



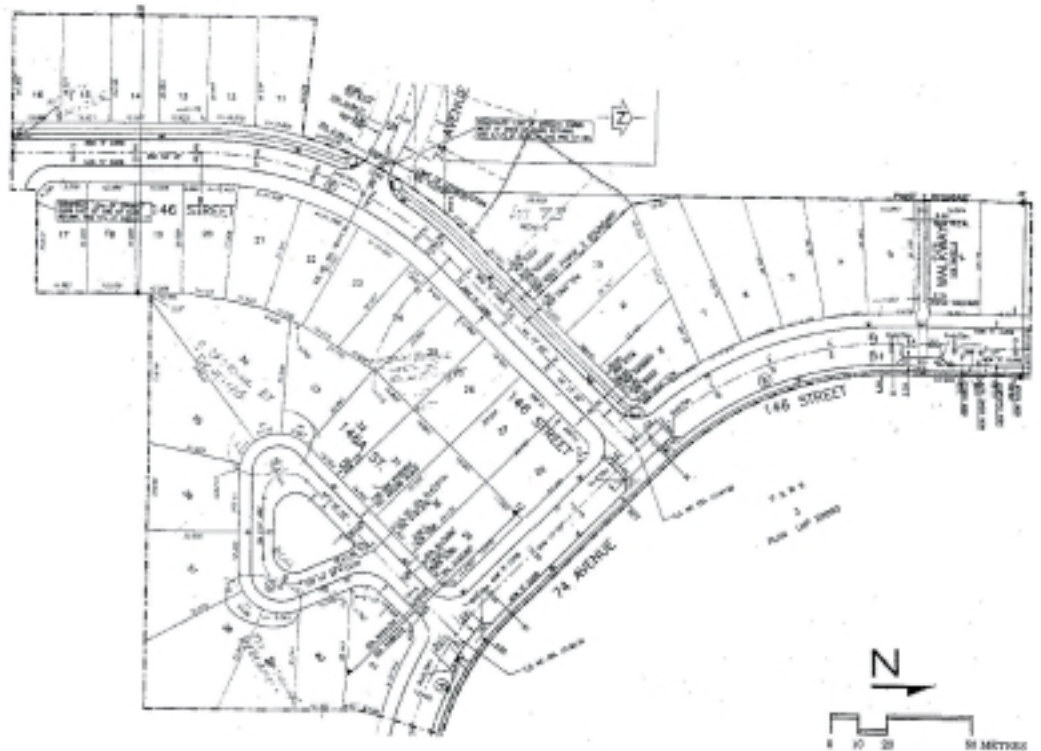
**Sites Compared**

Figure 2-3 - East Clayton site- A sustainable residential development to be built in East Clayton, B.C. The NCP, which is based on seven principles of sustainable design (NCP, p 24), envisions a complete, mixed use community with an integrated street system. The plan calls for smaller lots and higher density within a network of community green spaces and natural systems. This 4.23ha area of the East Clayton plan is low density residential, which in the East Clayton NCP, is defined as 6-10 d.u. per acre.



Single family residential	37 units
Duplexes	54 units
S.f. residential with secondary suites	10 units

Figure 2-4 - Status Quo Site - A residential development in South Newton, B.C. comprised of a 4.27ha area of single-family homes on large lots with a curvilinear street pattern. The density is 4 dwelling units per acre.



**Impervious cover**

The percent of impervious surface on both standards is about the same: approximately 50%. Despite the higher density, the East Clayton standard performs better than expected here because the dwelling units are relatively thin and tall and the roads are narrower. Despite the land efficiency of the East Clayton standard, every dwelling unit still includes at least a small terrace or backyard, and in some cases a backyard comparable to those found in the status quo standard.

**Land, building and infrastructure cost analysis**

On a per dwelling unit basis, the cost for land is \$48,000 less in the East Clayton standard than the status quo standard. This difference is primarily a result of the higher density and a more efficient street layout of the former.

The cost for infrastructure in the East Clayton standard is less than half the cost of infrastructure per dwelling unit in the status quo standard, amounting to a difference of over \$12,000 per dwelling unit.

**Table 2-1 - Cost Comparison**

		CONVENTIONAL SUBURBAN SITE	EAST CLAYTON SITE
Site Area	hectares	4.27	4.23
	acres	10.50	10.45
Total Parcels		41	74
Total Dwelling Units <sup>1</sup>		41	111
Parking	stalls per unit	2	2
	total stalls	82	222
Gross Density	d.u./ha.	9.60	26.24
	d.u./acre	3.90	10.62
Lot Coverage	net (lots only)	0.40	0.45
Floor Area Ratio <sup>2</sup>	net (lots only)	0.30	0.55
	gross (lots & ROWs)	0.20	0.38
Average Unit Size <sup>3</sup>	sq.m.	214.00	155.00
	s.f.	2300.00	1661.00
Average Utility Run	m/d.u.	13.80	8.50
	f./d.u.	45.30	27.88
Pavement	sq.m/d.u.	229.00	83.45
	s.f./d.u.	2463.70	897.09
Site Permeability (%) <sup>4</sup>		50.00	49.65
<b>LAND COST <sup>5</sup></b>			
per unit <sup>6</sup>		\$76,829	\$28,243
per parcel <sup>7</sup>		\$76,829	\$42,365
<b>BUILDING COST <sup>8</sup></b>			
per average sized unit (2300 sq. ft./1661 sq. ft.)		\$138,000	\$99,660
per equal sized structure 2,000 sq. ft.		\$120,000	\$120,000
<b>INFRASTRUCTURE COST</b>			
Roadworks		\$218,894	\$256,853
	Asphalt Paving	\$24,553	\$38,247
Storm Sewer		\$205,820	n/a
Surface Drainage	Swale Pipe <sup>9</sup>	n/a	\$80,000
Boulevard Landscaping		\$30,000	\$36,070
Water Mains		\$113,705	\$169,107
Water Tie-ins and Connections *		\$18,177	\$49,211
Sanitary Sewers		\$135,255	\$229,780
Sanitary Tie-ins and Connections *		\$5,000	\$13,536
Street Lighting		\$44,000	\$64,500
Lot Grading and/or Swales		\$24,450	\$24,221
Hydro/ Telephone installation (buried services) *		\$54,000	\$146,196
Boulevard Tree Planting		\$20,000	\$24,052
Utilities *		\$54,000	\$89,859
Block interior pathways and emergency access		\$12,500	n/a
Block interior pathways landscaping		\$4,000	n/a
Total Infrastructure Cost	entire site	\$964,354	\$1,221,632
	per unit	\$23,521	\$11,005.69
	per parcel <sup>10</sup>	\$23,521	\$16,509
<b>TOTAL COST OF AN AVERAGE SIZED UNIT (Land+Building+Infrastructure) <sup>11</sup></b>			
Average unit sizes (2300 sq. ft.vs. 1661 sq.ft)		\$238,350	\$138,909
<b>Total Cost per Square Foot of interior space (Land+Building+Infrastructure)</b>			
Average unit sizes (2300 sq. ft.vs. 1661 sq.ft)		\$104	\$84
<b>TOTAL COST OF EQUAL SIZED STRUCTURE (Land+Building+Infrastructure) <sup>12, 13</sup></b>			
Equal sized structures of 2000 sq. ft.		\$220,350	\$178,873
1 The East Clayton site includes 111 units on 74 parcels: 47 single-family homes, 54 duplexes and 10 accessory apartments. Each unit represents a			
2 Includes 2 habitable floors.			
3 Habitable space is on average 1661 s.f. per dwelling unit. This figure is based on an average single-family home size of 2266 s.f. (47 units), a strata unit size of 1200 s.f. (54 units) and an accessory apartment of 800 s.f. (10 units).			
4 Site permeability refers to the percentage of each parcel that is covered with impervious surface (i.e., building, driveway, pathways).			
5 Assumes \$300,000/acre for raw land.			
6 Per unit land costs are calculated by multiplying bare land cost (\$300,000/acre) by the total site area and dividing by total number of units			
7 Per parcel land costs are calculated by multiplying bare land cost (\$300,000/acre) by the total site area and dividing by total number of parcels.			
8 Assumes \$60.00/s.f. construction cost for building only. Note: These reflect building costs only for the single-family residential areas used for this study.			
9 Assumes 'Infiltrator' system is used. Additional product information can be found in tech bulletin # 3. Surface drainage system cost analysis is provided by Infiltrator Systems, Durante Kreuk and Green Thumb Landscaping Co.. For a more detailed summary, call 822-5148.			
10 Per parcel infrastructure is calculated by taking the total infrastructure cost and dividing by number of parcels. In the case of East Clayton, a proportion of infrastructure costs, such as individual servicing hook-ups, are dependant upon the number of units. As there are 111 units in the East Clayton pattern, the total infrastructure costs are derived by multiplying those items marked with (*) by 111 units and adding all other infrastructure costs. To calculate the per parcel infrastructure costs, the total infrastructure cost is then divided by the number of parcels (74).			
11 Does not include DOCs, developer profit, carrying costs, permit fees, realtor fees, etc.			

*Cost Comparisons -- total cost benefits of the East Clayton site*

**Land cost differs OVER \$48,000 PER D.U.**

**Building cost differs OVER \$38,000 PER D.U.**

**Infrastructure cost differs OVER \$12,000 PER D.U.**

**Total differs OVER \$99,000 PER average size D.U. or \$20.00 PER S.F. of interior space**

The total average cost (land, building and infrastructure) per dwelling unit in the status quo standard is over \$99,000 more than the average cost per d.u. in the East Clayton standard. The total savings come from reductions in infrastructure cost and from increased density. As a way of comparing "apples to apples", the total cost of equal sized structures is calculated by adding the per parcel land costs, the per parcel infrastructure costs and a 2,000 sq. ft building cost. The total cost of equal sized structures is over \$41,000 more in the conventional plan when compared to the East Clayton plan.<sup>1</sup>

An additional important consideration for the City is the relationship between the value of its homes and the future cost of replacing the infrastructure that serves them, especially as it relates to municipal tax revenue. The higher the relative value of the homes to the replacement cost of the infrastructure the better. Given that there is almost twice as much housing value per acre in the East Clayton area than in the status quo area, the potential tax revenues would also be double, while the infrastructure to serve the area would be about equal in cost to replace.

Finally it should be recognized that our computations do not consider the effect of the two alternative proposals on off-site infrastructure and development cost charges; however, most assessments of this question support the common sense conclusion that a tighter community pattern requires lower per capita expenditures for roads, storm drains, utility trunk lines, and sanitary systems than do more sprawling communities.

## Resources

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