

ANNUAL REPORT  
OF THE  
CITY ENGINEER  
1983

CITY OF FREDERICTON

PUBLIC WORKS DEPARTMENT

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

Madam and Gentlemen:

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

This report covers the period from 1983 01 01 to 1983 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 & Gutter .....	9.474	km
New Concrete Sidewalk .....	1.130	km
New Street Construction .....	0.691	km
New Pavement - Type 'B' Asphalt .....	3.163	km
Resurface - Type 'D' Asphalt .....	2.789	km
Resurface - Type 'E' Asphalt .....	5.892	km
Double Chip Sealed Streets .....	1.297	km
Gravity Sanitary Sewer Mains .....	1.488	km
Sanitary Sewer Force mains .....	0.279	km
Storm Sewer Mains .....	1.585	km
Water Mains .....	1.948	km

ALSO

- 143 Water Services Installed
- 139 Sanitary Sewer Services Installed
- 6 Sprinkler Lines Installed
- 38 Services Renewed (Water)
- 309 Water Meters Installed
- 8 Extension of Existing Services
- 1 Services Renewed (Sanitary Sewer)
- 1 Fire Line Service

Contractors under contract with the Public Works Department of the City of Fredericton in 1983 constructed, completed construction or began construction, on the following projects:

- John MacBean - 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
- Diamond Construction (1961) 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

- Shell Canada Ltd.
  - supply and delivery of gasoline and diesel fuel
- Norlantic Paint (Maritimes) Ltd.
  - supply of traffic lane striping paint
- Norlantic Paint (Maritimes) Ltd.
  - supply and placement of epoxy highway markings
- Atlantic Colas Ltd.
  - supply and delivery of double chip seal
- P.D. Moore Landscaping Ltd.
  - supply and delivery of cover material at sanitary landfill
- Gerard Burns
  - bulldozing services - sanitary landfill
- Co-op Fuels
  - supply and delivery of furnace oil
- Irving Oil Limited
  - supply and delivery of furnace oil
- Gorman Construction Ltd.
  - installation of curb & gutter, asphalt concrete & landscaping on Devon Indian Reserve No. 30
- Multi-Ventures Ltd.
  - installation of Garden Creek Pollution Control Facility
- R. C. Bird Construction Ltd.
  - installation of water mains for Manganese Removal Plant
- Charmac Construction Co. Ltd.
  - installation of sanitary sewer and water mains on Long Court
- Charmac Construction Co. Ltd.
  - installation of storm sewer on the Back Drain
- Maritime Sanitation Services
  - garbage collection services
- Multi-Ventures Ltd.
  - installation of Golf Club Trunk Sewer
- Atlas Construction
  - installation of Manganese Removal Plant
- John Kilburn & Sons Ltd.
  - installation of storm sewer and curb & gutter on Royal Road

General Fund expenditures for the period 1983 01 01 to 1983 12 31 were as follows:

Item	Budget	Net Expenditure	Deficit	Surplus
<b>TRANSPORTATION SERVICES</b>				
Common Services	\$ 1 425 805	\$ 1 582 129	\$ 156 324	\$ -
Road Transport (Admin.)	24 400	21 729	-	2 671
Roads & Streets	610 775	672 804	62 029	-
Sidewalk Maintenance	13 550	11 297	-	2 253
Culverts, Ditching	23 600	17 063	-	6 537
Storm Sewer Maintenance	75 000	82 700	7 700	-
Street Cleaning	225 225	180 673	-	44 552
Spring Cleanup	20 000	18 079	-	1 921
Snow & Ice Removal	761 550	564 938	-	196 612
Street Lights	419 200	410 152	-	9 048
Traffic Services	271 230	244 705	-	26 525
<b>ENVIRONMENTAL HEALTH SERVICES</b>				
Garbage & Waste Disposal	398 725	321 997	-	76 728
Garbage & Waste Collection	367 000	364 217	-	2 783
<b>PUBLIC HEALTH SERVICE</b>				
Old Burial Ground	9 485	9 372	-	113
Loyalist Burial Ground	314	268	-	46
<b>PARKS &amp; TREES SERVICES</b>				
Wilmet Park	32 450	31 560	-	890
Odell Park	34 290	35 257	967	-
Carleton Park	13 125	10 418	-	2 707
Riverfront Greens	41 650	24 665	-	16 985
Development of Park Areas	1 175	2 000	825	-
Other Parks	4 500	3 691	-	809
Trees	315 700	314 415	-	1 285
Greens; Benches; etc.	31 600	22 960	-	8 640
<b>Totals</b>	<b>\$ 5 120 349</b>	<b>\$ 4 947 089</b>	<b>\$ 227 845</b>	<b>\$ 401 105</b>

**SURPLUS: \$ 173 260**

Utility Fund expenditures for the period 1983 01 01 to 1983 12 31 were as follows:

Item	Budget	Net Expenditure	Deficit	Surplus
<b>WATER SUPPLY</b>				
Administration	\$ 77 842	\$ 79 369	\$ 1 527	\$ -
Purification & Treatment	28 800	13 824	-	14 976
Source of Supply	301 400	280 898	-	20 502
Power & Pumping	157 040	125 959	-	31 081
Maintenance & Equipment	30 000	15 248	-	14 752

Item	Budget	Net Expenditure	Deficit	Surplus
Transmission & Distribution (Operation)	\$ 130 500	\$ 146 730	\$ 16 230	\$ -
Transmission & Distribution (Maintenance)	611 500	489 732	-	121 768
Billing & Collection	130 400	161 936	31 536	-
Meters	152 800	128 146	-	24 654
<u>SANITARY SEWER</u>				
Operations (Lift Stations)	63 200	77 045	13 845	-
Maintenance	467 000	495 194	28 194	-
Treatment & Disposal	785 200	835 848	50 648	-
Other (Insurance)	650	626	-	24
Totals	\$ 2 936 332	\$ 2 850 555	\$ 141 980	\$ 227 757

SURPLUS: \$ 85 777

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

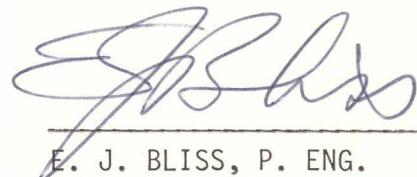
Location	MUNICIPAL ROADS & STREETS				DESIGNATED ROUTES			T.C.H. By-Passes & Ramps
	Asphalt	Gravel	Chip Seal	Total	Asphalt	Gravel	Total	
Fredericton South	88.808	3.521	6.658	98.987	20.067	2.583	22.650	22.697
Fredericton North	18.823	1.218	0.401	20.442	4.770	-	4.770	3.416
Nashwaaksis	38.303	1.411	9.975	49.689	2.533	-	2.533	8.214
Marysville	14.774	1.093	5.572	21.439	8.216	-	8.216	3.460
Barker's Point	3.119	0.394	3.288	6.801	4.643	-	4.643	1.275
Silverwood	3.473	0.395	0.644	4.512	-	-	-	2.757
Garden Creek	5.362	1.685	8.289	15.336	6.294	-	6.294	8.771
Douglas	-	0.191	3.910	4.101	2.554	-	2.554	-
Lincoln	2.923	1.750	3.032	7.705	1.332	-	1.332	-
Lower St. Marys	-	-	1.970	1.970	-	-	-	-
Killarney Road	0.332	-	-	0.332	4.230	-	4.230	-
Totals	175.917	11.658	43.759	231.314	54.639	2.583	57.222	50.590

Total (Municipal and Designated Routes) = 288.536 km

231.314  
57.222  
288.536  
16.150  
30 4.686

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 department may be found by referring to the index.

Respectfully submitted,



E. J. BLISS, P. ENG.  
CITY ENGINEER

## TRANSPORTATION SERVICES

The expenditure under this item is subdivided under two main headings:

- (1) Common Services
- (2) Road Transport

### (1) COMMON SERVICES

The total net expenditure under this heading was \$1 582 129 made up as follows:

Administration .....	\$ 45 558
Engineering Services .....	167 199
General Equipment .....	716 065
Service Depots .....	197 345
Safety & Benefits .....	<u>455 962</u>
TOTAL .....	\$1 582 129

### (2) ROAD TRANSPORT

Road Transport is made up of the following items:

Administration .....	\$ 21 729
Roads & Streets .....	1 547 554
Street Lighting .....	410 152
Traffic Services .....	<u>244 705</u>
TOTAL .....	\$2 224 140

(a) Administration: The total net expenditure under this heading amounted to \$21 729 for wages, pensions, general services, travel, memberships, etc.

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

(1) Roadway Surfaces (maintenance) .....	\$ 672 804
(2) Sidewalk Maintenance .....	11 297
(3) Culverts & Ditching .....	17 063
(4) Storm Sewer Maintenance .....	82 700
(5) Street Cleaning & Flushing (includes Spring Cleanup)...	198 752
(6) Snow Control (snow & ice removal)...	333 141
(7) Sanding & Salting .....	<u>231 797</u>
TOTAL .....	\$1 547 554

The expenditures for the above items as well as a brief description of work done are summarized below.

(1) Roadway Surfaces (maintenance)

The net expenditure of \$672 804 was made up as follows:

Gravel Roads & Chip Seal .....	\$ 78 391
Paved Streets .....	260 897
Asphalt Resurface Program .....	253 595
Curb & Gutter Repair .....	31 091
Driveway Entrances .....	8 419
Rights-of-way maintenance .....	<u>40 411</u>
TOTAL .....	\$ 672 804

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

In 1983 the following streets were double chip sealed:

Location	Length (metres)
Starview Street	220
Adams Street	606
Biggs Street	144
Fulton Avenue	49
Sierra Drive	191
Cherry Avenue	<u>87</u>
TOTAL .....	1297

1297 metres = 1.297 km

Paved Streets - patching and repairing pavement, applying seal coat, light tar or asphalt to pavement.

Asphalt Resurface Program

Under this item, the following streets were resurfaced with Type "E" (10 mm) asphalt in 1983.

Location	Length (metres)
Queen St.- Westmorland St. to Northumberland St.	201
Northumberland St.- Queen St. to King St.	110
King St.- Northumberland St. to Smythe St.	229
Brunswick St.- Smythe St. to York St.	634
Smythe St.- Charlotte St. to Brunswick St.	232
Brookmount Street	91
University Avenue	884
York St.- Dundonald St. to Kings College Rd.	521
York St.- Montgomery St. to near Priestman St.	483
York St.- King St. to George St.	226

Asphalt Resurface Program (continued)

Location	Length (metres)
Smythe St.- Montgomery St. to R.R. Tracks	1171
Canterbury Dr.- Essex St. to Liverpool St.	305
Liverpool St.- Canterbury Dr. to Southampton Dr. (north)	262
Queen St.- St. John St. to Church St.	216
Bridge St.- Downing St. to Coronation St.	207
Bridge St.- Morrison St. to Marshall St.	100
* Doak Rd.- Vanier Hwy. to Wilsey Rd.	424
* Maple St.- McKeen St. to St. Marys St.	116
* King St. - Westmorland St. to York St.	189
Queen St.- York St. Intersection	20
TOTAL .....	6621

\* Type "D" asphalt was placed

6621 metres = 6.621 km

Curb and Gutter Repair - replacement of sections of curb and gutter on various streets.

Driveway Entrances - placement of asphalt between curb line and street right-of-way primarily on streets curbed in recent years.

Rights-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 \$11 297 for sidewalk repairs was made up as follows:

Personnel (labour, pensions, workmen's compensation) .....	\$ 8 816
Materials .....	2 481
TOTAL .....	\$ 11 297

(3) Culverts and Ditching

The maintenance and installation of culverts and ditches.

The net expenditure of \$17 063 was made up as follows:

Personnel (labour, pensions, workmen's compensation) .....	\$ 8 626
Materials .....	8 437
TOTAL .....	\$ 17 063

(4) Storm Sewer Maintenance

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

The net expenditure of \$82 700 was made up as follows:

Personnel (labour, pensions, workmen's compensation) ....	\$ 60 733
Materials .....	21 967
	<hr/>
TOTAL ....	\$ 82 700

(5) Street Cleaning and Flushing

International Sweeper #49 and Wayne Sweeper #50 carried out the cleaning of City streets. These machines worked a total of 1508 hours from March 14 to November 21.

The net expenditure under this heading amounted to \$ 198 752 and was made up as follows:

Personnel (wages, pensions, workmen's compensation) ....	\$156 632
General Services (trucking & repairs) .....	30 243
Gas, oil, grease .....	3 966
Brooms - main & gutter .....	4 773
Brooms - hand .....	2 568
Anti-litter cans .....	108
Dust control .....	462
	<hr/>
* TOTAL .....	\$198 752

\*Includes an amount of \$18 079 for Spring cleanup.

(6) and (7) Sanding & Salting and Snow Control

(a) Sanding and Salting Streets and Sanding Sidewalks

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

Streets:

Personnel (labour, pensions, workmen's compensation) ....	\$ 53 178
General Services (vehicle repairs) .....	24 037
Materials (salt, gas, oil & lubs, sand) .....	116 156
Fixed Assets (new equipment) .....	17 765
	<hr/>
TOTAL .....	\$211 136

Sidewalks:

Personnel (labour, pensions, workmen's compensation) ....	\$ 10 636
General Services (vehicle repairs) .....	4 808
Materials (gas, oil & lubs, sand) .....	5 217
	<hr/>
TOTAL .....	\$ 20 661

(b) Snow Control

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

Streets:

The total net cost of snow control (streets) amounted to \$277 617 and was made up as follows:

Personnel (labour, pensions, workmen's compensation) ....	\$154 532
General Services (repairs & maintenance of vehicles, hired trucks & machinery).....	103 726
Materials (fuel & lubricants) .....	<u>19 359</u>
TOTAL .....	\$277 617

The City of Fredericton was responsible for plowing, sanding, and salting 304.586 km of roads and streets in 1983 (144.233 km on the north side and 160.353 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.

The overall net expenditure for plowing, sanding and salting City roads and streets was made up as follows:

Personnel (labour, pensions, workmen's compensation) ....	\$207 710
General Services (repairs & maintenance of vehicles, hired trucks & machinery) .....	127 763
Fixed Assets (new equipment) .....	17 765
Materials (gas, oil & lubs, salt, sand) .....	<u>135 515</u>
TOTAL .....	\$488 753 (1)

Sidewalks:

142.96 km of sidewalk were plowed during the winter months of 1983. (47.09 km on the north side and 95.87 km on the south side)

The total net expenditure for plowing amounted to \$55 524 and was made up as follows:

Personnel (labour, pensions, workmen's compensation) ....	\$ 30 906
General Services (repairs & maintenance of vehicles) ....	20 745
Materials (fuel & lubricants) .....	<u>3 873</u>
TOTAL .....	\$ 55 524

The overall net expenditure for plowing and sanding sidewalks was \$76 185 made up as follows:

Personnel (labour, pensions, workmen's compensation) .....	\$ 41 542
General Services (repairs & maintenance of vehicles) .....	25 553
Materials (fuel & lubricants, sand) .....	9 090
TOTAL .....	\$ 76 185 (2)

TOTAL NET COST OF SNOW CONTROL - ADD (1) & (2) ..... \$564 938

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

1979	Agriculture Canada	154.90 cm
	Airport Weather Office	188.00 cm
1980	Agriculture Canada	189.20 cm
	Airport Weather Office	209.70 cm
1981	Agriculture Canada	282.30 cm
	Airport Weather Office	249.10 cm
1982	Agriculture Canada	305.10 cm
	Airport Weather Office	297.20 cm
1983	Agriculture Canada	139.3 cm
	Airport Weather Office	179.2 cm

(c) Street Lighting

The multiple lighting system for the City of Fredericton as of 1983 12 31, consisted of:

1-180 Watt L.P. Sodium	@	\$186.00	per light per year
35-400 Watt H.P. Sodium	@	221.16	per light per year
10-125 Watt M.V. Wood	@	103.44	per light per year
2-175 Watt M.V. Conc.	@	147.00	per light per year
201-175 Watt M.V. Wood	@	124.20	per light per year
350-175 Watt Ref. M.V.	@	96.60	per light per year
12-250 Watt M.V. Conc.	@	187.32	per light per year
5-250 Watt M.V. Wood	@	164.52	per light per year
1710-250 Watt Ref. M.V.	@	136.92	per light per year
573-400 Watt Ref. M.V.	@	188.16	per light per year
1-500 Watt Ref. M.V.	@	162.72	per light per year
2-400 Watt Flood Lights	@	0.61	per watt per year
1-150 Watt H.P. Sodium	@	138.00	per light per year

The total street lighting costs for 1983 were as follows:

Multiple Lighting System .....	\$ 402 981
New Poles .....	7 155
New Bulbs .....	16
TOTAL .....	\$ 410 152

(d) Traffic Services

The expenditure under this heading is made up as follows:

- (1) Street Signs
- (2) Paint Department
- (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 \$23 157 made up as follows:

Personnel (labour, pensions, workmen's compensation) .....	\$ 1 824
General Services (repairs & maintenance) .....	200
Goods (posts, street sign purchases, etc.) .....	<u>21 133</u>
TOTAL .....	\$ 23 157

(2) Paint Department

The net expenditure under this heading was \$75 750 made up as follows:

Personnel (labour, pensions, workmen's compensation) .....	\$ 46 373
General Services (equipment repairs, vehicle maintenance, rent, etc.) .....	9 488
Goods (paint, gas & oil, misc. supplies, signs) .....	18 770
Fixed Assets (new equipment) .....	<u>1 119</u>
TOTAL .....	\$ 75 750

(3) Traffic Signals

The net expenditure under this heading was \$105 706 made up as follows:

Personnel (labour, pensions, workmen's compensation) .....	\$ 35 469
General Services (vehicle maintenance) .....	2 512
Government Services (electric power) .....	49 380
Goods (gas & oil, materials) .....	14 036
Fixed Assets (new equipment) .....	<u>4 309</u>
TOTAL .....	\$105 706

(4) Railway Crossings

The net expenditure under this heading was \$40 092 for maintenance.

ENVIRONMENTAL HEALTH SERVICES

Net Expenditure ..... \$ 686 214

The following items are included under the above heading:

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

(1) GARBAGE AND WASTE COLLECTION

In 1983, the amount paid for the garbage and waste collection operation was \$364 217 made up as follows:

General Services (Contract Services) .....	\$ 363 223
General Services (Advertising) .....	994
TOTAL .....	\$ 364 217

(2) GARBAGE AND WASTE DISPOSAL - SANITARY LANDFILL

The expenditure under this section was \$321 997 made up as follows:

Personnel (labour, pensions, workmen's compensation) ....	\$ 840
General Services (equipment services and land rentals)...	152 736
Government Services (taxes) .....	1 741
Goods (gravel and cover material) .....	166 680
TOTAL .....	\$ 321 997

PUBLIC HEALTH SERVICES - CEMETERIES

Net Expenditure ..... \$ 9 640

The following are included under the above heading:

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

(1) THE OLD BURIAL GROUND

Net Expenditure ..... \$ 9 372

The above expenditure was made up as follows:

Personnel (labour, pensions, workmen's compensation) ....	\$ 7 180
General Services (machinery) .....	277
Government Services (lighting) .....	485
Goods (materials, tools) .....	1 430
TOTAL .....	\$ 9 372

(2) THE LOYALIST BURIAL GROUND

Net Expenditure ..... \$ 268

The above expenditure was made up as follows:

Personnel (labour, pensions, workmen's compensation)....	\$ 263
General Services (machinery) .....	5
TOTAL .....	\$ 268

PARKS AND TREES SERVICES

Net Expenditure ..... \$ 444 966

Included under this heading are:

(1) Wilmot Park	(5) Development of Park Areas
(2) Odell Park	(6) Other Parks
(3) Carleton Park	(7) Trees
(4) Riverfront Greens	(8) Greens, Benches & Other

(1) Wilmot Park

Net Expenditure ..... \$ 31 560

The above expenditure was made up as follows:

Personnel (labour, pensions, workmen's compensation)....	\$ 20 981
General Services (machinery, equipment repairs) .....	5 577
Government Services (water & sewer rates, lights & power)	2 098
Goods (gas & oil, materials) .....	2 904
TOTAL .....	\$ 31 560

(2) Odell Park

Net Expenditure ..... \$ 35 257

The above expenditure was made up as follows:

Personnel (labour, pensions, workmen's compensation)....	\$ 23 044
General Services (telephone, machinery, equipment repairs) .....	5 047
Government Services (water & sewer rates, lights & power)	455
Goods (fuels & lubricants, materials) .....	6 711
TOTAL .....	\$ 35 257

(3) Carleton Park

Net Expenditure ..... \$ 10 418

The above expenditure was made up as follows:

Personnel (labour, pensions, workmen's compensation)....	\$ 5 413
General Services (machinery & land rental) .....	4 417
Goods (materials, gas & oil) .....	588
TOTAL .....	\$ 10 418

(4) Riverfront Greens

Net Expenditure ..... \$ 24 665

The above expenditure was made up as follows:

Personnel (labour, pensions, workmen's compensation)....	\$ 7 940
General Services (machinery) .....	2 088
Goods (gas & oil, materials, new trees) .....	13 134
Fixed Assets (new equipment) .....	<u>1 503</u>
TOTAL .....	\$ 24 665

## (5) Development of Park Areas

Net Expenditure ..... \$ 2 000

The above expenditure was made up as follows:

Personnel (labour, pensions, workmen's compensation) ...	\$ 1 243
General Services (machinery) .....	356
Goods (gas & lubricants, materials) .....	<u>401</u>
<b>TOTAL .....</b>	<b>\$ 2 000</b>

## (6) Other Parks

Net Expenditure ..... \$ 3 691

The above expenditure was made up as follows:

Personnel (labour, pensions, workmen's compensation) ...	\$ 2 910
General Services (machinery, repairs & maintenance) ....	781
Goods (materials) .....	0
<b>TOTAL .....</b>	<b>\$ 3 691</b>

## (7) Trees

Net Expenditure ..... \$ 314 415

The above expenditure was made up as follows:

In 1983, 415 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 1983:

Species	Number Removed
Elm	364
Willow	10
Maple	16
Poplar	4
Hornbeam	2
Basswood	1
Spruce	4
Apple	1
Hemlock	1
Ash	1
Birch	2
Pine	1
Tamarack	8
TOTAL .....	415

In 1983, 133 trees were removed with Dutch Elm Disease in the City of Fredericton.

Following is a summary of Elm trees removed from 1964 to 1983:

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
TOTALS	5263	67.5	2539	7802

Trees were planted (first planting) at the following locations in  
1983:

Location	Number of Trees
Ebony Drive	37
Neville Street	18
Bates Street	30
Wilcox Street	33
Dykeman Street	35
Westview Street	21
Vineland Street	20
Oakland Street	23
Nashwaaksis Junior High	6
320 Sunset Drive	1
105 Melvin Street	1
117 Friel Street	1
240 St. Marys Street	1
336 Forbes Street	1
Emmerson Street	29
Sewell Street	28
MacLaren Avenue	8
MacPherson Street	24
Lawson Court	15
Hamilton Court	6
Hollybrook Street	1
Hallett Street	7
291 Canada Street	1
Wilmot Park	7
Dundonald Fire Station	2
Waggoners Lane	5
806 George Street	1
450 George St.	1
Hatheway Street	1
Waterloo Row	4
Northumberland Street cor Argyle Street	1
Odell Park	7
10 Colter Court	1
Argyle Street- York Street to Westmorland Street	5
323-422 Gibson Street	4
Officer's Square	3
Greenfields Drive & Court	21
Smythe Street	5
225 University Avenue	1
Argyle Street	3
Greens	5
346 St. John Street	1
TOTAL .....	425

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

281 trees were also planted on the Riverfront Drive.

Trees purchased in 1983 were obtained from Brookdale Nursery, J. Connan Nursery, Brawn Nursery, Sheridan Nursery and C. C. Smith.

A number of trees were also trimmed in 1983. The number and class of trees were 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 3000 mixed species.

Stumps removed, topsoiled and seeded - 204

Shrubs planted on the Riverfront Drive - 545

Trees on 1983 removal list to be removed in Spring of 1984 - 44

(8) Greens, Benches & Other

Net Expenditure ..... \$ 22 960

The above expenditure was made up as follows:

Personnel (labour, pensions, workmen's compensation)...	\$ 11 216
General Services (communications, machinery & trucking, equipment maintenance).....	7 342
Goods (gas & oil, materials, small tools) .....	4 402
Fixed Assets (new equipment) .....	0
TOTAL .....	\$ 22 960

SANITARY SEWER

Net Expenditure .... \$ 1 711 008

The above expenditure was made up as follows:

Operating: Lift Stations

Personnel (labour, pensions, workmen's compensation)....	\$ 58 370
General Services (repairs & maintenance) .....	4 478
Government Services (lights & power) .....	11 740
Goods (materials) .....	2 457
	\$ 77 045

Maintenance:

Personnel (labour, pensions, workmen's compensation)....	\$ 243 243
General Services (truckng & machinery) .....	37 128
Goods (materials, fuels & lubricants) .....	67 919
Fixed Assets (new equipment) .....	146 904
	\$ 495 194

Sewage Treatment & Disposal:

General Services:	Repairs & Maintenance .....	\$ 5 994
	Treatment (F.P.C.C.) .....	809 350
Government Services:	Water & Sewer Rates .....	7 948
	Lights & Power .....	12 556
Goods:	Chlorine, etc. .....	0 \$ 835 848

Debt Charges:

Principal .....	\$ 133 741
Interest .....	168 554
	\$ 302 295

Other:

General Services (Insurance) .....	\$ 626
	TOTAL .....
	\$ 1 711 008

New customers connected to the City sewer system in 1983 - 139

The Fredericton Sanitary Sewer System consists of approximately 236 kilometres of mains made up as follows:

Size	Silverwood Garden Creek	Nashwaaksis	Marysville	Barker's Point	Fredericton	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	9.418	31.091	16.825	7.559	108.139	173.032
200 mm F.M.	0.254	-	0.314	-	0.064	0.632
250 mm	1.959	3.158	0.607	0.298	8.325	14.347
250 mm F.M.	1.178	-	-	-	-	1.178
300 mm	0.443	3.200	1.006	1.868	12.669	19.186
300 mm F.M.	-	-	-	-	0.739	0.739
350 mm	0.159	0.686	-	-	0.713	1.558
350 mm F.M.	-	-	0.528	-	0.254	0.782
375 mm	-	2.163	0.500	0.174	2.449	5.286
400 mm	-	0.076	-	-	0.193	0.269
450 mm	0.798	0.031	1.350	-	3.463	5.642
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>17.388</b>	<b>42.413</b>	<b>21.983</b>	<b>9.967</b>	<b>144.491</b>	<b>236.242</b>

NOTE: Fredericton includes the Lincoln area.

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

*23 Pab. e.  
WATER  
SIN 91 C*

There are at present 24 active wells, 16 reservoirs, and 7 booster stations in the City of Fredericton Water Supply System as noted below.

Location	Wells	Reservoirs	Booster Stations
South Fredericton System	6	8	7
Hanwell System	1	1	0
Silverwood System	2	1	0
North Fredericton Low Level System	10	4	0
Killarney System	2	1	0
Marysville System	3	1	0
TOTALS	24	16	7

Following is a list of reservoirs and their capacities which provide water storage for the City of Fredericton Water System:

#### FREDERICTON SOUTH

Location	No. of Reservoirs	Full Capacity (cubic metres)	Useful Capacity (cubic metres)
Silverwood	1	245	245
Regent Street	1	1140	1140
Montgomery Street	2	9090	4545
Smythe Street	2	18180	18180
Forest Hill (Canterbury Drive)	2	1105	1105
Flemming Road	1	3750	1880
Hanwell Road	1	460	270
Sub-Total	10	33970	27365

#### FREDERICTON NORTH

Location	No. of Reservoirs	Full Capacity (cubic metres)	Useful Capacity (cubic metres)
Nashwaaksis	2	2865	2865
Barker's Point	1	1140	1140
Marysville	1	2840	2840
Devon	1	4545	4545
Killarney Road	1	3750	3750
Sub-Total	6	15140	15140
Totals	16	49110	42505

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 (salaries of office staff, office equipment, billing & collecting) .....	\$ 241 305
(2)	Water Ordinary (including meters) .....	764 608
(3)	Water Pumping Station & Well Production Costs .....	435 929
(4)	Debt Charges - Principal .....	352 289
(5)	Debt Charges - Interest .....	<u>419 751</u>
	TOTAL NET EXPENDITURE .....	\$2 213 882

(1) Water Administration

Net Expenditure ..... \$ 241 305

The above expenditure was made up as follows:

Personnel (Engineering Department Staff) .....	\$ 79 369
Billing & Collecting:	
Office salaries & benefits .....	\$ 95 955
Postage .....	15 949
Telephone .....	0
Professional Services .....	25 730
Machinery Rental .....	0
Office Rental .....	0
Materials .....	6 745
New Equipment .....	<u>17 557</u>
TOTAL .....	\$ 241 305

(2) Water Ordinary (including meters)

Net Expenditure ..... \$ 764 608

The above expenditure was made up as follows:

Transmission & Distribution (operation)

Labour - Boosters .....	\$ 89 365
Equipment Maintenance - Boosters .....	3 973
Power - Boosters .....	44 441
Taxes - Boosters .....	6 080
Materials - Boosters .....	<u>2 871</u>
	\$ 146 730

Transmission & Distribution (maintenance)

Personnel (labour, pensions, etc.) .....	\$ 314 853
Workmen's Compensation .....	7 807
Distribution Repair Parts .....	72 945

Transmission & Distribution (maintenance) continued

Trucks (maintenance) .....	13 850
Goods (gas & oil) .....	5 906
Materials, labour, trucking .....	5 205
Hydrant Parts .....	19 970
Fixed Assets (new equipment) .....	49 196
	\$ 489 732

Meters

Labour - Reading .....	\$ 39 164
Labour - Repairs .....	3 236
Labour - Installation .....	33 360
Fuel & Lubricants .....	3 500
Meter Parts .....	8 060
Miscellaneous Parts .....	3 426
Maintenance (Trucks) .....	2 928
Fixed Assets (new meters) .....	34 472
	<u>128 146</u>
TOTAL .....	\$ 764 608

On 1983 12 31 there were 10 827 water services on meter and 361 on flat rate, making a total of 11 188.

309 new meters were installed in 1983, 205 regular meters changed to TRT or RRT, and 24 ARB meters changed to TRT or RRT.

In 1983, 11 discontinued services were excavated and shut off at the main, 185 stopped meters replaced and 29 frozen meters replaced.

The following sprinklers were installed in 1983:

Police Facility - 311 Queen Street  
Northside Co-op - 800 St. Marys Street  
Regent Place - 1133 Regent Street  
Centennial Print - 550 Prospect Street West  
Exhibition Grounds Horse Barn  
Exhibition Grounds Cattle Barn

There are in the City as of 1983 12 31, 1351 hydrants situated in the following areas:

Fredericton South .....	628
Fredericton North .....	145
Nashwaaksis .....	245
Marysville .....	130
Barker's Point .....	66
Silverwood .....	22
Sub-Total .....	1236
Located on private property .....	<u>115</u>
Total .....	1351

Hydrants were installed or added to City totals at the following locations in 1983:

Location	Number
Northumberland Street	1
Northside Co-op (St. Marys St.)-private	1
Castleton Court (formerly private)	2
Ecole St. Anne - Private	2
Canterbury Drive	2
Birmingham Court	2
Long Court	1
TOTAL .....	11

There was also one hydrant removed from Canada Street near N.B. Power.

#### Distribution System

New Services installed in 1983 .....	143
Old Services relayed in 1983 .....	38
Frozen Services that had to be thawed .....	9

The Fredericton Distribution System consists of approximately 253 kilometres of water main, made up as follows:

Size	Marysville	Nashwaaksis	Barker's Point	Silverwood Garden Creek	Fredericton	TOTAL
25 mm	-	-	-	-	0.030	0.030
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	10.291	15.784
150 mm	12.054	20.669	3.915	3.929	56.685	97.252
200 mm	5.859	16.664	0.954	2.580	37.658	63.715
250 mm	2.465	6.546	5.163	0.964	19.278	34.416
300 mm	0.616	2.074	0.031	4.558	23.385	30.664
350 mm	-	0.207	-	-	3.466	3.673
400 mm	-	-	-	-	4.079	4.079
450 mm	-	-	-	-	1.965	1.965
500 mm	-	-	-	-	0.035	0.035
600 mm	-	-	-	-	0.395	0.395
Unknown	0.249	-	-	-	-	0.249
TOTAL	21.996	48.617	10.063	14.693	157.702	253.071

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 Supply

Net Expenditure ..... \$ 435 929

The above expenditure was made up as follows:

Source of Supply

Labour - Wells .....	\$ 58 114
Maintenance - Wells .....	24 773
Maintenance - Trucks .....	5 803
Power - Wells .....	184 005
Fuels & Lubricants (Trucks) .....	4 014
Materials - Wells .....	<u>4 189</u>
	\$ 280 898

Power & Pumping (Plant)

Labour .....	\$ 116 348
Workmen's Compensation .....	2 169
Light & Power .....	1 088
Diesel Fuel & Lubricants .....	338
Heating .....	3 987
Supplies .....	773
Miscellaneous .....	<u>1 256</u>
	125 959

Maintenance of Equipment (Plant)

Labour .....	137
Insurance (Pumping Station) .....	8 413
Maintenance (Equipment) .....	37
Taxes (Pumping Station) .....	6 661
Materials .....	<u>0</u>
	15 248

Purification & Treatment

Labour - Analyst .....	7 488
Chlorine .....	2 866
Chemicals .....	970
H.T.H. Crystals .....	0
H.T.H. Tablets .....	758
Chlorination (Parts) .....	<u>1 742</u>
TOTAL .....	\$ 435 929

Following is the yearly costs of heating the Fredericton Pumping Station Plant for the last ten years:

YEAR	COST
1974	\$ 1836.79
1975	2132.89
1976	2156.01
1977	2176.81
1978	2459.14
1979	3141.97
1980	4502.00
1981	5065.00
1982	5998.00
1983	3987.00

COMPARISON OF WATER PUMPED AND COSTS FOR  
FREDERICTON FOR THE LAST TEN YEARS

Year	Cubic Metres Produced	Production Expenditure	Production Cost per Cubic Metre
1974	4 375 165	\$ 105 320.82	2.4 cents
*1975	6 394 385	165 319.34	2.6 cents
*1976	6 459 340	207 272.52	3.2 cents
*1977	6 463 520	215 683.16	3.3 cents
*1978	6 307 295	246 509.77	3.9 cents
*1979	6 628 241	303 364.45	4.6 cents
*1980	7 037 407	360 611.00	5.1 cents
*1981	6 907 216	355 321.00	5.1 cents
*1982	7 029 560	432 326.00	6.15 cents
*1983	7 225 102	435 929.00	6.03 cents

\* Production costs for the entire amalgamated area.

The total amount of water pumped from 1983 01 01 to 1983 12 31 for the entire City was 7 225 102 cubic metres divided as follows:

Fredericton South (Wilmot Park) .....	4 937 504
Hanwell .....	31 323
Fredericton North .....	449 377
Nashwaaksis .....	765 201
Marysville .....	334 533
Barker's Point .....	305 402
Duval .....	191 149
Silverwood .....	56 639
Rainsford Lane Park .....	8 003
Killarney .....	145 971
TOTAL .....	7 225 102

The total net water expenditure (operating) for the City from 1983 01 01 to 1983 12 31 was determined from the following:

Source of Supply .....	\$ 280 898
Power & Pumping .....	125 959
Maintenance of Equipment .....	174
Purification & Treatment .....	13 824
Transmission & Distribution (operation).....	140 650
Transmission & Distribution (maintenance) .....	489 732
Other (taxes & insurance) .....	21 154
TOTAL .....	<u>\$ 1 072 391</u>

Therefore, the net operating cost to pump and deliver to the customer one cubic metre of water from 1983 01 01 to 1983 12 31 was:

$$\frac{\$ 1 072 391}{7 225 102} = \$ 0.148$$

The cost of one cubic metre of water delivered including principal and interest charges was calculated as follows:

Total net Administration & Operating costs .....	\$ 1 441 842
Principal and Interest .....	<u>772 040</u>
TOTAL .....	\$ 2 213 882

Total cost of water per cubic metre:

$$\frac{\$ 2 213 882}{7 225 102} = \$ 0.306$$

Principal and Interest costs per cubic metre:

$$\frac{\$ 772 040}{7 225 102} = \$ 0.106$$

Administration and Operating costs per cubic metre:

$$\frac{\$ 1 441 842}{7 225 102} = \$ 0.200$$

Following is a table showing a comparison of net operating costs, administration and operating costs, principal and interest costs, and total costs per cubic metre from 1968 to 1983:

COSTS PER CUBIC METRE

Year	Net Operating	Administration & Operating	Principal & Interest	* Total Cost
1968	\$ 0.042	\$ 0.053	\$ 0.055	\$ 0.108
1969	0.064	0.080	0.039	0.119
1970	0.043	0.058	0.042	0.100
1971	0.047	0.061	0.049	0.110
1972	0.053	0.067	0.040	0.107
1973	0.041	0.064	0.040	0.104
**1974	0.064	0.092	0.051	0.143
**1975	0.073	0.106	0.059	0.165
**1976	0.075	0.114	0.108	0.222
**1977	0.081	0.119	0.132	0.251
**1978	0.088	0.125	0.125	0.250
**1979	0.103	0.145	0.119	0.264
**1980	0.124	0.163	0.104	0.267
**1981	0.121	0.165	0.100	0.265
**1982	0.136	0.180	0.096	0.276
**1983	0.148	0.200	0.106	0.306

\* Total Cost = Administration & Operating + Principal & Interest

\*\* Values from 1968 to 1973 are for pre-amalgamated City only while values from 1974 onwards are for the amalgamated City.

WATER AND SEWER REVENUE - 1983

WATER:

Item	Net Expenditure	Revenue
<u>Water Office Administration</u>		
(a) Administrative (Eng. Dept. Staff)	\$ 79 369	\$
(b) Billing & Collecting (office)	161 936	
<u>Water Ordinary</u>		
(a) General- operating & maintenance (includes hydrants)	636 462	2 967 824 ✓
(b) Meters	128 146	
<u>Water Pumping Station</u>		
(a) General Costs - wells, plant purification & treatment, etc.	413 367	
(b) City Analyst	7 488	
(c) Taxes & Insurance	15 074	
<u>Principal &amp; Interest</u>	772 040	
<u>TOTALS</u>	\$ 2 213 882	\$ 2 967 824

SURPLUS: \$ 753 942

SANITARY SEWER:

Item	Net Expenditure	Revenue
<u>Sewage Domestic - Maintenance &amp; Installation</u>	\$ 599 363	\$ 2 027 968
F.A.P.C. Sewage Treatment	809 350	
Principal & Interest	302 295	
<u>TOTALS</u>	\$ 1 711 008	\$ 2 027 968

SURPLUS: \$ 316 960

### CAPITAL PROGRAMS

The following gives brief descriptions of capital projects done in 1983. Some of these projects were begun in 1982 and finalized in 1983 while others will be finalized in 1984.

#### WATER:

1983 saw the beginning of construction for a Manganese Water Treatment facility along with associated water mains. Water mains were also installed during the upgrading of the Smythe Booster station and Long Court. New main installations were installed in the Pine Acres Subdivision and Hermitage Park Subdivision.

Following are lengths and sizes of mains installed in 1983:

Location	Length of Mains (metres)								
	25 mm Cu.	150 mm D.I.	200 mm D.I.	250 mm D.I.	350 mm D.I.	400 mm D.I.	450 mm D.I.	500 mm D.I.	600 mm D.I.
Long Court ✓		4	189						
Smythe St. Booster Station					75	30			
Pumping Station Interconnection							51		
Manganese Treatment Facility							55	35	395
*Pine Acres Subdivision		21	398	286					
*Hermitage Park Subdivision		252							
**Babbitt Street	30								
**Northumberland Street			127						
TOTALS	30	277	714	286	75	30	106	35	395

1948 metres = 1.948 km

\* Entire cost paid by developers through Local Improvement Agreement. The City of Fredericton paid for a loop connection to a proposed school site and also the difference in cost for an oversized main in Pine Acres Subdivision.

\*\* Replacement mains placed under normal maintenance in the Utility budget.

SANITARY SEWER:

1983 saw the installation of new sanitary sewer mains for the Golf Club Trunk as well as for Pine Acres Subdivision and Hermitage Park Subdivision. Sanitary Sewer mains were also replaced on Long Court.

Construction also began on the Garden Creek Sewage Treatment facility. This construction will be finalized in 1984.

Following are lengths and sizes of mains installed in 1983:

Location	Length of Mains (metres)			
	100 mm DIFM	200 mm PVC	250 mm PVC	200 mm AC
**Golf Club Trunk			680	
Long Court		108		
*Pine Acres Subdivision	279	524		
*Hermitage Park Subdivision		144		32
TOTALS	279	776	680	32

1767 metres = 1.767 km

- \* Entire cost paid by developers through Local Improvement Agreement
- \*\* 50% of costs associated with Golf Club Trunk and Garden Creek Sewage Treatment facility paid by Environment New Brunswick by agreement.

CURB & GUTTER:

Concrete curb and gutter was constructed at the following locations in 1983:

Location	Length (metres)
***Regent St. (near Beaverbrook Intersection)	196
Broad Street	82
*Smythe Street (near Priestman Intersection)	146
**Royal Road - Barton Crescent to new school site	1045
***Waterloo Row - Lansdowne St. to near Elmcroft Place	1216
Vanier Industrial Park (Pepin Road, etc.)	1165
McAdam Avenue	1033
Hillcourt Drive	1134
Myrtle Court	142
Raymond Avenue	187
Essex Street	122
Gloucester Crescent	634
Reading Street	630
***Union Street - St. Marys Street to near Hughes Street	684
****Indian Reserve Contract #4	1000
Ascot Drive	58
TOTAL	9474

9474 metres = 9.474 km

- \* Done under Intersection Improvements
- \*\* Paid for by Department of Transportation by agreement
- \*\*\* Designated Route program
- \*\*\*\* Contracted by City of Fredericton for Department of Indian Affairs

All the above curb and gutter was constructed by City forces with the exception of Royal Road and the Indian Reserve Contract which were done by contractors. Concrete was obtained from Elmtree Concrete for \$94 per cubic metre.

PAVING:

In 1983, Diamond Construction (1961) Limited was awarded a contract to supply and place asphalt on a number of City streets.

The street preparatory work, other than the laying in place of the premixed material, was done by regular City forces.

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

- (1) Binder Course (20 mm) - Type B @ \$34 per tonne in place
- (2) Surface Course (13 mm) - Type D @ \$39 per tonne in place

(1) Binder Course - Type B

The following streets were paved with Type "B" asphalt in 1983

Location	Length (metres)
McAdam Avenue	515
Hillcourt Drive	560
Myrtle Court	60
Raymond Avenue	90
*Royal Road - Barton Cres. to new school	500
Essex Street	49
Gloucester Crescent	314
Reading Street - Ascot Drive	378
Broad Street	41
**Vanier Industrial Park (Pepin Rd., etc.)	656
TOTAL .....	3163

3163 metres = 3.163 km

- \* Paid for by Department of Transportation by agreement
- \*\* Paid for by Department of Commerce & Development.  
Both Type "B" and Type "D" asphalt were placed.

(2) Surface Course - Type D

The following streets were paved with Type "D" asphalt in 1983:

Location	Length (metres)
*Waterloo Row - Lansdowne St. to near Elmcroft Place	590
*Union Street - St. Marys St. to near Hughes Street	370
**Indian Reserve Contract #4	1100
Total .....	2060

2060 metres = 2.060 km

\* Designated Route Program

\*\* Contracted by City of Fredericton for Department of Indian Affairs

CONCRETE SIDEWALKS

Sidewalks were constructed at the following locations in 1983:

Location	Length (metres)
Royal Road - Barton Crescent to new school site	479
*Waterloo Row	146
McAdam Avenue	479
Essex Street	108
Ascot Drive	20
Broad Street	44
Total .....	1276

\* Necessitated by curb and gutter construction. (reconstructed)

New sidewalk (not including reconstruction) = 1.130 km

STORM SEWER:

1983 saw the installation of new storm sewer mains in the Back Drain as well as Pine Acres Subdivision and Hermitage Park Subdivision. The City shared in the cost of placing larger culverts across Kimble Road in conjunction with Pine Acres Subdivision.

Storm sewers were also upgraded in Waterloo Row in conjunction with curb and gutter and paving.

Some storm sewer construction was also undertaken in conjunction with upgrading of the Smythe Street booster station and the construction of the Manganese Treatment Plant.

Following are lengths and sizes of mains installed in 1983:

Location	Length - metres								
	250 mm Conc.	250 mm PVC	300 mm Conc.	300 mm PVC	375 mm Conc.	450 mm Conc.	600 mm Conc.	1050 mm Conc.	1200 mm Conc.
Back Drain								465	
*Smythe Street	33								
Booster									
*Manganese									
Treatment Plant			22						
**Waterloo Row		174		4			94		
***Pine Acres			90	246		74	157	20	
Subdivision								35	1
***Hermitage Park			74	96					
Subdivision									
TOTALS	33	338	364	4	74	157	114	500	1

1 585 metres = 1.585 km

- \* Paid for under Capital Water
- \*\* Designated Route Program
- \*\*\* Entire cost paid by developers through Local Improvement Agreement with the exception of the above noted Kimble Road.

#### RECONSTRUCTION:

Work associated with the widening of Regent Street near Beaverbrook Street was done under reconstruction. This work involved the removal of existing curb on the west side of Regent Street, the construction of an additional lane, installation of new curb and gutter and paving of the new lane. A new traffic light base was installed and the intersection radius improved at Beaverbrook Street and Regent on the southwest corner.

#### TRAFFIC LIGHTS:

Traffic light installations were upgraded at the King-Carleton, Brunswick-York and Regent-King intersections in 1983. This upgrading took the form of new traffic light bases, poles, arms, ducts and controllers if necessary.

#### INTERSECTION IMPROVEMENTS:

A variety of work was undertaken under this account. Work involved the upgrading of various intersection radii, replacement of traffic light bases and most noticeably the construction of a slip-off lane at the Smythe-Priestman Street intersection.

DESIGNATED ROUTES

The City of Fredericton has a total of 57.222 km of provincial designated highways within its boundaries. In 1983, the Provincial Government paid \$1531 and \$403 per lane kilometre towards winter and summer maintenance of the routes respectively. If any improvements such as new curb and gutter, paving or storm sewer installations are done to these routes, they have to be authorized by the Department of Transportation. If so authorized, then the Provincial Government assists the City in paying for the construction.

The following authorized projects were undertaken in 1983:

(1)	Installation of storm sewer, curb and gutter, paving - Route 102 - Waterloo Row	\$ 206 543.35
(2)	Installation of curb and gutter and paving, Route 105 - Union Street	100 967.94
*(3)	Installation of storm sewer, curb and gutter, paving - Route 620 - Royal Road	155 044.37
(4)	Intersection Improvements - Route 101 Regent Street - Beaverbrook Intersection	<u>36 912.64</u>
	TOTAL .....	\$ 499 468.30

\* Reflects 1983 costs only. Portion of project done in 1982.

CAPITAL PROGRAMS  
SUMMARY OF EXPENDITURES

Item	Budget	Expenditure	Remarks
<u>UTILITY:</u>			
Long Court to Crockett St.- water interconnection	\$ 40 000	\$ 39 296	
Long Court- Sanitary Sewer	30 000	22 894	
Smythe Booster Stn.- Water	100 000	81 285	
Deactivate Pumping Stn. System - Water	20 000	12 844	Continued from 1982
Garden Creek Sewage Treatment	700 000	258 064	Budget reflects 50% of cost. To be continued in 1984.
Manganese Treatment Facility System Plan- Sanitary Sewer	*2 600 000	1 633 491	To be continued in 1984
Engineering for Lamson Court Services	50 000	33 969	To be continued in 1984
Waterloo Row- Water & Sanitary Sewer	20 000	648	To be continued in 1984
Golf Club Trunk- Sanitary Sewer	20 000	687	In conjunction with designated routes
	120 000	90 921	To be continued in 1984
<u>GENERAL FUND:</u>			
Back Drain- Storm Sewer	110 000	105 283	Continued from 1982
Broad Street - Curb & Gutter	26 000	13 942	Continued from 1982
Broad Street - Paving	14 000	13 023	Continued from 1982
Broad Street - Sidewalk	11 000	9 086	Continued from 1982
Intersection Improvements	67 000	50 192	Continued in 1984
Royal Road - Sidewalk	30 000	37 487	Continued from 1982
Vanier Industrial Park- Curb & Gutter	80 000	32 446	
McAdam Avenue- Curb & Gutter	63 000	65 123	
McAdam Avenue- Paving	36 000	39 870	
McAdam Avenue - Sidewalk	25 000	18 063	
Hillcourt Dr.-Myrtle Ct.- Raymond Ave.-Curb & Gutter	86 000	86 147	
Hillcourt Dr.-Myrtle Ct.- Raymond Ave.- Paving	50 000	51 306	

\* Budget revised to \$3 170 000 when final contract was awarded

add 7440 to this  
for 1984

50 192  
7440  
57 632

CAPITAL PROGRAMS  
SUMMARY OF EXPENDITURES

Item	Budget	Expenditure	Remarks
Essex-Gloucester-Reading- Curb & Gutter	72 000	52 641	
Essex-Gloucester-Reading- Paving	57 000	44 259	\$40 000 paid by NBHC.
Essex-Gloucester-Reading- Sidewalk		5 625	Local Improvement Agreement
King-Carleton - Traffic Lights	15 000	17 444	
✓ Brunswick-York Traffic Lights	30 000	17 101	To be continued in 1984
✓ Regent-King Traffic Lights	30 000	12 537	To be continued in 1984
 <u>DESIGNATED ROUTES:</u>			
Regent-Beaverbrook- Reconstruction	32 000	36 913	
Royal Road- Storm Sewer, Curb & Gutter, Paving	220 000	262 287	Continued from 1982
Waterloo Row - Storm Sewer, Curb & Gutter, Paving	200 000	206 543	
Union Street- Curb & Gutter, Paving	78 000	100 968	

Following is the 1983 report of Laurence Corbett, P. Eng., on  
Water Quality of the City of Fredericton Water Supply.

WATER QUALITY - 1983

BACTERIAL ANALYSIS

Coliform bacteria 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 <sup>ARE</sup> more hardy than disease-causing bacteria.

Samples for coliform analysis were taken monthly from the wells in service and various distribution points in the City water system. In all 334 samples were taken and tested by the membrane filtration technique.

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

<u>Date</u>	<u>Location</u>	<u>No. Colonies</u>
83 03 17	Silverwood #2 Well	2
83 03 17	Silverwood #3 Well	1
83 03 19	Silverwood #3 Well	2
83 06 06	Silverwood #3 Well	1
83 06 08	Highland Well	3
83 06 11	Highland Well	4
83 07 26	Hanwell Well	1
83 07 26	Silverwood #3 Well	1
83 07 27	Rainsford Well	1
83 07 27	Marysville #3 Well	13
83 07 27	Killarney K1 Well	1
83 10 04	Silverwood #2 Well	1
83 10 04	Rainsford Well	5
83 10 06	#63 Garden Street	2
83 10 06	Rainsford Well	50 +
83 10 06	Silverwood Irving	1
83 10 06	Silverwood #2 Well	30 +
83 10 10	#39 Day Street	25
83 10 11	Rainsford Well	26
83 11 14	MacLaren Fire Station	1
83 11 15	#19 Day Street	4
83 11 15	Silverwood #2 Well	4
83 11 17	Silverwood #2 Well	1
83 12 14	Highland Well	1
83 12 14	#29 Veteran's Court	1
83 12 14	Marysville #3 Well	1
83 12 14	MacLaren Fire Station	4
83 12 14	Silverwood #2 Well	8

All locations whose corresponding samples tested positively were resampled and retested until no coliform colonies were present.

Poor test results in the Rainsford Park system resulted in chlorination equipment being installed at the source on 83 10 15.

Coliform samples were also analysed for all new mains to ensure proper disinfection before opening them to the system.

It should be noted that the tests reported were for total coliform, not fecal coliform. Low and inconsistent total coliform counts suggest that fecal coliform is not present and that sampling procedures may be to blame.

The new laboratory presently under construction will provide the ability to test for fecal coliform where total coliform counts are high and consistent.

The test results indicate that our water system is healthy and reasonably free from pathogenic bacteria.

SPECIAL MONITORING PROGRAM

The 1981 ADI report "Installation of Standpipe Piezometers in the Wilmot Park and Waterloo Areas ...." suggested monthly checks of certain water quality parameters in the Wilmot Well field. From 1982-12 to 1983-12, samples were taken from the wells and distribution system and delivered to K.F. Laboratories to determine Fe and Mn concentrations and pH. The water temperature was recorded at the time of sampling.

With respect to the well field, no relationships between the four parameters could be determined. In most cases, variations at each well were small and erratic.

Water temperature at Lincoln Booster was 2°C higher than that of the combined well water during the summer months. Manganese concentrations were slightly but consistently lower while iron concentrations rose slightly at the Lincoln Booster.

At the Flemming Booster, manganese levels dropped even lower and iron concentrations again increased. It would appear that manganese is being precipitated out of the water in the mains, while iron is being leached from the pipe walls.

Temperatures at the Flemming Booster lowered to 7°C in the winter and reached a high of 17°C in summer, presumably due to the above ground steel reservoir on the Lincoln system.

This monitoring program is presently suspended but may continue once the new laboratory is operational.

### CHEMICAL ANALYSIS

Samples for chemical analysis were taken from all wells in May 1983, and analysed by Environment New Brunswick. The results of the analyses are displayed on the following page.

The analyses also included arsenic, nitrite, lead, aluminum, and cadmium. These elements were not found in measureable amounts.

Two columns concerning the 1983 pumpages were added to the table for quick reference. The first column gives the actual pumpages, while the second proportions each output to the total 1983 City supply. These are not intended to be indications of the maximum possible output of each well.

