

green block
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the hastings experience masterplan : hastings corridor individual design

sustainable urbanism : the hastings corridor

ubc urban studio : fall 2008

Research

Context

Managing urban growth in Burnaby has become an increasing challenge. Burnaby currently has an estimated population of 202,799, and this amount is expected to double in the next 50 years. Rapid growth has created the need for new housing, shops, jobs and infrastructure. However, developable space is limited and endlessly replicating the existing single family housing neighborhood pattern is not an option. Sustainable communities are those that balance ecology, economy and equity. In order to design landscapes that enhance natural function and improve quality of life, issues of density, environmental protection, stormwater management and affordability need to be considered as an integrated whole. Green infrastructure and connectivity between green spaces has been a significant part of our masterplan for the Hastings region, and the re-envisioning of the residential block is an opportunity to tackle these issues as a whole.



The block chosen is part of the green corridor system that link existing green spaces.

Water

Urbanization has a significant negative impact on natural hydrological function and water flow. In Burnaby, stormwater is channeled off and deposited off site. This method of stormwater management disrupts surface flow and does not allow water to soak into the ground and irrigate vegetation. This does not allow ground water to recharge, and can cause aquifer levels to drop. Disruption to the watershed can have drastic impact on vegetation and wildlife. However, by simply allowing water to infiltrate through the soil rather than directing it through pipes, we can protect our watershed. Infiltration systems where rainwater is absorbed into the ground maintain the hydrological cycle of soil and ensure that ground water is recharged at a natural rate. The proliferation of impervious surfaces generates large amounts of stormwater runoff which carry pollutants such as nutrients, toxins and pathogens. Allowing stormwater to infiltrate on site reduces pollution and degradation of water bodies.

Density/ Affordability

Increasing density and providing more housing options allow people of diverse economic backgrounds to reside in the same community. Infrastructure costs and taxes are lower with higher density neighborhoods since costs are shared more people. Providing a range of homes for people of different incomes can create a socially diverse neighborhood.

Quality of Life

Green infrastructure can substantially improve the urban environment, both ecologically and socially. Plants and trees can remove pollutants from the air and help create a more favorable microclimate by providing shade and releasing water during the transevaporation process. Vegetation creates much needed habitat for fauna in the city. Urban green spaces can also bring substantial social benefits, providing gathering and recreational spaces for people. Studies have shown that contact with nature can be restorative, relieving the stress of city life and improving mental health.

Opportunities

Increasing density in the residential block and retrofitting additional green infrastructure such as green alleys, boulevards and greenways is a viable option to address the issues of growth, affordability, and stormwater management while improving the quality of life for the residents of the Hastings Region. Burnaby has an extensive street and alley grid system, which could be developed into a green system that offers a unique sense of place to individual neighborhoods.



The block chosen for further study.

Goal

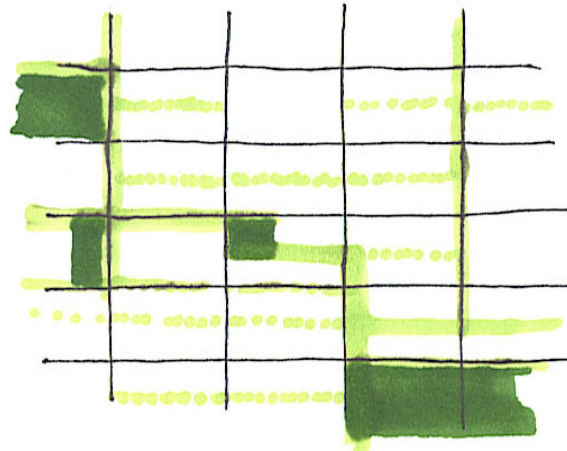
Integrate green infrastructure into the built environment in order to develop a green system that links existing green spaces, and will bring social, economical and ecological benefits.

Objectives

1. Develop a pattern of integrating green space with blocks of increased density
2. Affordable green infrastructure which increases value of property
3. Minimalize urban runoff
4. Create habitat
5. Increase interaction of people with people in their neighborhood and with the environment

Principles

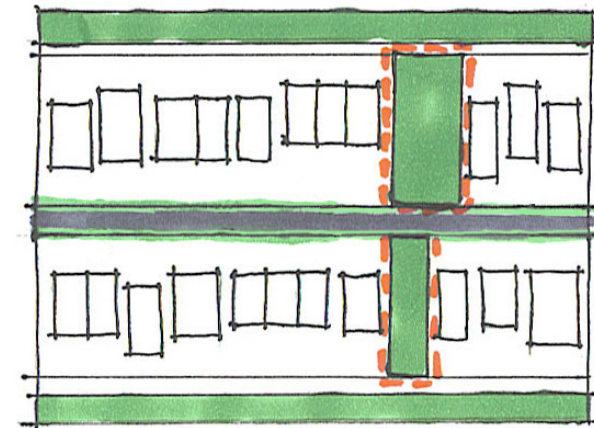
1. Infiltration of **ECOLOGICAL** Systems into the Built Environment



Regional Level: Connecting existing green spaces through a system of green streets and alleys in order to enhance and restore the ecological system

Block level: Integrating more permeable and green spaces into the block, creating greener urban fabric

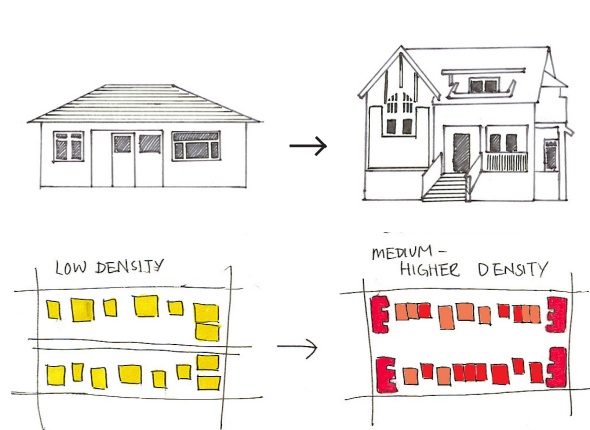
2. Green **IFRASTRUCTURE** performs multiple functions



Green infrastructure allows on site storm water management, provides habitat and also community spaces for people.

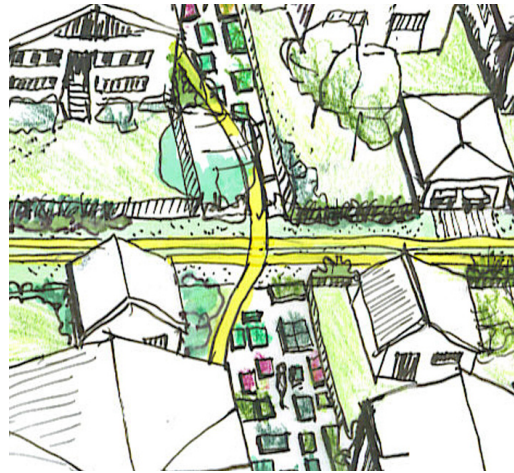
Principles

3. FLEXIBILITY for change



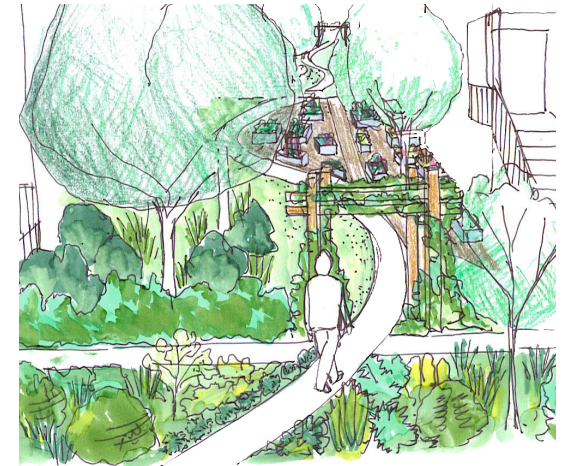
In anticipation towards change in the next 50 years, density will need to increase to accommodate the increasing population. There is also a gradual diversification in building types, allowing people of various socio-economic backgrounds to reside in the same neighborhood.

4. AFFORDABLE housing and infrastructure



Green infrastructure performs both ecological and social functions, and is more affordable in a higher density neighborhood where there's more people to share the cost.

5. Definition of Hastings as a distinct PLACE



Regional level: Green infrastructure connects Hastings as a region and increases the sense of place in Hastings as a whole

Block level: Each block is given a stronger sense of place with additional green infrastructure, making each neighborhood distinct within the overall green network

Precedent Study

Green Block

Building Types



2 Unit House



3 Unit House



6 Unit House

Green Alley and Boulevards



Greenway and Community Garden

Green Boulevard



Green Boulevard

Green Alley

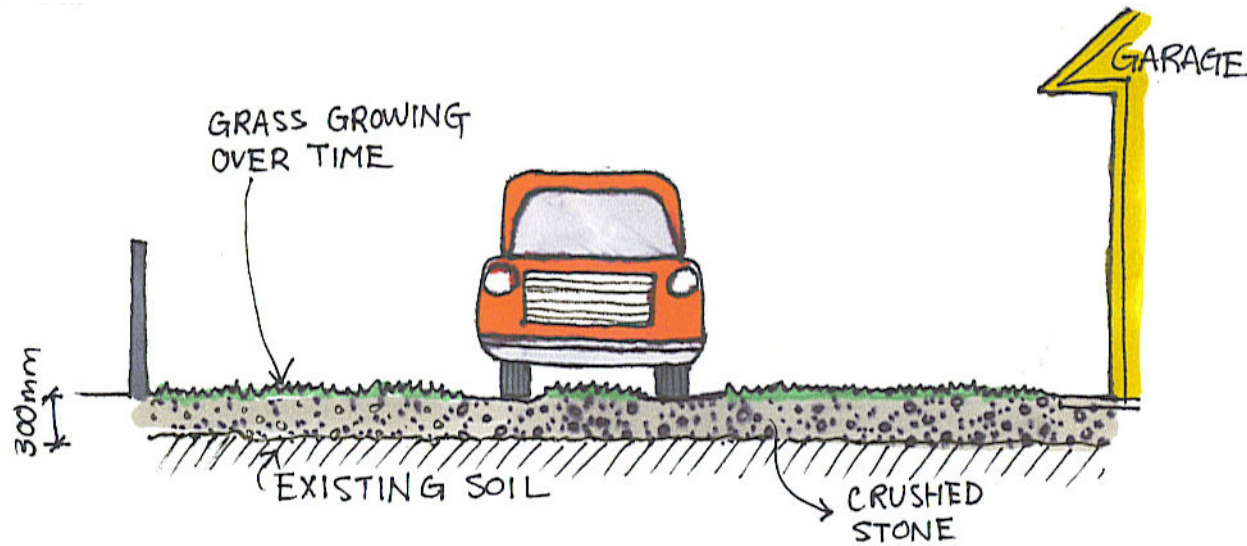


Community Garden

Green Driveway



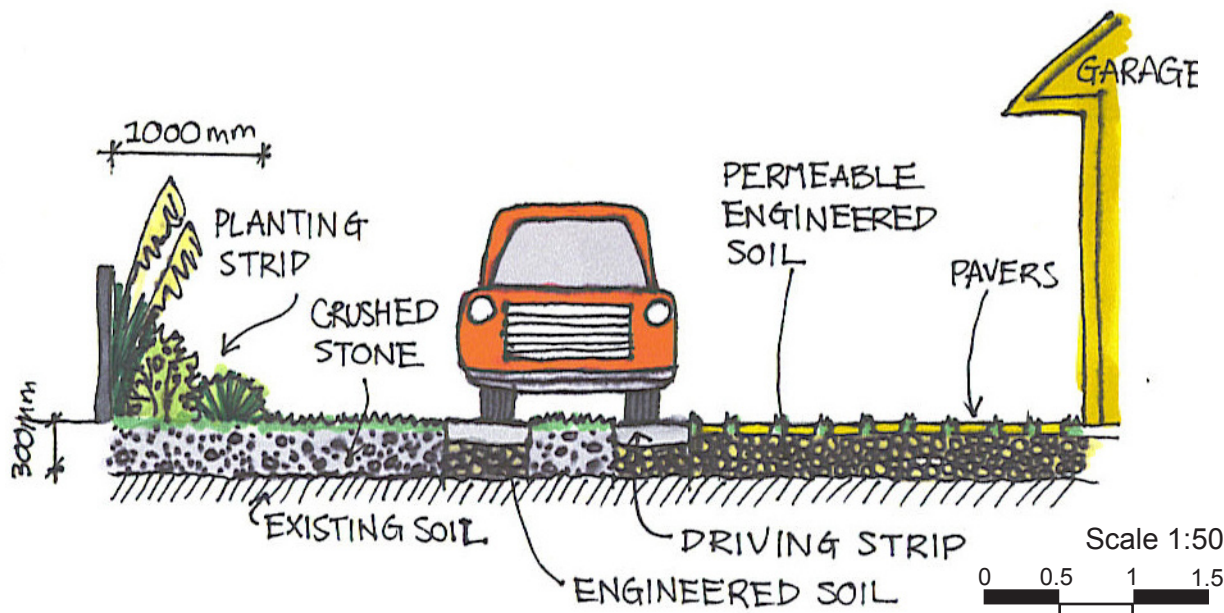
Community Garden



Option 1: Crushed Stone

Pros: The CHEAPEST option, allowing grass to grow out of crushed stone over time. This allows 100% on site storm water infiltration, in contrast to the conventional alley where water is directed to the drain

Cons: Has a tendency to get muddy, not well suited for alleys with heavy usage

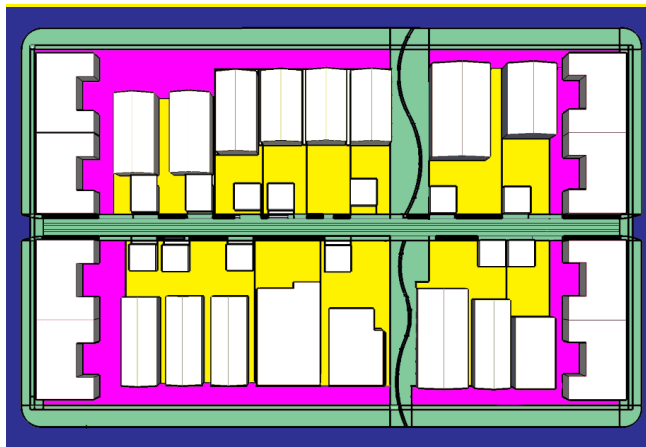


Option 2: Country Lane

Pros: The DURABLE option, with driving strips and pavers. It has more complex plantings, higher habitat value. This option also provides 100% on site storm water infiltration for the alley.

Cons: Costs more than Option 1, plantings require additional maintenance.

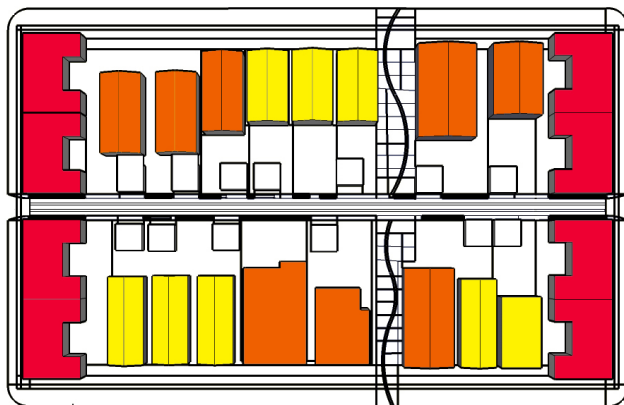
Public/ Private Space



- Public, government managed
- Public, privately managed
- Semi private, privately managed
- Private, privately managed

The **green boulevard, green alley and green way** are public spaces that are accessible to everyone, but are all privately managed. This requires heavy participation from the residents of the block. Residents will be encouraged to take greater ownership over boulevards and alleys, creating unique plantings. There are community garden plots and habitat orientated plants within the greenway, again requiring heavy involvement from the community.

Density



- 6 unit dwelling
- 3 unit dwelling
- 2 unit dwelling

In anticipation to the great increase of population over the next 50 years, the overall density of the residential block needs to be raised. Raise in density is concentrated along main arterials and green corridors. The character of the single family house is retained, but more units are retrofitted. With this configuration it comes to a total of **80 units per block**, approximately **16 dwelling units per acre**. This is a significant increase from the existing block with 18 buildings. Assuming 2 dwelling units for each building, it comes to 36 units per block and 7.2 dwelling units per acre.

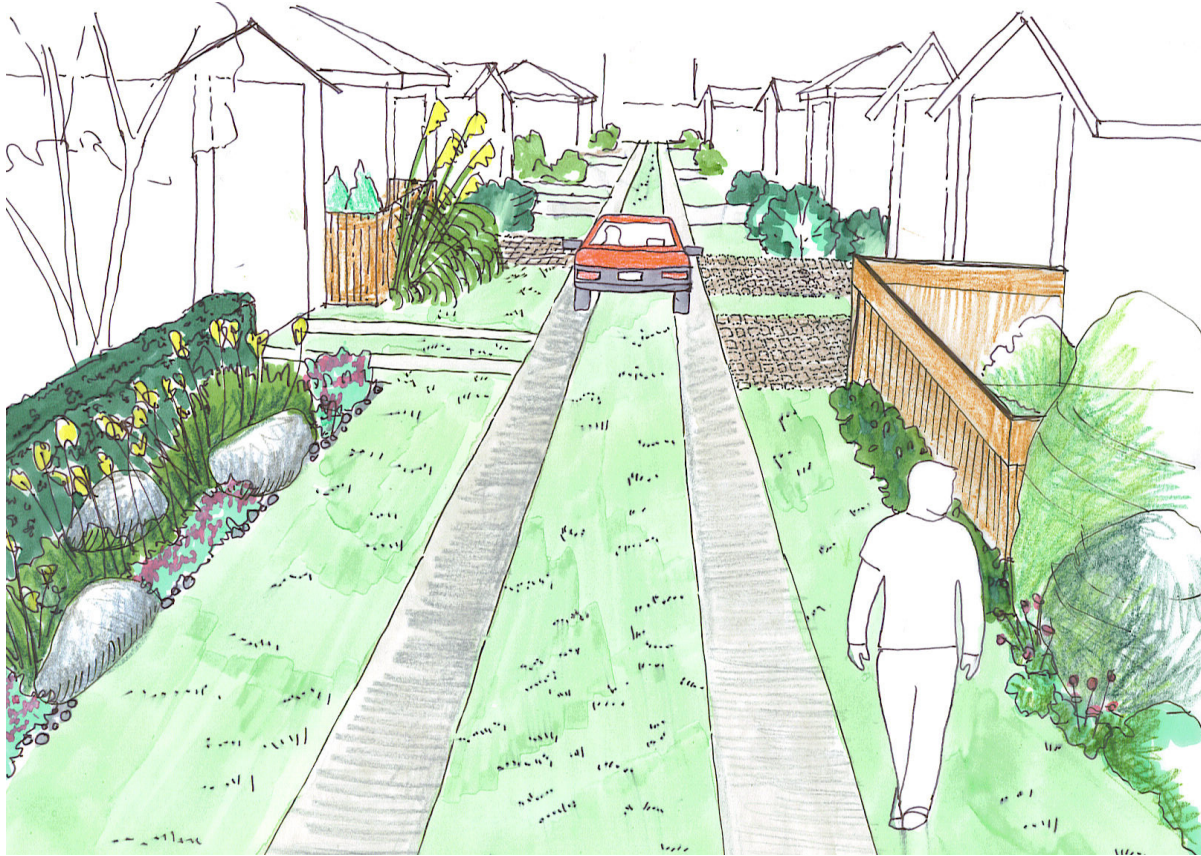
Block Axonometric

Green Block



Pedestrian Oriented Experience
Higher density and proximity to transit encourages less dependence on cars, and the greenery also has the effect of slowing traffic. The diverse greenery will create an engaging pedestrian and biking experience, creating a more lively and socially active neighborhood.

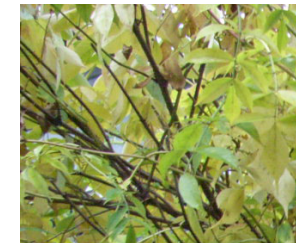
Perspective



Green Alley

Alleys are multipurpose public spaces which are privately maintained, and are influenced by behavior of residents, service and access patterns. Alleys generally service local traffic, and can create an intimate atmosphere which encourages informal social interaction. The environmental value of alleys could be greatly enhanced with plantings along the alley and permeable paving materials. Residents are encouraged to take ownership of the planting strips outside their property. For conventional asphalt alleys approximately 75% rainfall becomes runoff, but with this alley configuration runoff is reduced to 10-20% of rainfall.

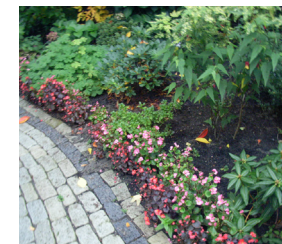
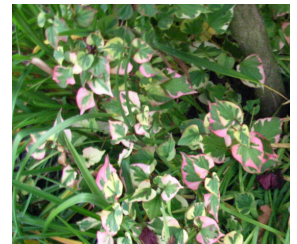
Green Block



Perspective



Green Block



Green Way and Green Boulevard

The half of the Green Way is allocated for small community garden plots, and the other half provides opportunity for higher denser shrubs, groundcovers which provide valuable habitat for fauna. The Green Boulevard displays a greater diversity of planting than the conventional tree and lawn boulevard. Space for community garden plots within the Green Way is limited, so the space on the boulevards can be utilized for additional community garden plots.

Conclusion

This design strives to create healthy habitat for humans and other living beings, provide affordable homes for future residents, while keeping in mind the needs of the environment. The block design shows possibilities and direction for integration of green infrastructure in a residential block that can hopefully be adapted for use in many different neighborhoods. This block is part of a greater system of green corridors, is a component of the greener urban fabric that will be developed over the next 50 years. The quality of life of residents of the Hastings Region can be enhanced while protecting and restoring the natural functions of the landscape.

References

(All photos taken by author)

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