

RES.R10-1467

1. *Receive Corporate Report R180 as information;*
2. *Approve the boundaries for West Clayton Neighbourhood #1 and West Clayton Neighbourhood #2 as shown in Appendix I;*
3. *Authorize staff to initiate background studies for the West Clayton area in advance of preparing Neighbourhood Concept Plans ("NCPs"), including:*
 - A. *heritage review and assessment study;*
 - B. *commercial market study; and*
 - C. *detailed ecosystem review study, including a tree survey; and*
 - D. *review and understand what was done well in East Clayton and where improvements can be made;*
4. *Authorize staff to prepare Terms of Reference, including consulting services, to prepare an NCP for each of West Clayton Neighbourhood #1 and Neighbourhood #2 as shown in Appendix I.*

DISCUSSION

Neighbourhood Plan Boundaries

The West Clayton area is bounded by Fraser Highway on the south, 188 Street on the east, and by the Agricultural Land Reserve on the north and west (see Figure 1 to Appendix "A"). For planning purposes, the West Clayton area has been divided into two neighbourhoods, Area #1 and Area #2, as approved by Council in July 2010. The boundary between Area #1 and Area #2 is 76 Avenue. This boundary is generally consistent with the engineering servicing catchment areas. Preliminary analysis of the existing major trunk sanitary sewers that serve the West Clayton area indicates that the area south of 76 Avenue (Area #1) can be serviced with some upgrades to the existing trunk servicing infrastructure. Development in the area north of 76 Avenue (Area #2) will likely require significantly more sanitary sewer infrastructure upgrades and new construction. Each of the areas is also considered to be of a size that is fully manageable from a planning perspective. The boundaries around the respective Areas generally coincide with roads, which will assist in addressing interface issues along the boundaries.

Background Studies

Consultants for each of the heritage study, commercial market study and ecosystem study have been retained and the work on all three studies has commenced. It is expected that a final report on each study will be completed by the end of April 2011. As part of a review of the efficacy of the East Clayton NCP, staff has undertaken a review of the small lot single-family zones that are prevalent in East Clayton, and has initiated discussion with the Development Advisory Committee on potential improvements to these zones.

In addition to the background studies referenced above, work has proceeded on an Integrated Stormwater Management Plan (ISMP) for the Clayton watersheds which includes the two referenced West Clayton NCP areas.

These background studies will inform the preparation of land use and servicing plans for the West Clayton NCPs, by indicating priority areas for environmental protection and heritage protection and interpretation, by establishing the amount and types of commercial development needed to serve the planned neighbourhoods, and by identifying the stormwater management approaches for protecting local streams and preventing downstream flooding. The timing of these studies will allow for information to be fed into the NCP process at appropriate points in the planning process.

Review of East Clayton

In conjunction with the process of developing the West Clayton NCPs, a review of the East Clayton neighbourhood will continue with a view to assessing the successes of this new neighbourhood and evaluating where improvements could be made. Matters under consideration include the timing and phasing of roads, transit, recreational amenities and community facilities and infrastructure. The effectiveness and practicality of various sustainable drainage features will be reviewed in the context of the proposed land uses and ISMP recommendations. Parking demand and place making considerations will also be considered.

Terms of Reference

The proposed Terms of Reference, attached as Appendix "A" to this report, have been prepared for use in relation to preparing an NCP for each of Area #1 (the area to the south of 76 Avenue) and Area #2 (the area north of 76 Avenue) in West Clayton. A map that illustrates the boundaries of these two NCP areas is attached as Figure 1 to Appendix "A". The planning process for these NCPs is intended to commence concurrently and will involve an introductory public meeting and the establishment of a Citizens Advisory Committee (CAC) for each NCP area as the first steps in the process.

The NCP processes and the preparation of the land use concepts will, primarily, be undertaken by staff from the Planning and Development, Engineering and Parks, Recreation and Culture Departments. A consulting team will be retained to develop the engineering strategy for each plan, including stormwater management, transportation, district energy, water and wastewater systems and a financing model for implementing the plan.

The Terms of Reference, which are attached as Appendix "A" to this report, for these NCP areas support the preparation of detailed land use concepts for each NCP area. Staff will work with the CACs and other stakeholders including external agencies such as Ministry of Transportation and Federal Department of Fisheries, among others, to establish a vision and guiding principles for each NCP area. The detailed land use concept for each area will include, among other things, types of land uses, development densities, subdivision pattern, circulation concepts, locations of schools, parks and open spaces and natural areas to be protected. Each NCP will also address the integration of the West Clayton area with the developed neighbourhoods in East Clayton, transitions and interfaces with the Agricultural Land Reserve, a detailed engineering servicing and financing strategy, and provision of parks and community amenities. The preparation of each NCP will be undertaken within the context of Council-adopted strategic plans and policies, including the Official Community Plan, Sustainability Charter and Transportation Strategic Plan and with consideration for the principles of place-making. The findings and recommendations of the background studies

and the Clayton ISMP will be taken into consideration in the development of the land use options.

These NCPs will also be the first to identify opportunities for energy conservation and GHG emissions reductions through building energy efficiency, waste heat recovery, renewable energy generation and distributed generation of electricity. As evaluation of the potential for a district energy system to provide heating and/or cooling for development in some or all of the area covered by the NCP will be considered in the NCP preparation process.

The planning process will involve public consultation through regular meetings with the CAC and external agencies and will involve several public open houses. In keeping with the Council endorsed Child and Youth Friendly City Strategy staff will engage young people through interactive workshops to understand their aspirations for these future neighbourhoods in West Clayton. Council will be kept apprised of the progress of in relation to the preparation of each of the two NCPs at major milestones through Corporate Reports and presentations.

In accordance with normal practice, it is anticipated that costs that are incurred by the City in preparing these NCPs will be recovered through the approval process for development applications in the area covered by each of these NCPs.

CONCLUSION

Based on the above discussion, it is recommended that Council:

- approve the Terms of Reference, which are attached as Appendix "A" to this report, as the basis for the preparation of a NCP for each of Area #1 and Area #2 in the West Clayton neighbourhood; and
- authorize staff to proceed with the preparation of each of these NCPs based on the subject Terms of Reference.

Original signed by
Jean Lamontagne
General Manager,
Planning and Development

Original signed by
Vincent Lalonde, P.Eng.
General Manager, Engineering

BP:saw

Attachments

Appendix "A" - Terms of Reference for Preparation of an NCP for Each of the West Clayton Area #1 and the West Clayton Area #2

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TERMS OF REFERENCE
for the Preparation of a Neighbourhood Concept Plan for Each of
West Clayton Area #1 & West Clayton Area #2

INTRODUCTION

On July 26, 2010, Surrey City Council approved the boundaries of two areas in West Clayton for preparing Neighbourhood Concept Plans (NCPs). These two NCP areas are: West Clayton NCP Area #1 (south of 76 Avenue) and NCP Area #2 (north of 76 Avenue). The attached **Figure 1** shows the two West Clayton NCP areas. Council also authorized staff to initiate background studies for the West Clayton area in advance of preparing the NCPs. These background studies, which are underway, include an environmental review, a commercial market analysis and a heritage study. The anticipated completion for these studies is in April, 2011. Also, a stormwater management study for the Clayton watersheds has commenced: Clayton Integrated Stormwater Management Plan Study (ISMP). This study will identify stormwater management issues and make recommendations on reducing the impact of development on the watersheds including farmland. The anticipated completion of this study is in spring 2011.

The Official Community Plan (OCP) sets out broad objectives and policies to guide growth and development within the City. The General Land Use Plan (GLUP) for Clayton, approved in 1999, illustrates, in broad terms, the general land use pattern, including residential, commercial, work place, institutional and other land uses at densities appropriate to meet the overall objectives of the City. It also illustrates general location of parks, schools and major greenways, the community structure and sets out a general approach to providing engineering services in the area. The GLUP provides a conceptual reference for the exploration of land use concepts for future neighbourhoods in the Clayton area. In 2003, the first NCP in the Clayton area - an NCP for the East Clayton neighbourhood, was approved. In 2005 plans for the extensions of this NCP, one to the north of 72 Avenue and second to the west of 188 Street, were approved. **Figure 2** is the 1999 Clayton GLUP, **Figure 3** shows the East Clayton NCP and the two NCP extensions, and **Figure 4** is the composite of the Clayton GLUP and East Clayton NCPs.

NCPs detail more precisely, on a lot by lot basis, land uses and densities, the transportation network, as well as requirements for engineering servicing, amenities and a financing strategy, based on the principle of "development pays". An NCP provides the basis for reviewing and approving rezoning and development applications in the area. It establishes, among other things, the land use concept for the area, density of development, design concepts and overall neighbourhood character, alignment of roads and lanes, locations of various land uses, subdivision patterns and locations of schools, parks, walkways and open spaces.

PURPOSE

These Terms of Reference (ToR) set out the parameters for undertaking a planning and public consultation process for the preparation of separate NCPs for each of West Clayton NCP Area #1 and, separately, for West Clayton NCP Area #2. They set the context, provide guidelines for preparing the NCP, define the study area, outline the content of the NCP (Stage 1 and Stage II) and set the approximate timeframe for preparing the plan.

WEST CLAYTON NCP AREAS

NCP Area #1

The West Clayton NCP Area #1 is bounded by Fraser Highway to the south, the boundary of the Agricultural Land Reserve (ALR) to the west, 76 Avenue to the north and 188 Street to the east, except the area covered by the west extension of the East Clayton NCP and an existing shopping centre development south of 68 Avenue (Clayton Crossing).

The NCP Area covers approximately 180 hectares (445 acres). It is designated "Suburban" in the OCP. It is currently characterized by a rural and semi-rural ambiance and contains large lots ranging from one acre to about ten acres in size, predominantly zoned RA (One-Acre Residential Zone) and used primarily for residential purposes including some large estate type homes. There are two properties which are not zoned RA. A property located to the southeast of 74 Avenue and 185 Street, which is zoned CCR (Child Care Zone) and currently used for residential purposes, and a property to the northwest of Fraser Highway and 184 Street, which is zoned C4 (Local Commercial Zone) and currently vacant.

Two properties to the northeast of Fraser Highway and 184 Street (18431 Fraser Highway and 18470 70 Avenue) are currently under development application (#06-0351) for rezoning from RA to CD (Comprehensive Development Zone). The rezoning by-law received Third Reading in September 2009 to permit the development of a townhouse project that includes the restoration of the heritage George Lawrence House, which was damaged by fire. Also, the property located at 7481 184 Street, adjacent to the Clayton Elementary School, is under a development application (#10-0018) for rezoning from A-1 to RF (Single Family Residential Zone) and RAG (Acreage Gross Density Residential Zone) to permit subdivision into 67 RF lots and 2 RAG lots. This application is on hold pending completion of Stage 1 NCP.

Clayton Community Park is located on 70 Avenue to the east of 184 Street. Also, the City owns three parcels of land, totalling about 5.46 Ha (13.5 Ac), to the east of the Clayton Park. A portion of the parcel adjacent to the park (3.8 Ha/9.42 Ac) currently contains Clayton Heights Elementary School building, which is now closed. The other two parcels, totalling 1.65 Ha (4.1 Ac), are used for an off-leash dog park. Clayton Elementary School is located at 7541 184 Street (southwest of 76 Avenue and 184 Street). The older school building is on Surrey's Heritage Register. The West Clayton NCP Area #1 contains several forest blocks and Class B (yellow-coded) creeks, which will be studied in detail by the Environmental Study. The land slopes towards the ALR edge ranging from a gentle slope of 4% to 6% to a steeper slope of about 13% closer to the ALR.

NCP Area #2

The West Clayton NCP Area #2 is bounded by 76 Avenue to the south, the boundary of the Agricultural Land Reserve (ALR) to the west and north, 80 Avenue to the north and 188 Street to the east. The NCP Area covers approximately 80 hectares (200 acres). It is designated "Suburban" on the OCP, except portions of some of the lots at the westerly boundary are located in the ALR and designated "Agriculture".

This NCP Area is currently characterized by a rural ambiance and predominantly large lots of approximately eight to ten acres zoned A-1 (General Agriculture Zone) and one lot zoned A-2 (Intensive Agriculture Zone). It contains a number of Class B (yellow-coded) creeks and a forested area, which will be studied in detail in the Environmental Study. The land slopes

generally to the northwest and north towards the ALR edge, with slopes ranging from about 8-10% to about 13% closer to the ALR.

SCOPE

Key Issues

The following will be addressed and resolved as part of the two NCP processes:

1. Identify the NCP's vision, principles, and objectives within the context of the City's Sustainability Charter, Parks, Recreation & Culture Strategic Plan, Official Community Plan, Transportation Strategic Plan and the Clayton GLUP including opportunities for local employment, open space, tree preservation, walking, bicycling and transit, energy conservation, efficiency and integration of renewable energy systems and integration of place-making features.
2. Review the East Clayton NCP and development of the area to date, identify the planning and engineering principles and features that merit consideration in the proposed NCP and explore alternative solutions for those where improvements are warranted, and determine how West Clayton NCP areas should be integrated with the East Clayton area.
3. Review and incorporate the findings and recommendations relevant to the NCP area from the background studies on the environmental assets, commercial market opportunities and heritage assets, as appropriate, through land use options, policies guidelines and, where applicable, servicing strategies.
4. Review and incorporate the findings and directions relevant to this NCP Area from the Clayton ISMP, as appropriate, through the land use options, policies and guidelines and servicing strategies as applicable.
5. Determine traffic circulation and transportation access from the major roads in the area and consideration of the impacts from the future widening and extension of 72 Avenue.
6. Development of all transportation modes, including cycling and transit, and the development of a walkability plan including identification and designs of greenways, multi-use corridors, trails and walkways.
7. Confirm the location and determine the scale and character of the Clayton Village Centre and gathering places in keeping with "place-making" principles, and the location and size of neighbourhood parks and open space as well as an Elementary School or schools as required by the Surrey School District.
8. Explore options for the type, extent, form and density of land uses in and around areas of environmental sensitivity and in the vicinity of the ALR boundary, and develop guidelines to minimize and mitigate impacts.
9. Explore options and recommend solutions for the effective transition and buffering at the interface with the ALR.

10. Explore options and recommend solutions for the effective transition at the interface of the adjacent areas.
11. Identify existing established suburban residential areas, which are likely to remain unchanged for the foreseeable future, and explore options and recommend solutions for the effective transition at the interface of these areas.
12. Identify any significant view corridors, and develop policies and guidelines for their preservation.
13. Integrate considerations for sustainable and low-impact development.
14. Identify opportunities for energy conservation and GHG emissions reductions through building energy efficiency, waste heat recovery, renewable energy generation and distributed generation of electricity (DG). Explore potential for district energy (DE) systems for the provision of heating, cooling and hot water using renewable energy sources, such as waste heat recovery, solar, ground-source heat exchange, biomass heat and combined heat and power (CHP).

NCP Preparation and Consultation Process

The Land Use Plan component of the NCP preparation and consultation process will be undertaken primarily by City staff drawn from the Planning & Development, Engineering, and Parks, Recreation & Culture Departments. It is expected that a consultant will be retained to complete the engineering components of the NCP (drainage, water, sewer, transportation, district energy and financing). The Engineering Terms of Reference for the West Clayton NCPs are provided in **Appendix "A2"**.

The NCP process will commence with the establishment of a Citizens Advisory Committee (CAC) for each of the two NCP Areas. It will be made up of the property owners or their authorized agents and representatives from community organizations active within the area and the adjacent areas. City staff will hold regular meetings with the CAC to receive advice and input into the development of a vision, planning principles and land use concept options. City staff will also hold meetings with the representatives from external agencies and other stakeholders including the Ministry of Transportation, TransLink, Fraser Health Authority, the Federal Department of Fisheries & Oceans and Metro Vancouver, among others, to understand their needs and receive their input into the NCP.

At least two land use concept options will be developed. Public Open Houses will be held during the planning process to present the vision, planning principles and land use concepts as they evolve and receive comments from the general public. Additionally, workshops and interactive sessions will be conducted with young people either living or attending schools in the NCP area and the adjacent areas in order to understand their aspirations and views on the land use and design of the future community in each NCP Area. Council will be apprised of development of the land use concept options and progress of the NCP at major milestones.

Appendix "A1" lists the proposed tasks and steps in the NCP process. Planning of the engineering infrastructure and servicing and developing a strategy for their financing, as detailed in **Appendix "A2"**, will be an integral part of the NCP process, as will be extensive public consultation through committees, workshops, meetings, open houses and focus groups. **Appendix "A3"** is the sample NCP Table of Contents.

The NCP process will entail two stages. Specifically, staff will report to Council with a Stage I Report once there is consensus regarding a general Land Use Concept that is supportable through preliminary planning, engineering, environmental and other works. After Council is satisfied with the general Land Use Concept as outlined in Stage I, the final detailed engineering and financing strategies, amenity requirements and design guidelines for the NCP will be described in the Stage II report. The Stage II report will be the Final NCP Report.

NCP Content

The final NCP will contain the elements specified in Part 5: Secondary Plans of the OCP (see below). The NCP will include a physical plan for land uses, known as the Land Use Concept Plan, and contain strategies for facilities, amenities, engineering servicing and financing for the provision of services to and for the neighbourhood.

The content and level of detail required for the Stage I and Stage II reports are set out in the following table:

ITEM	LEVEL OF DETAIL FOR STAGE I:	LEVEL OF DETAIL FOR STAGE II
Land Use Concept – Map and Policies	Distribution of uses and densities, projected population/commercial and other land area, reflecting items listed in this table Draft policies Development of overall sustainability principles.	Finalized concept, policies and population analysis. Specific plans and actions related to the development of a sustainable neighbourhood.
Location of Schools, Parks, Walkways and Greenways	Recommended sites for schools and parks to the satisfaction of the School District and Parks planning staff	Confirmation of sites, design details for walkways, greenways & implementation strategy. Development of a finalized neighbourhood walkability plan.
Design Guidelines	Preliminary design and place-making concepts	Detailed design and place-making guidelines.

ITEM	LEVEL OF DETAIL FOR STAGE I:	LEVEL OF DETAIL FOR STAGE II
Transportation	Proposed road layout, hierarchy of roads, preliminary indication of impact on transportation system to the satisfaction of Engineering staff	Finalized transportation plan and impact assessment, including the incorporation of transit service. Integration of the road network with the walkways, greenways and cycling routes. Full costing of infrastructure and a financing strategy, including DCC's.
Stormwater Management	Proposed Stormwater Management within the context of the watershed and corresponding impact mitigation strategies in consideration of Serpentine-Nicomekl Strategic Plan for Lowlands Flood Control, the recommendations of the Clayton ISMP Study, and to the satisfaction of Engineering staff	Conceptual sizing of neighbourhood stormwater management facilities (including ponds, trunks, etc.) and associated financial analysis, coordinated with environmental analysis
Water, Sewer	Preliminary servicing strategy and indication of the capacity and impact on surrounding area to the satisfaction of Engineering staff	Completed design of water and sewer water systems, including Financials.
Energy	Energy demand forecast based on proposed land-use and density at various phases of build-out. General screening of renewable, non-electric energy sources within reasonable proximity to the area that may be able to provide a significant portion of the base heating, cooling and hot water loads. General layout of proposed DE system(s) based on energy screening and proposed land-use. Identify potential for DG within area boundaries.	Identify sites for energy generation and distribution centres. Conceptual design and layout of DE distribution network. Recommendations for further detailed feasibility studies on DG, DE and targeted energy efficiency measures in specific building types.

ITEM	LEVEL OF DETAIL FOR STAGE I:	LEVEL OF DETAIL FOR STAGE II
Environmental analysis	Site assessment, assessment of environmentally sensitive areas, coded streams, significant stands of trees as identified by the West Clayton Environmental Study. Preliminary review by EAC, ERC, AAC and other applicable committees	Review of plan by EAC and ERC if necessary. Integration of environmental concept into finalized plan and policies.
Heritage assessment	Overview assessment of the heritage resources & preliminary recommendations of the West Clayton Heritage Study regarding their incorporation into the plan	Recommendations for incorporation of heritage resources into plan
Amenity charges		List of amenities, their estimated costs and calculation of amenity fees

Appendix "A2" describes the Terms of Reference for the Engineering components for each NCP. It sets out the Stage I and Stage II requirements related to the Transportation, Drainage, Energy, Water and Sewer components, and the Financing and Staging Strategy.

The final NCP will address all of the issues and items listed under "SCOPE" and contain the following components:

1. The Vision, Planning Principles and Policies for the development of the NCP area;
2. Maps and statistics describing the plan area and sub-areas;
3. A description of the overall development concept;
4. A description of the sustainability features of the concept;
5. Policies for the development and provision of services, amenities and facilities;
6. Policies and strategies reflecting the OCP policy directions;
7. A land use concept plan showing:
 - (a) Proposed land uses for each lot;
 - (b) Locations for parks, open space and recreational uses, including greenway connections with adjacent areas; and
 - (c) Buffers, landscaped areas and edge conditions, specifically in relation to adjacent future commercial/business development;
8. A transportation and circulation concept plan that provides for balanced transportation modes, including walking, bicycling, transit and automobiles, traffic calming, appropriate

parking supply and plans and strategies for access to/from arterial roads and regional highways;

9. Policies and strategies aimed at meeting energy conservation and GHG reduction targets as identified City's OCP and Community Climate Action Strategy;
10. A renewable energy generation and distribution concept plan, including proposed locations for generation of renewable energy in the form of heat and/or electricity and conceptual layout of a DE distribution network.
11. Guidelines related to neighbourhood character and urban design, CPTED, nuisance control, edge conditions, screening and buffering, environmental protection and tree protection;
12. An environmental impact analysis with recommendations for protection and enhancement of treed areas, watercourses and fish and wildlife habitats;
13. Buffering and landscaping standards to achieve appropriate interfaces and separation, where applicable; and
14. A servicing and financing strategy that contains the following, based on the principle of "development pays" as set out in **Appendix "A2"** "Engineering Terms of Reference Summary",:
 - (a) A comprehensive servicing plan that includes the location, staging and standards of services, including sanitary sewer, water, drainage, district energy, transportation infrastructure and other utilities and methods of their implementation through rezoning, subdivision and other mechanisms, as appropriate; and
 - (b) A financial analysis that demonstrates how the servicing plan will be financed.

NCP Timeline

It is anticipated that the NCP process will commence when substantial information is available from the background studies of the environmental assets, commercial market opportunity and heritage assets. Draft reports of these studies are anticipated by spring 2011. It is expected that after the NCP process commences, completion of the final Stage 1 report will take approximately one year.

Figures

1. West Clayton NCP Areas in the Context of the Existing and Future NCP Areas
2. 1999 Clayton GLUP
3. East Clayton NCP & East Clayton NCP Extensions
4. Composite of the Clayton GLUP and East Clayton NCPs

Appendices

Appendix "A1" – Proposed Tasks/Steps in the Process

Appendix "A2" – Engineering Terms of Reference Summary

Appendix "A3" – Sample NCP Table of Contents

Figure 1

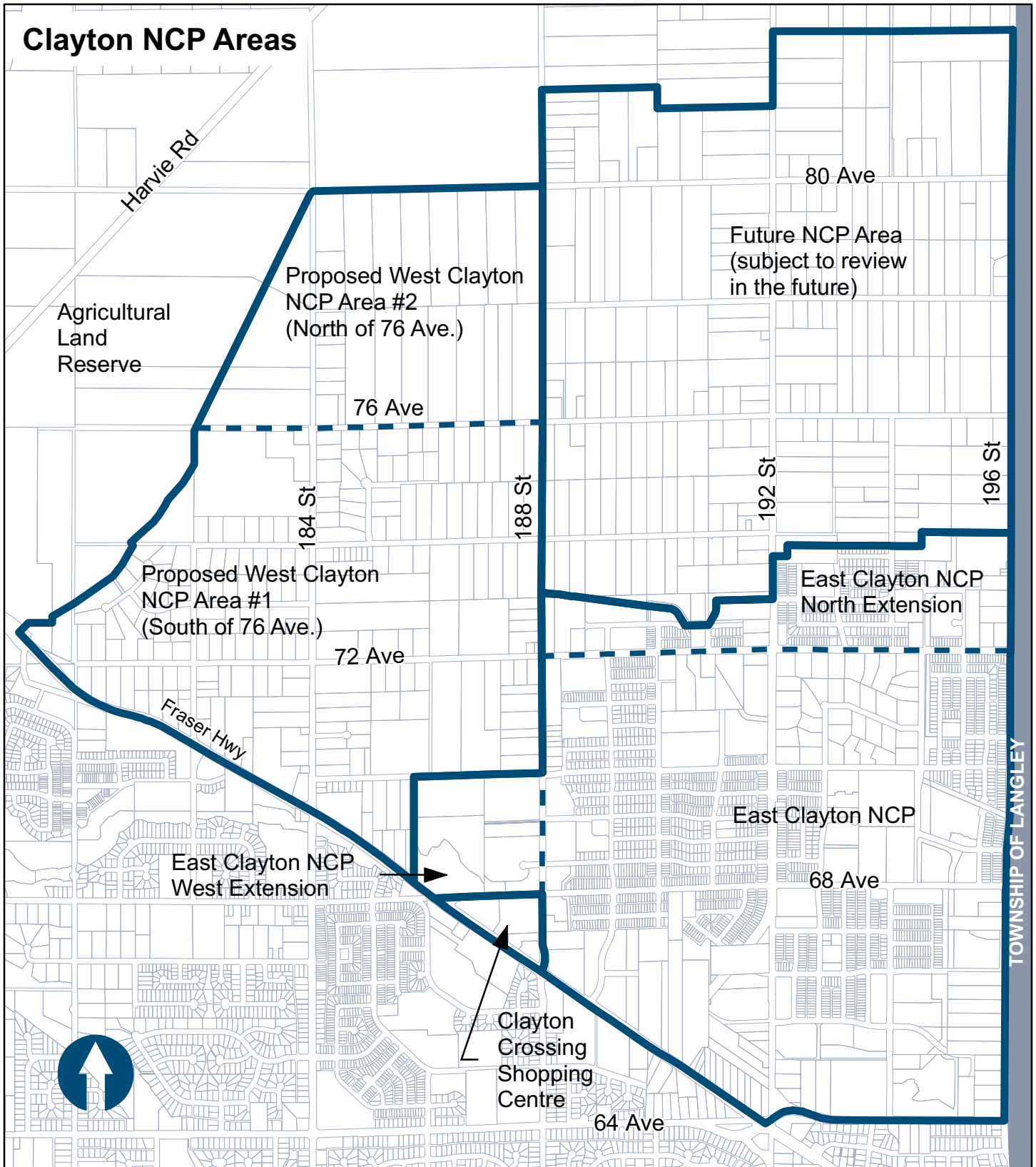
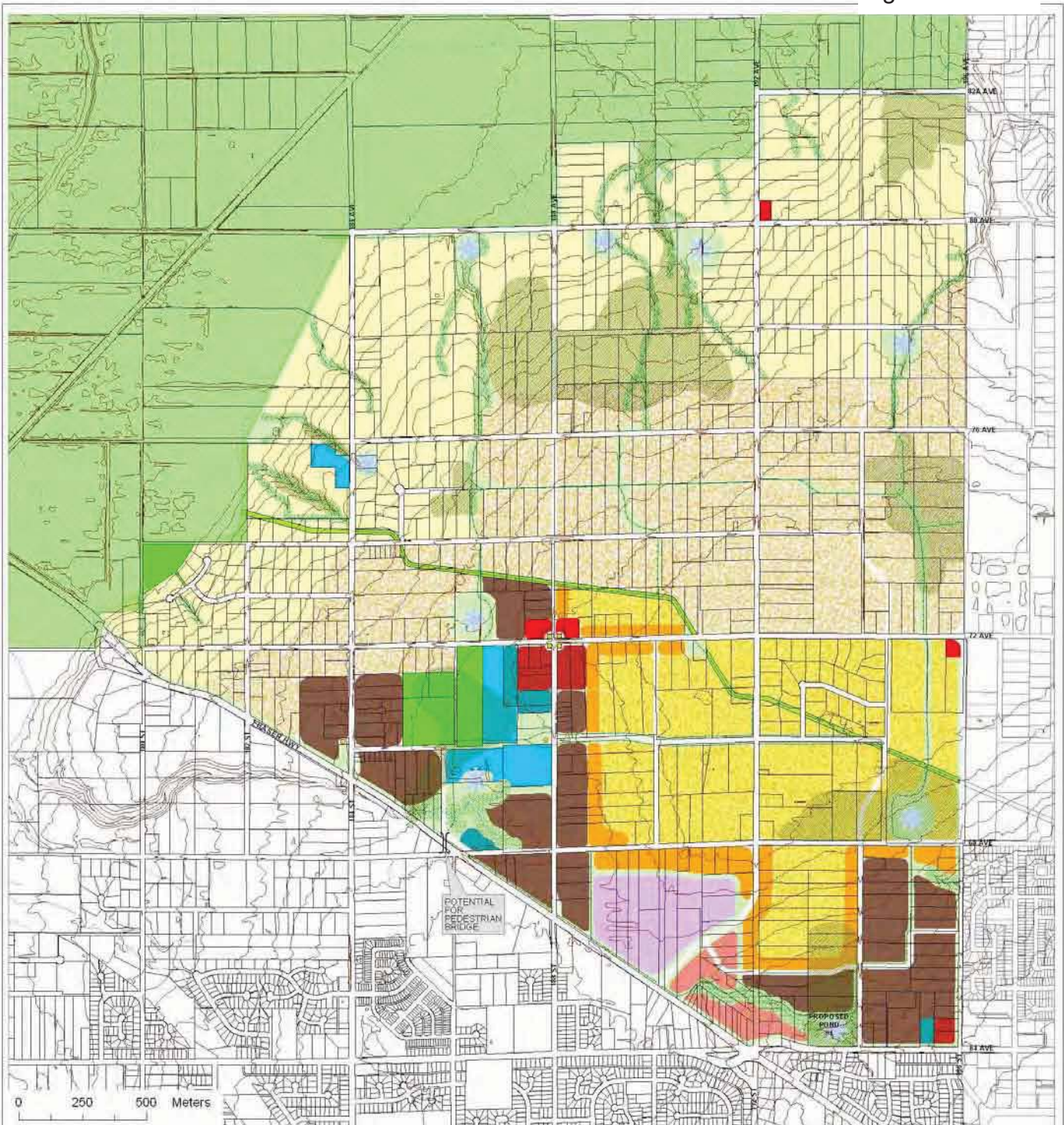


Figure 2



Clayton Neighbourhood Concept Plan Proposed General Land Use



NOTE: For proposed elementary schools and parks, refer to map showing neighbourhood boundaries.

NOTE: Greenways and linkages will connect major community amenities and school / park sites.

DATE: Dec. 14, 1998

NOTE: This plan is conceptual in nature and is only intended to reflect a general pattern of land uses. Exact land use boundaries to be determined through the Neighbourhood Concept Plan process.

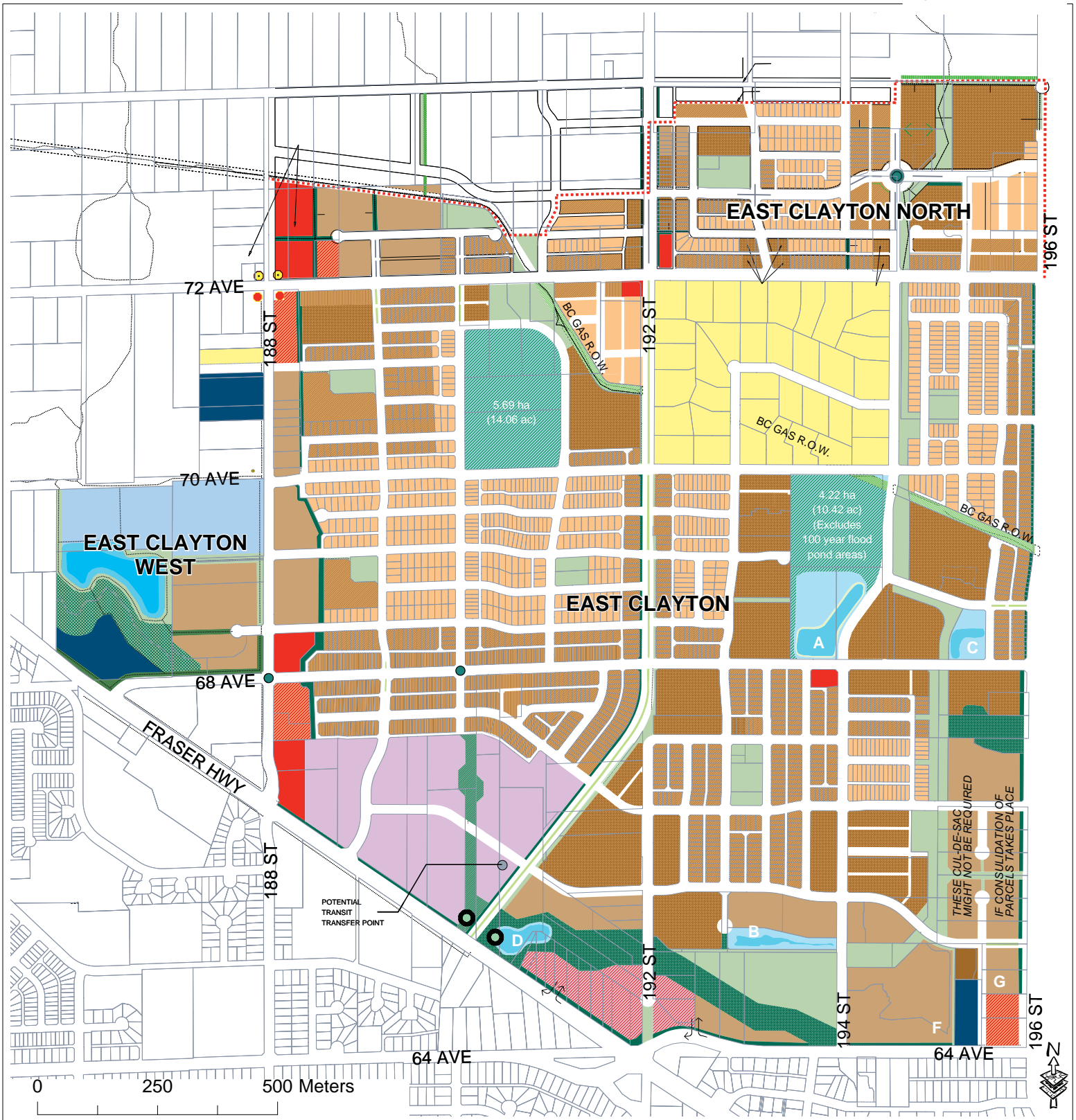
LEGEND

- Suburban
- Future Urban
- Urban Residential (Single - Family)
- Urban Residential / Transitional Density Area
- Multi Family Residential/Townhouses or Apartments
- Mixed: Commercial / Residential
- Commercial
- Business Park / Work Place
- Business Park / Live & Work Area

- Institutional
- Existing Schools
- Existing Parks
- Greenways / Utility Right of Way
- Environmentally Sensitive Areas
- Creeks / Riparian Setbacks
- Proposed Detention Ponds
(Precise shape, size and location subject to further analysis)
- Buffers / Linkages / Open Space
- Landmark / Focal Point

This map is provided as general reference only. The City of Surrey makes no warranties, express or implied, as to the fitness of the information for any purpose, or to the results obtained by individuals using the information and is not responsible for any action taken in reliance on the information contained herein.

Figure 3



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|------------------------------------|---|--|
| Half Acre Residential | Specialty Community - Oriented Commercial | Natural Area |
| 6-10 u.p.a. (Low Density) | Utility - Open Space | Public Open Space / Park |
| 10-15 u.p.a. (Medium Density) | Special Treatment of Street, Traffic Calming | Open Space / Park on Private Property |
| 10-15 u.p.a. Special Residential | Institutional (church, schools, civic buildings, seniors housing, etc.) | Special Setback and Landscaping, Buffers (landscaped area on private property) |
| 15-25 u.p.a. (Medium-High Density) | Storm Water Ponds (100 year flood event) | Urban Landmark / Reference Point |
| 22-45 u.p.a. (High Density) | Storm Water Pond on Private Property | Neighbourhood Gateway Feature |
| 30-70 u.p.a. (High Density) | Proposed School & Park | Multi Use Pathway on Public Land or on Private Property with Public Use R.O.W. |
| Business Park | Existing School | |
| Neighbourhood Commercial | Riparian Protection Area | |
| Commercial / Residential | | |

EAST CLAYTON LAND USE PLAN

This map is provided as general reference only. The City of Surrey makes no warranties, express or implied, as to the fitness of the information for any purpose, or to the results obtained by individuals using the information and is not responsible for any action taken in reliance on the information contained herein.

(APPROVED BY COUNCIL AT ITS REGULAR MEETING OF MARCH 10, 2003. RESOLUTION R03-661)

**Proposed Tasks
West Clayton NCP#1 and NCP #2**

	Activity/Task	Estimated Timeline
STAGE 1E1	Initiate formal planning process <ul style="list-style-type: none"> • Collect background materials and information & invite participation on the Citizens Advisory Committee (CAC) • Hold the initial Public Open House (#1) and confirm CAC • Initiate youth consultation process 	March – April 2011
	Form Inter-Agency Committee (IAC) and hold initial meeting <ul style="list-style-type: none"> • Identify key concerns and needs Meet w/Council's EAC, AAC, HAC, TC and other committees, as necessary, for advice & comments	
	Prepare at least 2 land use concept options with consideration for the findings of the background studies on the environmental assets, commercial market opportunities and heritage assets, and directions of the Clayton ISMP Study, and comments of the IAC, EAC and AAC	May – June 2011
	Review the land use concept options <ul style="list-style-type: none"> • Technical Review (Inter-Departmental) • Meetings with the various stakeholders including CAC, IAC and Youth, and EAC, AAC & TC as required • Seek Council's approval to present the options to the public • Hold a Public Open House (#2) 	July – September 2011
	Develop a Preferred Land Use Concept <ul style="list-style-type: none"> • Technical Review (Inter-Departmental) • Peer Review (Industry experts – urban design, sustainability, engineering, development) • Meetings with CAC, TC and other stakeholders as required • Seek Council's approval to present the options to the public • Hold a Public Open House (#3) 	October 2011 – January 2012
	Refine the Preferred Land Use Concept, as required	February – March 2012
	Develop preliminary land use & place-making policies & guidelines for Stage 1	
	Seek Council's approval of: <ul style="list-style-type: none"> • Stage 1 report including the land use concept, policies & guidelines and servicing concepts • Initiation of Stage 2 	

	Activity/Task	Estimated Timeline
STAGE 2	Resolve any outstanding issues from Stage 1 and expand upon, add to and finalize Stage 1 policies & guidelines Prepare urban design policies & sustainable development guidelines Prepare detailed servicing, phasing and financing strategies	
	Review of final plan <ul style="list-style-type: none">• Technical Review (Inter-Departmental)• Peer Review (Industry experts – urban design, sustainability, engineering, development)• Meetings with CAC, TC and other stakeholders as required• Seek Council's approval to present the options to the public	
	Hold the final Public Open House (#4)	
	Present the final and complete NCP report to Council for approval	

**Engineering Terms of Reference Summary
West Clayton NCP Area #1 and NCP Area#2**

DRAINAGE

The proposed study area generally drains northwest towards the lowland farms in the agricultural land reserve and ultimately drains to the Serpentine River through the Fry's Corner Pump Station. A small portion of the NCP area, approximately south of 71 Avenue, drains south towards the East Clayton NCP West Extension area before draining into a tributary of the Serpentine River. Currently, overall drainage flows from the NCP area through ditches to Class A(O) and Class B watercourses in the lowlands. These watercourses convey the flows through private farms to the Harvey Road ditch, from where it flows across Highway 15 to the Fry's Corner pump station. No agreement exists in the lowlands to allow increased flows or expansion of conveyance capacity due to upland development.

The Clayton Integrated Stormwater Management Plan (ISMP) is currently underway and encompasses the NCP area. This ISMP will develop a servicing strategy including development objectives, confirmation of available drainage conveyance capacity, environmental protection, watercourse health, and sustainability for the larger catchment. The Clayton ISMP is anticipated to complete in Spring 2011 and the ISMP findings are to be incorporated in the engineering servicing for the West Clayton NCP. Engineering servicing will include preliminary pipe sizing, outfall locations, confirm open channel capacity through the lowlands, and identify land requirements for the drainage system.

In addition, drainage servicing will work with the environmental component of the NCP to determine required creek setbacks for the purposes of habitat and public safety.

An important component in the development of this NCP's drainage strategy will be a retrospective review of East Clayton's implementation and how the recommendations made there and in other recent NCPs could be modified to increase success.

Stage 1

In general, Stage 1 of the servicing study must include all servicing requirements that may have an impact on land use. Requirements such as detention facilities and other surface drainage features are strongly influenced by topography and need to be included in the development of the land use plan. The proposed road network can also affect the layout of the proposed drainage network. Drainage routes should be chosen to avoid any rear and side yard servicing and enable all properties to be serviced by gravity. In addition, the stormwater servicing in the NCP will mitigate the increase in upland runoff due to development and avoid impacting the lowlands.

Available background stormwater and watercourse studies which encompass the West Clayton NCP area include:

- Clayton Master Drainage Plan 1999
- Nicomekl and Serpentine Integrated Watershed Study - Strategic Plan for Lowlands Flood Control (July 1997) – UMA
- Flood Management Strategy for Fry's Corner (May 1998) – KWL-CH2M
- Verification of the Functional Plan for Fry's Corner (December 1998) – UMA
- Verification of the Detailed Design for Fry's Corner (April 2000) - UMA
- Latimer Creek MDP 2003

- Latimer Creek Dyke Tie-in Functional Plan – Stormwater Management Review (March 1998), Urban Systems
- Latimer Creek Dyke Tie-in Functional Plan – Verification (January 1999) UMA
- 1997 Environmental Report prepared for the Clayton GLUP by Dillon Consulting Ltd. & Strix Environmental Consulting
- 1999 Master Drainage Plan prepared for the Clayton GLUP
- Ravine Stability Analysis (2002, 2005, 2009)
- B-IBI data from 1999 to 2009. Data from 2010 will be provided when available.
- Ecosystem Management Study (EMS) by HB Lanarc (2009)

Stage 1 drainage servicing plans for the West Clayton NCP will include but may not be limited to:

1. Confirmation of existing and future drainage catchments.
2. Identification of downstream constraints associated with the NCP area.
3. Recommendation of stormwater management and mitigation measures required to address downstream constraints. This includes conveyance upgrades for minor and major flows, detention facilities, and low impact development best management practices.

Stage 2

Review and complete the drainage servicing plan including but not limited to:

1. Servicing of the upland areas for urban development. Surrey's Design Criteria for drainage is to have the minor 5-year return period storm flows contained in the storm sewer pipe while the major 100-year return period storm flows are safely conveyed along identified overland flow routes or within the piped system. The major flow system is to be designed as part of the NCP development.
2. A preliminary layout with size and profiles of critical sections of the storm sewer to show the extent of area that can allow construction of homes with basements based on existing and planned storm and sanitary sewer depth. Gravity servicing is to be assumed for drainage.
3. Identification and integration of opportunities for stormwater best management practices (BMPs) to protect the hydrologic regime of the downstream watercourses and minimize the risk of water quality degradation.
4. Confirmation that the Strategic Plan for Lowlands Flood Control is not negatively impacted from the development schemes proposed in the NCP. The Serpentine River floodplain starts immediately along the western border of this NCP area. There should be no negative impact to floodplain areas due to development in the NCP area.
5. Confirmation that watercourses will not be negatively impacted by proposed land use changes with respect to channel stability and capacity.

WATER

The area is currently partially serviced with municipal water through small diameter mains. A new system of feeder mains, pressure reducing stations, and distribution water main system will be required to support developments in the area. Planning, phasing and an overall functional plan of the water system to service the NCP is required.

The topography of the area requires this NCP area be serviced by two separate pressure zones. The eastern portion of the NCP is located in the Pumped Zone (115m HGL) serviced by the existing Clayton Pump Station. The existing Clayton Pump Station, located at 72 Ave east of 190 St, has been designed to include servicing of this NCP. Upgrades such as additional pumps may

be required. Feeder mains upgrade along 72 Ave from Clayton Pump Station to the NCP area would be required.

The western portion of the NCP, generally below 55m contours, is located within the 90m HGL pressure zone. This pressure zone would either be supplied by direct connection from GVWD transmission mains or a gravity main from Clayton Reservoir. Inter-pressure zone from the Pumped Zone via pressure reducing valves is not allowed. There is no existing feeder main servicing this area. The existing feeder main system from 176 St does not have capacity to service this new NCP. A new system of feeder main and alternate source is to be considered.

On site (within NCP areas) distribution mains would be required to service the developments of the NCP area. The layout and sizing will be determined when the land use plan and road layout is developed.

The City has a water model for Clayton/Cloverdale area, which reflects the water consumption based on existing land use and pressure zone boundary. Updating of the model would be required. The successful consultant may use City's WaterCad licence in City's computer network.

The work shall include, but not be limited to, the following:

Stage 1

General - Identification of servicing opportunities and constraints. Confirmation of connectivity to Surrey systems, preliminary servicing strategy and indication of capacity and impact on surrounding area to the satisfaction of Engineering staff.

1. Review Clayton Cloverdale Water Model Upgrade Report 2010,
2. Re-define the pressure zone boundary within this NCP area including all areas south of Fraser Hwy and west of 184 St. Two pressure zones at 115m and 90m HGL will be required,
3. Review the existing and build out demand. Identify the feeder main network for both pressure zones and the associated water sources, and obtain approval if required, and
4. The two pressure zones shall be serviced separately. Interconnections via pressure reducing valves shall be provided for emergency supply only. Eliminate any inter-pressure zone flow under all normal demand scenarios except fire flow and emergency conditions.

Stage 2

General - Completed design of the water system, including financial strategy:

1. Provide layout and size of off-site and on-site feeder mains to service each of the pressure zones and adjacent areas:
 - (a) The feeder mains for each pressure zone shall either be looped, or an emergency feed provided for the system redundancy;
 - (b) A system of PRVs shall be provided to allow emergency interconnection between the two pressure zones,
 - (c) The proposed and existing feeder mains shall be of adequate capacity to provide the required fire flow and domestic demand for this NCP, and other adjacent areas including the Agricultural Land Reserve;

- (d) The feeder mains shall be designed for the preferred Land Use option ultimate build out condition; and
 - (e) Provide the Maximum Day Demand plus Fire Flow and Peak Hour Demand of each of the pressure zones of this NCP and adjacent areas.
2. Provide a network of water distribution mains within the NCP area:
 - (a) Provide sufficient domestic demand and fire flows (supported with calculations) to the study area for the proposed land uses in accordance with the City's Design Criteria,
 - (b) Identify locations of all pressure reducing valves;
 - (c) Identify all water mains within the NCP area that are larger than the minimum size of 200mm. Provide cost estimate of the upsizing cost.
 3. Provide supporting information to confirm that the proposed network is of adequate capacity. Calculations and maps indicating the pressure at peak demand, fire flow availability, hydraulic gradient and velocity within pipes shall be required. Provide model results and model logging/assumption as per City's requirements.
 4. Coordinate with the land use plan such that appropriate utility corridors are provided, as appropriate, so that all water mains shall be looped. Dead end main will not be allowed.
 5. Recommend all practical interim supply scenario if development occurs before the completion of any and each feeder main system, PRVs, and interim interconnections between the two pressure zones that are planned in this NCP. Provide phasing for the construction of each feeder main system/section.
 6. Recommend the cost and funding strategy and phasing/sequence for the off-site and on-site feeder mains, PRVs, and looped connections; and
 7. Identify the costs attributable to this NCP and the other surrounding areas, if applicable.

SANITARY SEWER

Presently, the West Clayton NCP area is not serviced by sanitary sewer system. All existing dwellings in the area are service by individual septic field. The area slopes to the north and west towards the Serpentine lowlands which is generally under the Agricultural Land Reserve

The Cloverdale Trunk Sewer ("Trunk"), which is in place up to south of Fraser Highway, following generally along the toes of the hill, will need to be extended to service the NCP area, Local sewers following the roads will discharge to this Trunk. This Trunk in turn discharges to the North Cloverdale Pump Station at 68 Avenue and 176 Street or to the proposed sewer tunnel on 176A Street from 68 Avenue to 60 Avenue. A preliminary layout and the preliminary profile for this Trunk is currently being prepared by R.F. Binnie and is tentatively expected to be completed by Spring 2011. The sanitary sewer servicing study shall include, but not be limited to, the followings:

Stage 1

Identify servicing opportunities and constraints. Prepare a preliminary servicing strategy and identify constraints and impacts on the existing system and the surrounding area.

Background studies:

- Cloverdale Trunk Sewer Functional Study – R.F.Binnie 2011 (draft report)
 - 184 Street North of Fraser Highway – Sanitary Servicing Study by EarthTech, February 2007
 - Cloverdale Trunk Sewer Conveyance Study – Dayton & Knights Ltd, June 2005
 - North Cloverdale West NCP
1. Identify downstream constraints on the City sewer system up to the Metro Vancouver Trunk at Highway 10 for all sewer capacity issues;
 2. Incorporate the Trunk corridor with the proposed land-use and the general subdivision layouts including and
 3. Review the road layout to meet the following guideline for sewer design:
 - (a) Incorporate the Trunk alignment including reviewing the viability of incorporating multi-use trail along the Trunk corridor;
 - (b) Avoid down-slope cul-de-sac;
 - (c) Avoid sewer flow against ground or road grades;
 - (d) Align road to follow contours whenever possible;
 - (e) Provide maintenance access for all sewer lines;
 - (f) Provide gravity services to all properties with an elevation higher than the Trunk. Areas at lower elevations than the Trunk will be serviced by individual pump connections or by low pressure sewer system. Evaluate the feasibility of providing community pump station versus LPS for larger catchment area.

Stage 2

General – Provide a complete conceptual design of sewer system, including a phasing and financial strategy.

1. Recommend the upgrades for the relief of the identified downstream capacity constraint sections
2. Identify any odour issues and recommend solutions to deal with the odour issues including design to minimize odour issues.
3. Define the sewer catchments and sub-catchments including providing a map identifying each of the catchments and sub catchments;
4. Define and depict the sewer collector system for this NCP area and within each sewer catchment areas depict the profiles for the proposed sewer system. All sanitary sewer routes should be chosen such that rear and side yard servicing will not occur and that properties are to be serviced by gravity, wherever possible.

5. Prepare sewer design calculation sheets showing flow, flow velocities, and highlighting the sections of constraint. Determine and recommend the options to address the constraints;
6. Prepare preliminary sewer profiles on critical sections of main to ensure that the sewer depth is not excessive while servicing the future lots in the sub catchment and allows for extensions where required. This work may require spot surveys at locations where depths are deemed to be critical;
7. Identify and depict the proposed sewer and facilities upgrades (both new and upgrades) within the NCP and sewer catchment areas and for all downstream constraints.
8. Prepare preliminary cost estimates for the new sewers and the required upgrades (both on-site and off-site). Identify the works that qualify for DCC reimbursement.
9. Review and recommend the option between upgrading the North Cloverdale Pump Station, its force-mains and emergency overflow tank, and the Cloverdale Trunk Sewer Tunnel. Review should include financial analysis that includes projections for energy cost; robustness of the system; financing; and risk implication.
10. Prepare the financial balance sheet with projected Sewer DCC revenue and projected Sewer DCC Capital expenditure.
11. Prepare a comprehensive cash flow for the sanitary sewer servicing plan including an implementation strategy. This includes plan how and when the "big ticket" capital items will be financed and implemented especially on the off-site upgrades or relief system.

TRANSPORTATION

West Clayton is a roughly triangular area generally bounded on the north by 80 Avenue, on the east by 188 Street, on the southwest by Fraser Highway, and on the northwest by the Agricultural Land Reserve (ALR). West Clayton comprises Areas 1 & 2 of eight identified neighbourhoods within the overall Clayton General Land Use Plan. To date, one NCP, with two extensions, has been prepared for the Clayton area. This area, East Clayton, is southeast of West Clayton.

Most of arterial and collector roads in the study area are currently at an interim rural standard. Arterial roads include 72 Avenue (not currently connected to Fraser Highway), 80 Avenue, and 184 Street, as well as Fraser Highway; currently a four-lane divided arterial and planned to be a rapid transit corridor. Only two collector roads currently serve the area: 76 Avenue and 188 Street. The existing internal road network is limited to a few local roads providing property access. Overall, the existing local road network pattern does not follow a grid/connected road system and provides very few connectivity options through the neighbourhood.

Planned densification of the area, in accordance with the designations of the General Land Use Plan, will require additional connectivity, modal choice and road capacity and must take into consideration a variety of opportunities and constraints such as the topography, land use, and environment. Throughout the project a review of East Clayton's implementation will help form recommendation for these NCPs. The transportation servicing study shall include, but not be limited to, the following:

Stage 1

Most of the transportation planning, traffic analysis, modelling and road network improvement work will be undertaken in Stage 1 as the consultant explores opportunities and constraints related to the topography, land use, environment, the ALR, and the interface between adjoining existing communities and those planned for future NCPs. The consultant will also review and test several proposed road network options developed by the transportation consultant and Engineering staff, with input from the Citizens' Advisory Committee.

Based on the transportation modelling results for the proposed road network options, the consultant will identify a future transportation system that will support the newly generated trips, transit, and the needs for pedestrians and cyclists, taking into account the future density of the Clayton areas that have not yet been planned.

The scope of the study shall include, but not be limited to, the following requirements:

1. The study shall respond to the:
 - (a) Clayton General Land Use Plan,
 - (b) Surrey Road Classification Map (R-91),
 - (c) Design Criteria Manual (2011),
 - (d) Surrey Major Road Allowance Map
 - (e) Transportation Strategic Plan
 - (f) Bicycle Plan (2011),
 - (g) Walking Plan (2011),
 - (h) 10-Year Servicing Plan,
 - (i) TransLink plans,
 - (j) Ministry of Transportation and Infrastructure plans, and
 - (k) Sustainability Charter.
2. Develop, test, and review several road network options within the context of the City's Transportation Strategic Plan, in particular providing a well-connected, short-blocks road network system, supporting open and integrated neighbourhoods, and where appropriate, incorporating environmental protection (including tree and creek preservation), greener streets, maximizing on-street parking, walking, biking, greenways and multi-use corridors, transit, and enhanced place-making.
3. Analyze the existing transportation system: road network, intersection channelization, traffic controls, traffic volumes, intersection performance (7:00-9:00 a.m. and 3:00-6:00 p.m. weekdays, unless the consultant recommends otherwise), transit services, pedestrian facilities, and bicycle facilities.
4. Forecast future traffic conditions for the horizon years of 2021, 2031, and 2041. Calculate trips generated by the preferred land uses (using trip generation rates established by the Institute of Transportation Engineers or the MoT Trip Generation Manual (subject to the City's discretion)). Distribute and assign the trips (analyse and document the distribution of traffic, using the preferred road network). Identify the percentage mode split for transit, cycling and walking trips.

Clearly document the principles and the model used, including zonal inputs and assumptions. Analyze intersection capacity using methods and procedures outlined in the Canadian Capacity Guide or the Highway Capacity Software. Calculate the volume/capacity ratios and Levels of Service of all intersections and major access points. Determine future laning. Propose a neighbourhood road network functional classification, pedestrian and bicycle facilities, and traffic calming (e.g. schools and parks, curb extensions).

5. Assess the impact of traffic generated by the Anniedale-Tynehead NCP, particularly related to the integration of the planned north-south connections with Clayton and Highway 1. Assess the impact of a future rapid transit line on Fraser Highway, in terms of access and land use. Assess the impact of the future widening of 72 Avenue to an ultimate arterial standard, plus its connection to Fraser Highway. Assess the network sufficiency and whether an extension of 72 Avenue west of Fraser Highway will be necessary to support development of Clayton. Determine the alignment of 72 Avenue at Fraser Highway, taking into account future land uses, the impact on adjacent properties, safety, and geometry.

The outcomes of the study shall include, but not be limited to, the following:

1. Functional road classification map, incorporating both the surrounding approved road network and the preferred NCP road network.
2. Traffic control and access management plans along the arterial and collector road system, including signal and roundabout locations.
3. Pedestrian and bicycle network plans.
4. Transit network – proposed bus routes, bus stop locations and any other transit facilities.
5. Parking and traffic calming plans.
6. Traffic safety at the major accesses (school zones, commercial/retail areas, parks).
7. Interim cross-section requirements for arterial roads, to accommodate interim parking, pedestrian and cyclist facilities, landscaping, and street lighting.
8. Cost estimate for all of the improvements needed to support the function of West Clayton and allow for the undeveloped Clayton areas to proceed with densification. This may include the widening of roads, the construction of new roads, and the installation of traffic signals or roundabouts.

Stage 2

The transportation review in Stage 2 will consist of refining the selected and approved road network option from Stage 1, based on the approved land use concept and finalizing a financial strategy.

1. Detail any proposed road cross-sections that differ from those in Surrey's Standard Drawings (2011),
2. Finalize all of the Transportation Plans developed in Stage 1 (road network, traffic control, parking, traffic calming and transit, as well as the pedestrian, cyclist, and greenway plans)

3. Quantify developer funding requirements to implement interim arterial works for parking and other identified needs. Identify any intersection other works to be funded directly by adjacent developers rather than through DCC's.
4. Prepare separate financial balance sheets for the projected Arterial and Collector DCC revenues and capital expenditures.

ENERGY

The NCP process provides an opportunity to ensure the successful integration of energy conservation, renewable energy systems and land use within the broader planning framework in order to respond to the challenges of climate change and energy security as highlighted in the City's Sustainability Charter.

The vast majority of energy consumption at the community level is related to transportation and buildings, representing approximately 62% and 35%, respectively, of GHG emissions according to the 2007 Community Energy and Emissions inventory for Surrey. In 2011, staff will be developing a Community Climate Action Strategy (CCAS) that will outline urban design principles and energy efficiency requirements for buildings, aimed at meeting ambitious GHG reduction targets and energy conservation goals. The City's OCP currently sets a target of 33% reduction in per capita GHG emissions by 2020. The CCAS will be presented to council in early 2012, with anticipated adoption in advance of the approved NCP for West Clayton Areas 1 and 2. As a result, the West Clayton NCP will require rigorous analysis of the potential for energy conservation, efficiency and integration of renewable energy systems into all facets of the plan.

Stage 1

An analysis of the opportunities to impact energy use and GHG emissions within the NCP area in each of the NCP components will be required. This will include assessment of opportunities for implementation of renewable energy and district energy systems in the West Clayton area, within the broader context of the City's general DE and Clean Energy strategies. Consideration will be given to the comparative value of various forms of energy available for use (i.e. thermal energy, electricity, energy density of fuels) and the highest and best use for each.

A design charrette will be required early on in the analysis with a specific focus on energy in transportation, buildings and urban design. Through this process, specific policies will be identified to encourage energy conservation and efficiency throughout the NCP. Funding for the energy component of a design charrette is available from BC Hydro up to a maximum of \$20,000.

District Energy

Surrey City Council has recently approved the establishment of a municipally-owned DE utility that will be responsible for the implementation and operation of DE systems in Surrey. The first systems will be developed in City Centre, but there is considerable interest to implement district energy systems in other parts of the City where it is proved to be viable.

This component of the energy analysis will involve a detailed assessment of the viability of a district energy system within the context of the City's plans for utility expansion over time. District Energy is a system of distributing thermal energy from a centralized generation facility to a neighbourhood or district for heating and cooling of interior spaces and the provision of domestic hot water. District Energy systems provide the distribution infrastructure that conveys heated water from a range of renewable sources, including:

- Waste heat from sanitary sewers or industrial processes;
- Ground-source heat exchange (or geoexchange);
- Solar thermal collectors;
- Biomass combustion or gasification; and
- Combined heat and power (CHP) from combustion of biomass, biogas or municipal solid waste.

The principles and land use policies determined by the NCP process for West Clayton areas 1 and 2 will reflect the future potential for DE systems while recognizing that the timing of energy generating facilities and connections to energy consumers will vary depending on the rate of build out, energy prices and the relative proximity of development to energy sources.

The City has conducted various studies to identify the potential for DE systems and the availability of renewable energy sources in specific neighbourhoods. The following documents will provide background information on the work completed to date and a broader understanding of the identified potential for DE systems throughout the City:

1. City Centre District Energy Strategy;
2. Civic Centre District Energy Feasibility Study;
3. Grandview Heights/ Campbell Heights District Energy Pre-Feasibility Study;
4. Semiahmoo Town Centre Integrated Energy Master Plan Study;
5. Surrey Preliminary Sewer Heat Recovery Study; and
6. Grandview Heights Geoexchange Feasibility Study.

The deliverables will include technical background papers, a policy framework for land use and buildings and direction for incorporating district energy systems and alternative energy sources into the neighbourhood's infrastructure plans. Specific tasks include:

1. Identify the boundaries for the study area for West Clayton NCP areas 1 and 2, based on the Clayton GLUP and East Clayton NCPs (that are under development), which would be suitable for district energy systems that incorporate renewable and/or alternative energy sources.
2. Prepare a rough order of magnitude demand forecast, taking into account existing loads, the potential for retrofitting buildings in the study area, and future demands to build out. In preparing the forecast, the density and mix of land uses of the Clayton General Land Use Plan should be incorporated. The demand forecast should also discuss phasing principles for meeting incremental demands as these areas develop over time. The demand forecast should identify both base and peak load expectations, and include load duration curves for determining the general sizing of the energy supply system.
3. Undertake a general screening of low-impact, non-electrical energy sources that are, or may be, available within a reasonable proximity of the study areas and have the potential to meet a significant proportion of base heating requirements, including sewer heat recovery and other sources such as geoexchange, biomass, and waste-to-energy facilities.
4. Provide a summary of the best options for meeting the remainder of the base demand and the peak demand, including natural gas.

5. Using the information from Tasks 1 to 4, prepare summaries of the general, high-level technical feasibility for the study area, based on estimated loads, potential energy sources, and distribution system requirements.
6. Complete a financial synopsis of the capital and operating costs of the proposed systems and the approximate stream of costs and benefits over time from system inception to build-out (assume 20 years) for the owner and operator of the system, developers and end users, including industrial building owners/tenants and residential stratas/unit owners. Potential energy savings to end users of the system and reductions in total energy use, electricity consumption, fossil fuel use and greenhouse gas emissions, should be outlined. Where the capital and/ or operating costs are estimated to be in excess of costs for the "Business as Usual" approach (e.g. electric baseboard heat for residential units) and exceed the likely additional value that hydronically heated and cooled buildings would be expected to provide, propose incentives or other tools that should be explored to address this financial gap. The incentives should address both the short term (during the construction and sales period) and long-term (building occupation and operation period) time frames. Incentives should include, but not limited to, density bonusing, green building funding available from financial institutions, or grants and rebates from utilities or senior levels of government.
7. Prepare and support a community and stakeholder education and engagement process to provide practical information on district energy systems in an accessible format and receive feedback on issues that need to be addressed in order to promote acceptance of district energy efficient buildings from land owners and the development and building industry as well as the public.

Stage 2

Assuming that a DE system for the West Clayton area is determined to be viable and building on the results of the Phase 1 DE study, an implementation strategy for a DE system will be prepared. This should include:

1. Conceptual design and layout of the overall system;
2. Identification of anchor locations for energy generation and thermal energy distribution;
3. General layout of DE distribution infrastructure;
4. Strategy for coordinating installation of DE distribution infrastructure with the provision road, water and sewer servicing; and
5. General financing strategy for the investment in capital infrastructure.

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