

**ANNUAL REPORT
OF THE
CITY ENGINEER**

1989

CITY OF FREDERICTON

PUBLIC WORKS DEPARTMENT

INDEX

	<u>PAGE</u>
Letter of Transmittal	1
Capital Programs	34
Common Services (Public Works)	6
Environmental Health Services	15
Parks and Trees Services	17
Public Health Services	16
Road Transport Services	6
Utility Fund (Sanitary Sewer & Water)	22
Water Quality - 1989	49

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 1989 01 01 to 1989 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	13.792 km
Sidewalk Reconstruction	0.400 km
New Concrete Sidewalk	1.602 km
New Street Construction	5.247 km
New Pavement - Type "B" Asphalt Concrete	5.826 km
Resurface - Type "D" Asphalt Concrete	4.168 km
Resurface - Type "E" Asphalt Concrete	4.342 km
Gravity Sanitary Sewer Mains	6.728 km
Storm Sewer Mains	6.137 km
Water Mains	7.395 km
Double Chip Sealed Streets	4.394 km

ALSO

- 258 Water services were installed
- 257 Sanitary sewer services were installed
- 11 Sprinkler lines were installed
- 3 Water services were renewed
- 3 Sanitary sewer services were renewed
- 258 New water meters were installed
- 6 Existing water service installations were extended
- 5 Existing sanitary service installations were extended
- 22 Frozen services were thawed
- 194 Storm sewer services were installed

Contractors under contract with the Engineering Department of the City of Fredericton in 1989 supplied materials, completed construction or began construction, as follows:

- WENDELL THOMAS & SONS LTD. - supply and delivery of bedding sand
- supply and delivery of topsoil
- ELMTREE CONCRETE LTD. - supply and delivery of concrete
- DUNHAM'S CONTRACTING LTD. - supply and delivery of granular material
- GORMAN PAVING INC. - supply and placement of asphalt concrete
- SANDI-CO LTD. - supply and delivery of winter sand
- AKZO SALT LTD. - supply and delivery of highway salt
- LAURENTIDE CHEMICALS - supply of traffic lane striping paint
- TRIUS TAXI LTD. - garbage collection services
- ATLANTIC COLAS LIMITED - supply and placement of double chip seal
- BEMROSE & KILBURN LTD. - Brunswick Street trunk sewer and water main upgrading
- R.C. BIRD CONSTRUCTION LTD. - removal of retaining wall on Woodstock Road
- installation of water main and sanitary sewer - Hodgson Road.
- ASCON LTD. - installation of curb and gutter and sidewalk
- JOHN MACBEAN - supply and delivery of granular material
- KWI - construction of Marysville Reservoir
- LANDMARK STRUCTURES (ONTARIO) LTD. - construction of Smythe Street Reservoir
- MULTI-VENTURES - installation of services on Prospect Street from Hanwell Road to Monteith Motors.
- installation of water main along T.C.H. near Regent Mall on/off ramps

General Fund expenditures for the period 1989 01 01 to 1989 12 31
were as follows:

Item	Budget	Net Expenditure	Over	Under
COMMON SERVICES (Public Works)	\$ 3 157 890	\$ 3 142 925	\$ -	\$ 14 965
ROAD TRANSPORT SERVICES				
Administration	231 600	245 459	13 859	-
Roadway Surfaces	989 150	982 006	-	7 144
Sidewalk Maintenance	327 200	342 953	15 753	-
Culverts, Ditching	38 300	43 569	5 269	-
Storm Sewer Maintenance	138 000	108 844	-	29 156
Street Cleaning	410 500	433 593	23 093	-
Spring Cleanup	31 050	22 787	-	8 263
Sanding & Salting & Snow Control	1 100 000	1 461 168	361 168	-
Street Lights	504 110	477 398	-	26 712
Traffic Services	370 270	354 097	-	16 173
ENVIRONMENTAL HEALTH SERVICES				
Garbage & Waste Disposal	306 700	294 008	-	12 692
Garbage & Waste Collection	394 400	458 311	63 911	-
PUBLIC HEALTH SERVICES				
Old Burial Ground	14 425	10 324	-	4 101
Loyalist Burial Ground	353	447	94	-
PARKS & TREES SERVICES				
Wilmot Park	34 510	27 846	-	6 664
Odell Park	57 100	56 190	-	910
Carleton Park	12 375	11 319	-	1 056
Trees	326 500	333 132	6 632	-
Greens, Benches, other parks, etc.	148 800	136 909	-	11 891
TOTALS	\$ 8 593 233	\$ 8 943 285	\$ 489 779	\$ 139 727

OVER: \$ 350 052

Utility Fund expenditures for the period 1989 01 01 to 1989 12 31 were as follows:

Item	Budget	Net Expenditure	Over	Under
<u>COMMON SERVICES</u>				
General Equipment	\$ 327 900	\$ 372 210	\$ 44 310	\$ -
Safety & Benefits	222 000	161 553	-	60 447
Administration	121 000	110 014	-	10 986
<u>WATER</u>				
Purification & Treatment	252 600	216 505	-	36 095
Source of Supply	443 300	413 941	-	29 359
Power & Pumping	50 000	40 276	-	9 724
Maintenance of Equipment (Plant)	79 300	63 936	-	15 364
Transmission & Distribution (Oper)	392 300	497 600	105 300	-
Transmission & Distribution (Maint)	611 400	563 340	-	48 060
Billing & Collection	174 400	183 417	9 017	-
Meters	185 600	184 801	-	799
<u>SANITARY SEWER</u>				
Operation (Lift Stations)	143 500	68 042	-	75 458
Maintenance	478 500	430 272	-	48 228
Treatment & Disposal	1 350 200	1 297 577	-	52 623
TOTALS	\$4 832 000	\$4 603 484	\$158 627	\$387 143

UNDER: \$ 228 516

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	96.521	2.198	7.659	106.378	20.073	2.523	22.596	24.572
Fredericton North	20.167	0.029	0.653	20.849	9.000		9.000	3.701
Nashwaaksis	45.028	0.934	7.723	53.685	2.533		2.533	8.214
Marysville	17.526	0.304	4.655	22.485	7.556		7.556	8.073
Barker's Point	6.418		1.894	8.312	2.766		2.766	1.317
Silverwood	4.343	0.085	0.184	4.612				2.757
Garden Creek	12.413	1.634	3.389	17.436	6.294		6.294	8.771
Douglas	1.855	0.191	2.315	4.361	2.571		2.571	
Lincoln	5.256	1.314	0.879	7.449	1.332		1.332	
Lower St. Marys	1.138		0.832	1.970				
TOTALS	210.665	6.689	30.183	247.537	52.125	2.523	54.648	57.405

TOTAL (Municipal and Designated Routes) = 302.185 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.
CITY ENGINEER

COMMON SERVICES (PUBLIC WORKS)

The total net expenditure under this heading was \$3 142 925 made up as follows:

Administration	\$ 65 408
Engineering Services	415 936
General Equipment	1 772 786
Service Depots	307 872
Safety & Benefits	<u>580 923</u> \$ 3 142 925

ROAD TRANSPORT SERVICES

Road Transport Services is made up of the following items:

Administration	\$ 245 459
Roads & Streets	3 394 920
Street Lighting	477 398
Traffic Services	354 097
Recovery Account - Rentals	<u>(960 274)</u> \$ 3 511 600

(a) Administration: The total net expenditure under this heading amounted to \$245 459 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) \$	982 006
(2) Sidewalk Maintenance	342 953
(3) Culverts & Ditching	43 569
(4) Storm Sewer Maintenance	108 844
(5) Street Cleaning (includes Spring cleanup)	456 380
(6) Winter Maintenance	<u>1 461 168</u> \$ 3 394 920

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 \$ 982 006 was made up as follows;

Gravel Roads	\$ 64 832
Paved Streets	662 107
Curb & Gutter Repair	142 974
Driveway Entrances	1 952
Right-of-way Maintenance	<u>110 141</u> \$ 982 006

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

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

The following streets or portions of streets were double chip sealed in 1989:

Location	Length (metres)
* Aspendale Lane	158
* Barrett Court	68
* Carter Court	67
* Drammen Drive	394
* Duval Court	220
** Forest Hill Road - Kimble Drive to existing near Biggs St.	160
* Herschel Court	75
*** Highland Reservoir Road	387
* Jason Court	59
* Jewett Street - existing to Drammen Drive ..	161
* Kimble Drive - existing to Forest Hill Road. Kimble Drive - R.R. Tracks to Sutton Street.	613
Reynolds Street	48
Ruby Street	488
* Stairs Street	268
* Stoneybrook Crescent	373
* Trites Court	335
* Wetmore Road - existing to Kimble Drive	45
Wiggins Drive	320
	155
TOTAL	4394

4394 metres = 4.394 kilometres

* Paid for by developer through local improvement agreement.

** Portion paid for by developer. Balance by City.

*** Paid for under water ordinary.

The following streets or portions of streets were resurfaced with asphalt concrete in 1989 (Type "B" for Harrison Court and Hodgson Road; remainder Type "D")

<u>Location</u>	<u>Length (metres)</u>
Bishop Drive	265
Bourque Lane	1097
Greer Street	150
Harrison Court	151
Mill Street	182
Prospect Street extension	120
Hodgson Road	695
St. Roch Street	320
Sunset Drive - Wilkins Ave. to Drammen Dr....	180
White Court	182
TOTAL	3342

3342 metres = 3.342 kilometres

Also, selected sections of Bridge Street, Brookside Drive, Canada Street, McLeod Hill Road, Rainsford Lane, River Street, Springhill Road, Doak Road and Hanwell Road were padded with Type "D" asphalt concrete utilizing a spreader.

The following streets were resurfaced with Type "E" asphalt concrete in 1989.

<u>Location</u>	<u>Length (metres)</u>
Athlone Street	204
Carleton Street - George St. to Charlotte St...	116
Carney Street	284
College Hill Road - Montgomery St. to Priestman St.	524
Coombes Street	256
Duke Street - Marshall St. to Fisher Ave.....	61
Fisher Avenue - Duke Street to curbed section..	290
Forest Hill Road - Canterbury Dr. to Kimble Dr.	591
Highland Avenue (curbed section)	472
Inglewood Drive	578
McGloin Street - Fisher Ave. to former R.R. Tracks	107
Neill Street - Union St. to Dobie St.	235
Rookwood Avenue - Saunders St. to Waggoner's Lane	558
York Street by City Hall	66
TOTAL	4342

4342 metres = 4.342 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 \$ 342 953 for sidewalk repairs was made up as follows:

Personnel Costs	\$ 124 672
Materials	138 076
General Services (use of equipment..... & special projects)	<u>80 205</u> \$ 342 953

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

The net expenditure of \$ 43 569 was made up as follows:

Personnel Costs	\$ 17 465
Materials	11 107
General Services (use of equipment)	<u>14 997</u> \$ 43 569

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

The net expenditure of \$ 108 844 was made up as follows:

Personnel Costs	\$ 60 403
Materials	11 320
General Services (use of equipment)	<u>37 121</u> \$ 108 844

(5) Street Cleaning and Flushing

The City of Fredericton used sweepers #51, #52 and #57, Vac-all unit #54, and trackless units #120, #121, #130, #131, #220 and #221 for street cleaning purposes in 1989. These pieces of equipment worked a combined total of 2934 hours in this operation. A contractor was also engaged to sweep major streets on a regular basis in 1989.

The net expenditure under this heading amounted to \$ 456 380* and was made up as follows:

Personnel Costs	\$ 254 558
General Services (use of equipment & contract services).....	180 485
Brooms - main & gutter	12 074
Brooms - hand	11
Anti-litter cans	244
Dust Control	<u>9 008</u> \$ 456 380

* Includes an amount of \$ 22 787 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 314.238 km of roads and streets in 1989 (150.667 km on the north side and 163.571 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 1989, 156.237 km of sidewalk were plowed and sanded. (52.954 km on the north side and 103.283 km on the south side)

Streets:

The total net cost for plowing streets amounted to \$800 358 and was made up as follows:

Personnel Costs	\$ 436 096
General Services (use & maintenance of equipment).....	357 229
Goods	40
Fixed Assets (new equipment)	<u>6 993</u>
	\$ 800 358

The total net cost of sanding and salting streets amounted to \$430 000 made up as follows:

Personnel Costs	\$ 127 172
General Services (use & maintenance of equipment)	98 950
Materials (salt and sand)	193 267
Fixed Assets (new equipment)	<u>10 611</u>
	\$ 430 000

The overall net expenditure of \$1 230 358 for plowing, sanding, and salting City roads and streets was made up as follows:

Personnel Costs	\$ 563 268
General Services (use & maintenance of equipment)	456 179
Goods	40
Fixed Assets (new equipment)	17 604
Materials (salt & sand)	<u>193 267</u>
	\$1 230 358

Sidewalks:

The total net expenditure for plowing sidewalks amounted to \$158 673 and was made up as follows:

Personnel Costs	\$ 87 219
General Services (use & maintenance of equipment)	71 447
Goods	<u>8</u>
	\$ 158 674

The total net expenditure for sanding sidewalks amounted to \$72 135 and was made up as follows:

Personnel Costs	\$ 25 434
General Services (use & maintenance of equipment)	19 790
Materials (sand)	9 759
Fixed Assets (new equipment)	<u>17 153</u>
	\$ 72 136

The overall net expenditure for snow plowing and sanding of sidewalks was \$230 810 made up as follows:

Personnel Costs	\$ 112 653
General Services (use & maintenance of equipment)	91 237
Materials (sand)	9 759
Fixed Assets (new equipment)	17 153
Goods	<u>8</u> \$ 230 810

TOTAL NET COST OF WINTER MAINTENANCE - ADD (1) & (2) = \$1 461 168

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

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
1988	Agriculture Canada Airport Weather Office	139.20 cm 227.60 cm
1989	Agriculture Canada Airport Weather Office	218.60 cm 350.80 cm

(c) Street Lighting

The multiple lighting system for the City of Fredericton as of 1989 12 31 consisted of:

8 - 100 Watt H.P.S.	at	\$138.09 per light per year
6 - 150 Watt H.P.S.	at	184.16 per light per year
134 - 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
38 - 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
1709 - 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 1989 were as follows:

Salaries & Benefits	\$ 1575
Multiple Lighting System Contract	478 237
General Services - Maintenance of Equipment	677
Government Services (Power to City Owned Lights)	632
New Poles	(3 966)
New Bulbs	<u>243</u> \$ 477 398

(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 \$12 467 made up as follows:

Personnel Costs	\$ 3 202
General Services (repairs & maintenance of signs & use of equipment)	1 194
Goods (posts, street sign purchases, etc.)	<u>8 071</u>
	\$ 12 467

(2) Painting & Striping

The net expenditure under this heading was \$186 312 made up as follows:

Personnel Costs	\$ 81 042
General Services (use & maintenance of equipment)	26 327
Goods (paint, misc. supplies, signs) ...	72 344
Fixed Assets (new equipment)	<u>6 600</u>
	\$186 312

(3) Traffic Signals

The net expenditure under this heading was \$111 545 made up as follows:

Personnel Costs	\$ 41 759
General Services (use of equipment)	14 238
Government Services (electric power) ...	40 509
Goods (materials)	<u>15 039</u>
	\$111 545

(4) Railway Crossings

The net expenditure under this heading was \$43 773 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 1989, the net amount paid for the garbage and waste collection operation was \$458 311 made up as follows:

General Services - (Contract Services) ...	\$ 324 000
General Services - (Advertising).....	14
General Services - (Recycling Collection).	<u>134 297</u>
	\$ 458 311

(2) **Garbage and Waste Disposal**

The net expenditure under this section was \$294 008 made up as follows:

General Services (recycling boxes & advertising, solid waste commission payments, and land rental)	\$ 292 299
Government Services (taxes)	<u>1 709</u>
	\$ 294 008

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 \$ 10 324 made up as follows:

Personnel Costs	\$ 8 582
General Services (use of equipment)	332
Government Services (lighting)	499
Goods (materials)	<u>911</u> \$ 10 324

(2) Loyalist Burial Ground

The net expenditure under this section was \$ 447 made up as follows:

Personnel Costs	\$ 424
General Services (use of equipment)	<u>23</u> \$ 447

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 \$27 846 made up as follows:

Personnel Costs	\$ 20 362
General Services (use & maintenance of equipment, building repairs).....	1 486
Government Services (water & sewer rates, light & power)	2 155
Goods (materials; fuels & lubricants)...	<u>3 843</u> \$ 27 846

(2) Odell Park

The net expenditure for this item was \$ 56 190 made up as follows:

Personnel Costs	\$ 39 982
General Services (use & maintenance of equipment, communications; building repairs)	9 520
Government Services (water & sewer rates, lights & power) ...	930
Goods (materials; fuels & lubricants)...	<u>5 758</u> \$ 56 190

(3) Carleton Park

The net expenditure for this item was \$ 11 319 made up as follows:

Personnel Costs	\$ 6 688
General Services (use of equipment & land rental).....	2 676
Goods (materials)	<u>1 955</u> \$ 11 319

(4) Trees

The net expenditure for this item was \$333 132 made up as follows:

Personnel Costs	\$246 042
General Services (use & maintenance of equipment)	38 123
Goods (fuels & lubricants, materials, new trees, small tools & equipment)	<u>48 967</u> \$333 132

In 1989, 175 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 1989:

<u>Species</u>	<u>Number Removed</u>
Elm	98
Maple	56
Linden	3
Poplar	3
Ash	2
White Pine	4
Other	<u>9</u>
TOTAL	175

In 1989, 47 trees were removed because of Dutch Elm Disease.

Following is a summary of Elm trees removed from 1964 to 1989:

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
1989	47 (48.0)	51	98
TOTALS	5645 (66.9)	2786	8431

Trees were planted (first planting) at the following locations in 1989:

<u>Location</u>	<u>Number of Trees</u>
Adams Street	50
Barton Crescent	3
Beaconsfield Crescent	1
Broad Street Park	49
Brunswick Street	27
Canada Street	13
Canterbury Drive	5
Carleton Street - Library	8
Case Street	57
Colebrook Court	4
Corbett Avenue	1
Derby Court	19
Doyle Court	4
Goodine Street	12
Holland Street	8
Hospital (DECH)	26
Johnston Avenue	9
King Street	6
London Court	29
MacPherson & Stafford Streets	30
Malloy Park	86
McMann Street	3
Mitchell Street	2
Montgomery Street	18
Northumberland Street	1
Nottingham Street	9
Odell Park	11
Piercy Crescent	50
Prince Street	14
Queen Street - City Hall	11
Reading Street Park	55
Reading Street Tot Lot	23
River Street	9
Rookwood Avenue	4
Sierra Park	10
Smythe Street	1
Union Street - Irving Car Wash	2
University Avenue	3
Wilmot Park	59
 TOTAL	732

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

A number of trees were also trimmed in 1989. The number and class of trees were made up as follows:

(a) Trees above 14 m in height - approximately 350 mixed species

(b) Trees 6 m to 14 m in height - approximately 700 mixed species

(c) Trees under 6 m in height - approximately 3000 mixed species

Stumps removed, topsoiled and seeded - 120

Shrubs planted on City park land - 460

(6) Greens, Benches & Other Parks

The net expenditure for this item was \$ 136 909 made up as follows:

Personnel Costs	\$ 74 905
General Services (use & maintenance of equipment & special projects)..	30 334
Goods (fuels & lubricants, materials, small tools & equipment & new trees)..	14 498
Fixed Assets (new equipment)	<u>17 172</u> \$136 909

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 1989 was \$643 777.
This expenditure was made up as follows:

General Equipment	\$ 372 210
Safety & Benefits	161 553
Administration	110 014
	\$643 777

(2) SANITARY SEWER

In 1989 the net expenditure for this item was \$ 1 992 580 made up as follows:

Operating: Lift Stations

Maintenance:

Personnel Costs	\$219	419
General Services (use & maintenance of equipment)	52	805
Goods (repair parts & tools).....	83	339
Fixed Assets (new equipment)	74	709
		\$430 272

Sewage Treatment & Disposal:

Personnel Costs	\$ 12 988
General Services - use & maintenance	
of equipment	4 480
- treatment (contract	
services)	1 247 741
Government Services: Water & Sewer	
Rates	611
Lights & Power...	31 495
Goods (Miscellaneous Supplies)	<u>262</u> \$ 1 297 577

Debt Charges:

Principal	\$ 132 124
Interest	<u>64 565</u> \$ 196 689
TOTAL	\$ 1 992 580

New customers connected to the City sewer system in 1989 257

The Fredericton sanitary sewer system consists of approximately 262 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	15.488	36.172	17.523	7.559	113.811	190.553
200 mm F.M.	0.254	-	0.314	-	0.064	0.632
250 mm	1.959	3.158	0.955	0.298	9.071	15.441
250 mm F.M.	1.178	-	-	-	-	1.178
300 mm	1.267	3.200	1.006	1.868	16.721	24.062
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	-	-	-	2.144	2.300
750 mm	-	-	-	-	0.322	0.322
900 mm	-	-	-	-	1.432	1.432
TOTALS	26.227	47.494	23.029	9.967	155.604	262.321

NOTE: Fredericton includes the Lincoln area.

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 year's end, 14 separately monitored water systems, comprising 22 wells (13 active), 16 reservoirs, 5 active booster stations and the Water Treatment Plant.

The Water Treatment Plant treats the water from the 5 Wilmot Park wells, which provide over 90% of the City's water. The following describes the 14 water systems and their normal sources.

<u>SYSTEM</u>	<u>SOURCE</u>	<u>STORAGE</u>
South Low	5 wells via W.T.P., 1 emergency standby well	18200 kL
North Low	South Low via River Crossing (same pressures) 7 emergency standby wells	8540 kL
South Intermediate	South Low via booster	9090 kL
South High	South Interim. via booster	2410 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
Vanier South Intermediate	South High via Pressure Reducing Valve	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 1 emergency standby well	2840 kL
Canterbury	South High via Altitude Valve	910 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)	\$ 183 417
(2)	Water Ordinary (including meters)	1 429 158
(3)	Water Treatment Facility & Well Production Costs	734 658
(4)	Debt Charges - Principal	249 730
(5)	Debt Charges - Interest	<u>136 890</u> \$ 2 733 853

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

The net expenditure of \$183 417 was made up as follows:

Office salaries & benefits	\$ 97 476
Postage	17 047
Machinery Rental	4 027
Professional Services	16 926
Materials	15 570
New Equipment	944
Computer Lease Payments	<u>31 427</u> \$ 183 417

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

The net expenditure of \$1 429 158 was made up as follows:

Transmission & Distribution (Operation)

Personnel Costs	\$ 77 504
General Services (use & maintenance of equipment)	316 758
Government Services (light & power, provincial taxes).....	83 095
Goods (materials)	<u>20 243</u> \$ 497 600

Transmission & Distribution (Maintenance)

Personnel Costs	\$ 299 055
General Services (use & maintenance of equipment & hydrants)	118 951
Goods (fuels & lubricants, tools, materials, parts)	<u>145 334</u> \$ 563 340

Meters

Personnel Costs	\$ 102 823
Meter Parts, miscellaneous supplies, & tools	10 299
Use of Equipment	17 698
Fixed Assets (new meters)	<u>53 981</u> \$ 184 801
TOTAL	\$1 429 158

On 1989 12 31 there were 12031 water services on meter and 230 on flat rate, making a total of 12261.

258 new meters were installed in 1989, 30 regular register meters changed to RRT or KRT, and 283 ARB register meters changed to RRT or VRT. 7 flat rate services were metered. 83 meters were also changed for various reasons.

In 1989, 24 discontinued services were excavated and shut off at the main, 139 stopped meters replaced and 40 frozen meters replaced.

The following sprinklers were installed in 1989:

- 10 Barton Crescent (Occo Development)
- 605-607 Campbell Street (Keddy's Lamont Bldg.)
- 615 Campbell Street (Lighthouse)
- 156 Hodgson Road (Topmar Housing)
- 180 Hodgson Road (R. & R. Book Binding)
- 650 Montgomery Street (N.B. Teacher's Federation)
- 570 Queen Street (Barkerhouse)
- 1111 Regent Street (Village Centre)
- 311 St. Marys Street (Elm City Chrysler)
- 180 Woodbridge Street (Forest Hill Rehab)
- 81 York Street (Rundle Industries)

There are in the City as of 1989 12 31, 1539 hydrants situated in the following areas:

Fredericton South	726
Fredericton North	156
Nashwaaksis	279
Marysville	145
Barker's Point	66
Silverwood	<u>23</u>

SUB TOTAL 1395

LOCATED ON PRIVATE PROPERTY 144

TOTAL 1539

Hydrants were installed at the following locations in 1989:

Location	Number
Alison Boulevard	5
Aspendale Lane	2
Brentwood Drive	2
Campbell Court (Trius)	1
Campbell Street	2
Coburn Court	2
Collett Court	1
Devon Indian Reserve	2
Douglas Avenue	1
Forest Hill Road	1
Gillis Road	1
Harrison Court	1
Hodgson Road	1
Kimble Drive	4
Lexington Lane	4
McLaren Avenue	1
Mannington Lane	3
Stairs Street	2
Stoneybrook Crescent	3
Wetmore Road	<u>2</u>
Sub-total (City Owned).....	41

PLUS: PRIVATE HYDRANTS

Northside Indoor Pool	1
650 Montgomery Street	
(N.B. Teacher's Federation)	1
Regent Mall Expansion	6
951 Regent Street (Preferred Properties) ..	1
1111 Regent Street (Village Centre)	1
77 Westmorland Street (Frederick Square) ..	1
180 Woodbridge Street (Forest Hill Rehab) ..	1
	<u>12</u>
OVERALL TOTAL	53

The Fredericton distribution system consists of approximately 285 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	12.431	20.871	3.915	4.810	57.271	-	99.298
200 mm	6.252	21.372	0.954	7.253	42.018	-	77.849
250 mm	2.951	6.720	5.163	0.966	21.525	-	37.325
300 mm	1.050	2.794	0.031	7.776	27.575	-	39.226
350 mm	-	0.207	-	-	-	3.872	4.079
400 mm	-	-	-	-	-	5.689	5.689
450 mm	-	-	-	-	-	1.965	1.965
500 mm	-	-	-	-	-	1.831	1.831
600 mm	-	-	-	-	-	0.395	0.395
Unknown	0.146	-	-	-	-	-	0.146
TOTAL	23.583	54.421	10.063	23.467	172.977	-	284.511

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 \$734 658 was made up as follows:

Source of Supply

Personnel Costs	\$ 113 474
Use of Equipment	11 859
Maintenance - Wells	61 769
Communications	18 188
Power - Wells	198 103
Materials - Wells	<u>10 548</u> \$ 413 941

Power & Pumping (Plant)

Personnel Costs	\$ 31 594
Communications	160
Light & Power	4 446
Supplies	<u>4 076</u> \$ 40 276

Water Treatment Plant

Personnel Costs	\$ 108 040
Insurance	30 606
Maintenance of Equipment	40 063
Power	7 313
Taxes	31 101
Materials	4 974
Goods (Chlorine, Soda Ash, Lime, etc.)	<u>58 344</u> \$ 280 441
TOTAL	\$ 734 658

The total amount of water pumped into the City's distribution systems from 1989 01 01 to 1989 12 31 for the entire City was 8440 megalitres. The amount of water produced by the Water Treatment Plant in 1989 was 7660 megalitres or 91% of the total City demand. The average daily demand for the City is 23.1 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
1980	7037	360 611	51
1981	6907	355 321	51
1982	7030	432 326	62
1983	7225	435 929	60
1984	7368	523 393	71
1985	7880	646 991	82
1986	7781	732 141	94
1987	8177	712 102	87
1988	8740	743 604	85
1989	8440	734 658	87

The total net expenditure for transmission and distribution of water for the City from 1989 01 01 to 1989 12 31 was determined from the following:

Transmission & Distribution:

Operation	\$ 497 600
Maintenance	<u>563 340</u> \$1 060 940

Therefore, the net expenditure for transmission and distribution of one megalitre of water from 1989 01 01 to 1989 12 31 was:

$$\frac{\$1\ 060\ 940}{8440} = \$126$$

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

Transmission and Distribution Costs

<u>YEAR</u>	<u>NET EXPENDITURE per megalitre</u>
1980	72
1981	70
1982	74
1983	87
1984	92
1985	99
1986	88
1987	89
1988	93
1989	126

The total net expenditure for administration costs and debt charges for the City from 1989 01 01 to 1989 12 31 was determined from the following:

Water Administration

(1) Billing & Collection	\$ 183 417
(2) Meters (Installation, Reading, Repairs)	184 801
<u>Debt Charges (Principal & Interest)</u>	<u>386 620</u> \$ 754 838

Administration costs per megalitre of water produced:

$$\frac{\$ 368 218}{8440} = \$ 43.63$$

Debt Charges per megalitre of water produced:

$$\frac{\$ 386 620}{8440} = \$ 45.81$$

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 megalitre
(rounded to nearest dollar)

<u>Year</u>	<u>Administration (Billing & Collection & Meters)</u>	<u>Debt Charges</u>
1980	39	104
1981	44	100
1982	44	96
1983	51	107
1984	42	97
1985	43	94
1986	43	75
1987	37	52
1988	39	46
1989	44	46

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

Total Costs per megalitre

<u>Year</u>	<u>Production Costs</u>	<u>Transmission & Distribution Costs</u>	<u>Administration Costs</u>	<u>Debt Charges</u>	<u>*TOTAL</u>
1980	51	72	39	104	266
1981	51	70	44	100	265
1982	62	74	44	96	276
1983	60	87	51	107	305
1984	71	92	42	97	302
1985	82	99	43	94	318
1986	94	88	43	75	300
1987	87	89	37	52	265
1988	85	93	39	46	263
1989	87	126	44	46	303

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

S U M M A R Y**WATER AND SEWER REVENUE & EXPENDITURES****1989**

Item	Net Expenditure	Revenue
COMMON SERVICES (WATER & SEWER)		
General Equipment	\$ 372 210	\$ 247 424
Safety & Benefits	161 553	
Administration	110 014	
WATER		
Water Administration (Billing & Collection)	183 417	
Water Ordinary (Including Meters)	1 245 741	4 434 286
Water Treatment Facility & Well Production Costs	734 658	
Debt Charges - Principal & Interest	386 620	
SANITARY SEWER		
Operating & Maintenance	498 314	2 859 002
Sewage Treatment & Disposal	1 297 577	
Debt Charges	196 689	
TOTALS	\$ 5 186 793	\$ 7 540 712
SURPLUS: \$ 2 353 919		

NOTE: \$2 120 716 of the above noted surplus was appropriated for Utility Capital expenditures.

CAPITAL PROGRAMS

The following gives brief descriptions of capital projects begun or completed in 1989.

WATER:

In 1989, water mains were installed on Smythe Street from Prospect Street to the Smythe Tower Reservoir; the existing portion of Hodgson Road; Brunswick Trunk near Waterloo Row; a portion of the Hanwell Road reservoir interconnection; Collett Court; the Trans Canada Highway near the new on/off ramps by Regent Mall; York Street between Queen Street and King Street; Forest Hill Road between Biggs Street and Kimble Drive and on the Hanwell Place easement near Prospect Street.

New mains were also installed by developers in the Oakridge Subdivision (Coburn Court & Drive and Brentwood Drive); Riverview Subdivision Phase 2 (Wetmore Road, Kimble Drive, Stoneybrook Crescent, Aspendale Lane) Trites Court, Barrett Court, Carter Court, Jason Court); Chippins Subdivision (Hodgson Road, Gillis Road, Alison Boulevard); Brookside Mini-Home Park (Stairs Street); Llewellyn easement between Prospect Street and the Trans Canada Highway; and Carrington Lane Subdivision Phase 2 (Rosemere Drive, Lexington Lane, Mannington Lane, Carrington Lane, Douglas Avenue).

New water mains were also installed in the Devon Indian Reserve on Maliseet Drive.

Following are lengths and sizes of mains installed in 1989.

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.
Smythe Street - Prospect St. to Smythe Tower Reservoir					3	20	100
* Oakridge Subd. (Coburn Ct. & Dr.; Brentwood Dr.)	21	404		252			
X** Chippins Ltd. Riverview Subdivision Phase 2 (Wetmore Rd; Kimble Dr; Stoneybrook Cres.; Aspendale Lane; Trites Ct.; Barrett Ct.; Carter Ct.; Jason Ct.)			66	832	620		
Hodgson Road (completed in 1989)				9		173	
✓ Brunswick Trunk	14				14		472
* Chippins Ltd. Subd. (Gillis Rd; Alison Blvd.) Hodgson Rd.	46	18		48	1394		
* Stairs Street	12	432					
Hanwell Rd. res. interconnection	55						
✓** Collett Court	108						
*** Devon Indian Reserve (Maliseet Dr.)	10	282					
T.C.H. near Regent Mall on/off ramps							225
V**** York Street - Queen St. to King St.				94			
***** Forest Hill Rd.- Biggs St. to Kimble Dr.				165			
Prospect Street -Hanwell Rd. to Monteith Motors		100	2		19		
* Easement (Llewellyn) - Prospect St. to T.C.H.				100			
* Carrington Lane Subd. Phase II (Rosemere Dr.; Lexington Lane; Mannington Lane; Douglas Ave.)	49	1062	174				
TOTALS	381	3130	1112	1782	193	325	472
OVERALL TOTAL - 7395 metres = 7.395 kilometres							

* Entire cost paid for by Developers through Local Improvement Agreements

** Done under System Repair and Replacement

*** Paid for by the Department of Indian and Northern Affairs

**** Done in conjunction with the Mainstreet Program

***** Done in conjunction with Riverview Subdivision Phase 2

SANITARY SEWER:

In 1989, sanitary sewer mains were installed for the Brunswick Trunk near Waterloo Row; the existing portion of Hodgson Road; Collett Court and Prospect Street between Hanwell Road and Monteith Motors.

New mains were also installed by developers in the Oakridge Subdivision (Coburn Court & Drive and Brentwood Drive); Chippins Subdivision (Hodgson Road, Gillis Road, Alison Boulevard); Riverview Subdivision Phase 2 (Wetmore Road, Kimble Drive, Stoneybrook Crescent, Aspendale Lane, Trites Court, Barrett Court, Carter Court, Jason Court); Brookside Mini-Home Park (Stairs Street); Llewellyn easement between Prospect Street and the Trans Canada Highway; and Carrington Lane Subdivision Phase 2 (Rosemere Drive, Lexington Lane, Mannington Lane, Carrington Lane, Douglas Avenue)

New sanitary sewer mains were also installed in the Devon Indian Reserve on Maliseet Drive.

Following are lengths and sizes of mains installed in 1989:

LOCATION	LENGTH OF MAINS - metres			
	200 mm PVC	250 mm PVC	300 mm PVC	600 mm PVC
* Oakridge Subd. (Coburn Ct. & Dr.; Brentwood Dr.)	647			
* Chippins Ltd. Subd. (Hodgson Rd.; Gillis Rd.; Alison Blvd.)	24			1359
Hodgson Road				185
✓ Brunswick Trunk				472
* Chippin's Ltd. Riverview Subd. Phase 2 (Wetmore Rd.; Kimble Dr.; Stoneybrook Cres.; Aspendale Lane; Trites Ct.; Barrett Ct.; Carter Ct.; Jason Ct.)	1293	315		
* Stairs Street	394			
✓ ** Collett Court	107			
**** Prospect Street - Hanwell Rd. to Monteith Motors	446			
*** Devon Indian Reserve (Maliseet Dr.)	268			
* Easement (Llewellyn) -Prospect St. to T.C.H	100			
* Carrington Lane Subd. Phase II (Rosemere Dr.; Lexington Lane; Mannington Lane; Douglas Ave.)	1118			
TOTALS	4397	315	1544	472

OVERALL TOTAL: 6728 metres or 6.728 kilometres

- * Entire cost paid by Developers through Local Improvement Agreements
- ** Done under System Repair and Replacement
- *** Paid for by the Department of Indian and Northern Affairs
- **** Cost shared with adjacent property owners

STORM SEWER:

In 1989, storm sewer mains were installed on the Woodstock Road near the Condor Motel; Prospect Street between Hanwell Road and Monteith Motors; Golf Club Road near Duval Court and Prospect Street near Clark's Chevrolet.

New mains were also installed by Developers in the Oakridge Subdivision (Coburn Court & Drive and Brentwood Drive); Riverview Subdivision Phase 2 (Wetmore Road, Kimble Drive, Stoneybrook Crescent, Aspendale Lane, Trites Court, Barrett Court, Carter Court, Jason Court); Chippin's Subdivision (Hodgson Road, Gillis Road, Alison Boulevard); Brookside Mini-Home Park (Stairs Street); Relco Property (Prospect Street); and Carrington Lane Subdivision Phase 2 (Rosemere Drive, Lexington Lane, Mannington Lane, Carrington Lane, Douglas Avenue)

New storm sewer mains were also installed in the Devon Indian Reserve on Maliseet Drive.

Following are lengths and sizes of mains installed in 1989:

LOCATION	LENGTH OF MAINS - metres								10	
	250 mm	300 mm	375 mm	450 mm	600 mm	750 mm	900 mm	1050 mm		
Hodgson Road					5					
*Oakridge Subd. (Coburn Ct. & Dr.;Brentwood Dr.	147	433	32	125	87	41	99			
*Chippins Ltd. Riverview Subd. Phase 2 (Wetmore Rd; Kimble Dr; Stoney-brook Cres; Aspendale Lane; Trites Ct.; Barrett Ct.; Carter Ct; Jason Ct.)	294	1118	86	86	67			353	44	
*Chippin's Ltd. Subd. (Hodgson Rd.; Gillis Rd; Alison Blvd.)	100	278			12			59	51	
*Stairs Street						87				
**Woodstock Road (near Condor)				115						
***Prospect St.- Hanwell Rd. to Monteith Motors	93	382	10							
*Prospect Street (Relco Property)										
****Golf Club Rd. (near Duval Ct.)	11	187	106					125		
****Devon Indian Reserve (Maliseet Dr.)										
*****Prospect St. (near Clark's Chevrolet)										64

LENGTH OF MAINS - metres

LOCATION	250 mm	300 mm	375 mm	450 mm	600 mm	750 mm	900 mm	1050 mm	1200 mm	1500 mm	1800 mm
*Carrington Lane Subd.											
Phase II (Rosemere Dr;											
Lexington Lane;											
Mannington Lane;											
Douglas Ave.)	153	673	83	85							
TOTALS	798	2908	595	426	289	150	474	353	90	44	10

OVERALL TOTAL - 6137 metres or 6.137 kilometres

- * Entire cost paid for by Developers through Local Improvement Agreements
- ** Done in conjunction with reconstructing retaining wall area on Woodstock Road
- *** Cost shared with adjacent property owners
- **** Done in conjunction with curb and gutter
- ***** Paid for by the Department of Indian and Northern Affairs
- ***** Done in conjunction with construction of Odell Park Pond

CURB AND GUTTER

Concrete curb and gutter was constructed at the following locations in 1989:

Location	Length (metres)
* Angelview Court	447
Burpee Street - Huron Ave. to McNeill Ave. and McNeill Avenue	526
Canada Street near Hollybrook Street	419
Crocket Street - existing to the end	930
Embleton Avenue	343
Emmerson Street - existing to Tilley Drive	331
** Gibson Street - R.R. Tracks to Ashfield Street..	1916
Glengarry Place	2399
Golf Club Road - Golf Club parking lot to Duval Court	1611
Golf Club Road - Woodstock Road to Kingswood Drive (east side)	132
Harrison Court	304
Pettigrove Crescent	359
*** Prospect Street - end of existing to Odell Park.	188
River Street	141
Riverview Court	466
Riverview Drive	999
Shamrock Terrace	216
Spur Street	153
**** St. Marys Street - Maple Street intersection....	217
Sunset Drive - Wilkins Avenue to Drammen Drive..	369
Wildwood Lane	460
Wilkins Avenue	726
***** Woodstock Road (near Condor Motel)	<u>140</u>
 TOTAL	 13792

13792 metres = 13.792 kilometres

- * Paid for by Developer. City to reimburse cost in 1990.
- ** Done under Designated Route Program
- *** Done in conjunction with Odell Park Pond
- **** Done under Traffic Management
- ***** Done in conjunction with the Retaining Wall removal

PAVING:

In 1989, Gorman Paving Inc. 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) Type "B" at \$33.93 per tonne in place
- 2) Type "D" at \$37.67 per tonne in place

(1) **BINDER COURSE - TYPE "B"**

The following streets were paved with Type "B" asphalt concrete in 1989:

<u>Location</u>	<u>Length (metres)</u>
Angelview Court	224
Burpee Street - Huron Ave. to McNeill Ave.....	32
Crocket Street - existing to the end	465
Embleton Avenue	185
Emmerson Street - existing to Tilley Drive ...	160
Glengarry Place	1220
Golf Club Road - Golf Club parking lot to Duval Court	830
McNeill Avenue	209
Pettigrove Crescent	190
Riverview Court	240
Riverview Drive	528
Spur Street	75
Wildwood Lane	240
Wilkins Avenue	382
 TOTAL	 4980

4980 metres = 4.980 kilometres

(2) SURFACE COURSE - TYPE "D"

The following streets were paved with Type "D" asphalt concrete in 1989:

Location	Length (metres)
* Gibson Street - R.R. Tracks to Ashfield Street	907
* Riverside Drive - Watters Drive to Sumac Street	<u>765</u>
TOTAL	1672
1672 metres = 1.672 kilometres	

* Done under Designated Route Program

CONCRETE SIDEWALKS:

New sidewalks were constructed at the following locations in 1989:

Location	Length (metres)
* Canada Street near Hollybrook Street	400
Crocket Street - near McGinnis Court to the end	440
Fairview Drive - T.C.H. to Arlington Street	252
Golf Club Road - Golf Club parking lot to Riverview Drive	455
Pettigrove Crescent	188
Smythe Street by Exhibition Grounds	<u>267</u>
TOTAL	2002
2002 metres = 2.002 kilometres	

* Existing asphalt/crusher dust sidewalk reconstructed

STREET CONSTRUCTION AND RECONSTRUCTION:

In 1989, costs were incurred for the design of upgrading to take place on Regent Street between Montgomery Street and the Trans Canada Highway and for surveying work on Dunns Crossing Road to determine land requirements for future upgrading.

TRAFFIC MANAGEMENT:

In 1989, work was begun on intersection improvements at the Gibson Street - Union Street and St. Mary's Street - Maple Street intersections. This work is to be finalized in 1990. Preliminary design work was also done for upgrading of the Sunset Drive-Main Street intersection.

RETAINING WALL:

In 1989, the retaining wall on Woodstock Road near the Condor Motel was removed. Curb and gutter and storm sewer were installed along the road and the area which once held the retaining wall completely reshaped and landscaped to remove the need for the wall.

MAINSTREET PROGRAM:

In 1989, the upgrading of the downtown area of the City continued. Work was finalized on York Street between Queen Street and King Street and the Phoenix Square area of Queen Street.

ACOUSTICAL FENCE - KIMBLE DRIVE

In 1989, the design was completed for an acoustical fence along Kimble Drive in the Birmingham Court - Derby Court - Canterbury Drive area. This will be constructed in 1990.

ODELL PARK POND

In 1989, a storm water detention pond was constructed on City owned land next to Clark's Chevrolet on Prospect Street. This was constructed to control the amount of flow through Odell Park, thus reducing erosion problems caused by high flows.

NEW STREET CONSTRUCTION:

The following new streets or portion of streets were constructed in 1989:

<u>Location</u>	<u>Length (metres)</u>
* Alison Boulevard	2276
** Aspendale Lane	158
** Barrett Court	68
** Brentwood Drive	322
** Carter Court	67
** Coburn Court	172
** Coburn Drive - existing to Brentwood Drive	39
** Gillis Road	230
** Hodgson Road - existing to Gillis Road	344
** Jason Court	59
* Kimble Drive - Vanier Highway to Alison Boulevard	215
** Stairs Street	373
** Stoneybrook Crescent	335
** Trites Court	45
** Wetmore Road - existing to Kimble Drive	274
Devon Indian Reserve (Maliseet Drive)	270
 TOTAL	 5247

5247 metres = 5.247 kilometres

* Portion constructed by Developer through Local Improvement Agreement and remainder by the Department of Transportation in conjunction with their Vanier Highway upgrading.

** Constructed by Developers through Local Improvement Agreements.

*** Paid for by the Department of Indian and Northern Affairs.

DESIGNATED ROUTES

The City of Fredericton has a total of 54.648 km of provincial designated highways within its boundaries. In 1989, the Provincial Government paid \$ 323.76 (winter) and \$ 81.69 (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 1989:

(1)	Route 8 - Gibson Street (R.R. Tracks to Ashfield Street) Curb & Gutter & Paving	\$ 269 078.14
(2)	Route 105 - Riverside Drive (Nashwaak River to Sumac Street) Resurfacing	<u>52 443.49</u>
TOTAL		\$ 321 521.63

CAPITAL PROGRAMS
SUMMARY OF EXPENDITURES

ITEM	BUDGET	EXPENDITURE	REMARKS
<u>UTILITY FUND</u>			
Kimble Dr. across Vanier Hwy - Water	\$ 100 000	\$ 73 000	
Hodgson/Service Rd. - Water & Sanitary Sewer	830 000	505 013	Continued from 1988
Brunswick St. Trunk - Water & Sanitary Sewer	300 000	242 806	
Hodgson Road extension	160 000	3 375	To be finalized in 1990
Smythe/TCH - Water Reservoir	790 000	828 684	Budget includes \$90 000 from Tritor Development
Smythe St. - Prospect St. to TCH Reservoir - Water	200 000	179 337	
Marysville Reservoir	800 000	648 987	
Major System Repair and Replacement - Water & Sanitary Sewer	200 000	100 757	
Prospect St. - Hanwell to Monteith Motors - Water & Sanitary Sewer	88 000	52 605	City share of expenditure.
		40 560	Property owners share of expenditure.
<u>GENERAL FUND</u>			
Hodgson/Service Rd. - street construction & reconstruction	60 000	65 314	
Kimble Dr. - Wilsey Rd. to R.R. tracks - railroad signals and street construction	110 000	111 000	Continued from 1988
Solid Waste Management (Vanier Landfill site closeout)	100 000	108 247	Continued from 1988
Hodgson Rd. Extension - street construction & reconstruction	250 000	84 479	To be finalized in 1990
Back Drain (Regent to York) - storm sewer	300 000	50 444	To be continued in 1990

CAPITAL PROGRAMS
SUMMARY OF EXPENDITURES

ITEM	BUDGET	EXPENDITURE	REMARKS
<u>GENERAL FUND (continued)</u>			
Riverview-Glengarry Area - curb & gutter and paving	760 000	743 866	
Sunset Drive- Wilkins to Drammen - curb & gutter and paving	50 000	37 467	
Wilkins-Embleton-Spur - curb & gutter and paving	140 000	126 494	
McNeill Avenue - curb & gutter and paving	60 000	50 865	
Crocket & Pettigrove - curb & gutter and paving	140 000	117 416	
Emmerson Street - existing to Tilley - curb & gutter and paving	15 000	34 910	
Regent St. (Montgomery to T.C.H.)- street construction & reconstruction	1 100 000	250 656	To be continued in 1990. Budget includes 1 000 000 from Tritor Development
Dunn Crossing Rd. (survey & engineering)	30 000	6 834	
Gibson/Union intersection - Traffic Management	200 000	11 816	To be continued in 1990
St. Marys/Maple intersection - Traffic Management	120 000	39 091	To be continued in 1990
Sunset/Main intersection - Traffic Management	70 000	74	To be continued in 1990
Woodstock Rd. - retaining wall	300 000	187 903	
Mainstreet Program	100 000	214 266	Cost shared 50% by DDFI and Provincial Gov't.

CAPITAL PROGRAMS
SUMMARY OF EXPENDITURES

ITEM	BUDGET	EXPENDITURE	REMARKS
<u>GENERAL FUND (continued)</u>			
Kimble Drive Acoustical Fence	40 000	5 947	To be finalized in 1990
Odell Park Pond	50 000	59 787	
Prospect Street - Hanwell to Monteith Motors -storm sewer	53 000	46 015 40 201	City share of expenditure Property owner's share of expenditure.
<u>DESIGNATED ROUTES</u>			
Riverside Dr. - Nashwaak River to Sumac - resurfacing	50 000	52 443	
Gibson St.- R.R.Tracks to Ashfield St. - curb & gutter and paving	230 000	269 078	
<u>NEW SIDEWALK CONSTRUCTION</u> (Done under O & M Budget)			
Golf Club Road - parking lot to Riverside Drive	30 000	34 181	
Brookside Dr. (Killarney Brook) Bridge	30 000	6 755	To be finalized in 1990
Canada St. Phase I	40 000	45 845	
Waterloo Row - Forest Hill Rd. to P.M. Bridge	40 000	119	To be done in 1990
Fairview Dr. - TCH to Arlington	20 000	21 130	
Smythe St. by Exhibition Grounds	15 000	24 370	
Beaverbrook St. - University Gates to Gymnasium	15 000	-	To be done in 1990
Gibson St. - MacLaren to Ashfield	10 000	24 012	

WATER QUALITY - 1989**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, 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 reducing the damage by corrosion to the water system. The chlorine content of the treated water is 0.9 - 1.1 mg/L measured as free chlorine. This water is odourless, colourless, and has an agreeable taste.

Layers of impurities and corrosion byproducts left in parts of the distribution system by previous water supplies tend to deplete 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. 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.

Breakpoint chlorination began in the Killarney and Marysville water systems during May, 1989, after laboratory testing and public meetings on the subject. As chlorine residuals made their way through the systems, some taste and odour complaints were received. At year end, it was the perception of staff that chlorine related problems in these systems had also dropped to a minimum.

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

Forty-two locations, including all active and emergency wells and key distribution system locations, are each sampled by water operators twice each month. All samples are tested for total coliform by the membrane filtration technique, by the Provincial Health Department at the Dr. Everett Chalmers Hospital.

Tests showing positive with small numbers of coliform are not uncommon, and are usually attributed to poor sampling conditions, slight contamination of sample tap, or inexperience of sampler. In such cases, resampling and reanalysis is carried out. During 1989, no samples contained more than a few coliform and no location provided positive results twice in a row.

CHEMICAL ANALYSIS

Samples for chemical analysis were taken from wells and the distribution system in January, 1989 and analysed by Environment New Brunswick's laboratory. Results are displayed on the following page.

One column concerning annual pumpage is added for quick reference.

LOCATION	pH	TOT ALK pH units mg/L CaCO ₃	TURB. NTU	COND. µS/cm	Mg mg/L	Na mg/L	K mg/L	Cl mg/L	SO ₄ mg/L	F mg/L	N mg/L	Fe mg/L	Mn mg/L	Cu mg/L	Zn mg/L	Pb-qt ug/L	1989 PUMPSITE ML	
WILMOT #1 WELL	7.259	56.84	0.1	148	17.1	2.39	6.53	0.906	3.9	16.4	0.12	0.01	0.86	0.131	0.075	0.4	1562.7	
WILMOT #2 WELL	6.681	47.18	6.1	176	17.6	2.76	9.28	0.678	11.4	16.5	0.13	0.16	0.112	2.02	0.044	0.096	0.2	1006.0
WILMOT #3 WELL	7.19	76.28	0.1	319	35.9	4.48	13.7	2.94	30.6	28.4	0.11	0.75	0	0.057	0.018	0.049	0	1678.9
WILMOT #4 WELL	7.099	51.72	0.1	169	18.2	2.56	9.07	1.62	10.8	12.6	0.12	0.09	0.145	0.359	0.007	0.059	4.1	780.5
WILMOT #5 WELL	7.223	52.73	0.2	141	17.3	2.24	5.28	1.09	3.5	10.7	0.12	0.01	0.112	1.12	0.138	0.083	0.7	1900.2
* DUNAL WELL	7.648	109.95	0.2	339	39.2	3.79	21.7	0.851	26.9	19.4	0.17	0.27	0.192	0.086	0.011	0.097	0.1	0.8
CAMERON CT. WELL	7.181	75.68	0.3	309	30.7	3.68	23.4	0.659	36.2	15.7	0.12	0.99	0.065	0.031	0.046	0.085	0	48.9
RAINSFORD WELL	7.249	53.22	0.4	135	18.2	1.87	4.91	0.341	1.4	12.6	0.1	0.07	0.153	0.009	0.007	0.135	0	18.6
SILVERWOOD #2 WELL	7.907	154.5	0.6	474	37.8	24.2	27.7	0.721	46.9	18.1	0.1	0.58	0	0.026	0.054	0.204	0	10.3
SILVERWOOD #3 WELL	7.868	97.42	0.6	236	25.3	11.1	4.83	0.393	10.5	8.7	0.1	0.03	0.135	0.009	0.004	0.102	0.3	54.3
KILLARNEY #K1 WELL	7.362	72.58	0.6	186	14.3	2.48	7.14	0.496	6	15.3	0.11	0.06	0.178	0.002	0	0.104	2.3	137.0
KILLARNEY #K10 WELL	7.925	114.6	0.2	254	36.1	3.53	11.3	0.566	5.3	11.8	0.15	0.01	0.082	0.37	0	0.068	0	137.0
TOWER RD. #1 WELL	7.668	78.62	0.4	318	40.9	3.65	15.8	0.487	9.3	36.6	0.17	0.01	0.146	0.036	0.021	0.175	0.7	93.0
TOWER RD. #2 WELL	7.422	67.89	0.2	264	30	3.96	12.9	0.53	29.5	16	0.13	0.03	0.146	0.009	0.019	0.235	0.2	341.6
* MCGLOIN ST. WELL	7.706	90.6	3.8	307	33	3.84	21.5	0.827	23.3	25.8	0.23	0.1	1.36	0.312	0.011	0.143	0	
* MAPLE ST. #1 WELL	7.325	99.36	0.8	390	43.1	4.26	29.4	0.801	43.5	25.6	0.15	0.48	0.104	0.068	0.027	0.131	0.7	
* MAPLE ST. #2 WELL	7.2	114	4.7	466	62.4	6.72	21.4	1.21	54.6	32.4	0.15	1.03	0.15	0.062	0.035	0.129	0.1	
* MAPLE ST. #3 WELL	7.845	102.2	0.4	346	43.9	2.81	18.8	0.725	28.5	27.6	0.15	0.12	0.047	0.163	0.023	0.034	0.1	2.3
* HIGHLAND WELL	7.096	61.83	0.5	189	22.7	2.25	8.72	0.638	4.2	24.2	0.1	0.07	0	0.125	0.036	0.088	0	
* CLIFFE ST. WELL	7.622	90.23	0.5	210	30.2	1.68	8.79	0.573	1.1	15.4	0.1	0.01	0.107	0.192	0.044	0.112	0	
* GREENWOOD #1 WELL	9.043	124.45	3.5	334	2.79	0.18	70.8	0.337	17.9	15.9	1.04	0.01	0.267	0.019	0.012	0.079	0.3	
* GREENWOOD #2 WELL	7.475	96.47	37.6	465	11.3	1.29	81.5	1.17	67.1	16.7	0.48	0.28	3.1	0.196	0.151	7.3		
WTP RAW WATER	6.927	60.07	0.6	223	20.8	3.28	10.3	1.8	18.4	20.7	0.12	0.39	0	0.451	0.004	0.005	0	
WTP FINISHED WATER	7.942	65.88	0.2	280	28.9	3.34	14	1.83	22.3	19.2	0.12	0.39	0	0.018	0.036	0.003	0	
PARK STREET	7.617	100.1	0.2	233	32.3	3.24	9.59	0.618	2.5	13.8	0.13	0.01	0.018	0.077	0.068	0.039	0.3	
WOODBRIDGE ST.	7.937	87.3	0.2	262	36	3.07	10.9	1.52	15.4	16.4	0.12	0.24	0.163	0.014	0.024	0.132	0	
NBHC BUNKER	7.436	69.36	0.3	269	32	3.85	13	0.553	30	17.3	0.12	0.01	0.142	0.003	0.159	0.144	1	
VANIER IND. PARK	8.524	84.06	0.3	260	32.8	3.1	12	2.05	19.6	17.5	0.11	0.04	0.152	0.065	0.035	0.066	0.4	
M.A.C.		1								1.5								
A.O.	6.5-8.5	<5								<0.3								

* These wells are on emergency standby duty.

M.A.C. - Maximum Acceptable Concentration,
 1987 Guidelines for Canadian Drinking Water Quality

A.O. - Aesthetic Objectives,
 1987 Guidelines for Canadian Drinking Water Quality

Pb-qt = 8652.201