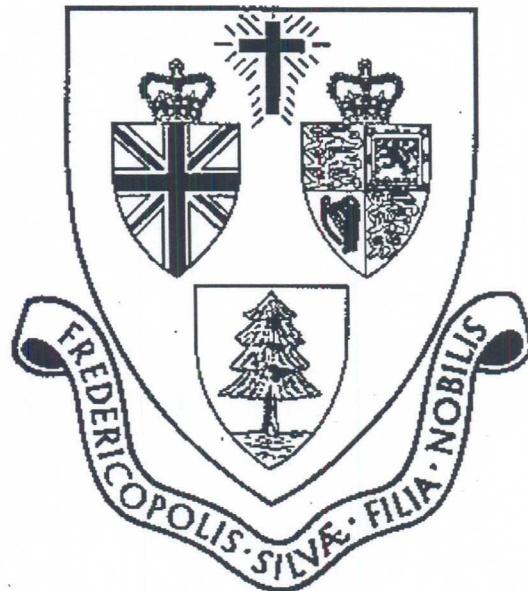


ANNUAL REPORT
OF THE ENGINEERING AND PUBLIC
WORKS DEPARTMENT
1997



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TO HIS WORSHIP THE MAYOR AND COUNCILORS OF THE CITY OF FREDERICTON

I submit herewith this report which is a statement of work done under the supervision of the Director of Engineering and Public Works.

This report covers the period from 1997 01 01 to 1997 12 31 and is written for the purpose of maintaining an accurate record on file of the activities and costs associated with the various operations.

During the year, along with regular maintenance, City forces and Contractors constructed the following works:

Concrete Curb and Gutter		13.087 km
Sidewalk		6.171 km
New Street Construction		2.486 km
*	New Pavement - Type "B" Asphalt Concrete	3.609 km
	Resurface - Type "D" & "C" Asphalt Concrete	11.542 km
	Gravity Sanitary Sewer Mains	8.086 km
	Storm Sewer Mains	4.843 km
	Water Mains	9.238 km
	Sanitary Sewer Force main	- km

* Type "D" asphalt concrete was also placed on streets in new subdivisions. This was paid for by developers under Local Improvement Agreements.

ALSO

- 208 Water services were installed
- 207 Sanitary sewer services were installed
- 185 Storm sewer services were installed
- 1586 New water meters were installed

Contractors under contract with the Engineering and Public Works Department of the City of Fredericton in 1997 supplied materials, completed construction or began construction, as follows:

Elm City Paving Ltd.	-	Supply of Asphalt Concrete for Patching
Charmac Construction Company Limited	-	Bishop Drive Servicing and Roadway Construction
Diamond Construction (1961) Limited	-	Supply and Delivery of Granular Material
Charmac Construction Company Limited	-	Supply and Delivery of Bedding Sand
Wendell Thomas & Sons Ltd.	-	Supply and Delivery of Subsoil
Fairville Construction Ltd.	-	Brunswick Street Trunk Sewer and Water Main Upgrading Phase 9
Prospect Contractors Ltd.	-	Diamond Street Booster Station
Northside Ready Mix	-	Supply and Delivery of Concrete
Elm City Paving Ltd.	-	Supply and Placement of Asphalt Concrete
Sandi-Co Inc.	-	Supply and Delivery of Winter Sand
Cargill Salt	-	Supply and Delivery of Highway Salt
Laurentide Atlantic Limited	-	Supply of Traffic Lane Striping Paint
Trius Taxi Ltd.	-	Garbage Collection Services
Mira Construction	-	Installation of Curb and Gutter and Sidewalk
Rainsford Contracting Ltd.	-	Contract Services
Fairville Construction Ltd.	-	Water and Sewer Services Douglas Area Phase 8
Nautilus Construction & Rentals Ltd.	-	Storm and Sanitary Sewer and Water Main upgrading and Extensions Brookside Drive Area - Contract I
Charmac Construction Company Limited	-	Sanitary Sewer and Water Main Extensions - Brookside Drive Area - Contract II

- | | | |
|--------------------------------------|---|-----------------------------------------------------------------------------------------|
| Hogan Paving Ltd. | - | Supply and Placement of Asphalt Concrete
on Municipal Trenches |
| Charmac Construction Company Limited | - | Reconstruction of Matthews Court |
| Fairville Construction Ltd. | - | College Brook Sanitary Sewer Phase I |
| Charmac Construction Company Limited | - | Installation of Water and Sewer Services
Bishop Drive/St. Roch Street (Hanwell Road) |
| Hazen Thomas & Sons Contracting Ltd. | - | St. John Street Storm Sewer Upgrading |

General Fund expenditures for the period 1997 01 01 to 1997 12 31 were as follows:

ITEM	BUDGET	NET EXPENDITURE	OVER	UNDER
COMMON SERVICES (Public Works)	\$4 137 990	\$4 140 195	\$ 2 205	-
ROAD TRANSPORT SERVICES				
Administration	\$ 236 048	\$ 224 015	-	\$ 12 033
Roadway Surfaces	\$ 887 931	\$ 676 481	-	\$ 211 450
Sidewalk Maintenance	\$ 490 994	\$ 401 922	-	\$ 89 072
Culverts, Ditching	\$ 56 846	\$ 56 624	-	\$ 222
Storm Sewer Maintenance	\$ 170 742	\$ 121 095	-	\$ 49 647
Street Cleaning	\$ 423 844	\$ 456 175	\$ 32 331	-
Sanding & Salting & Snow Control	\$ 1 397 264	\$1 914 096	\$ 516 832	-
Street Lights	\$ 711 322	\$ 776 320	\$ 64 998	-
Traffic Services	\$ 458 838	\$ 450 928	-	\$ 7 910
ENVIRONMENTAL HEALTH SERVICES				
Garbage & Waste Disposal	\$ 481 700	\$ 521 019	\$ 39 319	-
Garbage & Waste Collection	\$ 451 500	\$ 466 206	\$ 14 706	-
Recycling	\$ 139 400	\$ 128 250	-	\$ 11 150
Hazardous Waste	\$ 6 336	\$ 5	-	\$ 6 331
Recycling Recovery	(\$ 7 000)	\$ 6 019	\$ 13 019	\$ -
PARKS & TREES SERVICES				
Wilmot Park	\$ 58 945	\$ 27 306	-	\$ 31 639
Odell Park	\$ 92 379	\$ 67 994	-	\$ 24 385
Carleton Park	\$ 11 618	\$ 8 608	-	\$ 3 010
Old Government House	\$ 14 634	\$ 10 964	-	\$ 3 670
Trees	\$ 398 977	\$ 425 631	\$ 26 654	-
Greens, Benches, Other Parks, etc.	\$ 185 347	\$ 235 006	\$ 49 659	-
Old Burial Ground	\$ 13 820	\$ 10 728	-	\$ 3 092
TOTALS	\$10 819 475	\$11 125 587	\$ 759 723	\$ 453 611

Utility Fund expenditures for the period 1997 01 01 to 1997 12 31 were as follows:

ITEM	BUDGET	NET EXPENDITURE	OVER		UNDER
			OVER	UNDER	
COMMON SERVICES					
General Equipment	\$ 703 698	\$ 552 369	-		\$ 151 329
Safety & Benefits	\$ 353 197	\$ 288 408	-		\$ 64 789
Administration	\$ 192 771	\$ 217 561	\$ 24 790		\$ -
WATER					
Purification & Treatment	\$ 377 248	\$ 311 554	-		\$ 65 694
Source of Supply	\$ 434 854	\$ 419 014	-		\$ 15 840
Power & Pumping	\$ 47 797	\$ 42 718	-		\$ 5 079
Maintenance of Equipment (Plant)	\$ 98 953	\$ 54 003	-		\$ 44 950
Transmission & Distribution (Oper)	\$ 293 933	\$ 220 566	-		\$ 73 367
Transmission & Distribution (Maint)	\$ 944 751	\$ 770 257	-		\$ 174 494
Billing & Collection	\$ 202 030	\$ 141 823	-		\$ 60 207
Meters	\$ 311 366	\$ 352 936	\$ 41 570		-
SANITARY SEWER					
Operation (Lift Stations)	\$ 126 361	\$ 90 325	-		\$ 36 036
Maintenance	\$ 632 379	\$ 481 626	-		\$ 150 750
Treatment & Disposal	\$1 518 262	\$1 538 449	\$ 20 187		-
FISCAL SERVICES					
Funding (Current Year's Capital Projects)	\$ 4 900 000	\$ 4 509 254	-		\$ 390 746
TOTAL					
	\$11 137 600*	\$9 990 866*	\$ 86 547		\$1 233 281

*Surplus does not take into account revenues (budgeted or actual)

Following is a table giving total kilometrage (as of 97 12 31) of municipal roads and streets, provincial designated and regional highways and provincial by-passes & ramps divided with respect to type of surface on the various streets.

LOCATION	MUNICIPAL ROADS & STREETS				DESIGNATED & REGIONAL HIGHWAYS (Asphalt)	T.C.H. BY-PASSES & RAMPS (Asphalt)
	Asphalt	Gravel	Chip Seal	TOTAL		
Fredericton South	110.895	-	3 423	114.318	21.191	27.932
Fredericton North	21.856	0.029	0.578	22.463	9.008	1.378
Nashwaaksis	58.386	1.669	1.700	61.755	2.580	8.194
Marysville	24.609	0.304	0.792	25.705	5.563	3.007
Barker's Point	8.267	-	0.418	8.685	2.037	4.428
Silverwood	4.428	-	0.184	4.612	-	2.748
Garden Creek	17.881	1.101	1.734	20.716	-	2.482
Douglas	3.871	0.511	0.359	4.741	2.560	-
Lincoln	3.633	0.502	0.879	5.014	6.695	2.458
Lower St. Marys	1.970	-	-	1.970	-	2.681
TOTALS	255.796	4.116	10.067	269.979	49.634	55.308

TOTAL (Municipal, Designated & Regional Highways) = 319.613

Following in the body of this report is a detailed statement of the work done, associated expenditures and unit costs for the various operations. The report of any particular division may be found by referring to the index.

Respectfully submitted,

Garnet Hetherington, P. Eng.

GENERAL FUND

COMMON SERVICES

The total net expenditure under this heading was **\$ 4 140 195** made up as follows:

Administration	\$ 129 534	
Engineering Services	\$ 600 651	
General Equipment	\$1 988 005	
Service Depots	\$ 407 543	
Safety & Benefits	<u>\$1 014 462</u>	\$ 4 140 195

ROAD TRANSPORT SERVICES

Road Transport Services is made up of the following items:

Administration	\$ 224 015	
Roads & Streets	\$3 626 393	
Street Lighting	\$ 776 320	
Traffic Services	<u>\$ 450 928</u>	\$ 5 077 656

(a) **Administration:** The total net expenditure under this heading amounted to **\$ 224 015** for personnel costs, general services, etc.

(b) **Roads & Streets:** The total net expenditure under this item was made up as follows:

(1)	Roadway Surfaces (maintenance)	\$ 676 481	
(2)	Sidewalk Maintenance	\$ 401 922	
(3)	Culverts & Ditching	\$ 56 624	
(4)	Storm Sewer Maintenance	\$ 121 095	
(5)	Street Cleaning	\$ 456 175	
(6)	Winter Maintenance	<u>\$ 1 914 096</u>	\$ 3 626 393

The expenditures for the above items, as well as a brief description of work done, are summarized as follows:

(1) Roadway Surfaces (Maintenance)

The net expenditure of **\$676 481** was made up as follows:

Paved Streets Maintenance	\$ 320 065
Curb & Gutter Repair	\$ 132 516
Right-of-way Maintenance	<u>\$ 223 900</u>
	\$ 676 481

Paved Streets This includes the patching and repairing of pavement and the asphalt concrete resurfacing program.

The following streets or portions of streets were resurfaced in 1997. Class I Type "C" and Class II Type "D" asphalt concrete was used.

CLASS I TYPE "C"

Location	Length (metres)
Canada Street (Civic #337 to Marysville Street)	652
Clements Drive (Gesner Lane to Grasse Circle)	479
Dundonald Street (York Street to Regent Street)	396
Dundonald Street (Northumberland Street to near York Street)	350
Golf Club Road (Woodstock Road to Birdie Court)	675
Hanwell Road (Selected Sections)	167
Hanwell Road (Hermitage Court to the Walking Trail)	396
King Street (Northumberland Street to Smythe Street)	200
Riverside Drive (Watters Drive to Sumac Street)	762
Royal Road (Selected Sections)	245
Smythe Street (Saunders Street to Victoria Street)	365
St. Mary's Street (Selected Sections)	300
Union Street (Miles Street to the Underpass)	360
Westmorland Street (Brunswick Street to Dundonald Street)	840
Wilsey Road South (Selected Sections)	200
York Street/Priestman Street (Pederson Crescent to Priestman Street)	<u>575</u>
	TOTAL
	6962

CLASS II TYPE "D"

Aberdeen Street (Regent Street to Church Street)	398
Ayres Street	226

CLASS II TYPE "D" (continued)

Location	Length (metres)
Charlotte Street (Carleton Street to Regent Street)	198
Church Street (George Street to Charlotte Street)	122
Cochrane Street	114
Douglas Avenue (Maple Street to the River)	542
Dover Crescent	265
Leeds Drive	506
Marysville Street	122
Massey Street	547
Oxford Street (York Street to Eglinton Street)	314
Southampton Drive	820
Wetmore Road (Chandler Drive to Pugsley Street)	168
Rookwood Avenue (Woodstock Road to Saunders Street)	238
<hr/>	
TOTAL	4580

(2) Sidewalk Maintenance

The net expenditure of \$ 401 922* for sidewalk repairs was made up as follows:

Personnel Costs	\$ 114 496
Materials, use of equipment &	
contract services	<u>\$ 287 426</u> \$ 401 922

*Includes costs of \$258 484 associated with Special Projects - Sidewalk Maintenance

(3) Culverts and Ditching

- The maintenance and installation of culverts and ditches.

The net expenditure of \$ 56 624 was made up as follows:

Personnel Costs	\$ 23 026
Materials	\$ 11 185
General Services (use of equipment &	
contract services)	<u>\$ 22 413</u> \$ 56 624

(4) Storm Sewer Maintenance

- The flushing of mains, cleaning and repair of catch basins and the repair of mains.

The net expenditure of \$ 121 095 was made up as follows:

Personnel Costs	\$ 54 684
Materials	\$ 10 920
General Services (use of equipment &	
contract services)	<u>\$ 55 491</u> \$ 121 095

(5) Street Cleaning and Flushing

The City of Fredericton used a number of sweepers, trackless units and a Vac-all unit for street cleaning purposes in 1997.

The net expenditure under this heading amounted to \$ 456 175 and was made up as follows:

Personnel Costs	\$ 270 616
General Services (use of equipment &	
contract services)	<u>\$ 162 273</u>
Goods (brooms, litter cans, dust control)	<u>\$ 23 286</u> \$ 456 175

(6) **Winter Maintenance**(a) **Sanding and Salting Streets and Sanding Sidewalks**

Storing sand and salt in winter storage piles and spreading same on slippery streets and sidewalks.

(b) **Snow Control**

Blowing, shoveling and hauling snow, plowing or scraping roads, cleaning gutters, thawing catch basins and any other means of snow control.

The City of Fredericton was responsible for plowing, sanding and salting 334.161 km of roads and streets in 1997 (160.250 km on the north side and 173.911 km on the south side). Included in these figures is the Westmorland Street Bridge along with adjacent highways and ramps which are maintained through an agreement with the Department of Transportation.

During the winter months of 1997, 187.397 km of sidewalk were plowed and sanded. (72.912 km on the north side and 114.485 km on the south side).

Streets:

The total net cost for **plowing streets** amounted to **\$ 946 997** and was made up as follows:

Personnel Costs	\$ 570 982
General Services (use & maintenance of equipment)	\$ 358 775
Goods	\$ 2 963
General Equipment	<u>\$ 14 277</u>
	\$ 946 997

The total net cost of **sanding and salting streets** amounted to **\$ 689 405** and was made up as follows:

Personnel Costs	\$ 280 817
General Services (use & maintenance of equipment)	\$ 95 848
Materials (salt and sand)	\$ 296 483
General Equipment	<u>\$ 16 257</u>
	\$ 689 405

The overall net expenditure of **\$ 1 636 402** for **plowing, sanding and salting** City roads and streets was made up as follows:

Personnel Costs	\$ 851 799
General Services (use & maintenance of equipment)	\$ 454 623
General Equipment	\$ 30 534
Materials (salt & sand)	\$ 296 483
Goods	<u>\$ 2 963</u>
	\$ 1 636 402

Sidewalks:

The total net expenditure for **plowing sidewalks** amounted to **\$ 186 544** and was made up as follows:

Personnel Costs	\$ 114 196
General Services (use & maintenance of equipment)	\$ 71 755
Goods	\$ 593

\$ 186 544

The total net expenditure for **sanding sidewalks** amounted to **\$ 91 077** and was made up as follows:

Personnel Costs	\$ 56 163
General Services (use & maintenance of equipment)	\$ 19 169
Materials (sand)	\$ 15 745

\$ 91 077

The overall net expenditure for **snow plowing and sanding of sidewalks** was **\$ 277 621** and was made up as follows:

Personnel Costs	\$ 170 359
General Services (use & maintenance of equipment)	\$ 90 924
Materials (sand)	\$ 15 745

(2)
\$ 277 621

TOTAL NET COST OF WINTER MAINTENANCE - ADD (1) & (2) **\$ 1 914 023**

Snowfall in Fredericton for the last five years was as follows:

1993	Airport Weather Office	205.1 cm
1994	Airport Weather Office	250.4 cm
1995	Airport Weather Office	292.7 cm
1996	Airport Weather Office	214.8 cm
1997	Airport Weather Office	350.4 cm

(c) Street Lighting

The total street lighting costs for 1997 were as follows:

Salaries & Benefits	\$ 11 291
Municipal Lighting System Contract	\$ 751 977
General Services (Standards & contract services)	\$ 3 738
Government Services (Power to City Owned Lights)	\$ 559
New Poles	\$ 6 722
New Bulbs	\$ 2 043

\$ 776 330

(d) Traffic Services

The expenditure under this heading is made up as follows:

- 1) Street Signs
- 2) Paint Department
- 3) Traffic Signals

(1) Street Signs

Purchasing, repairing and installing street signs on City Streets.

The net expenditure under this heading amounted to \$ 100 423 made up as follows:

Personnel Costs	\$ 47 872
General Services (use of equipment)	\$ 9 938
Goods (posts, street sign purchases, etc.)	\$ 42 613
	\$ 100 423

(2) Paint Department

The net expenditure under this heading was \$ 121 403 made up as follows:

Personnel Costs	\$ 73 293
General Services (use & maintenance of equipment & contract services)	\$ 17 537
Goods (paint & miscellaneous supplies)	\$ 29 275
Fixed Assets (new equipment)	\$ 1 298
	\$ 121 403

(3) Traffic Signals

The net expenditure under this heading was \$ 229 247 made up as follows:

Personnel Costs	\$ 78 586
General Services (use & maintenance of equipment & contract services)	\$ 39 955
Government Services (electric power)	\$ 78 065
Goods (material)	\$ 32 641
	\$ 229 247

ENVIRONMENTAL HEALTH SERVICES

The following items are included under the above heading.

- 1) Garbage and Waste Collection
- 2) Garbage and Waste Disposal
- 3) Recycling
- 4) Hazardous Waste
- 5) Old Burial Ground

(1) Garbage and Waste Collection

In 1997, the net amount paid for the garbage and waste collection operation was **\$ 466 244** made up as follows:

General Services (Garbage Collection Contract)	\$ 458 604
General Services (Advertising & Printing)	<u>\$ 7 640</u>
	\$ 466 244

(2) Garbage and Waste Disposal

The net expenditure under this section was **\$ 521 019** made up as follows:

General Services (Solid Waste Commission payments)	\$ 519 415
Government Services (Taxes)	<u>\$ 1 604</u>
	\$ 521 019

(3) Recycling

The net expenditure under this section was **\$ 141 269** made up as follows:

Personnel Costs	\$ 187
Goods (Composters)	\$ 9 793
General Services (Recycling Collection Contract)	\$ 118 270
General Services (Blue Boxes)	<u>\$ 13 019</u>
	\$ 141 269

(4) Hazardous Waste

Cleanup of oil spills from accidents, etc.

The net expenditure under this section was **\$ 5*** made up as follows:

General Services (use of equipment)	\$ 5
	\$ 5

* Costs of \$ 6331 were recovered from other sources and are reflected in the overall net expenditure.

(5) Old Burial Ground

The net expenditure under this section was **\$ 10 728** made up as follows:

Personnel Costs	\$ 8 662
General Services (use of equipment)	\$ 476
Goods (materials)	\$ 1 590
	\$ 10 728

PARKS AND TREES SERVICES

The following items are included under the above heading:

- 1) Wilmot Park
- 2) Odell Park
- 3) Carleton Park
- 4) Old Government House
- 5) Trees
- 6) Greens, Benches & Other Parks

(1) Wilmot Park

The net expenditure for this item was \$ 27 306 made up as follows:

Personnel Costs	\$ 20 044
General Services (use & maintenance of equipment)	\$ 1 183
Government Services (water & sewer rates)	\$ 405
Goods (materials, fuels & lubricants)	\$ 5 674
	\$ 27 306

(2) Odell Park

The net expenditure for this item was \$ 67 994 made up as follows:

Personnel Costs	\$ 53 596
General Services (use & maintenance of equipment, communications; building repairs)	\$ 4 899
Government Services (water & sewer rates, lights & power)	\$ 2 579
Goods (materials, fuels & lubricants)	\$ 6 920
	\$ 67 994

(3) Carleton Park

The net expenditure for this item was \$ 8 608 made up as follows:

Personnel Costs	\$ 4 879
General Services (use of equipment & land rentals)	\$ 2 609
Goods (materials)	\$ 1 120
	\$ 8 608

(4) Old Government House

The net expenditure for this item was \$ 10 964 made up as follows:

Personnel Costs	\$ 7 570
General Services (use of equipment)	\$ 1 361
Goods (materials)	\$ 1 905
Government Services (lights & power)	\$ 128

\$ 10 964

(5) Trees

The net expenditure for this item was \$ 425 416 made up as follows:

Personnel Costs	\$ 328 928
General Services (use & maintenance of equipment & contract services)	\$ 53 885
Goods (fuels & lubricants, materials, new trees, small tools & equipment)	\$ 42 603

\$ 425 416

TREE REMOVAL

In 1997, 408 trees were removed. These trees were either in a decadent condition, a menace to public safety or possible breeding places for the Elm Bark Beetle.

Following is a list of trees removed in 1997:

Species	Number Removed
Ash	2
Birch	3
Elm	264
Ivory Silk Lilac	3
Linden	6
Manitoba Maple	15
Norway Maple	19
Red Maple	3
Silver Maple	12
Sugar Maple	47
Poplar	1
Oak	6
Softwoods	20
Other Hardwoods	7
TOTAL	408

In 1997, 231 trees were removed because of Dutch Elm Disease.

Following is a summary of Elm trees removed from 1964 to 1997:

Year	No. Lost (% Lost) To Dutch Elm Disease	No. Removed For Other Reasons	Total No. Removed
1964	14 (29%)	34	48
1965	8 (24%)	25	33
1966	12 (21%)	44	56
1967	18 (20%)	73	91
1968	33 (16%)	174	207
1969	30 (21%)	108	138
1970	49 (39%)	78	127
1971	57 (42%)	77	134
1972	61 (42%)	84	145
1973	92 (46%)	108	200
1974	132 (33%)	266	398
1975	75 (19.6%)	307	382
1976	118 (28.2%)	300	418
1977	681 (91.6%)	62	743
1978	680 (92%)	56	736
1979	937 (91.8%)	84	1021
1980	1146 (95.7%)	51	1197
1981	500 (59.7%)	327	827
1982	487 (90.7%)	50	537
1983	133 (36.5%)	231	364
1984	121 (63.4%)	70	191
1985	77 (80.2%)	19	96
1986	45 (60.8%)	29	74
1987	49 (53.8%)	42	91
1988	43 (54.4%)	36	79
1989	47 (48.0%)	51	98
1990	55 (79.7%)	14	69
1991	42 (89.4%)	5	47
1992	52 (76.5%)	16	68
1993	18 (51.4%)	17	35
1994	39 (52.7%)	35	74
1995	23 (27.7%)	60	83
1996	108 (67.5%)	52	160
1997	231 (87.5%)	33	264
TOTAL	6 213	3 018	9 231

TREE PLANTING

There were 660 trees planted along City Streets and in parks in 1997. Street trees were planted in new subdivisions as well as on newly curbed streets.

Over 100 shrubs were planted in City parks and City-owned properties in various beautification projects.

In addition, over 500 seedlings received from the Canadian Forest Service were planted along the North side Rail Trail, Gibson Trail, Valley Trail, and the Lincoln Trail.

(6) Greens, Benches & Other Parks

The net expenditure for this item was \$ 235 006 made up as follows:

Personnel Costs	\$ 180 349
General Services (use & maintenance of equipment)	\$ 22 308
Goods (fuels, materials, small tools)	\$ 32 349
	\$235 006

UTILITY FUND

The above item is made up of the following headings:

1. Common Services
2. Sanitary Sewer
3. Water

(1) COMMON SERVICES

In 1997 the net expenditure for this item was **\$1 058 338** made up as follows:

General Equipment	\$ 552 369
Safety & Benefits	\$ 288 408
Administration	<u>\$ 217 561</u>
	\$ 1 058 338

(2) SANITARY SEWER

In 1997 the net expenditure for this item was **\$ 2 110 403** made up as follows:

Operating: Lift Stations

Personnel Costs	\$ 33 163
General Services (use & maintenance of equipment)	\$ 29 468
Government Services (light & power)	\$ 26 284
Goods (materials)	<u>\$ 1 410</u>
	\$ 90 325

Maintenance:

Personnel Costs	\$ 313 856
General Services (use & maintenance of equipment & contract services)	\$ 97 943
Goods (repair parts & tools)	<u>\$ 69 830</u>
	\$ 481 629

Sewage Treatment & Disposal

Personnel Costs	\$ 17 260
General Services (use & maintenance of equipment)	\$ 3 479
(Treatment (F.A.P.C.C.))	\$ 1 493 315
Government Services - Water & Sewer rates	\$ 653
Lights & Power	\$ 20 525
Goods (Miscellaneous Supplies)	<u>\$ 3 217</u>
	\$1 538 449
TOTAL	\$ 2 110 403

The Fredericton sanitary sewer system consists of approximately 299 kilometres of mains made up as follows:

SIZE	SILVERWOOD GARDEN CREEK	NASHWAAKSIS DOUGLAS	MARYSVILLE	LR.ST.MARY'S BARKER'S PT.	FREDERICTON	TOTAL
100mm	-	0.158	-	-	-	0.158
100mm F.M.	0.013	-	-	-	1.103	1.116
150mm	-	1.433	0.314	-	0.316	2.063
150mm F.M.	0.031	1.071	0.539	0.712	3.008	5.361
200mm	16.045	43.359	18.567	10.864	121.305	210.140
200mm F.M.	0.254	0.463	0.314	-	0.064	1.095
250mm	1.959	6.676	0.955	0.298	10.101	19.989
250mm F.M.	1.178	-	-	-	-	1.178
300mm	1.267	4.301	1.006	1.868	17.858	26.300
300mm F.M.	0.420	0.489	-	-	0.739	1.648
350mm	0.287	0.843	-	-	0.713	1.843
350mm F.M.	-	-	0.528	-	0.254	0.782
375mm	1.138	5.503	0.500	0.174	2.042	9.357
400mm	0.018	0.147	-	-	0.210	0.375
450mm	1.039	0.117	1.350	-	2.630	5.136
500mm	2.979	-	-	-	-	2.979
525mm	-	2.420	-	-	0.310	2.730
600mm	0.156	0.964	-	-	3.508	4.628
750mm	-	-	-	-	0.322	0.322
900mm	-	-	-	-	1.432	1.432
TOTALS	26.784	67.944	24.073	13.916	165.915	298.632

NOTE:

Fredericton includes the Lincoln area.

The above figures do not include mains at the Fredericton Exhibition Grounds, U.N.B. and St. Anne's Point on the Woodstock Road or the Fredericton Area Pollution Control Commission sewer system which has approximately 11.4 kilometres of main.

(3) **WATER**

The City of Fredericton has two separate municipal water supply systems comprised of 22 wells (9 active), 20 reservoir tanks or cells on 13 reservoir sites, 8 active booster stations and the Water Treatment Plant. There are, within these two systems, at year's end, 15 separately monitored water pressure zones.

The Water Treatment Plant treats the water from the seven Wilmot Park wells, which provide 95% of the City's water. The following describes the 15 water zones and their normal sources.

ZONE	SOURCE	STORAGE
South Low	7 wells via W.T.P. 1 emergency standby well	18180 kL
North Low	South Low via River Crossing (same top reservoir elevations) 5 emergency wells	8499 kL
South Intermediate	South Low via Booster	9090 kL
South High	South Intermediate via Booster	4540 kL
Golf Club Road	South High via Pressure Reducing Valve	0 kL
Rosewood	South Low via Booster	0 kL
Lincoln	South Low via Booster	3750 kL
Alison	South High via Pressure Reducing Valve	0 kL
Hanwell	South High via Pressure Reducing Valve 1 Emergency Well	460 kL
Silverwood	2 Wells Direct	2250 kL
Rainsford	Golf Club road via Booster 1 Emergency Well	0 kL
Killarney	South Low via Booster 2 Emergency Wells	3750 kL
Marysville	North Low Via Booster 3 Emergency Wells	6819 kL
Canterbury	South High via Altitude Valve	1070 kL
Diamond	North Low via Booster	0 kL

The water account includes all expenditures other than capital expenditures for water.

Water costs for the City of Fredericton were made up as follows:

1. Water Administration (Billing & Collection)	\$ 141 823
2. Water Ordinary (including meters)	\$1 343 759
3. Water Production Costs	<u>\$ 827 339</u>
	\$ 2 312 921

(1) **WATER ADMINISTRATION (BILLING & COLLECTION)**

The net expenditure of \$ 141 823 was made up as follows:

Personnel Costs	\$ 96 805
General Service (Postage, Professional Services, Rental of Equipment, Computer External Services)	\$ 34 374
Goods (Computer & Office Supplies)	<u>\$ 10 644</u>
	\$ 141 823

(2) **WATER ORDINARY (INCLUDING METERS)**

The net expenditure of \$1 343 759 was made up as follows:

Transmission & Distribution (Operation)

Personnel Costs	\$ 48 719
General Services (use & maintenance of equipment)	\$ 38 679
Government Services (light & power, provincial taxes)	\$ 129 056
Goods (materials)	<u>\$ 4 112</u>
	\$ 220 566

Transmission & Distribution (Maintenance)

Personnel Costs	\$ 430 072
General Services (use & maintenance of equipment & hydrants & contract services)	\$ 135 016
Goods (fuels & lubricants, tools, materials, parts)	<u>\$ 205 169</u>
	\$ 770 257

Meters

Personnel Costs	\$ 190 950
Goods (meter parts, miscellaneous supplies & tools)	\$ 9 124
General Services (use of equipment)	\$ 47 822
Fixed Assets (new meters)	<u>\$ 105 040</u>
	\$ 352 936

TOTAL **\$1 343 759**

At the end of 1997 there were 13 429 water services on meter and 181 on flat rate, making a total of 13 610.

208 new meters (new construction and former flat rate) were installed in 1997.

In 1997, 18 discontinued services were excavated and shut off at the main and 15 frozen meters were replaced. There were also 1363 meters replaced due to their age.

At the end of 1997 there were 4620 units on the Automated Meter Reading (AMR) System.

There are in the City, as of 1997 12 31, 1783 hydrants situated in the following areas:

Fredericton South	803
Fredericton North	169
Nashwaaksis/Douglas	387
Marysville	155
Barker's Point/Lower St. Marys	85
Silverwood/Garden Creek	27
SUB TOTAL	1626
LOCATED ON PRIVATE PROPERTY	<u>157</u>
TOTAL	1783

Hydrants were installed at the following locations in 1997:

<u>Location</u>	<u>Number</u>
Acorn Street	1
Biggs Street/Forest Hill (Kimble Terrace)(Private)	1
Brookside Drive	20
Diamond Street	4
Douglas Avenue	8
Durelle Street	1
F.A.P.C.C.	1
Hanwell Road	4
Kings College Road	1
Knowledge Park	6
McGregor Street	5
St. Roch Street	1
Woodstock Road (Government House)(Private)	1
TOTAL	54

The Fredericton distribution system consists of approximately 326 kilometres of water main, made up as follows:

SIZE	MARYSVILLE	NASHWAAKSIS DOUGLAS	LR. ST. MARYS BARKER'S POINT	SILVERWOOD GARDEN CREEK	FREDERICTON	TOTAL
32mm	-	0.153	-	-	-	0.153
38mm	-	0.072	-	-	0.153	0.225
50mm	-	-	-	0.154	-	0.154
75mm	-	-	-	-	0.205	0.205
100mm	0.753	2.232	-	2.508	11.172	16.665
150mm	12.583	21.453	4.053	4.835	57.625	100.549
200mm	7.376	26.210	2.266	7.812	45.031	88.695
250mm	3.201	9.410	5.169	0.966	26.566	45.312
300mm	1.436	11.442	1.070	7.776	30.319	52.043
350mm	-	0.840	-	-	6.222	7.062
400mm	-	2.241	-	-	7.127	9.368
450mm	-	-	-	-	1.965	1.965
500mm	-	-	-	-	3.197	3.197
600mm	-	-	-	-	0.427	0.427
Unknown	0.146	-	-	-	-	0.146
TOTALS	25.495	74.053	12.558	24.051	190.009	326.166

Figures for Marysville, Nashwaaksis, Barker's Point and Silverwood are approximate only, due to measurement from maps in some instances.

The above figures do not include water mains installed at the Exhibition Grounds; the University of New Brunswick and St. Anne's Point Barracks on the Woodstock Road.

(3) WATER PRODUCTION COSTS

The net expenditure of \$ 827 339 was made up as follows:

Source of Supply

Personnel Costs	\$ 102 632
Use of Equipment	\$ 10 063
Maintenance - Wells	\$ 47 976
Power - Wells	\$ 253 300
Materials - Wells	\$ 5 043
	\$ 419 014

Power & Pumping (Plant)

Personnel Costs	\$ 39 338
Communications	\$ 290
Light & Power	\$ 1 778
Supplies	\$ 1 312
	\$ 42 718

Water Treatment Plant

Personnel Costs	\$ 130 140
Insurance	\$ 11 616
Maintenance	\$ 97 028
Power	\$ 5 155
Taxes	\$ 39 516
Computers and Related Purchases	\$ 3 496
Goods (Chlorine, Soda Ash, Lime, etc.)	\$ 78 656
	\$ 365 607
TOTAL	\$ 827 339

The total amount of water pumped into the City's distribution systems from 1997 01 01 to 1997 12 31 for the entire City was 8560 megalitres. The amount of water produced by the Water Treatment Plant in 1997 was 8500 megalitres or 99% of the total City demand. The average daily demand for the City is 22.8 megalitres.

The following table gives a comparison of water production costs for the last ten years:

WATER PRODUCTION COSTS

YEAR	MEGALITRES PRODUCED	PRODUCTION EXPENDITURE	PRODUCTION COST PER MEGALITRE
1988	8740	\$743 604	\$85
1989	8440	\$734 658	\$87
1990	8600	\$679 440	\$79
1991	8450	\$823 353	\$97
1992	8570	\$828 783	\$97
1993	8023	\$794 406	\$99
1994	8340	\$874 562	\$105
1995	8160	\$839 058	\$103
1996	8270	\$827 735	\$100
1997	8560	\$827 339	\$97

The total net expenditure for transmission and distribution of water for the City from 1997 01 01 to 1997 12 31 was determined from the following:

Transmission & Distribution:

Operation	\$ 220 566	
Maintenance	<u>\$ 770 257</u>	\$ 990 823

Therefore, the net expenditure for transmission and distribution of one megalitre of water from 1997 01 01 to 1997 12 31 was:

$$\frac{\$ 990\,823}{8560} = \$ 115.75$$

The following table gives a comparison of net expenditures for transmission and distribution of one megalitre of water for the last ten years:

YEAR	NET EXPENDITURE PER MEGLALITRE
1988	\$ 93
1989	\$ 126
1990	\$ 106
1991	\$ 117
1992	\$ 121
1993	\$ 147
1994	\$ 125
1995	\$ 114
1996	\$ 127
1997	\$ 116

The total net expenditure for water administration costs for the City from 1997 01 01 to 1997 12 31 was determined from the following:

Water Administration

(1) Billing & Collection	\$ 141 823
(2) Meters (Installation, Reading, Repairs)	<u>\$ 352 936</u>
	\$ 494 759

Administration costs per megalitre of water produced:

$$\frac{\$ 494\,759}{8560} = \$57.80$$

The following table gives a comparison of administration costs and debt charges per megalitre of water produced for the last ten years:

ADMINISTRATION COSTS AND DEBT CHARGES PER MEGLITRE
(Rounded to nearest dollar)

YEAR	ADMINISTRATION (BILLING & COLLECTION & METERS)	DEBT CHARGES
1988	\$ 39	\$ 46
1989	\$ 44	\$ 46
1990	\$ 44	\$ 43
1991	\$ 45	\$ 43
1992	\$ 46	\$ 38
1993	\$ 62	\$ 24
1994	\$ 63	\$ 19
1995	\$ 67	\$ 12
1996	\$ 70	\$ -
1997	\$ 58	\$ -

The following table gives a comparison of total water costs per megalitre of water produced for the last ten years:

TOTAL COSTS PER MEGLITRE

YEAR	PRODUCTION COSTS	TRANSMISSION & DISTRIBUTION COSTS	ADMINISTRATION	DEBT CHARGES	*TOTAL
1988	\$ 85	\$ 93	\$ 39	\$ 46	\$ 263
1989	\$ 87	\$ 126	\$ 44	\$ 46	\$ 303
1990	\$ 79	\$ 106	\$ 44	\$ 43	\$ 272
1991	\$ 97	\$ 117	\$ 45	\$ 43	\$ 302
1992	\$ 97	\$ 121	\$ 46	\$ 38	\$ 302
1993	\$ 99	\$ 147	\$ 62	\$ 24	\$ 332
1994	\$ 105	\$ 125	\$ 63	\$ 19	\$ 312
1995	\$ 103	\$ 114	\$ 67	\$ 12	\$ 296
1996	\$ 100	\$ 127	\$ 70	\$ -	\$ 297
1997	\$ 97	\$ 116	\$ 58	\$ -	\$ 271

***TOTAL COST = Production Costs + Transmission & Distribution Costs
+ Administration Costs + Debt Charges**

SUMMARY**WATER AND SEWER REVENUE & EXPENDITURES
1997**

ITEM	NET EXPENDITURE	REVENUE
COMMON SERVICES (WATER & SEWER)		
General Equipment	\$ 552 369	\$ 420 040
Safety & Benefits	\$ 288 408	
Administration	\$ 217 561	
WATER		
Water Administration (Billing & Collection)	\$ 141 823	\$ 5 073 017
Water Ordinary (Including Meters)	\$ 1 343 759	
Water Treatment Facility & Well Production Costs	\$ 827 339	
SANITARY SEWER		
Operating & Maintenance	\$ 571 954	
Sewage Treatment & Disposal	\$1 538 449	\$3 949 820
TOTAL	\$ 5 481 662	\$ 9 442 877

1997 SURPLUS: \$3 961 215

PLUS: SECOND PREVIOUS YEAR'S SURPLUS @ BEGINNING OF YEAR \$ 819 030

OVERALL SURPLUS: \$ 4 780 245
LESS: CAPITAL PROJECT FUNDING \$ 4 509 254

NET SURPLUS \$ 270 991

NOTE: \$ 4 509 254 of the above noted overall surplus was appropriated for utility capital expenditures.

CAPITAL PROGRAMS

The following gives brief descriptions of capital projects begun or completed in 1997.

WATER

In 1997, water mains were installed on Brunswick Street between York Street and Westmorland Street; in the Douglas area (Diamond Street; Emerald Street; McGregor Street; Garnet Lane); on Brookside Drive between Hawkins Street and St. Mary's Street; and in the Bishop Drive area on Bishop Drive from Hanwell Road to near Avonlea Court, on Acorn Street and on Durelle Street.

Streets such as Connaught Street between Albert Street and Northumberland Street; Westmorland Street between King Street and Brunswick Street; and the easement between Downing Street and Bunker Street in Marysville, had their water mains upgraded or installed under the System Replacement and Oversizing Account.

New mains were also installed in the Chippin's Limited Real Estate/Hill Brothers Realty Ltd. Subdivision (Douglas Avenue; Fulton Avenue); the Garden Hill Subdivision (Ridgewell Place; Fleet Court) and the Douglas Heights Subdivision (McGregor Street) by developers under Local Improvement Agreements.

Water mains or portions of water mains were also installed on Gregory Avenue, Kings College Road, Canada Street between Young Street and Murray Avenue and at F.A.P.C.C. on Barker Street in Conjunction with other projects.

The following are lengths and sizes of water mains installed in 1997.

LENGTH OF MAINS - metres

LOCATION	100mm D.I. P.V.C.	150mm D.I. P.V.C.	200mm D.I. & P.V.C.	250mm D.I.	300mm D.I.	500mm D.I.
(1) Connaught Street- Albert St. to Northumberland St.			45		91	
(1) Westmorland Street - King St. to Brunswick St.				7	22	204
Brunswick Street- York St. to Westmorland St.						
Douglas Area - (Diamond St.;Emerald St.; McGregor St.; Garnet Lane)			42	818	230	6
Brookside Drive - Hawkins St. to St. Mary's St.		127	16	475	3337	
Bishop Drive; Acorn St.; Durelle St.		52	492		618	
(2) Douglas Avenue/Fulton Avenue		61		562	609	
(2) Garden Hill Subdivision (Ridgewell Place; Fleet Ct.)	91	109	20			
(2) McGregor St. Extension		12	211			
(1) College Brook (McLeod Ave./Regent St.) Phase I			26		300	
(3) Wilsey Road-Lincoln Rd. to Kimble Dr.				211		
(4) Gregory Avenue					200	
(5) Kings College Road						104
(6) Canada Street-Young St. to Murray Ave.						30
(7) F.A.P.C.C. (Barker Street)						
(1) Easement- Downing St. to Bunker St.				110		
TOTALS	91	440	1949	1580	4974	204

OVERALL TOTAL - 9238 metres = 9.238 kilometres

- (1) Done under system replacement and oversizing.
- (2) Paid for by the developer through Local Improvement Agreement.
- (3) Done in conjunction with railway crossing improvement.
- (4) Done in conjunction with street reconstruction.
- (5) Twinning existing system.
- (6) Done in conjunction with Young's Crossing Booster Station.
- (7) Done in conjunction with septage discharge system.

SANITARY SEWER:

In 1997, sanitary sewer mains were installed on Brunswick Street between York Street and Westmorland Street; in the Douglas area (Diamond Street; Emerald Street; McGregor Street; Garnet Lane); on Brookside Drive between Hawkins Street and St. Mary's Street; and in the Bishop Drive area on Bishop Drive from Hanwell Road to near Avonlea Court, on Acorn Street and on Durelle Street.

Streets such as Connaught Street between Albert Street and Smythe Street and Gregory Avenue had their sanitary sewer mains upgraded under the System Replacement and Oversizing Account.

New Mains were also installed in the Chippin's Limited Real Estate/Hill Brothers Realty Ltd. Subdivision (Douglas Avenue; Fulton Avenue); the Garden Hill Subdivision (Ridgewell Place; Fleet Court) and the Douglas Heights Subdivision (McGregor Street) by developers under Local Improvement Agreements.

The following are lengths and sizes of sanitary sewer mains installed in 1997.

LOCATION	LENGTH OF MAINS - metres					
	150mm PVC	200mm PVC	250mm PVC & D.I.	300mm PVC	350mm D.I.	375mm PVC & D.I.
*Connaught Street- Albert St. to Northumberland St.	46					
*Gregory Avenue	295					
Brunswick Street - York St. to Westmorland St.	25					
Douglas Area (Diamond St.; Emerald St.; McGregor St.; Garnet Lane)	1013					
Brookside Drive-Hawkins St. to St. Mary's St.	23	1580	224	78	1889	25
Bishop Dr.; Acorn St.; Durelle St.	925					
**Douglas Avenue/Fulton Avenue	1100					
**Garden Hill Subdivision (Ridgewell Place; Fleet Ct.)	204					
**McGregor St. Extension	226					
*College Brook (McLeod Ave./Regent St.)Phase I	13					
*Connaught Street-Northumberland St. to Smythe St.	63					
TOTALS	63	3870	1580	224	78	1889
						25
						153
						204

OVERALL TOTAL - 8086 metres = 8.086 kilometres

- * Done under System Replacement and Oversizing
- ** Paid for by the developer through Local Improvement Agreements

STORM SEWER:

In 1997, storm sewer mains were installed on Brunswick Street between York Street and Westmorland Street; in the Douglas area (Diamond St. Emerald Street; McGregor Street; Garnet Lane); and in the Bishop Drive area on Bishop Drive from Hanwell Road to near Avonlea Court, on Acorn Street and on Durelle Street.

Streets such as Connaught Street between Albert Street and Northumberland Street; Wilsey Road between Lincoln Road and Kimble Drive; St. John Street near the Beaverbrook Hotel; Brookside Drive near the Brookside Mall and College Brook (McLeod Avenue and Regent Street) had their storm sewer mains upgraded under the System Replacement and Upgrading Account.

New mains were also installed in the Chippin's Limited Real Estate/Hill Brothers Realty Ltd. Subdivision (Douglas Avenue; Fulton Avenue); the Garden Hill Subdivision (Ridgewell Place; Fleet Court) and the Douglas Heights Subdivision (McGregor Street) by developers under Local Improvement Agreements.

A portion of the Gregory Avenue storm sewer system was upgraded in conjunction with reconstruction of the street.

The following are lengths and sizes of storm sewer mains installed in 1997.

LOCATION	250mm	300mm	375mm	450mm	500mm Poly	525mm	600mm	750mm	900mm
*Connaught Street-Albert St. to Northumberland St.				47					
*Wilsey Rd. - Lincoln Rd. to Kimble Dr.	180								
*St. John St. near Beaverbrook Hotel				73	12				
*Brookside Drive near Brookside Mall	1			285					15
Brunswick Street-York St. to Westmorland St.	48		41						
Douglas Area - (Diamond St.;Emerald St.; McGregor St.; Garnet Lane)	239	277	284	188		267	34		
Bishop Drive; Acorn St.; Durelle St.	72	217	92	162	93				
**Douglas Avenue/Fulton Avenue	156	232	105						1011 69
**Garden Hill Subdivision (Ridgewell Place; Fleet Ct.)	58	181		17					
**McGregor St. Extension	24				223				
*College Brook (McLeod Ave./Regent St.) Phase I	95								
***Gregory Avenue	45								
TOTALS	738	1087	522	772	12	583	34	1011	84

OVERALL TOTAL - 4843 metres = 4.843 kilometres

- * Done under System Replacement and Upgrading
- ** Paid for by developer through Local Improvement Agreement
- *** Done in conjunction with street reconstruction

CURB AND GUTTER:

Concrete curb and gutter was constructed at the following locations in 1997. (Notes indicate budget item under which work was done)

Location	Length (metres)
(1) Brunswick Street (York St. to Westmorland St.)	452
(1) Canada Street (Gilbert St. to Murray Ave.)	856
(5) Canada Street (Civic #512 to Civic #580)	455
(3) Central Court	173
(1) Connaught Street (York St. to Albert St.)	1026
(2) Dora Drive	99
(2) Faith Court	186
(4) Forest Hill Road	126
(2) Goodine Street (Adams St. to the end)	772
(1) Gregory Avenue	936
(4) King Street (Northumberland St. to Smythe St.)	364
(2) Leisure Avenue	530
(2) Manresa Drive (End of existing to McAdam Avenue)	747
(1) Matthews Court	307
(2) McAdam Avenue (End of existing to Manresa Drive)	162
(3) Prospect Street (Smythe St. to Ballfield)	2031
(2) Rhonda Lane	349
(6) R.R. Crossing Improvements (Various Locations)	787
(2) Spiro Lane	92
(1) Sunset Drive (Drammen Dr. to Currie Ave.)	1867
(4) Town Plat (Aberdeen St.; Argyle St.; Charlotte St.; Saunders St.)	46
(4) Union Street (Westmorland St. Bridge Westward)	219
(7) Veterans Drive	373
(4) Windsor St.; Valleyview St.; Hanson St.	138
TOTAL	13 087

- 1) Done under Capital Street Reconstruction.
- 2) Paid for by developer through Local Improvement Agreements.
- 3) Done under Capital Traffic Management.
- 4) Done in conjunction with sidewalk construction.
- 5) Done under Capital Designated Routes.
- 6) Done under Capital Special Projects.
- 7) Done under O & M Curb and Gutter Repair.

PAVING:

In 1997, **Elm City Paving Ltd.** was awarded a contract to supply and place asphalt concrete on a number of City Streets.

The street preparatory work was done by City forces.

The paving program required the supply and placement of the following grades of asphalt concrete:

- 1) Binder Course - Clase I Type "B" @ \$35.80 plus H.S.T. per tonne in place
 Class II Type "B" @ \$35.80 plus H.S.T. per tonne in place

- 2) Surface Course - Class I Type "C" @ \$35.80 plus H.S.T. per tonne in place
 Class II Type "D" @ 35.80 plus H.S.T. per tonne in place

(See Page 10 for a list of streets which received a surface course)

BINDER COURSE - TYPE "B"

The following streets were paved with Class I or Class II Type "B" asphalt concrete in 1997.

Location	Length (metres)
(1) Brunswick Street (York St. to Westmorland St.)	236
(3) Central Court	85
(1) Connaught Street (York St. to Albert St.)	344
(2) Dora Drive	42
(2) Faith Court	87
(2) Goodine Street (Adams St. to the end)	390
(1) Gregory Avenue	474
(2) Leisure Avenue	286
(2) Manresa Drive (End of existing to McAdam Avenue)	371
(1) Matthews Court	116
(2) McAdam Avenue (End of existing to Manresa Drive)	81
(2) Rhonda Lane	159
(2) Spiro Drive	37
(1) Sunset Drive (Drammen Dr. to Currie Ave.)	901
TOTAL	3 609

1. Done under Capital Street Reconstruction.
2. Paid for by developer through Local Improvement Agreements.
Type "D" Asphalt was also placed on these streets.
3. Done under Traffic Management.

CONCRETE SIDEWALKS:

New sidewalks were constructed or reconstructed at the following locations in 1997.

Location	Length (metres)
(1) Barton Crescent (Civic #116 to McKnight St.)	118
(4) Brookside Drive (near former R.R. Tracks)	30
(3) Brunswick Street (York St. to Westmorland St.)	361
(3) Canada St. (Murray Ave. to Gilbert St.)	468
(3) Connaught Street (York St. to School)	706
(1) Forest Hill Road near Forest Acres Court	112
(1) Haines Crescent (William St. to Shibu Court)	171
(2) Jeremy Street Extension	240
(1) King Street (Northumberland St. to Smythe St.)	407
(5) Lisgar Street	189
(2) Manresa Drive/McAdam Avenue	411
(2) McKnight Street Extension	408
(1) Prospect Street (North side - Greensfield Dr. to Ballfield)	302
(1) Town Plat (Aberdeen St.; Argyule St.; Charlotte St.; Saunders St.)	506
(1) Union Street (Westmorland St. Bridge Westward)	227
(1) Windsor St.; Valleyview St.; Hanson St.	501
(6) Central Court	122
(3) Sunset Drive (Drammen Dr. to Currie Ave.)	892
TOTAL	6 171

- 1) Capital Sidewalk Construction done under O & M Budget.
- 2) Paid for by developer through Local Improvement Agreement.
- 3) Done under Capital Street Reconstruction.
- 4) Done in conjunction with Railway Crossing Improvements.
- 5) Done under O & M Budget.
- 6) Done under Capital Traffic Management

PASSIVE PARKS

In 1997, work was done in the Botanical Garden; on Odell Park roads; on Valley Trail landscaping; on the Lincoln and Marysville Trails; on the Nashwaak Bridge Crossing and Trail (Barker St. to Gibson Trail); and on the Killarney Lake Project.

STREET RECONSTRUCTION:

In 1997, a number of streets were upgraded with curb and gutter and paving and in some instances sidewalks. These streets included Brunswick Street between York Street and Westmorland Street; Connaught Street from York Street to Albert Street; Sunset Drive between Drammen Drive and Currie Avenue; Canada Street from Murray Avenue to Gilbert Street on the West side; Matthews Court; and Gregory Avenue.

TRAFFIC MANAGEMENT:

In 1997, Prospect Street between Smythe Street and the ballfields and the Dundonald and Westmorland intersection were upgraded and land was acquired at a number of locations for future and ongoing traffic management improvements.

SPECIAL PROJECTS:

In 1997, improvements were made to the vertical alignment of a number of former railway crossings; various streets were resurfaced under Capital Paving; and additional improvements were made to the G.I.S. system under this account.

NEW STREET CONSTRUCTION:

The following new streets or portions of streets were constructed in 1997.

Location	Length (metres)
Acorn Street	170
Douglas Avenue (Extension)	1109
Durelle Street	243
Edward Street (Extension)	126
Fleet Court	117
Fulton Avenue (Extension)	80
Logan Street (Extension)	221
McGregor Street (Extension)	320
Ridgewell Place	100
<hr/>	
TOTAL	2486

2486 metres = 2.486 kilometres

PROVINCIAL DESIGNATED AND REGIONAL HIGHWAYS

In 1997 the City of Fredericton had a total of 49.634 km of provincial designated and regional highways within its boundaries. In 1997, the Provincial Government paid \$312.13 (winter) and \$78.76 (summer) per lane kilometre towards maintenance of the routes. If any improvements such as new curb and gutter, paving or storm sewer installations are done to these routes, authorization by the Department of Transportation is required.

The following authorized projects were undertaken in 1997.

(1)	Route 8 - Canada Street Civic #512 TO Civic #580 Curb and Gutter	\$ 51 867
(2)	Route 102 - Woodstock Road Rookwood Avenue to Hanwell Road Resurfacing	\$ 27 946
(3)	Route 640 - Hanwell Road (Seslected Sections) Resurfacing	\$ 30 984
		<hr/>
TOTAL		\$ 110 797

1997 Annual Report of the Engineering and Public Works Department

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ITEM	BUDGET	EXPENDITURE	REMARKS
UTILITY FUND			
System Replacement & Oversizing-Water & Sanitary Sewer	\$ 450 000	\$ 539 178	
Automation of Meter Reading - Water	\$ 300 000	\$ 319 037	
Brunswick Street Trunk - Water & Sanitary Sewer	\$ 300 000	\$ 225 585	
Douglas Area (Spencer to Diamond) Water & Sanitary Sewer	\$ 800 000	\$ 727 400	
Banner CIS Utility System - Water	\$ 50 000	\$ 37 351	
Brookside Drive - Water & Sanitary Sewer	\$2 200 000	\$2 083 789	
Bishop Drive - St. Roch Street-Water & Sanitary Sewer	\$ 800 000	\$ 540 537	
GENERAL FUND			
Fredericton Botanic Garden - Passive Parks	\$ 10 000	\$ 10 022	
Odell Park Road Upgrading-Passive Parks	\$ 10 000	\$ 13 799	
Valley Trail Landscaping-Passive Parks	\$ 15 000	\$ 27 553	\$1492 Revenue Received (Youth Services Rest Area)
Rail Trail - Marysville- Passive Parks	\$ 15 000	\$ 18 739	
Rail Train - Lincoln - Passive Parks	\$ 15 000	\$ 78 583	\$55 258 Recovered from NB Trails Coalition
Nashwaak Bridge Crossing and Trail- Passive Parks	\$ 15 000	\$ 16 292	
Killarney Lake Project - Passive Parks	\$ 20 000	\$ 10 243	
System Replacement & Upgrading - Storm Sewer	\$ 200 000	\$ 203 824	
Diamond St.; Emerald St.; McGregor St.;-Storm Sewer	\$ 160 000	\$ 278 138	
Bishop Drive - St. Roch Street - Storm Sewer	\$ 330 000	\$ 119 592	To be finalized in '98
Brentwood Drive/Coburn Drive - Curb & Gutter & Paving	\$ 70 000	\$ 67 335	
Brunswick Street-(York to Westmorland) - Street Reconstruction	\$ 200 000	\$ 202 336	\$30 000 Recovered from NBTEL
Connaught Street (York to Albert) Street Reconstruction	\$ 190 000	\$ 245 788	
Sunset Drive (Drammen to Currie) Street Reconstruction	\$ 570 000	\$ 391 586	
Bishop Drive - Street Reconstruction	\$ 380 000	\$ 72 527	To be finalized in '98

ITEM	BUDGET	EXPENDITURE	REMARKS
GENERAL FUND (Continued)			
Canada Street (Gilbert to Murray-West Side) Street Reconstruction	\$ 120 000	\$ 170 495	
Matthews Court - Street Reconstruction	\$ 90 000	\$ 90 197	
Gregory Avenue - Street Reconstruction	\$ 220 000	\$ 187 428	
York & Dundonald Streets - Traffic Management	\$ 100 000	\$ 36 413	Land Acquisition
299 Union Street - Traffic Management	\$ 100 000	\$ 114 124	Land Acquisition
494-496 Westmorland Street-Traffic Management	\$ 110 000	\$ 223 612	Land Acquisition
495 Westmorland Street-Traffic Management	\$ 120 000	\$ 123 579	Land Acquisition
Hanwell Road - Traffic Management	\$ 20 000	\$ 42 617	Land Acquisition from Kennedy Developments
Bishop Drive - Traffic Management	\$ 150 000	\$ 41 852	Land Acquisition Ongoing
Prospect Street - Smythe to Ballfield (North) Traffic Management	\$ 300 000	\$ 377 283	Widening and Sidewalk Construction
Miscellaneous - Traffic Management	\$ 50 000	\$ 180 879	Land Acquisition
Dundonald & Westmorland - Traffic Management	\$ 50 000	\$ 61 733	Land Acquisition
Fulton & Main - Traffic Management	\$ 100 000	\$ 73	To be carried over in '98 for Land Acquisition
GIS System Improvement-Special Projects	\$ 81 100	\$ 83 159	
Capital Paving - Special Projects	\$ 398 900	\$ 389 215	
Railroad Crossing Improvements - Special Projects	\$ 100 000	\$ 160 357	
Canada Street - Designated Routes	\$ 100 000	\$ 51 867	
Woodstock Road (Golf Club Road to TCH)-Designated Routes	\$ 60 000	\$ 27 946	
Regent St. (McLeod to Beaverbrook) Designated Routes	\$ 80 000	\$ 14 199	Additional work to be done in '98

1997 Annual Report of the Engineering and Public Works Department

ITEM	BUDGET	EXPENDITURE	REMARKS
NEW SIDEWALKS (DONE UNDER O & M BUDGET AND LOCAL IMPROVEMENT)			
Barton Crescent (Civic # 116 to McKnight St.)	\$ 10 000	\$ 8 767	
Forest Hill Road near Forest Acres Court	\$ 20 000	\$ 20 823	
Regent Street (McLeod Ave. to Beaverbrook St.)	\$ 30 000	\$ 190	Deferred to '98
Prospect Street (North Side - Ballfield to Civic # 281)	\$ 30 000	\$ 71	Cost included in Traffic Management Component
Haines Crescent (William St. to Shibu Court)	\$ 20 000	\$ 15 885	
Windsor; Valleyview; Hanson Area	\$ 30 000	\$ 60 077	
Union Street (Westmorland Bridge Ramp Westward)	\$ 40 000	\$ 31 098	
King Street (Northumberland St. to Smythe St.)	\$ 80 000	\$ 65 785	
Town Plat (Aberdeen; Argyle; Charlotte;Saunders)	\$ 40 000	\$ 55 787	
Jeremy Street	\$ 17 000	\$ 18 011	
Manresa Drive/McAdam Avenue	\$ 29 000	\$ 33 894	
McKnight Street Extension	\$ 29 000	\$ 32 767	

CITY OF FREDERICTON 1997 WATER PUMPING RECORD

WATER SUPPLY

The City of Fredericton is supplied with water from twenty-two (22) municipally owned wells. Nine (9) of these wells were regularly active, while the remaining thirteen (13) were on emergency standby duty at year end. The names of these wells, water analyses, and 1997 pumpages are compiled in the last section of this report.

THE FREDERICTON WATER TREATMENT PLANT

The Water Treatment Plant was put on line in July of 1984. It initially treated water from five Wilmot Park wells. A sixth well was fully developed and running in January 1991, and a seventh well was in production in May 1993.

The filter room was doubled in size during 1992, with equipment to double capacity added over the next two years, bringing capacity to 50 ML/d. The plant removes iron and manganese, stabilizes sulfur compounds, decreases corrosiveness, and provides water with a free chlorine residual which meets federal and provincial drinking water guidelines.

DISTRIBUTION ZONES

There are fifteen (15) individually metered water zones in the city. Together they make up the following statistics:

Total kilometres of mains	-	327
Hydrants	-	
City owned	-	1 628
Private	-	157
Total	-	1 730
Water Services	-	13 621
Sprinkler Services	-	200
Total Storage, ML	-	58

Detailed system descriptions follow:

South Fredericton Low Zone

This zone services the south side of the city below elevation 38 m near Kings College Road and from Monteith Drive to the Fredericton Boat Club on the Lincoln Road. Its water supply is received from eight (8) wells; four (4) in Wilmot Park, the fifth, sixth, and seventh located at Saint Anne's Point, and the eighth, an emergency well, located opposite Angelview Court on Woodstock Road.

The seven (7) active wells pump water through the Water Treatment Plant and into the system. Pressure control and storage is provided by two 9090 kL in-ground reservoirs on Smythe Street. Both have a top water level of 57.7m.

Twelve (12) other separately metered zones are directly or indirectly supplied by this zone:

South Intermediate Zone
South High Zone
Rosewood Zone
Lincoln Zone
Canterbury Zone
Golf Club Road Zone
Hanwell Zone
North Low Zone
North High Zone
Rainsford Zone
Marysville Zone
Diamond Zone

A thirteenth area, Vanier South, is separate but not metered. It is supplied through a P.R.V. from the South High zone.

South Intermediate Zone

This zone serves an area generally bounded by elevation 38 m, elevation 76 m, Odell Park, and the eastern side of the University of New Brunswick. The water is received via the Smythe Street Booster Station from the Low zone. Pressure control and storage are provided by two 4545 kL reservoirs with a top water level of 106.7 m. These are located in Odell Park at Montgomery Street.

South High Zone

The Montgomery Street booster draws water from the South Intermediate zone to supply the area above elevation 76 m. The south high zone stretches from Hanwell Road to Kimble Road, and extends to the City Depot on Regent Street. Pressure control and storage are provided by two (2) 2270 kL reservoirs, one at the top of Smythe Street and a second one at the top of Regent Street. Both have a top water level of 146.0 m.

Hanwell Zone

A section of Hanwell Road, the upper reaches of Colonial Heights, and Cameron, Foley, Burnham and Eagle Courts, are served by the Hanwell zone. Supply is via an altitude valve from the south high zone, and a 460 kL reservoir, with a top water elevation of 82.0 m, is connected to the zone above Cameron Court. A well on Cameron Court provides emergency supply.

Canterbury Zone

The Canterbury zone is supplied from the South High Zone through a meter and altitude valve at Canterbury Drive. This valve maintains the water level within the Canterbury reservoirs at 99.8 m. These reservoirs, with a total capacity of 1070 kL, serve lower Skyline Acres, Dunns Crossing Road, and the area eastward to and including Wetmore Road. This area contains the former Flemming Zone, which was connected in 1989.

Golf Club Road Zone

This zone serves the general area of Golf Club Road and Glengarry Place. It works similarly and serves the same elevations as the South Intermediate Zone, but presently has no storage. The zone receives water from the south high zone through a pressure reducing valve assembly near the Prospect/Hanwell intersection which is capable of providing reasonable fire protection.

Rainsford Park Zone

This zone supplies the Rainsford Park subdivision only, and has no reservoir. Prior to 1983 this zone was privately owned. 1991 construction provided a tie between this zone and the Golf Club Road zone. The connection, which was activated in January 1992, provides domestic flows through a small booster station and lower pressure fire flows through a check valve. Fire hydrants were installed in 1991. The original well and pressure tanks, although non-operational, still with some modifications could serve as emergency supply and control.

Rosewood Zone

The Rosewood Booster Station pumps water from the South Low Zone for use by the upper elevations of the Rosewood and Monteith subdivisions. As the Rosewood Zone has no reservoir, a jockey pump system has been installed to maintain pressures.

Lincoln Zone

This zone receives its supply from the South Low Zone, through the Lincoln Booster Station situated across from the Fredericton Boat Club on Lincoln Road.

The zone, which extends almost to the city boundary and includes the Vanier Industrial Park and the Wilsey Road area, is served by the 3750 kL reservoir on Flemming Road. The top water level is 85.3 m.

North Fredericton Low Zone

In November 1987, the St. John River Crossing water main was activated, and this zone began receiving water from the south low zone. There are also five (5) wells available on emergency standby duty to

serve this zone. As well, a pressure reducing valve can provide water to the North Low Zone from the North High Zone on an emergency basis.

The zone serves all areas of north Fredericton below elevation 37 m. Four reservoirs, all with a top water elevation of 57.7 m float on the zone. These are:

Highland Avenue Reservoir	-	4550 kL
Longwood Reservoir #1	-	2850 kL
Dewitt Reservoir	-	1140 kL

With the commissioning of the Longwood Booster Station in 1990, this zone provides water to the North High Zone. Also, in 1996, Young's Crossing Booster Station began supplying Marysville with water from this zone.

A check valve separates this zone and the Marysville Zone to provide water to a limited portion of Marysville should its water supply fail.

North Fredericton High Zone

The Longwood Booster Station was commissioned in 1991, providing water from the north low zone. Storage for the north high level zone is provided by a 3800 kL reservoir on the south side of Killarney Lake with a top water elevation of 97.2 m. This zone serves upper St. Mary's Street and Nashwaaksis above elevation 38 m. Two wells situated on the west side of St. Marys Street, 2.8 km north of Maple Street act as an emergency supply for this zone.

Marysville Zone

The Marysville zone is now supplied with water from the North Low Zone via Young's Crossing Booster Station. The two wells on Tower Road and the McGloin Street well act as emergency supply wells for this zone.

Diamond Zone

This zone supplies the Diamond Street subdivision only, and has no reservoir. It is supplied with water from the North Low zone via the Diamond Booster Station which uses a jockey pump system for domestic supply plus a diesel pump for fire protection.

Silverwood System

Silverwood is supplied by two wells; one at the intersection of Mountain Drive and Fairview Drive; and another above Silverwood outside the City limits. The two celled reservoir on the top of the system holds 2250 kL and has a top water elevation of 134.0 m. Presently, for better turn-over of storage, only one cell is in use. Pressure control valves halfway down Orchard Drive and Fairview Drive separate the system into two parts, allowing both to develop reasonable static pressures.

TABLES

The following pages provide the pumpage from Wilmot Park Wells, the Net System Demands, the Annual Chemical Dosages and Costs for the Water Treatment Plant.

1997 PUMPAGE - WILMOT PARK WELLS, ML

MONTH	WELL 1	WELL 2	WELL 3	WELL 4	WELL 5	WELL 6	WELL 7	MONTHLY TOTALS
January	91.9	162.0	64.8	31.3	54.0	154.0	142.7	700.7
February	133.8	151.1	80.8	5.5	74.4	112.1	99.1	656.8
March	147.7	105.8	36.6	3.7	145.5	167.9	97.2	704.4
April	296.7	45.3	86.4	3.3	4.4	152.4	117.5	706.0
May	332.1	37.4	86.0	3.5	4.7	126.3	100.2	690.2
June	253.3	36.4	86.0	3.7	5.2	170.8	126.3	681.7
July	41.1	168.7	81.4	9.0	141.8	172.8	123.8	738.1
August	128.5	128.8	56.8	0.0	154.8	167.6	91.5	728.0
September	106.9	181.3	108.3	0.0	126.6	93.1	99.2	715.4
October	161.4	154.6	39.7	1.0	159.7	145.3	94.8	740.0
November	140.6	167.5	0.0	18.7	97.5	173.5	78.3	692.6
December	158.8	160.0	0.0	2.3	106.9	118.5	131.8	678.3
TOTALS	1992.8	1496.9	726.8	82	1075.4	1754.3	1302.4	8432.2

NOTE:

Well #3 was taken out of commission in November 1997 due to corrosivity problems. The vertical turbine pump was replaced with a submersible pump before bringing the well back on line.

1997 NET SYSTEM DEMANDS, ML

SYSTEM ZONE	QUARTERS, 1997				AVERAGE DAILY DEMAND
	1ST	2ND	3RD	4TH	
SOUTH LOW	848	882	870	805	3405
SOUTH INTERMEDIATE	134	119	129	142	524
SOUTH HIGH	256	259	259	259	1033
CANTERBURY	76	76	85	81	318
LINCOLN	59	64	69	61	253
ROSEWOOD	10	11	11	10	42
GOLF CLUB ROAD	15	14	16	15	60
HANWELL	9	10	9	6	34
RAINSFORD	4	4	4	4	16
SILVERWOOD	14	16	17	15	62
NORTH LOW	431	470	492	495	1888
NORTH HIGH	73	84	94	86	337
MARYSVILLE	89	91	83	85	348
DIAMOND	-	-	-	1	1
QUARTERLY TOTALS	2018	2100	2138	2065	8321
					22.8

**FREDERICTON WATER TREATMENT PLANT
CHEMICAL DOSAGE AND COSTS, 1997**

CHEMICAL	UNIT COST \$/t	ANNUAL USAGE, t	ANNUAL COST \$	DOSAGE mg/L	COST / ML OF WATER	AVERAGE COST / DAY \$
CHLORINE	839.00	33	26 000	3.9	3.05	70
SULFUR DIOXIDE	2490.00	6	12 700	0.7	1.49	34
LIME	131.09	182	29 800	21.4	3.51	80
SODA ASH	327.75	36	15 000	4.2	1.77	40
TOTALS			83 400		9.82	224

NOTES:

- (1) DOSAGES ARE BASED ON PLANT INFLUENT: 8498 ML
- (2) ANNUAL COSTS ARE CALCULATED INCLUDING HST (minus HST Rebate)

WATER QUALITY - 1997

General

Fredericton's Water Treatment Plant was put into service in July 1984, and with the commissioning of the pipeline to Fredericton North in late 1987, the commissioning of the Longwood Booster Station in late 1990, Young's Crossing Booster Station in January 1997 and Diamond Street Booster in 1997, is now treating approximately 99% of the City supply. The plant removes iron and manganese and raises the pH to approximately 8 pH units, thus reducing the damage by corrosion to the water system, and controlling the leaching of harmful heavy metals from plumbing. The chlorine content of the treated water is 1.0-1.4 mg/L as it leaves the Water Treatment Plant measured as free chlorine. This water is odourless, colourless, and has an agreeable taste.

Breakpoint chlorination began in Silverwood, the only area not served by the Water Treatment Plant, during March of 1988.

Layers of biofilm, manganese, and corrosion byproducts left in parts of the distribution system by less treated water supplies tend to decrease the free chlorine residual until their own chlorine demand is satisfied. When the resultant chlorine residual is low, reaction byproducts with chemical or bleach like odours can be sensed by the public. As chlorine residuals have continued to rise throughout the systems served by the Water Treatment Plant, complaints concerning objectionable tastes and odours have continued to decrease.

Bacterial Analysis

Coliform bacteria counts are accepted as a good index of the degree of bacteriologic safety of water. Although they are not themselves disease producers, coliform bacteria are found in densities roughly proportional to the degree of fecal pollution in polluted water. When members of the coliform group are present, other kinds of microorganisms capable of causing disease may also be present. The absence of coliform bacteria from water is an indication that water is bacteriologically safe for human consumption, since coliform bacteria are more hardy than disease-causing bacteria.

Nine (9) locations related to supply and treatment, twenty-six (26) distribution system locations, and twelve (12) emergency supply wells are each sampled by water operators, once per month. All samples are tested for total coliform using the membrane filtration technique, by the water operators, and results are monitored by the New Brunswick Department of Health and Community Services.

The test results indicated that all water which was delivered in 1997, was biologically safe. Further, tests done in conjunction with sampling indicate that a stable free chlorine residual was maintained within the distribution system.

WATER QUALITY 1997

Inorganic Analysis

Most recent samples for inorganic analysis were taken from wells and the distribution system in July, 1997 and analysed by the N.B. Department of the Environment Central Laboratory. Results are displayed on the following page. All water delivered to the distribution system meets the Guidelines for Canadian Drinking Water Quality, Health & Welfare Canada.

Organic Analysis

The nine (9) active wells, Water Treatment Plant influent and effluent, and five (5) distribution system locations were sampled and analysed for fifteen (15) contaminants in June, 1997. The results are displayed in the following table.

NOTE: Organic and inorganic analysis for stand-by wells is completed every other year.

Water Analysis
Organic 1997

Water Analysis
Inorganic 1997