

**LANGFORD GREEN DEVELOPMENT ZONE DESIGN CHARRETTE
FINAL REPORT**

APRIL 2006

Prepared by Design Centre for Sustainability at UBC

1.0 INTRODUCTION

1.1 Background

The City of Langford wishes to establish the benchmark for innovative, sustainable development of Greenfield locations in North America. It sees the establishment of a LEED certification for Neighbourhood Developments (Canadian adaptation) as the first step in this process.

The City of Langford has therefore entered into discussions with the Canadian Green Building Council to create new guidelines for Greenfield developments. Once complete, these guidelines will form the basis of Langford's new Green Building Zone, and may result in an amendment to the Official Community Plan and its bylaws.

A site has been selected for a pilot project to test and establish the CaGBC's adaptation of a *LEED for Neighbourhood Developments Rating System*. The site is located at the base of the Malahat Summit, on the west side of Langford Lake. It consists of approximately 500 acres of second growth forest that are proposed to be developed as a residential neighbourhood with office / commercial space.

A range of partners have come together to conduct the pilot project. These include:

- Province of BC Ministry of Community Services (Smart Development Partnerships)
- City of Langford
- CaGBC
- Design Centre for Sustainability at UBC
- TBKG Consultants
- KeyCorp Developments
- Sustainable Valley Developments

This report provides the results of the design charrette that was held to apply general ideas of sustainable neighbourhood development to a specific site in Langford.

1.2 Project Objectives

The objectives of this project are to:

- apply LEED – ND to a Canadian (Langford) context to assess applicability as a standard for greenfield developments;
- use a modified design charrette process to develop a preliminary master plan to be used in the Langford pilot project;
- use the outputs of the design charrette to assist in the adaptation of the USGBC's LEED-ND;
- use the outputs of the design charrette to assist the City of Langford in developing a Green Development Standard to be created concurrently with the development of the CaGBC LEED-ND standard.

1.3 Concept Design Approach: Design Charrette

A modified design charrette was selected as the process for developing a preliminary master plan for the specific development site in Langford. The charrette engaged a range of professionals and stakeholders in an intensive design exercise that relied on a statement of project goals and the LEED-ND criteria as a basis for design decisions. The charrette followed an integrated design model as the preferred process for determining a development concept plan.

Held over two days in February, Langford Design Workshop produced a conceptual plan that was the culmination of much discussion, drawing, and general agreement on numerous planning issues related to "green" site development. The plan is described in the sections that follow.

The Langford Green Development Zone charrette was facilitated by the Design Centre for Sustainability at UBC (DCS). The DCS is an academic leader in applying sustainability concepts to the development of land, cities, and community. Through interdisciplinary approaches, the DCS is capable of demonstrating to the development community, to municipalities, and to citizens how to shift community-based planning and design toward on-going consideration of sustainability as a matter of course rather than exception. Implementing sustainability requires the development, application and testing of integrative and holistic landscape planning, management and design knowledge. The DCS develops and assists in the application this type of knowledge through unique collaborative stakeholder-driven processes that give form to more sustainable forms of development (“charrettes”). Charrettes provide a mechanism for applying leading-edge approaches to developing community, for ensuring cross fertilization between researchers and professionals, and for providing a common machinery for disseminating scholarly results.

1.4 Project Location

The site focused on in the design charrette is located immediately south of Langford Lake, bordered by the E&N Railway, Sooke Road, Mt. Wells, Irwin Road, and Humpback Road.



Figure 1: Project Location and Boundaries

2.0 DEVELOPMENT CONCEPTS & PROGRAM

2.1 Development Goals

The following goals were identified prior to the charrette as guiding the development of this site. These goals were kept in mind as a higher level framework for design decisions throughout the charrette:

- create a healthy community that results in the optimum social, economic, and physical well-being of its people and the natural environment;
- apply design principles for urbanization that respect the unique visual quality and rural history of the area;
- use land efficiently;
- protect and restore natural areas and ecological processes important to people, flora and fauna;
- preserve clean and natural flow in area streams;
- improve air quality;
- protect and create opportunities to grow food;
- provide for a fair share of the region's new jobs;
- provide ample and affordable housing, schools, public infrastructure, facilities and transportation choices in the neighbourhood;
- preserve and create cultural opportunities throughout the community.

2.2 Development Characteristics

The following characteristics of sustainable neighbourhoods were also identified as being important to embed into the project design (for more detail on these, please see attached presentation):

- integrated
- efficient
- responsive
- adaptable
- permeable
- transparent
- productive
- multi-purpose
- low impact
- healthy
- cheaper
- inspirational

Layered on to these goals were the LEED-ND criteria which were modified to reflect the context of this project specifically, and other greenfield developments in Canada generically. Analysis of performance towards these criteria was conducted throughout the design charrette, and was reviewed in greater detail following the charrette.

2.3 Key Design Concepts

A number of key concepts were derived from the project objectives and from site issues identified by the charrette team as they worked through the design. These concepts provided a general framework for the conceptual plan:

- Set aside high value ecologies
- Maintain a network of open space
- Concentrate development in buildable areas
- Achieve desired number of residential units

- Design street network to minimize slopes
- Create a pedestrian friendly environment
- Place transit and commercial services at the core
- Connect to Langford community

2.4 Development Program

A number of programmatic elements for the site were identified prior to the workshop. These included residential development, commercial and office development, a possible high school or learning centre, and a commuter rail station. As well, the site was known to have areas of sensitive ecosystems, and it was unclear as to how best accommodate the desired uses while maintaining ecological functionality. Additionally, the potential for a positive contribution of the natural environment to an enhancement of resident and visitor experience of the site was recognized.

The following table lists the proposed and minimum desired land use allocations for the development site:

Component	Quantity
population	10-15,000
single family dwellings	1500
townhouses	1000
condominium apartments	1000
retail & service commercial	300,000 sq.ft.
rapid transit (especially taking advantage of existing rail line)	1 or 2 stops
neighbourhood pub	1
boutique hotel(s)	18-65 beds
theatre / arts centre	
school(s)	
rock outcrops, wetlands, Garry Oak	As much of critical areas as identified by mapping possible
fire interface setback	
naturalized park area, playing field	

Table 1: Proposed Development Program

3.0 Results

3.1 Charrette Concept Plan

The following image documents the overall result of the charrette team. The discussion that follows describes it in more detail.

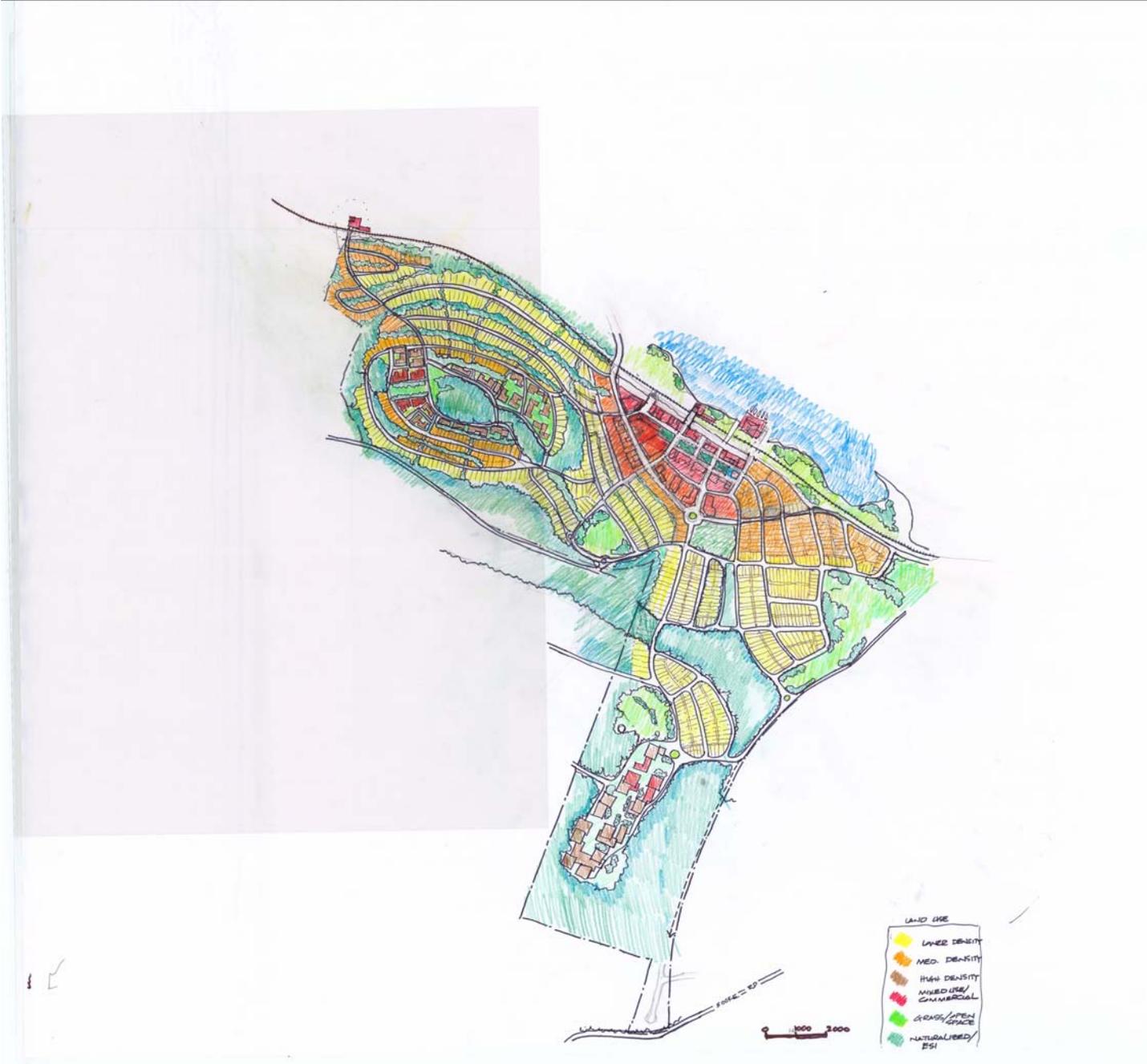


Figure 2: Charrette Concept Plan

3.2 Description of Core Concept Plan Components:

Open Space and Sensitive Ecosystems

The site contains numerous pockets of valuable ecosystem types, including forest stands, waterways/wetlands, and rock outcroppings. Stream flows on the site are mostly ephemeral and do not connect to lakes (and are therefore not fish-bearing). Riparian buffers are retained along streams, with >30m width over most of the site, and not less than 10m width.

The northwest portion of the site is characterized as a large hill with sensitive ecosystem areas along its ridge. The goal to preserve as much of this “green spine” as possible was identified by the workshop team. This spine appears as a central open space area providing an amenity for residents of this neighbourhood. The spine traverses from the farthest northwestern point of the site, up along the hill ridge, down through a dedicated park site, and connecting to major wetland areas at lower elevations that leads to a stream running to the site’s eastern border. Roads adjacent to sensitive ecosystem areas should be designed to be especially sensitive to this situation, with narrow right of ways, canopy cover from street trees, and swales. Fine-grained connections to the spine penetrate into residential areas as “green ribbons” - greenways, green lanes, and trails. Greenways typically range from 10-30m in width. Larger open space areas remain, particularly in the southern portion of the site.

Sensitive ecosystem areas are also found on the southern portion of the site. To minimize the development footprint in this area, high density residential development has been clustered here. Located at the higher elevations in this area, views to surrounding areas are provided.

With the goal of preventing any degradation of lake waters, it is desirable that rainwater runoff from streets and roofs is captured on site. Open space, park areas and greenways can capture, convey and infiltrate much of the anticipated runoff. This will continue to recharge the areas water table, and prevent unnecessary runoff to lakes. Wetlands and small pond on site may become retention areas for runoff, but this requires a more detailed examination of the sensitivity of these areas and possible impacts resulting from this strategy.

The plan attempts to find the balance between a maximization of green space preservation, and a maximization of property value. LEED credits would be achieved in the context of having saved significant land area from development.

Land Use

The land uses proposed for the site include single family and multi family residential, mixed use (residential, commercial and office), institutional (school), park and open space.

Residential

The plan accommodates this land use in abundance, with a range of types of housing choices housing The following articulation of residential development provides a balance between affordability, preservation of space for other desired components, and variation in housing types.

Residential Type	Quantity	Lot Size (range)	Density
SF – small lot	227 units	200-300m ²	Low
SF – medium lot	476 units	350-560m ²	Low
SF – large lot	462 units	600-1050m ²	Medium
MF - Townhouse	1000 units	n/a	Medium/high
MF - Apartment	2000 units	n/a	High

Secondary suites may be provided on single family lots. On medium and large lots, this may take the form of coach houses. SF small lots with only street access should minimize the presence of garages to create streets with positive pedestrian experience. Townhouses should have "single family character."

Apartments are located in the Town Core and in the southern neighbourhood. In the Town Core, apartments typically comprise the top two stories of mixed use 4 story buildings. Wood frame construction is most likely, as the current costs for concrete is prohibitive.¹ Buildings should demonstrate variety of form. In the southern portion of the site, residential towers may be an appropriate building form.

A portion of the residential units on the site may be available to rent.

Mixed Use

This land use type appears in the Town Core, as well as in the southern and northwestern neighbourhoods. In the Town Core this land use is dominant, and provides commercial uses at grade with office use on the second story. Residential use comprises above stories. In the primarily residential neighbourhoods, commercial is at grade, with only residential above. Mixed use development in the residential neighbourhoods provides needed local services, allowing residents to walk to such services.

Institutional

Land area dedication for a future high school or learning centre has been located at the eastern boundary of the site. The identified need for this land area includes approximately 5-6ha of relatively flat land, for buildings and possible playing field.

Park

Allocated park area is located adjacent to wetland and stream areas, and also on the southeastern slope of the northeastern residential neighbourhood. In the latter park area, a playing field has been proposed. This use may be able to sit atop the existing reservoir. Additional research on this issue is required.

Open Space

The largest open space areas are in the southern portion of the site, though significant areas of open space are scattered throughout the site, linked by parks, greenways, green lanes, and trail corridors. These areas are the primary runoff infiltration areas.

Circulation

The circulation pattern was developed in response to multiple "centres" or neighbourhoods, as well as topography. As well, significant discussion ensued related to ensuring that the circulation pattern be appropriate to the style of development desired, and the natural characteristics of the site. In this context, although initially a highway was intended to bisect the site, the charrette team reached consensus that this was inconsistent with a wide range of project goals and opportunities. It was removed, and attention was paid to providing other modes of transport as a mechanism for ensuring easy movement of people and goods.

Vehicle and pedestrian streets, trails, and rail have been developed as interconnected networks. The goal of these interconnected networks is to provide for pedestrian modal priority within the neighbourhoods and within the site as a whole, and for vehicle modal priority for external trips.

The sloping hillsides of much of the site present a challenge to circulation. Topography generally dictates a circulation pattern that is organized to traverse east-west, to minimize slope. The street network in the

¹ Should the need for 6-7 story buildings be determined, construction techniques should be modified to suit.

plan is designed to keep slopes within 10% - allowing for all modes to travel. Pedestrian trail/greenway networks in the northwest neighbourhood utilize the north-south orientation to traverse shorter distances.

The street network is designed as a variation on a grid pattern, but incorporating both “grey and green” corridors. Grey corridors are the paved right of ways, while green corridors are greenways or green lanes. Together these form the larger circulation pattern. The street network can be described as having three paved street types – parkway, connector, and local roads.

The parkway enters and exits the site at the northern and eastern boundaries, wrapping around the Town Core area. Roundabouts branch the parkway into the northwestern hillside residential neighbourhood, and also into the southern residential cluster of high density development. Connector streets extend off of the parkway to provide access to residential, commercial and mixed land uses in the northwestern and eastern neighbourhoods, as well as the Town Core. These streets have pedestrian and cycling demands as well as vehicle demands, and should be “friendly” towards these other modes. Local streets provide access to development areas that are “final destinations” and have limited connectivity to surrounding areas. These streets prioritize pedestrian and cycling modes.

Though not explicitly located or detailed, desire exists for traffic-calmed street types. In particular, Woonerfen streets (an example of a green street type) were identified as working well with the residential land uses of the northwestern neighbourhood. Though lanes are not desirable on hillsides due in part to the high cost of development, green lanes have been located in the pockets of residential development in the eastern portion of the site.

Commuter rail service is proposed to utilize the existing E&N Railway track that runs along the northeastern site boundary. Commuter rail service is seen as part of the solution to reduce car needs, which further reduces the need for garages/parking on site. Though more feasibility analysis is needed, the workshop team was optimistic that the proposed local population would be able to financially support this service.

3.3 Description of Core Concept Plan Neighbourhoods

The workshop team identified three distinct “centres” within the site, each characterized differently and viewed conceptually as a neighbourhood with a distinct identity within the project site. These neighbourhoods are described below. Additional pockets of residential development also border these neighbourhoods.

Town Core Area

The Town Core neighbourhood is the beating heart of the site. This area is conceptualized as a vibrant place, dense with people and activity. The neighbourhood is accessed via the parkway, commuter rail, and on foot (and possibly also by transit). Consideration of street design should be given to differentiate vehicle-oriented streets from pedestrian-oriented ones. Deep parcels/blocks allow for building footprints and parking, with building facades facing the primary streets to provide a positive pedestrian environment. A “public green” provides a place of rest and activity that may be enjoyed by residents and visitors. This park space also functions to infiltrate runoff, and to transition to a radial development pattern.

This area is envisioned to hold 300,000 – 500,000 ft² of commercial space, 200,000 – 220,000 ft² of which is retail. The total commercial allocation would be distributed over two stories, with office use only on the second story. Therefore, the approximate commercial footprint is approximately 350,000 ft². Commercial uses provide amenities to site residents and off site residents alike, and provide a tourist draw because of the attractive character of the development, and it's location on the commuter rail line.

The proposed commuter rail line has its stop/station located at the edge of this neighbourhood. Residents will filter through the site to get to this stop, thereby convening in the Town Core neighbourhood. Coordination of the train station with transit/bus routes servicing adjacent (off site) areas would allow for easy connections for passengers. Bus bays and parking would be elements required in proximity to the train station. Stacked parking under hydro lines, between rock outcrop areas located between the rail line and the Town Core development area may accommodate the parking requirement. Parking in this location would allow for the overlay of three functions in the parking area – parking, the hydro line, and drainage areas for runoff.

Northwestern Neighbourhood Area

This residential neighbourhood takes advantage of the views afforded by hillside development, while maintaining a degree of ecological functionality and slope integrity, and providing a range of single family lot sizes and townhouse units. The neighbourhood is accessed by the parkway, which quickly branches into an upper and middle ring road, and a lower road on the northern side. Additional access is provided to pedestrians via north-south trails and greenways. The neighbourhood is bordered on three sides by a natural buffer, to mitigate noise, views into the neighbourhood, and runoff.

At the top of the hill, surrounded by medium density multi family development, is a central open space. This space forms part of the “green spine,” and provides an environmental and social amenity. The upper ring road provides access to this area, and is bordered on its downslope side by single family units. The middle ring road serves multi family and single family units as well, including some large lot single family lots located on the south slope. The middle ring road and lower road connect with Irwin Road to access western and southern portions of the site. A small amount of medium density mixed use development is located on top of the hill, providing basic services to residents of this neighbourhood.

Single family units are designed to “perch” on the hillside, rather than to require cut and fill techniques. Units are situated tightly to the street, to minimize development footprint. Vehicle access at grade requires that garages are minimized to prevent the experience of the street from being dominated by vehicle uses. Carports and tucked under parking may strategies useful in addressing this situation.

A playing field is located in park space on the southern slope, providing an amenity for residents throughout the site. It is possible that this field may be located on top of the site’s reservoir, though more research on this is needed.

Southern Neighbourhood Area

In the southern portion of the site, minimizing the development footprint is desirable in order to preserve valuable ecosystems and open space. Residential and mixed use towers, with underground parking, achieve this by accommodating many people in a relatively small area. The undeveloped area allows for connectivity between park and open space areas with Mt Wells. The vistas created by hilltop development provide visual connectivity with other portions of the site, including the primary points of entry at northern and eastern boundaries.

Mixed use development provides basic services to residents, allowing them to meet some of their basic needs – like basic groceries - in their immediate neighbourhood area.

Additional Development Areas

Located between the Town Core and Southern neighbourhood areas are additional pockets of residential development. These areas consist of single family units on a range of lot sizes, and low density multi family areas. A proposed school site is located amongst this development, at the eastern site boundary.