Case Studies for Sustainable Community

East Clayton - Surrey, BC
1. Conserve land and energy by designing compact walkable neighbourhoods. This will encourage pedestrian activities where basic services are within a five to six minute walk of their homes.
2. Provide different dwelling types (a mix of housing types, including a broad range of densities), in the same neighbourhood and even on the same street.
3. Communities are designed for people, therefore, all dwellings should present a friendly face to the street in order to promote social interaction.
4. Ensure that car storage and services are handled at the rear of the dwelling.
5. Provide an interconnected street network, in a grid or modified grid pattern, to ensure a variety of itineraries and to disperse traffic congestion; and provide public transit to connect with the surrounding region.
6. Provide narrow streets shaded by rows of trees in order to save costs and to provide a greener, friendlier environment.
7. Preserve the natural environment and promote natural drainage systems (in which stormwater is held on the surface and permitted to seep naturally into the ground).
Case Studies for Sustainable Community

East Clayton

Designed at “Implementation” Charrette
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The East Clayton Community Plan

560 acres
5,000 units of housing
Over 5,000 jobs
13,000 residents
20 year build out
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The East Clayton Community Plan

45 du/acre

25 du/acre

Mixed use and high density residential
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The East Clayton Community Plan

15 – 18 du/acre

Neighbourhood commercial with residential above 10 - 20 du/acre)

5 – 8 du/acre

Medium density residential with neighbourhood commercial
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The East Clayton Community Plan

Office/Business FSR 1

Street friendly, open skin

Business Park
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The East Clayton Community Plan

Live/Work FSR 1

Work/live FSR 1.5

Live Work.....Work Live
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The East Clayton Community Plan

1 and 2 storey commercial - .3 to .6 FSR

Highway oriented commercial
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School Sites
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Riparian Parkways

The East Clayton Green Infrastructure Plan

[Diagrams showing various elements of green infrastructure planning, including parkways and green spaces.]
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Car Free Greenways

The East Clayton Green Infrastructure Plan
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The East Clayton Green Infrastructure Plan

Protected Riparian Zones
## NCP Objectives

**Front yard setbacks** should be reduced to 4 meters for single family lots and elevated front porches should be encouraged.

## Project Results

Achieved, as seen in picture above, 4 meter standard setbacks have been followed and front porches included.

## Comments/Lessons

- Residential development has taken place within the RF-12 Zone, which allows 4 meter setbacks, front porches and a further front setback of 2 meters in possible.
- RF-12 also requires that front garages be designed to be ancillary in the overall house design, and a 2 meter setback was enforced for front access garages from the primary facade of a house.

For blocks with no lanes, **shared driveways** should be provided to reduce the number of curb cuts.

Partially achieved; for blocks with no lanes, it was decided that driveways would instead be paired.

- Although paired driveways are a departure from shared driveways, they continue to minimize curb cuts.
- The decision to provide paired instead of shared driveways was an attempt by the developer to compensate for the perceived risk involved in reduced front setbacks and lot sizes.
- Success in sales so far, over 100 lots sold since January 2003, has encouraged developers in future phases to accept universal lane access and will eliminate environmental, social and transportation safety issues consequent to driveways.
Diagram of rear lanes to be integrated into community.
East Clayton

Sara Barron
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Forest Resources Management
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Suburban dreams
How much land (ha) would each housing type use to house the population of East Clayton?

High density: 287
Med-high density: 114
Medium density: 191
Low density: 240
1/2 acre: 76
708
www.pinchot.org
loneliness
heat islands

Source: National Oceanic and Atmospheric Administration
Suburban forests

Cool urban heat islands
Suburban areas with mature trees are 2-3 °C cooler than new suburbs without trees

Increase residents’ health
Across 15 states, the loss of trees to the Emerald Ash Borer was associated with an additional 6113 deaths related to illness of the lower respiratory system, and 15,080 cardiovascular-related deaths

Filter air
New York’s million trees are expected to remove more than 10,000 tons of air pollutants over the next 100 years

Beautify neighbourhoods
“Urban forests contribute to human emotional, intellectual, and moral fulfillment”

Create shade
By 2031, the annual Canadian economic burden of skin cancer will be $992 million.

Increase property value
“On average, street trees add $8870 to sales price” for homes in Portland, Oregon.

Create biofuel
Annual sustainable urban forest yields in the United States could supply an estimated 2.8 million people with electricity annually

Decrease building energy
In terms of avoiding carbon combustion, “one shade tree in Los Angeles is equivalent to three to five forest trees” because of the tree’s effect on building energy use.

Sequester carbon
“Urban trees in the contiguous USA currently store 700 million tonnes of carbon.”

Increase habitat
“Even if exotic species are excluded from measures of diversity, suburban and peri-urban ecosystems sometimes have higher species richness than the native systems they replaced”

Manage stormwater
“In Houston, Texas trees provide $1.3 billion in stormwater benefits”

MITIGATE CLIMATE CHANGE
ADAPT TO CLIMATE CHANGE
INCREASE WELL-BEING
SUPPORT LOCAL ECOLOGY
Preferences
Preferences

Methods: interviews & focus groups

Findings:
• Residents prefer stands of trees, mature trees, and native trees
• Current conditions don’t meet these values
“Do you see any pine trees now? This place used to be full of pine trees”

“When Clayton was forested, there were occasional magnificent fir trees. One was left standing at the elementary school site*, but when the school went in, they took out the tree. I guess it was a safety issue because of the kids.”

*This particular tree was mentioned by 2 residents
Stands of trees
Below: Riparian Parkway Greenway. An artificial stream located in boulevard, provides habitat and biofiltration of surface water.
Mature trees

2004 canopy
Future canopy

2053 canopy

Population: 149
Trees: 63 - 46 years old
Design Intentions

60% canopy coverage (at maturity) of street trees
30% canopy coverage in residential yards
Residents prefer native trees, mature trees, and stands of trees
Native trees
Native trees
Soil Preservation on Street Rights-of-way

Site topsoil must be carefully stockpiled for later redistribution on the right-of-way. In no cases should topsoil be removed from the site. Generally, the area available in street rights-of-way for re-spreading this topsoil will be approximately 30 per cent of the area of the right of way prior to development. Consequently, topsoil depths in the finished site should be up to twice what they were originally.

Topsoil depth in East Clayton is generally thin, often less than 0.5 metre (1.6 feet). Topsoil excavated for replacement by structural gravel is to be stockpiled on the site for later distribution over the areas of the right-of-way intended for permeable surfaces (i.e., boulevards/swales).

Proper aeration of returned topsoil is crucial. Topsoil areas will be checked for depth and aeration prior to the granting of an occupancy permit by Surrey Engineering/Building Department. Pre-existing vegetation on the site may need to be ground up and added to the soil to improve aeration and humus content. If this process still leaves soil unsuitable, then additional soil amendments will be required. The Surrey Parks, Recreation and Culture Department will review soil tests and proposed amendment strategies.

Native trees

Figure 4.2.a    Residential Lane

East Clayton Lane, NCP
Native trees
Scenarios
HABITAT
MENTAL HEALTH