

**ANNUAL REPORT  
OF THE  
CITY ENGINEER  
1987**

1987

## CITY OF FREDERICTON

**PUBLIC WORKS DEPARTMENT**

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TO HIS WORSHIP THE MAYOR & COUNCILLORS  
OF THE CITY OF FREDERICTON

I submit herewith this report which is a statement of work done under the supervision of the City Engineer.

This report covers the period from 1987 01 01 to 1987 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 .....	8.081 km
Sidewalk Reconstruction (Capital) .....	0.494 km
New Concrete Sidewalk .....	2.716 km
New Street Construction .....	1.968 km
New Pavement - Type "B" Asphalt Concrete .....	3.72 km
Resurface - Type "D" Asphalt Concrete .....	1.892 km
Resurface - Type "E" Asphalt Concrete .....	5.419 km
Gravity Sanitary Sewer Mains .....	2.559 km
Storm Sewer Mains .....	2.958 km
Water Mains .....	4.883 km
Double Chip Sealed Streets .....	2.821 km
Street Reconstruction .....	0.595 km

ALSO

- 187 Water services were installed
- 186 Sanitary sewer services were installed
  - 3 Sprinkler lines were installed
  - 39 Water services were renewed
  - 6 Sanitary sewer services were renewed
- 179 New water meters were installed
  - 7 Existing water & sanitary service installations were extended
- 45 Frozen services were thawed
- 190 Storm sewer services were installed

Contractors under contract with the Engineering Department of the City of Fredericton in 1987 supplied materials, completed construction or began construction, as follows:

- H. C. SMITH & SONS LTD. - supply and delivery of bedding sand
- WENDELL THOMAS & SONS LTD. - supply and delivery of topsoil
- ELMTREE CONCRETE LTD. - supply and delivery of concrete
- DUNHAM'S CONTRACTING LTD. - supply and delivery of granular material
- DURAPAVE LTD. - supply and placement of asphalt concrete
- SANDI-CO LTD. - supply and delivery of winter sand
- IROQUOIS SALT PRODUCTS LTD. - supply and delivery of highway salt
- NORLANTIC PAINTS (A DIVISION OF IBIS PRODUCTS LTD.) - supply of traffic lane striping paint
- CHARMAC CONSTRUCTION COMPANY LIMITED - installation of sanitary sewer and water mains on Kimble Drive
- installation of water mains on Woodstock Road from Rookwood Avenue to Hanwell Road
- R.C. BIRD CONSTRUCTION LTD. - installation of trunk water main in the Main Street area
- MARITIME SANITATION SERVICES - garbage collection services
- ATLANTIC COLAS LIMITED - supply and placement of double chip seal
- ADVANCE CONSTRUCTION CO. LTD. - installation of storm sewer and sanitary sewer in the Central Devon area (Pine, Gill, Babbitt)
- GORMAN PAVING INC. - installation of curb and gutter
- MILLCON LTD. - installation of Saint John River water main
- ATCO CONSTRUCTION LTD. - Construction of Silverwood Reservoir
- HAYLAND LTD. - supply and erection of sand storage facility

General Fund expenditures for the period 1987 01 01 to 1987 12 31  
were as follows:

Item	Budget	Net Expenditure	Over	Under
<u>COMMON SERVICES (Public Works)</u>	\$2 737 852	\$2 784 997	\$ 47 145	-
<u>ROAD TRANSPORT SERVICES</u>				
Administration	76 491	69 613	-	6 878
Roadway Surfaces	1 016 260	976 298	-	39 962
Sidewalk Maintenance	113 500	118 904	5 404	-
Culverts, Ditching	36 725	66 756	30 031	-
Storm Sewer Maintenance	130 587	124 533	-	6 054
Street Cleaning	367 100	340 757	-	26 343
Spring Cleanup	23 280	22 707	-	573
Sanding & Salting & Snow Control	1 029 573	1 178 096	148 523	-
Street Lights	492 345	476 850	-	15 495
Traffic Services	351 883	345 204	-	6 679
<u>ENVIRONMENTAL HEALTH SERVICES</u>				
Garbage & Waste Disposal	403 700	319 105	-	84 595
Garbage & Waste Collection	380 900	382 148	1 248	-
<u>PUBLIC HEALTH SERVICES</u>				
Old Burial Ground	14 700	14 830	130	-
Loyalist Burial Ground	353	68	-	285
<u>PARKS &amp; TREES SERVICES</u>				
Wilmot Park	34 035	26 217	-	7 818
Odell Park	55 250	56 603	1353	-
Carleton Park	12 300	12 209	-	91
Trees	316 481	290 227	-	26 254
Greens, Benches, other parks, etc.	107 700	95 551	-	12 149
<b>TOTALS</b>	<b>\$7 701 015</b>	<b>\$7 701 673</b>	<b>\$233 834</b>	<b>\$233 176</b>

OVER - \$ 658

Utility Fund expenditures for the period 1987 01 01 to 1986 12 31 were as follows:

Item	Budget	Net Expenditure	Over	Under
<u>COMMON SERVICES</u>				
General Equipment	\$ 398 500	\$ 411 615	\$ 13 115	\$ -
Safety & Benefits	197 400	199 280	1 880	-
Administration	104 100	107 028	2 928	-
<u>WATER</u>				
Purification & Treatment	254 200	206 966	-	47 234
Source of Supply	406 050	379 133	-	26 917
Power & Pumping	61 100	42 250	-	18 850
Maintenance of Equipment (Plant)	60 140	83 753	23 613	-
Transmission & Distribution (Oper)	173 600	210 702	37 102	-
Transmission & Distribution (Maint)	682 800	517 487	-	165 313
Billing & Collection	183 800	154 407	-	29 393
Meters	193 200	149 698	-	43 502
<u>SANITARY SEWER</u>				
Operation (Lift Stations)	97 900	60 130	-	37 770
Maintenance	371 900	362 807	-	9 093
Treatment & Disposal	1 155 800	1 216 660	60 860	-
<b>TOTALS</b>	<b>\$4 340 490</b>	<b>\$4 101 916</b>	<b>\$139 498</b>	<b>\$378 072</b>

UNDER: \$ 238 574

Following is a table giving total kilometrage of municipal roads and streets, provincial designated routes, and by-passes & ramps divided with respect to type of surface on the various streets.

LOCATION	MUNICIPAL ROADS & STREETS					DESIGNATED ROUTES			T.C.H., BY-PASSES & RAMPS
	Asphalt	Gravel	Chip Seal	TOTAL	Asphalt	Chip Seal	TOTAL		
Fredericton South	91.659	1 786	9.344	102.789	20.073	2.523	22.596	22.234	
Fredericton North	19.374	0.029	1.039	20.442	4.770		4.770	3.701	
Nashwaaksis	41.779	2.622	8.465	52.866	2.533		2.533	8.214	
Marysville	16.151	0.863	5.471	22.485	8.216		8.216	3.460	
Barker's Point	4.306		2.101	6.407	4.671		4.671	1.275	
Silverwood	3.933	0.085	0.184	4.202				2.757	
Garden Creek	8.899	1.445	6.339	16.683	6.294		6.294	8.771	
Douglas	0.805	0.191	3.105	4.101	2.571		2.571		
Lincoln	4.255	1.494	1.700	7.449	1.332		1.332		
Lower St. Marys	1.138		0.832	1.970					
Killarney Crescent	0.332			0.332	4.230		4.230		
<b>TOTALS</b>	<b>192.631</b>	<b>8.515</b>	<b>38.580</b>	<b>239.726</b>	<b>54.690</b>	<b>2.523</b>	<b>57.213</b>	<b>50.412</b>	

**TOTAL (Municipal and Designated Routes) = 296.939 km**

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

Respectfully submitted,

*E. J. Bliss, P. Eng.*  
E. J. BLISS, P. ENG.  
CITY ENGINEER

COMMON SERVICES (PUBLIC WORKS)

The total net expenditure under this heading was \$2 784 997 made up as follows:

Administration .....	\$ 54 716
Engineering Services .....	290 256
General Equipment .....	1 565 605
Service Depots .....	274 493
Safety & Benefits .....	<u>599 927</u> \$ 2 784 997

ROAD TRANSPORT SERVICES

Road Transport Services is made up of the following items:

Administration .....	\$ 69 613
Roads & Streets .....	2 828 051
Street Lighting .....	476 850
Traffic Services .....	345 204
Recovery Account - Rentals ....	<u>(948 567)</u> \$ 2 771 151

(a) Administration: The total net expenditure under this heading amounted to \$69 613 for wages, pensions, general services, etc.

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

(1) Roadway Surfaces (maintenance)	\$ 976 298
(2) Sidewalk Maintenance .....	118 904
(3) Culverts & Ditching .....	66 756
(4) Storm Sewer Maintenance .....	124 533
(5) Street Cleaning (includes Spring cleanup) .....	363 464
(6) Winter Maintenance .....	<u>1 178 096</u> \$ 2 828 051

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 \$ 976 298 was made up as follows;

Gravel Roads .....	\$ 57 171
Paved Streets .....	770 038
Curb & Gutter Repair .....	80 344
Driveway Entrances .....	7 000
Right-of-way Maintenance .....	<u>61 745</u> \$ 976 298

Gravel Roads - general maintenance and repairs to gravel roads and roadway surfaces.

Paved Streets - this includes the patching and repairing of pavement, the asphalt resurface program and the chip seal program.

The following streets or portions of streets were double chip sealed in 1987:

Location	Length (metres)
* Amberwood Lane .....	167
* Baxter Court .....	173
* Baxter Street .....	115
* Coburn Drive .....	323
* Cowperthwaite Street .....	204
Douglas Avenue above Broad Street .....	38
* Hearne Street .....	504
* Kimble Drive .....	117
* Kingswood Drive .....	445
* Malibu Court .....	105
* Mason Avenue .....	250
* Sutton Street .....	241
* Wetmore Road .....	<u>139</u>
<b>TOTAL .....</b>	<b>2821</b>

2821 metres = 2.821 kilometres

\* Paid for by developer through Local Improvement Agreement

The following streets were resurfaced with Type "D" asphalt concrete in 1987.

<u>Location</u>	<u>Length (metres)</u>
Carriage Hill Drive .....	870
Dewitt Acres .....	200
Jones Street .....	40
Johnston Avenue .....	140
Seymour Street .....	<u>45</u>
<b>TOTAL .....</b>	<b>1295</b>

1295 metres = 1.295 kilometres

Also, selected sections of McLeod Hill Road, Brookside Drive, Springhill Road, Royal Road, Highland Avenue, Doak Road and Lincoln Road near the Research Station were padded utilizing a spreader.

The following streets were resurfaced with Type "E" (10 mm) asphalt concrete in 1987.

5419 metres = 5.419 kilometres

- Curb and Gutter Repair - replacement of sections of curb and gutter on various streets.
- Driveway Entrances - placement of asphalt between curbline and street right-of-way primarily on streets curbed in recent years.
- Right-of-way Maintenance - sodding and seeding, rip rapping, grass cutting, repair and placement of guide rails and clearing of rights-of-way.

#### (2) Sidewalk Maintenance

The net expenditure of \$ 118 904 for sidewalk repairs was made up as follows:

Personnel (labour, pensions, worker's compensation) .....	\$ 65 539
Materials .....	40 266
General Services (use of equipment) ....	<u>13 099</u> \$ 118 904

#### (3) Culverts and Ditching - the maintenance and installation of culverts and ditches

The net expenditure of \$ 66 756 was made up as follows:

Personnel (labour, pensions, worker's compensation) .....	\$ 31 017
Materials .....	11 852
General Services (use of equipment) ....	<u>23 887</u> \$ 66 756

#### (4) Storm Sewer Maintenance - the flushing of mains, cleaning and repair of catch basins and the repair of mains

The net expenditure of \$ 124 533 was made up as follows:

Personnel (labour, pensions, worker's compensation) .....	\$ 93 141
Materials .....	2 606
General Services (use of equipment) ....	<u>28 786</u> \$ 124 533

(5) Street Cleaning and Flushing

The City of Fredericton used sweepers #51 and #57, Vac-all unit #54, and trackless units #126, #127, #129 and #131 for street cleaning purposes in 1987. These pieces of equipment worked a combined total of 1600 hours in this operation. A contractor was also engaged to sweep major streets on a regular basis in 1987.

The net expenditure under this heading amounted to \$ 363 464\* and was made up as follows:

Personnel (labour, pensions, worker's compensation) .....	\$ 198 807
General Services (use of equipment & contract services).....	159 364
Brooms - main & gutter .....	1 691
Brooms - hand .....	2 026
Anti-litter cans .....	17
Dust Control .....	<u>1 559</u> \$ 363 464

\* Includes an amount of \$ 22 707 for Spring Cleanup

(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, shovelling 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 313.828 km of roads and streets in 1987 (150.667 km on the north side and 163.161 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 1987, 151.169 km of sidewalk were plowed and sanded. (51.502 km on the north side and 99.667 km on the south side)

Streets:

The total net cost of snow control (streets) amounted to \$ 729 020 and was made up as follows:

Personnel (labour, pensions, worker's compensation) .....	\$ 381 338
General Services (use & maintenance of equipment).....	342 069
Fixed Assets (new equipment) .....	5 613
	<hr/>
	\$729 020

The total net cost of sanding and salting streets amounted to \$266 927 and was made up as follows:

Personnel (labour, pensions, worker's compensation) .....	\$ 89 451
General Services (use & maintenance of equipment) .....	41 734
Materials (salt and sand) .....	125 551
Fixed Assets (new equipment) .....	<u>10 191</u> \$266 927

The overall net expenditure of \$995 947 for plowing, sanding, and salting City roads and streets was made up as follows:

Personnel (labour, pensions, worker's compensation) .....	\$ 470 789
General Services (use & maintenance of equipment) .....	383 803
Fixed Assets (new equipment) .....	15 804        (1)
Materials (salt & sand) .....	<u>125 551</u> \$995 947

Sidewalks:

The total net expenditure for plowing sidewalks amounted to \$144 682 and was made up as follows:

Personnel (labour, pensions, worker's compensation) .....	\$ 76 268
General Services (use & maintenance of equipment) ....	<u>68 414</u> \$144 682

The total net expenditure for sanding sidewalks amounted to \$37 466 and was made up as follows:

Personnel (labour, pensions, worker's compensation) .....	\$ 17 891
General Services (use & maintenance of equipment) ....	8 348
Materials (sand) .....	3 947
Fixed Assets (new equipment) .....	<u>7 281</u> \$ 37 467

The overall net expenditure for snow control and sanding of sidewalks was \$182 148 made up as follows:

Personnel (labour, pensions, worker's compensation) .....	\$ 94 159
General Services (use & maintenance of equipment) ....	76 762
Materials (sand) .....	3 947       (2)
Fixed Assets (new equipment) .....	<u>7 281</u> \$182 149

**TOTAL NET COST OF WINTER MAINTENANCE - ADD (1) & (2) = \$1 178 096**

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

1983	Agriculture Canada Airport Weather Office	139.30 cm 179.20 cm
1984	Agriculture Canada Airport Weather Office	297.50 cm 332.90 cm
1985	Agriculture Canada Airport Weather Office	178.90 cm 198.20 cm
1986	Agriculture Canada Airport Weather Office	193.10 cm 259.70 cm
1987	Agriculture Canada Airport Weather Office	212.80 cm 372.20 cm

(c) Street Lighting

The multiple lighting system for the City of Fredericton as of 1987 12 31 consisted of:

6 - 100 Watt H.P.S.	at	\$138.09 per light per year
1 - 150 Watt H.P.S.	at	184.16 per light per year
101 - 100 Watt H.P.S.	at	107.38 per light per year
1 - 180 Watt L.P.S.	at	208.33 per light per year
36 - 400 Watt L.P.S.	at	245.97 per light per year
10 - 125 Watt M.V.	at	115.05 per light per year
2 - 175 Watt M.V.	at	163.40 per light per year
203 - 175 Watt M.V.	at	138.09 per light per year
354 - 175 Watt Ref. M.V.	at	107.38 per light per year
12 - 250 Watt M.V.	at	205.44 per light per year
4 - 250 Watt M.V.	at	180.13 per light per year
1710 - 250 Watt M.V.	at	149.42 per light per year
573 - 400 Watt Ref. M.V.	at	209.21 per light per year
1 - 500 Watt Ref. M.V.	at	180.89 per light per year
2 - 400 Watt Flood Lights	at	0.67 per Watt per year
1 - 150 Watt H.P.S.	at	153.45 per light per year
19 - 150 Watt H.P.S.	at	60.42 per light per year

The total street lighting costs for 1987 were as follows:

Salaries & Benefits .....	\$ 4 136
Multiple Lighting System Contract .....	467 973
Government Services (Power to City Owned Lights) .....	539
New Poles .....	4 079
New Bulbs .....	<u>123</u> \$476 850

(d) Traffic Services

The expenditure under this heading is made up as follows:

- (1) Street Signs
- (2) Painting & Striping
- (3) Traffic Signals
- (4) Railway Crossings

(1) Street Signs

Purchasing, repairing and installing street signs on City Streets.

The net expenditure under this heading amounted to \$32 252 made up as follows:

Personnel (labour, pensions, worker's compensation) .....	\$ 3 206
General Services (repairs & maintenance, use of equipment) .....	7 224
Goods (posts, street sign purchases, etc.)	<u>21 822</u>
	\$ 32 252

(2) Painting & Striping

The net expenditure under this heading was \$142 979 made up as follows:

Personnel (labour, pensions, worker's compensation) .....	\$ 67 973
General Services (use & maintenance of equipment) .....	16 489
Goods (paint, misc. supplies, signs) ...	53 504
Fixed Assets (new equipment) .....	<u>5 013</u>
	\$142 979

(3) Traffic Signals

The net expenditure under this heading was \$124 427 made up as follows:

Personnel (labour, pensions, worker's compensation) .....	\$ 23 082
General Services (use of equipment) ....	5 975
Government Services (electric power) ...	64 751
Goods (materials) .....	19 541
Fixed Assets (new equipment) .....	<u>11 078</u>
	\$124 427

(4) Railway Crossings

The net expenditure under this heading was \$45 546 for maintenance done by railway companies.

ENVIRONMENTAL HEALTH SERVICES

The following items are included under the above heading:

- (1) Garbage and Waste Collection
- (2) Garbage and Waste Disposal

(1) Garbage and Waste Collection

In 1986, the net amount paid for the garbage and waste collection operation was \$382 148 made up as follows:

General Services - (Contract Services) ...	\$380 150
General Services - (Advertising).....	<u>1 998</u>
	\$382 148

(2) Garbage and Waste Disposal

The net expenditure under this section was \$319 105 made up as follows:

General Services ( diversion fees, solid waste commission payments, and land rental) .....	\$318 025
Government Services (taxes) .....	<u>1 080</u>
	\$319 105

PUBLIC HEALTH SERVICES

The following items are included under the above heading:

- (1) Old Burial Ground
- (2) Loyalist Burial Ground

(1) Old Burial Ground

The net expenditure under this section was \$14 830 made up as follows:

Personnel (labour, pensions, worker's compensation) .....	\$13 339
General Services (use of equipment) .....	387
Government Services (lighting) .....	545
Goods (materials) .....	<u>559</u>
	\$ 14 830

(2) Loyalist Burial Ground

The net expenditure under this section was \$ 68 made up as follows:

Personnel (labour, pensions, worker's compensation) .....	\$ 68	\$ 68
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### PARKS AND TREES SERVICES

The following items are included under the above heading:

- (1) Wilmot Park
- (2) Odell Park
- (3) Carleton Park
- (4) Trees
- (5) Greens, Benches & Other Parks

(1) Wilmot Park

The net expenditure for this item was \$26 217 made up as follows:

Personnel (labour, pensions, worker's compensation) .....	\$ 18 159
General Services (use & maintenance of equipment, building repairs).....	4 076
Government Services (water & sewer rates, light & power) ....	2 344
Goods (materials; fuels & lubricants)...	<u>1 638</u> \$ 26 217

(2) Odell Park

The net expenditure for this item was \$ 56 603 made up as follows:

Personnel (labour, pensions, worker's compensation) .....	\$ 37 465
General Services (use & maintenance of equipment, communications; building repairs) .....	10 529
Government Services (water & sewer rates, lights & power) ...	1 009
Goods (materials; fuels & lubricants)...	<u>7 600</u> \$ 56 603

(3) Carleton Park

The net expenditure for this item was \$ 12 209 made up as follows:

Personnel (labour, pensions, worker's compensation .....	\$ 7 224
General Services (use & maintenance of equipment & land rental) .....	3 231
Goods (materials) .....	<u>1 754</u> \$ 12 209

(6) Trees

The net expenditure for this item was \$290 227 made up as follows:

Personnel (labour, pensions, UIC, worker's compensation) .....	\$211 046
General Services (use of equipment) ....	33 974
Goods (fuels & lubricants, materials, new trees, small tools & equipment) ....	<u>45 207</u>
	\$290 227

In 1987, 106 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 1987:

<u>Species</u>	<u>Number Removed</u>
Elm	91
Maple	9
Poplar	1
Willow	4
Pine	<u>1</u>
<b>TOTAL .....</b>	<b>106</b>

In 1987, 49 trees were removed because of Dutch Elm Disease.

Following is a summary of Elm trees removed from 1964 to 1987:

Year	No. Lost To Dutch Elm Disease	% Lost To Dutch Elm Disease	Other Causes	Total
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
<b>TOTALS</b>	<b>5555</b>	<b>67.3</b>	<b>2699</b>	<b>8254</b>

Trees were planted (first planting) at the following locations in 1987:

Location	Number of Trees
Birmingham Court	19
Brookmount Street	6
Canada Street (136, 142, 174-176, 280, 416)	5
Canada Street/Gibson Street Monument	2
Canterbury Drive Cemetery	24
Carleton Park	36
Carleton Street	7
Castleton Court	18
Cathedral	3
Chandler Drive	2
City Hall	2
Coventry Crescent (196)	2
Dufferin Street (500)	2
Eagle Court (15)	1
Elm Court	7
Forestview Court	10
Fulton Avenue (101)	1
George Street	9
George Street (239)	1
Gill Street	3
King Street	3
Malloy Field	20
Mitchell Street	19
Montgomery Street (496)	1
Odell Park	91
Parkside Drive	31
Prince Street (743)	1
Prospect Street	44
Pugsley Street	29
Queen Square	5
Queen Street Green	2
Reading Street	18
Riverfront Drives	33
Smythe Street (248)	2
Smythe Street (Tractors & Equipment)	5
Sunset Drive (227)	1
Sunset Drive	15
St. Marys Street	4
Talmadge Court	11
Tilley Drive (corner of Flemming Road)	1
Union Street (377, 663)	4
Waterloo Row	2
Wetmore Road	21
Willis Street	28

Trees (first planting) 1987 (continued)

Location	Number of Trees
Wilmot Park	5
Woodstock Road (150)	1
York Street	<u>11</u>
<b>TOTAL .....</b>	<b>568</b>

171 trees were planted at various locations to replace losses due to dry weather and vandalism.

A number of trees were also trimmed in 1987. The number and class of trees were made up as follows:

- (a) Trees above 14 m in height - approximately 300 mixed species
- (b) Trees 6 m to 14 m in height - approximately 700 mixed species
- (c) Trees under 6 m in height - approximately 3500 mixed species

Stumps removed, topsoiled and seeded - 78

Shrubs planted on City park land - 522

#### (7) Greens, Benches & Other Parks

The net expenditure for this item was \$95 551 made up as follows:

Personnel (labour, pensions, worker's compensation) .....	\$ 51 537
General Services (use & maintenance of equipment) .....	16 263
Goods (fuels & lubricants, materials, small tools & equipment) .....	22 336
Fixed Assets (new equipment) .....	<u>5 415</u>
	<b>\$ 95 551</b>

UTILITY FUND

The above item is made up of the following headings:

- (1) Common Services
- (2) Sanitary Sewer
- (3) Water

(1) COMMON SERVICES

The net expenditure for this item in 1987 was \$717 923.  
This expenditure was made up as follows:

General Equipment .....	\$ 411 615
Safety & Benefits .....	199 280
Administration .....	<u>107 028</u>
	\$717 923

(2) SANITARY SEWER

In 1987 the net expenditure for this item was \$ 1 852 283  
made up as follows:

Operating: Lift Stations

Personnel (labour, pensions, worker's compensation) .....	\$ 35 601
General Services (use & maintenance of equipment) .....	10 250
Government Services (light & power) ....	10 791
Goods (materials) .....	<u>3 488</u>
	\$ 60 130

Maintenance:

Personnel (labour, pensions, worker's compensation) .....	\$210 851
General Services (use & maintenance of equipment; communications) .....	68 601
Goods (materials & tools) .....	<u>83 355</u>
	\$362 807

Sewage Treatment & Disposal:

Personnel (labour, worker's compensation) .....	\$ 14 953
General Services - use & maintenance	
of equipment .....	7 832
- treatment (contract services) .....	1 158 813
Government Services: Water & Sewer	
Rates .....	524
Lights & Power... .	33 310
Goods (Miscellaneous Supplies) .....	<u>1 228</u> \$1 216 660

Debt Charges:

Principal .....	\$122 130
Interest .....	<u>90 556</u> \$ 212 686
TOTAL .....	\$1 852 283

New customers connected to the City sewer system in 1987 .... 186

The Fredericton sanitary sewer system consists of approximately 251 kilometres of mains made up as follows:

Size	Silverwood Garden Creek	Nashwaaksis	Marysville	Barker's Point	Fredericton (Pre 1973)	Total
100 mm	-	0.158	-	-	-	0.158
100 mm F.M.	0.013	-	-	-	1.103	1.116✓
150 mm	-	1.433	0.314	-	0.108	1.855
150 mm F.M.	0.031	0.417	0.539	0.068	3.008	4.063✓
200 mm	12.109	34.102	17.523	7.559	111.610	182.903
200 mm F.M.	0.254	-	0.314	-	0.064	0.632✓
250 mm	1.959	3.158	0.851	0.298	8.684	14.950
250 mm F.M.	1.178	-	-	-	-	1.178✓
300 mm	1.267	3.200	1.006	1.868	14.484	21.825
300 mm F.M.	0.420	-	-	-	0.739	1.159✓
350 mm	0.287	0.686	-	-	0.713	1.686✓
350 mm F.M.	-	-	0.528	-	0.254	0.782✓
375 mm	1.138	2.163	0.500	0.174	2.816	6.791
400 mm	0.018	0.076	-	-	0.210	0.304
450 mm	1.039	0.031	1.350	-	3.088	5.508
500 mm	2.979	-	-	-	-	2.979
600 mm	0.156	-	-	-	1.510	1.666
750 mm	-	-	-	-	0.322	0.322
900 mm	-	-	-	-	1.432	1.432
<b>TOTALS</b>	<b>22.848</b>	<b>45.424</b>	<b>22.925</b>	<b>9.967</b>	<b>150.145</b>	<b>251.309</b>

NOTE: Fredericton includes the Lincoln area.

✓ F.m.= 8.93 ✓

The above kilometrages 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

There are at present 12 separately monitored water systems, comprising 22 wells (13 active), 16 reservoirs, 5 booster stations and the Water Treatment Plant.

The Water Treatment Plant treats the water from the 5 Wilmot Park wells, which now provide over 90% of the City's water. The following describes the 12 water systems and their normal sources.

<u>SYSTEM</u>	<u>SOURCE</u>	<u>STORAGE</u>
South Low	5 wells via W.T.P., 1 well direct	18200 kL
North Low	South Low via River Crossing	8540 kL
South Intermediate	South Low via booster	9090 kL
South High, Canterbury	South Interim. via booster	2209 kL
Rosewood	South Low via booster	0 kL
Lincoln	South Low via booster	3750 kL
Flemming	Lincoln via booster	0 kL
Hanwell	1 well direct	270 kL
Silverwood	2 wells direct	245 kL
Rainsford	1 well direct	0 kL
Killarney	2 wells direct	3750 kL
Marysville	2 wells direct	2840 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) .....	\$	154	407
(2) Water Ordinary (including meters) ....		877	766
(3) Water Treatment Facility & Well			
Production Costs ....		712	102
(4) Debt Charges - Principal .....		261	303
(5) Debt Charges - Interest .....		<u>167</u>	<u>851</u>
			\$2 173 429

(1) WATER ADMINISTRATION (BILLING & COLLECTION)

The net expenditure of \$154 407 was made up as follows:

Office salaries & benefits .....	\$	98	207
Postage .....		18	520
Machinery Rental .....		3	000
Professional Services .....		6	319
Materials .....		10	688
New Equipment .....		<u>17</u>	<u>673</u>
			\$ 154 407

(2) WATER ORDINARY (INCLUDING METERS)

The net expenditure of \$877 887 was made up as follows:

Transmission & Distribution (Operation)

Labour - Boosters .....	\$	65	079
Use of Equipment .....		15	293
Equipment Maintenance - Boosters .....		31	549
Power - Boosters .....		59	796
Taxes - Boosters .....		10	923
Materials - Boosters .....		<u>28</u>	<u>062</u>
			\$ 210 702

Transmission & Distribution (Maintenance)

Personnel (labour, pensions, U.I.C., worker's compensation) .....	\$ 278 371
General Services (use & maintenance of equipment) .....	100 069
Goods (fuels & lubricants, tools, materials, parts) .....	101 603
Fixed Assets (new equipment) .....	<u>37 444</u>
	\$ 517 487

Meters

Personnel (labour, pensions, etc.) ...\$	89 756
Meter Parts, miscellaneous supplies, & tools .....	9 903
Use of Equipment .....	17 195
Fixed Assets (new meters) .....	<u>32 844</u>
TOTAL .....	\$ 877 887

On 1987 12 31 there were 11531 water services on meter and 301 on flat rate, making a total of 11832.

179 new meters were installed in 1987, 102 regular meters changed to RRT, and 108 ARB meters changed to RRT. 6 flat rate services were metered.

In 1987, 9 discontinued services were excavated and shut off at the main, 190 stopped meters replaced and 17 frozen meters replaced.

The following sprinklers were installed in 1987:

Head Hall Extension	-	Windsor Street
R.P.C. Extension	-	Montgomery Street
Victoria Health Centre	-	Brunswick Street

There are in the City as of 1987 12 31, 1439 hydrants situated in the following areas:

Fredericton South .....	665
Fredericton North .....	151
Nashwaaksis .....	265
Marysville .....	142
Barker's Point .....	66
Silverwood .....	<u>22</u>

SUB TOTAL ..... 1311

LOCATED ON PRIVATE PROPERTY ..... 128

TOTAL ..... 1439

Hydrants were installed at the following locations in 1987:

Location	Number
Carrington Lane	5
Fulton Avenue	3
Kingswood Drive	1
Woodstock Road	2
Maliseet Drive	5
Devon Reserve (Court "A")	1
Windsor Street & Albert (Head Hall)	<u>1</u>
SUB-TOTAL (CITY OWNED) .....	18
PLUS: PRIVATE HYDRANTS	
Maritime Forestry Complex	<u>2</u>
OVERALL TOTAL .....	20

The Fredericton distribution system consists of approximately 270 kilometres of water main, made up as follows:

Size	Marysville	Nashwaaksis	Barker's Pt.	Silverwood	Garden Creek	Fredericton	TOTAL
32 mm	-	0.153	-	-	-	-	0.153
38 mm	-	0.072	-	-	-	-	0.072
50 mm	-	-	-	0.154	-	-	0.154
75 mm	-	-	-	-	-	0.435	0.435
100 mm	0.753	2.232	-	2.508	10.401	15.894	
150 mm	12.316	20.781	3.915	4.630	56.890	98.532	
200 mm	5.991	19.555	0.954	4.897	40.840	72.237	
250 mm	2.951	6.546	5.163	0.964	20.107	35.731	
300 mm	1.050	2.387	0.031	4.758	25.337	33.563	
350 mm	-	0.207	-	-	3.522	3.729	
400 mm	-	-	-	-	5.364	5.364	
450 mm	-	-	-	-	1.965	1.965	
500 mm	-	-	-	-	1.194	1.194	
600 mm	-	-	-	-	0.395	0.395	
Unknown	0.146	-	-	-	-	-	0.146
<b>TOTAL</b>	<b>23.207</b>	<b>51.933</b>	<b>10.063</b>	<b>17.911</b>	<b>166.450</b>	<b>269.564</b>	

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

The above kilometrages do not include water mains installed at the Exhibition Grounds; the University of New Brunswick; St. Anne's Point Barracks on the Woodstock Road and the low rental housing development in Fredericton North.

### (3) WATER PRODUCTION COSTS

The net expenditure of \$712 102 was made up as follows:

#### Source of Supply

Labour - Wells .....	\$ 83 691
Use of Equipment .....	10 730
Maintenance - Wells .....	58 207
Communications .....	8 056
Power - Wells .....	197 416
Materials - Wells .....	<u>21 033</u> \$ 379 133

Power & Pumping (Plant)

Labour .....	\$ 31 818
Communications .....	1 011
Light & Power .....	4 400
Supplies .....	<u>5 021</u>
	\$ 42 250

Water Treatment Plant

Labour .....	\$ 112 110
Insurance .....	23 913
Maintenance of Equipment .....	57 909
Power .....	16 757
Taxes .....	26 336
Materials .....	1 951
Goods (Chlorine, Soda Ash, Lime, etc.)	<u>51 743</u>
	\$ 290 719
<b>TOTAL .....</b>	<b>\$ 712 102</b>

The total amount of water pumped from 1987 01 01 to 1987 12 31 for the entire City was 8 177 000 kilolitres. The amount of water produced by the five Wilmot wells in 1987 was 6 051 000 kilolitres or 74% of the total City supply. The average daily demand for the City is 22 200 kilolitres.

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

WATER PRODUCTION COSTS

Year	kilolitres Produced	Production Expenditure	Production Cost per kilolitre
1978	6 307 295	246 509.77	0.039
1979	6 628 241	303 364.45	0.046
1980	7 037 407	360 611.00	0.051
1981	6 907 216	355 321.00	0.051
1982	7 029 560	432 326.00	0.062
1983	7 225 102	435 929.00	0.060
1984	7 368 351	523 393.00	0.071
1985	7 880 000	646 991.00	0.082
1986	7 781 000	732 141.00	0.094
1987	8 177 000	712 102.00	0.087

The total net expenditure for transmission and distribution of water for the City from 1987 01 01 to 1987 12 31 was determined from the following:

Transmission & Distribution:

Operation .....	\$ 210 702
Maintenance .....	<u>517 487</u> \$ 728 189

Therefore, the net expenditure for transmission and distribution of one kilolitre of water from 1987 01 01 to 1987 12 31 was:

$$\frac{\$ 728 189}{8 177 000} = \$ 0.089$$

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

Transmission and Distribution Costs

<u>YEAR</u>	<u>NET EXPENDITURE per kilolitre</u>
1978	0.048
1979	0.057
1980	0.072
1981	0.070
1982	0.074
1983	0.087
1984	0.092
1985	0.099
1986	0.088
1987	0.089

The total net expenditure for administration costs and debt charges for the City from 1987 01 01 to 1987 12 31 was determined from the following:

Water Administration

(1) Billing & Collection .....	\$ 154 407
(2) Meters (Installation, Reading, Repairs) .....	149 577
<u>Debt Charges (Principal &amp; Interest)</u> .....	<u>429 154</u> \$ 733 138

Administration costs per kilolitre of water produced:

$$\frac{\$ 303 984}{8 177 000} = \$ 0.037$$

Debt Charges per kilolitre of water produced:

$$\frac{\$ 429 154}{8 177 000} = \$ 0.052$$

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

Administration Costs and Debt Charges per kilolitre

<u>Year</u>	<u>Administration (Billing &amp; Collection &amp; Meters)</u>	<u>Debt Charges</u>
1978	0.039	0.125
1979	0.042	0.119
1980	0.039	0.104
1981	0.044	0.100
1982	0.044	0.096
1983	0.051	0.107
1984	0.042	0.097
1985	0.043	0.094
1986	0.043	0.075
1987	0.037	0.052

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

Total Costs per kilolitre

<u>Year</u>	<u>Production Costs</u>	<u>Transmission &amp; Distribution Costs</u>	<u>Administration Costs</u>	<u>Debt Charges</u>	<u>*TOTAL</u>
1978	0.039	0.048	0.039	0.125	0.251
1979	0.046	0.057	0.042	0.119	0.264
1980	0.051	0.072	0.039	0.104	0.266
1981	0.051	0.070	0.044	0.100	0.265
1982	0.062	0.074	0.044	0.096	0.276
1983	0.060	0.087	0.051	0.107	0.305
1984	0.071	0.092	0.042	0.097	0.302
1985	0.082	0.099	0.043	0.094	0.318
1986	0.094	0.088	0.043	0.075	0.300
1987	0.087	0.089	0.037	0.052	0.265

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

S U M M A R YWATER AND SEWER REVENUE & EXPENDITURES1987

Item	Net Expenditure	Revenue
<b>COMMON SERVICES (WATER &amp; SEWER)</b>		
General Equipment	\$ 411 615	\$ 217 514
Safety & Benefits	199 280	
Administration	107 028	
<b>WATER</b>		
Water Administration (Billing & Collection)	154 407	
Water Ordinary (Including Meters)	877 887	3 899 680
Water Treatment Facility & Well Production Costs	712 102	
Debt Charges - Principal & Interest	429 154	
<b>SANITARY SEWER</b>		
Operating & Maintenance	422 937	2 570 629
Sewage Treatment & Disposal	1 216 660	
Debt Charges	212 686	
<b>TOTALS</b>	<b>\$ 4 743 756</b>	<b>\$ 6 687 823</b>
<b><u>SURPLUS: \$ 1 944 067</u></b>		

NOTE: \$1 267 938 of the above notes surplus was appropriated for Utility Capital expenditures.

CAPITAL PROGRAMS

The following gives brief descriptions of capital projects begun or completed in 1987.

WATER:

In 1987, water mains were installed across the Saint John River from the City of Fredericton Water Treatment Facility to Main Street and along Main Street from Douglas Avenue to Wallace Avenue. Water mains were also installed along the Woodstock Road from Rookwood Avenue to Hanwell Road and up to the new Silverwood Reservoir from the supply line near the old Silverwood Reservoir.

New mains were also installed in the Chippins Limited Carrington Lane Subdivision in Nashwaaksis (Fulton Avenue, Carrington Lane, Cherry Avenue, Broad Street, and Thorburn Court); on the Devon Indian Reserve (Maliseet Drive and the first court off of the new section of Maliseet Drive); on Kimble Drive near the fire station site, and Golf Club Road Estates Subdivision (Golf Club Rd.; Kingswood Dr.; Coburn Dr.)

Following are lengths and sizes of mains installed in 1987:

LOCATION	LENGTH OF MAINS - metres								
	150 mm D.I.	200 mm D.I.	250 mm D.I.	300 mm D.I.	350 mm D.I.	400 mm D.I.	500 mm D.I.	500 mm P.E.	
* Golf Club Road Estates Subd. (Golf Club Rd.; Kingswood Dr; Coburn Dr.)	11	208							
* Chippin's Carrington Lane Subd.(Fulton Ave.;Cherry Ave; Broad St.; Carrington Lane; Thorburn Ct.)	45	855			313				
Saint John River Crossing & Main Street	13	16					418	332	827
✓ Woodstock Road-Rookwood Ave. to Hanwell Rd.;	7	15			12	31	867		
Team Dr. & Silverwood Reservoir					200				
** Devon Indian Reserve	19	332	130			25			
*** Kimble Drive	4	7	196						
TOTALS	99	1433	326	525	56	1285	332	827	

OVERALL TOTAL - 4883 metres or 4.883 kilometres

- \* Entire cost paid by Developers through Local Improvement Agreements.
- \*\* Paid for by the Department of Indian and Northern Affairs.
- \*\*\* Services extended to accommodate the proposed Fire Station.

SANITARY SEWER:

In 1987, sanitary sewer mains were installed in the Chippin's Limited Carrington Lane Subdivision in Nashwaaksis (Fulton Avenue, Carrington Lane, Cherry Avenue, Broad Street, and Thorburn Court), the Golf Club Road Estates Subdivision (Golf Club Road, Kingswood Drive, Coburn Drive), on the Devon Indian Reserve (Maliseet Drive and the first court off of the new section of Maliseet Drive) and on Kimble Drive near the Fire Station site. Upgrading was also done in the Central Devon Area (Pine, Gill and Babbitt Streets).

Following are lengths and sizes of mains installed in 1987:

Location	LENGTH OF MAINS - metres		
	200 mm PVC	375 mm PVC	400 mm D.I.
* Chippin's Carrington Lane Subd. (Fulton Ave; Cherry Ave; Broad St; Carrington Lane & Thorburn Ct.)	1151		
* Golf Club Road Estates Subd. (Golf Club Rd; Kingswood Dr; Coburn Dr.)	199		
** Devon Indian Reserve	414		
*** Kimble Drive	198		
**** Central Devon Area (Pine, Gill, Babbitt)	213	367	17
<b>TOTALS</b>	<b>2175</b>	<b>367</b>	<b>17</b>

OVERALL TOTAL = 2559 metres or 2.559 kilometres

- \* Entire cost paid by developers through Local Improvement Agreements.
- \*\* Paid for by the Department of Indian and Northern Affairs.
- \*\*\* Services extended to accommodate the proposed Fire Station.
- \*\*\*\* Paid for under Major System Repair & Replacement

STORM SEWER:

In 1987, storm sewer mains were installed in the Chippin's Limited Carrington Lane Subdivision in Nashwaaksis (Fulton Avenue, Carrington Lane, Cherry Avenue, Broad Street and Thorburn Court), the Golf Club Road Estates Subdivision (Golf Club Road, Kingswood Drive, Coburn Drive), on the Devon Indian Reserve (Maliseet Drive and the first court off of the new section of Maliseet Drive), Central Devon Area (Pine, Gill & Babbitt Streets), Derby Court, and in conjunction with the new Silverwood Reservoir.

Following are lengths and sizes of mains installed in 1987:

## LENGTH OF MAINS - metres

Location	250 mm	300 mm	375 mm	450 mm	900 mm
* Chippin's Carrington Lane Subd. (Fulton Ave, Cherry Ave, Broad St, Carrington Lane, Thorburn Ct.)	178	829	216		146
* Golf Club Road Estates Subd. (Golf Club Rd, Kingswood Dr, Coburn Dr.)	100	60		139	
** Devon Indian Reserve	94	91	118	208	
Central Devon Area (Pine, Gill, Babbitt)	44	397	25	131	
*** Derby Court					45
**** Team Drive and Silverwood Reservoir			137		
<b>TOTALS</b>	<b>416</b>	<b>1377</b>	<b>496</b>	<b>478</b>	<b>191</b>

OVERALL TOTAL = 2958 metres or 2.958 kilometres

- \* Entire cost paid by Developers through Local Improvement Agreements
- \*\* Paid for by the Department of Indian and Northern Affairs
- \*\*\* Installed under General Fund Storm Sewer in O & M budget.
- \*\*\*\* Paid for under Capital Water. Installed to accommodate drainage from Silverwood Reservoir

CURB AND GUTTER:

Concrete curb and gutter was constructed at the following locations in 1987:

<u>Location</u>	<u>Length (metres)</u>
Anderson Street .....	657
Broad Street .....	647
Cherry Avenue .....	825
Colwell Drive .....	546
Coronation Court .....	482
Day Street .....	430
Fulton Avenue .....	166
Garden Street .....	793
** Greenwood Drive .....	802
* Hanwell - Prospect Intersection .....	122
Jewett Street - Kent Street .....	279
Marigold Street .....	390
Marlborough Drive .....	599
* Priestman-York Intersection .....	327
Ridgewell Place .....	162
Sierra Drive .....	351
Sumac Street .....	177
Tweedie Court .....	326
<b>TOTAL .....</b>	<b>8081</b>

8081 metres - 8.081 kilometres

\* Done under Traffic Management (Intersection Improvements)

\*\* Done under Designated Route Program

PAVING:

In 1987, Durapave 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 (20 mm) - Type "B" at \$37.00 per tonne in place
- 2) Surface Course (13 mm)- Type "D" at \$40.00 per tonne in place

(1) BINDER COURSE - TYPE "B"

The following streets were paved with Type "B" asphalt concrete in 1987:

Location	Length (metres)
Anderson Street	335
Broad Street	307
Cherry Avenue	387
Colwell Drive	538
Coronation Court	243
Day Street	198
Fulton Avenue	98
Garden Street	380
Jewett Street - Kent Street	144
Marigold Street	198
Marlborough Drive	377
Ridgewell Place	100
Sierra Drive	188
Sumac Street	92
Tweedie Court	135
<b>TOTAL .....</b>	<b>3720</b>

3720 metres - 3.72 kilometres

(2) SURFACE COURSE - TYPE "D"

The following streets were paved with Type "D" asphalt concrete in 1987:

<u>Location</u>	<u>Length (metres)</u>
* Greenwood Drive - Victory Avenue to #180	402
Hanwell - Prospect Intersection	45
Priestman - York Intersection	<u>150</u>
 TOTAL .....	597

597 metres = 0.597 kilometres

\* Done under Designated Route Program

CONCRETE SIDEWALKS:

Sidewalks were constructed at the following locations in 1987:

<u>Location</u>	<u>Length (metres)</u>
Broad Street .....	317
Cherry Avenue .....	385
Colwell Drive .....	492
Dunns Crossing Road .....	343
Fulton Avenue .....	94
* Greenwood Drive .....	398
Hanwell Road .....	105
Marlborough Drive .....	348
* Priestman-York Intersection .....	96
Royal Road .....	52
Sierra Drive .....	179
Smythe Street .....	230
Sumac Street .....	78
Wetmore Road .....	<u>93</u>
	3210

3210 metres = 3.21 kilometres

\* Reconstruction of existing sidewalk

WORKS FACILITIES:

In 1987, a new sand/salt storage dome was constructed at the Regent Street depot.

TRAFFIC MANAGEMENT

In 1987, a complete upgrading of the Prospect Street-Hanwell Road intersection took place. This upgrading included the installation of curb and gutter, paving and traffic signals.

INTERSECTION IMPROVEMENTS

In 1987, the York Street-Priestman Street intersection was upgraded. This upgrading included the installation of curb and gutter, the construction of slip off lanes and the installation of duct work for future traffic signals.

There was also some acquisition of materials to be used when the Prospect Street-Smythe Street intersection is upgraded.

STREET RECONSTRUCTION

In 1987, Kimble Drive between the existing paved portion and the new fire station site was reconstructed. This reconstruction included the excavation and removal of existing material to subgrade and the placement of granular base material.

MAIN STREET PROGRAM

In 1987, the upgrading of the downtown area of the City continued. Work in front of City Hall was finalized. Further work in the Phoenix Square area is planned in 1988.

PARK DEVELOPMENT

In 1987, work was started on the development of the Reading Street Park.

SOLID WASTE MANAGEMENT

Work continued on closing out the Vanier landfill site in 1987. It is anticipated that this will be finalized in 1988.

NEW STREET CONSTRUCTION:

The following new streets were constructed in 1987:

<u>Location</u>	<u>Length (metres)</u>
Broad Street	150
Carrington Lane	606
Cherry Avenue	40
Coburn Drive	323
Fulton Avenue	317
Kingswood Drive	445
Thorburn Court	87

**TOTAL ..... 1968**

1968 metres = 1.968 kilometres

**NOTE: All the above streets were constructed through Local Improvement Agreements**

DESIGNATED ROUTES

The City of Fredericton has a total of 57.213 km of provincial designated highways within its boundaries. In 1987, the Provincial Government paid \$ 299.34 (winter) and \$ 75.53 (summer) per lane kilometre towards maintenance of the routes respectively. 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 1987:

(1)	Route 10-Greenwood Drive - Curb, Gutter, Paving - \$ 97 180.29 (Victory Ave. to #180)	
(2)	Route 101 - Regent Street (Brunswick St. to Beaverbrook St.) - Resurface	- 40 985.30
(3)	Route 8 - Bridge Street (McGloin St. to Downing St.) - Resurface	- 16 998.54
(4)	Route 650 - Wilsey Road (Vanier Hwy. to Shaw Brick Yard) - Reconstruction	- 48 789.48

**TOTAL ..... \$ 203 953.61**

CAPITAL PROGRAMS  
SUMMARY OF EXPENDITURES

ITEM	BUDGET	EXPENDITURE	REMARKS
<u>UTILITY FUND</u>			
Silverwood Reservoir	\$ 650 000*	\$ 416 739	
St. John River Water Main Crossing	2 000 000*	1 284 854	
Woodstock Rd. Water Main (Rookwood to Hanwell)	400 000*	244 639	Restoration to be completed in 1988.
Riverview Drive Mains (Water & Sanitary Sewer)	800 000*	5 657	To be finalized in 1988.
Lower Glengarry/Golf Club Rd. Mains(Water & Sanitary Sewer)	300 000*	2 366	To be finalized in 1988.
Major system repair & replacement (water & sanitary sewer)	200 000*	139 767	
<u>GENERAL FUND</u>			
Central Devon Area (Pine, Gill, Babbitt - storm sewer)	110 000	177 192	Continued from 1986
Rainsford Lane Park (curb, gutter, paving)	290 000	208 995	
Colwell Drive - Sumac Street (curb, gutter, paving, sidewalk)	140 000	158 217	
Fulton Ave.-Sierra Dr.-Cherry Ave. (curb, gutter, paving, sidewalk)	100 000	94 711	
Cherry Ave. (curb, gutter, paving, sidewalk)	90 000	85 042	
Jewett Street (curb, gutter, paving)	30 000	29 296	

\* Budget figures were established for a two year program (1987 & 1988)

CAPITAL PROGRAMSSUMMARY OF EXPENDITURES

ITEM	BUDGET	EXPENDITURE	REMARKS
Broad Street (curb, gutter, paving, sidewalk)	80 000	76 097	Urban design, 96% completed
Tweedie Court (curb, gutter, paving)	40 000	32 700	Infrastructure - 100% material
Coronation Court (curb, gutter, paving)	50 000	47 997	Infrastructure - 100% material
Kimble Drive (Street Reconstruction)	120 000	120 075	STUDY ONGOING
Dunn Crossing Rd. (sidewalk)	30 000	29 219	Infrastructure - 100% completed
Smythe Street-Waggoner's Lane to Tamarack Terrace - sidewalk	20 000	24 540	Infrastructure - 100% completed
Royal Rd. - Main St. to R.R. Tracks - sidewalk	10 000	22 850	Infrastructure - 100% completed
Works Facilities (sand storage building - Regent depot)	110 000	129 700	Works safety - 100% completed
Traffic Management (Prospect Street/Hanwell Road Intersection)	40 000	59 527	+ busy road work at intersection
Intersection Improvements (Prospect/Smythe Intersection)	90 000	10 515	
Intersection Improvements (York/Priestman Intersection)	50 000	65 426	
Preliminary Engineering	30 000	11 165	
Park Development (Reading Street Park)	20 000	23 500	
Main Street Program	180 000	147 067	
Solid Waste Management (Vanier Landfill Site Closeout)	200 000	325 984	

CAPITAL PROGRAMSSUMMARY OF EXPENDITURES

ITEM	BUDGET	EXPENDITURE	REMARKS
<u>GENERAL FUND</u> (continued)			
Garden Place Subdivision (curb, gutter, paving, sidewalk)	90 000	114 114	Actual amount spent includes sidewalk
Hanwell Rd.- Woodstock Rd. to Inglewood Dr.- sidewalk	10 000	12 172	Actual amount spent includes sidewalk
<u>DESIGNATED ROUTES</u>			
Greenwood Dr.-Victory Ave. to #180 Greenwood Dr. (curb, gutter, paving, sidewalk)	130 000	114 216	Actual amount spent includes sidewalk
Regent St.- Brunswick St. to Beaverbrook St.- Resurface	60 000	40 985	Actual amount spent includes sidewalk
Bridge St.- McGloin St. to Downing St.- Resurfacing	30 000	16 999	Actual amount spent includes sidewalk
Wilsey Rd.- Vanier Highway to Shaw Brick Yard - reconstruction	50 000	48 789	Actual amount spent includes sidewalk
TOTAL	330 000	390 000	Total amount spent includes sidewalk

WATER QUALITY - 1987BACTERIAL 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 the water is bacteriologically safe for human consumption, since coliform bacteria are more hardy than disease-causing bacteria.

Samples for coliform analysis were taken monthly from the wells in service and on stand-by and various distribution points in the City water system. All samples were tested for total coliform by the membrane filtration technique.

The following is a description of those samples which developed coliform colonies:

Date	Location	No. Coliform/100 mL
87 05 11	Highland Well	1
	Veteran's Court	1
	Silverwood #2 Well	3
	Silverwood #3 Well	4
	Silverwood Reservoir	6
87 06 08	Wilmot #4 Well	10
	Silverwood #2 Well	5
	Silverwood #3 Well	6
	Highland Well	2
	Killarney K-1 Well	1
	Maple #1 Well	>10
87 07 02	Highland Well	3
	Silverwood #2 Well	6
	Silverwood #3 Well	3
	Cameron Court	1
	Woodbridge Street Rehab	2

In all cases, positive tests were followed by negative tests for each location.

The positive tests may be due to the following factors:

- a) poor sampling conditions
- b) less care in sampling
- c) increased involvement of operators in laboratory

With the low counts experienced, fecal contamination is not suspected.

#### WATER TREATMENT PLANT

Fredericton's new water treatment plant was put on line in July of 1984 and is now treating approximately 90% of the City supply. The plant removes iron and manganese and raises the pH to approximately 8 pH units, thus decreasing corrosion rates. The chlorine content of the effluent is 0.90 mg/L measured as free chlorine. This water is odourless, colourless, and has an agreeable taste.

Impurities from previous water supplies have left sediments which, in some areas, deplete our chlorine residual and allow trichloramines to form. These may have a metallic or chemical taste, and an odour similar to that of bleaching agents. At years end this problem was prevalent in the north low pressure system, where water from the treatment plant was first introduced in late October, 1987. As the chlorine demand of the sediments is satisfied, the free chlorine residual will return and the tastes and odours will subside.

#### CHEMICAL ANALYSIS

Samples for chemical analysis were taken from wells and the distribution system in January, 1988 and analysed by Environment New Brunswick's laboratory. Results are displayed on the following page.

Two columns concerning pumpage and percent of supply are added for quick reference.

## FREDERICK WATER CHEMICAL ANALYSES; 1988-01

LOCATION	TOT.ALK		TDS		HARD		RES.		Ca		Mg		Na		K		Cl		SO4		F		N		Fe		Mn		Cu		Zn		Pb-69		HOUS 1987 PURPAGE		2 of Total Supply	
	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					
WELNOT #1 WELL	7.119	54.2	0.1	145	106	44.6	14.10	2.29	6.40	0.82	5.9	10.2	0.15	L.01	L.05	0.82	0.03	0.02	L.20	66										1701	20.8							
WELNOT #2 WELL	6.807	67.6	2.0	234	151	64.6	20.10	3.51	10.80	0.63	13.6	19.5	0.19	0.10	0.25	3.00	0.02	0.03	2.0	82										295	3.6							
WELNOT #3 WELL	7.017	82.1	0.1	346	226	99.8	32.20	4.70	15.50	3.21	39.1	27.8	0.14	0.82	L.05	0.04	0.01	0.03	L.20	100										1570	19.2							
WELNOT #4 WELL	7.148	54.3	0.2	252	150	62.7	19.60	3.34	13.10	1.78	26.2	17.9	0.13	0.38	L.05	0.31	0.06	0.04	L.20	66										714	8.7							
WELNOT #5 WELL	7.423	54.2	0.1	140	103	41.6	13.20	2.09	5.54	0.89	5.1	10.1	0.13	0.05	L.05	1.38	0.02	0.01	4.6	66										1772	21.7							
DUAL WELL	7.993	116.0	0.1	342	263	88.8	30.50	3.08	30.00	0.76	28.7	18.3	0.22	0.06	L.05	0.98	L.01	0.02	2.8	141										252	3.1							
CHESTER CT. WELL	7.261	79.1	0.2	325	217	90.4	30.00	3.76	23.20	0.57	44.5	15.0	0.18	0.75	L.05	0.02	0.02	L.01	L.20	96										42	0.5							
BENSTROD WELL	7.559	68.0	0.2	164	130	61.6	21.10	2.17	5.80	0.32	L5	12.7	0.12	0.06	L.05	0.05	0.02	0.10	L.20	83										16	0.2							
SILVERWOOD #2 WELL	7.985	179.1	0.2	390	318	148.0	25.80	20.30	18.70	0.72	10.1	24.5	0.17	L.01	L.05	0.04	0.01	0.18	L.20	218										10	0.1							
SILVERWOOD #3 WELL	8.048	99.6	0.2	209	171	91.7	17.60	11.60	3.23	0.39	L5	11.2	0.13	0.05	L.05	0.01	L.01	0.02	2.3	121										53	0.7							
KILLARNEY #1 WELL	7.585	73.4	0.6	230	166	95.7	33.30	3.04	7.97	0.46	19.6	10.5	0.16	0.31	L.05	0.02	0.05	0.06	L.20	89										171	2.1							
KILLARNEY #10 WELL	7.891	108.8	0.9	249	206	91.8	31.70	3.06	16.40	0.42	6.2	15.3	0.22	L.01	L.05	0.25	0.01	L.01	L.20	133										170	2.1							
TOWER RD. #1 WELL	7.892	80.2	0.1	320	230	117.2	40.90	3.65	17.20	0.40	13.6	56.0	0.19	0.03	L.05	0.04	0.03	0.09	6.3	98										73	0.9							
TOWER RD. #2 WELL	7.661	70.1	0.2	275	187	98.9	32.80	4.13	14.20	0.45	34.1	16.0	0.16	0.03	0.22	0.01	0.09	0.02	L.20	85										296	3.6							
MODULIN ST. WELL	7.541	98.8	2.2	300	230	96.7	32.60	3.72	22.90	0.69	19.8	29.8	0.19	0.06	0.25	0.28	0.02	L.01	L.20	120										0	0.0							
MAPLE ST. #1 WELL	7.453	107.6	2.6	425	292	137.0	47.20	4.66	27.70	0.85	54.3	23.5	0.19	0.69	0.44	0.06	0.02	0.11	7.2	131										215	2.6							
MAPLE ST. #2 WELL	7.713	122.1	1	495	337	186.3	65.10	5.76	21.30	1.26	61.0	28.7	0.22	1.08	0.17	0.03	0.03	0.03	L.20	149									0	0.0								
MAPLE ST. #3 WELL	7.708	108.2	1.4	381	278	139.9	50.80	3.16	21.70	0.68	35.9	33.2	0.20	0.11	L.05	0.11	0.01	L.01	L.20	132										379	4.6							
HIGHLAND WELL	7.368	77.3	0.7	226	173	86.7	31.00	2.75	11.00	0.63	10.4	21.9	0.16	0.20	L.05	0.04	0.03	0.02	L.20	94										77	0.9							
CLIFFE ST. WELL	7.892	94.5	1.6	214	179	65.6	30.50	1.80	10.30	0.49	L5	16.0	0.16	L.01	L.05	0.25	0.01	0.04	L.20	115										330	3.9							
GREENWOOD #1 WELL	9.036	130.2	4.3	328		4.1	1.38	0.15	72.10	0.30	15.3	15.5	0.80	L.01	0.11	0.04	0.02	L.01	7.4										6	0.1								
GREENWOOD #2																													6	0.6								
CITY HALL	8.026	88.6	0.1	267	205	118.1	42.10	3.15	11.90	1.47	19.3	18.1	0.17	0.23	L.05	L.01	0.01	0.06	L.20	108										0.0	0.0							
WOODBROOK ST.	8.026	87.1	0.1	269	194	92.3	31.80	3.13	10.90	1.66	21.4	18.3	0.13	0.27	L.05	0.05	0.03	0.04	L.20	106										0.0	0.0							
MAGNETIC LIMITS		6.5		5.0		200	200	250	270		250	300	1.5	1.0	0.3	0.05	1.0	5.0	50											8177								
		6.5		5.0																																		

