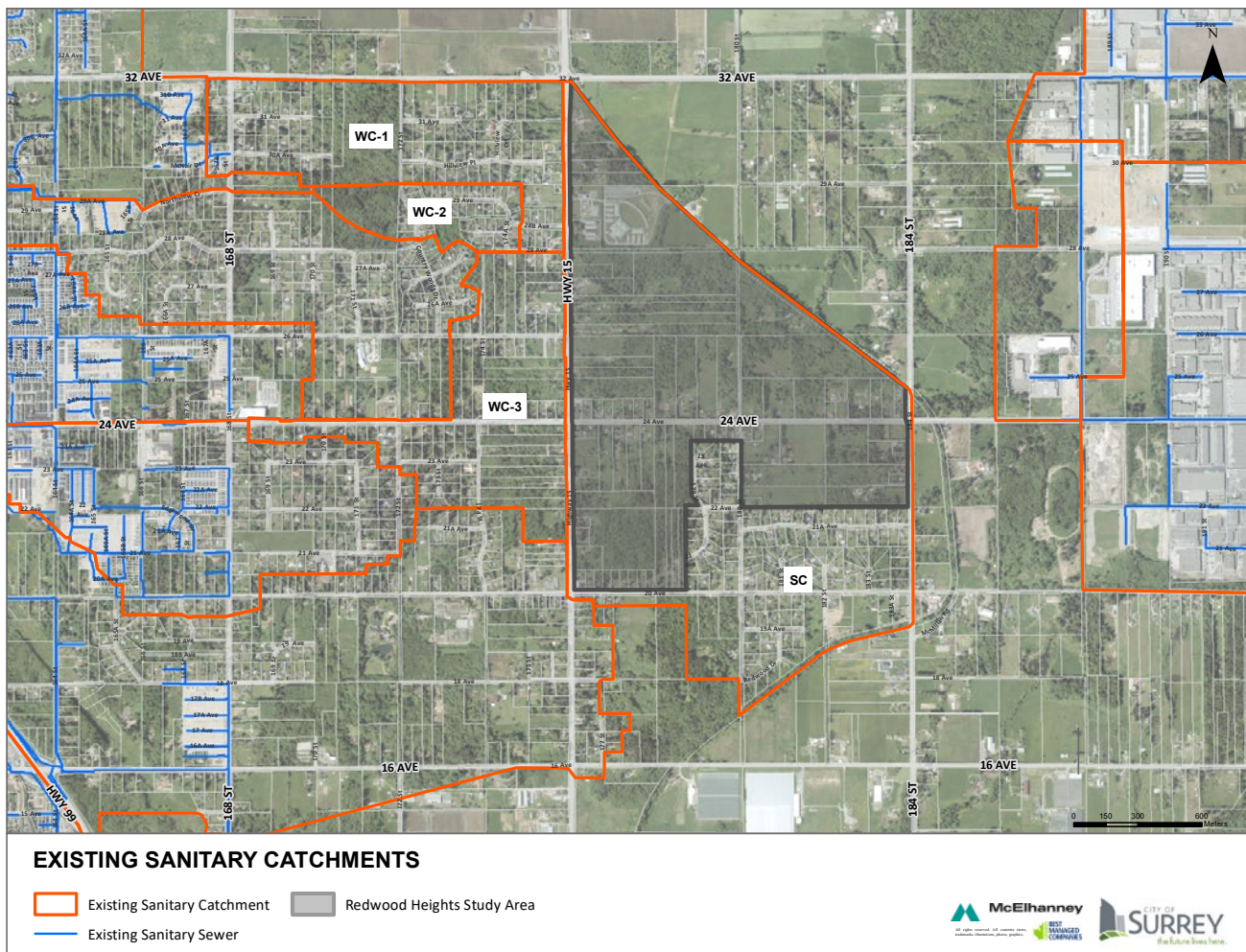


Figure 6.7 Existing Sanitary Catchments

6.5.1 Design Criteria

The proposed sanitary sewer system for the NCP area has been designed in accordance with the City of Surrey's 2016 Design Criteria Manual. Key design criteria are summarized as follows:

- Average day dry weather flow per person of 350 L/day.
- Groundwater infiltration of 11,200 L per hectare per day.
- Manning coefficient of roughness of 0.013 for all pipes.
- Minimum velocity of 0.6 m/s based on partial pipe flow hydraulics.
- Pipe grades less than 0.5% may be used if the flow equal to 0.7 x Peak Dry Weather Flow attains a minimum velocity of 0.6 m/s.
- The sewer flow in sanitary (local) mains does not exceed 40 l/s.
- Depth of flow in local mains should not exceed 50% of the internal diameter.
- Depth of flow in trunk mains should not exceed 70% of the internal diameter.
- Minimum sewer size of 200 mm diameter for single family residential lands and zones with less than 90 ppha, and 250 mm diameter for other areas.
- Sewer depth between 2.0 and 3.5 m

The peaking factor, which is the ratio of peak dry weather flow to the average dry weather flow, is calculated using the Harman equation. The Peak Wet Weather Flow (PWVF), which consists of the peak dry weather flow plus inflow and infiltration, is used as the design flow for sizing the pipes.

The population densities, used to determine total population and to compute average day dry weather flow, are provided in Table 6.8.

6.5.2 Sanitary Sub-Catchments

WITHIN NCP BOUNDARIES

The NCP area is divided into five sanitary sub-catchments, as shown in Figure 6.8. Each sub-catchment has sanitary sewer mains to collect wastewater and convey it to a trunk main that runs along the north boundary of the NCP, at the toe of the slope. This trunk extends from manhole T.1, as shown in Figure 6.8, to the proposed pump station located adjacent to 32 Avenue and approximately 340 m west of 176 Street.

A distribution collection network is defined for each sub-catchment and the corresponding pipes are sized following the design criteria in Section 6.5.1. Design calculations considered the pipe slope, pipe length, invert elevations, and design flows. Secondary pipes connecting to the collecting lines were sized following the minimum size requirement of 200 mm diameter for single family residential zones and 250 mm diameter for all other zones.

OUTSIDE NCP BOUNDARIES

The proposed sanitary mains within the NCP area will receive sewage flow from areas located upslope of the NCP boundary. These areas are shown as the south catchments (SC) in Figure 6.8. The pump station will also serve areas outside the NCP area that are located downslope of Grandview Heights interceptor; these areas are shown as west catchments (WC) IN Figure 6.8.

Table 6.9 presents a summary of the land area and estimated population for the catchments outside the NCP. The estimated populations consider future residential development.

LAND USE POPULATION DENSITIES

Land Use	Land Use Designation	Land Use Density (upha)	People per Unit (ppu)	People per Secondary Suite (ppu)	Total People per Unit (ppu)	People per Hectare (ppha)	Total Area (ha)	Total Population
Residential Transition	RH-G, RQ	10	2.96	1.45	4.41	44	5.9	260
Cluster Residential	RF, RF-G, RM-10	25	2.96	1.45	4.41	110	11.89	1,311
Detached Residential	RF-10, RF-13	35	2.96	1.45	4.41	154	13.15	2,030
Flex: Detached / Multiple Residential	RF-10, RF-13, RF-15	35	2.96	0	2.96	104	3.3	342
Semi-Detached	RF-SD, RF-10	35	2.96	0	2.96	104	2.1	218
Multiple Residential	RM-15	50	2.96	0	2.62	131	24.1	3,157
Townhouse	RM-30	75	2.62	0	2.62	197	20.6	4,048
Apartment	RM-45, RM-70	111	1.36	0	1.36	151	8.3	1,253
Commercial / Residential Mixed-Use	C-15, RM-70	88	2.62	0	2.62	231	5.63	1,298
Elementary School	PI					50	3.48	174
Proposed Institutional	PI					50	3.04	152
Existing Institutional	PI					50	7.69	385
TOTAL							109.18	15,036

Table 6.8 Land Use Population Densities

SANITARY CATCHMENTS OUTSIDE REDWOOD HEIGHTS NCP

Catchment Area	Area (ha)	Estimated Population
WC-1	85.3	568
WC-2	23.6	194
WC-3	81	5,252
SC	72.3	766

Table 6.9 Sanitary Catchments outside Redwood Heights NCP

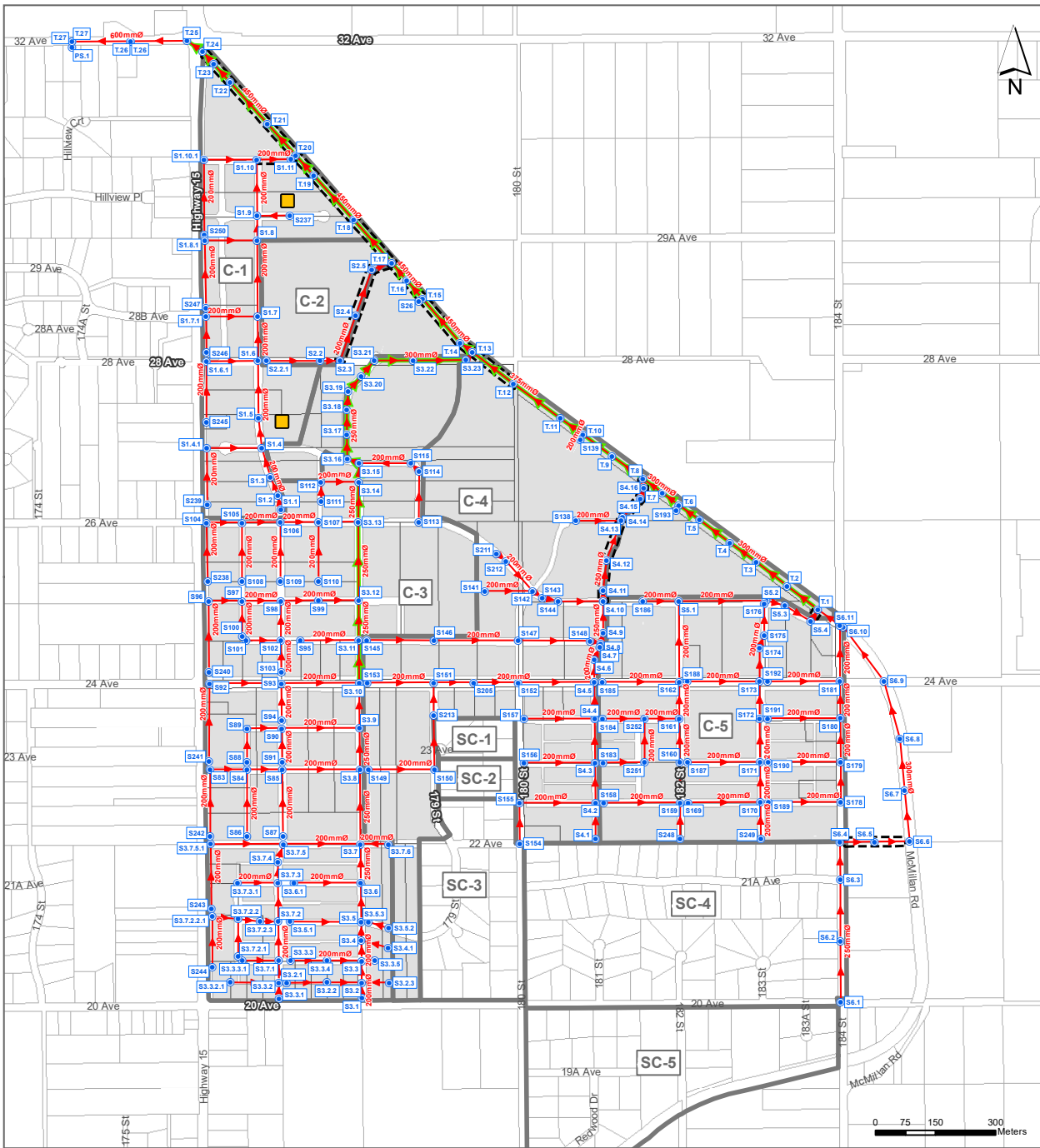
6.6 PROPOSED SANITARY SYSTEM

The proposed sanitary system includes local and trunk sewers within the NCP area, a pump station, and a force main that will convey wastewater to the Grandview Heights Interceptor.

6.6.1 Local Sewers

Local sewers have a flow under 40 litres per second and are the upstream mains of the sanitary system. Local sewers make up the entire collection system within sub-catchments C-1, C-2 and C-5, and the upstream mains within sub-catchments C-3 and C-4. The alignments of local sewers are placed within roads or at the edge of the riparian areas.

The area south of the NCP area is divided into five sub-catchments, shown in Figure 6.8. Wastewater from sub-catchments SC-1, SC-2 and SC-3 will discharge into the local sewers within the NCP sub-catchment C-4. A collection main will be required to convey the wastewater from sub-catchments SC-4 and SC-5 via 184 Street and 22 Avenue to the main trunk sewer at manhole T.1. The alignment of this sewer will run along a proposed right-of-way between manhole S6.4 and S6.6; and along an existing park dedication between manholes S6.6 and S6.11.



PROPOSED SANITARY SEWER

- Proposed Sanitary Sewer
 Proposed Catchment
● Manholes
- Proposed Trunk Sewer
 Proposed Right of Way
 Possible Pumped Area



Figure 6.8 Proposed Sanitary Catchments

6.6.2 Trunk Sewers

Trunk sewers are pipes that convey a peak wet weather flow in excess of 40 litres per second. Following this criterion, the proposed pipes between manholes S3.10 and T.13 in sub-catchment C-3 and between manholes S4.13 and T.8 in sub-catchment C-4 are also considered trunk sewers.

The trunk sewer that runs along the north boundary of the NCP will convey wastewater for the entire Redwood Heights area and the southern catchments into the proposed pump station. This trunk sewer will run through riparian areas and the transition buffer zones defined along the NCP's north boundary. The cover depth of this sewer ranges from 1.5m to 3.5m, with the exception of the pipes between manhole T.26 and the pump station, where the cover exceeds 5m for a short section. Although the slope of these pipes is less than 0.5%, the flow velocity under 0.7 x PWWF conditions is greater than 0.6 m/s. As shown in Figure 6.9, this trunk sewer will cross Justin Brook via an aerial pipe bridge located between manholes T.7 and T.8.

Most of the trunk sewers in sub-catchment C-3 are located within roads, with the exception of the pipe between manholes S3.21 and T.13, which is located in a future right-of-way. The cover depth of this sewer line is within 1.5m and 3.5m. The trunk sewer in sub-catchment C-4 is entirely located at the edge of the riparian area of Justin Brook.

The plan and profile view the trunk sewers in the system are shown in Figure 6.9 and Figure 6.10

6.6.3 Pump Station

The proposed pump station is located adjacent to 32 Avenue and approximately 340m west of 176 Street. The pump station will collect wastewater from the NCP area as well as from other areas located south and west of Redwood Heights, including future NCP areas.

The proposed catchment boundaries for the pump station are shown in Figure 6.11. The populations and design flows for the pump station catchments are provided in the Table 6.10. Based on these calculations, the total PWWF design flow to the pump station that will also flow into the upper end of the Grandview Heights Interceptor is 292 litres per second.

The in-ground infrastructure for the pump station will be sized for ultimate buildout including the wet well and pump chamber, valve chamber, electrical / mechanical housing room, odour control / mitigation facilities, emergency storage tank, and emergency generator. Based on the ultimate design flow of 292 litres per second, the pump chamber and valve chamber is likely to accommodate 4 pumps ultimately. Section 6.6.5 discusses phasing for interim and ultimate pump sizing.

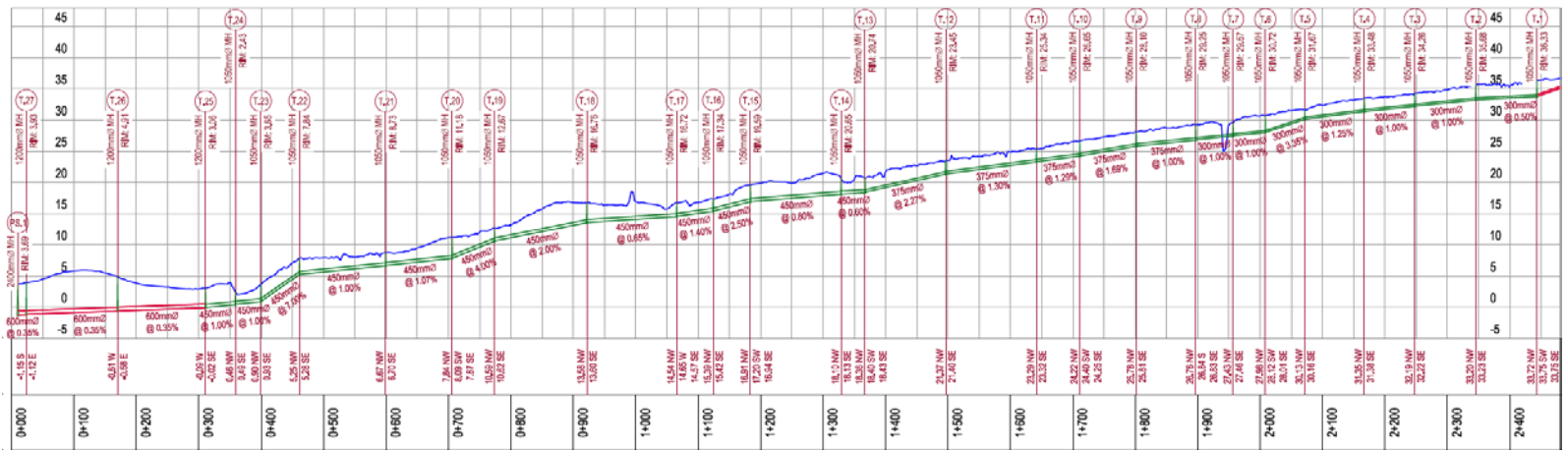
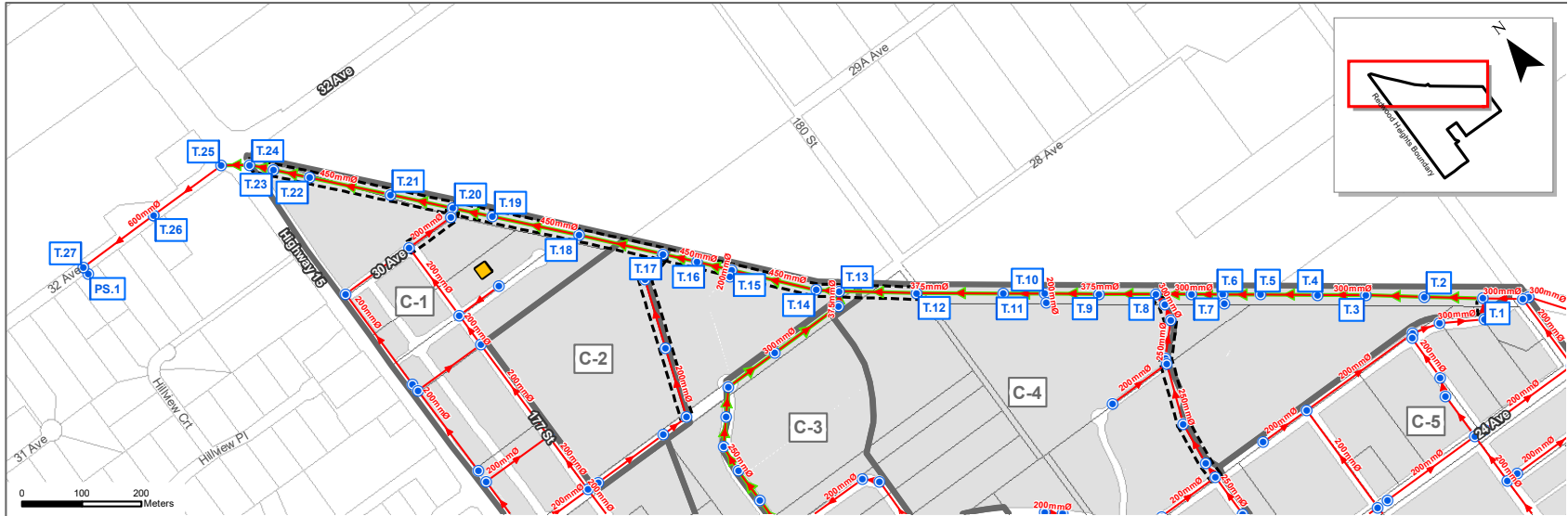
The emergency storage requires a capacity of 0.5 hours at peak wet weather flow (PWWF). This will require a volume of 533 cubic metres, based on total build-out.

PUMP STATION SANITARY FLOW CALCULATION

Catchment	Area (ac)	Area (ha)	Estimated Population	Peak Factor	ADSF (L/d)	ADWF (L/s)	Infiltration Flow (L/s)	PWWF (L/s)
WC-1	210.8	85.3	568	3.95	350	2.30	11.06	20.14
WC-2	58.3	23.6	194	4.15	350	0.79	3.06	6.32
WC-3	200.1	81.0	5,252	3.23	350	21.28	10.50	79.11
SC	205.5	72.3	881	3.83	350	3.57	10.78	24.47
Redwood Heights	512.13	207.3	15,032	2.78	350	60.89	26.88	196.99
Total (Average)	1,187.0	469.5	21,927	(2.61)	(350)	88.83	62.28	291.90

Table 6.10 Pump Station Sanitary Flow Calculation

Figure 6.9 Sanitary Trunk Plan and Profile



SANITARY TRUNK PLAN AND PROFILE

- Proposed Sanitary Sewer
- Proposed Trunk Sewer
- Proposed Catchment
- Proposed Right of Way
- Manholes
- Possible Pumped Area

Figure 6.10 Sanitary Trunk Plan and Profile

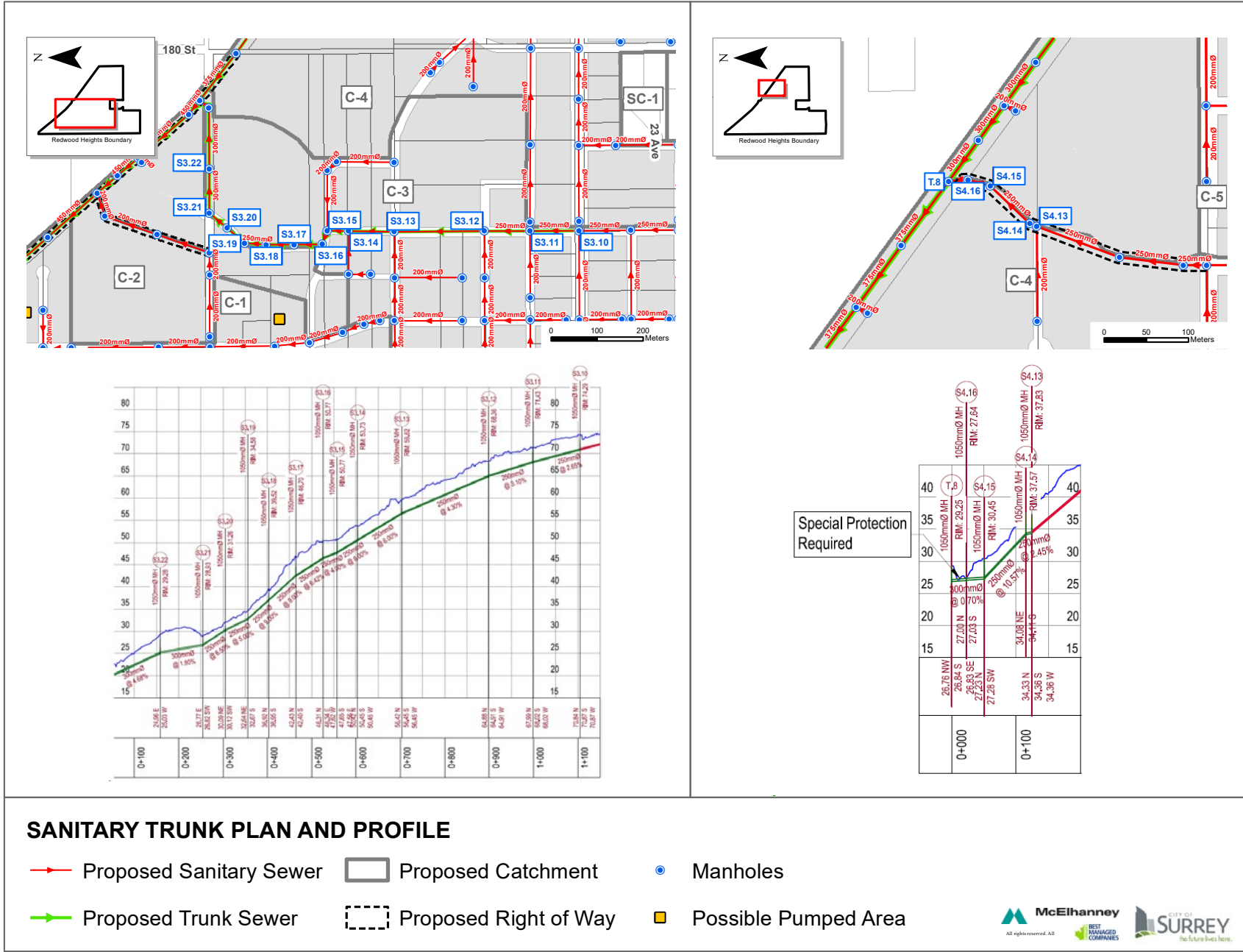
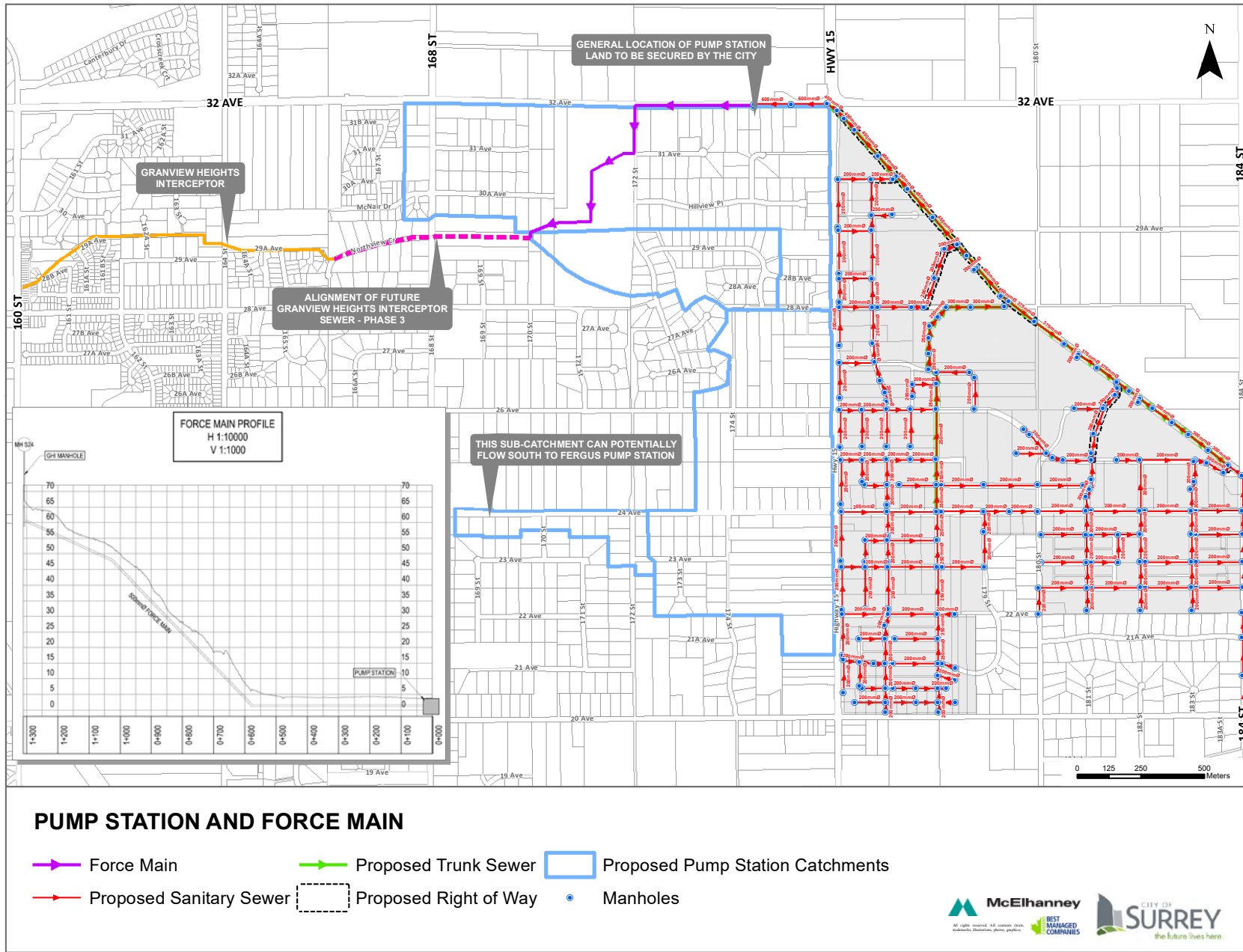


Figure 6.11 Pump Station and Force Main



6.6.4 Force Main

The alignment of the force main was studied in the Stage 1 report and a recommended alignment was selected for Stage 2. The force main alignment needs to be coordinated with future or instream development so that easements and right-of-ways can be secured, following road right-of-ways where possible. Transient analysis should be carried out before the alignment of the force main is confirmed.

The force main will be sized to account for full build-out conditions of the areas serviced by the pump station. The calculations show that a 445 mm internal diameter force main is required. Figure 6.11 shows a preliminary profile for the proposed force main.

6.6.5 System Phasing

There are no existing sewer facilities within the NCP area; therefore, all applicable downstream infrastructure needs to be constructed prior to development. This includes local and trunk sewer mains from the proposed development to the proposed pump station, the pump station, force main, and part of the Grandview Heights Interceptor. The Grandview Heights Interceptor must be completed to its terminus per the City's Grandview Heights Interceptor Phase 2 and 3 design and construction plans. The Interceptor is currently constructed up to 2934 165B Street.

It is recommended that all trunk sewers, the pump station, and force main be constructed to their ultimate sizes to avoid increased costs of replacement in the future. The pump station wet well, emergency generator and emergency storage tanks should be constructed to their ultimate size; however, the number of pumps can be staged to allow for interim conditions prior to building the ultimate configuration.

6.6.6 Cost & Financing

Table 6.11 summarizes the cost estimates of DCC-eligible items related to the Redwood Heights NCP area. DCC-eligible costs include the proposed trunk sewers, pump station and force main that are attributable to the NCP.

Up sizing costs for the Grandview Heights Interceptor are already included in the City's current 10-Year Servicing Plan.

SUMMARY OF SANITARY DCC-ELIGIBLE COSTS

Item	Description	Total DCC-Eligible Costs	DCC-Eligible Costs Attributable to Redwood Heights NCP	DCC-Eligible Costs Attributable to Areas Outside Redwood Heights NCP
1	Trunk Sewer including upsizing in Catchment 3 (S3.10 - T.13)	\$959,100	\$959,100	\$0
2	Trunk Sewer in Catchment 4 (S4.13 - T.8)	\$449,000	\$449,000	\$0
3	Truck Sewer including upsizing in Catchment 5 (S5.2 - T.1)	\$78,100	\$78,100	\$0
4	Sewer outside NCP (S6.1 - T.1)	\$2,177,400	\$0	\$2,177,400
5	Main Trunk Sewer (T.1 - T.24)	\$7,990,300	\$7,990,300	\$0
6	Main Trunk Sewer Outside NCP (T.24 - PS.1)	\$1,402,600	\$1,316,400	\$86,200
7	Pump Station	\$5,618,000	\$3,771,000	\$1,847,000
8	Land Acquisition for Pump Station including BCS corridor	\$1,590,000	\$1,067,300	\$522,700
9	Odour Control Facility	\$988,800	\$663,700	\$325,100
10	Force Main	\$2,312,600	\$1,552,300	\$760,300
	TOTAL	\$23,565,900	\$17,847,200	\$5,718,700

Table 6.11 Summary of Sanitary DCC-Eligible Costs

6.7 EXISTING WATER SYSTEM

The Redwood Heights NCP area lies within the Grandview water service area, which is supplied by the Grandview reservoir and pump station, located at 16666 24 Avenue. The NCP area is mostly within the existing 142 metre pressure zone, with the exception of the area north of 29A Avenue which is within the 80 m pressure zone, as shown in Figure 6.12.

Existing water supply mains along 24 Avenue, Highway 15, 20 Avenue and 184 Street that supply the 142 m pressure zone are fed by the Grandview pump station. These mains have pipe diameters between 50 and 200 mm, which do not have capacity to service the proposed land uses in the NCP area.

6.8 DESIGN CRITERIA & ANALYSIS

The existing water system that supplies the Redwood Heights NCP area does not have the capacity to meet future demands. The construction of a new water supply system is proposed. The proposed system will be fed directly from the Grandview reservoir and pump station through two large feeder mains along 24 Avenue: a low pressure main to service low lying areas in the neighborhood, and a high pressure main to service areas with higher elevations. Adjustments to the existing pressure zone boundaries are also proposed. Details on the proposed water system are provided in Section 6.9. This section discusses the design criteria used and analysis completed for the proposed water system.

FIRE FLOW DEMANDS

Land Use	Zone	Fire Flow (L/s)
Residential Transition	RH-G, RQ	60
Cluster Residential	RF-10, RF, RF-G	120
Detached Residential	RF-13, RF-10	60
Flex-Detached / Multiple Residential	RF-10, RM-13, RM-15	60
Semi-Detached	RF-SD, RF-10	60
Multiple Residential	RM-15	120
Townhouse	RM-30	120
Commercial / Residential Mixed-Use	C-15, RM-70	200
Apartment	RM-45	120
Institutional	PI	120

Table 6.12 Fire Flow Demands

6.8.1 Design Criteria

The proposed water distribution system has been designed in accordance to the City of Surrey 2016 Design Criteria Manual. Key design criteria are as follows:

- Average Day Demand (ADD) of 500 L/capita/day.
- Maximum Day Demand (MDD) of 1000 L/capita/day.
- Peak Hour Demand (PHD) of 2000 L/capita/day.
- Hazen-Williams friction coefficient of 125 for watermain with a pipe diameter of 250mm and larger.
- Hazen-Williams friction coefficient of 100 for watermains with a pipe diameter 200mm and smaller.
- Minimum operating pressure of 28 m during peak hour.
- Minimum residual head of 14 m at the discharge of a fire hydrant during maximum day plus fire flow condition.
- Maximum hydraulic grade of 0.5% for mains with a pipe diameter larger than 250 mm.
- The velocity of water in pipes should be lower than 2 m/s.
- Minimum pipe diameter of 200mm for new water mains.

Projected populations and water demands are based on the proposed land use plan for Redwood Heights. Since the proposed water system will also serve areas outside the NCP, these water demands are also considered in the analysis. For areas outside the NCP, equivalent population projections are used to estimate future water demands. These areas includes Kensington Zones A, B and C and Grandview Zones A, B and C, which are located within Grandview Heights Area #3 and #5, as shown in Figure 6.13.

The projected land uses for areas outside the NCP are residential only with the exception of Grandview Zone B which has a mixed-use commercial and residential land use component. For the commercial component, an employment projection of 18 to 31 employees is used. The employment projections are the equivalent populations for the commercial component, based on equivalent populations derived from gross densities from Table 2.3.1 of the City's Engineering Design Criteria Manual.

Fire flow and water demands are shown in Tables 6.12 and 6.13.



WATER DEMANDS

Land Use	Low Pressure Main				High Pressure Main / Pump Station			
	Equivalent Population	Demands (L/s)			Equivalent Population	Demands (L/s)		
		ADD	MDD	PHD		ADD	MDD	PHD
Residential Transition	260	1.5	3.0	6.0				
Cluster Residential	1,311	7.6	15.2	30.3				
Detached Residential	1,102	6.4	12.8	25.5	928	5.4	10.7	21.5
Flex-Detached Residential / Medium Density	342	2.0	4.0	7.9				
Semi-Detached					218	1.3	2.5	5.0
Multiple Residential	2,106	12.2	24.4	48.8	1,461	8.5	16.9	33.8
Townhouse	3,276	19.0	37.9	75.8	772	4.5	8.9	17.9
Commercial / Residential Mixed-Use					1,253	7.3	14.5	29.0
Apartment	676	3.9	7.8	15.6	620	3.6	7.2	14.4
Institutional	711	4.1	8.2	16.4				
Subtotal	9,783	56.6	113.2	226.5	5,251	30.4	60.8	121.6
OUTSIDE REDWOOD HEIGHTS								
Kensington Zone A	1,965	11.4	22.7	45.5				
Kensington Zone B					91	0.5	1.1	2.1
Kensington Zone C	516	3.0	6.0	12.0	1,175	6.8	13.6	27.2
Grandview Zone A					7,004	40.5	81.1	162.1
Grandview Zone B								
Residential					2,527	14.6	29.2	58.5
Commercial					31	0.2	0.4	0.7
Grandview Zone C					1,523	8.8	17.6	35.3
Subtotal	2,481	14.4	28.7	57.5	12,351	71.4	143.0	285.9
TOTAL	12,264	71.0	141.9	284.0	17,602	101.8	203.8	407.5

Table 6.13 Water Demands

6.8.2 Hydraulic Analysis

Hydraulic modeling of the proposed network was carried out using EPANET software. The model considered the future water demands in Table 6.13. The water demands were allocated at nodes at main grid intersections. Similarly, fire flows were allocated at critical locations throughout the system. The following boundary conditions were defined for the model:

- The water elevation at the Grandview reservoir was assumed to be 109 m (one-third full).
- The exit pressure at the Grandview pump station was set to 35 m for a total head of 142 m.
- The high pressure feeder main along 24 Avenue will be connected to the pump station's 600 mm outlet pipe, as shown on Figure 6.14
- Demands for Grandview Heights Area #3 and #5 were allocated at the feeder main nodes located at 168 Street and 172 Street.
- Demands for the Kensington Zone A (Grandview Heights Area #3 – 110 m) were allocated in the southern nodes of the Redwood Heights NCP – 110 m.
- The pressure reducing valves between the 110 m and 142 m distribution systems are closed during normal operations. Similarly, the gate valves between the 90 m and 110 m distribution systems are closed during normal operations.

The following water model simulations were conducted:

1. PHD for Redwood Heights NCP demands.
2. MDD for Redwood Heights NCP demands.
3. MDD for Redwood Heights NCP demands and a 120 L/s fire flow at node 148.
4. MDD for Redwood Heights NCP demands and a 120 L/s fire flow at node 126.
5. MDD for Redwood Heights NCP demands and a 200 L/s fire flow at node 186.
6. MDD for Redwood Heights NCP demands and a 120 L/s fire flow at node 182.
7. MDD for Redwood Heights NCP and Grandview Heights Area #3 and #5.
8. MDD for Redwood Heights NCP, Grandview Heights Areas #3 and #5, and fire flows at nodes 148 and 186.
9. PHD for Redwood Heights NCP and Grandview Heights Areas #3 and #5.

Simulations 1 through 6 were conducted to establish the required water main pipe sizing to service the Redwood Heights NCP area. Simulations 7, 8 and 9 were conducted to determine water main feeder main upsizing required to service Redwood Heights NCP and Grandview Heights Area #3 and #5. The demands for these areas are presented in Table 6.12.

Figure 6.15 identifies the model nodes and shows where the fire flow demands were allocated.



6.9 PROPOSED WATER SYSTEM

The proposed water system will be fed directly from the Grandview reservoir and pump station through two large feeder mains along 24 Avenue: a low pressure main to service low lying areas and a high pressure main to service areas with higher elevations. Adjustments to the existing pressure zone boundaries are also proposed.

6.9.1 Proposed Pressure Zones

Based on the elevations in the NCP area, three pressure zones are proposed for 90 m, 110 m, and 142 m hydraulic grade line (HGL). New pressure zones for the 90 m and 110 m HGL will follow the topographic elevations. Figure 6.16 shows the boundaries of the proposed pressure zones.

A new high pressure feeder main supplied by the Grandview pump station along 24 Avenue will service the 142 m pressure zone. A new low pressure feeder main supplied by the Grandview reservoir along 24 Avenue will service the 110 m pressure zone. The new feeder main supply connections are shown in Figure 6.14.

The 90 m pressure zone within the NCP will include areas currently located in the 80 m pressure zone and some additional areas south of 29A Avenue. The 80 m pressure zone, west of 176 Street, may be adjusted to a 90 m pressure zone and interconnected with the 90 m zone within the NCP area for redundancy. The 90 m pressure zone within the NCP area will be fed from the 110 m pressure zone, through pressure reducing valves (PRVs). The locations of the PRVs are shown in Figure 6.17. The 110 m system will be connected to the high-pressure 142 m system with PRVs for phasing and emergencies situations. Phasing is discussed in Section 6.9.8.

The existing 500 mm main along 24 Avenue and east of 184 Street has a maximum HGL of 72 m. As a result, connections from this main to service the 110 m and 90 m pressure zones will not be permitted.

6.9.2 Feeder Mains

The low pressure and high pressure feeder mains along 24 Avenue were sized based on the water model simulations discussed in Section 6.8. Scenarios were modeled based on water demands for Redwood Heights NCP area only and for Redwood Heights NCP plus Grandview Heights Area #3 and #5.

The water demands for the Redwood Heights NCP area require a 500 mm low pressure feeder main on 24 Avenue from the Grandview reservoir to 176 Street (Highway 15) that reduces to a 450 mm feeder main from 176 Street to 180 Street to service the 110 m and 90 m pressure zones. A 400 mm high pressure feeder main is required on 24 Avenue from the Grandview pump station to 176 Street that reduces to a 350 mm feeder main from 176 Street to 178 Street to service the 142 m pressure zone. These feeder mains are shown in Figure 6.18.

When the demands from Grandview Heights Area #3 and #5 are considered, the feeder mains need to be upsized. Figure 6.19 shows the size of the feeder mains when demands for Redwood Heights NCP and Grandview Heights Area #3 and #5 are considered. Under this condition, the 500 mm low pressure feeder main requires upsizing to a 600 mm feeder main from the Grandview reservoir to 172 Street. In addition, the 400 mm feeder main requires upsizing to a 500 mm feeder main on 24 Avenue from the Grandview pump station to 168 Street and to a 450 mm main from 168 Street to 172 Street.

6.9.3 Distribution Mains

The proposed water distribution main network within the NCP area has pipe diameters ranging from 200 mm to 300 mm, as shown in Figure 6.17. The distribution mains will be looped to avoid dead-end pipes that exceed 100 metres in length. Distribution mains may extend across 176 Street for looping and improved connectivity of the system, if the interconnections are within the same pressure zone.



6.9.4 Abandonment of Existing Mains

The following existing mains are under-sized and recommended for removal or abandonment:

- The 150 mm diameter main along 24 Avenue, between Highway 15 and 184 Street.
- The 50 mm / 150 mm diameter main along Highway 15, between 20 Avenue and 24 Avenue.
- The 150 mm diameter main along 20 Avenue, between Highway 15 and 178 Street.
- The 150 mm diameter main along 184 Street, between 21A Avenue and 24 Avenue.

6.9.5 Tie-in to Existing Mains

As shown in Figure 6.17, the proposed water mains will be tied-in to existing mains in several locations:

90M PRESSURE ZONE

- Tie-in to the 250 mm main along Highway 15 at 30 Avenue.

110 M PRESSURE ZONE

- Tie-in the proposed 300 mm major grid main along 24 Avenue to the existing 250 mm main along 180th Street. The proposed 200mm distribution lines would also tie-in to this existing line.
- Extend the proposed 250 mm water main along 184 Street and tie-in to the existing mains at 21A Avenue.
- Tie-in to the 250 mm main along Highway 15 at 28 Avenue.

142 M PRESSURE ZONE

- Tie-in the proposed 300 mm major grid main along 20 Avenue to the existing 150 mm main on this avenue at 178 Street.
- Extend the proposed 250 mm and 200 mm water mains along 21 and 22 Avenues and tie-in to the 250 mm mains.
- Tie-in to the 250 mm main along Highway 15 at 26 Avenue.

6.9.6 Pressure Reducing Valves

The distribution mains in the 90 m pressure zone will be connected to the mains in the 110 m pressure zone through pressure reducing valves (PRVs). The locations of these PRVs are shown in Figure 6.17. The connecting main at 177 Street between the 110 m and the 142 m pressure zone will also have a PRV, but it will be closed during normal conditions and will be opened only for emergency situations.

The proposed adjustment of the pressure zones would require the installation of two PRVs on existing mains on 21A Avenue and 20 Avenue. The location of these valves is also shown in Figure 6.17. The existing gate valve on 180 Street at 20 Avenue will be normally closed.

6.9.7 Grandview Pump Station

The Grandview pump station has adequate pumping capacity for future development, based on the water demand projections in Table 6.12. This capacity was defined as the pumping capacity at 35 m head which will provide a total head of 142 m. As shown in Table 6.14, the total capacity of the 6 pumps is 1,000 L/s, while the peak hour demand at total buildout within the study area will be 408 L/s. The peak hour demand from total buildout for the year 2,046 is expected to be 725 L/s. This flow value includes demands from areas outside of Redwood Heights and Grandview #3 and #5. The Grandview pump station has enough capacity to meet the demands from total buildout.

GRANDVIEW PUMP STATION CAPACITY

Pump	Capacity (L/s)
Pump 1	200
Pump 2	200
Pump 3	200
Pump 4	200
Pump 5	200
Pump 6	200
TOTAL	1,000

Table 6.14 Grandview Pump Station Capacity



6.9.8 Phasing

In order to facilitate full buildout, two separate feeder mains must be constructed from the Grandview reservoir and pump station to the NCP area along 24 Avenue. To minimize the initial cost due to the construction of the feeder mains, the following phasing is proposed.

PHASE 1

Build the high pressure 400 mm feeder main from 172 Street to Redwood Heights, and connect to the existing 300 mm water main that runs between the Grandview pump station and 172 Street. This allows for a total MDD plus fire flow demand of 215 L/s in Redwood Heights. The amount of development that can build-out will depend on the density/population and zoning, as each of these factors will dictate the MDD and fire flow required. Table 6.16 shows some examples of the maximum populations that could support this design flow.

New developments will require the construction of water mains from the high pressure feeder main to the development site at their ultimate size and location within existing and/or proposed right-of-ways. Developments in the low pressure zones (90 m and 110 m) will also require the installation of the PRV at 177 Street. The distribution mains in the low pressure zones will be fed from the high pressure network through this PRV until the low pressure feeder main is constructed (phase 3), at which time this PRV would then be closed under normal operating conditions.

PROPOSED PHASING

Phase	Construction	Impact
1	High pressure feeder main from 172 Street to Redwood Heights	Development in Redwood Heights up to 215 L/s, including fire flow.
2	High pressure feeder main from Grandview pump station to 172 St.	Allows for build-out in Redwood Heights up to 4,700 people or 400 L/s including fire flow for Redwood Heights and Grandview Heights Area #3 and #5.
3	Low pressure feeder main	Allow for full build-out in Redwood Heights and Grandview Heights Area #3 and #5.

Table 6.15 Proposed Phasing

PHASE 2

Build the remaining high pressure feeder main from the Grandview pump station to 172 Street. Ultimately, the complete high pressure feeder main is sized to serve the 142 m pressure zone within Redwood Heights and Grandview Heights Area #3 and #5. However in the interim, the complete high pressure main can also service the 90 m and 110 m pressure zones in addition to Grandview Heights Area #3 and #5, up to certain threshold before the low pressure main will be required. This threshold is a population of 4,700 people within Redwood Heights or a total design flow (MDD plus fire flow demand) of 400 L/s for Redwood Heights and Grandview Heights Area #3 and #5, whichever is reached first.

PHASE 3

The low pressure feeder main will be required once the threshold described above is reached.

As development progresses within Redwood Heights and Grandview Heights Area #3 and #5, the proposed phasing and specific thresholds will require further review.

Table 6.15 is a summary of the proposed phasing.

EXAMPLES OF INTERIM DEMANDS IN REDWOOD HEIGHTS DURING PHASE 1

Housing Type	Units	Number of People	Total Population	MDD (L/s)	Fire Flow (L/s)	MDD + Fire Flow (L/s)	PHD (L/s)
Townhouse	3,100	2.62	8,122	94	120	214	188
Commercial/ Residential Mixed-Use	500	2.62	1,310	15	200	215	30

Table 6.16 Examples of Interim Demands in Redwood Heights during Phase 1



6.9.9 Cost and Financing

Table 6.17 is a summary of the DCC-eligible infrastructure costs with a breakdown of costs attributable to the Redwood Heights NCP area and areas outside the NCP.

Upsizing costs are for the difference between the cost of the distribution main base size (200 mm) and the required size (250mm or larger). The trunk mains in the 110m pressure zone have a pipe diameter larger than 300 mm.

SUMMARY OF DCC ELIGIBLE WATER INFRASTRUCTURE COSTS

Item	Description	Total DCC-Eligible Costs	DCC-Eligible Costs Attributable to Redwood Heights NCP	DCC-Eligible Costs Attributable to Areas Outside Redwood Heights NCP
High Pressure Feeder Main				
1	600mm from PS to 168 St	\$625,000	\$600,000	\$25,000
2	450mm from 168 to 172 St	\$1,338,000	\$1,282,000	\$56,000
3	400 mm from 172 to 176 St	\$1,340,000	\$1,340,000	\$0
4	350mm from 176 to 178 St	\$600,000	\$600,000	\$0
	Subtotal	\$3,903,000	\$3,822,000	\$81,000
Low Pressure Feeder Main				
5	600mm from Reservoir to 172 St	\$2,025,000	\$1,972,000	\$53,000
6	500mm from 172 to 176 St	\$1,375,000	\$1,375,000	\$0
7	450mm from 176 to 180 St	\$1,380,000	\$1,380,000	\$0
	Subtotal	\$4,780,000	\$4,727,000	\$53,000
8	Trunk mains in 110m pressure zone	\$635,000	\$635,000	\$0
9	Upsizing in 142m pressure zone	\$1,375,000	\$1,375,000	\$0
10	Upsizing in 110m pressure zone	\$1,370,000	\$1,370,000	\$0
11	Upsizing in 90m pressure zone	\$700,000	\$700,000	\$0
	Subtotal	\$4,080,000	\$4,080,000	
12	PRV between 142m and 110m zone	\$200,000	\$200,000	\$0
13	4 PRVs between 110m and 90m zone	\$800,000	\$800,000	\$0
	Subtotal	\$1,000,000	\$1,000,000	\$0
	TOTAL	\$13,763,000	\$13,629,000	\$134,000

Table 6.17 Summary of DCC-Eligible Water Infrastructure Costs

Figure 6.12 Existing Water System

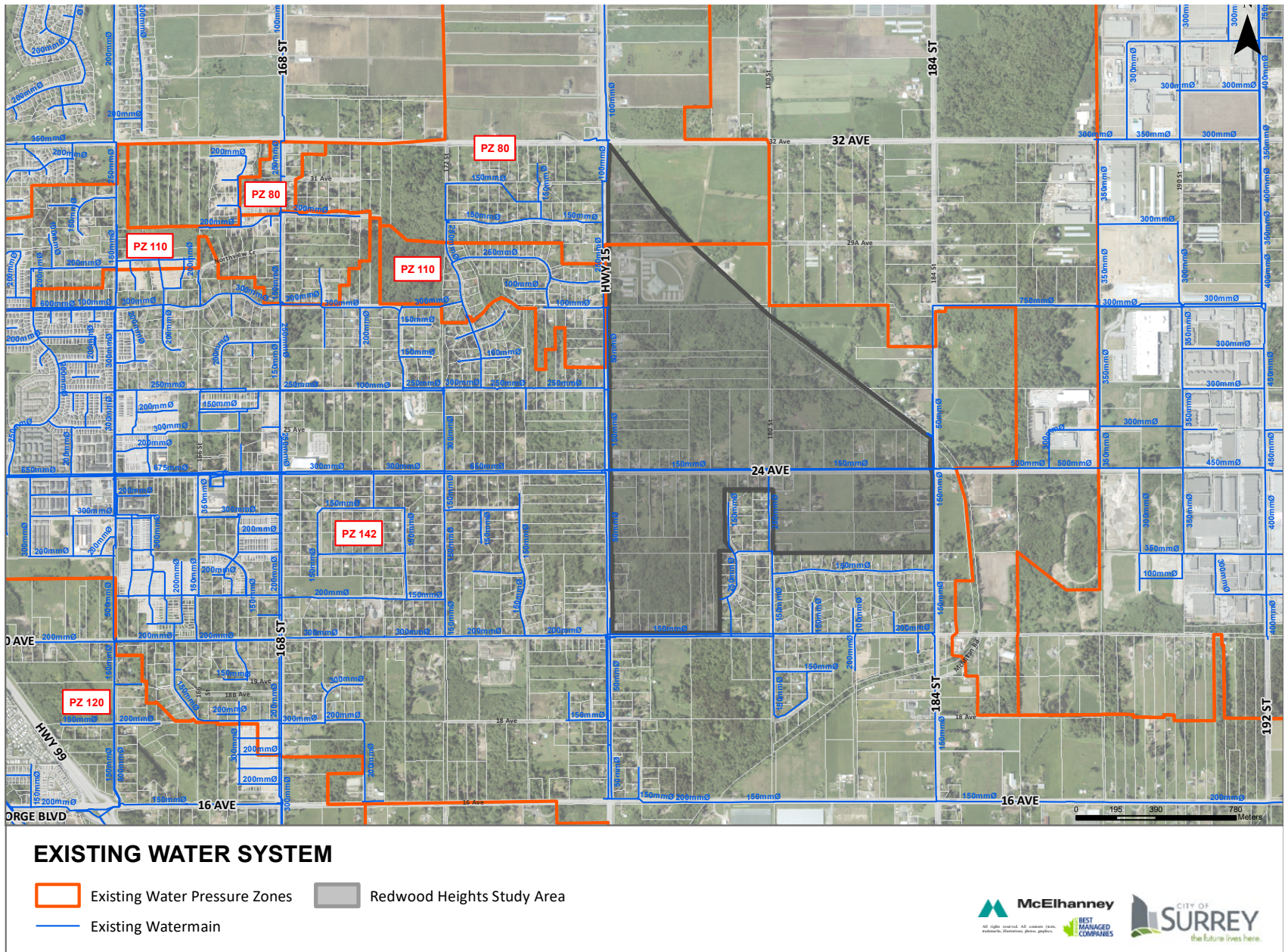
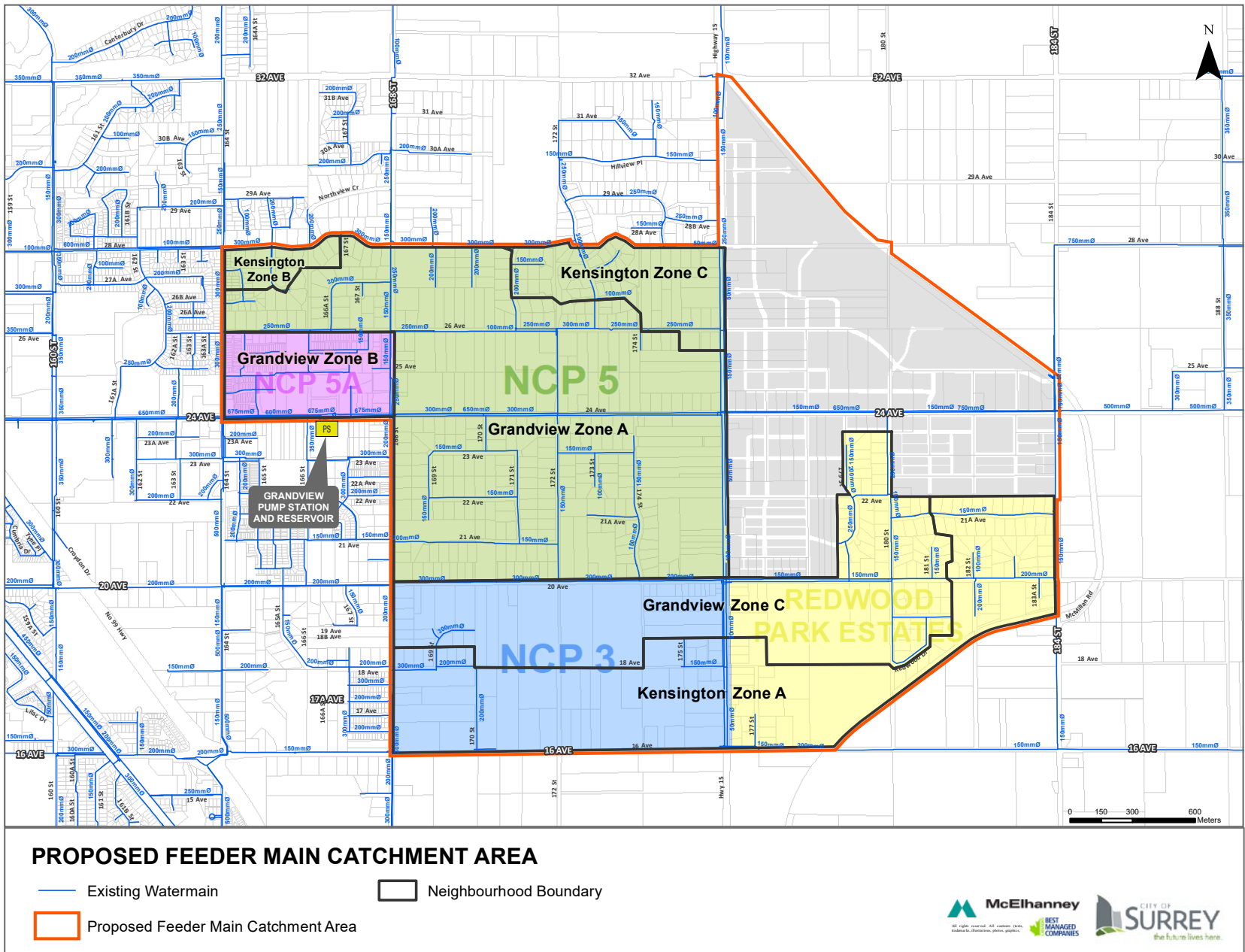


Figure 6.13 Proposed Feeder Main Catchment Area



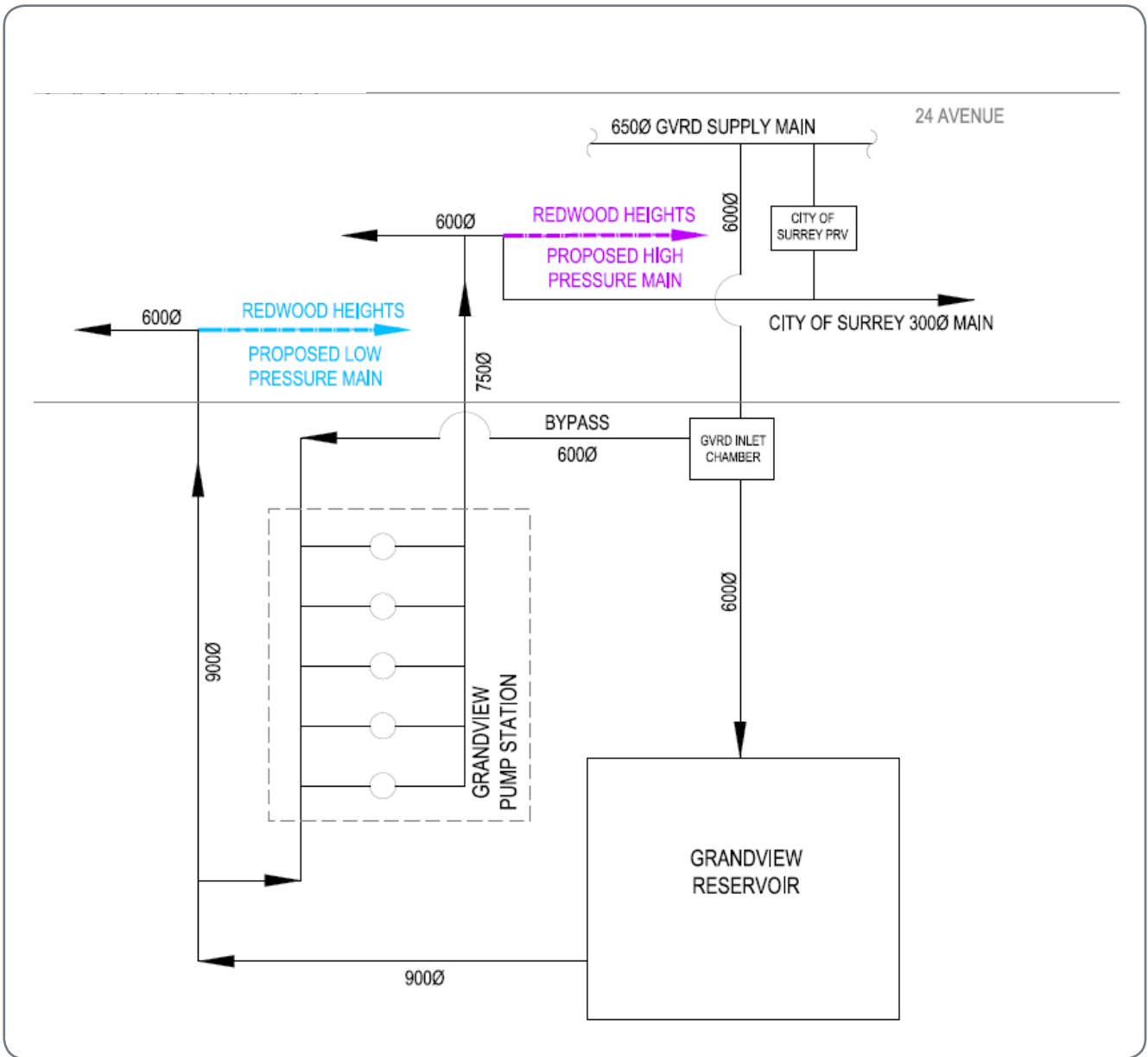
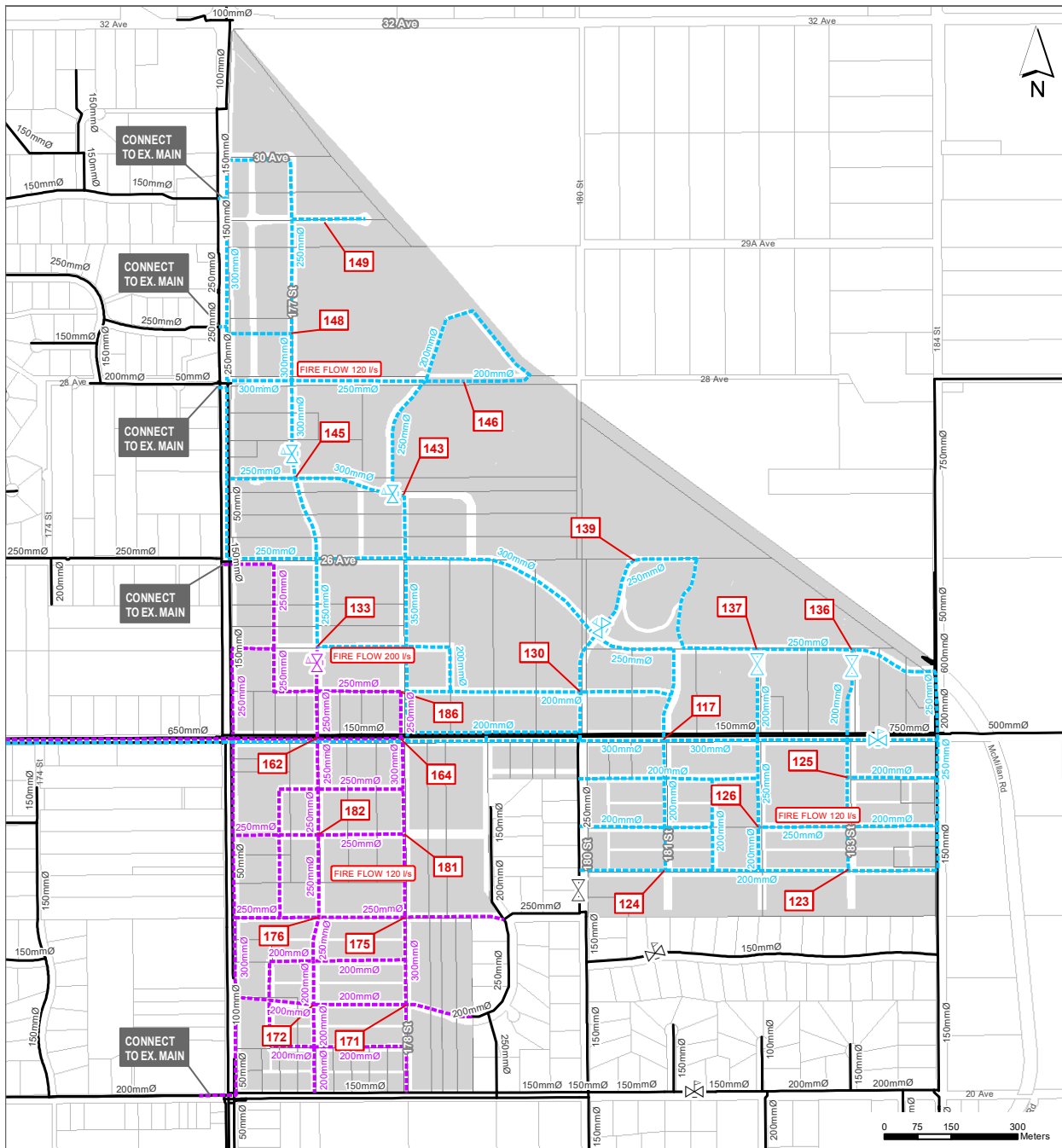


Figure 6.14 Proposed Feeder Main Connections



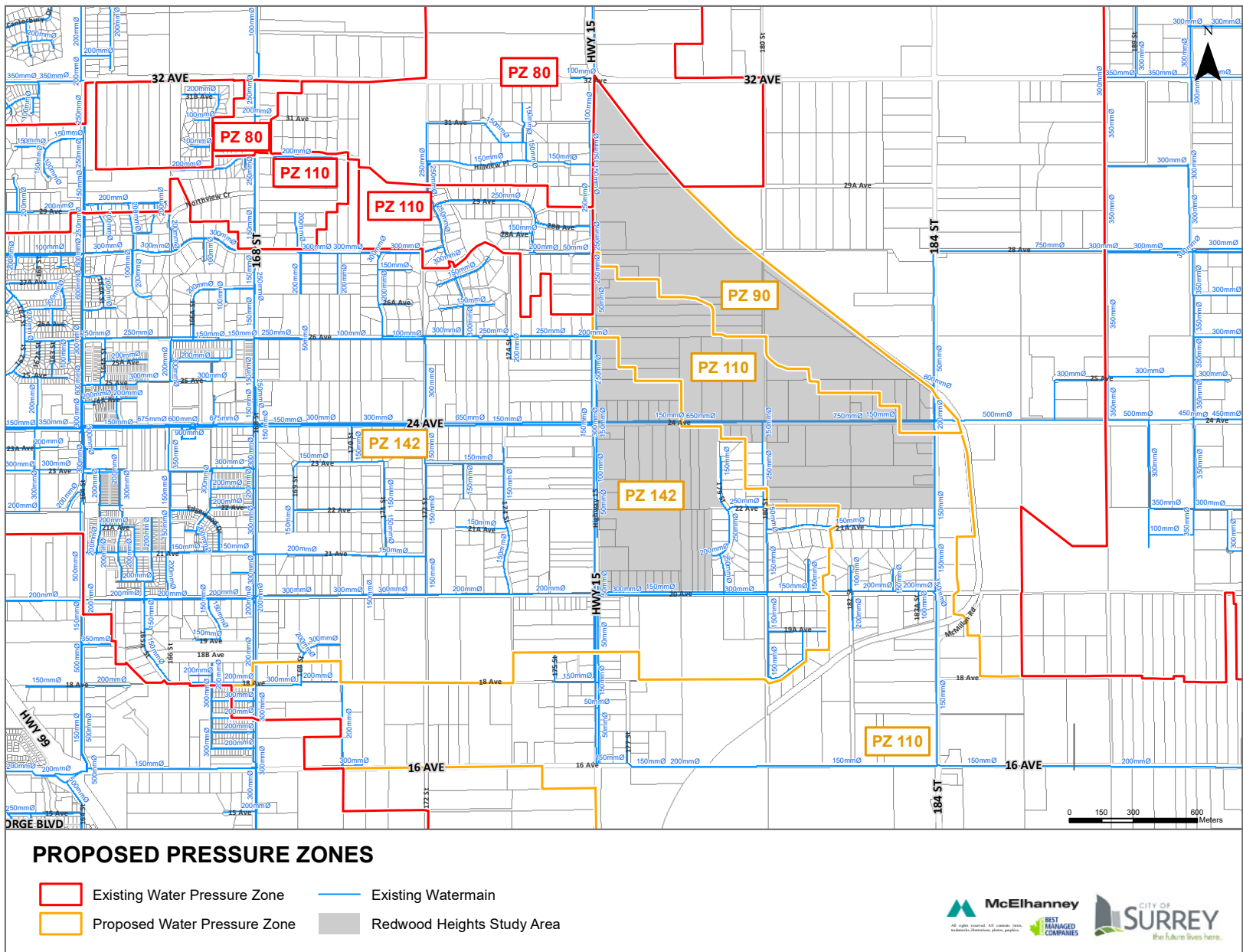
DEMAND NODES AND FIRE FLOW

- | | | | |
|---------------------------------|----------------------------|-----------------------------|------------------------------|
| — Existing Watermain | Existing Valve | Proposed Low Pressure Valve | Proposed High Pressure Valve |
| --- Proposed Low Pressure Main | ⊗ Control Valve | ⊗ Control Valve | ⊗ Control Valve |
| --- Proposed High Pressure Main | ⊗ Pressure Reduction Valve | ⊗ Pressure Reduction Valve | ⊗ Pressure Reduction Valve |



Figure 6.15 Demand Nodes and Fire Flow

Figure 6.16 Proposed Pressure Zone



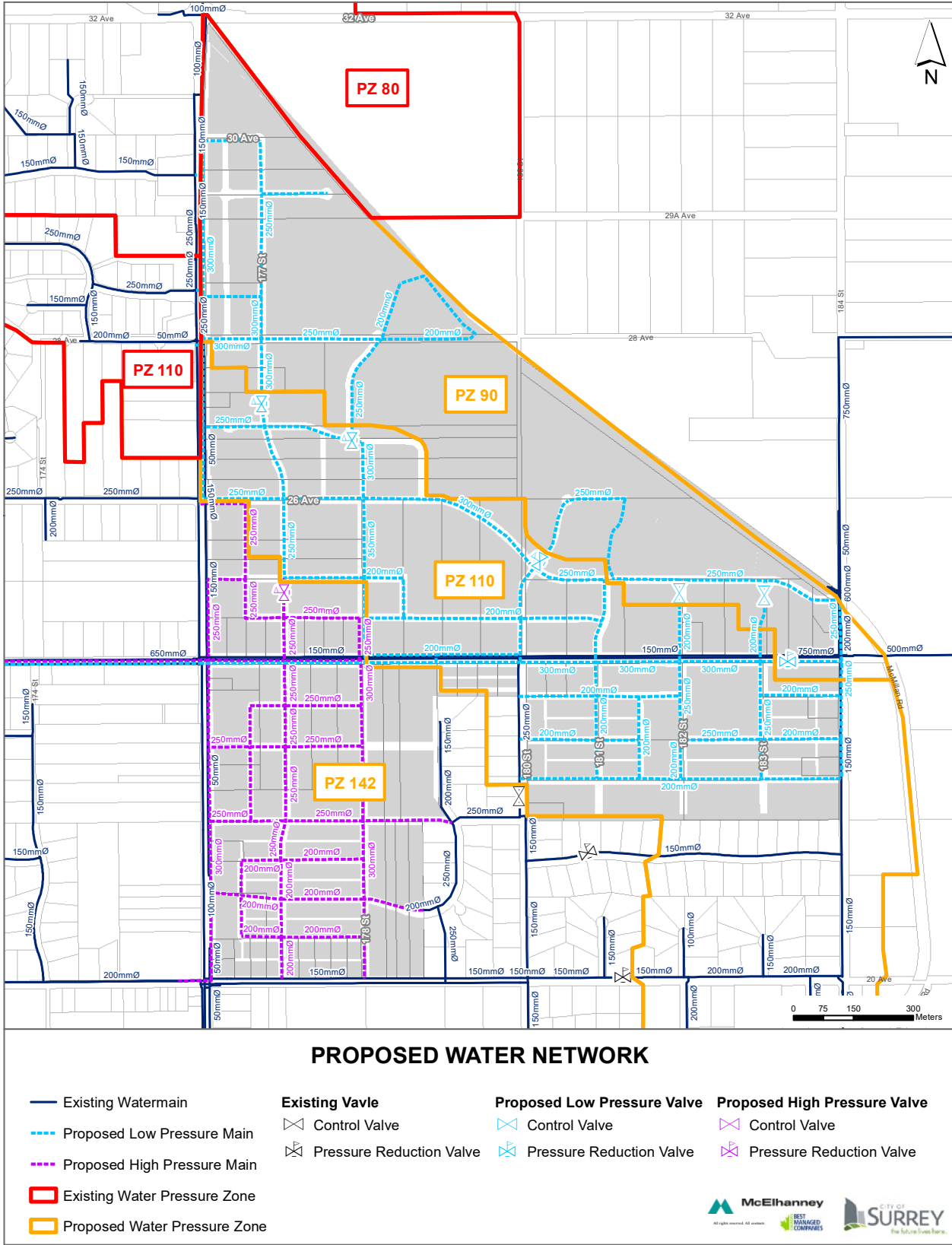


Figure 6.17 Proposed Water Network

Figure 6.18 Proposed Feeder Mains (Inside)

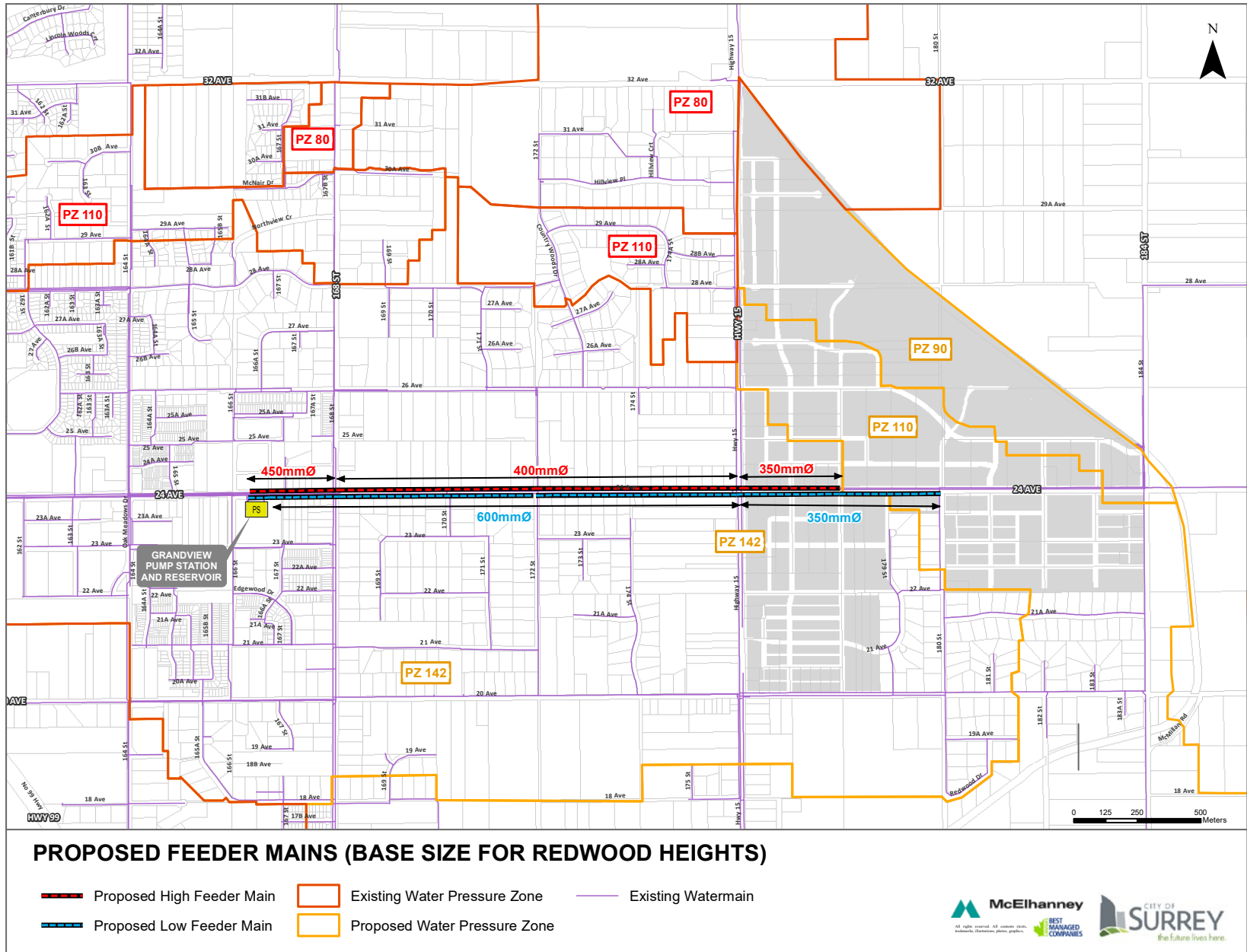
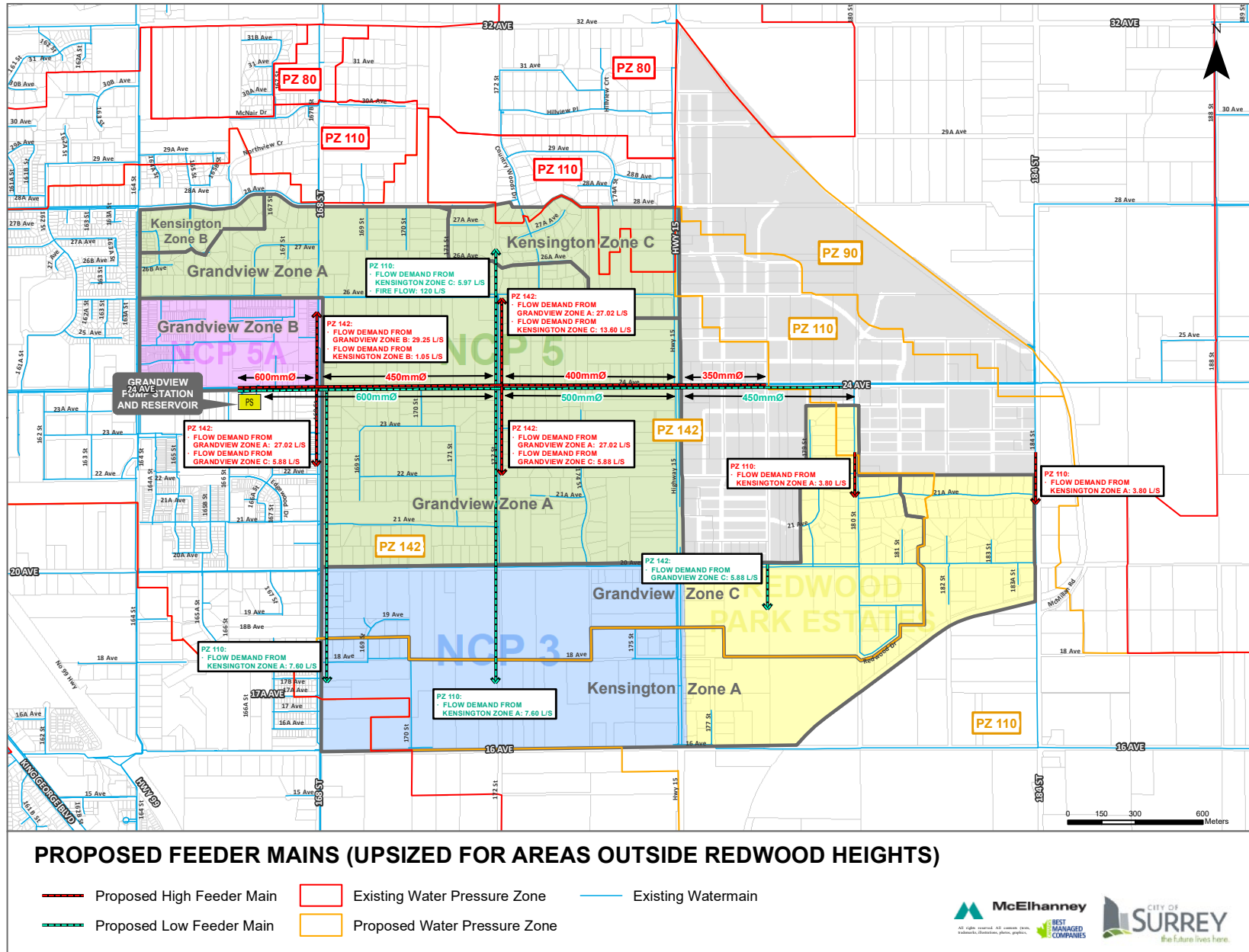


Figure 6.19 Proposed Feeder Mains (Outside)



Section 7

I Making it Work

BACKGROUND

PLAN
FRAMEWORK

LAND USE

TRANSPORTATION

PARKS &
NATURAL AREAS

UTILITIES

IMPLEMENTATION

The plan will increase development intensity and population. To address the impacts of growth, funding will be required to improve local amenities and infrastructure necessary for a high quality of life. A number of area specific considerations, such as flooding and watercourse protection, must also be considered as the area grows.

PAGE	SECTION
148	7.1 Land Consolidation Strategy
150	7.2 Official Community Plan Amendment
152	7.3 Design Guidelines
152	7.4 Development Permit Areas
157	7.5 Community Amenity Contributions
162	7.6 Cost Recovery Surcharge
163	7.7 Financing



7.1 LAND CONSOLIDATION STRATEGY

In several areas of the NCP, lot consolidation will be required to ensure efficient development of properties. These land consolidation opportunities will, in most circumstances, be determined on a case-by case basis at development application.

In some cases, however, consolidation requirements have been identified to avoid creating remnant pieces created by fragmented ownership. These remnants would not be developable on their own or limit the development potential of an adjoining lot.

Land consolidation areas have been generally identified in Figure 7.1 to inform developers and owners of the consolidation strategy guidelines, to ensure compatibility and feasible development areas, and to achieve an equitable distribution of road dedication and construction costs across properties. If land consolidation is proven not to be possible or feasible during the development process, the developer must:

- Demonstrate that the development potential of the excluded property is not compromised, to the satisfaction of the City; and
- Share any required road construction costs amongst properties shown in the land consolidation area.
- Provide additional road or lane and pedestrian access dedications to the satisfaction of the City.



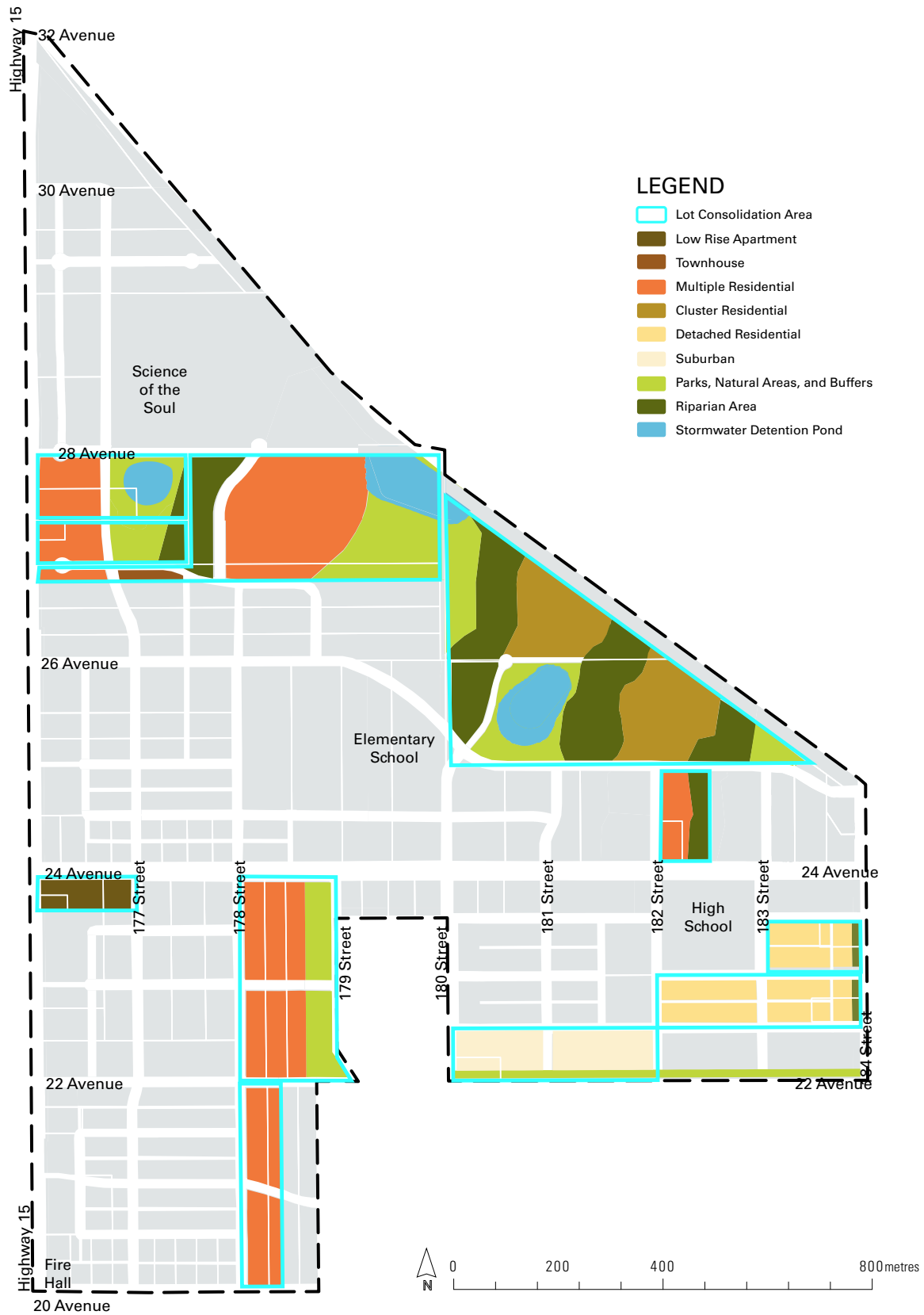


Figure 7.1 Land Consolidation Strategy

7.2 OFFICIAL COMMUNITY PLAN AMENDMENT

Redwood Heights is currently designated Suburban-Urban Reserve in the OCP (Figure 7.2). Bylaw amendment changes to the OCP land use designations are required to proceed to rezoning following the approval of the Redwood Heights NCP, as generally illustrated in Figure 7.2 and 7.3.

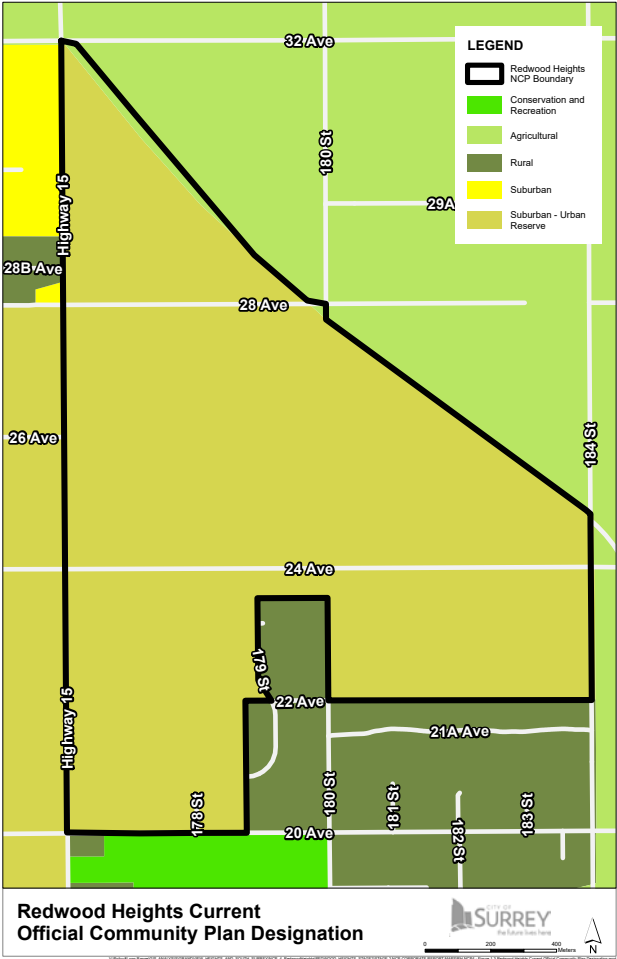


Figure 7.2 Current OCP Designations

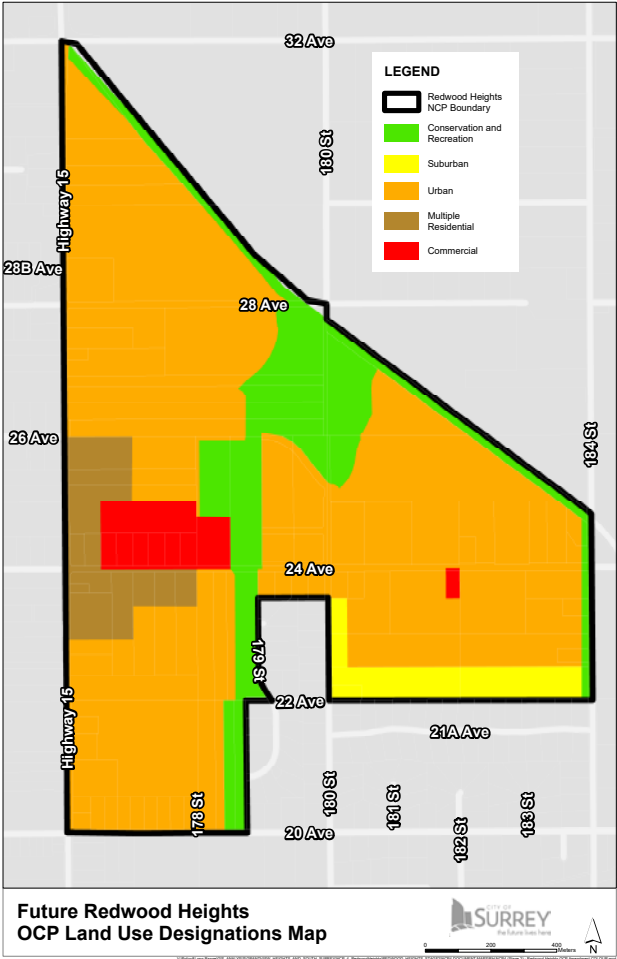
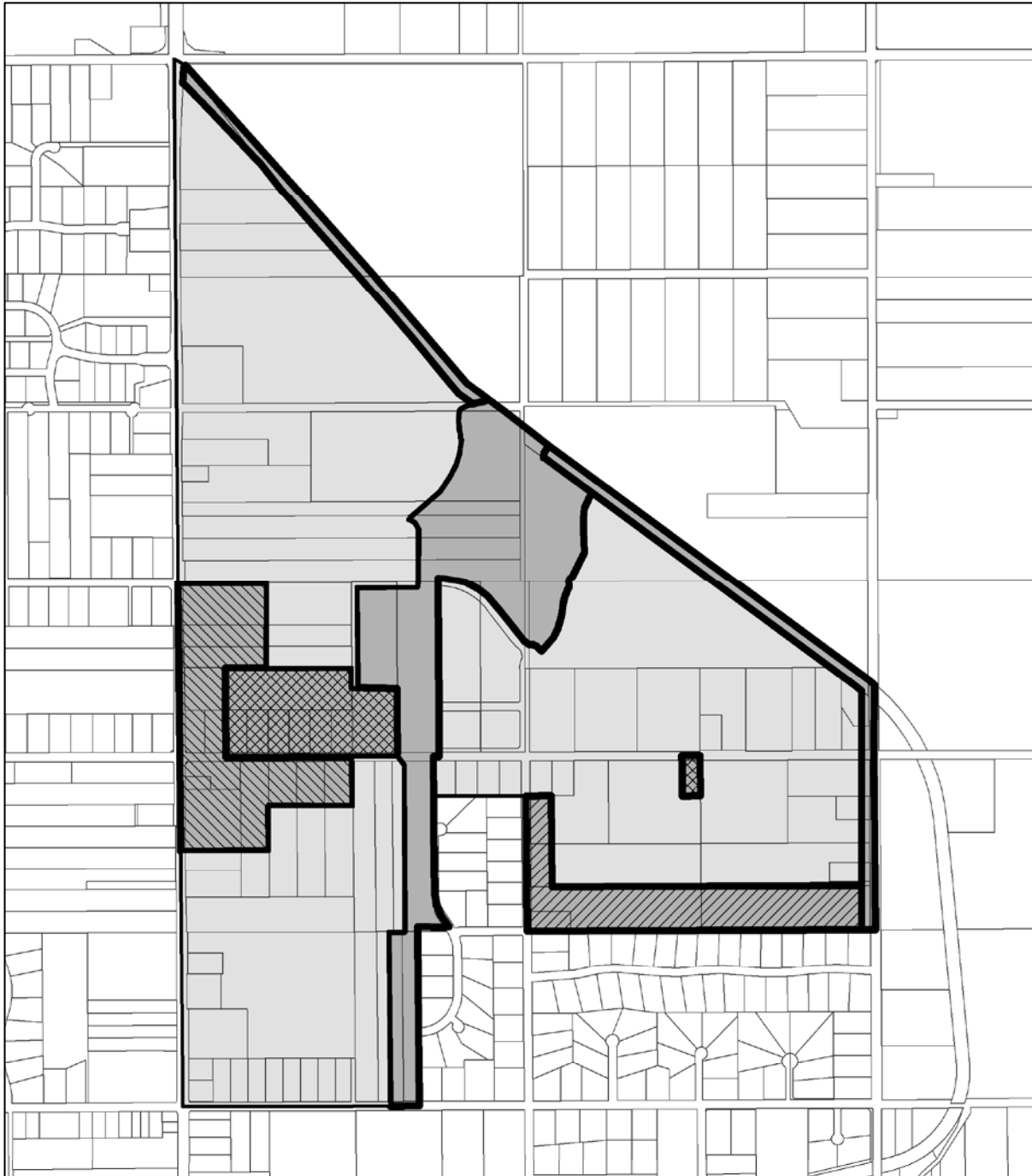







Figure 7.3 Future OCP Designations



Redwood Heights NCP OCP Amendments



Legend

-  Suburban - Urban Reserve To Urban
-  Suburban - Urban Reserve To Suburban
-  Suburban - Urban Reserve To Multiple Residential
-  Suburban - Urban Reserve To Commercial
-  Suburban - Urban Reserve To Conservation and Recreation



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Figure 7.4 OCP Amendments

7.3 DESIGN GUIDELINES

In the case of single-family residential development, approved building schemes will be required to control housing designs. Where single family developments are located in designated Development Permit Areas (DPA), as well as for any multiple unit residential development, design guidelines will be implemented through the review and approval of a Development Permit.

7.4 DEVELOPMENT PERMIT AREAS

Where developments are located in designated Development Permit Areas (DPA), as identified in the OCP (steep slopes, farm protection, environmentally sensitive areas, etc.), as well as in the case of multiple unit residential or commercial developments, the OCP Design Guidelines will be implemented through the process of reviewing and approving the related Development Permit at the time of development application.





Figure 7.5 Farm Protection DPA Map

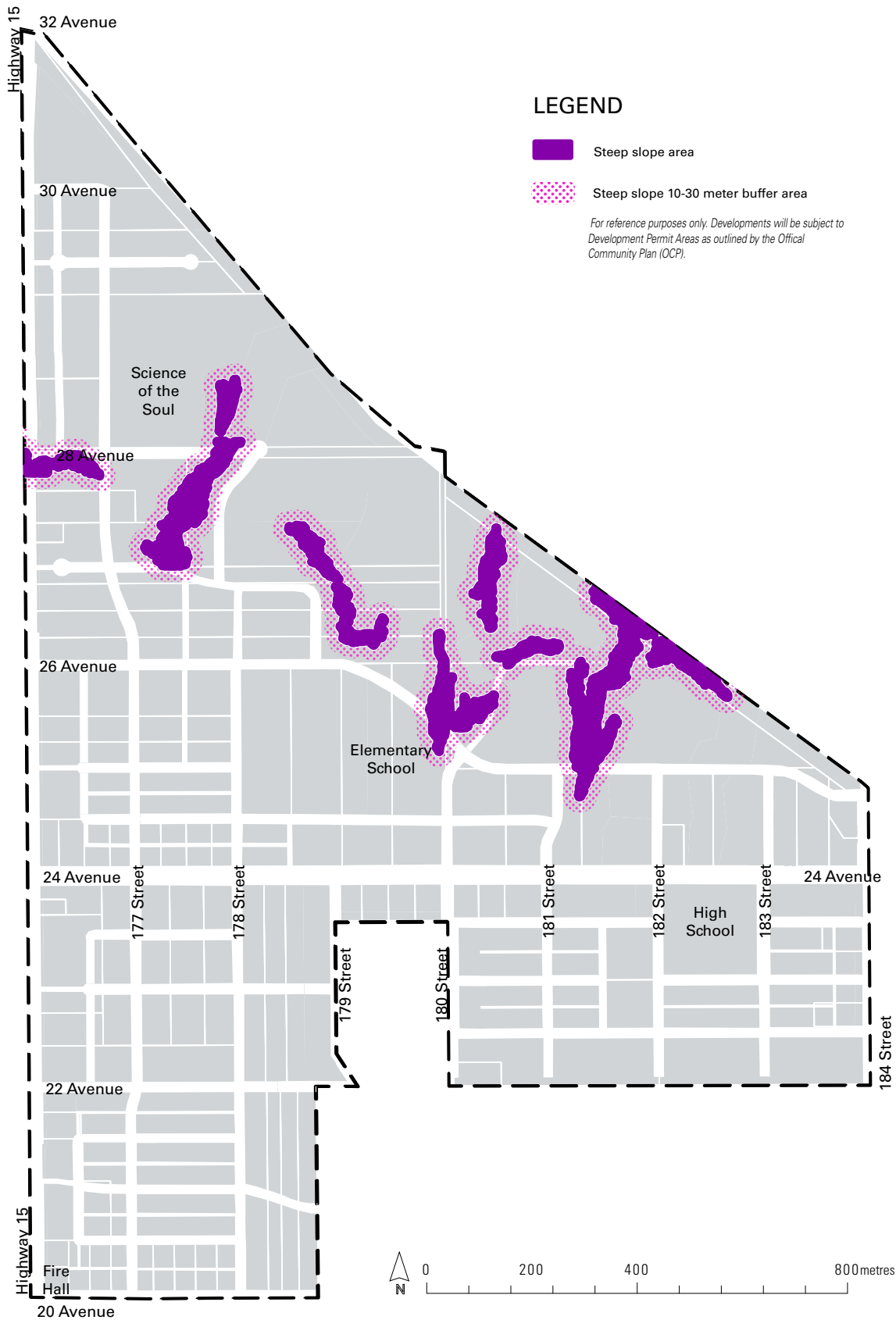


Figure 7.6 Steep Slopes Hazard DPA Map

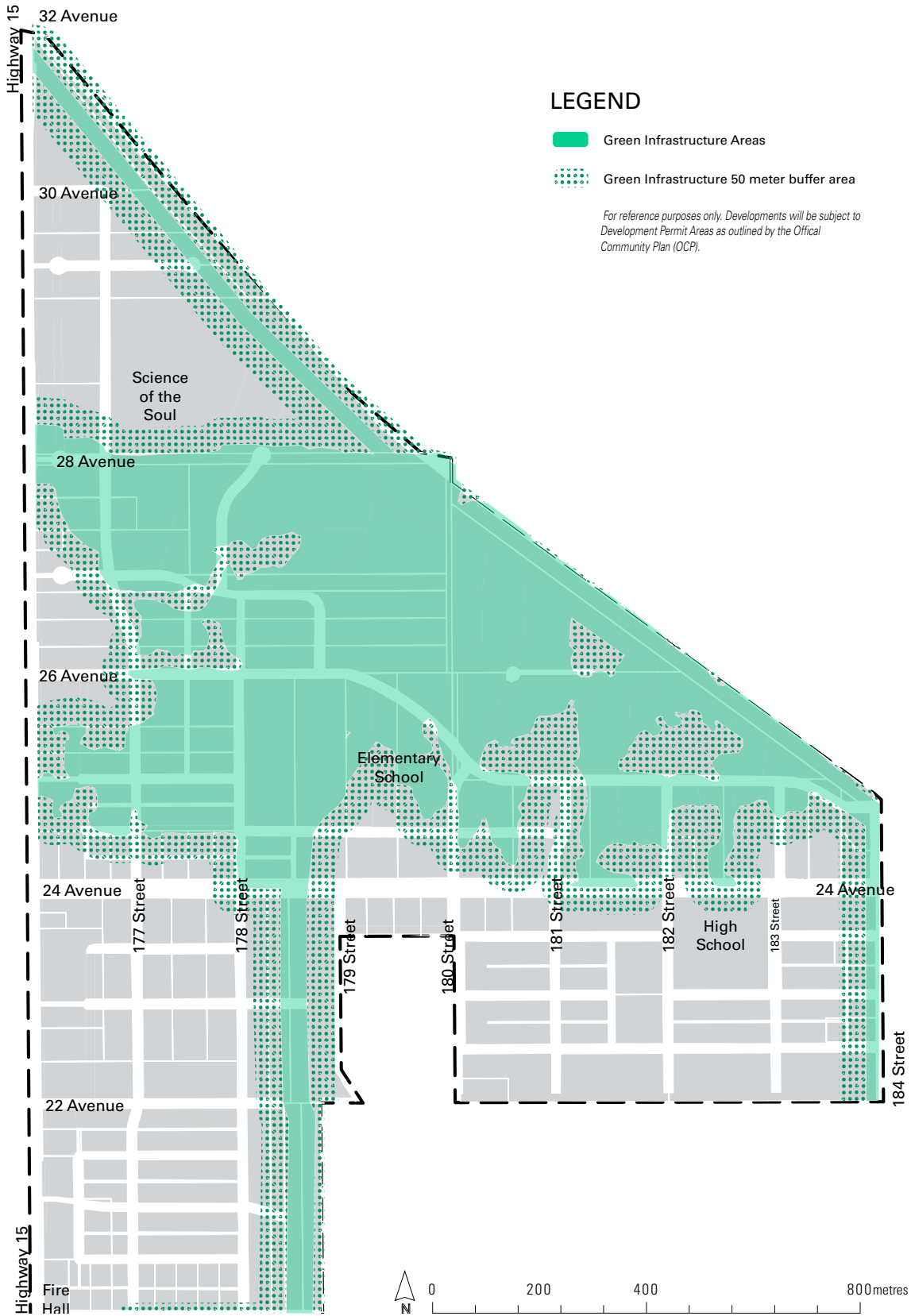


Figure 7.7 Sensitive Ecosystem Infrastructure Network DPA Map



Figure 7.8 Sensitive Ecosystem Riparian DPA Map

7.5 COMMUNITY AMENITY CONTRIBUTIONS

Growth and development will lead to increased demand for community amenities. To secure these amenities, Surrey uses density bonus zoning (“Density Bonusing”) in accordance with Section 482 of the Local Government Act.

Community Amenity Contributions (CAC’s) are collected as cash contributions provided by developers at time of rezoning or building permit. They are offered by developers when City Council grants increased development rights through rezoning properties for increased density in accordance with Schedule G of Surrey Zoning Bylaw #12000. These contributions help offset the impacts of growth and help fund new community facilities and services.

- **Tier 1 CAC’s** apply to all residential rezoning’s seeking increased density (with some exceptions) and is applicable to the portion of units that are consistent with the density within the Redwood Heights Plan/or the Official Community Plan (OCP), whichever is lower. Tier 1 CAC’s include area specific Secondary Plan CAC’s (Parks, Libraries, Fire, Police), and City-wide Capital Project CAC’s, and Affordable Housing CAC’s.
- **Tier 2 CAC’s** will only apply when residential rezoning’s seek increased density (Plan Amendment) above Redwood Heights Plan or OCP designations in accordance with Surrey’s Density Bonus Policy O-54. Tier 1 is applied up to the Plan or OCP designations and Tier 2 is then applied to the portion of density above the Plan or OCP designation.

Tier 1 - Area Specific Redwood Heights CAC’s

To enact the area specific Secondary Plan CAC’s noted above, the Zoning By-law will be amended to add Redwood Heights to the list of area specific Plan areas within which monetary amenity contributions are required. The monetary contributions toward parks, police, fire and library materials will offset capital costs of providing services to new development and are applied on a standardized basis in all of Surrey’s Secondary Plans. The monetary contributions toward parks, open spaces and pathway development are based upon an estimated capital costs of improvements for this NCP. The

total cost is divided by the average anticipated number of dwelling units (acreages in the case of non-residential development) to ensure an equitable contribution.

The estimated costs of the various amenities are distributed evenly to each dwelling unit. Therefore, if the number of dwelling units in a proposed development is lower than that anticipated by the NCP, the applicant will be expected to “top up” the amenity fees based on the number of the dwelling units used to calculate the amenity charge to ensure that there is no shortfall in the funding for the proposed.

City Wide CAC’s

Universal City-Wide CAC’s such as Affordable Housing and Capital Projects CAC’s, are also applicable to future development in Redwood Heights as identified in Schedule G of Surrey Zoning Bylaw.

7.5.1 Parkland & Pathway Development



The scope of parkland development within the NCP will include eight (8) new parks, a Biodiversity Preserve and a linear Habitat Corridor. The estimated cost of developing park amenities is \$13,146,013.14 which results in a \$2,509.26 per dwelling (in 2020 dollars) per dwelling unit. This estimate includes the construction of onsite park amenities, such as playgrounds, washroom buildings, parking lots, sports courts, athletic fields, tree and horticultural plantings, park pathways, seating areas, viewing platforms and passive open spaces. This also includes natural and riparian area management within land acquired by Parks.

Park amenity calculations do not include riparian area works on land conveyed to the City through the development process, such as invasive species removals, fence construction, replanting and naturalization, in-stream works and any other related riparian area costs, including planning and design costs, which are to be accounted for as part of the development process and subject to the Zoning By-Law.

7.5.2 Library Materials



A study of library requirements in Surrey's new neighbourhoods has established that a contribution of \$181.17 (in 2020 dollars) per dwelling unit (non-residential development is exempt) is necessary to cover the capital costs for library materials and services, which is sensitive to population growth. Consequently, a total of approximately \$949,149.63 will be collected from Redwood Heights towards materials such as books, computers, and electronic media.

7.5.3 Fire Protection



Future development in this neighbourhood will drive the need to upgrade existing fire and police protection facilities. A study of fire protection requirements in Surrey's new neighbourhoods has established that a contribution of \$347.89 per dwelling unit and \$2,087.34 per acre of non-residential development (in 2020 dollars) will cover the capital costs for fire protection. This will result in a total capital contribution from Redwood Heights of approximately \$1,862,046.44 toward fire protection.

7.5.4 Police Protection



A contribution of \$80.52 per dwelling unit and \$483.12 per acre of non-residential development will cover the capital costs for police protection. This will result in a total capital contribution from Redwood Heights of approximately \$430,975.25 toward police protection.

7.5.5 Capital Projects



The NCP area will be subject to Capital Plan Project CAC's for future rezonings, as identified in Surrey's Zoning Bylaw #12000. The Capital Project contribution rates are phased in over 2 years, with rates increasing from \$1,000 to 1,500, to \$2,000 from January 1, 2020 to January 1, 2022 as outlined in Section B.4 of Schedule G of the Zoning Bylaw. The proposed development will provide the phased zoning bylaw rates that are applicable at the time the future Building Permit is issued. This will result in a total capital contribution from Redwood Heights of approximately \$10,478,000 toward civic projects such as cultural, sport or recreation facilities within the larger Grandview Heights area.

7.5.6 Affordable Housing



The NCP is subject to Affordable Housing CAC's for future rezonings, as identified in Schedule G of Surrey's Zoning Bylaw. The (2020) Affordable Housing contribution rates are \$1,000 as outlined in Schedule G of the Zoning Bylaw. Proposed development will provide the bylaw rates that are applicable at the time the future Building Permit is issued. This will result in a total affordable housing contribution from Redwood Heights of approximately \$5,239,000 toward civic affordable housing projects in the South Surrey area.



REDWOOD HEIGHTS COMMUNITY AMENITY CONTRIBUTION PROJECTION SUMMARY

The estimated (2020 Rate) CAC's and total projected revenues expected from development in Redwood Heights is expected to be over \$32 Million dollars. The specific CAC's for Redwood Heights NCP area summarized below and are documented in Table 7.1.

REDWOOD HEIGHTS NCP COMMUNITY AMENITY CONTRIBUTION RATES

CAC	Per Unit Contribution All Residential (Approx. 5,239 dwelling units @ average density)	Per Acre Contribution All Non-Residential Uses (21.4 Acres)	Anticipated Total Revenue at Build Out
Police Protection	\$80.52 per dwelling	\$483.12 per acre	\$430,975.25
Fire Protection	\$347.89 per dwelling	\$2,087.34 per acre	\$1,862,046.44
Parks & Open Spaces	\$2,509.26 per dwelling	n/a	\$13,146,013.14
Library Materials	\$181.17 per dwelling	n/a	\$949,149.63
Civic Projects	\$2,000 per dwelling	n/a	\$10,478,000
Affordable Housing	\$1,000 per dwelling	n/a	\$5,239,000
Total contribution (per unit or per acre)	\$6,022.62 per dwelling	\$2,570.46 per acre	
ANTICIPATED TOTAL CAC REVENUE			\$32,105,184.46

Table 7.1 Community Amenity Contribution Rates

7.6 COST RECOVERY SURCHARGE

Several consultants were retained to assist with the preparation of the Redwood Heights NCP, including heritage, environmental, watercourse, commercial, transportation, financial, and engineering service studies. The total cost of consultant services to the City was \$587,926.59. The Fee Imposition By-law is to be amended to provide for the recovery of these NCP preparation costs through the payment of application surcharge fees at time of development.

A per unit surcharge fee will be based on the anticipated 5,239 units at the mid-range density and will result in a per unit fee of \$112.22. See Table 7.2.

Should the actual number of proposed units fall below the number anticipated on any site, the applicant will be required to make up the shortfall in the surcharge fee to ensure the City’s NCP preparation costs are fully recovered. For non-residential development the equivalent application surcharge fee will be based on the gross lot area at a rate of 10 units per hectare or \$1,122.00 hectare.

REDWOOD HEIGHTS NCP PREPARATION COST RECOVERY (SURCHARGE FEE)

Consultant Study	Cost	Per Unit Fee (Based On 5,239 Units)
Stage 1 Planning & Engineering	\$334,351.59	\$61.28
Environmental and Tree Studies	\$10,000.00	\$1.83
Stage 2 Engineering Servicing Studies (Water, Sanitary, Drainage)	\$195,402.00	\$35.81
South Surrey Transportation Study	*\$130,756.00 (25% to be paid by NCP #4)	\$5.99
Watercourse & Wetland Assessment	15,484.00	\$2.95
Total Consultant Study Costs:	\$587,926.59	\$112.22

Table 7.2 NCP Preparation Cost Recovery (Surcharge Fee)



7.7 FINANCING

New water, sanitary sewer, storm sewer and transportation infrastructure is required to support development in the NCP. Table 7.3 summarizes the projected DCC revenues and construction costs for each of the major infrastructure systems that will be needed to support build-out.

Revenues are based on the proposed DCC rates that are anticipated to come into effect on May 15, 2020 and include the DCC municipal assist factor for all DCC-Eligible Costs attributable to the NCP for each utility, as summarized in Table 7.5.

Included in these costs are road improvements that will be necessary for the development of this NCP but will also benefit development outside of this NCP area. In this regard, the NCP has only been burdened with a proportionate share of the total costs related to the road improvements.

The four drainage ponds in the NCP require acquisition of land, which makes up approximately 73% of drainage costs. Land costs are based on an average land acquisition price of \$2,500,000 per acre, as estimated by Realty Services Division staff.

7.7.1 Financing Approach

As shown in Table 7.3, the cost to provide the necessary water, sanitary sewer and drainage infrastructure to support development in the NCP exceeds the expected DCC revenues from development in the area, and currently there is no funding system in place to acquire the lands identified in the BCS.

This revenue shortfall will necessitate the introduction of additional levies to support development of this NCP.

RECOMMENDED FINANCING APPROACH

Given that there is a DCC funding shortfall for water, sanitary sewer, and drainage infrastructure, and for the acquisition of the BCS lands in the NCP, it is recommended that:

1. An area specific DCC be established as the means to pay for water and sanitary sewer, and for the acquisition of the BCS lands in the NCP;
2. The Citywide DCC be used as the means to pay for arterial and non-arterial road infrastructure and for parkland acquisition in the NCP area; and
3. A combination of the Citywide DCC and Development Works Agreements (DWA) to recover any DCC funding shortfall be used as the means to pay for drainage infrastructure, including stormwater detention ponds, to service this NCP.

An area-specific DCC was explored, in order to address the drainage funding shortfall; however, given that the cost of each stormwater detention pond varies and the DCC revenues generated by the benefiting area of each stormwater detention pond varies, the area-specific DCC approach would result in some front-ending developers not having the opportunity to fully recover their investment. As such using a combination of the in City-wide DCC and DWAs to recover any DCC funding shortfall as the means to pay for the stormwater detention ponds servicing this NCP area will provide the opportunity for each front-ending developer to fully recover their investment.

FINANCING IMPLEMENTATION

The 10-Year Servicing Plan establishes the City’s capital expenditure plan for the construction of engineering infrastructure to service existing neighbourhoods and to support new growth across the City. It also forms the basis for establishing the City’s DCC rates. Table 7.6 shows the DCC rates for the recommended approach.

With the completion of this NCP, it is recommended that the infrastructure needs identified in this NCP be added to the next update of the 10-year Servicing Plan, and the DCC rates be included in the next DCC bylaw update.

FINANCING LAND FOR THE BCS

The estimated cost to acquire BCS lands in the NCP is \$112,500,000, based on an average acquisition cost of \$2,500,000 per acre. Currently, there is no funding system in place to fund the acquisition of these lands. Recommended area specific DCC’s, including a municipal assist factor, are detailed in Table 7.6.

7.7.2 Operation and Maintenance

The development of the NCP area will increase the total length of infrastructure that the City is required to operate, maintain and eventually replace. The increases to the City’s major infrastructure categories are shown in Table 7.7.

The midline build-out population estimate of 13,500 persons in the Plan area represents a 2.6% increase in the City’s population. The infrastructure needed to support this increase in population results in the City’s infrastructure inventory increasing by 0.3 to 1.7%. Therefore, the added infrastructure to support the development of the Plan area is positively balanced when compared against the increase in population.



DCC SURPLUS/SHORTFALL FOR ENGINEERING INFRASTRUCTURE

Service	Estimated DCC Revenues	DCC-Eligible	Anticipated Total Revenue at Build Out
Water	\$10,110,000	\$13,630,000	-\$3,520,000
Sanitary Sewer	\$14,570,000	\$17,850,000	-\$3,280,000
Drainage	\$10,110,000	\$65,750,000	-\$55,640,000
Arterial Roads	\$60,410,000	\$54,160,000	\$6,250,000
Non-Arterial Roads	\$14,060,000	\$13,790,000	\$270,000

Table 7.3 DCC Surplus/Shortfall for Engineering Infrastructure

MUNICIPAL ASSIST FACTOR FOR BCS LANDS

Service	Municipal Assist Factor	Cost of the Municipal Assist Factor
Biodiversity Conservation Strategy Lands	1%	\$1,125,000

Table 7.4 Municipal Assist Factor for BCS Lands

MUNICIPAL ASSIST FACTOR FOR ENGINEERING INFRASTRUCTURE

Service	Municipal Assist Factor	Cost of the Municipal Assist Factor
Water	1%	\$101,100
Sanitary	1%	\$145,700
Drainage	1%	\$101,100
Arterial Roads	1%	\$ 604,100
Non-Arterial Roads	1%	\$ 140,600

Table 7.5 Municipal Assist Factor for Engineering Infrastructure

PROPOSED DCC RATE FOR EACH COMPONENT FOR REDWOOD HEIGHTS

	Arterial 2020 City Wide	Non-Arterial 2020 City Wide	Parks 2020 City Wide	Drainage 2020 City Wide*	Sewer Area Specific	Water Area Specific	BCS Lands Area Specific	Total
SF (RF, RF-12) (per lot)	\$18,969	\$4,409	\$9,889	\$3,542	\$4,855	\$3,707	\$30,599	\$75,970
SF Small Lot (RF-10) (per lot)	\$17,273	\$4,015	\$9,005	\$2,090	\$4,063	\$3,103	\$25,608	\$65,157
RM-10, RM-15 & RM-30 (per sq.ft. of DU)	\$7.13	\$1.66	\$9.07	\$1.33	\$2.16	\$1.65	\$13.64	\$36.64
RM-45 and RM-70 (per sq.ft. of DU)	\$9.28	\$2.16	\$9.24	\$0.93	\$2.98	\$2.27	\$18.76	\$45.62
Commercial (ground floor) (per sq.ft. of BA)	\$7.05	\$1.64	\$0.00	\$2.30	\$1.35	\$1.03	\$8.49	\$21.86

Note: * excludes potential DWA charges.

Acronyms: SF (single family), DU (dwelling unit), BA (building area)

Table 7.6 Proposed DCC Rate for Each Component for Redwood Heights

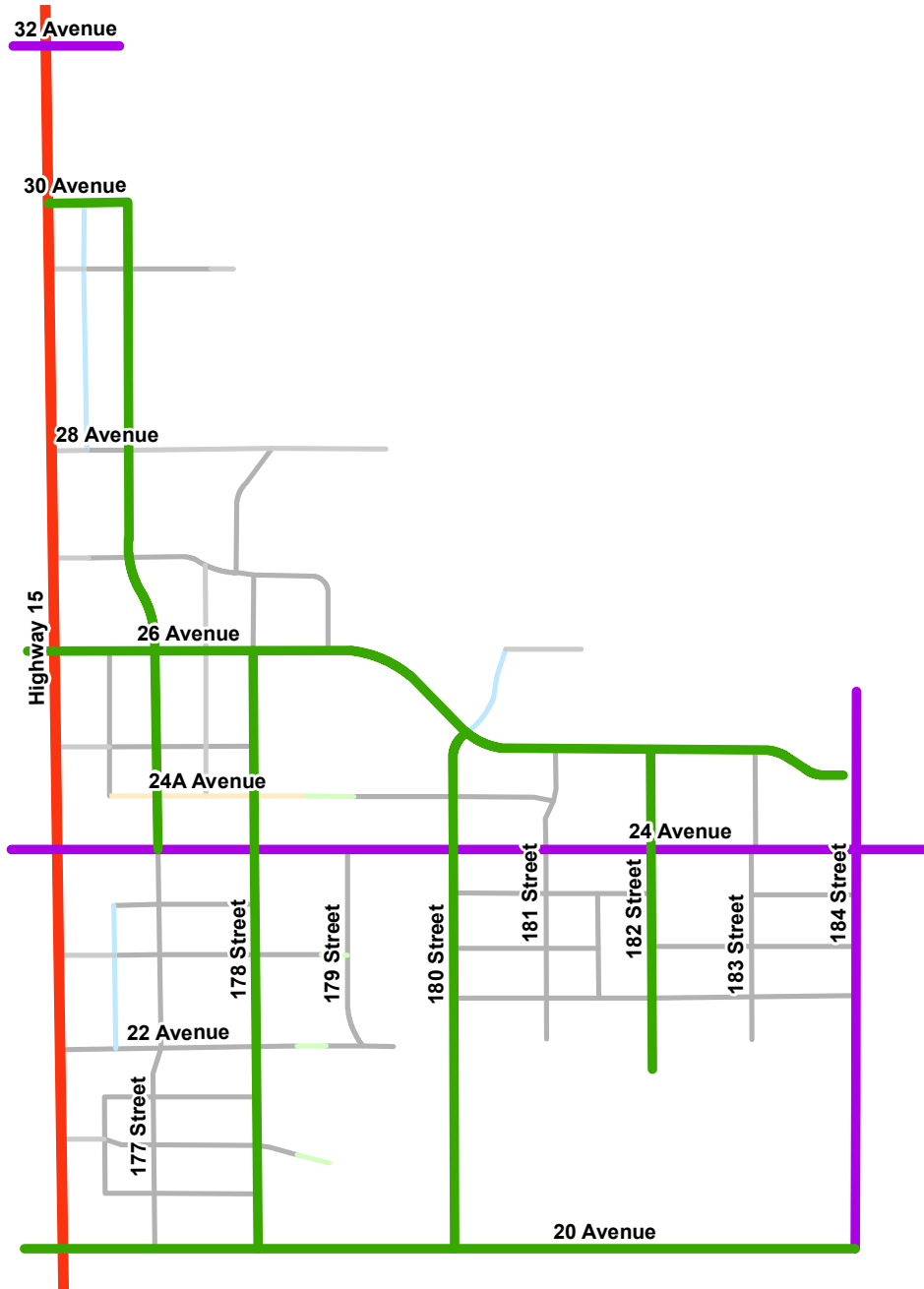
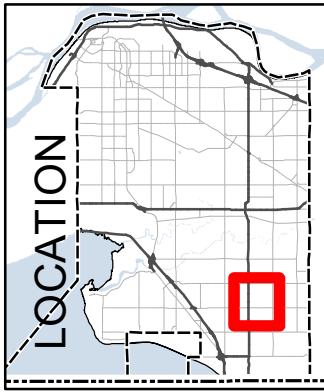
Infrastructure Type	Existing Inventory	Increase to Inventory	Increase to Inventory (%)
Sewer mains	1,595 km	27.3 km	1.7%
Water mains	1,862 km	25.6 km	1.4%
Drainage mains	1,955 km	6.5 km	0.3%
Local, Collector, and Arterial Roads (centreline length)	1,750 km	24.7 km	1.4%

Table 7.7 Increases to Major Infrastructure Categories for Redwood Heights



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LEGEND

Road Class

- Provincial Highway
- Arterial
- Collector
- Local
- Flex Street
- Local BCS Road Crossing
- Pedestrian Street
- Commercial High Street

Produced by GIS Section: 30-Apr-2020, P205934

Scale: 1:15,000



Redwood Heights NCP Planned Road Network

ENGINEERING
DEPARTMENT

CITY OF SURREY

BY-LAW NO. 8830

A By-law to Regulate the Subdivision and Development of Land.
.....

As amended by By-laws No. 8954, 03/23/87; 9122, 08/17/87; 9410, 02/08/88; 9520, 05/09/88; 9551, 06/20/88; 9603, 06/27/88; 9619, 07/11/88; 9999, 05/23/89; 10005, 04/24/89; 10106, 06/19/89; 10164, 08/14/89; 10603, 09/10/90; 10645, 10/29/90; 10834, 02/18/91; 10846, 02/05/91; 10985, 07/15/91; 11041, 09/09/91; 10958, 12/09/91; 11159, 01/06/92; 11228, 04/27/92; 11447, 03/22/93; 11667, 03/01/93; 11900, 09/13/93; 12145, 01/17/94; 12268, 04/25/94; 12522, 01/23/95; 12786, 03/11/96; 13054, 04/07/97; 13108, 05/05/97; 12353, 06/17/97; 13471, 07/06/98; 13252, 07/13/98; 13578, 11/23/98; 13968, 03/20/00; 14000, 04/10/00; 13499, 06/12/00; 14145, 11/06/00; 14158, 12/04/00; 14582, 12/03/01; 14704, 06/10/02; 14936, 03/24/03; 15022, 06/23/03; 15217, 06/07/04; 15471, 07/28/04; 15667, 05/18/05; 15939, 02/13/06; 16050, 07/10/06; 16211, 01/15/07; 16531, 01/14/08; 16858, 01/19/09; 17081, 12/14/09; 17121, 02/01/10; 17243, 07/29/10; 17326, 01/10/11; 17248, 14/03/11; 17568, 02/06/12; 17844, 12/17/12; 18003, 07/22/13; 18022, 07/29/13; 18137, 01/13/14; 18260, 09/08/14; 18359, 01/12/15; 18500, 10/20/15; 18602, 12/14/2015; 18591, 12/14/15; 18636, 02/01/16; 18644, 02/22/16; 18983, 12/19/16; 19099, 02/06/17; 19365, 10/02/17; 19429, 12/18/17; 19719, 12/19/18; 19985, 12/16/19

THIS IS A CONSOLIDATED BY-LAW PREPARED BY THE CITY OF SURREY FOR CONVENIENCE ONLY. THE CITY DOES NOT WARRANT THAT THE INFORMATION CONTAINED IN THIS CONSOLIDATION IS CURRENT. IT IS THE RESPONSIBILITY OF THE PERSON USING THIS CONSOLIDATION TO ENSURE THAT IT ACCURATELY REFLECTS CURRENT BY-LAW PROVISIONS.

WHEREAS it is deemed desirable to regulate the subdivision and development of land in order to promote the orderly and economic development of the City.

THEREFORE, the City Council of the City of Surrey, in open meeting assembled, ENACTS AS FOLLOWS:

- | | | |
|-------------------|----|---|
| Title | 1. | This By-law may be cited for all purposes as “Surrey Subdivision and Development By-law, 1986, No. 8830.” |
| Organi-
zation | 2. | This By-law is divided into nine parts and forty-nine sections dealing with the following subjects:

Section 1 Title
Section 2 Organization
Section 3 Schedules

<u>Part I</u> - <u>Interpretation</u>
Section 4 Definitions
Section 5 Interpretation |

- Part II - General Requirements
 - Section 6 Submission of Application, Preliminary Layout Approval
 - Section 7 Suitability
 - Section 8 Submission of the Final Plan
 - Section 9 Basis of Consideration of a Highway Allowance
 - Section 10 Additional Requirements
 - Section 11 Refusal of Subdivision
 - Section 12 Development Permits
- Part III - Dedication of Parkland
 - Section 13 Parkland Dedication
 - Section 14 Cash in Lieu of Parkland Dedication
 - Section 15 Parkland Dedication Not Applicable
- Part IV - Parcel Standards
 - Section 16 Parcel Dimensions
- Part V - Highway Dedication, Servicing and Construction Standards
 - Section 17 Highway Dedication
 - Section 18 Provision of Highways
 - Section 19 Sidewalks and Walkways
 - Section 20 Road Lengths
 - Section 21 Half-roads
 - Section 22 Construction Standards
 - Section 23 Boulevards
 - Section 24 Servicing Requirements, Exceptions and Alternate Servicing Systems
 - Section 25 Land for Drainage Control
 - Section 26 Type of Servicing
- Part VI - Servicing Agreements
 - Section 27 Agreement Conditions
 - Section 28 Failure to Construct the Works and Services

Part VII - Payment of Taxes and Charges

Section 29 Payment of Taxes

Section 30 Development Cost Charges

Section 31 Application Fees

Section 32 Processing Fees

Part VIII - Latecomer Agreements

Section 33 Application for Cost Sharing

Section 34 Policy/Procedure

Section 35 Latecomer Charge Escalation

Sections 36 to 48 Deleted BL 10834 2/18/91

Part IX - Repeal Section

Section 49 Repeal

Schedules 3. Attached to and hereby made an integral part of this By-law are the following schedules:

Schedule "A"- Road Standards, Servicing Requirements, Design Criteria, Standard Documents, Specifications and Standard Drawings

Table 1 - Servicing Requirements

Table 2 - Highway Dedication, Pavement Widths and Sidewalks

Table 3 - Highway Dedication, Pavement Widths and Sidewalks
Alternative Local Road Standards

Schedule "B"-- Servicing Agreement Processing, Engineering Administration and Latecomer Administration Fees

Schedule "C"- Deleted by By-law No. 13578

Schedule "D"- Surrey Road Classification Map (R-91)

Schedule "E"- Detention Map E-2-12
(Map too large to attach – please see City Clerk for more information)

Schedule "F"- Deleted by By-law No. 11041

Schedules "G", "H" & "I" Deleted by By-law No. 10834

Schedule "J"- Deleted by By-law No. 13578

Schedule "K" - Surrey Major Road Allowance Map

PART I - INTERPRETATION

Definitions 4. (a) In this By-law unless the context otherwise requires:

"Accept, Acceptance"	or any tense of these words when used with respect to Work or Works and Services shall mean the final acceptance of the Works and Services as certified by the General Manager, Engineering in writing, when the maintenance period has been completed to the satisfaction of the General Manager, Engineering.
"Approving Officer"	means a person appointed as an Approving Officer for the City of Surrey under the "Land Title Act".
"Assessment Roll"	means the record of real property for the City of Surrey prepared for purposes of determining Property Taxes by the British Columbia Assessment Authority.
"Benefitting Lands"	Deleted BL 10834 2/18/91
"Bond"	means cash or an irrevocable Letter of Credit in favour of the City.
"Boulevard"	means all those portions of a highway not occupied by roadway and shall include the 'median' area between separated roadways.
"Building Permit"	means permission or authorization in writing by the General Manager, Planning and Development, or his designate, for the City of Surrey to perform work regulated by the Surrey Building By-law.
"Collector"	means the Officer appointed by Council, pursuant to the "Surrey Officers By-Law, 1993, No. 11640" as amended, for purposes of collecting taxes, levies and other charges for the City, or his authorized representative.
"Complete or Completion"	or any tense of these words when used with respect to the work or works and services shall mean completion to the satisfaction of the City when so certified by the General Manager, Engineering in writing.
"Connection"	means the actual physical connection between a utility main and an individual parcel of land.
"Contractor"	means a person or firm having a contract with an owner or the City to construct roads or install City works or services or any other items required by this By-Law.
"City"	means the City of Surrey

"Council"	means the elected Mayor and Councillors of the City.
"Developer"	means the owner, or authorized agent of the owner, of property for which an application for subdivision or building permit is made.
"Development"	means all lands within the subdivision, or all lands affected by the building permit, as the case may be.
"Drainage Works"	means a system of works designed and constructed in accordance with Schedule A to control the flow of storm water in conformity with the Natural Drainage Policy or any successor policy, resolution or By-law.
"Electrical and Tele-communications Service Line"	means electrical and between the pole or dip service connection and the building.
"Equivalent Service Connection"	Deleted BL 10834 2/18/91
"Extension"	means the extension of a City water, sewer or drainage system by a main from an existing City or Regional system to the City system within a subdivision; and for the purpose of Latecomer Agreements shall include such portions of a main that fronts and potentially benefits lands outside of the subdivision.
"Extension of Main with Oversizing"	Deleted BL 11041 9/9/91
"Frontender"	Deleted BL 10834 2/18/91
"Highway"	means and includes a street, road, lane, walkway, bridge, viaduct and any other way open to the use of the public, but does not include a Statutory Right-of-Way on private property.
"Lane"	means a highway having a dedicated width of not more than 8 metres, and not assigned a name or number, and providing a secondary vehicular access to the abutting properties.
"Latecomer"	means the owner of real property within the Benefitting Lands other than the frontender.
"Medical Health Officer"	means the official appointed as head of the Boundary Health Unit of the British Columbia Ministry of Health, or his duly authorized representative.

"Minimum Size"	means the extension of a City water, sewer or drainage system with the minimum size required by Schedule A, the Design Criteria Manual, for the land use designation of the subdivision.
"General Manager, Engineering"	means the officer appointed by Council, pursuant to the "Surrey Officers By-Law, 1993, No. 11640" as amended, as head of the Engineering Department, or his authorized representative.
"General Manager, Planning and Development"	means the officer appointed by Council, pursuant to the Surrey Officers By-law, 1993, No. 11640" as amended, as head of the Planning and Development Department, or his authorized representative.
"Official Community Plan"	is that community plan established under the Surrey Official Community Plan By-law 1983 No. 7600, as amended.
"Owner"	in respect of real property means the registered owner of an estate in fee-simple, and includes: <ol style="list-style-type: none"> (1) the tenant for life under a registered life estate; (2) the registered holder of the last registered agreement for sale; (3) the holder or occupier of land held in the manner mentioned in Sections 409 and 410 of the Municipal Act. (4) an Indian who is an owner under the letters of patent of the City incorporated under Section 10 of the Municipal Act.
"Parcel"	means any lot, block or other area in which land is held or into which land is subdivided, including strata lots created by strata plan, but does not mean a highway or portion thereof.
"Preliminary Layout Approval (PLA)"	means a document issued by the Approving Officer which sets out terms and conditions for final subdivision plans approval.
"Professional Engineer"	means a person licensed to practice in the Province of British Columbia as a Professional Engineer.
"Provide"	in relation to services or other works means doing all that is necessary to make a service available and functioning in a proper manner, and shall include design, construction or installation, and testing.
"Units"	shall mean the number of self contained living areas that could be developed as per Surrey's zoning by-laws.

- "Public Utility" means any system having facilities installed in a highway or in a right-of-way for the purpose of providing a service to property, and shall include, but not be limited to, water distribution, sewage and drainage collection, street lighting, electric power distribution, telephone, cable television, and gas distribution systems.
- "Replotting Scheme" means the proposed plan for re-subdivision of an area under the replotting provisions of the Municipal Act.
- "Statutory Right-of-Way" means an easement without a designated dominant tenement registerable under Section 214 of the Land Title Act; and includes but is not restricted to any land or interest in land acquired for the purpose of:
- (1) public rights of passage with or without vehicles; or
 - (2) erecting and maintaining any pole-line; or
 - (3) laying, placing, maintaining and repairing drains, ditches, pipes, transmission-lines, or wires for the conveyance, transmission, or transportation of water, electric power, forest products, oil, or gas, or both oil and gas, or solids as defined in the "Pipe-lines Act"; or
 - (4) a water distribution system, a fire hydrant system, a sewage collection system, a sewage disposal system, a drainage collection system or a drainage disposal system; and
 - (5) the operation and maintenance of the undertaking for which the Statutory Right-of-Way is required.
- "Road, Arterial" means a highway whose primary function is to carry through traffic from one area to another with as little interference as possible from adjacent land uses, but which may provide direct access to property as a secondary function.
- Existing and future arterial roads are designated on the "Surrey Road Classification Map (R-91)", attached as Schedule "D" to this By-law.
- (1) Divided Arterial Road means an arterial road which prevents left turns except at selected points by means of a physical barrier between opposing traffic.
 - (2) Undivided Arterial Road means an arterial road which has no physical barrier between opposing traffic.

"Road, Collector"	means a highway primarily for collecting and distributing traffic between local roads and arterial roads but which may provide direct access to a parcel. Existing and future collector roads are designated on the "Surrey Road Classification Map (R-91)", attached as Schedule 'D' to this By-law.
"Road, Local"	<p>means a highway whose primary function is to serve vehicle trip ends by providing direct access to properties, and which usually connects to other local roads or to collector roads. Local roads are classified into two types:</p> <p>(1) Through Local Road means a local road having access to two different collector or local roads which may, therefore, serve some traffic having neither origin nor destination along its length.</p> <p>(2) Limited Local Road means a local road which, by virtue of its connections to the collector road system, is likely to be used by traffic having either an origin or a destination along its length. Three variations of the limited local road are:</p> <p style="padding-left: 40px;">(i) Cul-de-Sac: a limited local road with only one access point;</p> <p style="padding-left: 40px;">(ii) P-loop: a variation of the cul-de-sac having a loop at one end; and</p> <p style="padding-left: 40px;">(iii) Crescent: a limited local road having access to the same local or collector road at two separate locations.</p> <p style="padding-left: 80px;">For the purpose of this By-law, a local road which serves more than 100 self contained dwelling units is a through local road regardless of configuration.</p>
"Roadway"	means the portion of a highway surfaced for the purpose of facilitating vehicular movement.
"Sidewalk"	means an improved area adjacent to the roadway for the use of pedestrian traffic.
"School Board"	means the Board of School Trustees, School City 36, (Surrey).
"Storm Water Control Plan"	means the Storm Water Control Plan as identified in Schedule A, the Natural Drainage Policy.
"Subdivider"	means the owner of the land proposed to be subdivided or his authorized agent.
"Walkway"	means a highway for the use of pedestrian traffic.

- "Work" or any variation thereof means and includes all work required to be done for the setting out, the execution and the completion to the satisfaction of the General Manager, Engineering.
- "Zone" means an area or City established under a Surrey Zoning By-Law.

- Interpretation 5. (a) In this By-law whenever words are used importing the subdividing or subdivision of land, those words shall be deemed to refer to the division of land into two or more parcels, whether by plan or by metes and bounds description or by replotting scheme or otherwise; except that the words "subdivision plan" shall also be deemed to include a plan consolidating two or more parcels into a single parcel, or several parcels into a smaller number of parcels, or as defined in the Land Title Act.
- (b) Words directing or empowering any officer of the City to do any act or thing, or otherwise applying to him by his name of office, include his successors in such office and his lawful deputy, and such person as the Council may from time to time by By-law or resolution designate to act in his place or stead.
- (c) All gender terms shall include both masculine and feminine.
- (d) Unless otherwise defined herein all words or expressions used shall have the same meaning assigned to them as like words or expressions contained in the Land Title Act and in the Municipal Act and amendments thereto.

PART II - GENERAL REQUIREMENTS

- Submission of Application 6. (a) The subdivider shall provide at the time application is made for preliminary approval of any proposed subdivision:
- (1) A statement in writing of the intended use of such lands
 - (2) A dimensioned sketch plan of the proposed subdivision
 - (3) Proof that the applicant for subdivision is the owner of the land or his duly authorized agent
 - (4) Payment of the fees prescribed in Section 31 hereof.
- Preliminary Layout Approval (b) Prior to final approval of a subdivision, the subdivider may obtain a Preliminary Layout Approval from the Approving Officer in which the subdivision servicing requirements and other conditions pursuant to the provisions of this by-law will be set out as accurately as is practicable.

- Suitability 7. (a) No preliminary layout approval shall be given by the Approving Officer on an application for a subdivision of land unless such proposed subdivision:
- (1) Is suited to the configuration of the land being subdivided; and
 - (2) Is suited to the use to which it is intended; and
 - (3) Does not make impractical the future subdivision of the land within the proposed subdivision or the subdivision of any adjacent land.
- Submission of the Final Plan 8. The subdivider shall tender a final Subdivision Plan for examination by the Approving Officer and the Plan shall be accompanied by:
- (a) The examination fee as prescribed by the Lieutenant Governor in Council; and
 - (b) Any other charges as set out in this By-law such as development cost charges, levies, and application, processing and administration fees; and
 - (c) A certificate from the Collector that all taxes assessed on the subdivided land have been paid, and where local improvement taxes, rates or assessments are payable by instalments that all instalments owing at the date of the certificate have been paid pursuant to Section 29 hereof.
- Basis of Consideration of a Highway Allowance 9. Highway classifications shall be based on a hierarchy of highways integrated into the existing or proposed adjoining highway pattern, and are determined in relation to land use, configuration of the land, the classification of the existing or approach highway and current highway width. Highway allowances for arterial roads, collector roads, and unique local roads are identified in Schedule "K" to this By-law, the 'Surrey Major Road Allowance Map'.
- Additional Requirements 10. In deciding the suitability of the subdivision the Approving Officer may consider comments from:
- (a) The Federal Department of Fisheries with respect to salmon bearing streams;
 - (b) The Fish and Wildlife Branch of the Provincial Ministry of Recreation and Conservation with respect to fish bearing streams;
 - (c) The Water Resources Branch of the Provincial Ministry of the Environment with respect to floodplains and water rights; and
 - (d) The Medical Health Officer with respect to water supply and sewage disposal where City service is unavailable

And if the Approving Officer so requires the Subdivider shall provide the following:

- (e) Profiles and plan views of every new highway shown with such topographical detail including horizontal and vertical curvature required to assess the engineering problems to be dealt with in opening up the highways shown on the plan,
- (f) A dimensioned sketch showing that the parcels into which the land is to be subdivided can be resubdivided to the smallest parcel size permitted by the Official Community Plan.
- (g) A contour plan of the lands proposed for subdivision.
- (h) A survey of existing trees on the lands proposed for subdivision.
- (i) A preliminary storm water control plan as defined in Schedule A, Natural Drainage Policy.
- (j) A geotechnical slope stability study.
- (k) A traffic impact study.

Refusal of Subdivision 11.

- (a) The Approving Officer may, at any stage of examining the subdivision plan, refuse to approve the plan if he considers that the deposit of the plan is against public interest.
- (b) Without affecting the generality of Section 11(a) above, the Approving Officer may, at any stage of examining the subdivision plan, refuse to approve the plan if he considers that the subdivision does not conform to:
 - (1) All applicable provisions of the Municipal Act and Land Title Act; or
 - (2) The respective City by-laws regulating the subdivision of land and zoning.

Development Permits 12.

- (a) Council may issue Development Permits under the conditions laid out in the "Surrey Development Permit Form and Application Fee By-law, 1986, No. 8623" as amended, to vary or supplement the provisions of this By-law.

- Building Permits
12. (b) Where a developer applies for a building permit to construct or modify a building on a parcel of any zone within Surrey Zoning By-law, 1979, No. 5942 as amended, and Surrey Zoning By-law, 1993, No. 12000 as amended, other than zones A-1, A-2, RA, RA-G, RH, RH-G, RF, RM-D or RF-G, except for building permits involving modifications to existing buildings which do not involve a change in occupancy or use, as determined by the General Manager, Engineering, and where such modifications do not impose new capital cost burdens on the City, the developer shall provide highways, sidewalks, water distribution, sanitary sewer, drainage works, wiring and street lighting as required in Sections 24, 25, 26, 32 and Parts VI and VIII of Surrey Subdivision and Development By-law, 1986, No. 8830 as amended, as follows:
- (1) Zones C-4, C-5, C-8, C-8A, C-15, C-35, CHI, CG-1, CG-2, CTA, CCR, CPR, CPG, CPM, IB, IB-3, IL, IH, IS, or 1A: Highways, sidewalks, water distribution, sanitary sewer, drainage works, wiring and street lighting will be required where the value of construction is greater than \$400,000, including applicable taxes as estimated by the Chief Building Inspector.
 - (2) All other zones: Highways, sidewalks, water distribution, sanitary sewer, drainage works, wiring and street lighting will be required where the value of construction is greater than \$50,000, including applicable taxes as estimated by the Chief Building Inspector.
 - (3) For CD zones, the CD By-law will specify the applicable zone for the requirement of highways, sidewalks, water distribution, sanitary sewer, drainage works, wiring and street lighting.

PART III - DEDICATION OF PARKLAND

- Parkland Parkland Dedication
13. The subdivider shall dedicate, without compensation, up to five percent (5%) of the land proposed for subdivision for parkland at the locations required by the Approving Officer, in accordance with the Parks and Greenways Network maps and with the parkland dedication policies contained in the Surrey Official Community Plan, 2013, No. 18020, as amended.
- Cash-in-Lieu of Parkland Dedication
14. Where parkland dedication is not required as determined by the Approving Officer in accordance with the park dedication policy contained in the Surrey Official Community Plan, the subdivider shall pay cash-in-lieu of parkland dedication in an amount equivalent to 5% of the average market value of all the land proposed for subdivision assessed on the date of application for the subdivision.

- Parkland Dedication Not Applicable
15. Sections 13 and 14 do not apply:
- (a) to subdivisions of less than three lots; or
 - (b) to subdivisions where the smallest lot being created is larger than 2 hectares; or
 - (c) to the consolidation of existing parcels.

PART IV - PARCEL STANDARDS

- Parcel Dimensions
16. All parcels created by subdivision shall comply with the regulations and provisions with respect to the area, shape and dimensions for the zone in which the subdivision is located, as set out in Surrey Zoning By-law, 1964, No. 2265, as amended, and in Part 1 and Part 2 of Surrey Zoning By-law, 1979, No. 5942, as amended.

PART V - HIGHWAY DEDICATION, SERVICING AND CONSTRUCTION STANDARDS

- Highway Dedication
17. (a) The subdivider shall provide, without compensation
- (1) For the purpose of a highway identified in Schedule "K" to this By-law, the 'Surrey Major Road Allowance Map', and within the development, land the width of the ultimate highway allowance identified in Schedule "K";
 - (2) For the purpose of a highway identified in Schedule "K" to this By-law, the 'Surrey Major Road Allowance Map', and bordering the development, land one-half of the width of the highway allowance indicated in Schedule "K", measured from the centreline of the ultimate highway allowance, which may not necessarily coincide with the centreline of the existing highway (if any);
 - (3) For the purpose of a highway not identified in Schedule "K" to this By-law, the 'Surrey Major Road Allowance Map', land as required by the City.
- (b) Where, in the opinion of the Approving Officer, terrain and soil conditions are such that a roadway having a width of 8.0 metres cannot be adequately supported, protected, and drained within the widths specified in sub-section (a)(1), land sufficient to support, protect, and drain such a roadway may be required without compensation.

- (c) Additional dedication may be required at intersections with arterial roads in order to provide traffic turn-lane channelization.
- (d) Additional dedication may be required to accommodate utility Transformer Pads.

Section 18. Deleted BL 10834 2/18/91

Sidewalks and Walkways

- 19. (a) The subdivider shall provide sidewalks on highways within the lands being subdivided in accordance with the set standards as out in Schedule 'A' of this By-law for the various classifications of road in each zone.
- (b) Without limiting the generality of sub-section (a), the Approving Officer may require:
 - (1) Sidewalks along a highway within the subdivision on which substantial pedestrian traffic is expected to be generated.
 - (2) Sidewalks along the side of a highway within the subdivision which fronts on or abuts a school, park, recreation facility, public building, shopping and commercial development; and
 - (3) Sidewalks on each side of an arterial or collector road within the subdivision; and
 - (4) Walkways within the subdivision to facilitate pedestrian movement.
- (b) Sidewalks shall be constructed in accordance with the standards set out in Schedule 'A' of this By-law.
- (c) Deleted BL 13578 11/23/98

Road Lengths 20. Deleted BL 13578 11/23/98

Half-roads

- 21. (a) In a subdivision where the road layout is such that a highway or a portion thereof serves or will serve the adjoining properties outside the subdivision, the Approving Officer may allow the dedication and construction of new half-roads along the perimeter of the subdivision, provided however the following conditions are satisfied:
 - (1) There is sufficient highway dedication to provide for two-way traffic flow, sidewalk, street lights, and drainage collection system.
 - (2) Such half-roads shall be constructed to the standards as set out in Schedule 'A' of this By-law.

- Construction Standards 22. (a) The subdivider shall clear, grade, surface and otherwise construct the required highways including roadways, emergency access and transit bays, in accordance with the standards contained in Schedule 'A' of this By-law.
- (b) Where a road passes through more than one zone, the zone having the most significant impact on the roadway, will dictate the applicable road standards.
- Boulevards 23. The subdivider shall grade and improve to grass or sodded standard all boulevards along highways within the subdivision.
- Servicing Requirements 24. (a) Except as otherwise provided in this By-law, the developer shall provide vehicular and pedestrian highway systems, water distribution, sanitary sewer and drainage works, underground wiring and street lighting systems such that each system:
- (1) Serves and is connected to all parcels created by the subdivision or the development;
 - (2) Extends along all highways within the subdivision;
 - (3) Extends along all highways adjacent to the development, up to the centreline of the highway allowance,
 - (4) Connects to the appropriate public utility;
 - (5) Provides the standard of service set out in Schedule 'A' of this By-law; and
 - (6) Shall be constructed to allow for connection to lands and systems beyond the proposed development.
- Exceptions (b) Without limiting the generality of sub-section (a), the developer may not be required to provide water supply, sanitary sewer and drainage works, underground wiring, and street lighting systems where a system already exists which provides the standards required in Schedule 'A' for both the existing parcels and those to be created by subdivision; and
- Alternate Servicing Systems (c) Without limiting the generality of sub-section (a), where City services are not available, but are programmed for as part of an approved City Capital Works Program, the Approving Officer may approve a subdivision, or a building permit may be approved within which the provision and construction of water supply and/or sewage disposal and/or drainage works may be deferred; provided however that:
- (1) An alternative system satisfactory to the Approving Officer is provided at the expense of the developer and on a temporary basis; and

(2) The developer deposits with the City a bond for an amount satisfactory to the Approving Officer having regard to the cost of installing and paying for all works and services related to the deferred system.

(d) Without limiting the generality of Sub-Section (a), the developer may not be required to undergroundwiring along all highways adjacent to the development where overhead wiring already exists, and is adequate to service the development, except for electrical and telecommunications service lines, which must be provided to the standards required in Schedule 'A'.

Land for
Drainage
Control

25. (a) The developer shall, where required by the Approving Officer, or the Superintendent of Building Division provide and convey to the City, without compensation, such land and facilities sufficient to provide for drainage detention under Schedule A, the Natural Drainage Policy

(b) Where a detention facility is compatible with City public recreation facilities, it may be located on City property at the discretion of the General Manager, Engineering.

Type of
Servicing

26. The standards for servicing of land required under Section 24 of this By-law for different zones shall be as set out in Schedule 'A' to this By-law. In developments where the lot sizes and subdivision design simulate those of a zone with higher standards, then the standards of the higher zone shall apply.

PART VI - SERVICING AGREEMENTS

Agreement

27. All works and services to be constructed and installed to Conditions serve any proposed development of any lands shall be constructed and installed to the standards prescribed in Schedule 'A' of this By-law to the satisfaction of the General Manager, Engineering at the expense of the developer prior to the approval of such development, unless the subdivider:

(a) Deposits with the City, cash or a Bond for an amount equal to the cost of designing, installing and paying for all works and services required pursuant to this By-law; and

(b) Enters into an agreement with the City to construct and install the prescribed works and services by a specified date or forfeit the amount secured by the City.

(c) Pays to the City all fees in accordance with Schedule 'B' to this By-law.

(d) Provides evidence that he will indemnify and save harmless the City against:

- (1) All actions and proceedings, costs, damages, expenses, claims and demands whatsoever and by whomsoever brought by reason of the construction and installation of all services herein described, and
 - (2) All expenses and costs which may be incurred by reason of the execution of the said work resulting in damage to any property owned in whole or in part by the City or which the City by duty or custom is obliged, directly or indirectly, in any way or to any degree, to construct, repair or maintain, and
 - (3) All expenses and costs which may be incurred by reason of liens for non-payment of labour or materials, workmen's compensation assessments, unemployment insurance, Federal or Provincial Taxes, and for encroachments, and
- (e) Ensures that all works and services to be designed, constructed and installed at his expense are to the standards prescribed in Schedule 'A' of this By-law, and
 - (f) Retains as his agent a Professional Engineer, competent in the field of municipal engineering and who is registered as a member in good standing with the Association of Professional Engineers of B.C. (A.P.E.B.C.), to prepare, sign and seal design (construction) drawings, and to provide "General and Resident Engineering Services" during construction both as defined in the current A.P.E.B.C. "Outline of Service and Scale of Recommended Fees for General Engineering Projects", including but not limited to, field inspection, preparing and certifying as-constructed drawings. Where service connections only are required, the services of a Professional Engineer are not required, and
 - (g) Acknowledges that the City does not confirm the completeness or accuracy of the design (construction) drawings nor accept responsibility for any costs or damages resulting from errors, omissions or deficiencies in said drawings, and
 - (h) Upon written notice that construction completion has been certified by the General Manager, Engineering, maintains all of the said works and services for at least the period specified below:

Water Systems	One Year
Sanitary Sewer Systems	One Year
Storm Drainage Systems	One Year
Highway Paving, Asphalt Walks and Curbs,	
Street Lights	One Year
Concrete Curbs and Sidewalks	One Year

- (i) Arranges and pays for the connection to the City's existing works and services or utilities, and
- (j) Remedies any defects appearing within the maintenance period and reimburse (pay to) the City for any damage to others works and services or properties resulting therefrom, and
- (k) Deposits with the City for the maintenance period, on or before the date of issuance of the Certificate of Completion of said works and services, security in the form of a bond in an amount equal to at least five (5) per cent of the estimated construction cost of the said works and services, as calculated by the General Manager, Engineering, from which the City may deduct the cost of maintaining the works, remedying any defects or damages should the owner fail to do so, and
- (l) Deposits with the City prior to the issuance of the Certificate of Completion such inspection reports, test results or other documentation acceptable to the General Manager, Engineering, to confirm compliance with plans and Schedule A, as prepared by and certified as correct by a Professional Engineer, and within two months of the date of the issuance of the Certificate of Completion for the works and services deposit with the City one set of paper prints and one set of transparencies of the drawings showing the works and services as actually constructed as prepared by and certified as correct by a Professional Engineer, and
- (m) Assigns, transfers and conveys the works and services, upon issuance of a Certificate of Completion by the City, together with all lands dedicated for roads upon or in which the works and services are located, and
- (n) Provides all rights-of-way, easements, restrictive covenants or other documentation pursuant to plan registration necessary for construction or ultimate access required by the Approving Officer for the subdivision, or development, where applicable, and
- (o) Arranges for B.C. Hydro, B.C. Telephone and Cablevision companies to perform all work required to allow the provision of these services to the affected development within alignments approved by the General Manager, Engineering.

Failure to Construct the Works and Services

28. (a) Where the developer has failed to construct the work and services within the period as prescribed in the "Servicing Agreement" the City may elect to:
- (1) at the request of the developer, extend the period of the Servicing Agreement on such terms and conditions, including security that it may deem reasonable, or

- (2) may enter onto the site to complete the works and services and to use such security as it deems necessary, and, should such security be insufficient, to recover such additional amount from the developer.

PART VII - PAYMENT OF TAXES AND CHARGES

- Payment of Taxes 29. (a) The subdivider shall pay all school taxes and all City taxes, rates and charges including charges established under Section 286 of the Municipal Act, assessed and levied against the lands to be subdivided, and where such taxes, rates and charges for the current year have not been assessed, levied and imposed on the said lands at the date on which the approval of the subdivision is signed by the Approving Officer, pay the amount estimated by the Collector to be the total of the school taxes, City taxes, rates and charges to be assessed, levied and imposed on the said lands for the current year.
- (b) Deleted by By-law No. 10005 - April 24, 1989
- (c) Deleted by By-law No. 10005 - April 24, 1989
- (d) Every payment made pursuant to the provisions of clause (a) hereof shall be deemed to be monies to be applied at a future date in payment of taxes pursuant to Section 439 of the Municipal Act and every such payment and deposit shall be accepted by the Collector subject to the provisions of Section 440 of the Municipal Act.
- Development Cost Charges 30. Subdividers under the Land Title Act or the Condominium Act shall pay to the City development cost charges pursuant to the Surrey Development Cost Charge By-law, 1985, No. 7996.
- Application Fees 31. Deleted by Bylaw No. 18359.
- Processing Fees 32. Every developer shall pay the Servicing Agreement Processing and Engineering Administration Fees in the amount and at the times as set out in Schedule B.

PART VIII - LATECOMER AGREEMENTS

- Application for Cost Sharing 33. A developer may apply to Council for cost sharing of a water sewer, drainage or highway system extension which provides excess or extended services pursuant to Section 990 of the Municipal Act.
34. The City will process applications for cost sharing of a water, sewer or drainage or highway extension in accordance with current Council Policy, and the current Engineering Department procedure.

SCHEDULE "A"

SURREY SUBDIVISION AND DEVELOPMENT BY-LAW NO. 8830
ROAD STANDARDS, SERVICING REQUIREMENTS, DESIGN CRITERIA
AND STANDARD DOCUMENTS, SPECIFICATIONS
AND STANDARD DRAWINGS

As amended by By-law Nos: 9410, 02/08/88; 10164, 08/14/89; 10645, 10/29/90; 10603, 09/10/90; 10834, 2/18/91; 10958, 12/09/91; 11447, 03/22/93; 11900, 09/13/93; 12353, 06/17/97; 13252, 07/13/98; 13578, 11/23/98; 13968, 03/20/00; 13499, 06/12/00; 14704, 06/10/02; 15471, 07/28/04; 15667, 05/18/05; 16050, 07/10/06; 18022, 07/29/13; 18602, 12/14/2015; 19365, 10/02/17

Intent The intent of the regulation in this schedule is to ensure that every parcel is developed with an adequate standard or level of servicing and facilities including those provided by water supply, sanitary sewage disposal, drainage collection, electrical and telecommunications wiring, road, sidewalk, and street lighting systems.

1. SERVICING REQUIREMENTS RELATED TO ZONE

The minimum type of services required under various zones shall be in accordance with Tables 1, 2 and 3 of this schedule unless otherwise provided for in this by-law.

2. DESIGN AND CONSTRUCTION STANDARDS

All City Works (road, sewer, water main, drainage, etc.) shall be designed and constructed in compliance with the following documents, filed in the Office of the General Manager, Engineering, and as may be amended or replaced from time to time:

1. Design Criteria Manual, dated January 2016.
2. Supplementary Master Municipal Construction Documents, dated January 2016.
3. Master Municipal Construction Documents - Volume II, dated 2009.
4. City Centre Supplementary Standard Drawings, dated 2017.

Table 1
Servicing Requirements

Land Use	<i>Zoning By-law 5942</i>	Water	Sanitary Sewer	Drainage	Wiring	Highway Dedication, Pavement Width & Sidewalks	Street Lighting
A-1, A-2	<i>A-1, A-2, A-3</i>	1 or 2	4	O	OH	Table 2	SL-IO
RA	<i>RS</i>	1 or 6	4	5	OH	Table 2	SL-IO
RA-G	<i>R-A(G)</i>	1	4	5	OH	Table 2	SL
RH, RH-G, RC, RF-O, RF, RF-9, RF-9C, RF-9S, RF-10, RF-10S, RF-12, RF-12C, RF-SS, RF-SD, RF-G, RM-D, RM-M, RM-10, RM-15, RM-19, RM-30, RM-45, RM-70, RM-135, RMC-135, RMC-150	<i>R-1, R- H(G), R-F, R-F(R), R-F(F), RF-SS, R-F(C), R-F(D), R-F(M), RT-1, RM-1, RM-2, RM-3, RM-4, RFR-SS</i>	1	3	5	UG	Table 2	SL
C-4, C-5, C-8, C-8A, C-8B, C-15, C-35, CHI, CG-1, CG-2, CTA	<i>C-L, C-S, C-R(1), C-R(2), C-R(3), C-R(4), C-C, C-H, C-G(1), C-G(2), C-T(1), C-T(2), C-G</i>	1	3	5	UG	Table 2	SL
IB, IB-3	<i>I-1, I-P(2), I-G, I-C</i>	1	3	5	UG	Table 2	SL
IL, IL-1, IH	<i>I-4, I-S, I-T, I- W, I-H</i>	1	3	5	U/O	Table 2	SL
IA	<i>I-A</i>	1 or 2	3 or 4	5	U/O	Table 2	SL
PC, PA-1, PA-2, PI, CCR, CPR, CPG, CPM, RMS-1, RMS-1A, RMS-2	<i>P-C, P-A, P-P(1), P-P(2), P-R, P-D, P-P,</i>	To the standards of the surrounding Zone 8					
All zones in South Westminster and Bridgeview (as shown in the Standard Drawings)		1	3	FD	OH	Table 2	SL
All zones in West Panorama Ridge (as shown in the Standard Drawings)		1	3 or 4	7	UG	Table 2	SL - PR

Notes To Abbreviations In Table 1

O: Open ditch drainage system.

OH: Overhead wiring for electrical and telecommunications wiring.

UG: Underground wiring for electrical and telecommunications wiring.

For single family residential, all electrical and telecommunications wired service lines must be located underground except as hereinafter provided:

1. Subdivision is on the same side as a major existing overhead hydro plant' (3-phase primary).

Overhead service connections will be permitted on those lots on the same side as an existing major overhead hydro plant.

2. Subdivision is on same side as existing overhead pole line.

Overhead service connections will be permitted where a subdivision is

- (i) on the same side of the street as an existing overhead pole line, and
- (ii) more than two-thirds of the block length* of that side of the street is developed to OCP density and has overhead wiring.

* A block length is 200 m minimum.

The above exceptions are only applicable where the street has NOT been identified as an underground electrical beautification project area by the City.

U/O: Underground wiring for electrical and telecommunications wiring except for overhead primary power distribution.

SL: Street lighting to the criteria in the Design Criteria Manual.

SL-IO: Street lighting at intersections only.

SL-PR: Low profile street lighting at intersections of collector roads and arterial roads and in front of public buildings only.

FD: Modified French drain - ditch drainage system.

- 1: Water supply from the City distribution system to the criteria in the Design Criteria Manual.
- 2: Each parcel shall have a proven source of water meeting the most recent Drinking Water Quality Standards of the Province of British Columbia, and of sufficient quantity to provide a continuous flow of 2300 litres per day, all as certified by a Hydrogeologist registered in and for the Province of British Columbia.
- 3: Sanitary sewage collection system connected to the City trunk sewage mains.
- 4: A sewage disposal system designed and certified by an "Authorized Person" as defined, and in accordance with, the Sewerage System Regulation under the B.C. Health Act and Ministry of Health Sewerage System Standard Practice Manual. Minimum lot size shall be 0.81 hectare.

Holding tanks are not allowed within the Fraser Sewerage Area as defined by the GVS&DD.

- 5: Drainage system as specified in the Design Criteria Manual.
- 6: Where a proposed subdivision in an RS or RA Zone does not involve the extension of a water main, but fronts an existing water main which is unable to provide the fire flow specified in the Design Criteria Manual, but is able to provide at least 30 litres per second in addition to peak day demand as determined by the Design Criteria Manual, subdivision may be permitted, provided that:

- (a) the owner has provided to the General Manager, Engineering, a certificate from a Professional Engineer registered in the Province of British Columbia, specializing in fire protection engineering, stating that a structure or structures of particular area, shape, construction materials, and location can be constructed within the proposed subdivision, in conformance with the Fire Underwriters Survey's "Water Supply for Fire Protection - A Guide to Recommended Practice", current edition, and in conformance with the NFPA13D¹ specification, current edition; and

- (b) the owner has registered a restrictive covenant in favour of the City of Surrey on the title of all lots created which provides:

In recognition that the City water main servicing this lot is unable to provide the fire flow required by the City's design criteria, the owner agrees:

- (i) not to construct or use any dwellings or accessory structures on the lot that are not sprinklered in accordance with the NFPA13D* specification, current edition, and as approved by the engaged Professional Engineer;
- (ii) not to construct or allow to be constructed any dwellings or accessory structures on the lot which will require a fire flow in excess of the available fire flow as determined by the Fire Underwriters Survey's "Water Supply for Public Fire Protection - A Guide to Recommended Practice", current edition;
- (iii) that all building designs in support of applications for building permits shall be certified by a Professional Engineer specializing in fire protection engineering, attesting that each sprinkler system to be installed provides protection as set out in the NFPA13D* specification, current edition, and that the minimum fire flow calculated following the Fire Underwriters Survey's "Water Supply for Public Fire Protection - A Guide to Recommended Practice", current edition, is equal to or less than the fire flow available to the lot; and
- (iv) to indemnify and save harmless the City of Surrey, and its administrators, from any and all loss, damages or other expenses in any way arising from or caused by anything done hereunder.

* National Fire Protection Association

- 7: Open shallow swale drainage system with driveway culverts together with piped storm sewers where flow volumes (five year storm), velocities, existing storm systems or site conditions warrant. Detention pursuant to the Design Criteria Manual.
- 8: All new marinas, or marinas undergoing renovation that exceed 50 percent of their assessed value, shall install pump-out facilities for access by pleasure craft. As appropriate, these facilities shall be connected to the municipal sewer system or be designed for handling by trucked liquid waste.

Table 2
Highway Dedication, Pavement Widths And Sidewalks

Land Use (1)	<i>Zoning By-law</i> <i>5942</i>	Road Classification <i>Note 1</i>	Dedication width (m) <i>Note 1</i>	Pavement width (m) <i>Notes 1&2</i>	Number of sidewalks <i>Notes 1&3</i>	Shoulders or curbs <i>Notes 1,4 & 5</i>
A-1, A-2	<i>A-1, A-2, A-3</i>	Limited Local	16.5	6.0	0	shoulders
		Through Local	20.0	6.0	0	shoulders
		Collector	20.0	7.3	2	shoulders
		Undivided Arterial	24.0	7.3	2	shoulders
RA, RA-G, RH, RH-G RC, RF-O, RF, RF-SS, RF-G, RM-D	<i>RS, R-A(G),</i> <i>R-1, R-H(G),</i> <i>R-F, R-F(R),</i> <i>R-F(F),</i> <i>RF-SS,</i> <i>R-F(C),</i> <i>R-F(D),</i> <i>RFR-SS</i>	Limited Local	16.5	8.0	1	barrier curbs
		Through Local	20.0	8.5	2	barrier curbs
		Collector	22.0	12.2	2	barrier curbs
		Undivided Arterial	24.0	14.0	2	barrier curbs
		Divided Arterial	27.0	19.0	2	barrier curbs
RM-M, RM-10, RM-15, RF-12, RF-12C, RF-10, RF-10S, RF-9, RF-9C, RF-9S, RF-SD, RM-19	<i>R-F(M), RT-1</i>	Limited Local	20.0	11.0	1	barrier curbs
		Through Local	20.0	11.0	2	barrier curbs
		Collector	22.0	12.2	2	barrier curbs
		Undivided Arterial	24.0	14.0	2	barrier curbs
		Divided Arterial 1	27.0	19.0	2	barrier curbs
RM-30, RM-45, RM-70, RM-135, RMC-135, RMC-150	<i>RM-1, RM-2,</i> <i>RM-3, RM-4</i>	Limited Local	20.0	11.0	2	barrier curbs
		Through Local	20.0	11.0	2	barrier curbs
		Collector	22.0	12.2	2	barrier curbs
		Undivided Arterial	24.0	14.0	2	barrier curbs
		Divided Arterial	27.0	19.0	2	barrier curbs
C-4, C-5, C-8, C-8A, C-8B, C-15, C-35, CHI, CG-1, CG-2, CTA	<i>C-L, C-S,</i> <i>C-R(1), C-R(2)</i> <i>C-R(3),</i> <i>C-R(4), C-C,</i> <i>C-H, C-G(1),</i> <i>C-G(2), C-T(1)</i> <i>C-T(2), C-G</i>	Limited Local	20.0	11.0	2	barrier curbs
		Through Local	20.0	11.0	2	barrier curbs
		Collector	22.0	12.2	2	barrier curbs
		Undivided Arterial	24.0	14.0	2	barrier curbs
		Divided Arterial	27.0	19.0	2	barrier curbs
IB, IB-3, IL, IL-1, IH	<i>I-1, I-P(2),</i> <i>I-G, I-C, I-4,</i> <i>I-S, I-T, I-W,</i> <i>I-H, I-L(S)</i>	Limited Local	20.0	11.0	1	barrier curbs
		Through Local	20.0	11.0	1	barrier curbs
		Collector	22.0	12.2	2	barrier curbs
		Undivided Arterial	24.0	14.0	2	barrier curbs
		Divided Arterial	27.0	19.0	2	barrier curbs

Table 2, continued
Highway Dedication, Pavement Widths And Sidewalks

IA, All zones in South Westminster and Bridgeview (as shown in the Standard Drawings)	<i>I-A</i>	Limited Local	20.0	11.0	1	barrier curbs
		Through Local	20.0	11.0	1	barrier curbs
		Collector	22.0	12.2	2	barrier curbs
		Undivided Arterial	24.0	14.0	2	barrier curbs
All zones in West Panorama Ridge (as shown in the Standard Drawings)		Limited Local	16.5	6.0	0	shoulders
		Through Local	20.0	6.0	0	shoulders
All grid zones			20.0			

- (1) CD Zones: Highway Dedication, Pavement Widths and Sidewalks shall conform to the applicable land use as per this Table.

Notes To Table 2

Note 1 These requirements are to be read in conjunction with Part V of the By-law.

- (a) Highway dedications for collector and local roads are in accordance with Section 945 of the Local Government Act, R.S.B.C. 1996, c. 323. Public utilities may not be accommodated in the location preferred by the Public Utility Companies except by additional or separate dedication or statutory right-of-way.
- (b) Local Roads servicing more than 100 self-contained dwellings units shall be classified as Through Local.

Note 2 Pavement Widths

- (a) Where construction of half of the width of the pavement standard is required, and the other half does not exist, the minimum width of pavement for all zones will be 6 metres, and the minimum width of dedication will be 10 metres.
- (b) Additional pavement width is needed at the intersection of lanes in order to provide turn radius, and may be needed at intersections with arterial roads in order to provide traffic turn lane channelization. Refer to "Surrey Road Classification Map (R-91)", attached as Schedule "D" to this By-law.
- (c) Parking in cul-de-sac heads or in parking bays is permitted when the designated highway dedication to accommodate the parking arrangements together with sidewalks and street lights is insufficient, additional property for parking spaces shall be dedicated.

- (d) If a highway dedication already exists or if topographic conditions are extreme, the road requirements shall conform to current Council policy for unopened roads.

Note 3 Sidewalks

Sidewalks are required in accordance with this Table, and Part V of the By-law.

In land use zones: RF, RF-SS, RA, RA-G, RH, RH-G, RF, RF-G, RM-D, RM-M, RC, RF-O, RF-SD, RF-9, RF-9C, RF-9S, RF-10, RF-10S, RF-12, RF-12C, RM-10, RM-15 and RM-19:

- sidewalks are not required on limited local roads less than 50 metres in length;
- a sidewalk is required on one side only on limited local roads 50 metres to 220 metres in length;
- sidewalks are required on both sides of limited local roads over 220 meters in length.

Where sidewalks are provided on one side only, they shall be located on the side closest to an existing or future school, park or transit route.

Note 4 Shoulders

Shoulder details are shown in the Standard Drawings.

Note 5 Curbs

Where driveway locations can be determined prior to construction and no curb exists, barrier curb shall be installed in that block. Where rollover curb exists in a part block, rollover curb shall be installed to complete that block.

Rollover curbs may be used as an option on local roads in RA, RA-G, RH and RH-G zones. Barrier curbs are to be used on all corner lots.

For neo-traditional road sections (where barrier curb is required), rollover curb may be utilized in cul-de-sac bulbs.

Use MMCD Standard Detail Drawing C4 for all curbs except on arterial roads. For arterial roads, the curb will be MMCD Standard Detail Drawing C5 or as specified by the Engineer.

Table 3
Highway Dedication, Pavement Widths And Sidewalks
Alternative Local Roads Standards
 (Neo-Traditional Road Sections)

Land Use (1)	<i>Zoning By-law 5942</i>	Road Classification <i>Note 1</i>	Dedication width (m) <i>Note 1</i>	Pavement width (m) <i>Notes 1&2</i>	Number of Sidewalks <i>Notes 1&3</i>	Shoulders or curbs <i>Notes 1,4 & 5</i>
RA, RA-G, RH, RH-G, RC-type I, RF-O, RF, RF-G,	<i>RS, R-A(G), R-1, R-H(G), R-F, R-F(R), R-F(F), R-F(C), RFR-SS</i>	Limited Local	15.5	6.6	1	barrier curbs
		Through Local	17.0	7.5	2	barrier curbs
RM-M, RM-19 RF-SD RC-type II & III RF-SS, RF-9, RF-9C, RF-9S, RF-10, RF-10S, RF-12, RF-12C, RM-10, RM-15 RM-D	<i>R-F(M), RT-1</i>	Limited Local	17.0	7.5	1	barrier curbs
		Through Local	18.0	8.5	2	barrier curbs
RM-30, RM-45	<i>RM-, RM-2</i>	Limited Local	18.0	8.5	2	barrier curbs
		Through Local	20.0	10.5	2	barrier curbs
RM-70, RM-135, RMC-135, RMC-150	<i>RM-3, RM-4</i>	Limited Local	20.0	10.5	2	barrier curbs
		Through Local	20.0	10.5	2	barrier curbs

(1) CD Zones: Alternative Local Roads Standards shall conform to the applicable land use as per this Table.

Notes To Table 3

Note 1 These requirements are to be read in conjunction with Part V of the By-law.

- (a) Highway dedications for collector and local roads are in accordance with Section 945 of the Local Government Act, R.S.B.C. 1996, c. 323. Public utilities may not be accommodated in the location preferred by the Public Utility Companies except by additional or separate dedication or statutory right-of-way.
- (b) Local Roads servicing more than 100 self-contained dwellings units shall be classified as Through Local.

Note 2 Pavement Widths

- (a) Where construction of half of the width of the pavement standard is required, and the other half does not exist, the minimum width of pavement for all zones will be 6 metres, and the minimum width of dedication will be 10 metres.
- (b) Additional pavement width is needed at the intersection of lanes in order to provide turn radius, and may be needed at intersections with arterial roads in order to provide traffic turn lane channelization. Refer to "Surrey Road Classification Map (R-91)", attached as Schedule "D" to this By-law.
- (c) Parking in cul-de-sac heads or in parking bays is permitted when the designated highway dedication to accommodate the parking arrangements together with sidewalks and street lights is insufficient, additional property for parking spaces shall be dedicated.
- (d) If a highway dedication already exists or if topographic conditions are extreme, the road requirements shall conform to current Council policy for unopened roads.

Note 3 Sidewalks

Sidewalks are required in accordance with this Table, and Part V of the By-law.

In land use zones: RF, RF-SS, RA, RA-G, RH, RH-G, RF, RF-G, RM-D, RM-M, RC, RF-O, RF-SD, RF-9, RF-9C, RF-9S, RF-10, RF-10S, RF-12, RF-12C, RM-10, RM-15 and RM-19:

- sidewalks are not required on limited local roads less than 50 metres in length;
- a sidewalk is required on one side only on limited local roads 50 metres to 220 metres in length;
- sidewalks are required on both sides of limited local roads over 220 meters in length.

Where sidewalks are provided on one side only, they shall be located on the side closest to an existing or future school, park or transit route.

Note 4 Shoulders

Shoulder details are shown in the Standard Drawings.

Note 5 Curbs

Where driveway locations can be determined prior to construction and no curb exists, barrier curb shall be installed in that block. Where rollover curb exists in a part block, rollover curb shall be installed to complete that block.

Rollover curbs may be used as an option on local roads in RA, RA-G, RH and RH-G zones. Barrier curbs are to be used on all corner lots.

For neo-traditional road sections (where barrier curb is required), rollover curb may be utilized in cul-de-sac bulbs.

Use MMCD Standard Detail Drawing C4 for all curbs except on arterial roads. For arterial roads, the curb will be MMCD Standard Detail Drawing C5 or as specified by the Engineer.

SCHEDULE "B"
TO SURREY SUBDIVISION AND DEVELOPMENT BY-LAW NO. 8830
SERVICING AGREEMENT PROCESSING, ENGINEERING ADMINISTRATION AND
FINANCIAL ADMINISTRATION FEES

As amended by By-law Nos: 8954, 03/23/87; 10834, 02/18/91; 10846, 02/05/91; 11228, 04/27/92; 11667, 03/01/93; 12268, 04/25/94; 13108, 05/05/97; 14158, 12/04/00, 14582, 12/03/01, 14936, 03/24/03; 15939, 02/13/06; 16211, 01/15/07; 16531, 01/14/08; 16858, 01/19/09; 17081, 12/14/09; 17326, 01/10/11; 17568, 02/06/12; 17844, 12/17/12; 18137, 01/13/14; 18359, 01/12/15; 18591, 12/14/15; 18983, 12/19/16; 19429, 12/18/17; 19719, 12/19/2018

1. SERVICING AGREEMENT PROCESSING FEE (payable prior to the project scoping submission)

Pre-Application Engineering Review: \$1,255.00

Mini-Servicing Agreement (Service Connections/Sidewalk with Development):

\$3,600.00

Utility Main Extension:

\$7,205.00

Pre-Servicing Agreement:

\$7,205.00

Residential

Servicing Agreement for Single Family Developments (includes RM-23 and RM-D¹) with subdivision or building permit.

2 - 20 lots: \$1,595.00/lot; \$7,205.00 min., \$25,555.00 max.

21 - 50 lots: \$1,215.00/lot; \$50,875.00 max.

51 - 100 lots: \$990.00/lot; \$83,785.00

max. Over 100 lots: \$88,000.00 max.

Servicing Agreement for Multi-family Developments with subdivision or building permit.

2 - 20 units: \$730.00/unit; \$7,205.00 min., \$12,460.00

max. 21 - 50 units: \$625.00/unit; \$25,745.00 max.

51 - 100 units: \$500.00/unit;

\$41,485.00 max. Over 100 units:

\$43,640.00 max.

Commercial and Industrial

\$285.00/1,000 sq. m. of building/parking footprint area being developed with a minimum fee of \$7,205.00

Short Form Servicing Agreements, an additional fee of \$1,595.00

Agricultural

\$150.00/1,000 sq. m. of building/parking footprint area being developed with a minimum fee of \$7,205.00

Other

\$150.00/1,000 sq. m. of building/parking footprint area being developed with a minimum fee of \$7,205.00

Note: In the case of comprehensive developments involving more than one use, the above fees can be combined to arrive at the total fee.

Administrative Processing Only

\$1,595.00 for applications involving only the processing of legal documents and/or utility capacity calculations

\$730.00 for Processing Continuance (for each year project continues beyond Year 1)

\$405.00 for Servicing Agreement Extension or Reassignment

2. ENGINEERING ADMINISTRATION FEE (applicable only if project proceeds to construction stage)

Single Family Developments

4.0% on the first \$250,000.00 of estimated construction cost

2.5% on the next \$250,000.00 of estimated construction cost

1.5% on the remaining estimated construction cost

Agricultural, Multi-family, Institutional, Commercial and Industrial Developments

5.25% on the first \$250,000.00 of estimated construction cost

4.25% on the next \$250,000.00 of estimated construction cost

3.0% on the remaining estimated construction cost

Re-inspection of deficiencies: \$610.00 min.

3. FINANCIAL ADMINISTRATION FEE

Each Latecomer Agreement: \$2,010.00

Each DCC Front-Ending and Development Works Agreements: \$6,500.00

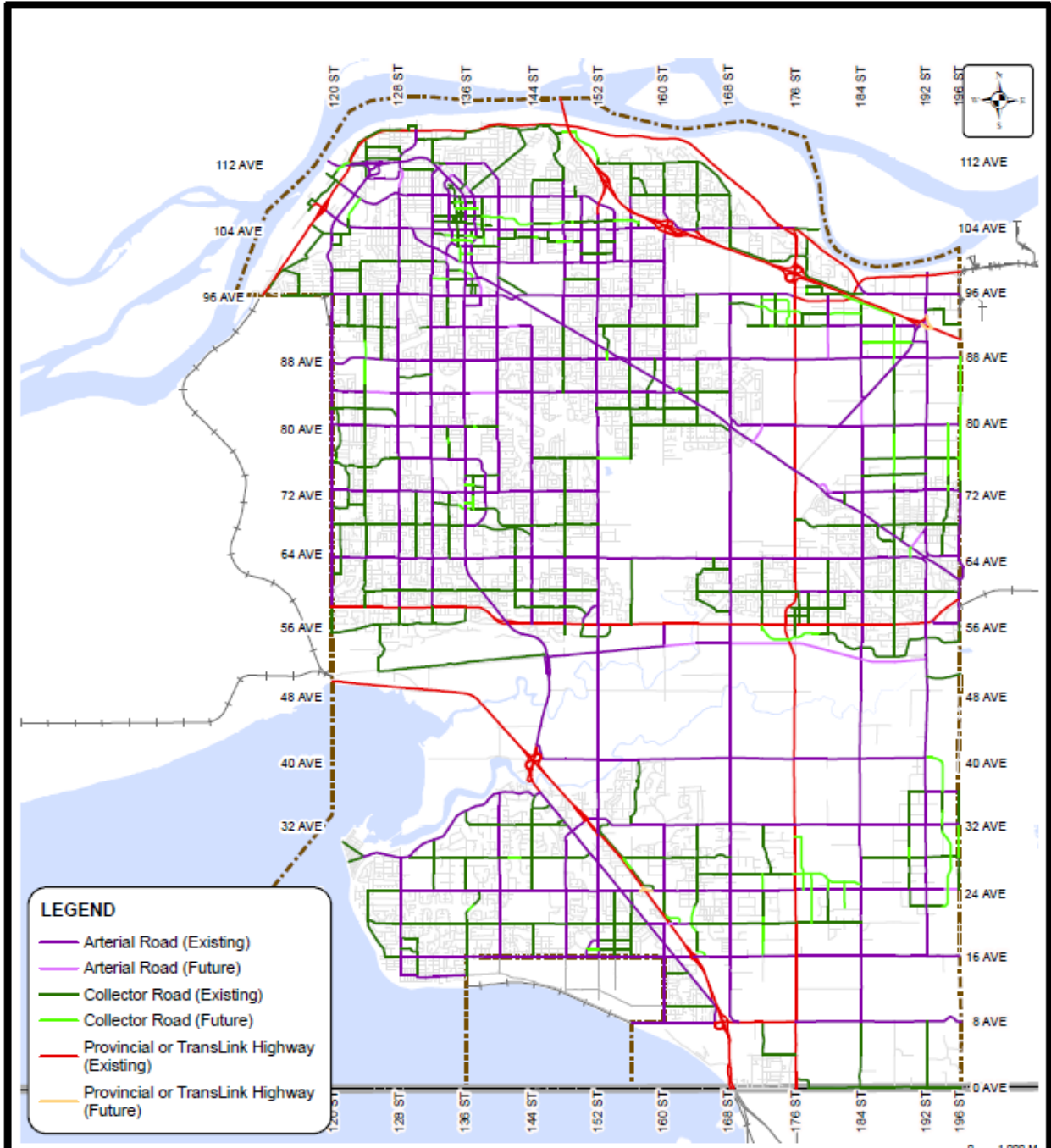
Each DCC Front-Ending and Development Works Agreements in Anniedale-Tynehead NCP approved for 20-year term: \$8,665.00

Each Latecomer, DCC Front-Ending or Development Works Agreement Reassignment:
\$405.00

¹ *Based on an ultimate of two dwelling units per lot.*

All fees are subject to applicable taxes.

Schedule "D" – Surrey Road Classification Map (R-91)



Produced by GIS Section: 30-Apr-2020, P205934

Scale: 1:125,000 0 1,000 M



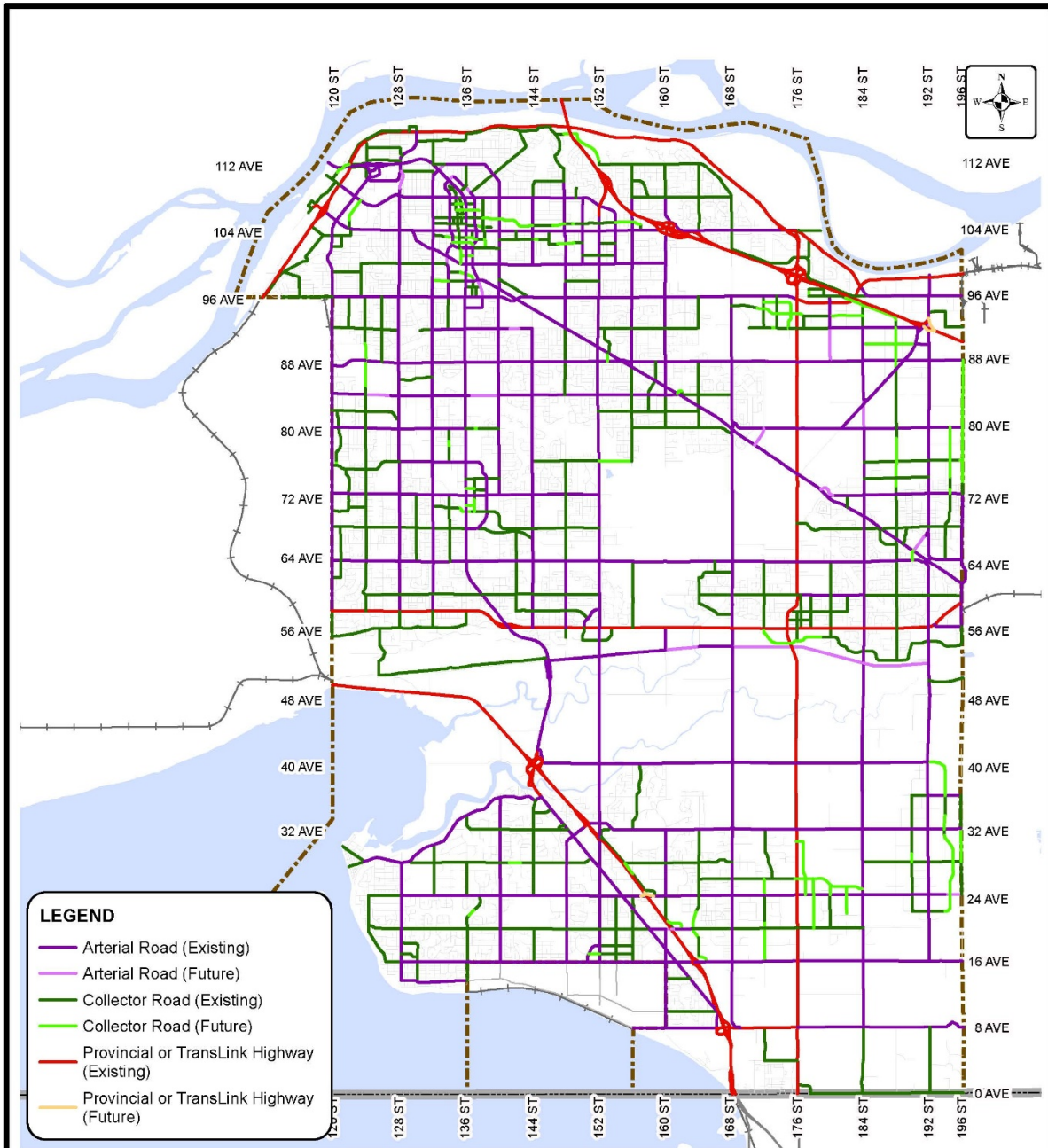
**Surrey Road
Classification Map (R-91)**

**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.

Source: G:\MAPPING\GIS\Maps\CorporateReps\Trans\PS_In\Redwood\Heights\NCP_ScheduleD.mxd

Schedule "D" – Surrey Road Classification Map (R-91)



Produced by GIS Section: 30-Apr-2020, P205934

Scale: 1:125,000



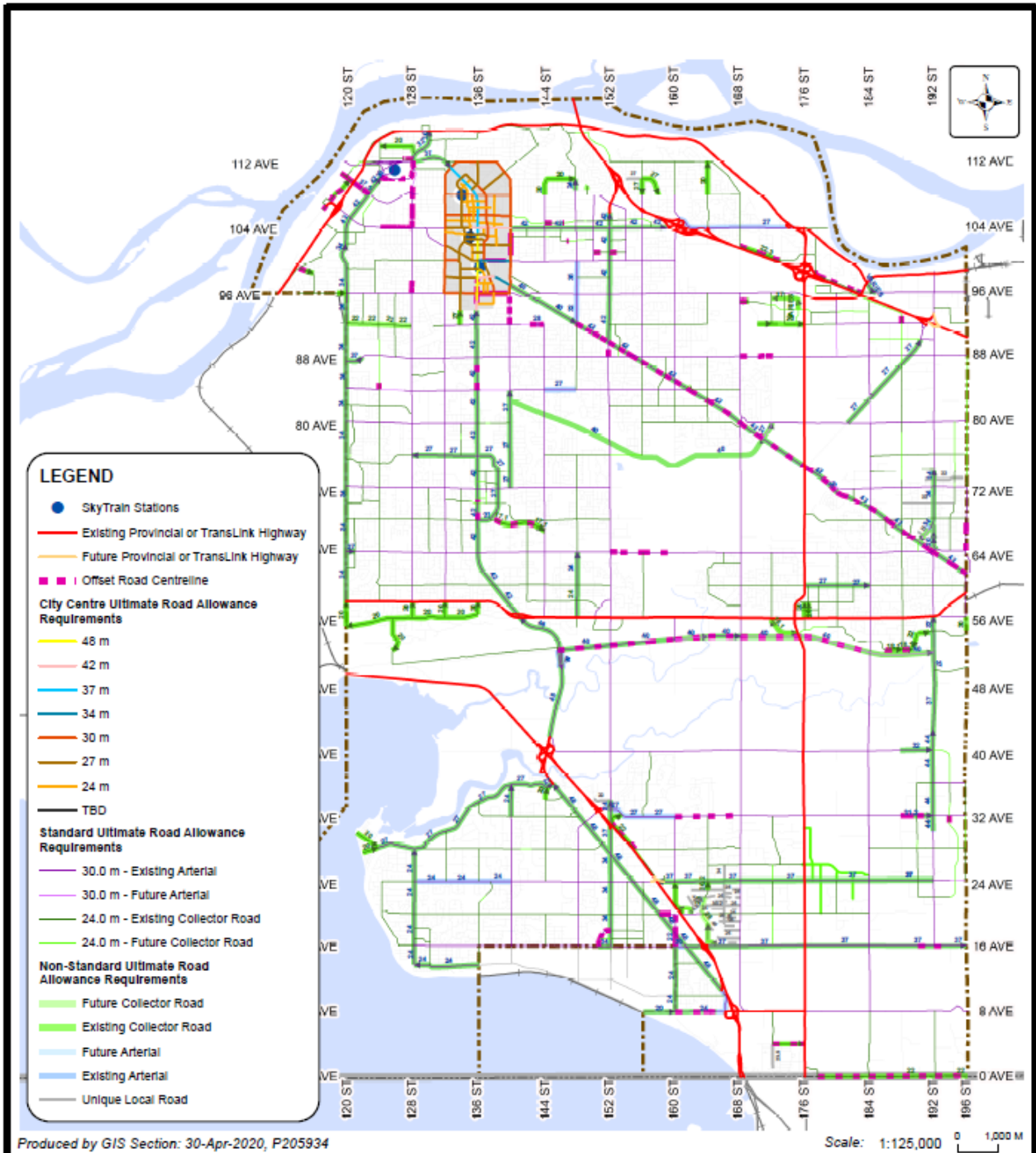
Redwood Heights NCP Road Classification

**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.
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Source:
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Schedule "K"- Surrey Major Road Allowance Map



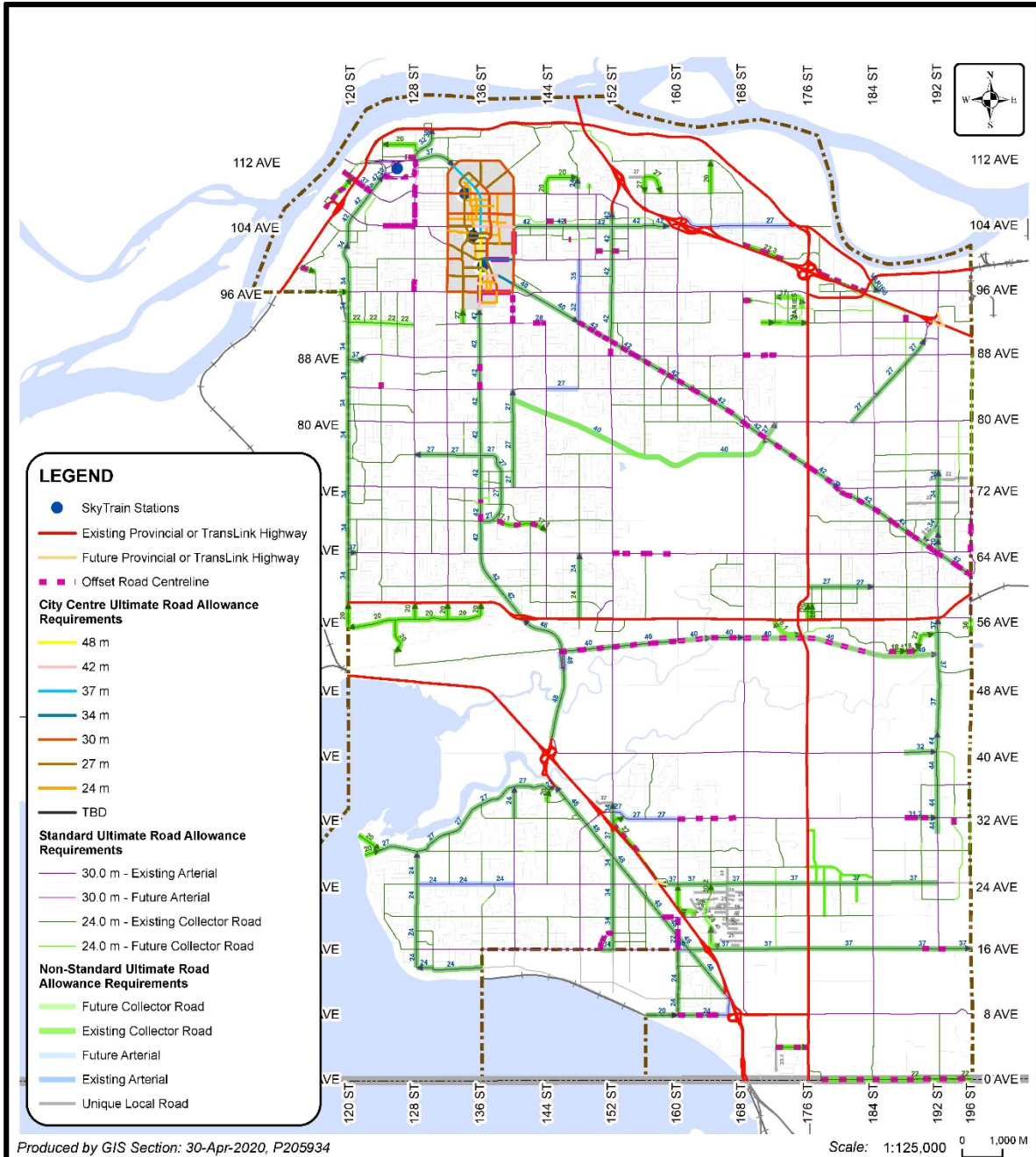
Surrey Major Road Allowance Map

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.

Source: G:\MAPPING\GIS\Map\CorporateReps\Transp\PS_ImRedwoodHeightsNCP_ScheduleK.mxd

Schedule "K" - Surrey Major Road Allowance Map

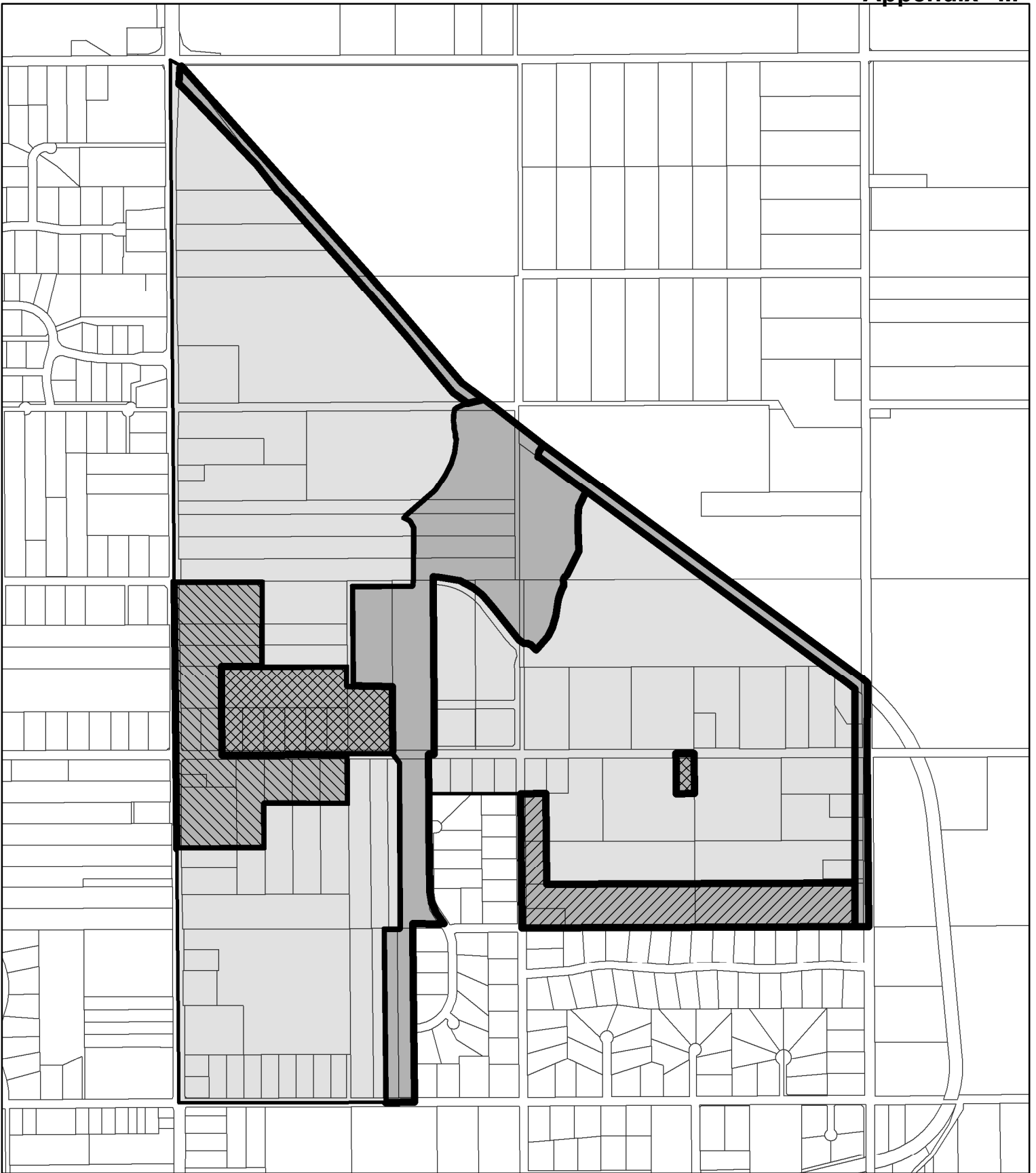


Redwood Heights NCP Road Allowances

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.
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Lot sizes, Legal descriptions and encumbrances must be confirmed at the Land Title Office.

Source: G:\MAPPING\GIS\Maps\CorporateReps\TransPIS_1m\RedwoodHeightsNCP_ScheduleK.mxd



Redwood Heights NCP OCP Amendments



Legend

- Suburban - Urban Reserve To Urban
- Suburban - Urban Reserve To Suburban
- Suburban - Urban Reserve To Multiple Residential
- Suburban - Urban Reserve To Commercial
- Suburban - Urban Reserve To Conservation and Recreation



Figure 3: General Land Use Designations- Existing

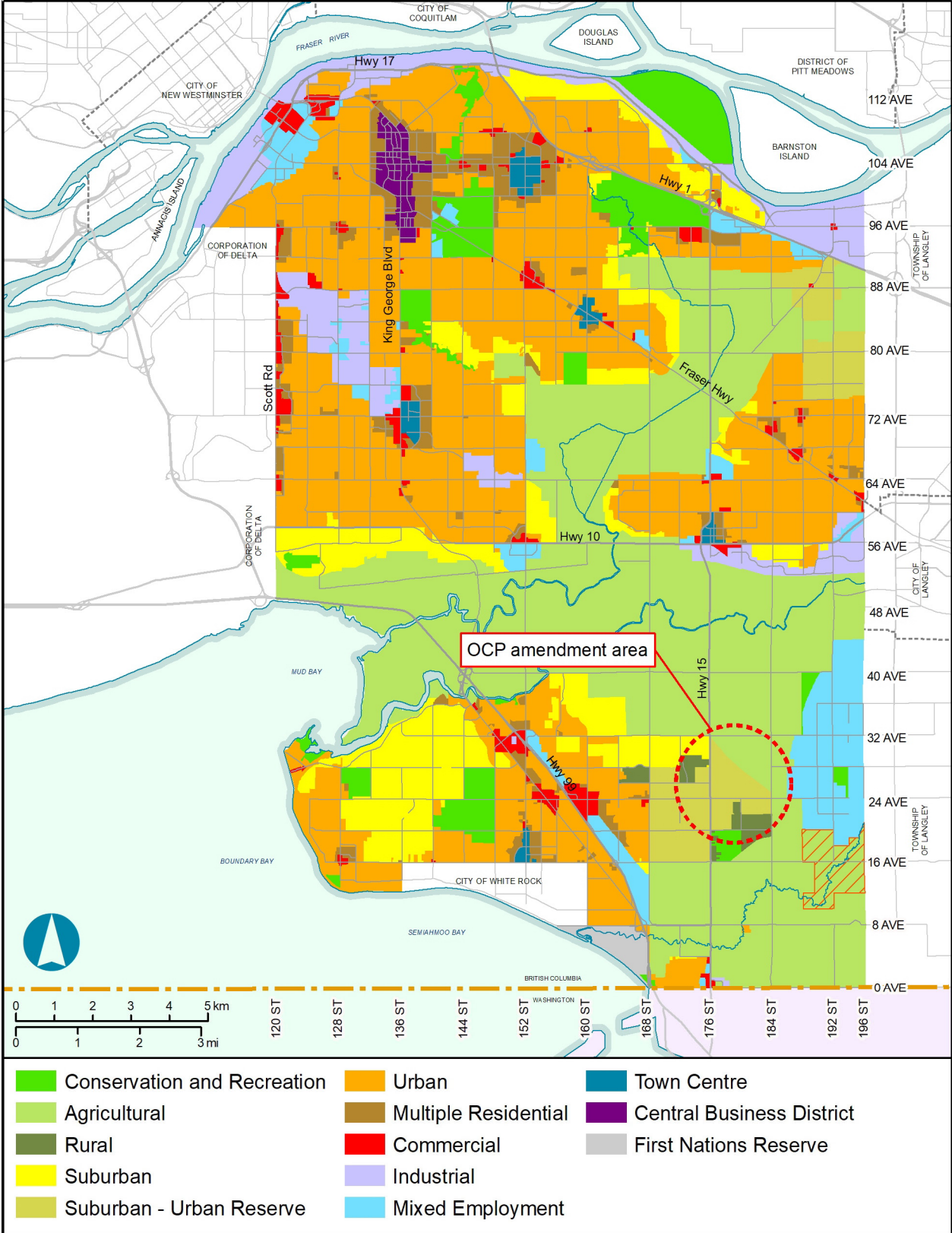
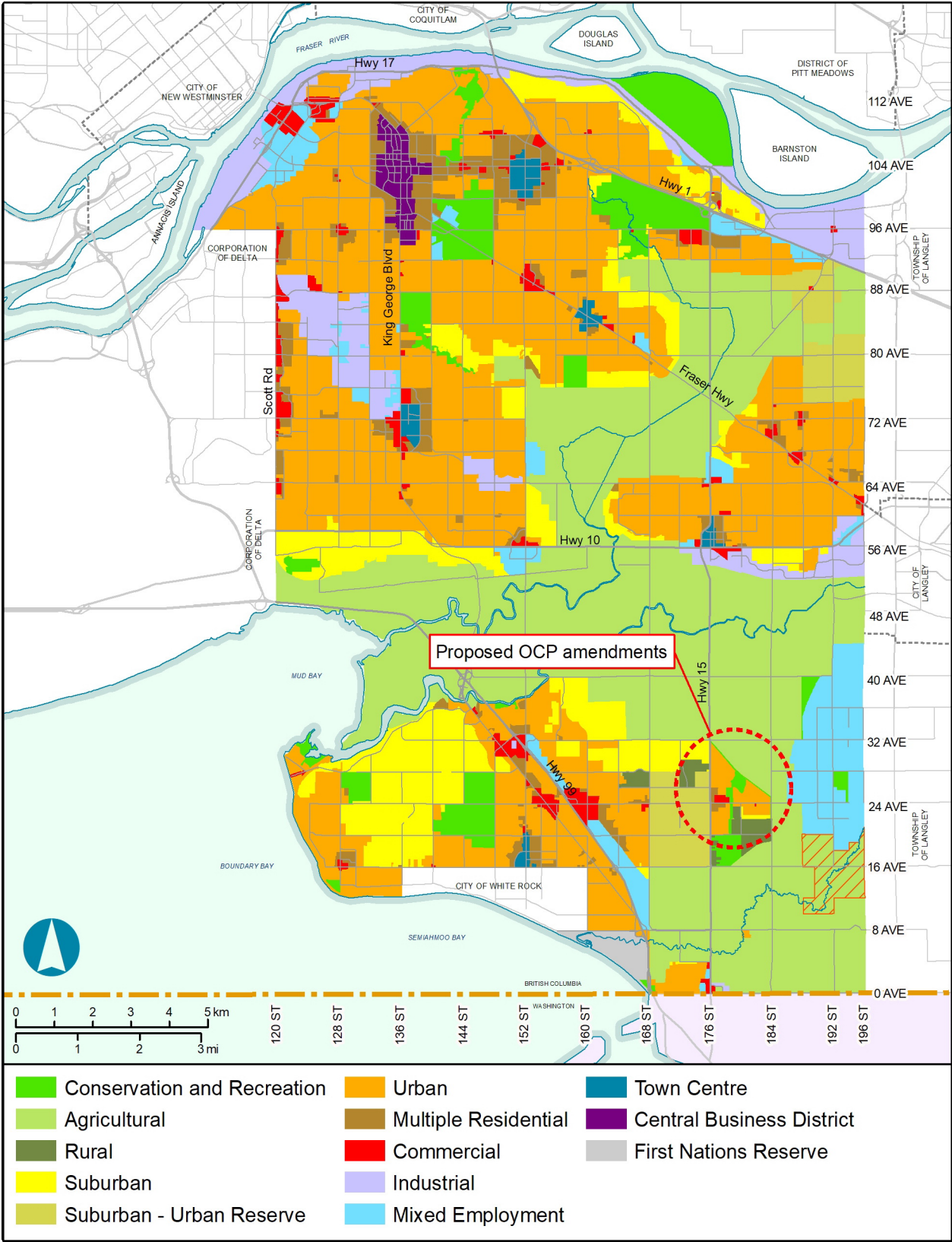


Figure 3: General Land Use Designations – Proposed



Proposed Amendment to Schedule G of the Zoning By-law

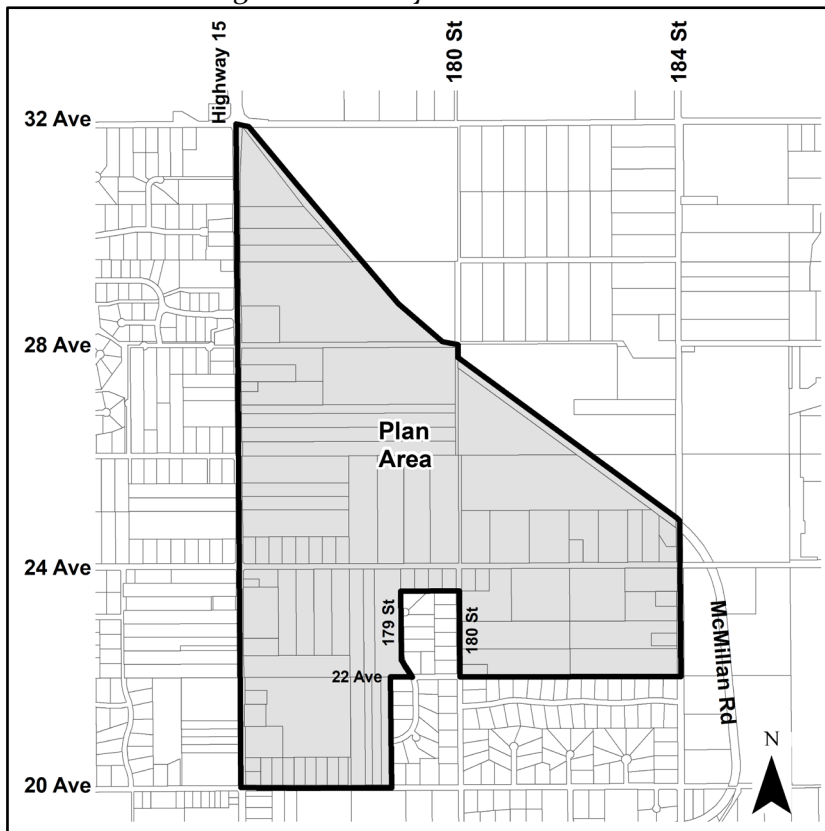
Proposed Amendments to
Surrey Zoning By-law, 1993, No. 12000, as amended

The following amendments are proposed to Surrey Zoning By-law, 1993, No. 12000, as amended:

1. Schedule G – Community Amenity Contributions Section E. Secondary Plan and Infill Area Contribution Areas and Rates is amended by inserting a new Sub-Section "33. Redwood Heights", as follows:

"33. REDWOOD HEIGHTS

- (a) The Redwood Heights Secondary Plan Area shall be identified as follows:

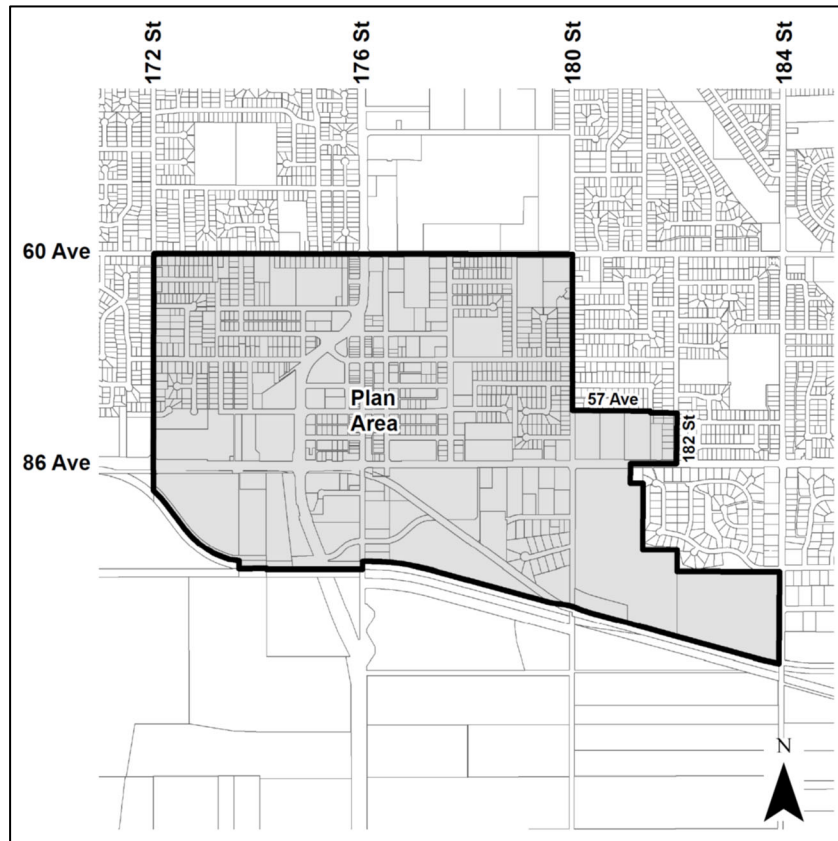


- (b) Amenity contributions for Redwood Heights Secondary Plan Area identified in Section E.33 (a) above are as follows

Uses	Amenity Contributions***				
	Police	Fire	Libraries	Parks	TOTAL
RESIDENTIAL* (\$/dwelling unit)	\$80.52	\$347.89	\$181.17	\$2,509.26	\$3,118.84
NON-RESIDENTIAL (\$/acre)	\$483.12	\$2,087.34	n/a	n/a	\$2,570.46"

31- 32. CLOVERDALE

(a) The Cloverdale Town Centre Plan Area shall be identified as follows:



(b) Amenity contributions for the Cloverdale Town Centre Plan Area identified in Section E.32(a) above are as follows

Uses	Amenity Contributions***				
	Police	Fire	Libraries	Parks**	TOTAL
RESIDENTIAL* (\$/dwelling unit)	\$80.52	\$347.89	\$181.17	\$3,160.00	\$3,769.58
NON-RESIDENTIAL (\$/acre)	\$483.12	\$2,087.34	n/a	n/a	\$2,570.46

Explanatory Notes:

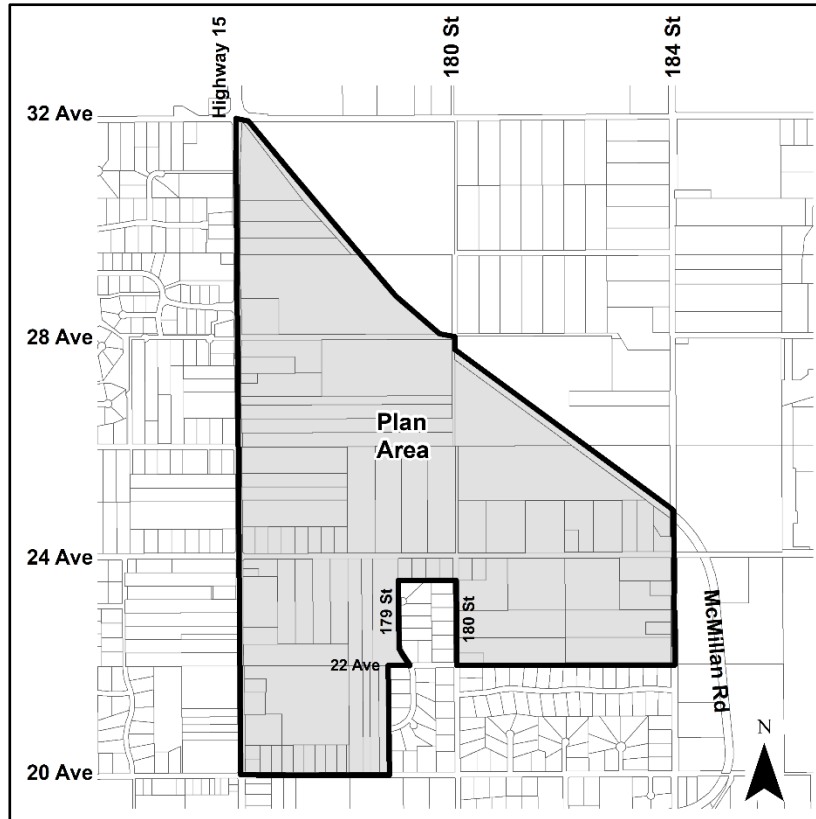
* Excludes *secondary suites*.

** Includes pathways and facilities.

*** See Section C of this Schedule for additional amenity contributions related to Cloverdale Town Centre density increases.

33. REDWOOD HEIGHTS

(a) The Redwood Heights Secondary Plan Area shall be identified as follows:



(b) Amenity contributions for the Redwood Heights Secondary Plan Area identified in Section E.33(a) above are as follows

Uses	Amenity Contributions				
	Police	Fire	Libraries	Parks**	TOTAL
RESIDENTIAL* (\$/dwelling unit)	\$80.52	\$347.89	\$181.17	\$2,509.26	\$3,118.84
NON-RESIDENTIAL (\$/acre)	\$483.12	\$2,087.34	n/a	n/a	\$2,570.46

Explanatory Notes:

* Excludes secondary suites.

** Includes pathways and facilities.

Proposed Amendments to Development Application Fees Bylaw, 2016, No. 18641

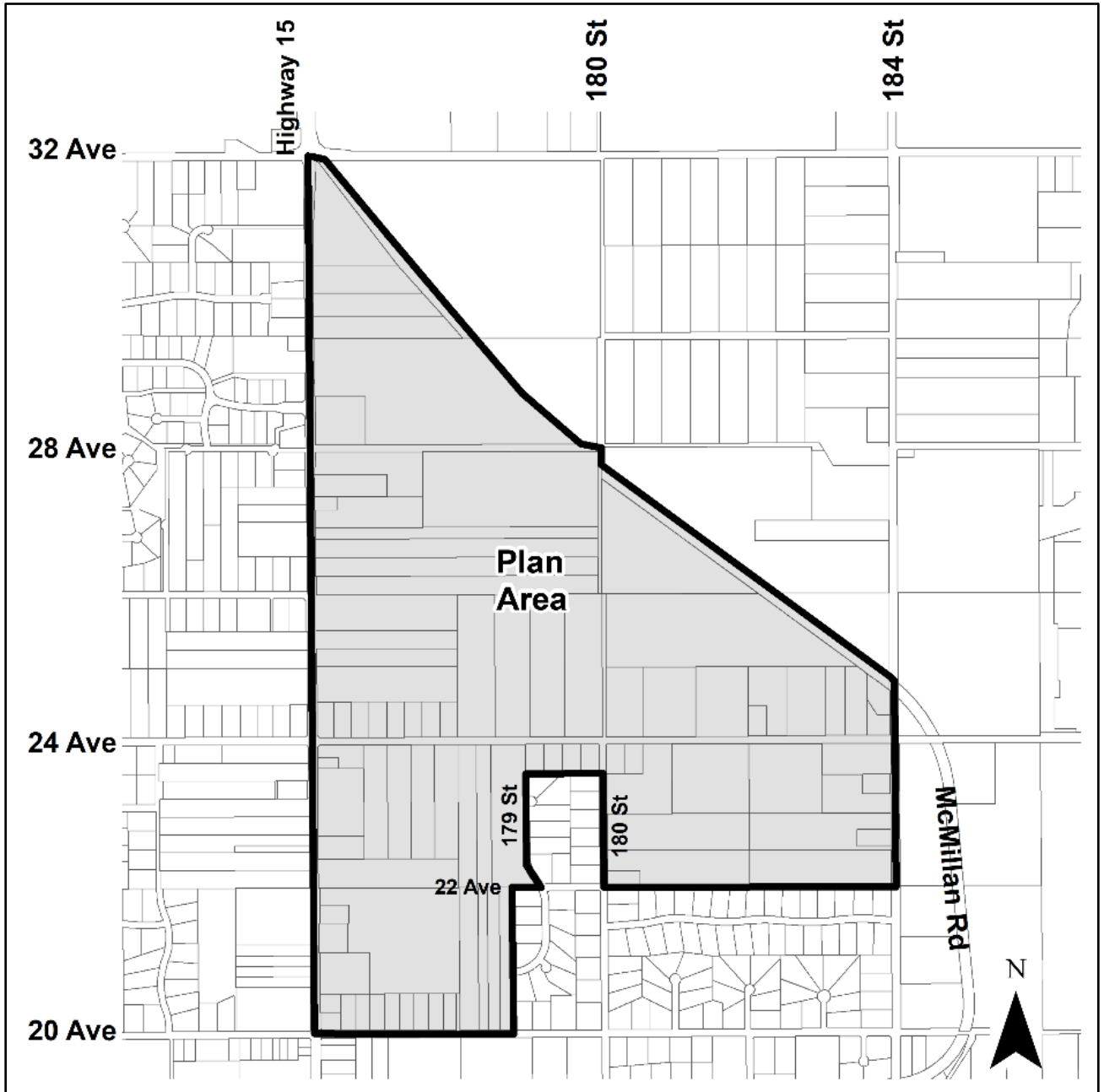
The following amendments are proposed to Development Application Fees Bylaw, 2016, No. 18641

1. Section 9. REZONING SURCHARGE, below the words "WEST CLAYTON NCP See MAP 14" by adding a new row as follows:

"REDWOOD HEIGHTS NCP See MAP 15	Residential Uses: + \$122.00 / lot or dwelling unit All Other Uses: + \$1,122.00 / hectare"
------------------------------------	--

2. After "Map NO. 14 West Clayton Neighbourhood Concept Plan Lands Subject to Surcharge" by adding a new "Map NO. 15 Redwood Heights Neighbourhood Concept Plan Lands Subject to Surcharge" shown at Attachment "A"

MAP NO. 15
REDWOOD HEIGHTS
NEIGHBOURHOOD CONCEPT PLAN
LANDS SUBJECT TO SURCHARGE



CITY OF SURREY

BYLAW NO. 18641

A bylaw to impose fees for rezoning, subdivision and development applications.

As amended by: 18488, 05/16/16; 18979, 12/19/16; 18807, 03/06/17; 19368, 10/02/17; 19425, 12/18/17; 19715, 12/19/18; 19981, 12/16/19

THIS IS A CONSOLIDATED BY-LAW PREPARED BY THE CITY OF SURREY FOR CONVENIENCE ONLY. THE CITY DOES NOT WARRANT THAT THE INFORMATION CONTAINED IN THIS CONSOLIDATION IS CURRENT. IT IS THE RESPONSIBILITY OF THE PERSON USING THIS CONSOLIDATION TO ENSURE THAT IT ACCURATELY REFLECTS CURRENT BY-LAW PROVISIONS.

WHEREAS pursuant to the authority of Section 462 of the *Local Government Act*, R.S.B.C. 2015, c. 1, as amended, the Council of the City of Surrey may, by Bylaw, impose fees to cover the costs of processing applications to rezone, subdivide or develop property;

NOW, THEREFORE, the Council of the City of Surrey, ENACTS AS FOLLOWS:

TITLE

A. This Bylaw may be cited for all purposes as "Development Application Fees Bylaw, 2016, No. 18641".

PROVISIONS

B. Fees, and any applicable taxes, shall apply for the following applications at the time of submission:

APPLICATION TYPE	APPLICATION FEE
1. REZONING <i>Single Family or Duplex Zones</i>	\$3,297.00
1.1 The following additional fees apply:	
ZONE	ADDITIONAL FEES*
RA, RA-G, RH, RH-G, RC, RF-O, RF, RF-SS, RF-G, RF-12, RF-12C, RF-13, RF-10, RF-10S, RF-9, RF-9C, RF-9S, RF-SD, RQ	+ 114.00 / lot
RM-D	+ \$114.00 / dwelling unit
*(a) LOT: Fees are calculated on the maximum number of lots allowed under the proposed zone. (b) DWELLING UNIT: Fees are calculated on the maximum number of dwelling units allowed under the proposed zone (excluding secondary suite dwelling units). (c) EXTRAS: Fees in Section 9 and 18 may apply.	
2. REZONING <i>Multiple Residential Zones</i>	\$4,600.00

2.1 The following additional fees apply:	
ZONE	ADDITIONAL FEES*
RM-M, RM-10, RM-15, RM-23	+ \$56.00 / dwelling unit
RM-30	+ \$48.00 / dwelling unit
RM-45	+ \$37.00 / dwelling unit
RM-70, RM-135, RMC-135, RMC-150	+ \$0.20 / square metre
<p>* (a) DWELLING UNIT: Fees are calculated on the maximum number of dwelling units allowed (including applicable amenity density increases) under the proposed zone. (b) SQUARE METRE: Fees are calculated on floor area of the maximum allowable density (including applicable amenity density increases). (c) EXTRAS: Fees in Sections 9 and 18 may apply.</p>	
3. REZONING Multiple Residential Special Care Zones	\$3,297.00
3.1 The following additional fees apply:	
ZONE	ADDITIONAL FEES*
RMS-1, RMS-1A, RMS-2	+ \$0.15 / square metre
<p>* (a) SQUARE METRE: Fees are calculated on floor area of the maximum allowable density (including applicable amenity density increases). (b) EXTRAS: Fees in Sections 9 and 18 may apply.</p>	
4. REZONING Institutional Zones	\$3,297.00
4.1 The following additional fees apply:	
ZONE	ADDITIONAL FEES*
PC	+ \$272.00 / hectare
PI, PA-1, PA-2	+ \$0.03 / square metre
<p>* (a) HECTARE: Fees are calculated on the total land area included in the rezoning. (b) SQUARE METRE: Fees are calculated on floor area of the maximum allowable density (including applicable amenity density increases). (c) EXTRAS: Fees in Sections 9 and 18 may apply.</p>	
5. REZONING Commercial Zones	\$4,572.00
5.1 The following additional fees apply:	
ZONE	ADDITIONAL FEES*
C-4, C-5	+ \$0.32 / square metre
C-8, C-8A, C-8B	+ \$0.30 / square metre
C-15	+ \$0.25 / square metre
C-35	+ \$0.20 / square metre
CHI	+ \$0.09 / square metre
CG-1, CG-2	+ \$0.85 / square metre
CTA	+ \$0.53 / square metre
CCR	+ \$0.28 / square metre
CPR, CPG, CPM	+ \$403.00 / hectare to a maximum of 40 hectares
<p>* (a) SQUARE METRE: Fees are calculated on floor area of the maximum allowable density (including applicable amenity density increases). (b) HECTARE: Fees are calculated on the total land area included in the rezoning. (c) EXTRAS: Fees in Sections 9 and 18 may apply.</p>	

6. REZONING <i>Industrial Zones</i>	\$4,572.00
6.1 The following additional fees apply:	
ZONE	ADDITIONAL FEES*
IL, IL-1	+ \$0.10 / square metre
IB-1, IB-2, IB-3	+ \$0.06 / square metre
IH	+ \$0.10 / square metre
IA	+ \$0.17 / square metre
* (a) <i>SQUARE METRE: Fees are calculated on floor area of the maximum allowable density (including applicable amenity density increases).</i> (b) <i>EXTRAS: Fees in Sections 9 and 18 may apply.</i>	
7. REZONING <i>Agricultural Zones</i>	\$3,297.00
7.1 The following additional fees apply:	
ZONE	ADDITIONAL FEES*
A-1	+ \$272.00 / hectare to a maximum of 4 hectares
A-2	+ \$412.00 / hectare to a maximum of 4 hectares
* (a) <i>HECTARE: Fees are calculated on the total land area included in the rezoning.</i> (b) <i>EXTRAS: Fees in Sections 9 and 18 may apply.</i>	
8. REZONING <i>Comprehensive Development Zones</i>	\$5,824.00
8.1 The following additional fees apply:	
DEVELOPMENT TYPE	ADDITIONAL FEES*
SINGLE FAMILY	+ \$156.00 / lot
MULTIPLE RESIDENTIAL AND/OR ALL OTHER USES (Sites up to 10 hectares) Residential Portion AND/OR Non-Residential Portion	+ \$0 / hectare AND + \$96.00 / dwelling unit AND/OR + \$0.32 / square metre
MULTIPLE RESIDENTIAL AND/OR ALL OTHER USES (Sites greater than 10 hectares) Residential Portion AND/OR Non-Residential Portion	+ \$389.00/ hectare to a maximum of 40 hectares AND + \$96.00 / dwelling unit AND/OR + \$0.32 /square metre
* (a) <i>LOT: Fees are calculated on the maximum number of lots allowed under the proposed zone.</i> (b) <i>HECTARE: Fees are calculated on the total land area included in the rezoning.</i> (c) <i>DWELLING UNIT: Fees are calculated on the number of dwelling units proposed in the rezoning.</i> (d) <i>SQUARE METRE: Fees are calculated on floor area proposed in the rezoning.</i> (e) <i>EXTRAS: Fees in Sections 9 and 18 may apply.</i>	
9. REZONING SURCHARGE	BY NCP OR INFILL AREA
Rezoning surcharge fees are in addition to the rezoning application fee. Surcharges reflect the costs of preparing Neighbourhood Concept Plans (NCP) and related traffic impact studies and include a fifteen percent (15%) repayment administration fee. Surcharges apply to all sites within the Neighbourhood Concept Plans or Infill Areas listed below.	
The following additional rezoning surcharge fees apply:	
NCP OR INFILL AREA	SURCHARGE FEES*
NORTH CLOVERDALE EAST NCP See MAP 1	Residential Uses: + \$77.00 / lot or dwelling unit All Other Uses: + \$770.00 / hectare

NORTH CLOVERDALE WEST NCP See MAP 2	Residential Uses: + \$142.78 / lot or dwelling unit All Other Uses: + \$1,420.78 / hectare
EAST NEWTON NORTH NCP See MAP 3	Residential Uses: + \$136.47 / lot or dwelling unit All Other Uses: + \$1,360.47 / hectare
WEST NEWTON SOUTH NCP See MAP 4	Residential Uses: + \$84.62 / lot or dwelling unit All Other Uses: + \$840.62 / hectare
ROSEMARY HEIGHTS CENTRAL NCP See MAP 5	Residential Uses: + \$59.47 /lot or dwelling unit All Other Uses: + \$590.47 / hectare
WEST NEWTON NORTH NCP See MAP 6	Residential Uses: + \$64.45 / lot or dwelling unit All Other Uses: + \$640.45 / hectare
WEST CLOVERDALE SOUTH NCP See MAP 7	Residential Uses: + \$116.36 / lot or dwelling unit All Other Uses: + \$1,160.36 / hectare
ROSEMARY HEIGHTS WEST NCP See MAP 8	Residential Uses: + \$85.70 / lot or dwelling unit All Other Uses: + \$850.70 / hectare
EAST NEWTON SOUTH NCP See MAP 9	Residential Uses: + \$68.87 /lot or dwelling unit All Other Uses: + \$680.87 / hectare
WEST CLOVERDALE NORTH NCP See MAP 10	Residential Uses: + \$146.71 / lot or dwelling unit All Other Uses: + \$1,460.71 / hectare
EAST CLAYTON NCP EXT. NORTH OF 72 AVE; See MAP 11	Residential Uses: + \$60.64 / lot or dwelling unit All Other Uses: + \$600.64 / hectare
ANNIEDALE-TYNEHEAD NCP See MAP 12	Residential Uses: + \$86.46 / lot or dwelling unit All Other Uses: + \$860.46 / hectare
FLEETWOOD ENCLAVE INFILL AREA See MAP 13	Residential Uses: + \$399.27 / lot or dwelling unit All Other Uses: + \$3,990.27 / hectare
WEST CLAYTON NCP See MAP 14	Residential Uses: + \$74.11 / lot or dwelling unit All Other Uses: + \$740.11 / hectare
REDWOOD HEIGHTS NCP See MAP 15	Residential Uses: + \$122.00 / lot or dwelling unit All Other Uses: + \$1,122.00 / hectare
* (a) LOT: Fees are calculated based on the maximum density approved in the corresponding NCP. (b) DWELLING UNIT: Fees are calculated on the maximum number of dwelling units allowed (including applicable amenity density increases) under the proposed zone.	
10. OFFICIAL COMMUNITY PLAN AMENDMENT <i>With or Without a Rezoning</i>	\$3,000.00
10.1 The following additional fees apply:	
AMENDMENT TYPE	ADDITIONAL FEES*
LAND USE DESIGNATION AMENDMENT	+ \$1,095.00 per hectare
* (a) HECTARE: Fees are calculated on the total land area included in the Official Community Plan Land Use Designation amendment. (b) EXTRAS: Fees in Section 18 may apply.	
11. NEIGHBOURHOOD CONCEPT PLAN AMENDMENT <i>Approved NCPs involving changes in Use, Density or Financial Allocations or any combination thereof</i>	\$2,737.00
12. NEIGHBOURHOOD CONCEPT PLAN AMENDMENT <i>Approved NCPs not involving changes in Use, Density or Financial Allocations or any combination thereof</i>	\$1,416.00

13.	LOCAL AREA PLAN (LAP) AMENDMENT	\$2,737.00
14.	LAND USE CONTRACT AMENDMENT* <i>Existing Land Use Contracts involving changes to Use or</i>	BY LAND USE TYPE
	LAND USE TYPE	
	SINGLE FAMILY OR DUPLEX	\$2,737.00
	MULTIPLE RESIDENTIAL	\$3,824.00
	INSTITUTIONAL	\$2,737.00
	COMMERCIAL OR INDUSTRIAL	\$3,824.00
	AGRICULTURAL	\$2,737.00
	RECREATIONAL	\$3,824.00
	ANY COMBINATION OF LAND USE TYPES	\$5,476.00
	* (a) EXTRAS: Fees in Section 18 may apply.	
15.	LAND USE CONTRACT AMENDMENT <i>Existing Land Use Contracts NOT involving changes to Use or</i>	BY APPLICATION TYPE
	APPLICATION TYPE	
	USING A DEVELOPMENT VARIANCE PERMIT	See Section 19
	USING A DEVELOPMENT PERMIT	See Section 20.1
	MINOR AMENDMENTS NOT REQUIRING COUNCIL APPROVAL BUT REQUIRING APPROVAL FROM THE PLANNING GENERAL MANAGER OR A BUILDING INSPECTOR	\$342.00
16.	LAND USE CONTRACT DISCHARGE	
	<i>With a Rezoning</i>	\$0*
	<i>Without a Rezoning</i>	\$687.00
	* (a) EXTRAS: Additional fees in Section 18 may apply.	
17.	TEMPORARY USE PERMIT	\$2,000.00
18.	PUBLIC INFORMATION MEETING FEE	\$459.00
19.	PUBLIC HEARING FEE*	
	When a Public Hearing is required, the following fees apply:	
19.1	FIRST PUBLIC HEARING Required for: Rezoning, Official Community Plan Amendment, Land Use Contract Amendment or Discharge, Liquor License, Gaming License, Heritage Revitalization Agreement, Heritage Alteration Permit or Heritage Covenant Applications OR	\$1,267.00

19.2 ADDITIONAL PUBLIC HEARINGS As determined by the City of Surrey	\$1,267.00
* (a) REFUNDS: In the event that an application does not proceed to a Public Hearing for any reason, the Public Hearing Fee, as paid, may be refunded at the written request of the applicant, provided that preparation for the Public Hearing has not already commenced	
20. DEVELOPMENT VARIANCE PERMIT	
<i>General</i>	\$1,700.00
<i>Land Use Contract Amendment</i> (Not for Use or Density)	\$1,502.00
<i>Crescent Beach Building Elevation Relaxation</i>	\$863.00
<i>Tree Retention</i>	\$0
21. DEVELOPMENT VARIANCE PERMIT REQUIRED FOR ILLEGAL CONSTRUCTION To be applied where the works associated with a Development Variance Permit (DVP) have been completed, and where the applicant wishes to retain these works, prior to Surrey City Council having granted approval of a DVP	\$3,004.00
22. DEVELOPMENT PERMIT	
22.1 NEW APPLICATIONS	
<i>Form and Character</i>	\$4,400.00*
* (a) EXTRAS: Additional fees in Section 22.3 also apply.	
<i>Hazard Lands</i>	\$0 (With a Form and Character Development Permit) (See also: Section 23.1)
<i>Sensitive Ecosystems</i>	
<i>Farm Protection</i>	
<i>Any Combination</i>	
<i>Comprehensive Sign Design Package</i>	\$1,856.00
<i>Land Use Contract Amendment</i> (For anything other than Use or Density)	\$1,502.00
22.2 AMENDMENT APPLICATIONS	
<i>For Previously Issued Development Permits Including Signs with Variances</i> (Signs without Variances – See Section 23.2)	\$3,297.00

22.3 For NEW Form and Character Applications only, the following additional fees apply:

ZONE	ADDITIONAL FEES*
RC	+ \$114.00 / dwelling unit
RM-D, RM-M, RM-10	+ \$90.00 / dwelling unit
RM-15, RM-23	+ \$90.00 / dwelling unit
RM-30	+ \$79.00 / dwelling unit
RM-45	+ \$64.00 / dwelling unit
RM-70	+ \$0.34 / square metre
RM-135	+ \$0.34 / square metre
RMC-135	+ \$0.34 / square metre
RMC-150	+ \$0.34 / square metre
RMS-1, RMS-1A, RMS-2	+ \$1.21 / square metre
C-4, C-5	+ \$0.94 / square metre
C-8, C-8A, C-8B	+ \$0.94 / square metre
C-15	+ \$0.94 / square metre
C-35	+ \$0.53 / square metre
CHI	+ \$0.84 / square metre
CG-1, CG-2	+ \$0.94 / square metre
CCR	+ \$0.94 / square metre
CPG, CPM, CPR (less than 2 hectares)	+ \$0.34 / square metre
CPG, CPM, CPR (more than 2 hectares)	+ \$272.00 per hectare (maximum 40 hectares)
IL, IL-1	+ \$0.85 / square metre
IB, IB-1, IB-2, IB-3, IP (2)	+ \$0.85 / square metre
IH	+ \$0.85 / square metre
I-4	+ \$1.29 / square metre
IA	+ \$0.85 / square metre
CD (Sites up to 10 Hectares)	\$0 / hectare AND + \$0.91/ square metre AND + \$96.00 / dwelling unit
CD (Sites Greater than 10 Hectares)	+ \$389.00 / hectare to a maximum of 40 hectares AND + \$0.91 / square metre AND + \$96.00 / dwelling unit
CTA**	+ \$0.94 / square metre** AND + \$17.63 / pad**

***(a) DWELLING UNIT: Fees are calculated on the number of proposed dwelling units.*

(b) SQUARE METRE: Fees are calculated on the total proposed floor area of all proposed buildings.

(c) HECTARE: Fees are calculated on total site area included in the application.

***(a) SQUARE METRE: Fees are calculated on the total proposed floor area of permanent buildings and structures.*

(b) PAD: Fees are calculated for each proposed trailer pad and/or mobile home pad."

23. DEVELOPMENT PERMIT - DELEGATED	
23.1 NEW APPLICATIONS	
<i>Hazard Lands</i>	\$1,728.00 (Without a Form and Character Development Permit)
<i>Sensitive Ecosystems</i>	
<i>Farm Protection</i>	
<i>Any Combination</i>	
<i>Surface Parking Lots</i>	\$687.00
<i>New Free-Standing Signs</i>	
<i>Sign Design Package</i>	\$687.00
23.2 AMENDMENT APPLICATIONS	
<i>For Previously Issued Development Permits (Excluding Signs)</i>	\$1,495.00
<i>For Previously Issued Development Permits (Signs Only with no concurrent Variance)</i>	\$342.00
23.3 APPLICATION SURCHARGE	
<i>Forwarding a Delegated Development Permit Application to Council</i>	\$1,146.00
24. SUBDIVISION	
<i>Creating One or More New Lots</i> Includes: Other Subdivision Types, for example, Lot Line Adjustments, Bare Land Strata and Long Term Lease Approvals	\$2,500.00 + \$116.00 per lot to be created
<i>Air Space</i>	\$5,981.00 + \$116.00 per lot to be created
<i>Strata Conversions or Amendments</i>	\$927.00
<i>Phased Strata</i> <i>Form P Approval</i>	\$964.00
<i>Form P Amendment</i>	\$430.00
<i>Plan Approval</i>	\$430.00
<i>Lot Consolidation</i> Where no additional lot is created	\$1,997.00
<i>Preliminary Layout Approval Extension</i>	25% of the original subdivision application fee for which the extension is requested
<i>Preliminary Layout Approval Amendment</i>	\$433.00 (When changes are initiated by the Applicant)
25. AGRICULTURE LAND RESERVE <i>Inclusion, Exclusion, Subdivision, Non-Farm Use, Place Fill/Remove Soil and/or Transportation, Utility and Recreation Trail Uses</i>	Fees Collected by City of Surrey on behalf of the Agricultural Land Commission

26. LIQUOR LICENCE	\$1,938.00
<i>* (a) EXTRAS: Additional fees in Section 18 may apply.</i>	
26.1 NEW LIQUOR PRIMARY APPLICATIONS	\$1,938.00
<i>* (a) EXTRAS: Additional fees in Section 18 may apply.</i>	
26.2 AMENDMENT APPLICATIONS	
<i>Liquor Primary Licence (Hours of Operation Extension > 1 hr)</i>	\$1,938.00
<i>Food Primary Licence (Liquor Service Extension Past 1:00 pm)</i>	
<i>All Other Licences</i>	
26.3 AMENDMENT APPLICATIONS - DELEGATED	
<i>Liquor Primary Licence (Increase in Person Capacity) (Hours of Operation Extension (<= 1 hr))</i>	\$1,103.00
<i>Food Primary Licence (Patron Participation) (Liquor Service Extension Past 1:00 pm)</i>	
<i>Manufacturer Licence (Lounge Endorsement) (Special Event Area Endorsement)</i>	
26.4 APPLICATION SURCHARGE	
<i>Forwarding a Delegated Liquor Licence Amendment Application to Council</i>	\$882.00
27. GAMING LICENCE	\$1,938.00
<i>* (a) EXTRAS: Additional fees in Section 18 may apply.</i>	
28. HERITAGE REVITALIZATION AGREEMENT HERITAGE ALTERATION PERMIT HERITAGE COVENANT	
<i>Initial Application Minor Amendment Major Amendment When application submitted PRIOR TO commencement of restoration work</i>	\$0
<i>Initial Application When work commences WITHOUT a Heritage Protection Instrument Major Amendment When application submitted AFTER commencement of restoration work</i>	\$3,297.00*
<i>* (a) EXTRAS: Fees in Section 18 may also apply.</i>	

29. RESTRICTIVE COVENANT AMENDMENT OR DISCHARGE	
<i>Requiring Council Approval</i>	\$864.00
<i>Not Requiring Council Approval</i>	\$433.00
30. LEGAL DOCUMENT REVISIONS/DISCHARGES	\$433.00
31. TRUCK PARKING FACILITY PERMIT	\$1,720.00
32. SITE PROFILE APPLICATION For all development applications	\$58.00
33. ADMINISTRATIVE FEES	
<i>Change of Owner</i> Each change identified in a development application	\$343.00
<i>Change of Authorized Agent</i> Each change identified in a development application	\$343.00
<i>Change of Scope</i> Applies each time after initial submission, for any additional density created or lots added by the change in scope	\$343.00 Plus the additional per dwelling unit, per lot, per square metre and/or per hectare Rezoning, Development Permit and/or Subdivision fee, as referenced in this Bylaw
<i>Mayor and City Clerk Plan Signing</i> For each non-phased strata plan that does not require execution by the Approving Officer but does require execution by the Mayor and City Clerk	\$343.00

C. "Surrey Land Use and Development Applications Fees Imposition By-law, 1993, No. 11631", and all amendments thereto is hereby repealed.

PASSED FIRST READING on the 1st day of February, 2016.

PASSED SECOND READING on the 1st day of February, 2016.

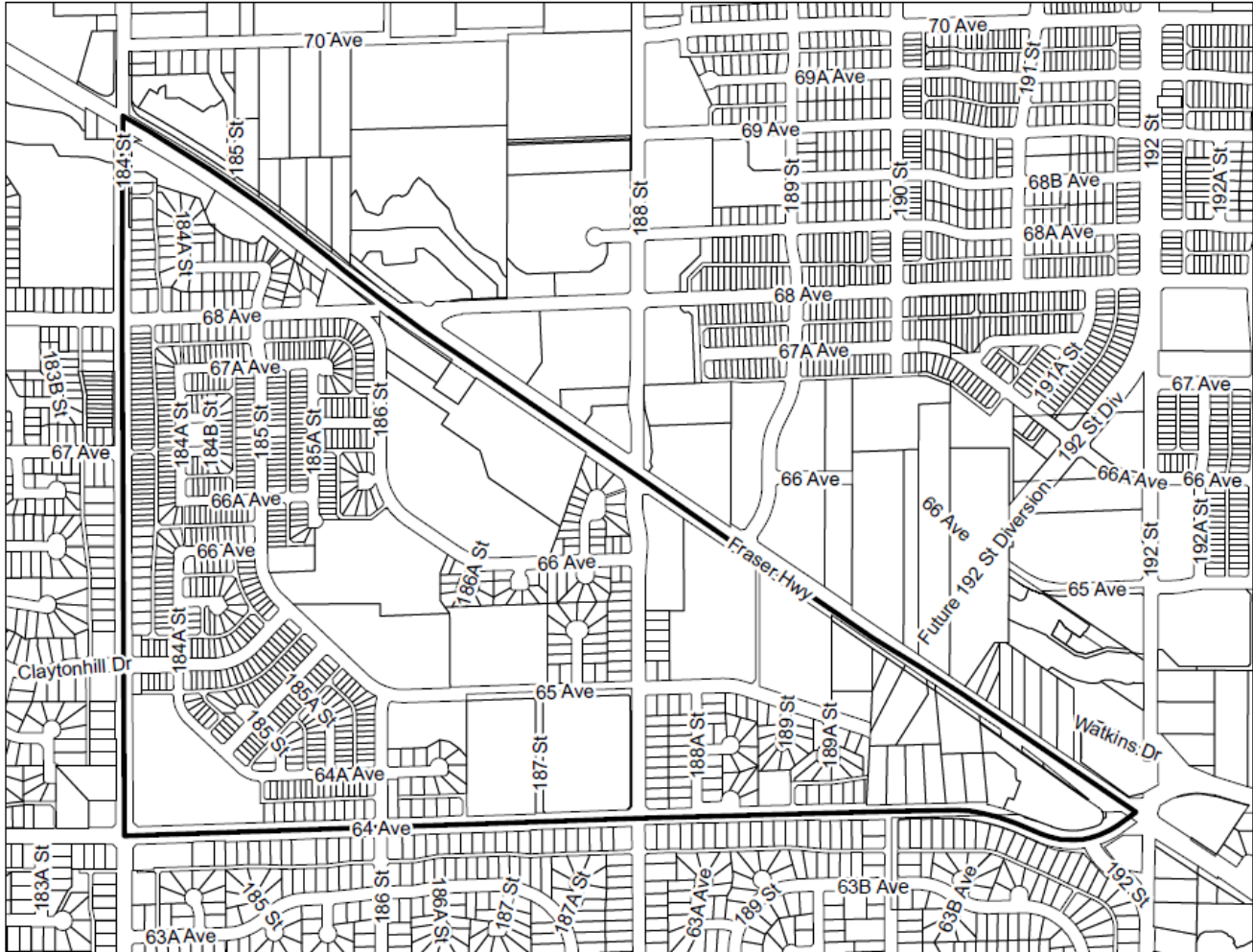
PASSED THIRD READING, as amended, on the 22nd day of February, 2016.

RECONSIDERED AND FINALLY ADOPTED, signed by the Mayor and Clerk, and sealed with the Corporate Seal on the 22nd day of February, 2016.

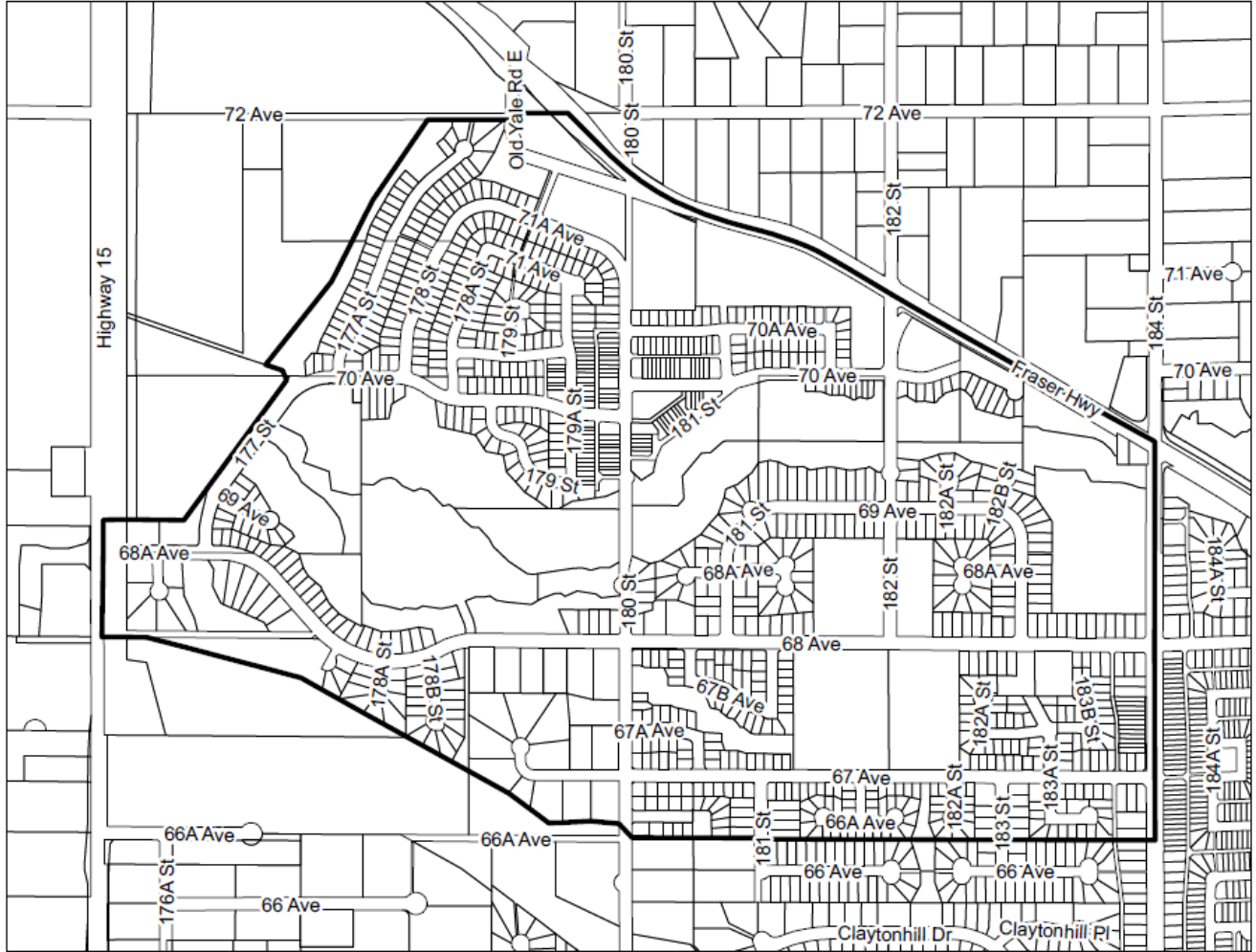
_____ MAYOR

_____ CLERK

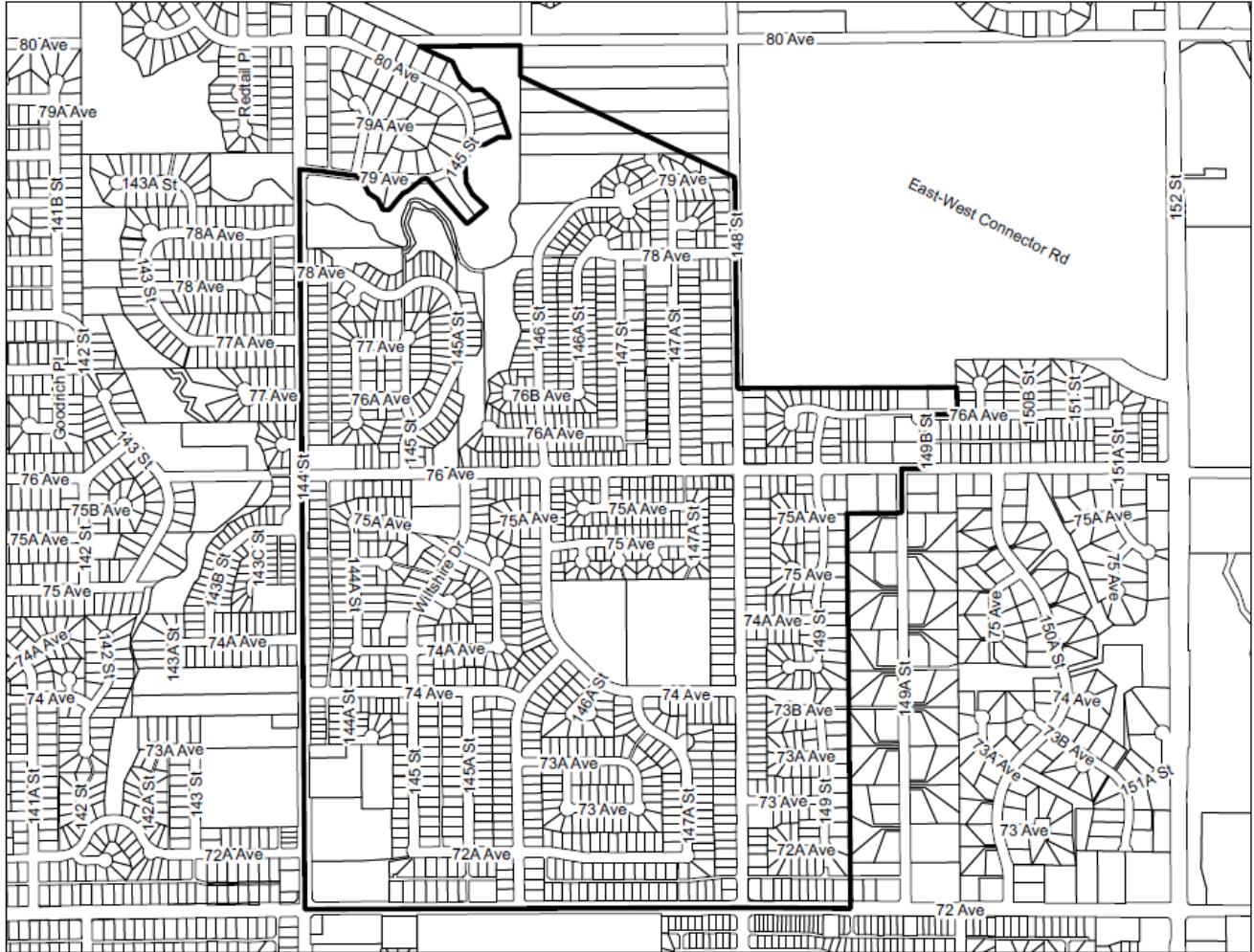
MAP NO. 1
NORTH CLOVERDALE EAST
NEIGHBOURHOOD CONCEPT PLAN
LANDS SUBJECT TO SURCHARGE



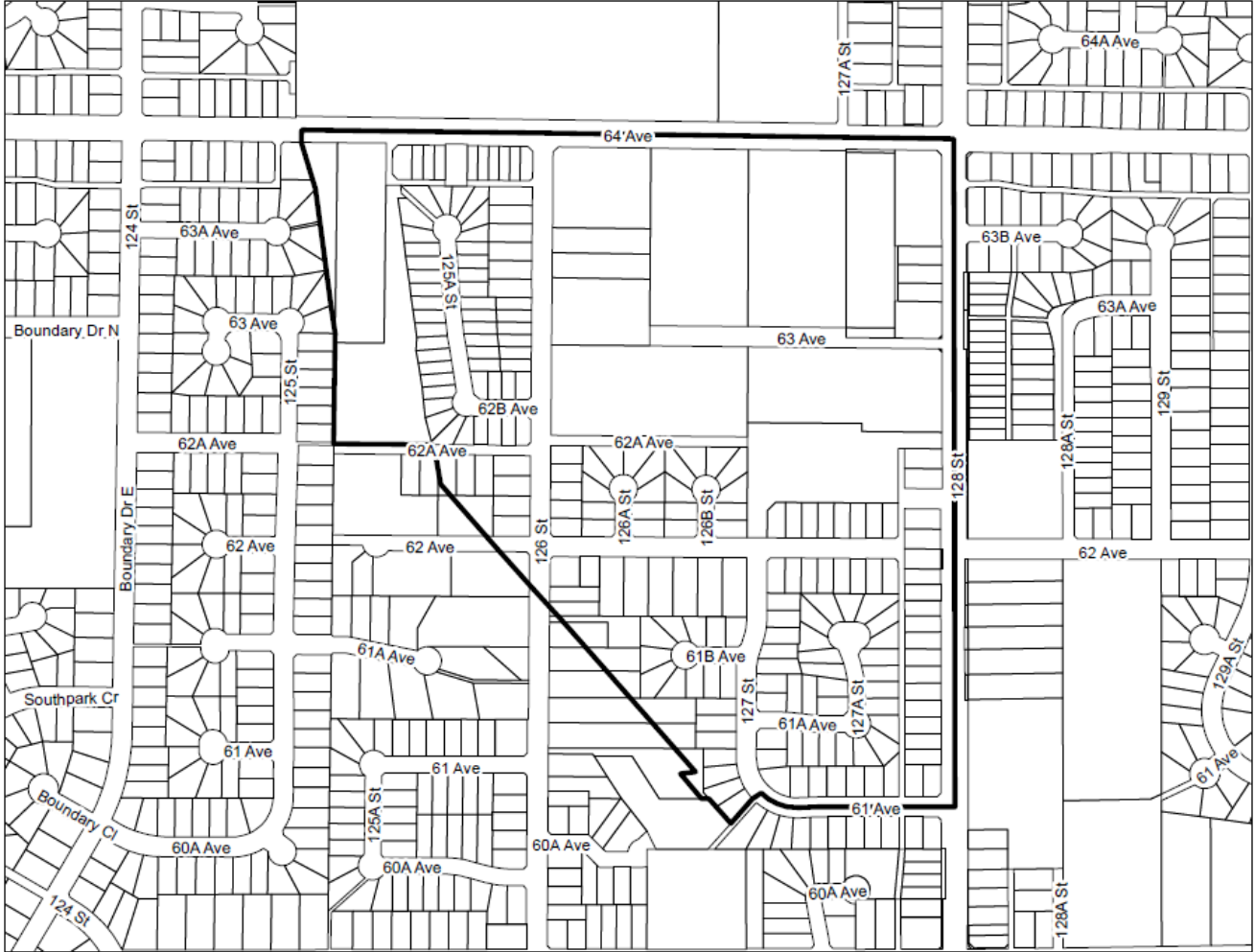
MAP NO. 2
NORTH CLOVERDALE WEST
NEIGHBOURHOOD CONCEPT PLAN
LANDS SUBJECT TO SURCHARGE



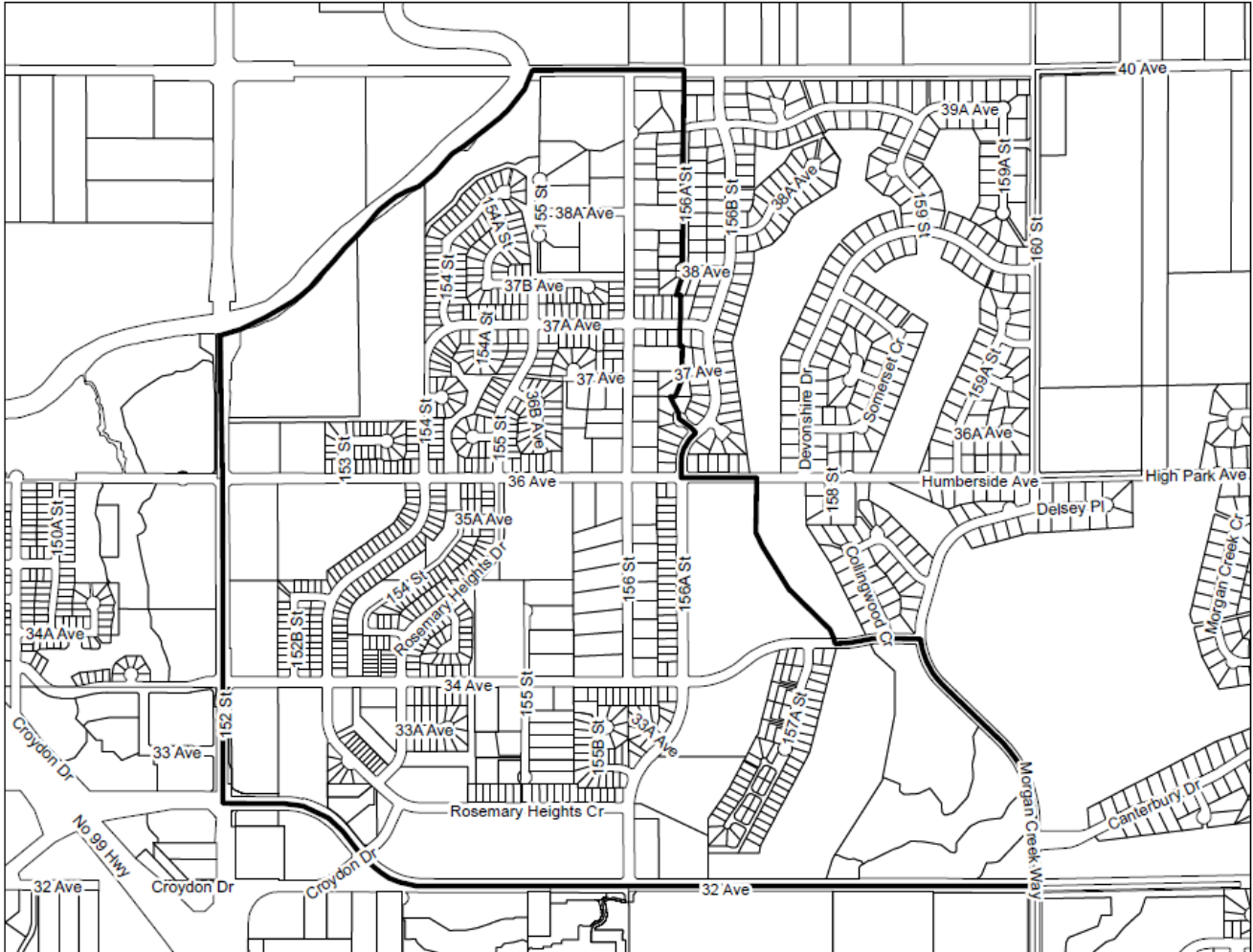
MAP NO. 3
EAST NEWTON NORTH
NEIGHBOURHOOD CONCEPT PLAN
LANDS SUBJECT TO SURCHARGE



MAP NO. 4
WEST NEWTON SOUTH
NEIGHBOURHOOD CONCEPT PLAN
LANDS SUBJECT TO SURCHARGE



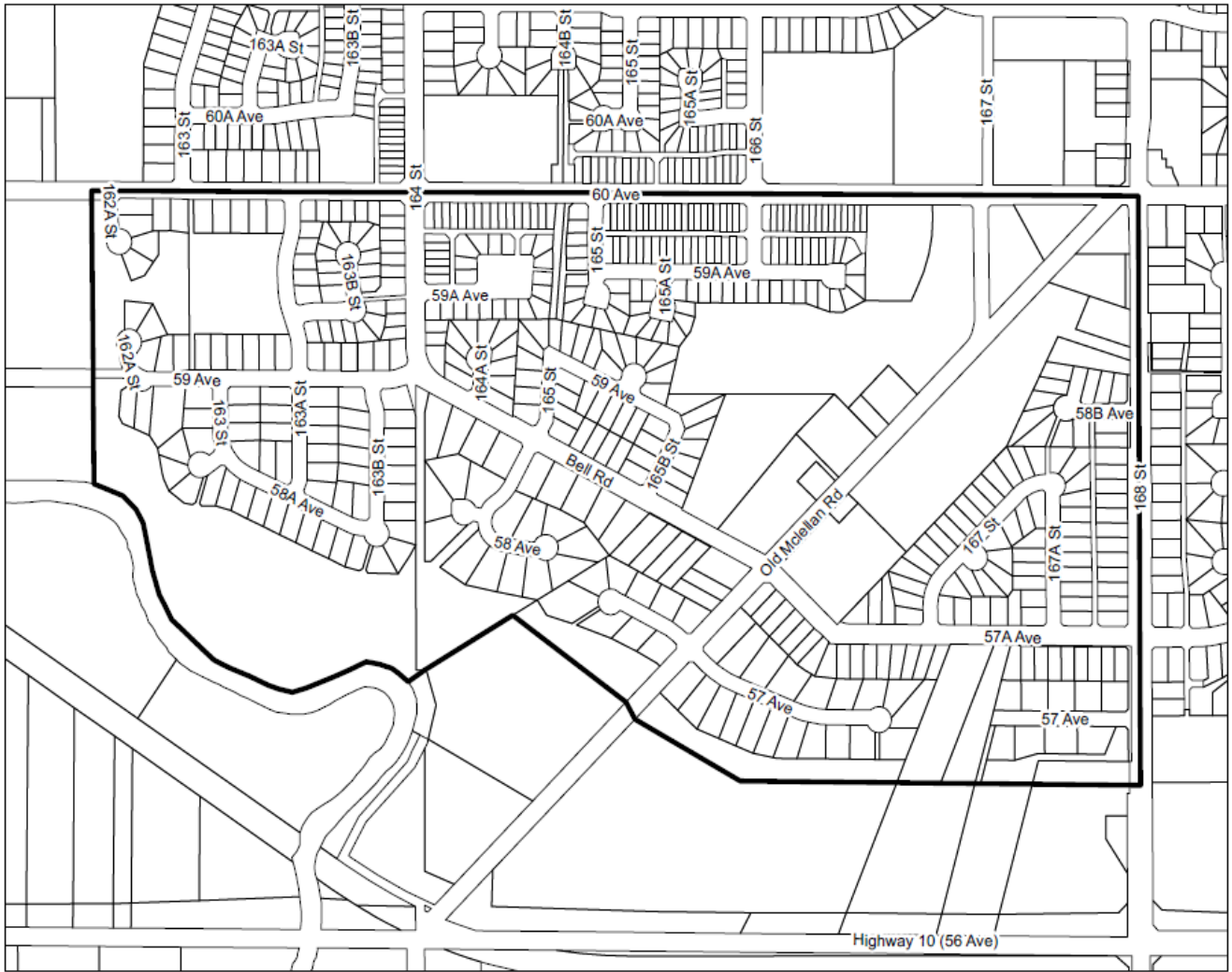
MAP NO. 5
ROSEMARY HEIGHTS CENTRAL
NEIGHBOURHOOD CONCEPT PLAN
LANDS SUBJECT TO SURCHARGE



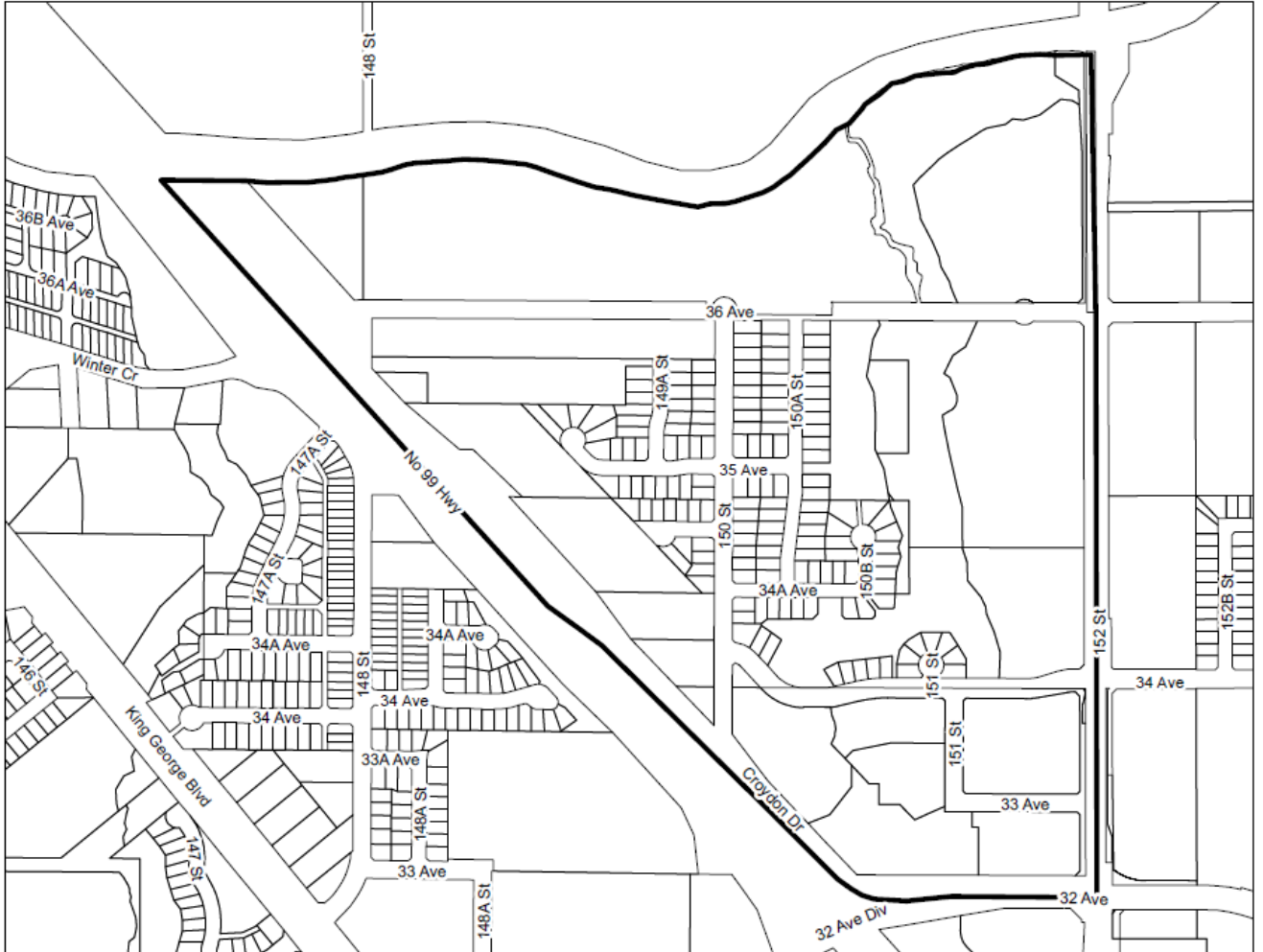
MAP NO. 6
WEST NEWTON NORTH
NEIGHBOURHOOD CONCEPT PLAN
LANDS SUBJECT TO SURCHARGE



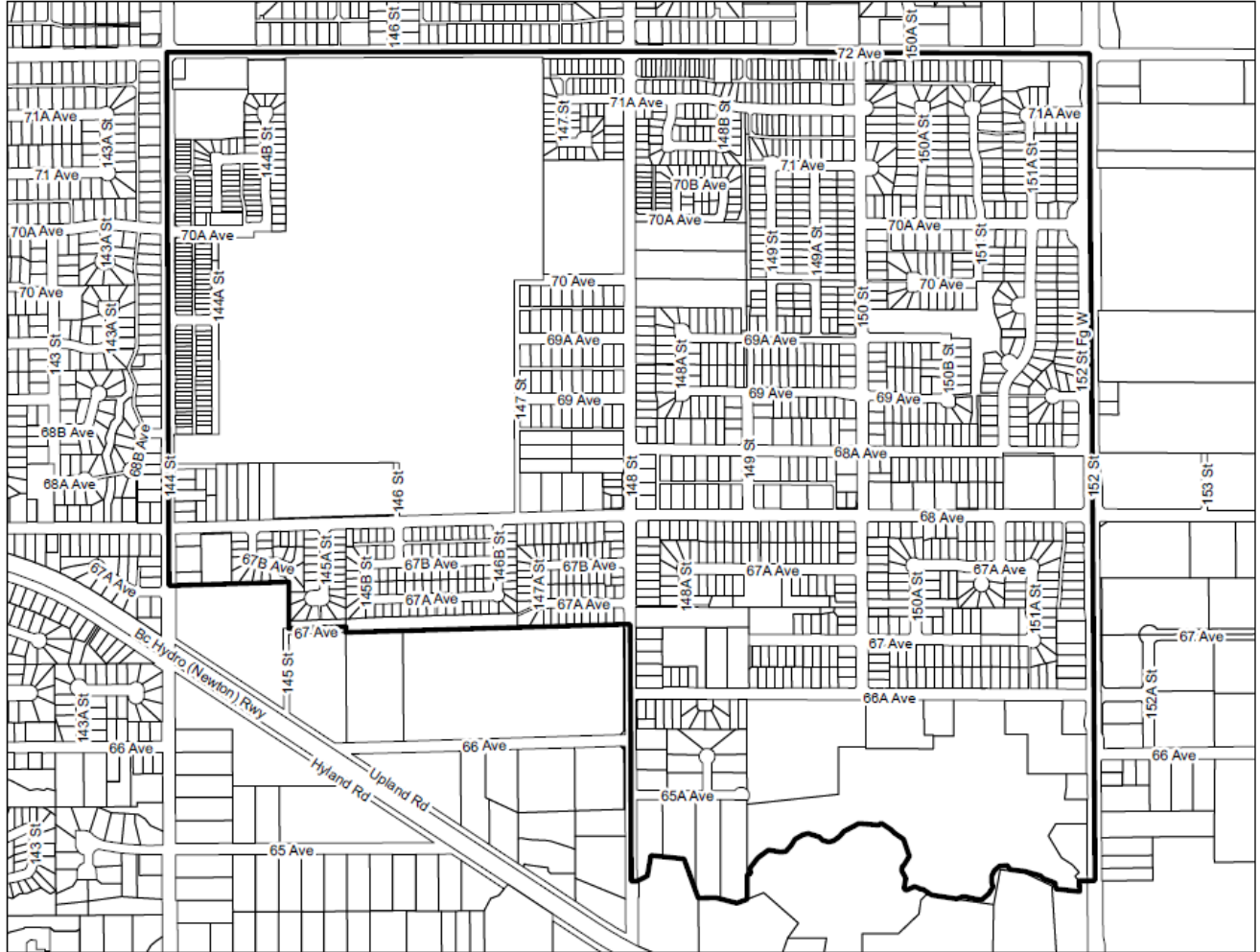
MAP NO. 7
WEST CLOVERDALE SOUTH
NEIGHBOURHOOD CONCEPT PLAN
LANDS SUBJECT TO SURCHARGE



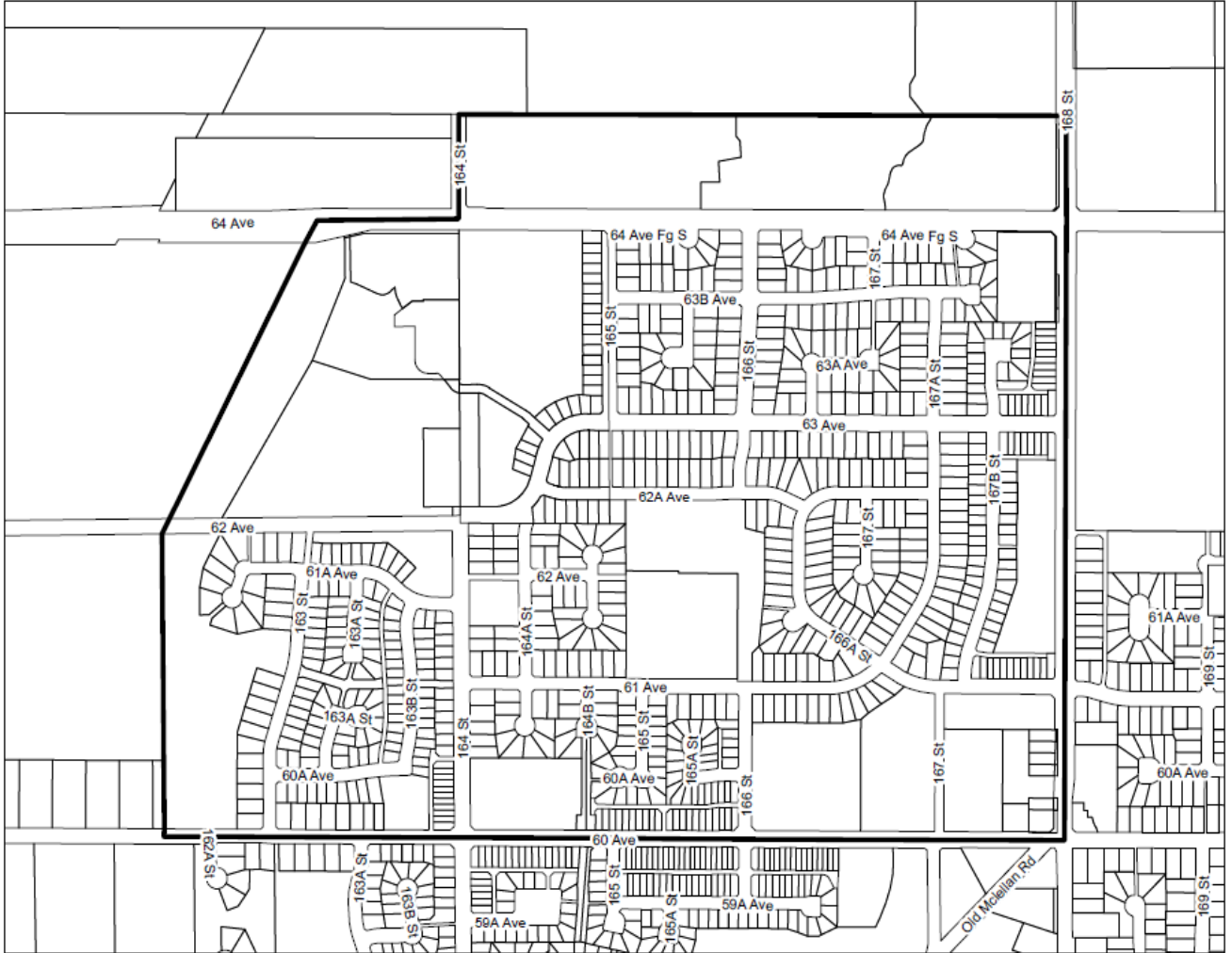
MAP NO. 8
ROSEMARY HEIGHTS WEST
NEIGHBOURHOOD CONCEPT PLAN
LANDS SUBJECT TO SURCHARGE



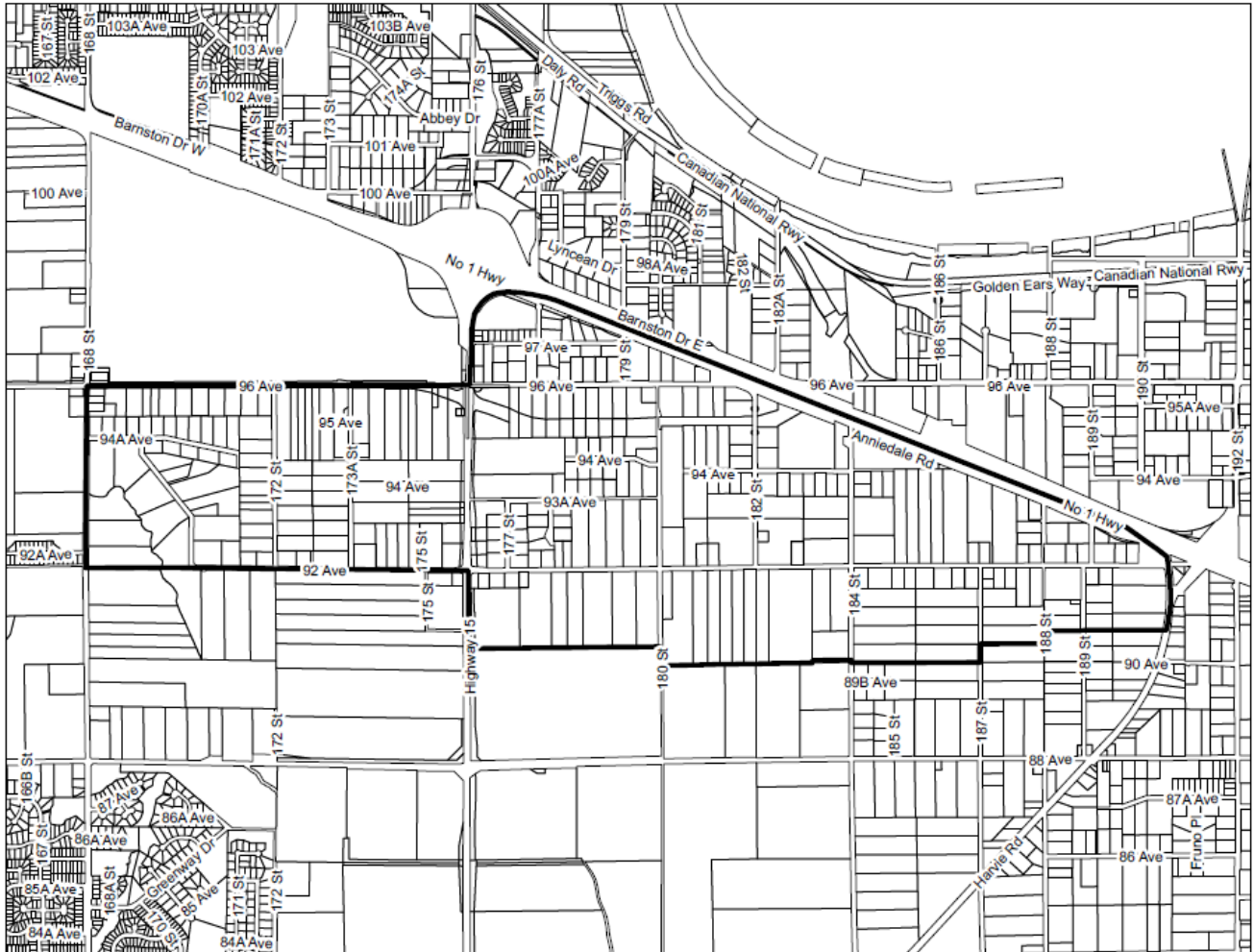
MAP NO. 9
EAST NEWTON SOUTH
NEIGHBOURHOOD CONCEPT PLAN
LANDS SUBJECT TO SURCHARGE



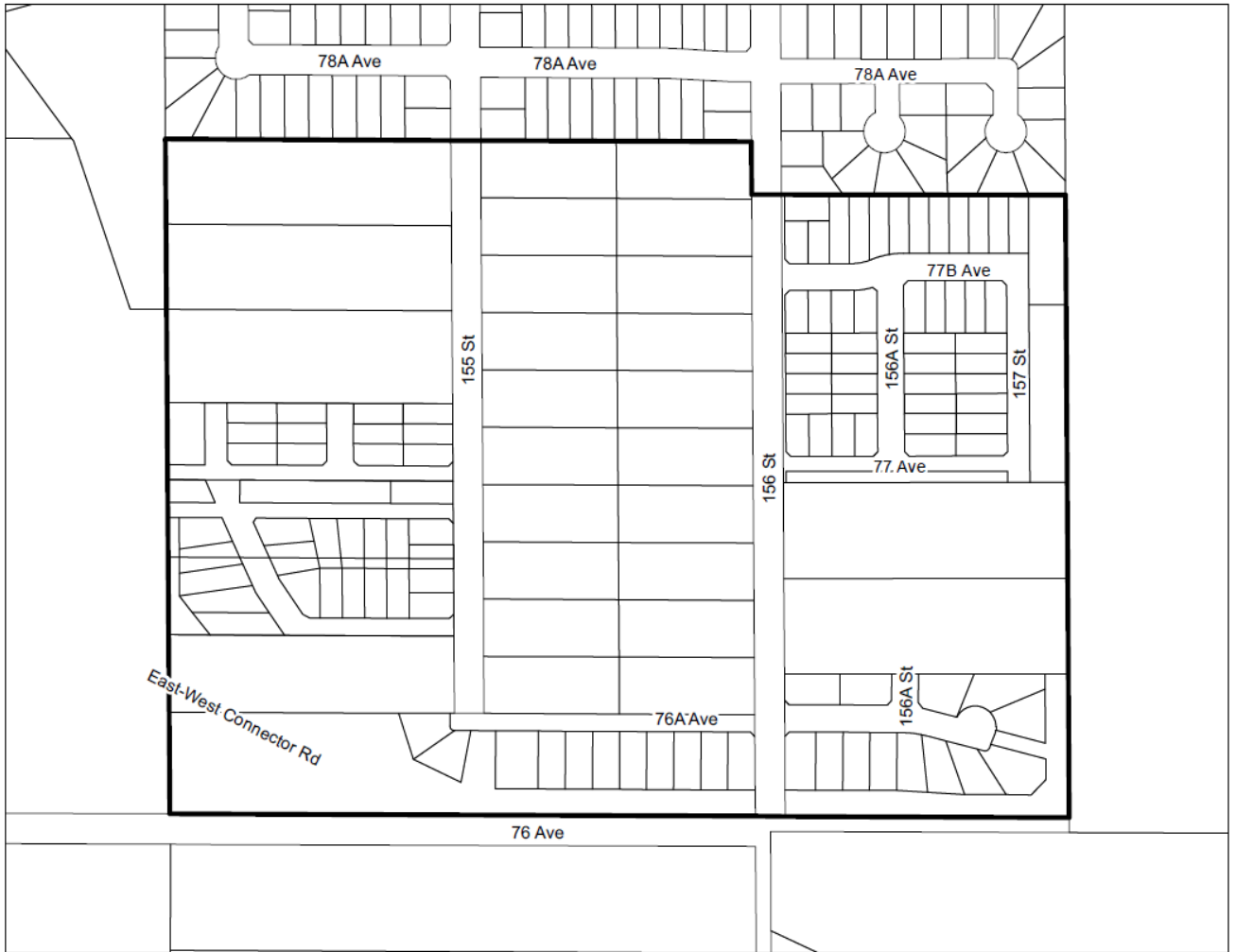
MAP NO. 10
WEST CLOVERDALE NORTH
NEIGHBOURHOOD CONCEPT PLAN
LANDS SUBJECT TO SURCHARGE



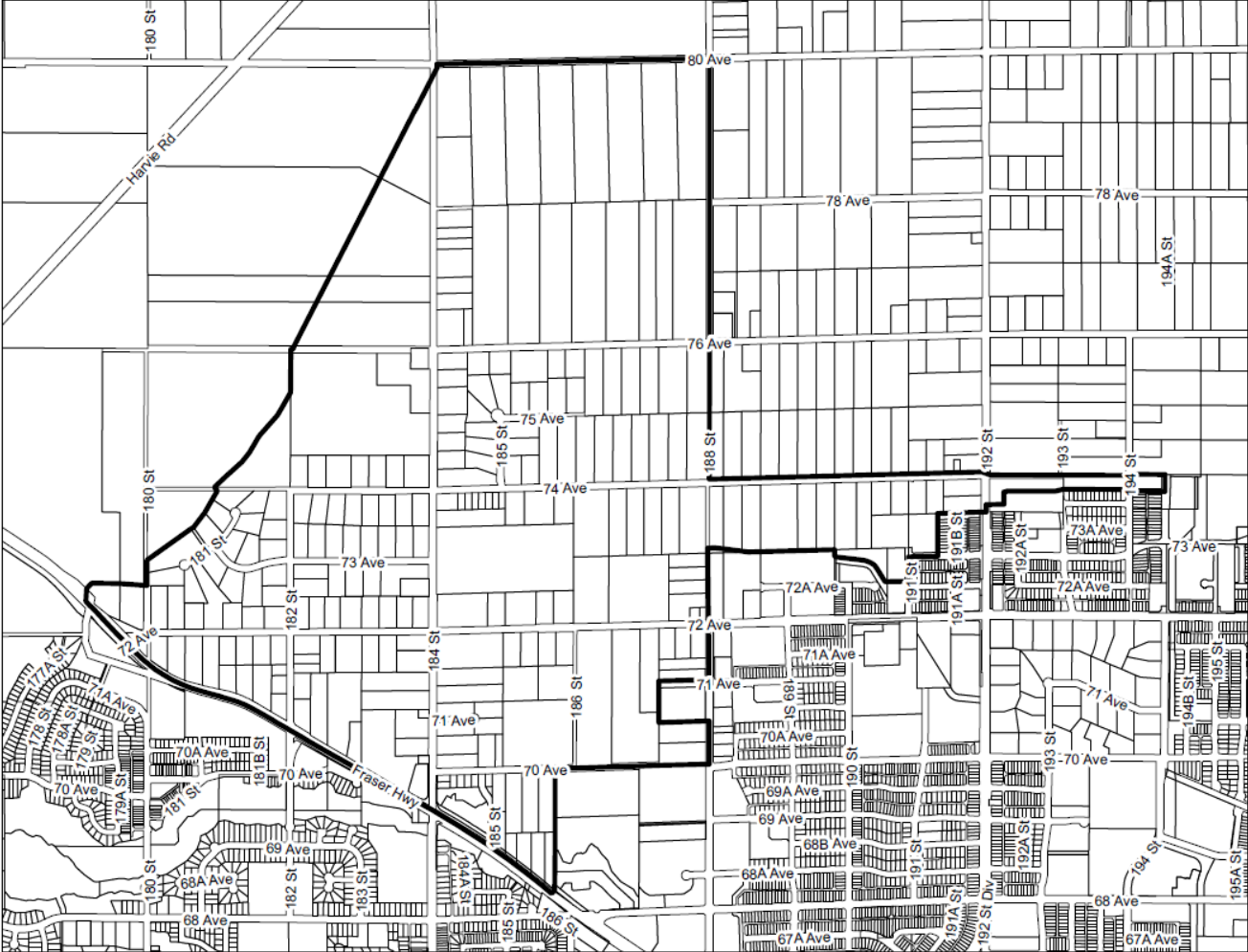
MAP NO. 12
ANNIEDALE-TYNEHEAD
NEIGHBOURHOOD CONCEPT PLAN
LANDS SUBJECT TO SURCHARGE



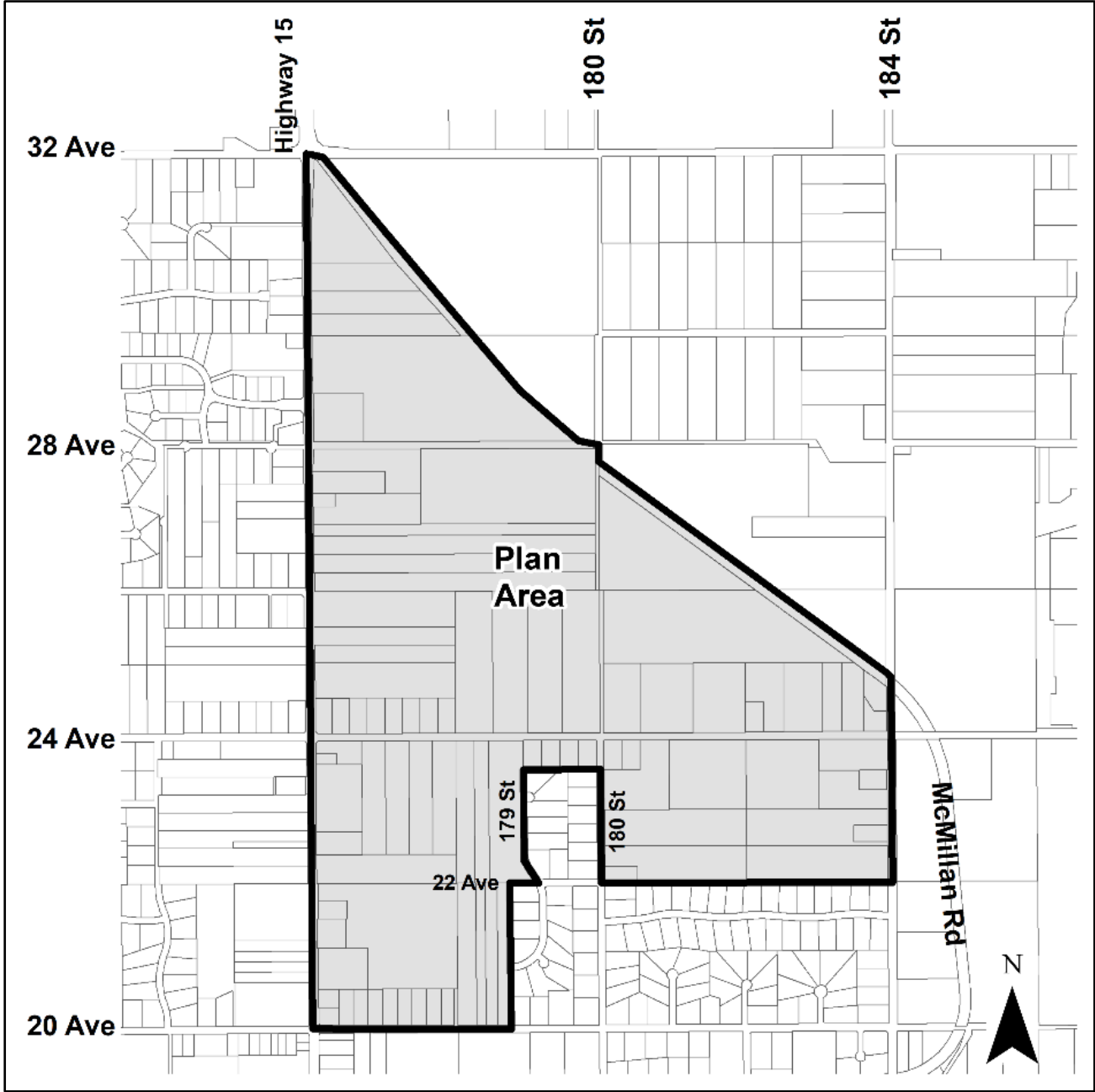
MAP NO. 13
FLEETWOOD ENCLAVE INFILL AREA PLAN
NEIGHBOURHOOD CONCEPT PLAN
LANDS SUBJECT TO SURCHARGE

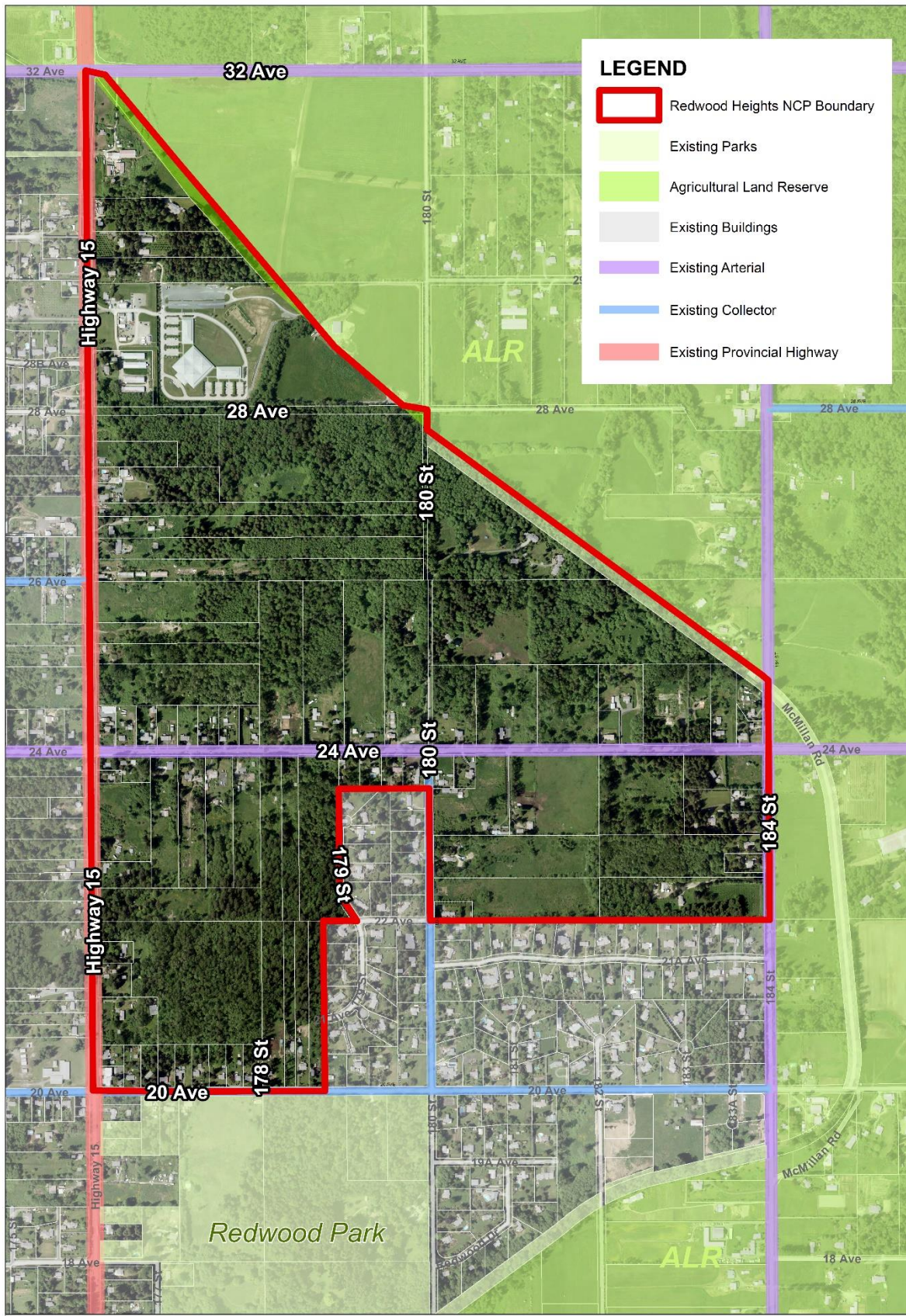


MAP NO. 14
WEST CLAYTON
NEIGHBOURHOOD CONCEPT PLAN
LANDS SUBJECT TO SURCHARGE



MAP NO. 15
REDWOOD HEIGHTS
NEIGHBOURHOOD CONCEPT PLAN
LANDS SUBJECT TO SURCHARGE





Redwood Heights Neighbourhood Plan Survey

Survey Results

April 5 2018

The results of this survey, conducted between March 6 2018 and March 31 2018, are not weighted to the City of Surrey's population.

The results are based on 223 survey responses.

Background

The final land use plan is being prepared for the Redwood Heights Neighbourhood Concept Plan (NCP) area. This plan includes land use refinements to the Stage I plan, approved by Surrey City Council in 2013 as well as utility servicing and financial plan.

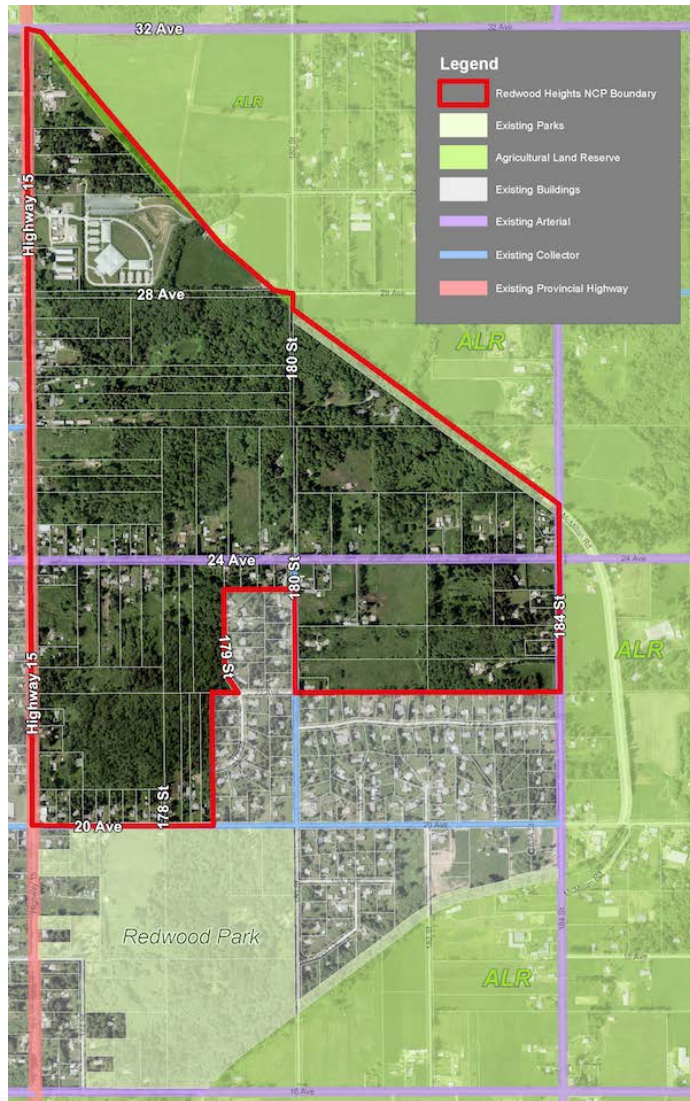
The City of Surrey conducted a survey to gather feedback from residents about the final plan.

This report is based 223 responses received from two online surveys:

Open Community Survey: 116 responses received between March 6 - 31 2018

CitySpeaks Panel Survey: 107 responses received between March 22 - 31 2018

Redwood Heights Plan Area



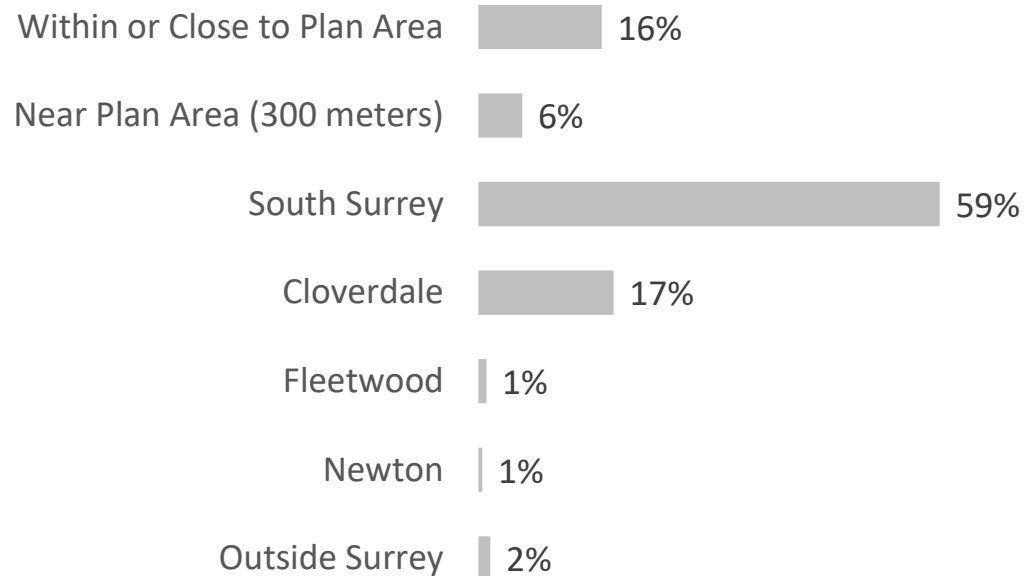
The plan area is bounded by the Agricultural Land Reserve ("ALR") to the north and east, 20 Avenue and the northerly boundary of the existing Redwood Park Estates subdivision to the south and 176 Street (Highway 15) to the west.

It has an area of approximately 201 hectares (497 acres) and includes 92 properties, and is currently home to approximately 300 people.

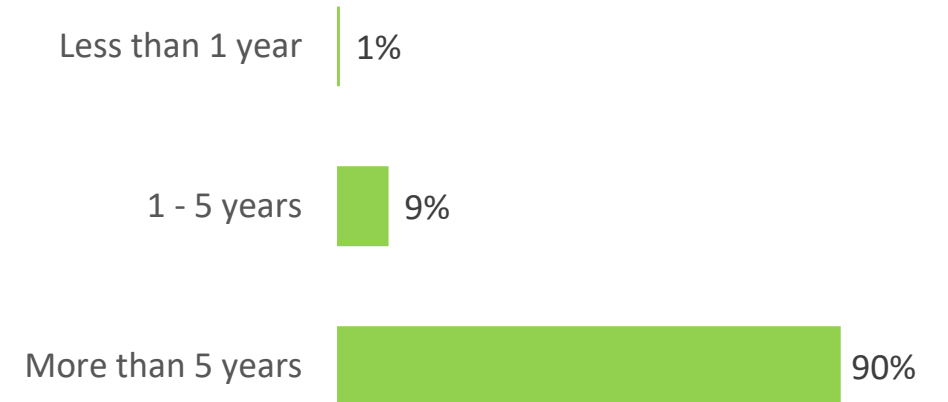
Profile of Survey Participants (#1)

98% of survey participants live in Surrey

Neighbourhood Area



Years of Residency in Surrey

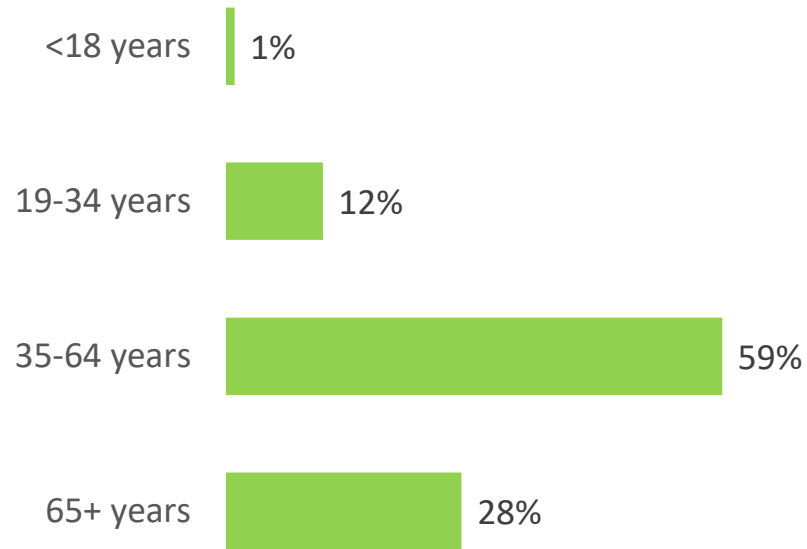


DEMOGRAPHICS

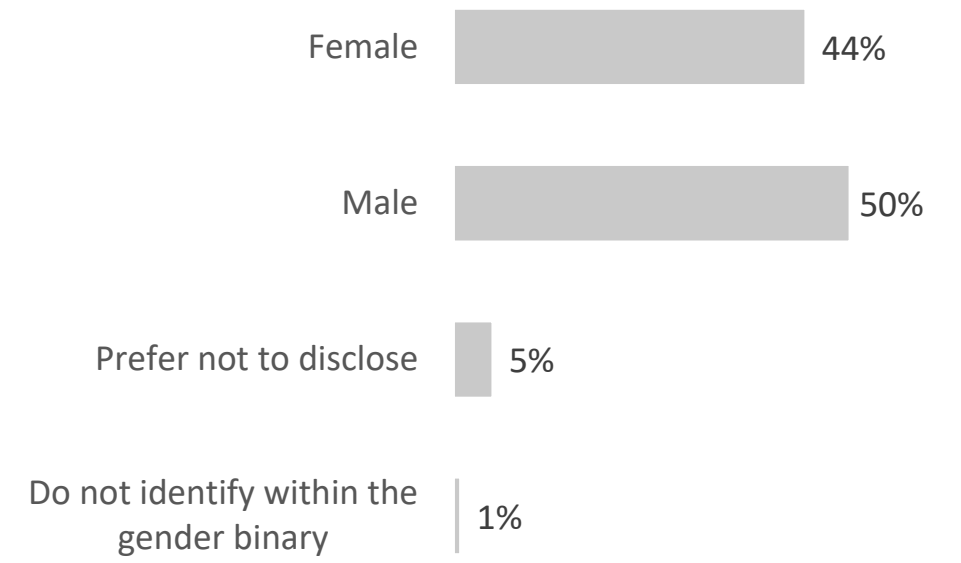
Demographics are provided as background on the composition of survey respondents. Please note these results are not weighted to the City of Surrey's population.

Profile of Survey Participants (#2)

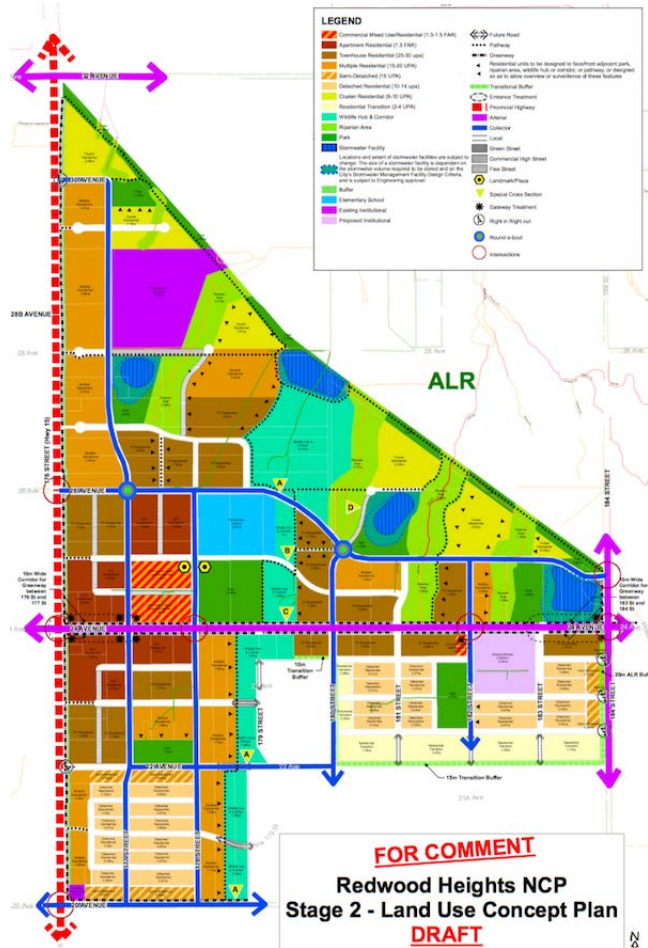
Age Range



Gender



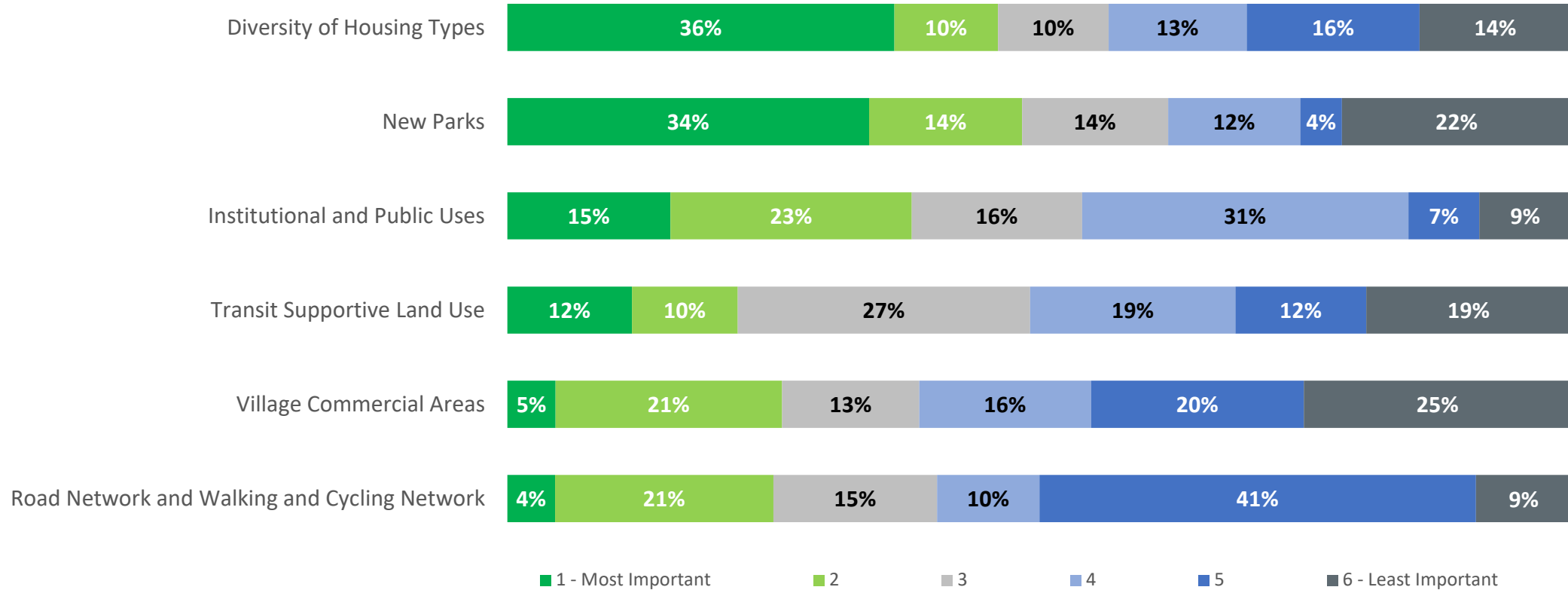
Overview of Land Use Concept



LEGEND

- Commercial Mixed Use/Residential (1.3-1.5 FAR)
 - Apartment Residential (1.3 FAR)
 - Townhouse Residential (25-30 upa)
 - Multiple Residential (15-20 UPA)
 - Semi-Detached (15 UPA)
 - Detached Residential (10-14 upa)
 - Cluster Residential (6-10 UPA)
 - Residential Transition (2-4 UPA)
 - Wildlife Hub & Corridor
 - Riparian Area
 - Park
 - Stormwater Facility
 - Buffer
 - Elementary School
 - Existing Institutional
 - Proposed Institutional
 - Future Road
 - Pathway
 - Greenway
 - Residential units to be designed to face/front adjacent park, riparian area, wildlife hub or corridor, or pathway, or designed so as to allow overview or surveillance of these features
 - Transitional Buffer
 - Entrance Treatment
 - Provincial Highway
 - Arterial
 - Collector
 - Local
 - Green Street
 - Commercial High Street
 - Flex Street
 - Landmark/Plaza
 - Special Cross Section
 - Gateway Treatment
 - Right in Right out
 - Round-a-bout
 - Intersections
- Locations and extent of stormwater facilities are subject to change. The size of a stormwater facility is dependent on the stormwater volume required to be stored and on the City's Stormwater Management Facility Design Criteria, and is subject to Engineering approval.

Ranking Key Land Use Features in Land Use Concept Plan



Q: The plan includes a number of key land use features. Please rank these features in order of importance to you where: 1 = Most Important to 6 = Least Important. Each rank may only be used once.
 Total participants: 150-171

Vision

At the initiation of the planning process, a neighbourhood vision statement was established in consultation with residents, land owners, stakeholder groups and the general public. The vision statement is intended to represent the enduring value and character of the neighbourhood once it is built out. The current vision is as follows:

“This is a livable village with a diversity of housing types, inter-connected transportation choices and local amenities that serves a varied population of different ages and lifestyles to promote aspects of a healthy and sustainable community. The neighbourhood centre, easily accessible by bike and walking, has a range of community and commercial services. It includes a vibrant gathering place.

We have natural areas and parks that are protected and cherished. The neighbourhood is in harmony with the existing natural systems that make it socially and economically sustainable now and in the future.

Our relationship with our neighbour communities is respectful. We work to preserve and enhance the overall area's natural and built assets, fostering a sense of place. Our community has been designed with innovation and quality; these unique features have made a place that is a happy and healthy 'home', embodied with community pride and spirit. Our neighborhood is a place that is safe and welcoming.”

Comments about the Vision

The main themes/concerns mentioned relate to:

- Safety concerns about the location of the elementary school next to a busy road like 24 Avenue – many survey participants believe it should be located in a quieter, safer and low density area.
- The likely impact of the plan on the environment, particularly on tree and wildlife preservation in the area.
- Road networks and related infrastructure should be in place before the residential and commercial development commences. Concern was also expressed about having sufficient parking, schools and medical facilities in and surrounding the plan area to cope with increasing demand from a growing population.
- There are mixed feelings with respect to type of housing that should be developed - some are pushing for single family homes while others want high density, but either way, there is a strong call for more affordable housing in the area.
- Finally, some respondents expressed their frustration at the amount and speed of development in Surrey.

Q: Do you have any comments or proposed revisions to the vision statement?

Q: Please provide your comments or revisions here:













Total participants: 63

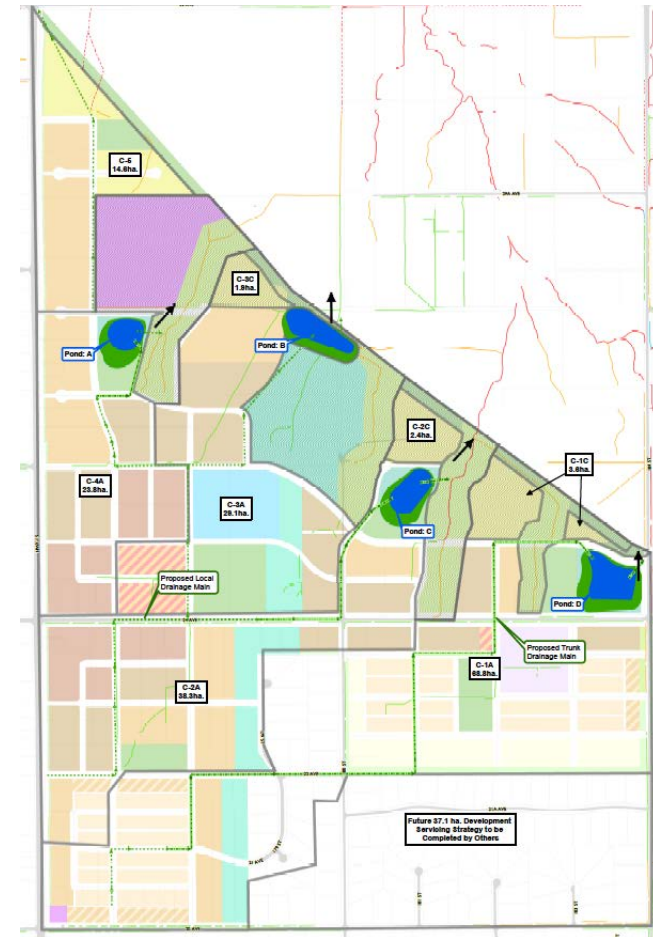
Stormwater Management – Drainage Catchment Areas

Redwood Heights is located within the Erickson Creek watershed which contains fish-bearing streams that drain through the agricultural lowlands into the Nicomekl River. To mitigate potential drainage problems and protect these important streams, a stormwater management strategy is proposed including 4 large stormwater detention ponds servicing 5 drainage catchment areas intended to capture and retain stormwater before it enters the Nicomekl River.

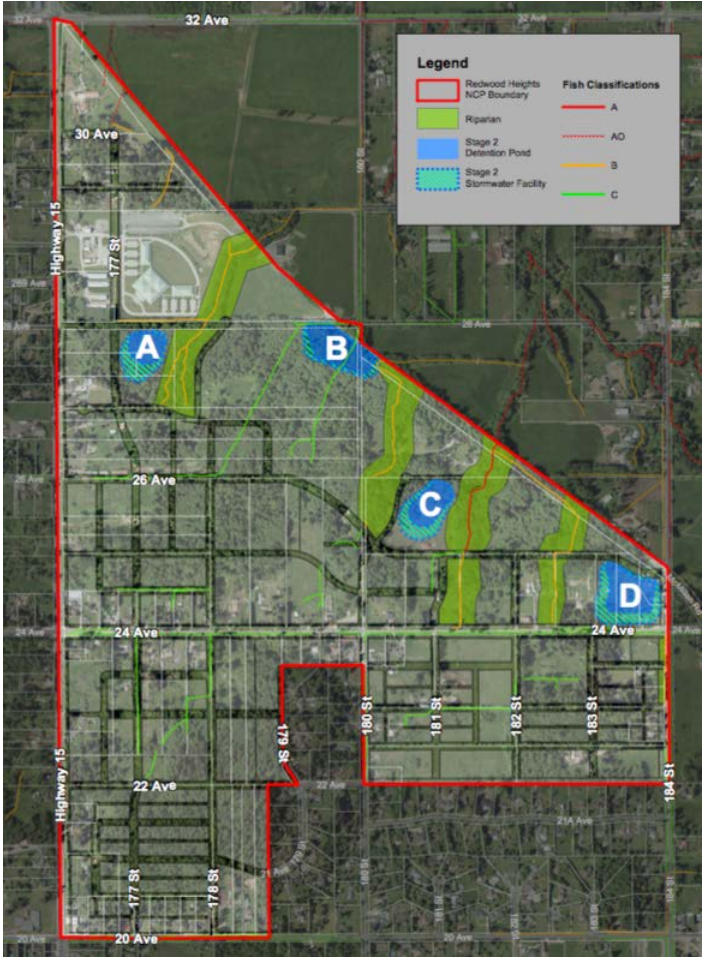
An overview of the proposed drainage catchment areas and pond locations are illustrated in this map.

LEGEND

	Proposed Local Drainage Main	<i>Fish Classifications</i>
	Proposed Trunk Drainage Main	 A
	Discharge Lines	 AO
	Proposed Pond	 B
	Pond Grading	 C
	Not Serviced by Pond	 Unknown
	Serviced by Pond	



Stormwater Management - Stormwater Pond Locations



Comments about the Stormwater Management Plan

Key highlights from the comments about the proposed Stormwater Management Plan are:

- Some survey participants are feeling positive believing the location of the parks and ponds makes sense.
- Others are concerned about the risk of potential flooding, particularly to their own property.
- Protecting the fish and wildlife habitats should be a priority.
- Many support greater preservation of trees and green space in the area.
- As well as being functional, the ponds should enhance the landscape and character of the area.
- A small number of respondents are concerned that stagnant water in the ponds will serve as a breeding ground for mosquitos.

Q: Do you have any comments on the proposed Stormwater Management Plan?

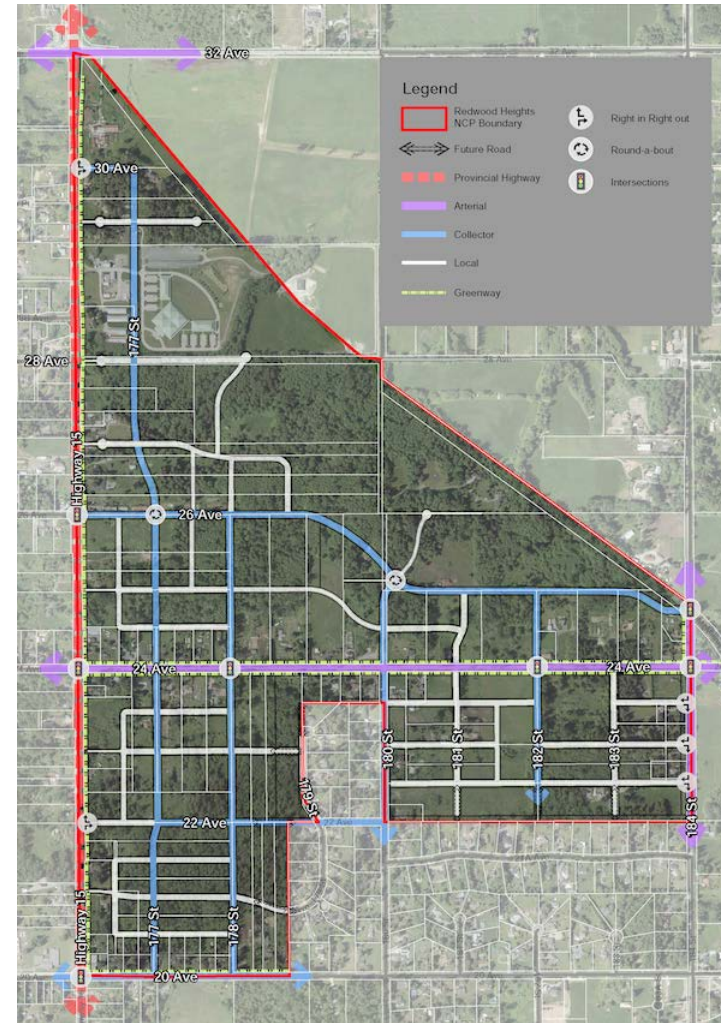
Q: Please provide your comments here:

Total participants: 31

Transportation Management

The transportation servicing plan for Redwood Heights is based on the guiding principles contained in the City's Transportation Strategic Plan and is structured around a modified grid road system. The road system takes into account property lines, tree and environmental protection, topography and adjacent land uses. In addition, it provides for walking and cycling connections throughout the neighbourhood and supports future transit service.

An overview of the road network plan is illustrated in this map.



Comments about the Road Network Plan

The key observations/concerns about the Road Network Plan mentioned were:

- There is a need for better traffic management in the area in general, suggestions include more traffic circles as an alternative to stop signs or traffic lights.
- Roads such as 16, 24 and 32 Avenue need to be widened to cater for increased traffic volumes, left and right turn lanes and parking.
- A number of survey participants expressed concern about the proximity of the park and school to 24 Avenue - safety is a concern given the expected vehicle and pedestrian traffic.
- Some others highlighted the need for a good public transit service in the area.

Q: Do you have any comments about the Road Network Plan?

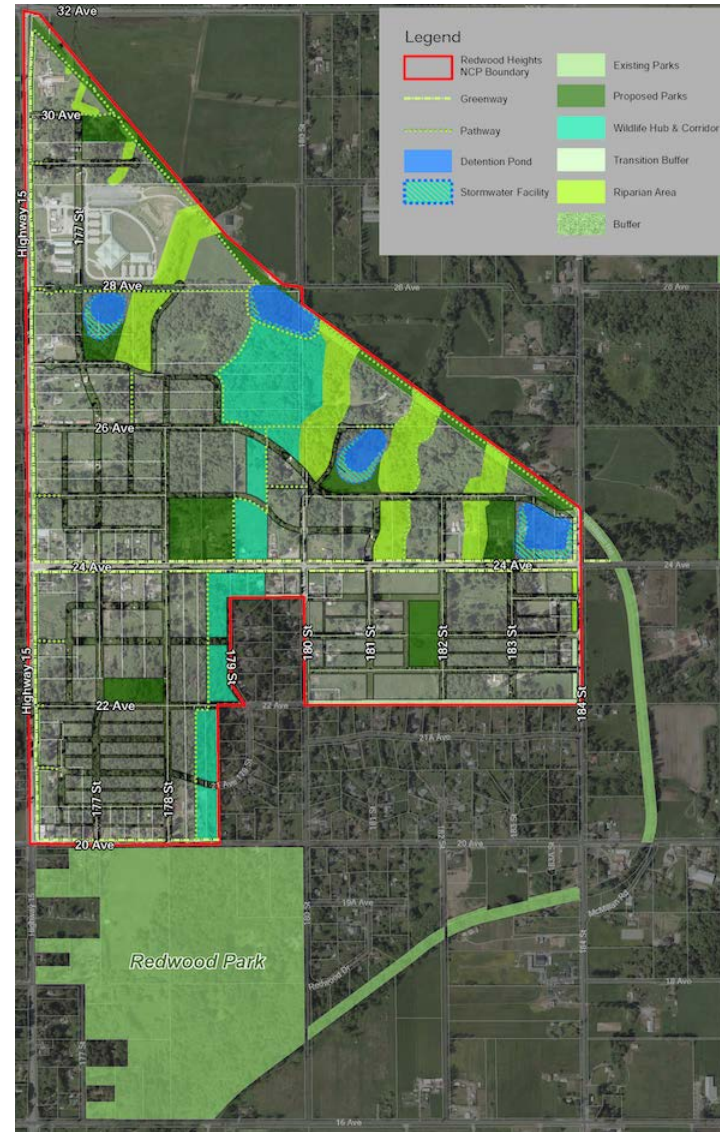
Q: Please provide your comments here:

Total participants: 54

Parkland

A total of seven new neighbourhood parks are proposed in the Redwood Heights area. In addition, a network of natural areas is proposed to protect the existing streams and a large natural wildlife hub and corridor area in the core of the neighbourhood connecting to Redwood Park.

Total parks and natural area represent approximately 30% of the total area, making Redwood Heights the greenest new neighbourhood in Surrey to date.



Comments about the Parks Plan

By far, the most frequently cited observation about the Parks Plan is the proposal to locate the largest park in such a high traffic area – this is a major safety concern and many survey participants feel the park should be relocated to a quieter low density area.

Other concerns noted include:

- The proximity of the proposed underpass to the school and park is raising concerns about children’s safety as it is likely to attract socially undesirable behavior.
- The road separating the school and park is also a safety concern.
- Many would like to see the land allocated for parks and preservation areas increased, while others favour more affordable housing instead of parks/preservation areas.
- Some asked whether there is a provision for a tunnel or culvert under 24 Avenue as part of the wildlife corridor.
- The risk of large animals such as bears, coyotes, deer etc. roaming residential areas was also mentioned.

Q: Do you have any comments about the Parks Plan?

Q: Please provide your comments here:

Total participants: 105

Parklands - The Development Cost Charge Levy

The central wildlife hub and corridor which total 43.6 acres are considered to be a community amenity acquired as natural area park at time of development. To support this acquisition an area specific parkland development cost charge (DCC) will be levied on the future development.

The main issues and concerns mentioned in relation to the DCC levy are:

- Some residents are against more development in the area.
- Many are very supportive of levying developers while some believe that this charge will ultimately be passed onto homebuyers.
- While there is very strong support for the wildlife hub and corridor, some believe that the preservation area is too large, while others suggest it should be more spread out across the plan area.

Q: Do you have any comments about this approach?

Q: Please provide your comments here:







Total participants: 59

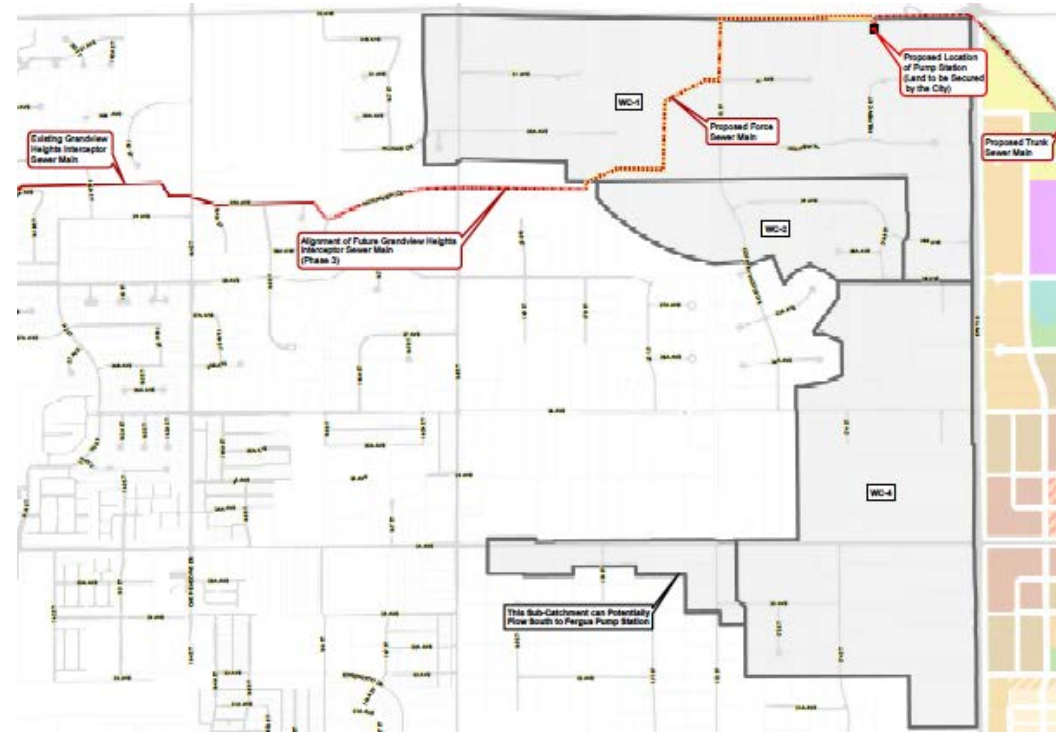
Sanitary Sewer

There is currently no community sanitary sewer system in the Redwood Heights. Individual properties currently rely on in-ground septic systems. A new pump station, located south of 32 Avenue and east of 152 Street, and a network of gravity sewers are required to service the NCP area. In general, the proposed sewer system is designed to flow by gravity toward the northwest corner of the NCP area, where it connects with the city's primary sewer system.

The significant sanitary sewer infrastructure needed to support the development of the NCP area is illustrated in the maps below.

LEGEND

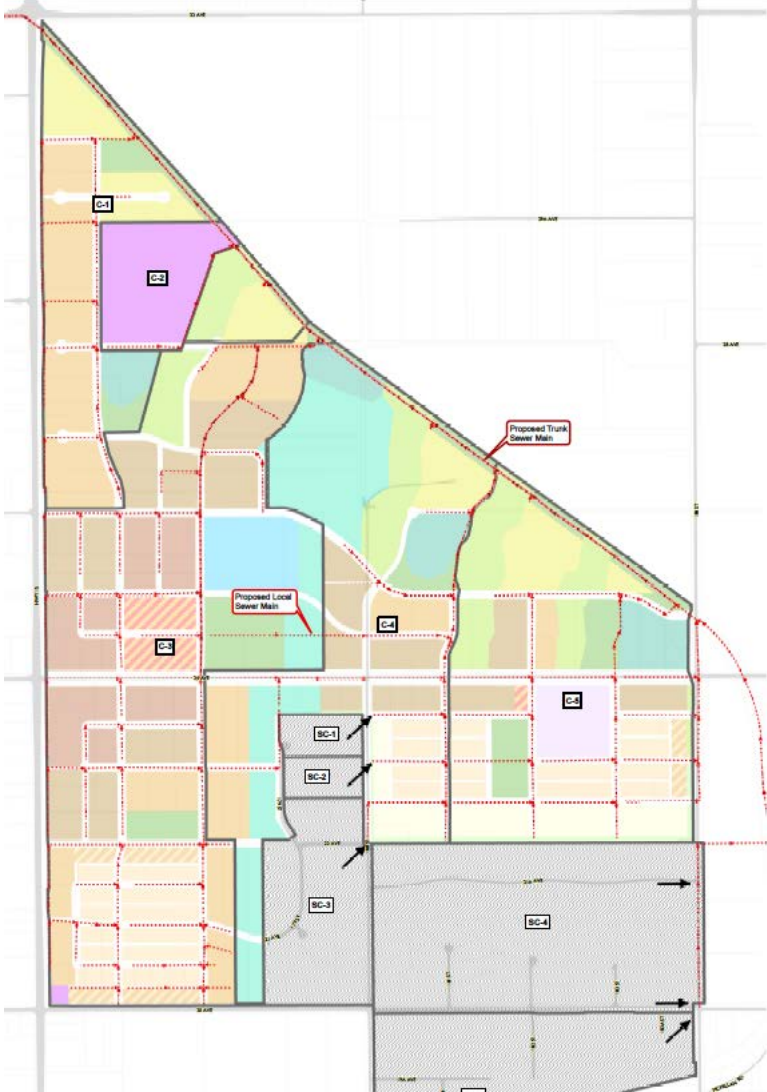
-  Proposed Pump Station
-  Proposed Trunk Sewer Main
-  Proposed Force Sewer Main
-  Proposed Interceptor Sewer Main
-  Existing Interceptor Sewer Main
-  Proposed Sanitary Catchment



Sanitary Sewer

LEGEND

- Proposed Local Sewer Main
- Proposed Trunk Sewer Main
- DischargeLines
- Proposed Sanitary Catchment
- Proposed Sanitary Sub-Catchment



Comments about the Sanitary Sewer Servicing Strategy

- The proposed Sanitary Sewer System was generally well received with some acknowledging the need for improved sanitary services in the surrounding area too.
- Concerns about the strategy relate to whether the plan sufficiently covers future growth and the subsequent increased demand for sanitary services.
- Others asked about who will cover the cost of these services.

Q: Do you have any comments about the Sanitary Sewer Servicing Strategy?

Q: Please provide your comments here:

Total participants: 27

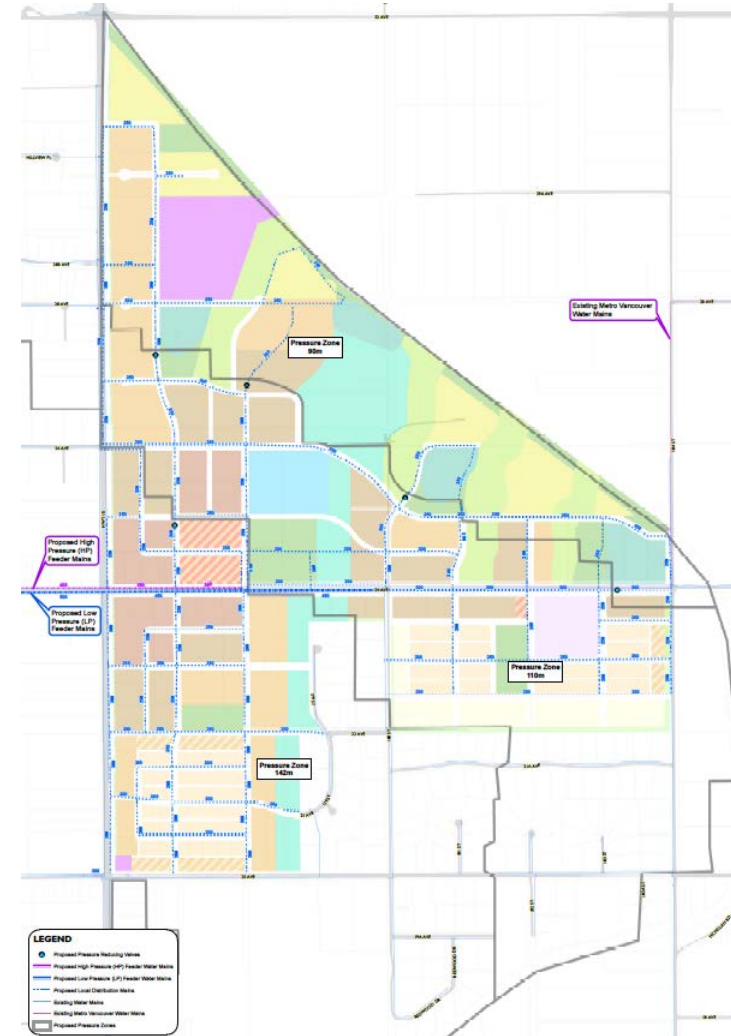
Water

Redwood Heights is currently serviced with municipal water by way of small diameter mains, with some properties serviced by private ground water wells. The existing water infrastructure does not have sufficient capacity to service the proposed development densities. A system of new feeder mains, pressure reducing stations, and distribution water mains will be required to support the proposed land uses and densities within the NCP area. The design of the proposed water feeder and distribution network will allow for the phased development of the area

The significant water infrastructure needed to support the development of the NCP area is illustrated in the maps below.

LEGEND

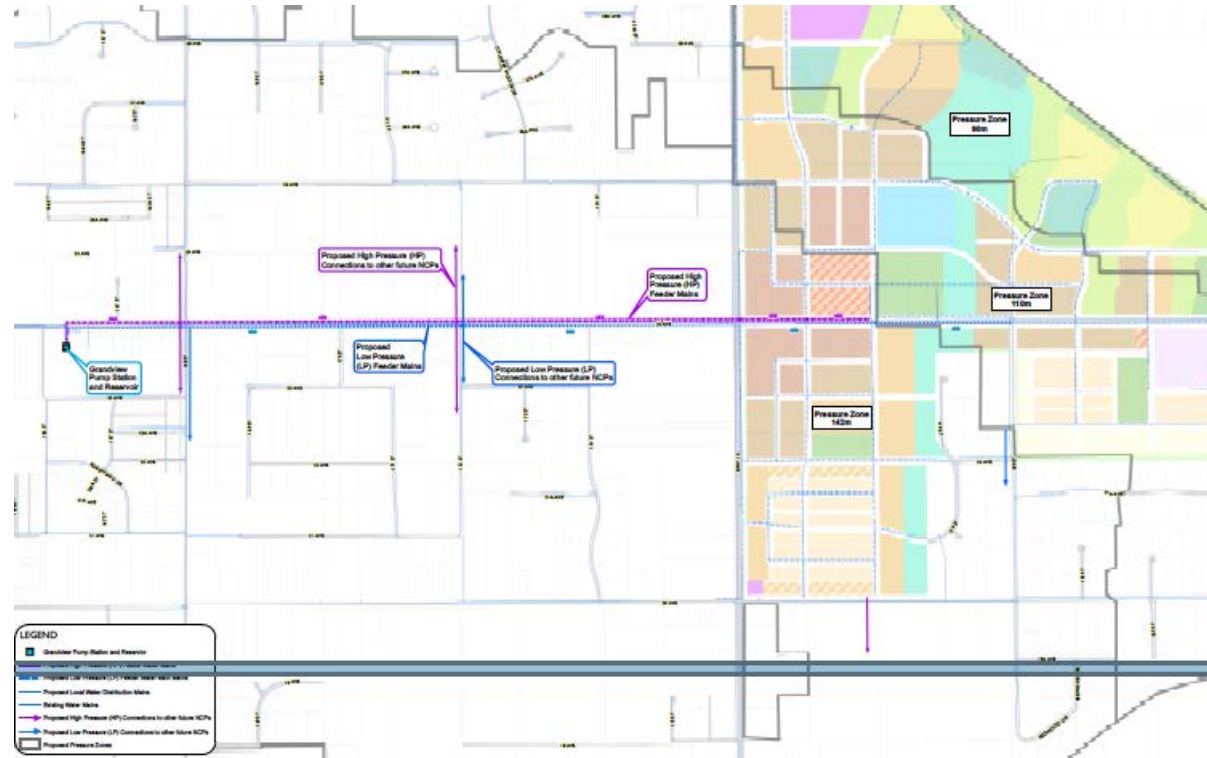
- Proposed Pressure Reducing Valves
- Proposed High Pressure (HP) Feeder Water Mains
- Proposed Low Pressure (LP) Feeder Water Mains
- Proposed Local Distribution Mains
- Existing Water Mains
- Existing Metro Vancouver Water Mains
- Proposed Pressure Zones



Water

LEGEND

- Grandview Pump Station and Reservoir
- Proposed High Pressure (HP) Feeder Water Mains
- Proposed Low Pressure (LP) Feeder Water Main Mains
- Proposed Local Water Distribution Mains
- Existing Water Mains
- ➔ Proposed High Pressure (HP) Connections to other future NCPs
- ➔ Proposed Low Pressure (LP) Connections to other future NCPs
- ▭ Proposed Pressure Zones



Comments about the Water Servicing Strategy

While some respondents expressed positive feedback about the Water Servicing Strategy, others are concerned about:

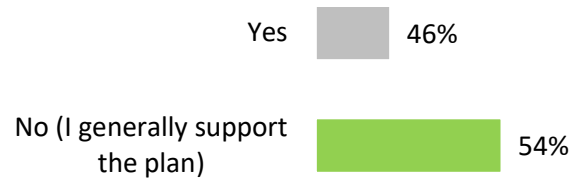
- Whether the plan addresses likely future water shortages,
- The impact on water pressure and supply for rural residences as a result of increased demand from new residences and businesses,
- The impact of the development on the natural flow of rain water to Redwood Park to mitigate the risks of forest fires and harm to the forest growth.

Q: Do you have any comments about the Water Servicing Strategy?

Q: Please provide your comments here:

Total participants: 15

Comments about the Final Redwood Heights Plan



“My wife and I own our property and have lived in the area for 45 years. Most of our neighbours are renters, and their property owned by investors/speculators. We intend to continue living in the area while it develops. This is an excellent plan, we support it.”

“You've done a good job of listening to the citizens in this area. We do appreciate the effort to keep the area green and the thought put into designing a village-like area. Not to mention the sewer and water and transportation issues - much appreciated.”

“Would like to see more green areas reserved (wildlife corridors). The frequency that we see deer and coyotes in our yards is high, and I don't look forward to the end of that...though I anticipate it.”

“Road networks need to be given serious consideration and upgrades. Traffic in the Grandview area is already a war zone, and this further development will only aggravate the issue.”

“The location of the school needs to be re-assessed. The current proposal is allocating high density housing and commercial sites around the school. The consequences of this will increased traffic to an already busy area and will raise safety concerns for pedestrians, which will mostly be young children.”

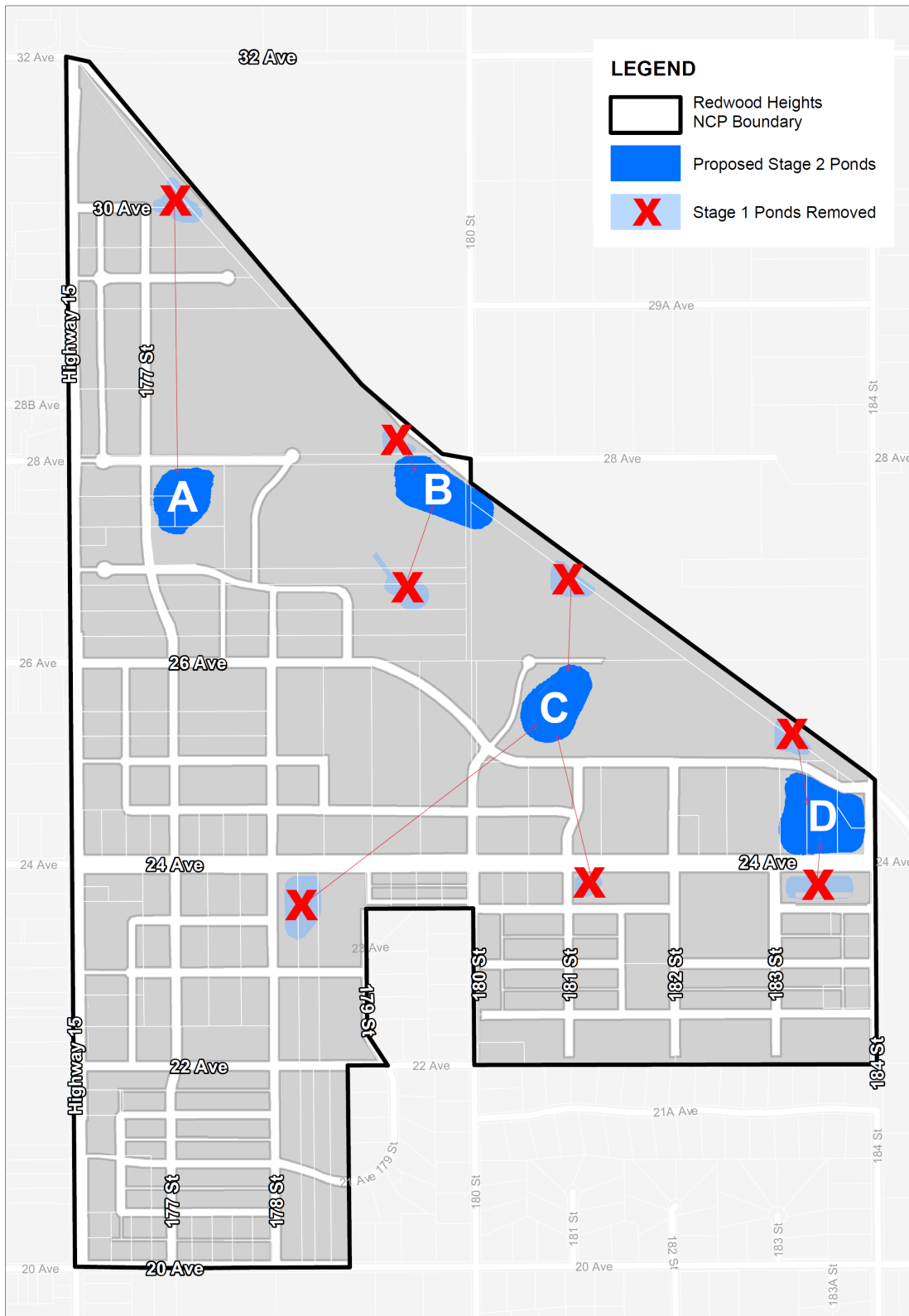
“I am not happy to see so much density we are not really creating livability when we overbuild every area.”

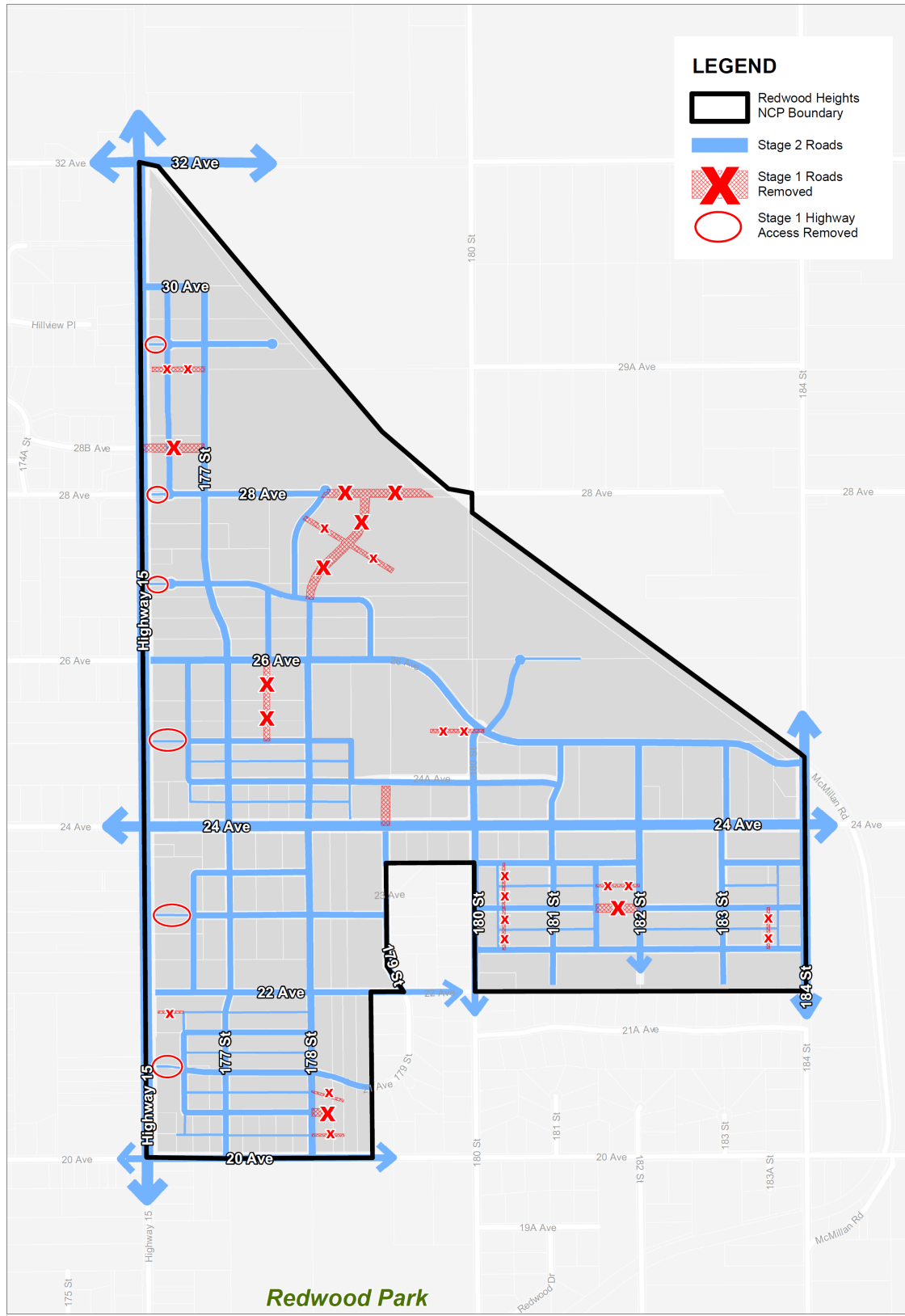
“The schools are too close to a potentially hazardous main road as is the park. Parks and schools need to be in residential areas and on quieter streets. I urge you to reconsider this entire plan.”

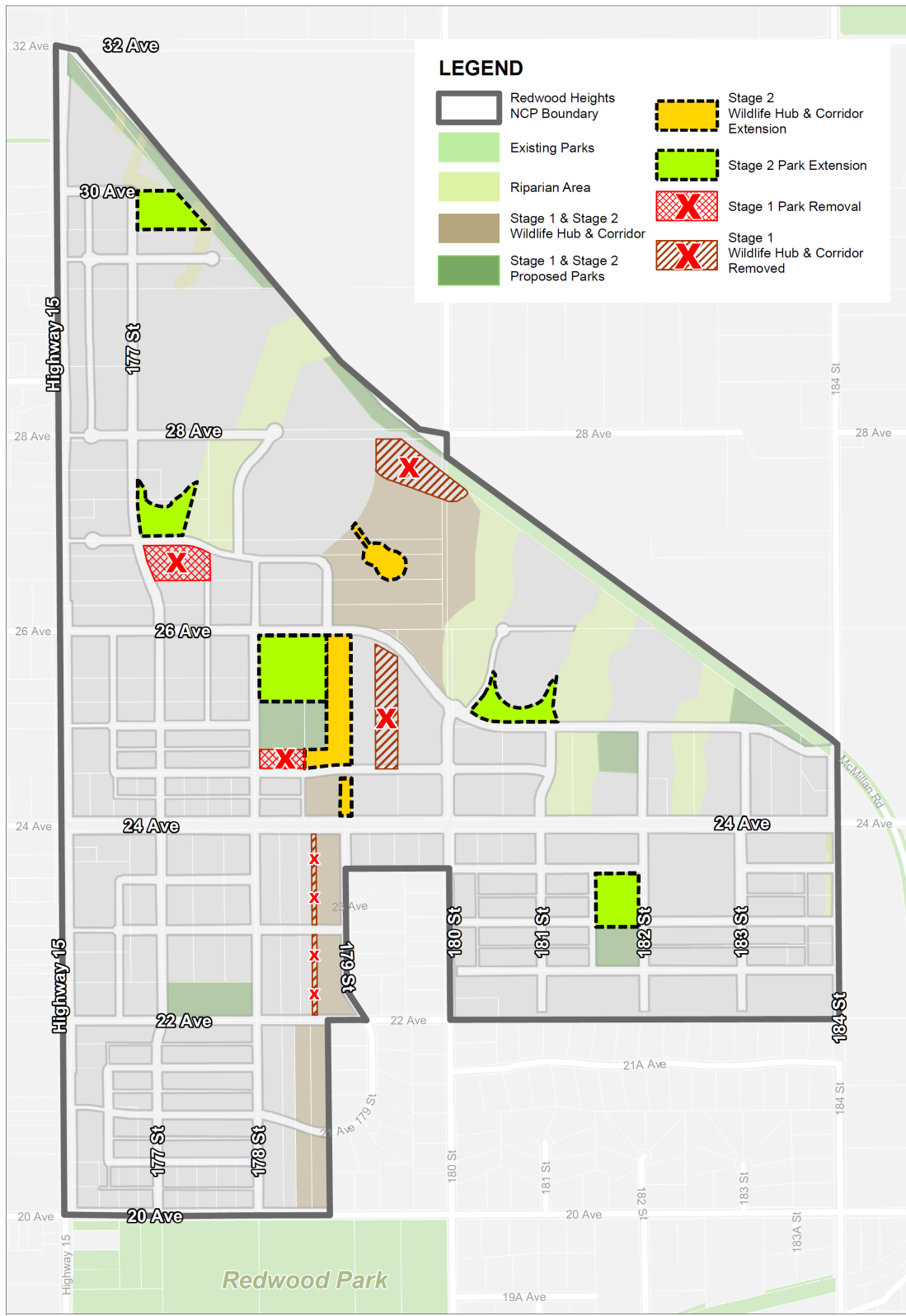
Q: Do you have any other comments about the Final Redwood Heights Plan?

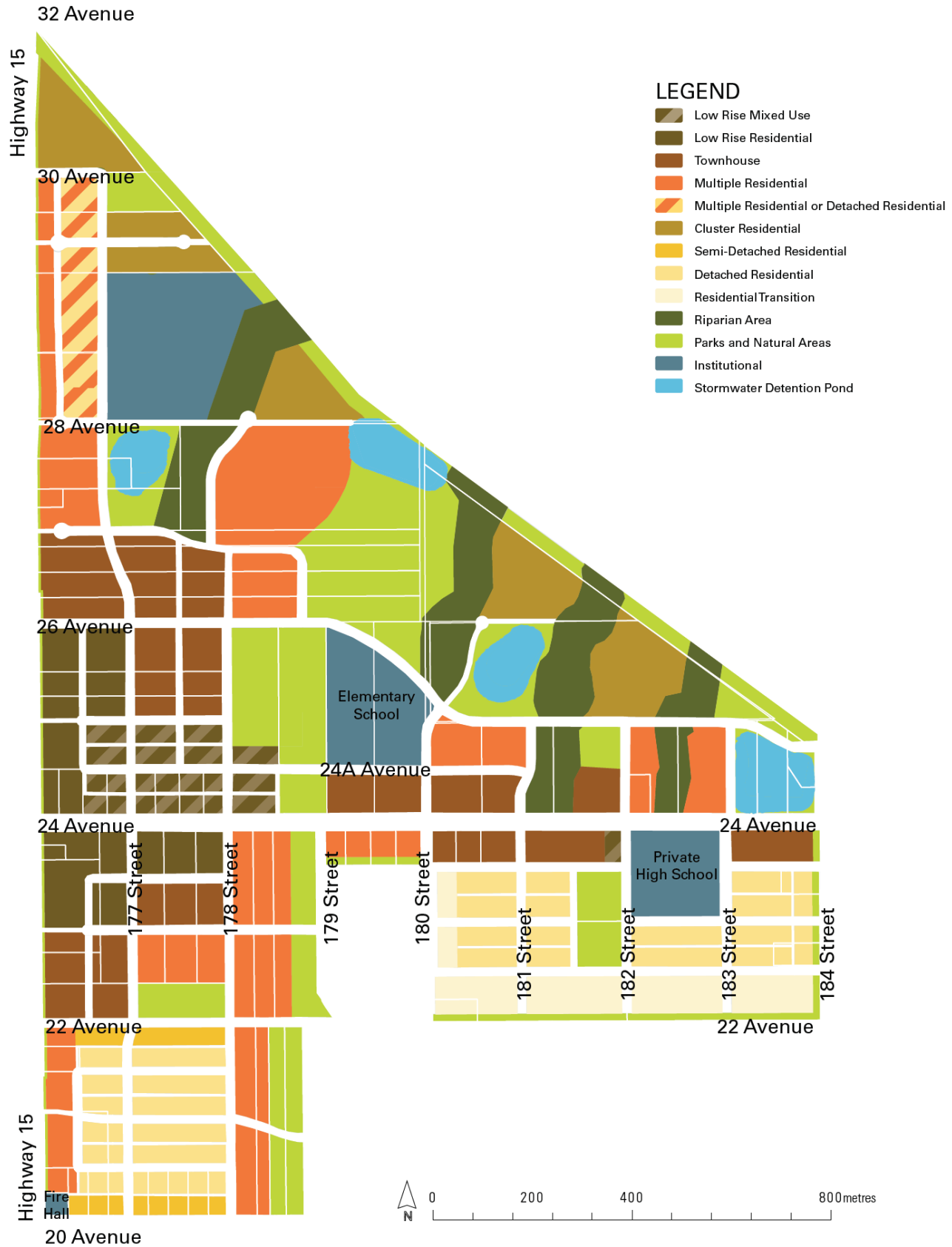
Q: Please provide your comments here:

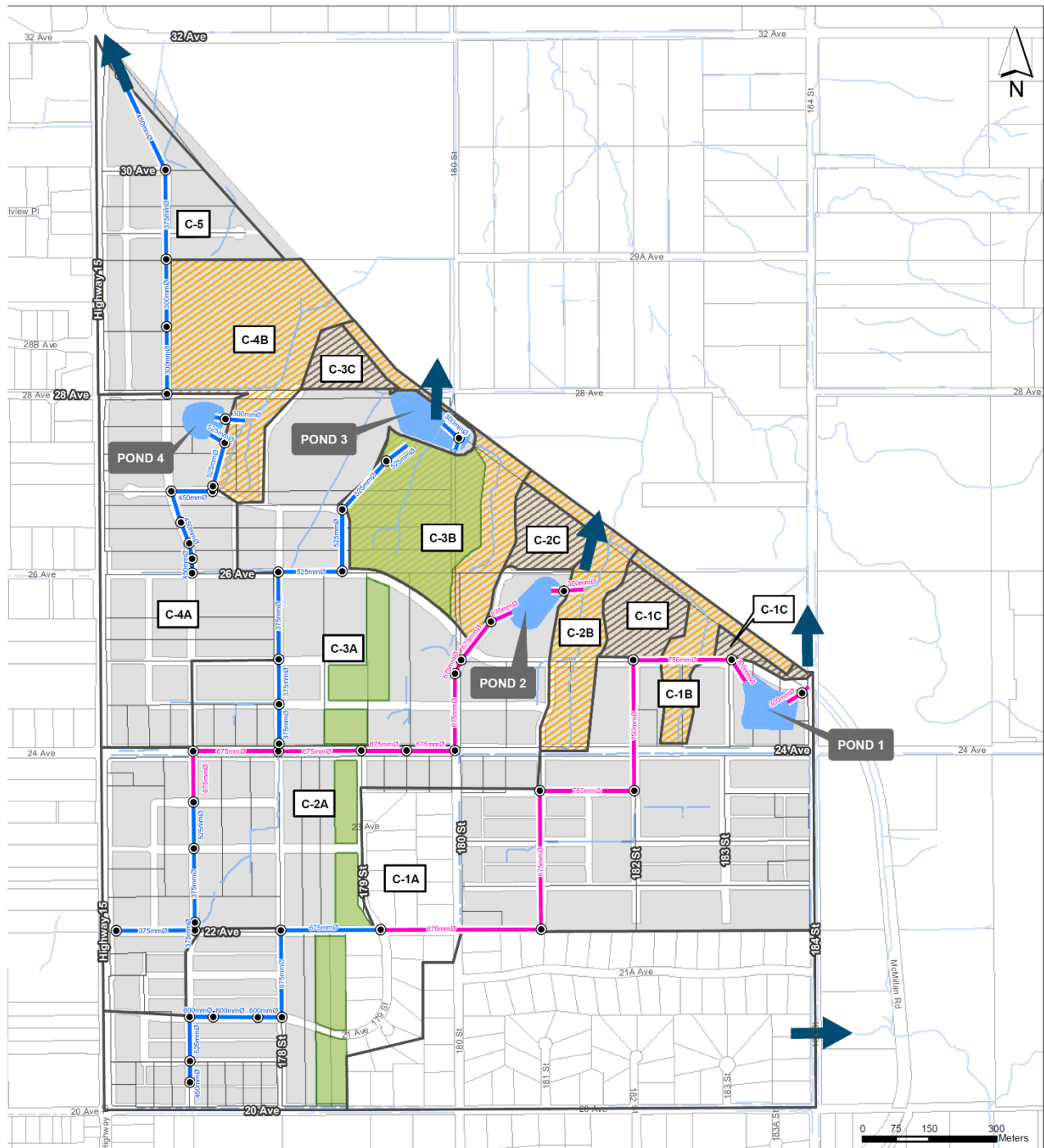
Total participants: 201/89





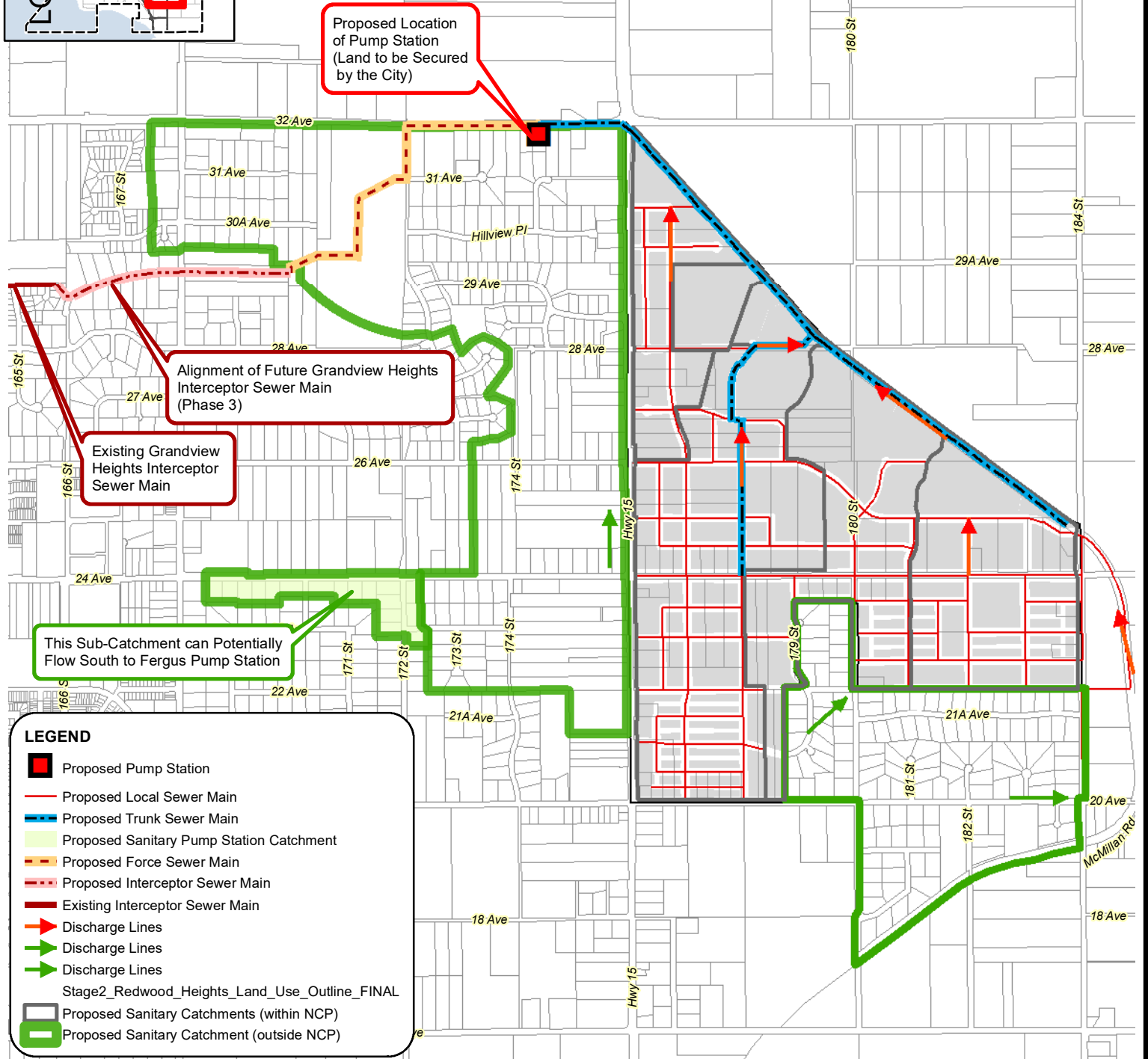
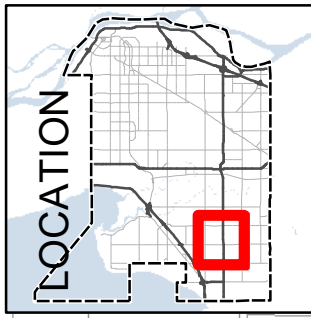






PROPOSED DRAINAGE

- Proposed Manholes
- ➔ Catchment Discharge Location
- ▨ Area to Maintain Existing Drainage Pattern
- Water Course
- ▨ Wildlife Hub
- ▨ Developable Property not Controlled by a Pond
- Proposed Local Sewer
- ▭ Proposed Catchment Boundaries
- Proposed Trunk Sewer



Produced by GIS Section: 13-Jul-2018, P207266

Scale: 1:20,000 0 200 M



**Redwood Heights NCP
Proposed Sanitary Infrastructure**

**ENGINEERING
DEPARTMENT**

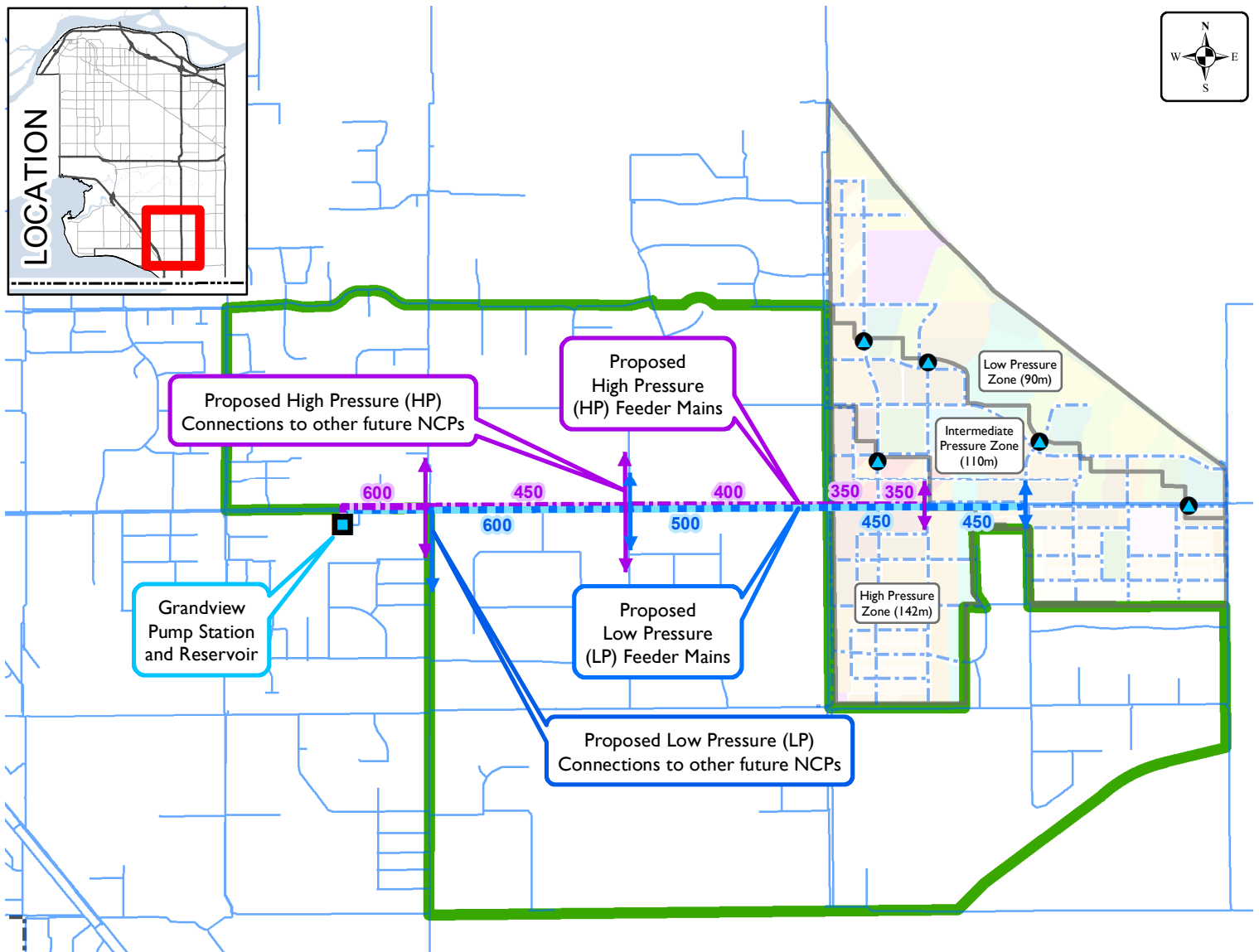
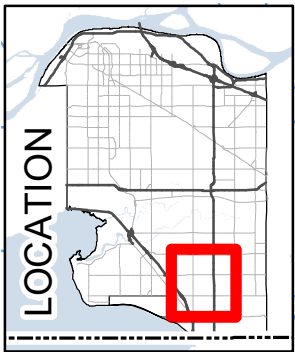
The data provided is compiled from various sources and IS NOT warranted as to its accuracy or sufficiency by the City of Surrey.

This information is provided for information and convenience purposes only.

Lot sizes, Legal descriptions and encumbrances must be confirmed at the Land Title Office.

V:\Policy\Long Range\CP_NCP Coordination (external)\Redwood Heights NCP\Maps\Engineering Figures\GIS Files\Fig8-3_ProposedSanitary_RedwoodsNCP_A.MXD

Source:

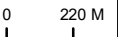


LEGEND

- Proposed High Pressure (HP) Connections to other future NCPs
- Proposed Low Pressure (LP) Connections to other future NCPs
- Proposed Pressure Reducing Valve
- Grandview Pump Station and Reservoir
- Proposed High Pressure (HP) Feeder Water Mains
- Proposed Low Pressure (LP) Feeder Water Mains
- Proposed Local Water Distribution Mains
- Existing Water Mains
- Proposed Pressure Zone Boundary
- Proposed Water Infrastructure Catchment (outside NCP)

Produced by GIS Section: 14-May-2018, P205934

Scale: 1:25,000



Redwoods NCP - Proposed Water Infrastructure

ENGINEERING
DEPARTMENT