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## **1.0 INTRODUCTION**

The purpose of this report is to provide a background analysis for the preparation of an updated Municipal Plan and Development Regulations for the Town of Clarenville.

### **1.1 Town Description**

Clarenville's municipal boundaries extend well beyond its built-up areas. Including backland west of the Trans Canada Highway, the municipal area covers 141 square kilometres. The built-up area, comprising the original Clarenville and Shoal Harbour townsites, as well as newly developing areas in between, take up 12-15 square kilometres, or about ten percent of the total municipal area.

The built-up town is divided into two primary development areas – the original community of Clarenville and Shoal Harbour. The original development pattern of both communities was influenced by the landform of the area. The most amenable land for development was low-lying and relatively flat areas near Smith Sound and Shoal Harbour River. The Newfoundland railway was a major influence. Constructed in the 1890's, it winds through both communities near the banks of Smith Sound and Shoal Harbour River.

Clarenville's main built-up areas are still concentrated within a few hundred metres of the waterfront. The Clarenville portion of town extends for over 4.5 kilometres along the shoreline. In recent years, it has expanded toward the Trans Canada Highway. Whereas Memorial Drive and Marine Drive were once the main business district, the commercial centre is now concentrated along Manitoba Drive. With Manitoba Drive reaching its capacity, Shoal Harbour Drive has become the new commercial expansion area.

The Shoal Harbour portion of town lies mostly north of Shoal Harbour. Hugging the shoreline, its built-up area extends from about a kilometre upstream of the river mouth north to the Random Island causeway. Constrained from developing westward by the steep hillsides, the Shoal Harbour town site is over four kilometres in length but rarely more than 300 or 400

metres in width. While recent development has been mostly residential, the area has a number of longstanding businesses scattered along Harbour Drive and Balbo Drive.

The Clarendville and Shoal Harbour communities are physically separated by Bare Mountain. Until recently, the old Bonavista Highway (aka Memorial Drive) provided the only access between the two communities. Shoal Harbour Drive, constructed in recent years over Bare Mountain, now provides a second connection. With capacity for new development on Manitoba Drive reaching its limit, Shoal Harbour Drive has now become the dominant location for new commercial development, and is also the most promising area for residential expansion of the town.

The largest portion of Clarendville's municipal area, by far, lies outside the built-up town, mainly west of the Trans Canada Highway. These areas are notable for lakes, rivers, wetlands, valleys, and hillsides. They comprise a major portion of the town's protected drinking water supply area fed by the Shoal Harbour River watershed. The White Hills Ski Resort is also located in the backland area west of the Highway.

## **2.0 COMMUNITY PROFILE**

This section sets the context for the Clarendville Municipal Plan Review. It includes a community profile with an analysis of key economic and social indicators, a profile of the town's current population, a future population projection to 2021, and a forecast of future housing needs.

### **2.1 Economic and Social Setting**

Clarendville's population has remained stable over the past decade, particularly in comparison to the surrounding region. The 2006 population of 5,265 was 2.6% below its 1996 level of 5,335 and 3.2% above its 2001 level of 5,104. In comparison, the regional population (Discovery Economic Zone) declined by 15.9% over the same ten-year period.

During this ten-year period, the number of households in Clarendville increased by 10.8%, from 1,850 in 1996 to 2,050 in 2006. While the population changed only marginally, the increase in households resulted from smaller households. Whereas in 1996 the average number of persons per household in Clarendville was 2.9 persons, by 2006 it had dropped to 2.5 persons.

Exhibit 2.1 presents key indicators to profile Clarendville and compare it with other selected communities to be used as a benchmark. The table shows that Clarendville residents are younger on average than the benchmark communities. Its median age of 38.6 is 4.8 years younger than the Clarendville-Bonavista region, 6 years younger than Bonavista, 1 year younger than Gander, and 3.1 years younger than the province as a whole.

The other indicators in Exhibit 2.1 are consistent with the status of Clarendville as an economically thriving community. Its labour force participation rate of 63.9% is 5.0% higher than the provincial rate. The town's median household income of \$52,300 surpasses all of the benchmark communities except Gander, and is 18.6% higher than the province as a whole. The incidence of income support assistance in Clarendville, at 7.9%, is 2.6 points lower than the provincial average, while the incidence of employment insurance is 4.1 points lower.

*Town of Clarendville Municipal Plan Review  
Background Report – May 2009*

The town has a comparatively new housing stock. Over forty percent of the town's housing in 2006 was less than 20 years old, compared 29.2% in the province as whole and even lower proportions in the benchmark communities. The average residential value of \$126,400 is 13.2% higher than the provincial average, and lower than only Gander among the benchmark communities. Clarendville has a high proportion of apartment dwellings compared with the benchmark communities and the province. An estimated 29.2% of its housing is apartment units, almost double the provincial average. Rental units comprise 31.2% of its housing stock compared to 21.1% at the provincial level.

**Exhibit 2.1 – Key Indicators  
Clarendville and Benchmark Municipalities**

	<b>Claren-ville</b>	<b>Clarendville Bonavista Region</b>	<b>Bona-vista</b>	<b>Bay Roberts</b>	<b>Gander</b>	<b>Grand Falls-Windsor</b>	<b>NL</b>
Population – 2006	5,265	28,650	3,764	5,414	9,951	13,558	505,470
Population – 2001	5,104	30,285	4,021	5,237	9,651	13,340	512,980
5-Year Pop'n Change (%)	3.2%	-5.4%	-6.4%	3.4%	3.1%	1.6%	-1.5%
Median Age – 2006	38.6	43.4	44.6	40.5	39.6	42.6	41.7
Population under 15 - 2006	19.2%	15.2%	14.1%	17.7%	17.3%	15.8%	15.5%
Population over 60 – 2006	18.4%	22.9%	22.9%	19.3%	18.7%	21.8%	19.9%
No. of Dwelling Units - 2006	2,050	11,480	1,648	2,025	4,153	5,564	197,185
Avg. Dwelling Value - 2006 (\$000)	\$126.4	n/a	\$57.3	\$112.3	\$152.4	\$118.6	\$111.7
Proportion of Dwellings Constructed after 1986	40.1%	22.0%	19.5%	26.2%	26.2%	26.4%	29.2%
Single Detached Dwelling Units - % of Total Dwellings	66.6%	88.7%	90.2%	91.1%	66.1%	64.5%	73.8%
Apartment Units - % of Total	29.2%	n/a	4.4%	6.0%	20.5%	19.1%	15.8%
Rented Dwellings - % of Total	31.2%	13.5%	17.8%	14.8%	31.3%	26.8%	21.1%
Median Mortgage	\$758	\$479	\$384	\$470	\$817	\$645	\$480
Median Rent	\$500	\$500	\$475	\$554	\$571	\$550	\$551
Avg. Household Size - 2006	2.5	n/a	2.5	2.7	2.5	2.5	2.5
Median Household Income (\$000) – 2006	\$52.3	\$33.4	\$35.6	\$43.6	\$55.1	\$44.6	\$44.1
Income Support Assistance Incidence – 2007	7.9%	8.9%	16.8%	16.5%	7.4%	12.7%	10.5%
Employment Insurance Incidence - 2007	29.6%	49.5%	58.6%	37.4%	17.4%	25.5%	33.7%
Labour Force Participation	63.9%	52.9%	50.9%	56.8%	65.3%	56.4%	58.9%
Lone-Parent Families - % of Total – 2006	11.7%	13.1%	17.3%	11.7%	13.4%	15.3%	15.5%
<u>Level of Schooling – 2006</u>							
W/O High School Certif.	31.7%	41.6%	47.8%	31.9%	22.2%	32.1%	33.5%
High School Certificate	21.6%	19.7%	21.1%	25.9%	22.6%	21.6%	22.1%
Trades or Non-University	31.6%	30.6%	22.7%	29.0%	38.4%	31.9%	29.7%
University	15.1%	8.1%	8.4%	13.2%	16.8%	14.3%	14.7%

Sources: 2006 Census of Canada; Community Accounts

An overview of municipal infrastructure in Clarendville and four benchmark municipalities (Bonavista, Bay Roberts, Gander, and Grand Falls-Windsor) is provided in Exhibit 2.2. It shows that Clarendville has approximately 55 kilometres of streets or 10.4 metres of street distance per resident. This indicates that Clarendville has more streets to maintain on a per capita basis than Gander and Grand Falls-Windsor, but less than Bay Roberts and Bonavista. Compared with the most compact town, Gander, it has 76.3% more kilometres of streets per capita. This is mainly a result of the spread-out pattern of development that has historically characterized Clarendville. While more recent development is more consolidated than in the past, the servicing of spread-out areas will continue to exert an upward pressure on public works costs.

The comparison of municipal operating costs shows that Clarendville's operating costs are higher than all of the benchmark municipalities. Its 2006 expenditures of \$971 per capita were 22.8% higher than the average of the other communities. When the costs of fiscal services (interest on capital debt) are eliminated from consideration, it shows that the Clarendville's operating costs were 9.4% higher than the average of the other communities, but considerably lower than both Gander and Grand Falls-Windsor. In 2006 Clarendville's public works (i.e. transportation and environmental services) budget was \$366 per capita, more than fifty percent higher than the average of \$243 for the benchmark communities.

<b>Exhibit 2.2 – Municipal Services and Expenditures Clarenville and Benchmark Municipalities</b>					
	<b>Claren- ville</b>	<b>Bona- vista</b>	<b>Bay Roberts</b>	<b>Gander</b>	<b>Grand Falls- Windsor</b>
Kilometres of Streets (Estimated)	55	52	65	59	109
Population per Km of Road	95.7	72.4	83.3	168.7	124.4
Metres of Road per Capita	10.4	13.8	12.0	5.9	8.0
Households with Municipal Water (%)	100.0%	91.7%	83.7%	97.1%	98.4%
Households with Municipal Sewer (%)	100.0%	91.7%	83.7%	97.1%	98.4%
Municipal Budget 2006 (\$000)	\$5,112	\$2,138	\$4,232	\$9430	\$11,758
Per Capita Budget	\$971	\$568	\$782	\$948	\$867
<u>Expenditures per Capita (2006)</u>					
General Government	\$129	\$100	\$119	\$162	\$192
Protective Services	\$31	\$16	\$17	\$78	\$41
Transportation Services	\$203	\$71	\$162	\$174	\$134
Environmental Services	\$163	\$107	\$85	\$111	\$126
Planning and Development Services	\$11		\$19	\$61	\$51
Recreational and Cultural Services	\$36	\$30	\$65	\$102	\$72
Fiscal Services	<u>\$398</u>	<u>\$244</u>	<u>\$315</u>	<u>\$260</u>	<u>\$253</u>
Total	\$971	\$568	\$782	\$948	\$869
<u>Proportional Expenditures (2006)</u>					
General Government	13.3%	17.6%	15.2%	17.0%	22.1%
Protective Services	3.2%	2.8%	2.2%	8.2%	4.8%
Transportation Services	20.9%	12.5%	20.7%	18.4%	15.4%
Environmental Services	16.8%	18.8%	10.9%	11.7%	14.5%
Planning and Development	1.1%		2.4%	6.4%	5.9%
Recreational and Cultural Services	3.7%	5.3%	8.3%	10.8%	8.3%
Fiscal Services	<u>41.0%</u>	<u>43.0%</u>	<u>40.3%</u>	<u>27.5%</u>	<u>29.2%</u>
Total	100.0%	100.0%	100.0%	100.0%	100.0%

## 2.2 Population

Clarenville's population has remained stable for many years, despite a significant decline in the region as a whole. In 2006, the population was 5,265, an increase of 3.0% over the 2001 population of 5,110.

Since the 1990's, employment in the Town has remained stable. The town is expected to benefit from nearby anticipated developments such as the proposed expansion of the Come by Chance oil refinery, Bull Arm activities associated with the Hebron offshore development, and the development of the Long Harbour nickel processing plant.

Exhibit 2.3 provides a breakdown of Clarenville's population by gender and five-year age group for the Census years 2001 and 2006. As a benchmark, Exhibit 2.4 provides a similar breakdown for the province as a

whole. A comparison of the tables confirms that Clarenville's population is aging but more slowly than the province as a whole. Between 2001 and 2006, the median age of Clarenville residents increased by about one year from approximately 36 to 37. During the same period, the median age of the provincial population increased from approximately 37 to 41.

Clarenville's youth population (0-24 age group) declined slightly in absolute numbers and as a proportion of total population. In absolute numbers this group declined from 1,695 in 2001 to 1,625 in 2006. This group's proportion of total residents declined from 33.2% in 2001 to 30.9% in 2006. At the provincial level, this age group comprised 31.6% of total residents in 2001, but only 28.4% in 2006. In absolute terms, the number of residents in the 0-14 age group expanded by 4.1% over the period while the 15-24 age group declined by 15.4% from 715 residents in 2001 to 605 residents in 2006.

Exhibit 2.3											
Clarenville Population by 5-Year Age Groups - 2001 & 2006											
	2006						2001				
	M	F	Total	Percent			M	F	Total	Percent	
0-4	155	160	315	6.0%	19.4%	180	145	325	6.4%	19.2%	
5-9	190	155	345	6.6%		166	155	321	6.3%		
10-14	200	160	360	6.8%		174	160	334	6.5%		
15-19	160	175	335	6.4%	11.5%	190	180	370	7.2%	14.0%	
20-24	130	140	270	5.1%		155	190	345	6.8%		
25-29	135	170	305	5.8%		139	172	311	6.1%		56.3%
30-34	190	185	375	7.1%	195	187	382	7.5%			
35-39	220	250	470	8.9%	226	253	479	9.4%			
40-44	210	240	450	8.5%	216	243	458	9.0%			
45-49	165	195	360	6.8%	187	205	392	7.7%			
50-54	175	195	370	7.0%	198	205	403	7.9%			
55-59	170	170	340	6.5%	129	126	255	5.0%			
60-64	140	120	260	4.9%	106	89	195	3.8%			
65-69	90	110	200	3.8%	13.5%	74	82	155	3.0%	10.6%	
70-74	75	85	160	3.0%		61	63	125	2.4%		
75-79	55	75	130	2.5%		49	54	103	2.0%		
80-84	35	85	120	2.3%		31	61	92	1.8%		
85+	25	75	100	1.9%		30	35	65	1.3%		
Total	2,520	2,745	5,265	100.0%	100.0%	2505	2605	5110	100.0%	100.0%	



The number of residents in the main working age group of 25 to 64 expanded by 1.9% over the period, but declined slightly from 56.3% to 55.7% as a proportion of the town's population. This was similar to the province as a whole, where this age group expanded in the same period by 1.4% in absolute numbers and from 56.1% to 57.7% as a proportion of the total population.

The population of seniors (65+) saw the most significant change during the period. From 2001 to 2006, this age group expanded by an estimated 170 residents or 31.5%. This compares to a much smaller increase in the province as a whole of 13.6%. As a proportion of the population, however, Clarendville continues to have fewer seniors than at the provincial level. Nevertheless the rapid increase in the town's senior population over such a short period indicates that Clarendville has become a popular destination for people in their senior years. .

<b>Exhibit 2.4</b>						
<b>NL Population by 5-Year Age Groups - 2001 &amp; 2006</b>						
	<b>2006</b>			<b>2001</b>		
	<b>Total</b>	<b>Percent</b>		<b>Total</b>	<b>Percent</b>	
0-4	22,860	4.5%	15.5%	24,815	4.8%	17.3%
5-9	25,905	5.1%		29,040	5.7%	
10-14	29,455	5.8%		34,915	6.8%	
15-19	34,105	6.7%	12.9%	39,450	7.7%	14.3%
20-24	31,190	6.2%		33,870	6.6%	
25-29	27,425	5.4%		30,525	6.0%	
30-34	30,940	6.1%	57.7%	36,040	7.0%	56.1%
35-39	36,540	7.2%		41,725	8.1%	
40-44	41,665	8.2%		43,475	8.5%	
45-49	42,775	8.5%		43,285	8.4%	
50-54	42,805	8.5%		39,695	7.7%	
55-59	39,375	7.8%		30,160	5.9%	
60-64	30,160	6.0%		22,880	4.5%	
65-69	22,160	4.4%	13.9%	19,150	3.7%	12.3%
70-74	17,525	3.5%		16,275	3.2%	
75-79	13,510	2.7%		12,655	2.5%	
80-84	9,425	1.9%		8,655	1.7%	
85+	7,655	1.5%		6,305	1.2%	
<b>Total</b>	<b>505,475</b>	<b>100.0%</b>	<b>100.0%</b>	<b>512,915</b>	<b>100.0%</b>	<b>100.0%</b>

### **2.3 Future Population**

Over the next 12 years, Clarendville's population is expected to grow to 6,500. This forecast was derived through a comparison of Clarendville with the actual and projected population for the Discovery Economic Zone of which Clarendville is a part.

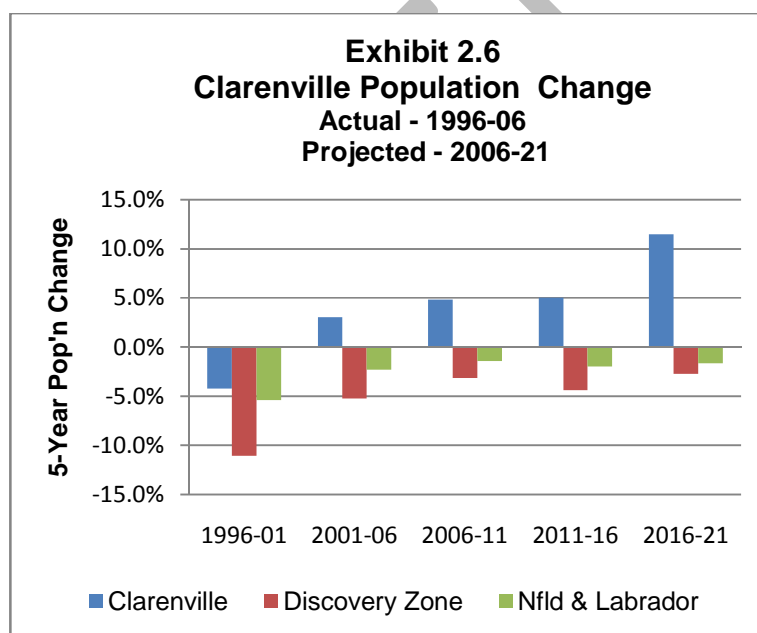
Whereas Clarendville's population increased by 3.0% between 2001 and 2006, the population of the Discovery Zone declined by 6.4%, representing a difference of 9.4% in how the two populations changed. This reflects a general migration trend in the province from outlying rural communities to larger centres. Based on the Medium Population Projection prepared by the Province (<http://www.communityaccounts.ca>), the Discovery Zone's total population is projected to decrease at a rate of 4.6% from 2006 to 2011, 4.4% from 2011 to 2016, and 2.7% from 2016 to 2021. Assuming a constant difference of 9.4% in population change between Clarendville and the region, Clarendville's population can be expected to grow at a rate of 4.8% between 2006 and 2011, 5.0% between 2011 and 2016, and 11.5% between 2016 and 2021.

Based on these assumptions, Exhibit 2.5 provides the forecast of Clarendville's population change in five-year increments from 2011 to 2021. For comparison, the exhibits include the Community Accounts population forecasts for the Discovery Zone and the province as a whole. The chart in Exhibit 2.6 compares the percentage change in Clarendville's population in five-year increments compared to the Discovery Zone and the province.

<b>Exhibit 2.5</b>						
<b>Population Forecast</b>						
<b>Year</b>	<b>Clarenville*</b>		<b>Discovery Zone</b>		<b>Province</b>	
	<b>Pop'n</b>	<b>5-Year Change</b>	<b>Pop'n</b>	<b>5-Year Change</b>	<b>Pop'n</b>	<b>5-Year Change</b>
2001	5110		30,778		521,986	
2006	5265	155	28,795	-1,983	509,940	-12,046
2011	5518	253	27,465	-1,330	502,615	-7,325
2016	5794	276	26,262	-1,203	492,684	-9,931
2021	6460	666	25,545	-717	484,503	-8,181

Source: (<http://www.communityaccounts.ca>)

\* Clarenville forecast derived from Discovery Zone forecast based on assumptions stated in text



## 2.4 Housing Demand

Exhibit 2.7 summarizes Clarenville's housing growth from 1996 to 2006 and forecasts new housing demand for the five-year Census periods from 2006 to 2021.

<b>Exhibit 2.7</b>						
<b>Housing Demand Forecast</b>						
	<i><b>Actual</b></i>			<i><b>Projected</b></i>		
	<u><b>1996</b></u>	<u><b>2001</b></u>	<u><b>2006</b></u>	<u><b>2011</b></u>	<u><b>2016</b></u>	<u><b>2021</b></u>
Population	5,335	5,110	5,265	5,518	5,794	6,460
Average Persons per Dwelling	2.88	2.70	2.56	2.40	2.25	2.10
Total Dwelling Units	1,855	1,895	2,055	2,299	2,575	3,076
New Dwellings per Census Period		40	160	244	276	501
Average per Year		8	32	49	55	100

Total new residential demand in the 15-year period from 2006 to 2021 is projected to be 1,021 dwelling units, representing an increase of almost fifty percent over the housing stock that existed in 2006. Annual requirements are expected to average 49 units in the 2007-2011 period, 55 in the 2012-2016 period, and 100 in the 2017-2021 period.

Exhibit 2.8 shows the distribution of housing in Clarendville by dwelling type. Single family units comprise approximately two-thirds of the housing stock. Apartments in duplex houses and in apartment comprise almost 30% of the total. There are relatively few semi-detached and row house units.

<b>Exhibit 2.8</b>		
<b>Dwelling Types in Clarendville</b>		
<b>Dwelling Type</b>	<b>Percent</b>	<b>Number</b>
Single-detached	66.8%	1,369
Semi-detached	1.7%	35
Row house	2.1%	43
Duplex apartment	18.6%	382
Apartment building	<u>10.8%</u>	<u>221</u>
	100.0%	2,050

Single family housing will continue to account for the majority of housing completions over the projection period. However, demographic shifts anticipated in the population profile (i.e. aging population; smaller households) suggest a gradual shift in demand toward multiple-unit housing. Sales of attached double (semi-detached) and multiple-unit dwellings are likely to increase at the expense of single-unit dwellings.

## **3.0 LAND USE ISSUES**

### **3.1 Natural Resources**

Clarendville's municipal area covers 141 square kilometres, most of which lie outside the town's main built-up area. Besides providing important habitat for fish and wildlife, these rural lands support forestry, aggregate extraction, outdoor recreation and tourism (i.e. White Hills Ski Resort), several major utility corridors, and the Town's protected water supply area. The following discussion addresses the primary land and resource uses in the town's outlying areas.

#### **3.1.1 Forest Resources**

Commercial and domestic logging are common throughout the municipal area. For the most part, this does not conflict with other land uses.

Some concern has been expressed about domestic cutting that takes place within and close to the town's built-up area. Mainly this concern is with the impact of clearcuts on viewscales within the town, particularly in areas that are valued for hiking and other recreational activities. Discussion with Ed Stewart, the District Manager of the Clarendville forestry office, indicated that a block of Crown-owned land (Block 7) within and on the outskirts of the town is designated for domestic cutting. It is used by residents to acquire firewood and sawlogs for personal consumption.

One portion of Block 7 is located in the vicinity of a favourite hiking trail and lookout site that winds along the crest of Bare Mountain. Another portion is located between Shoal Harbour Drive and the Trans Canada Highway, an area identified for future subdivision development. Other cutting areas are located south and north of Shoal Harbour River.

The District Manager indicated that no large scale clearcuts occur in these areas. Harvesting takes place in relatively small spread-out patches. Because wood is removed by snowmobiles and ATVs, ground disturbance is minimal. He indicated that these areas have a high incidence of overmature trees, which if not harvested will eventually become deadfall.

An argument can be made that forest stands close to recreational areas and within valued urban viewsapes should be harvested more selectively. As well, careful harvesting of areas identified for future residential development would provide flexibility to preserve forested sites in new subdivisions.

The Forest District does not monitor domestic harvesting on a day-to-day basis. To require selective harvesting in these areas, a community forestry approach to harvest management would be desirable. This would involve the marking of trees to be preserved, and closely monitoring harvesting to ensure this happens. Another option for the Town would be to not permit harvesting in areas it wants to preserve. This could be accomplished through policies and zoning restrictions in the municipal plan.

### **3.1.2 Aggregate Resources**

Active gravel pits and quarries are located in various locations within the Clarendville municipal area. No serious land use conflicts exist with quarries located outside the built-up townsite.

Some residents have voiced objection, however, to gravel operations within the town's developed area. The three most controversial sites include land east of Shoal Harbour Drive, near the Lori Ann subdivision on Balbo Drive, and north of Huntley Drive in Shoal Harbour. All three sites are being developed as residential or commercial land. The rationale for the gravel removal is that it was necessary to properly level and grade the sites for development.

From field observations, it is obvious that substantial quantities of gravel have been removed from these sites. Residents at the public forum described them as eyesores that undermine the beauty of the town. There was a strong nod of agreement when one person said that this type of "moonscape" development should not be permitted.

Section 4.0 on environmental issues recommends that Council enact stronger measures in the new Municipal Plan to reduce the environmental and aesthetic impacts of development. Tighter controls on gravel removal from

sites being prepared for development would complement these measures.

It is recommended that subdivision applications include an estimate of the quantity of gravel that will need to be removed to prepare the site for development. They should also specify what the finished grade of the site will be. Before approving developments that will involve substantial gravel removal or infilling, Council should consider whether this is necessary to appropriately develop the site and what the environmental and aesthetic effects will be. As much as possible Council should avoid permitting excessive cut and fill on sites. Development agreements for new subdivisions should specify what the agreed upon final grade of the site will be and this should be strictly enforced.

### **3.1.3 Drinking Water Supply**

Clarenville formerly had two protected drinking water supply areas, Shoal Harbour River and Lower Shoal Harbour River. With the completion of its new water treatment plant, the Shoal Harbour River is now its sole drinking water source. The quality of the Town's drinking water has improved enormously as a result of the treatment plant.

The water source protection area for the Shoal Harbour watershed covers an area well over 100 square kilometres, most of which is within the Clarenville municipal area. The existing Municipal Plan provides for two zones that provide different levels of source protection for the water supply area. The highest level of protection is in the Water Supply Protection zone, which provides a buffer ranging from 1-1.5 kilometres wide on each side of the Shoal Harbour River for a distance of about 8 kilometres upstream from the water intake. Conservation is the only permitted use in this zone. Passive recreation may be permitted at the discretion of Council.

The higher portion of the water supply area is zoned Watershed. Permitted uses include conservation and recreational open space. Uses permitted at Council's discretion include agriculture, forestry, mineral working, and antenna. Besides Town approval, new

developments must meet the approval and conditions of the Minister of Environment and Conservation

No changes are recommended with respect to levels of source water protection provided by these two zones. The only possible concern is that the Water Supply Protection zone does not extend downriver from the water supply intake. Steep contours in this vicinity indicate that there may be potential for runoff originating on slopes downstream from the intake to enter the river above the intake. Council may consider adjusting the zone boundary further downstream at this location as an additional precautionary measure.

## **3.2 Residential Uses**

### **3.2.1 Housing Demand**

Single-unit dwellings comprise approximately two-thirds of Clarendville's housing stock. Most of the remainder is divided between subsidiary (mainly basement) apartments and apartment building units. Semi-detached and row house dwelling units comprise less than four percent of the total. It is estimated that housing growth in Clarendville over the 15-year period from 2006 to 2021 will exceed 1,000 new units (see Section 2.4)

### **3.2.2 Housing Mix**

Single family units will continue to comprise the majority of this new demand. However, population aging and the associated trend to smaller family units suggest there increasing shift to demand for double and multiple-unit housing.

A number of participants at the public forum advocated greater integration within neighbourhoods of different forms of housing. They argued that mixed housing helps to bring together people of different abilities, ages, needs, and preferences, and provides the basis for a more diversified, inclusive, and vibrant community. Proactive land use policies and zoning would help accommodate Clarendville's needs for affordable housing, smaller homes on smaller lots, multiple-unit housing, etc.



The Rural Secretariat is presently conducting a study on housing shortages in the Clarendville-Bonavista region. In an interview, Colin Holloway of the local office said that there is a pressing need in Clarendville for more affordable housing and for higher upkeep standards of existing rental housing.

In the current Development Regulations, the Residential zone permits single and double dwellings. Subsidiary apartments are permitted in single dwellings. Row dwellings and apartment buildings can be permitted at the discretion of Council. This existing Residential zone authorizes Council to allow a mixing of higher density housing forms with single-unit dwellings. Subsidiary apartments are one of the most common means in the town to accommodate affordable housing.

A concern was raised that in some subdivisions, legal covenants are being used to require substantially larger dwellings than the minimum size set out in the zoning standards. This seems to be counterproductive to goals to increase the supply of affordable housing and create a more integrated and inclusive community.

### **3.2.3 Subdivision Development**

Residential land development has proceeded at a significant pace in recent years. Presently the Town has four new subdivisions fully or nearly completed. These have a lot capacity for estimated 200 new dwellings. Seven additional subdivisions with a capacity for over 500 new lots have received approval in principal from Council.

Spread throughout the town, these subdivisions range in capacity from 20 lots to over 100. They are located mostly in existing built-up areas of both Clarendville and Shoal Harbour. One new subdivision, Clearview Estates, is being developed on land recently opened up by the completion of the new collector road, Shoal Harbour Drive.

The capacity to develop new subdivisions in older areas of Clarendville and Shoal Harbour seems to be reaching its limit. Increasingly developers are resorting to excavating hillsides and filling in low-lying areas to make land for development. Residents have voiced concerns that this

is resulting in unacceptable environmental and aesthetic impacts. See Section 4.0 for detailed discussion of these issues.

The most suitable land for long-term residential expansion has been identified as the area between Shoal Harbour Drive and the Trans Canada Highway. Considerable interest in developing this area has been expressed to Council. The topography of area is fairly gentle. Directly west of Walmart, the land is generally flat to the Trans Canada Highway. From there it slopes gently in the direction of the Shoal Harbour River with most slopes ranging between 8 and 10 percent. There are a few areas where the slopes rise as high as 20 percent and others where it flattens out to less than 5 percent.

This area appears to be highly suitable for new subdivision developments. Planned carefully, it offers potential to create attractive and environmentally sustainable neighbourhoods. Section 4.5 provides a discussion on sustainable community design approaches that would be appropriate for this area.

### **3.3 Mixed Uses**

While Clarendville as a whole is growing steadily, this growth is not equal in all areas. Some areas, particularly the older downtown and waterfront areas along Memorial Drive and Marine Drive, have experienced some decline. A number of commercial buildings have become vacant or underused as businesses have moved to new quarters in the Manitoba Drive/Shoal Harbour Drive area.

It should be an objective of Council to encourage and facilitate new adaptive land uses and activities in these areas. The shortage of rental housing may create opportunities to reuse vacant buildings or redevelop vacant properties for apartments and other multi-unit residential buildings. A common approach used to promote development in such areas of decline is to create more flexible land use policies aimed at encouraging mixed development and reducing regulatory obstacles for development approvals.

The current zoning treatment of portions of Memorial Drive and Marine Drive is an example of land use controls that work to stymie redevelopment and reuse of land and buildings in areas suffering from decline. For example, while the area of Memorial Drive between Legion Road and Lower Shoal Harbour River has a wide mix of different land uses abutting each other, it has no fewer than seven different land use zones. These uses include houses, retail and service outlets, offices, car dealerships, strip malls, gas stations, public buildings, restaurants, bars, a motel, a greenhouse operation, and a recreation area to name a few. Anytime Council receives an application for a new development or reuse of a property that does not comply with the spot zoning, it becomes necessary to go through a lengthy amendment to the Municipal Plan.

More flexible policies and zoning regulations in these areas will improve the potential for adaptive redevelopment and reuse of properties and existing buildings. For example, vacant commercial buildings may offer potential for residential use and vice versa. Because these areas already have a mix of uses, there is minimal potential for significant land use conflicts as long as appropriate conditions are put on new developments.

### **3.4 Commercial Uses**

The current Clarendville municipal plan designates a various areas for commercial and industrial development. The main concentration of commercial development extends from Memorial Drive in the vicinity of the Clarendville Shopping Centre, along Manitoba Drive, and more recently along Shoal Harbour Drive. Other commercial areas are scattered throughout the town mainly on Memorial Drive, Marine Drive, and Balbo Drive. With Manitoba Drive developed to near capacity, the most likely area for future commercial developments is in the vicinity of Shoal Harbour Drive.

A number of highway commercial businesses, mainly hotels and service stations, are located along the Trans Canada Highway.

A number of people at the public forum lamented the lack of an identifiable town centre in Clarendville. They

felt that the spreading out of businesses that evolved over many years has reduced the town's charm to attract visitors and new residents. A case was made that Council should encourage new development to locate in key focal points such the historical area near the Clarendville shipyard. This could be achieved by promoting these locations for anchor developments such as a new courthouse or hotel.

This problem is certainly not unique to Clarendville. The rise of large and spread-out shopping areas resulted from the dominance of the automobile. Few towns have been successful in stemming the loss of old downtown commercial cores. Retail and service businesses generally want to locate where they are most accessible to automobile traffic. Mostly this is on the outskirts of towns where land is more readily available and close to highway traffic routes.

A strategy by Council to promote the revitalization of a downtown site may have potential for success. One successful example is Mount Pearl's Centennial Square. The City's strategy for Centennial Square included the redevelopment of the City Hall, the attraction of several anchor businesses, physical enhancement of the area as a public gathering place, and encouragement of a mix of storefront businesses and higher density housing. Lewisporte and Grand Falls-Windsor are embarking on similar efforts to revitalize their old downtown cores.

Probably the best opportunity for downtown revitalization in Clarendville is near the mouth of Lower Shoal Harbour River. As discussed in the preceding section, promoting this area for a mix of commercial, residential, and public buildings, and enhancing its outdoor spaces, would build on existing attractions such as the Clarendville Marina and the Elizabeth Swan Memorial Park. Another asset in this area is the now abandoned Irving Oil tank farm site, which is one of the few vacant waterfront properties remaining in the town.

### **3.5 Industrial Uses**

Industrial areas include the marine site in the vicinity of Clarendville shipyard, the Myers Place Industrial Park, and behind St. Jude's Hotel on the Trans Canada

Highway. With the industrial area on Myers Place developed to capacity, the area behind St. Jude's offers the best potential for large industrial developments. It is separated from residential areas of the town and has direct access to the Trans Canada Highway.

### **3.6 Recreation and Open Space Uses**

Recreational facilities in Clarendville include community parks, playgrounds, sports fields, hiking and ski trails, lookout sites, the Newfoundland T'Railway, the Rotary marina, and the White Hills ski resort. The old Clarendville Stadium will soon be replaced by the new Sports Centre, slated for completion in 2009. The town also has recreational resources such as snowmobile trails and swimming holes that are not part of its formal infrastructure.

Outdoor recreational needs were a hot topic at the public forum, particularly the need to protect and enhance the Town's network of trails. Concern was expressed that some existing trails are being threatened by encroaching development. Participants advocated for the incorporation of interconnecting walking and bike trails into the design of new subdivisions. They also suggested that a protected reserve corridor should be designated along the coastal shoreline to improve environmental protection, but also to facilitate public access along the waterfront.

A major recreational asset in Clarendville is the old Newfoundland railway corridor, which was converted to a provincially designated recreational trail in the nineties. It includes a 20-kilometre stretch of the former main railway line, now a part of the Newfoundland T'Railway Provincial Park. The old Bonavista Branch line follows the shoreline in Shoal Harbour for another five kilometres. These corridors permit multiple recreational uses. A controversial aspect of these trails is apparent conflict arising from motorized recreational uses within the community.

Some participants at the forum said that motorized trail use is not compatible within the town. They suggested that a new corridor for motorized vehicles could be developed outside Clarendville's built-up area. From a planning perspective, this could be accommodated by

delineating a corridor for a future bypass trail on the land use map. On the west side of the Trans Canada Highway, the distance between the east and west entrances of the T'Railway into Clarendville is approximately five kilometres. Because motorized use of the railway corridor is protected by Provincial policy, this would not allow the Town to eliminate motorized use through Clarendville, but it might help to reduce pass-through traffic.

The incorporation of walking trails into Clarendville's urban design would require the protection of more green space around and between new subdivisions. This is entirely possible, but would require some adjustment to how subdivisions are typically being designed to utilize the entire land base for new streets and building lots. To address this problem the new municipal plan could adopt policies and standards that require subdivision designs to incorporate more green spaces and corridors. As discussed in Section 4.2, strategically located green spaces would provide significant environmental benefits, particularly with respect to reducing runoff and stormwater impacts of new development.

### **3.7 Transportation**

#### **3.7.1 Road Network**

Clarendville's transportation system includes a hierarchy of roads and streets, including one major arterial road, the Trans Canada Highway, major and minor collector roads, and local streets.

Skirting the western boundary of the Clarendville's built-up area, the Trans Canada Highway extend through the municipal area for approximately 18 kilometres. It provides two main access points into the town, Memorial Drive and Manitoba Drive. Development fronting onto the Trans Canada Highway is tightly controlled in accordance with Section 8 of the Transportation and Works Act.

The existing Municipal Plan designates a corridor for a future 3.5-kilometre bypass of the existing Trans Canada Highway in Clarendville. The proposed bypass would separate from the existing route slightly east of

the Memorial Drive entrance to town and would reconnect in the vicinity of Manitoba Drive. Discussion with the Department of Transportation's Director of Highway Design indicated that the Department has no short-term plan to construct this bypass. However, he requested that this designation be maintained in the new Municipal Plan for future consideration.

There has been consideration by Council of developing a third access to the TCH west of the Manitoba Drive intersection. The consultant requested comments from the Director of Highway Design on whether this would be acceptable to the Department and how it might affect the existing entrance at Manitoba Drive. To date, no response has been received on this request.

Collector roads are used to collect and carry traffic between major points and local streets. Major collectors connect large traffic generators such shopping centres and the Trans Canada Highway, while minor collectors primarily provides access to lower traffic residential areas.

Clarendville has four major collector routes:

- Memorial Drive from the Trans Canada Highway to the Shoal Harbour Causeway (4.5 kilometres)
- Manitoba Drive from the Trans Canada Highway to Memorial Drive (2.0 kilometres)
- Shoal Harbour Drive and Harbour Drive from Manitoba Drive to the Shoal Harbour Causeway (3.5 kilometres)
- Balbo Drive from Shoal Harbour Causeway to Random Island Causeway (3.0 kilometres).

The following streets serve as minor collectors:

- Cormack Drive
- Marine Drive
- Huntley Drive

All other streets can be described as local streets. They serve mainly carry traffic to abutting properties and adjoining local streets.

### **3.7.2 Sidewalks**

Residents at the public forum stressed the importance of good sidewalks for pedestrian circulation and general



community health. The greatest sidewalk needs tend to be on collector streets where vehicle traffic is also high. Walkers use these roads to get public gathering areas such as shopping malls and recreation sites as well as between local areas. Pedestrian needs and safety concerns are much higher in these areas than on low-traffic local streets.

It is the consultant's opinion that the priority streets for the provision of high quality sidewalks and crosswalks are Memorial Drive, Manitoba Drive, Balbo Drive, and, as it becomes more developed, Shoal Harbour Drive.

### **3.8 Accessibility Standards**

Another concern raised in the public forum was that accessibility standards are inadequate for disabled and elderly residents. A follow-up meeting on the subject was held with representatives of the Independent Living Resource Centre. The goal of the organization is to educate municipalities, developers, and society as a whole to create a more acute disability lens in their everyday decision-making. The organization's efforts coincide with the designation of Clarendville as a pilot age-friendly community.

They advocated for the need to adopt and enforce stronger standards of accessibility in the design, construction, management, and maintenance of streets, sidewalks, parking areas, and buildings. They argued that policies and standards in the municipal plan should be inclusive of people with diverse needs. Accessibility standards should be considered with respect to all aspects of planning and design for transportation, housing, public and commercial buildings, recreation areas, and all public spaces.

Examples of key features that help to make a community friendlier to elderly and disabled people include:

- More and better maintained public spaces
- Outdoor seating
- Well designed and maintained pedestrian passageways and sidewalks that free of obstructions, wide enough for wheelchairs, and have drop curbs to road level.



- Good outdoor lighting along streets and public spaces
- Building and public spaces designed for accessibility, for example, ramps, railings, non-slip floors, and sufficient seating and toilets
- Parking and drop-off areas are safe, sufficient in number, and conveniently located.
- Provision of affordable housing in areas that are safe and close to services and the rest of the community.
- Housing with interior space and level surfaces that allow freedom of movement
- Conveniently located, accessible, and well-lit venues for events and social activities.
- Community emergency planning that takes account of the vulnerabilities and capacities of older and disabled people.
- Parking blue zones that are appropriately located and constantly enforced.
- Trails and playgrounds that make accommodation for access by disabled people.
- Regular clearing of snow and ice from sidewalks and access ramps.

The development a disability lens requires stronger awareness, understanding, and action by all people who can make a difference in improving the quality of life of people with diverse disabilities. In addition to municipal decision-makers, these include businesses and agencies that provide services to the public. From a municipal land use perspective, it means always keeping the needs of less able people in mind when new developments are being planned and considered for approval.

The adoption of policy statements in the new municipal plan that commit Council to always looking through a disability lens when considering development proposals and new municipal facilities would make a difference over time to enhancing Clarendville as an accessible and age friendly community.

### **3.9 Heritage Resources**

Members of Clarendville Heritage Society at the public forum stated that it is in the process of identifying buildings and sites for heritage designation. They

indicated that the old CNR railway station and property is the preferred site for a new community museum.

Council can adopt policies in the municipal plan that aim to protect important heritage sites and areas.

### **3.10 Land Ownership**

This section provides a general analysis of land ownership within and on the outskirts of the town's built-up area based on a review of maps obtained from the Crown Lands Division. The Division advised caution in interpreting the maps too literally because they are not kept regularly up to date. The delineation of private properties on the maps is only done for properties that are registered.

#### **3.10.1 Coastal Area**

Along the town's coastal area, the maps indicate that land ownership close to the shoreline is highly fragmented between Crown and private ownership. The extent to which a Crown shoreline reserve may exist is uncertain, as the maps show quite a few private land boundaries extending to the shoreline.

Due to the environmental sensitivity of the coastal zone, there is strong justification to designate an environmental protection buffer within a reasonable setback from the shoreline. Some jurisdictions, for example New Brunswick, have coastal policies to limit development on all coastal features such as beaches and rock platforms as well within an additional 30-metre setback on the landward side of coastal features. This policy, however, would grandfather existing individual lots in built-up areas. The policy has not yet been adopted as an enforceable regulation.

While there is environmental justification for a coastal buffer zone that restricts new development, private ownership of land to the shoreline would constrain the use of this buffer for public access to the waterfront. Further analysis is recommended to clearly identify sections that are under Crown ownership and sections that are privately owned.

### **3.10.2 Bare Mountain**

The Crown Land maps show that most of the land in the vicinity of Bare Mountain Trail is owned by the Crown. Because the trail runs close to the bluff of Bare Mountain, the area is environmentally sensitive to built-up development. The consultant's opinion is that this area should be designated as open space to protect the integrity of this area for public recreation and environmental protection of the adjacent steep slopes.

### **3.10.3 Shoal Harbour River**

For the most part, land on both sides of Shoal Harbour River upstream from the new water treatment plant are under Crown ownership. One exception is a block of approximately 6 hectares on the north side of the river adjacent to the water supply intake.

### **3.10.4 Dark Hole Brook**

The Dark Hole Brook area east of the Trans Canada Highway is shown on the maps as mostly Crown-owned land. This area is also traversed by a smaller brook that originates in the Bare Mountain/Manitoba Drive area. The close proximity of both watercourses to each other indicates that this is an ecologically rich and sensitive area. Other factors contributing to its sensitivity include some seasonal flood areas and wetlands and a nearly vertical and waterfall abutting the south side of T'Railway corridor.

Due to its environmental sensitivity, it is recommended that in addition to establishing 30-metre environmental buffers along both watercourses, the entire area of Crown-owned land upstream from the cleared trailer park site be designated for environmental protection.

### **3.10.5 Between Shoal Harbour Drive and Trans Canada Highway**

Immediately west of Shoal Harbour Drive in the vicinity of Walmart, the maps show an area of private land estimated to be about 60 hectares in size. North of this site, the entire area bounded on the east by Shoal Harbour River and on the west by the Trans Canada Highway is shown as Crown land. As discussed in the Section 3.2.3, the majority of this area appears to be very suitable land for development.

## **4.0 ENVIRONMENTAL ISSUES**

Environmental concerns related to land development dominated the discussions in the community consultation sessions. Participants overwhelmingly advocated the need for higher environmental and aesthetic standards, more green space, provision of trails and sidewalks, better runoff controls, and protection of environmentally sensitive areas.

### **4.1 Watercourses and Wetlands**

A watercourse is defined as a body of freshwater such as a stream, river, brook, lake, pond, estuary or other natural channel that conveys or contains water, whether the flow is continuous or not.

A wetland is defined as an area of land whose soil is saturated with moisture either permanently or seasonally. Wetlands include swamps, marshes, fens, and bogs. The water found in wetlands can be freshwater, saltwater, or a brackish mix of both.

Most watercourses and wetlands in the Clarendville municipal area are contained in the watersheds of three rivers— Shoal Harbour River, Lower Shoal Harbour River, and Dark Hole Brook. The upper watersheds of each of these systems are characterized many wetlands and some larger ponds and lakes. The outlets of all three rivers empty into Smith Sound within the built-up area of the town. Because of the town's hilly topography, there are numerous continuous and intermittent small streams that carry rainfall and snowmelt to one of these rivers or directly to saltwater. Because of the topography, there are few significant wetlands within the built-up area.

Watercourses and wetlands serve many hydrological and ecological functions. They provide habitat for aquatic and terrestrial species, maintain biodiversity, provide clean water, support recreational activities, and enhance the beauty of the natural environment. They are also very environmentally sensitive to development and human activity.

There is growing awareness about the need to establish protective vegetated buffers next to watercourses,

wetlands, and floodplains. Natural soils and vegetation in riparian areas play a vital role in maintaining biodiversity and clean water. The conservation benefits can include:

- Maintaining the biological, physical, and chemical integrity of water resources
- Slowing, dispersing, and storing stormwater runoff to filter sediments and remove nutrients, metals, and bacterial pollutants,
- Infiltrating storm runoff
- Stabilizing stream banks and preventing erosion of soils and vegetation
- Protecting fish and riparian wildlife habitat
- Sustaining biodiversity of plant and animal species
- Maintaining the base flow of streams
- Contributing organic matter as a source of energy for the aquatic ecosystem
- Providing tree canopy to shade streams and control water temperature
- Providing scenic and recreational value

Literature on the subject varies as to the most appropriate width of riparian buffer zones. While Provincial regulation generally requires the maintenance of a 15-metre buffer, 30-metres is increasingly becoming the standard. Some municipalities treat 30 metres as the base width and may require additional buffer where slopes are steep or the buffer lacks adequate vegetation.

Buffers are generally regulated to maintain natural soils and vegetation, prohibit buildings and other “hard” developments, and restrict direct channelling of stormwater into the watercourse. Low-impact developments such as hiking trails, small accessory buildings, and minor structures such as lookout platforms tend to be permitted with conditions.

Clarendville’s existing Municipal Plan delineates a conservation buffer along portions of some watercourses, including Dark Hole Brook, Shoal Harbour River, and the estuaries of both Shoal Harbour River and Lower Shoal Harbour River. However, buffers do not exist along major sections of these watercourses, or around any wetlands.

It is recommended that 30 metres be adopted as the standard buffer width for watercourse and wetland protection. In areas of existing development, Council may wish to allow narrower buffers (Provincial minimum is 15 metres) to accommodate existing and approved developments. New streets and subdivision lots would not be located within such buffers. Certain low-impact land uses such as trails and minor accessory buildings could be permitted at Council's discretion.

#### **4.2 Stormwater**

As Clarendville grows development has expanded into the higher hillsides behind Clarendville and Shoal Harbour. The topography of these areas varies between moderate to steep slopes with relatively few flat areas. Under undisturbed conditions, the runoff effect of the sloping terrain is moderated by porous soils and continuous forest cover, which promote good infiltration of rainwater and snowmelt.



Mud plume in Dark Hole Brook

As the hillsides are cleared of trees and the soils are covered by housing and pavement, the landscape loses its natural infiltration capacity. Increased overland flows of stormwater are directly proportional to reduced infiltration caused by impervious groundcover. Effects include higher erosion, sediment loads, and stormwater discharges that can overwhelm the natural carrying capacity of streams. Rapid increases in water volume and flow velocity can have a dramatic erosive effect on stream beds and banks, eliminating depressions and eddies that provide refuge and

habitat for aquatic species. The U.S. Environmental Protection Agency writes that, "As little as 10 percent impervious cover on a landscape can result in stream degradation."

Excessive stormwater discharges into watercourses can significantly reduce fish populations and species



diversity. Suspended sediments increase turbidity, scour streams of vegetation, raise summer temperatures, increase nutrient and metal contamination, and damage fish gills. Physical and hydrological changes during early stages of urban development usually have the most severe impacts on stream biodiversity. Incremental change after this point is less pronounced essentially because most of the potential damage has already occurred.



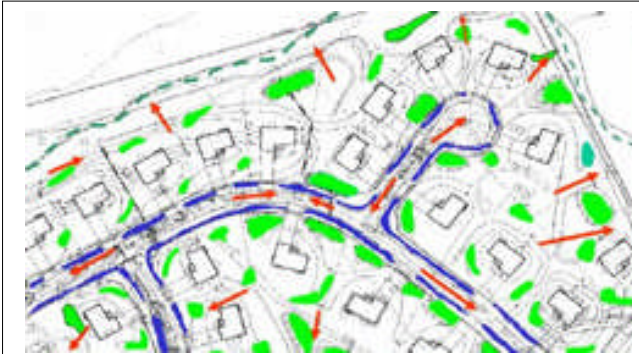
Lower infiltration caused by impervious ground cover also reduces groundwater storage needed to maintain stream flows in dry periods. This in turn reduces habitat quality and the ability of streams to flush pollutants from urban runoff.

Conventional stormwater management removes runoff from developed areas as quickly as possible. Storm sewer systems and landscaping are designed to drain the site, collect the water together, and drain it to a nearby watercourse. Pollutants that accumulate on streets, lawns and parking lots include sand and gravel sediments, oil, heavy metals, road salt, fertilizers, pesticides, and bacteria from garbage and pet excrement. Conventional stormwater practices facilitate the entry of these pollutants into natural waterways.

Discussions with Clarendville residents and Town staff revealed that stormwater problems have increased in frequency and severity in recent years. Mud plumes seen in streams and Smith Sound are not uncommon. While the problem may be attributed in part to inadequate drainage controls around construction projects, general urban runoff is a significant cause as well.

Recent innovations in stormwater management derive from the idea that runoff should be managed as close as possible to its source. A new approach referred to as Low Impact Design (LID) aims to replicate how nature manages rainfall and snowmelt. The ultimate objective of LID is to maintain site runoff at levels that existed before the site was cleared of vegetation. LID uses

natural landscape features and site design techniques that promote water infiltration as opposed to flushing it to nearby watercourses. Rather than concentrating flows, runoff is dispersed in smaller quantities to multiple locations where the impact is less. LID also promotes landowner practices that reduce runoff, for example, maintaining natural groundcover and vegetation, draining roof water to rain barrels, planting rain gardens, and directing roof and driveway drainage to grassed swales or natural depressions on the lot.



Low impact design

Natural forests are the most absorbent landscapes. Preserving or restoring forested land within the urban landscape is an extremely effective way to reduce runoff volumes. Absorbent soils in forested areas typically have the capacity to retain and infiltrate large volumes of runoff. Dispersing runoff from rooftops and paved surfaces into adjoining forested areas is a worthwhile infiltration strategy.



Roadside swale

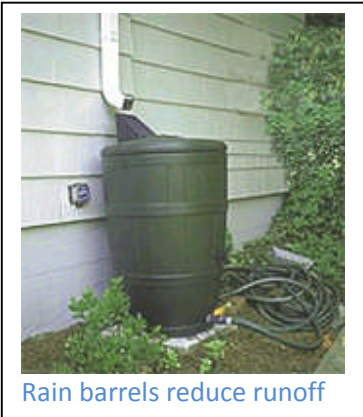
The LID approach has been proven to substantially reduce stormwater loads and sustain water quality, stream habitat, and groundwater storage. By preserving green space, it helps to retain the natural beauty of the landscape.

LID offers potential as well to reduce site development and infrastructure costs compared to conventional design. Cost savings can be realized in site preparation, grading, landscaping, and reduced requirements for stormwater infrastructure such as curb and gutter, catch basins, underground drainage pipes, and detention ponds. With less infrastructure to maintain, lower costs are also possible for municipal public works. Having to leave a higher proportion of land undeveloped may entail higher upfront costs for developers, but the upside is that development and infrastructure costs tend to be lower and property values higher in LID subdivisions.



Common Low Impact Design techniques include:

1. Reduction of impervious surfaces, for example, through narrower road and driveway widths and smaller parking lots.
2. Retention of more green space where runoff can be directed and allowed to soak into the ground.
3. Reduction of runoff from individual properties, for example, by maintaining natural soil surfaces and vegetation, directing roof and driveway drainage to grass swales and rain gardens, using rain barrels, and keeping grass longer to promote infiltration. In some jurisdictions such measures are required by regulation, but mostly it is encouraged through public education.
4. Wider vegetated buffer zones around streams and wetlands.
5. Planting of grass and other vegetation in drainage ditches and on exposed gravel surfaces, especially new construction sites.
6. Dispersing rather concentrating stormwater drainage.
7. Reducing stormwater pollution, for example, by cleaning up pet waste regularly and reducing pesticide and fertilizer use



Rain barrels reduce runoff



Grass swales infiltrate runoff



Rain gardens infiltrate runoff

The illustrations on the left demonstrate some typical LID techniques.

It is recommended that Clarendville's new Development Regulations establish stormwater management guidelines aimed at reducing the environmental impacts of land development. The Regulations should also require detailed stormwater management plans with subdivision applications. Subdivision approvals should be contingent on how well the stormwater plan meets the Town's guidelines.

### **4.3 Steep Slopes**

Land with a 0-3 percent slope is generally free of limitations, but often has poorly drained soil. Most wetlands are found in this slope category.

Slopes ranging from 3 to 15 percent are normally free from most development limitations. Problems may arise on slopes in the higher end of this range. However, difficulties with road and driveway construction, installation of water and sewer, stormwater run-off, soil erosion, and increased construction costs can usually be overcome with careful site planning.

Slopes ranging from 15 to 25 percent present considerable development limitations that are difficult and expensive to overcome. Typical problems encountered include tree cutting, increased need for cut-and-fill operations, changes to surface and subsurface water flows, significant soil erosion, and loss of scenic quality.

Slopes greater than 25 percent are vulnerable to any type of development. Environmental impacts are extremely difficult to avert or mitigate no matter how elaborate proposed engineering or construction

Given Clarendville's steep terrain, the Town would benefit from precautions to reduce the risk of environmental and scenic impacts, damage to properties, and costly maintenance and remediation measures.

The following are typical steep slope guidelines to encourage development forms that are environmentally sustainable and help to maintain the natural beauty of the urban landscape.

1. Minimize removal and disturbance of vegetation and sub-soils.
2. Use lot configurations and building designs that adapt to the topography rather than creating large flat lots through cut and fill.

3. Allow more flexible setbacks and building location standards to minimize the need for cut and fill and other site disturbances.
4. Protect sensitive features such as rock outcroppings, trees, natural channels, and ridgelines.
5. Incorporate erosion controls during the construction phase, and adopt measures to prevent erosion from the finished site.
6. Balance the desire for views with the need to maintain vegetation.
7. On more sensitive sites, require the preparation of a geotechnical report to identify how to minimize risk of erosion, subsidence, and stormwater hazards, as well as to ensure infrastructure will be sustainable.

It is recommended that slopes greater than 25 percent be excluded from all forms of development. For slopes in the 15-25 percent range, it is recommended that proposed developments be subject to appropriate guidelines and approvals aimed at minimizing environmental impacts and maintaining natural scenery.

#### **4.4 Coastal Area**

Stretching through the town for over ten kilometres, Clarendville's coastal shoreline is characterized by stunning scenery, rocky outcrops, beaches, and estuaries at the outlets of Shoal Harbour River and Lower Shoal Harbour River.

Clarendville's coastal zone includes two estuaries at the outlets of Shoal Harbour River and Lower Shoal Harbour River. Due to mixing of fresh and salt water;

estuaries are particularly rich ecosystems that provide food and habitat for many aquatic species. They can also be very sensitive land development and human activity.

Development close to the shoreline is extensive in the Clarenville portion of the town. Land uses include



shorefront residential properties, industrial uses in the vicinity of the Clarenville Shipyard and Newfoundland Hardwoods, and the road hugging the shore to Shoal Harbour. The outlet of Shoal Harbour River and its estuary also have significant waterfront development. North of Shoal Harbour, the coastal zone is mostly cushioned from development by the old railway corridor, which is now used as a recreational trail.

Coastal land can be very sensitive to the impacts of development and human activity. There is growing concern throughout the province that demand for waterfront homes, commercial establishments and recreational activities are stressing coastal environments.

A suggestion was made at the public forum that the Town should designate a reserve corridor along the shoreline for environmental protection and public access to the waterfront. Many towns in the province have established coastal conservation buffers in their municipal plans. Several provinces, including Newfoundland, are reviewing their coastal policies in light of development pressures, rising public alarm, and concerns about climate induced sea-level rise. New Brunswick has advanced the most in this regard. It has a coastal areas protection policy, which proposes to strictly limit waterfront development in a buffer area extending from the low-tide mark to a point 30-metres

inland from the edge of identified coastal features such as a beach, rock platforms, and salt marshes.

The potential for significant subdivision development close to Clarenville's shoreline is limited by the shortage of remaining developable land. A coastal protection zone would however restrict any infill development from encroaching too close to the shore.

It is recommended that Clarenville establish a coastal conservation buffer at least 15 metres wide. In some areas, for example between Shoal Harbour and Random Island Causeway and in Crown-owned areas, Council may want to consider wider buffers.

#### **4.5 Sustainable Community Design**

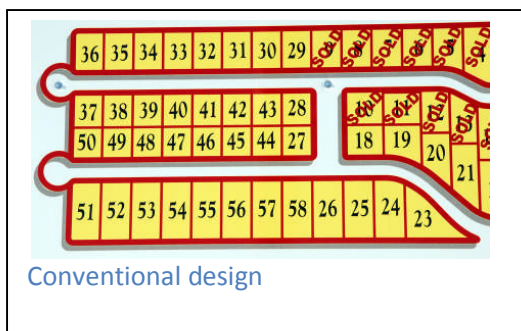
Many of the ideas and concepts presented in the foregoing analysis are referred to by terms such as Low Impact Design, Smart Growth and Sustainable Community Design. While such terms are relatively new, the idea of managing growth to reduce environmental impacts make towns more naturally scenic and socially inclusive, and less costly to build and maintain is almost as old as urban planning itself. More and more communities are incorporating the principles of sustainable design into their land use decisions.

In towns like Clarenville, sustainable design is a feasible alternative to conventional cookie-cutter subdivisions. Sustainable design is best described as land use practices that enhance the quality of life in communities, preserve the natural environment, and save money over time. The aim is to limit costly sprawl, use tax dollars more efficiently, and create more liveable communities.

Conventional subdivisions are typically developed by clearing and bulldozing first then landscaping and replanting later. The illustration to the left demonstrates how conventional subdivisions are usually designed.

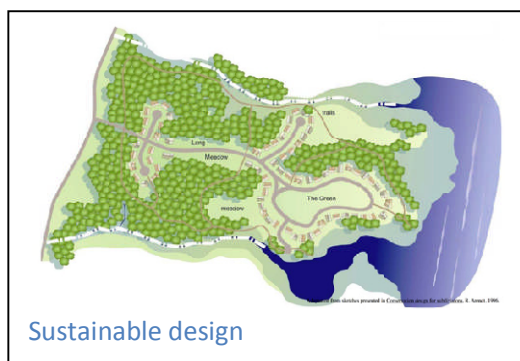


Conventional design normally involves the following steps:



1. Lay out streets
2. Draw in lot lines
3. Locate home building sites on the lots
4. If remaining land is available, identify open spaces

In contrast, sustainable subdivisions work with the natural landscape. Incorporation of open space is a fundamental aspect of design. It aims to create a stronger connection between people and nature and create a more “walkable” community. Sustainable design neighbourhoods promote lower reliance on cars, good health, and a strong sense of community. They often allow for a greater mixture of housing types to accommodate the diverse needs of residents.



Sustainable community design typically involves the following sequence of steps:

1. Identify natural areas to be preserved and protected
2. Locate sites for homes
3. Align streets, trails, and open space with home sites
4. Draw in the lot lines