

ANNUAL REPORT
OF THE
CITY ENGINEER

1980

CITY OF FREDERICTON

PUBLIC WORKS DEPARTMENT

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*for Community
Services
Contribution
Program*

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 in the various City Departments under the direct supervision of the City Engineer.

This report covers the period January 1, 1980 to December 31, 1980 and is written for the purpose of maintaining an accurate record on file of the activities and costs of the various departments.

During the year, along with regular maintenance, City Crews and contractors constructed the following works:

Concrete Curb & Gutter	12.745 km
Concrete Sidewalk	1.856 km
New Street Construction	0 km
New Pavement (20 mm Binder).....	8.288 km
Recap Surface Course (13 mm).....	0.990 km
Surface Sealing (10 mm)	13.196 km
Double Chip Sealed City Streets	2.664 km
Gravity Sanitary Sewer Mains	2.291 km
Sanitary Sewer Force mains	0.417 km
Storm Sewer Mains	5.483 km
Water Mains	3.106 km

ALSO

- 134 Water Services Installed ✓
- 123 Sanitary Sewer Services Installed ✓
- 3 Sprinklers Installed X
- 31 Services Relayed (Water) ✓
- 324 Water Meters Installed X
- 1 Extension of Existing Services ✓
- 3 Services Relayed (Sanitary Sewer) ✓

Contractors under contract with the Public Works Department of the City of Fredericton in 1980 constructed, completed construction or began construction, on the following projects:

Spade Construction Ltd.

- To installation of sanitary sewer and water on Golf Club Road

John Kilburn & Sons Ltd.

- To installation of water supply mains at Rosewood Booster Station

Frecon Ltd.

- To installation of storm sewer in the Dobie Area

- John Kilburn & Sons Ltd.
- To installation of storm sewer services and valve chamber construction on various streets in West Nashwaaksis Area
- Spade Construction Ltd.
- To installation of storm sewer services on various streets in East Nashwaaksis Area
- Ascon Ltd.
- To construction of concrete curb, gutter and sidewalk on various streets in East and West Nashwaaksis Areas
- Berube Madawaska Contractors
- To installation of services in Monteith Subdivision
- Diamond Construction (1961) Ltd.
- To supply and placement of asphalt
- Marine, Industrial & Technical Sales Co. Ltd.
- To supply of traffic lane striping paint
- Maritime Pavement Markings Ltd.
- To supply and application of traffic lane striping paint
- Shell Canada Limited
- To supply and delivery of gasoline and diesel fuel
- Wendell Thomas & Sons Ltd.
- To supply and delivery of pipe bedding sand
- Wendell Thomas & Sons Ltd.
- To supply and delivery of topsoil
- Elmtree Concrete Ltd.
- To supply and delivery of ready mixed concrete
- Dunham's Contracting Ltd.
- To supply and delivery of crushed gravel and crushed rock
- Forbes & Sloat Ltd.
- To supply and delivery of crushed rock
- R. S. Coughlan Ltd.
- To supply and delivery of winter sand
- Salt Sales Co.
- To supply and delivery of highway salt
- Flintkote Company of Canada Ltd.
- To supply and placement of double chip seal
- P. D. Moore
- To supply and delivery of cover material to Sanitary Landfill
- Gerard Burns
- Bulldozing Services - Sanitary Landfill
- Co-op Fuels
- To supply and delivery of furnace oil

D & D Construction Ltd.

- To supply and installation of Rosewood Booster Station Pumps

John Kilburn & Sons Ltd.
for the Rocca Group

- To installation of services on Brookside Dr., Reynolds St., and McKnight St.

The current expenditures for the twelve-month period January 1, 1980 to December 31, 1980 appear as follows:

ITEM	BUDGET	NET EXPENDITURE	DEFICIT	SURPLUS
Common Services	\$ 747 900	\$ 947 483	\$ 199 583	\$ -
Road Transport (Adm)	12 700	25 966	13 266	-
Roads & Streets	388 500	400 304	11 804	-
Sidewalk Repairs	12 700	9 886	-	2 814
Culverts & Ditches	28 000	10 555	-	17 445
Storm Sewers	34 900	67 906	33 006	-
Street Cleaning	248 200	307 119	58 919	-
Snow & Ice Removal	626 900	488 978	-	137 922
Street Lighting	354 100	340 544	-	13 556
Traffic Services	163 800	166 642	2 842	-
Off-Street Parking	820	21	-	799
Garbage Collection	294 200	294 265	65	-
Sanitary Landfill	225 300	177 502	-	47 798
Old Burial Ground	7 000	7 168	168	-
Loyalist Burial Ground	275	166	-	109
Wilmot Park	19 600	20 088	488	-
Odell Park	25 675	26 698	1 023	-
Carleton Park	11 800	11 615	-	185
Development of Park Areas	4 250	5 243	993	-
Other Parks	2 750	3 628	878	-
Public Works	155 100	175 197	20 097	
TOTALS	\$3 364 470	\$3 486 974	\$ 343 132	\$220 628

Overall Deficit - \$ 122 504

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

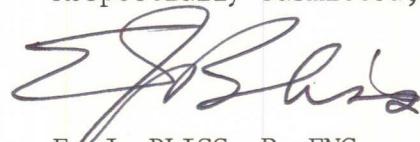
Location	MUNICIPAL ROADS & STREETS				DESIGNATED ROUTES			T.C.H. By-passes & Ramps
	Asphalt	Gravel	Chip Seal	Total	Asphalt	Gravel	Total	
Fredericton South	88.236	8.831	1.922	98.989	20.498	2.583	23.081	18.913
Fredericton North	17.365	1.218	1.253	19.836	4.564	-	4.564	-
Nashwaaksis	28.000	1.205	14.146	43.351	8.171	-	8.171	-
Marysville	14.774	1.093	5.572	21.439	8.216	-	8.216	3.460
Barkers Point	2.562	0.394	3.845	6.801	4.427	-	4.427	1.491
Silverwood	3.473	0.579	0.460	4.512	-	-	-	2.757

	MUNICIPAL ROADS & STREETS				DESIGNATED ROUTES			T.C.H. By-passes & Ramps
	Asphalt	Gravel	Chip Seal	Total	Asphalt	Gravel	Total	
Garden Creek	4.549	1.909	8.878	15.336	6.294	-	6.294	8.771
Douglas	-	0.933	3.910	4.843	2.554	-	2.554	-
Lincoln	2.435	2.359	2.911	7.705	1.332	-	1.332	-
Lower St. Marys	-	-	1.970	1.970	-	-	-	-
Killarney Road	0.332	-	-	0.332	4.230	-	4.230	-
TOTALS	161.726	18.521	44.867	225.114	60.286	2.583	62.869	33.602

TOTAL (MUNICIPAL AND DESIGNATED ROUTES) = 287.983 km

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

Respectfully submitted,



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

TOTAL YEARLY NET EXPENDITURE

The total yearly net expenditure under the direct supervision of the City Engineer in 1980 amounted to \$7 973 317.71, made up as follows:

Common Services	\$ 947 483.00
Road Transport	1 817 921.00
Environmental Health Services (Garbage & Waste Collection & Disposal)	471 767.00
Public Health Services (Cemeteries)	7 334.00
Cultural Services (Parks, Trees, etc.)	244 469.00
Water Department	1 147 383.00
Sanitary Sewer	✓ 907 611.00

*← excludes
Debt
Charges*

*includes
debt charges*

Capital Accounts

(a) Sanitary Sewer	660.43
(b) Surface Sewer)	211 238.73
(c) Curb & Gutter) Permanent	519 208.19
(d) Gravel Roads) Streets	40 749.32
(e) Paving)	621 708.43
(f) Water	94 349.41
(g) Permanent Streets Reconstruction	104 637.50
(h) Traffic Lights	24 807.40
(i) Concrete Sidewalks	84 893.38
(j) Transportation Study	10 127.37
(k) Westmorland Street Bridge	720.08
(l) Community Services Contribution Program	7 116.87
(m) Vanier Industrial Park	10 551.76 CR.

Capital Service Development Projects

(a) Water	5 021.18
(b) Sanitary Sewer	27 403.34
(c) Storm Sewer	668 626.18
(d) Solid Waste Disposal	43 978.20
(e) Service Depot & Equipment	29 462.14

TOTAL \$7 973 317.71

Following are itemized accounts for the various accounts included in the total yearly net expenditure.

TRANSPORTATION SERVICES

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

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

(1) COMMON SERVICES:

The total net expenditure under this heading was \$ 947 483 and is made up as follows:

Administration	\$ 38 306
Engineering Services	110 892
General Equipment	358 285
Workshops, Yards & Buildings	103 316
Research, Planning & Design	783
Safety & Benefits	335 901
TOTAL	<u>\$ 947 483</u>

(2) ROAD TRANSPORT:

(1) Administration: The total net expenditure under this heading was \$ 25 966.

(2) Roads & Streets: The total net expenditure is made up as follows:

(a) Roadway Surfaces (Maintenance)	\$ 400 304
(b) Sidewalk Repairs	9 886
(c) Culverts & Ditches	10 555
(d) Storm Sewer	67 906
(e) Street Cleaning & Flushing	307 119
(f) Snow & Ice Removal	306 189
(g) Sanding & Salting	182 789
TOTAL	\$1 284 748

(a) ROADWAY SURFACES (MAINTENANCE)

The net expenditure of \$ 400 304 under this item was made up as follows:

Personnel (Pensions & Workmen's Compensation)	\$ 16 893
Gravel Road & Chip Seal	29 554
Paved Streets	231 347
Asphalt Sealing Program	59 505
Curb and Gutter Repairs	11 531
Driveway Entrances	5 226
Rights-of-way, Guard Posts, etc.	46 248
TOTAL	\$ 400 304

- (1) Gravel Road and Chip Seal: The general maintenance and repairs to Gravel Roads and Roadway Surfaces. There was no Chip Seal placed under this account in 1980.
- (2) Paved Streets: Patching and repairing pavement, applying seal coat, light tar or asphalt to pavement. Patching material, when available, was obtained from Gorman Construction Ltd., Flintkote Company of Canada Ltd., and Diamond Construction (1961) Ltd.
- (3) Asphalt Sealing Program: Under this heading, the following streets were resurfaced with Type "E" (10 mm) asphalt by Diamond Construction (1961) Ltd.

<u>LOCATION</u>	<u>metres</u>
Grey Street	396
Shore Street	256
Lansdowne Street	348
Windsor St. - Albert St. to Kings College Rd.	412
Hawthorne Terrace	137
Chestnut St. - #690 to Albert St.	342
Palmer Street	369
Orchard Drive	507
TOTAL	2767

2767 metres = 2.767 km

- (4) Curb and Gutter Repairs: Replacement of sections of curb and gutter on various streets.
- (5) Driveway Entrances: Repair and placement of asphalt between curb line and street right-of-way primarily on streets curbed in recent years.
- (6) Rights-of-Way, Guard Posts, etc.: This work involves sodding and seeding, rip rapping, grass cutting, repair and placement of guard rails and clearing rights-of-way.

(b) SIDEWALKS (MAINTENANCE)

The net expenditure of \$ 9886 under this heading was made ^P as follows:

Personnel (Wages, Pensions, Workmen's Compensation ...	\$ 7 437
Materials	2 449
TOTAL	\$ 9 886

(c) STREETS (GENERAL MAINTENANCE)

This work involved the maintenance and installation of culverts and ditches.

The net expenditure of \$10 555 under this heading was made up as follows:

Personnel (Wages, Pensions, Workmen's Compensation) ...	\$ 2 139
Materials	8 416
TOTAL	\$ 10 555

(d) STORM SEWER

Storm sewers in the City were flushed where necessary and all catch basins were cleaned and repaired during the year and repairs were made to any breaks that occurred, amounting to \$67 906 made up as follows:

Personnel (Wages, Pensions, Workmen's Compensation) ...	\$ 55 395
Materials	12 511
TOTAL	\$ 67 906

(e) STREET CLEANING AND FLUSHING

Two Wayne Sweepers, #50 and #52, and a Vacuum-Sweep, #53, carried out the cleaning of City Streets. These machines worked a total of 2995 hours from March 24, 1980 to November 18, 1980.

The net expenditure under this heading amounted to \$307 119 and was made up as follows:

Personnel (Wages, Pensions, Workmen's Compensation) ...	\$ 212 520
General Services (Trucking & Repairs)	67 006
Gas, Oil, Grease	7 493
Brooms - Main & Gutter	14 770
Anti-Litter Cans & Waste Collection	1 566
Dust Control	1 463
TOTAL	\$ 307 119

(f) and (g) SANDING & SALTING AND SNOW & ICE REMOVAL

(1) Salting and Sanding Streets and Sanding Sidewalks

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

Streets:

Materials (Salt, Gas, Oil & Lubs, Sand)	\$ 98 844
Personnel (Labour, Pensions, Compensation)	56 994
General Services (Vehicle Repairs)	9 457
	<u>TOTAL</u>
	\$ 165 295
	<u>NET EXPENDITURE</u>

Sidewalks:

Personnel (Labour, Pensions, Compensation)	\$ 11 399
General Services (Vehicle Repairs)	1 891
Materials (Gas, Oil & Lubs, Sand)	4 204
	<u>TOTAL</u>
	\$ 17 494
	<u>NET EXPENDITURE</u>

Sand was purchased from R.S. Coughlan Ltd. at a price of \$3.34 per cubic metre, and salt from Salt Sales Company at a price of \$22.90 per tonne.

(2) Snow Control

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

Streets:

The total net cost of snow control (streets) amounted to \$258 238 and was made up as follows:

Personnel (Labour, Pensions, Compensation)	\$ 152 648
General Services (Repairs & Maintenance of Vehicles, Hired Trucks & Machinery)	88 708
Materials (Fuels & Lubricants)	16 882
	<u>TOTAL</u>
	\$ 258 238

The following table shows comparative labour (including hired trucks & machinery) costs of snow control for 1978 to 1980 inclusive:

ITEM	1978	1979	1980
Snow Plowing Roads & Streets	\$ 98 904.16	\$ 64 878.83	\$ 69 326.24
Blowing, Hauling & Shovelling	91 318.74	18 392.62	13 978.89
Catch Basins	31 246.26	29 701.52	24 900.00
Carleton Street Bridge	41.95	369.31	870.96
Snow Fences	1 686.07	1 174.56	1 370.45
Plowing Parking Lots	224.75	24.96	285.42
Repairs (Labour-Equipment)	11 061.55	12 379.59	18 988.39
Repairs (Flood)	4 695.16	9 399.10	17 981.87
TOTALS	\$ 239 178.64	\$ 136 320.49	\$ 147 702.22

The City of Fredericton was responsible for plowing, sanding, and salting 287.983 km of roads and streets in 1980. (130.734 km on the North Side and 157.249 km on the South Side)

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

Personnel (Labour, Pensions, Compensation).....	\$ 209 642
General Services (Repairs & Maintenance of Vehicles,	
Hired Trucks & Machinery)	98 165
Materials (Gas, Oil & Lubs, Salt, Sand)	<u>115 726</u>
TOTAL	<u>\$ 423 533</u> (1)

Therefore, the unit cost of plowing, sanding and salting one kilometre of road (street) was \$1471.

Sidewalks:

136.66 km of sidewalk were plowed during the winter months of 1980, 43.91 km on the North Side and 92.75 km on the South Side.

The total net expenditure for plowing amounted to \$47 951 and was made up as follows:

Personnel (Labour, Pensions, Compensation).....	\$ 30 530
General Services (Repairs & Maintenance of Vehicles)...	14 044
Materials (Fuels & Lubricants)	<u>3 377</u>
TOTAL	<u>\$ 47 951</u>

The overall net expenditure for plowing and sanding sidewalks was \$65 445 made up as follows:

Personnel (Labour, Pensions, Compensation).....	\$ 41 929
General Services (Repairs & Maintenance of Vehicles)...	15 935
Materials (Fuels & Lubricants, Sand)	<u>7 581</u>
TOTAL	<u>\$ 65 445</u> (2)

Therefore, the unit cost of plowing and sanding one kilometre of sidewalk was \$479.

TOTAL NET COST OF SNOW CONTROL - Add (1) & (2) \$ 488 978

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

1976	Agriculture Canada	271.90 cm
	Airport Weather Office	361.19 cm
1977	Agriculture Canada	256.79 cm
	Airport Weather Office	328.78 cm

1978	Agriculture Canada	226.80	cm
	Airport Weather Office	308.20	cm
1979	Agriculture Canada	154.90	cm
	Airport Weather Office	188.00	cm
1980	Agriculture Canada	189.20	cm
	Airport Weather Office	209.70	cm

(3) STREET LIGHTING:

The Multiple Lighting System for the City of Fredericton as of December 31, 1980 consisted of:

1 - 180 Watt L. P. Sodium	@ \$152.64 per light per year
35 - 400 Watt H. P. Sodium	@ \$203.28 per light per year
10 - 125 Watt M. V. Wood	@ \$ 84.96 per light per year
2 - 175 Watt M. V. Conc.	@ \$122.40 per light per year
199 - 175 Watt M. V. Wood	@ \$103.20 per light per year
346 - 175 Watt Ref. M. V.	@ \$ 80.40 per light per year
14 - 250 Watt M. V. Conc.	@ \$156.36 per light per year
9 - 250 Watt M. V. Wood	@ \$137.16 per light per year
1711 - 250 Watt Ref. M. V.	@ \$114.36 per light per year
573 - 400 Watt Ref. M. V.	@ \$157.20 per light per year
1 - 500 Watt Ref. M. V.	@ \$135.24 per light per year
2 - 400 Watt Flood Lights	@ \$ 0.51 per light per year

The total street lighting costs for 1980 were as follows:

Multiple Lighting System Contract	\$ 338 248
New Installations	2 113
New Bulbs	182
TOTAL	<u>\$ 340 543</u>

(4) TRAFFIC SERVICES:

The expenditure under this heading is made up as follows:

- (a) Street Signs
- (b) Paint Department
- (c) Traffic Signals
- (d) Railway Crossings
- (e) Off-Street Parking

(a) Street Signs

Purchasing, repairing and installing street signs on City Streets.

The net expenditure under this heading amounted to \$15 055 made up as follows:

Personnel (Labour, Pensions, Compensation)	\$ 2 743
General Services (Repairs & Maintenance)	97
Materials (Posts, Street Sign Purchases, etc.)	<u>12 215</u>
TOTAL	<u>\$ 15 055</u>

(b) Paint Department

The net expenditure under this heading was \$54 024 made up as follows:

Personnel (Labour, Pensions, Compensation).....	\$ 28 037
General Services (Equipment Repairs, Vehicle Maintenance, Rent, etc.)	7 183
Goods (Paint, Gas & Oil, Supplies, Signs)	18 804
TOTAL	<u>\$ 54 024</u>

(c) Traffic Signals

The net expenditure under this heading was \$73 464 made up as follows:

General Services (Maintenance of Signals)	\$ 38 021
Government Services (Electric Power)	<u>35 443</u>
TOTAL	<u>\$ 73 464</u>

(d) Railway Crossings

The net expenditure under this heading was \$24 099 for maintenance.

(e) Off-Street Parking

The net expenditure under this heading amounted to \$21 made up as follows:

Personnel (Workmen's Compensation Board)	\$ 21
--	-------

The following items of machinery were purchased in 1980 and charged to
TRANSPORTATION SERVICES (Common Services):

2 - Chevrolet 1/2 Tons - Asset No.'s 005 & 205

Cost.....	\$ 12 252.26
Plus 8% S.S.&E. Tax.....	980.18
License & Registrations.....	<u>18.00</u>
TOTAL COST	<u>\$ 13 250.44</u>

2 - Chevrolet 3 Tons - Asset No.'s 21 & 60

Cost.....	\$ 21 523.08
Plus 8% S.S.&E. Tax.....	1 721.84
License & Registrations	<u>18.00</u>
TOTAL COST	<u>\$ 23 262.92</u>

CAPITAL ACCOUNT CURB & GUTTER

The net expenditure under this heading amounted to \$519 208.19.

For the above expenditure, concrete curb and gutter was constructed at the following locations:

LOCATION	metres
Ebony Dr. - Existing to Wilcox St.	268
MacPherson St. - Murray Ave. to Grant St.	714
* Greenwood Drive - R.R. Tracks to By-Pass	1157
Goodine Street	387
Adams Street - Goodine St. to end of chip seal	393
Hargrove Court	977
Monteith Drive - T.C.H. to Mayflower St.	459
Mayflower Street	424 }
* Hanwell Road - Former City line to Prospect St.	1629
Dunn Crossing Rd. - Lincoln Rd. to near Boyne Ct.	779
** MacFarlane St. - Killarney Brook Bridge to Clarence Ave.	305
** Clarence Avenue	860
** Everett Court	420
** Burpee Street - Floral Ave. to Clearview Ave.	553
** Broadview Avenue	430
** Carol Avenue	450
** Adney Street	345
** Brawn Court	175
** Lombardi Lane	545
** Primrose Avenue	470
** Dahlia Drive	475
** William Street	530
TOTAL	12 745

$$12\ 745 \text{ metres} = 12.745 \text{ km}$$

- * Designated Routes - Provincial Assistance
- ** Constructed by Ascon Limited

All the above curb and gutter was constructed by City Forces except those denoted by Asterisks.

All concrete poured by City Forces was purchased ready-mix from Elmtree Concrete Ltd. at a price of \$70 per cubic metre. Ascon Limited were responsible for obtaining their own concrete.

The unit cost of one metre of curb and gutter placed by City Forces, found by dividing the total length laid, which equalled 7187 metres into the total cost of \$285 853.77 was \$39.77.

The unit cost of one metre of curb and gutter placed by Ascon Limited, found by dividing the total length laid, which equalled 5558 metres into the total cost of \$304 220.11 was \$54.74.

The topsoiling of boulevards is included in the above costs as well as design and supervision costs.

CAPITAL ACCOUNT PAVING

In 1980, Diamond Construction (1961) Limited was awarded a contract to supply and place asphalt on a number of City Streets. Flintkote Company of Canada Limited also double chip sealed a number of City Streets under the Capital Paving Program.

The street preparatory work, other than the laying in place of the pre-mixed material, was done by regular City Forces.

The total net expenditure under this heading amounted to \$621 708.43 made up as follows:

City Payrolls	\$ 51 523.78
City Machinery	37 172.00
City and Canada Pension	2 062.75
Gorman Construction Ltd.	17 025.92
A.D.I. Limited	19 611.30
Flintkote Company of Canada Ltd.	44 114.64
Diamond Construction (1961) Ltd.	480 060.81
Forbes & Sloat Ltd.	7 658.90
Bond Discount	9 450.00
Interest on Demand Note	16 658.62
Miscellaneous	628.95
<hr/>	
GROSS EXPENDITURE	\$ 685 967.67
LESS CREDIT: PROVINCIAL ASSISTANCE-DESIGNATED RTS..	64 259.24
<hr/>	
NET EXPENDITURE	\$ 621 708.43
<hr/>	

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

- (1) New Pavement - Binder Course (20 mm) - Type B
- (2) Surface Course - (13 mm) - Type D
- (3) Surface Course - (10 mm) - Type E
- (4) Double Chip Seal (20 mm and 10 mm)

(1) New Pavement

The following streets were paved with Type B Binder Course in 1980:

LOCATION	metres
MacFarlane St.- Existing to Clarence Avenue	143
Clarence Avenue	418
Everett Court	217
Burpee St.- Floral Ave. to Clearview Ave.	290
Broadview Avenue	212
Carol Avenue	211
Adney Street	187

LOCATION	metres
Brown Court	90
Lombardi Lane	309
Primrose Avenue	229
Dahlia Drive	232
William St.- Lombardi Lane to Royal Rd.	274
Hargrove Court	457
* Greenwood Dr.- R.R. Track to Marysville By-pass Rd.	564
* Hanwell Rd. - Former City line to Prospect St.	869
Monteith Dr. - Woodstock Rd. to Mayflower St.	232
Mayflower St.	117
Ebony Dr. - Existing to Wilcox St.	158
Dunn Crossing Rd.- C.N.R. Tracks to near Boyne Ct.	366
MacPherson St. - Murray Ave. to Grant St.	335
Goodine St.	213
Adams St. - Goodine St. to end of Chip Seal	183
TOTAL	8288

8288 metres = 8.288 km

* Designated Routes - Provincial Assistance

(2) Surface Course - Type D

The only street resurfaced with Type D asphalt in 1980 was Wilsey Road from the railway tracks to Doak Road. The distance was 990 metres or 0.990 kilometres.

(3) Surface Course - Type E

The following streets were resurfaced with Type E asphalt in 1980.

LOCATION	metres
Weyman Street	338
McKeen St.- C.P.R. Tracks to Maple St.	304
Fletcher Court	106
Mansfield St.- Turnaround area	92
Tilley Drive	277
Chandler Drive	238
Bliss Street	369
Doyle Court	203
Colebrook Court	177
Elgin Street	183
Lawrence Crescent	205
Lilac Crescent	570
Longwood Dr.- Fulton Ave. to Lilac Cres. East	597
Park Street	180
MacDonald Ave.	285
Wallace Avenue	385
Hawkins St. - Royal Rd. to Ebony Dr.	439
Alder Avenue	151
Hartt Street	274

LOCATION	metres
Jewett St.- Hartt St. to Berwick St.	116
Berwick St.	177
Kent St.- Hartt St. to Berwick St.	88
William St.- Lombardi Lane to Calder Avenue	402
Calder Avenue	146
Haines Crescent - Calder Ave. to William St.	116
Westwood Drive	323
Robin Drive	190
Birchcroft Drive	201
Hummingbird St.	332
Mooers Drive	317
Boyne Court - Excluding Court Area	122
Wright Street	546
Heather Terrace	222
Priestman St.- Regent St. to Hospital Entrance	700
Kensington Court	158
Allen Street	290
Morrison Street	305
Downing Street	305
TOTAL	10 429

10 429 metres = 10.429 km

(4) Double Chip Seal

The following streets were double chip sealed with 20 mm and 10 mm chips in 1980:

LOCATION	metres
Sewell St.- MacLaren Ave. to Ashfield St.	688
Lawson Court	163
Foster Street	222
Miller Street	75
Tower Road	243
Jewett Street	87
Kent Street	57
Ferris Street	250
Levine Street	259
Rosewood Drive	163
Hatheway Street	67
Emmerson Street	324
Quinn Court	66
TOTAL	2 664

2 664 metres = 2.664 km

CAPITAL ACCOUNT SANITARY SEWER

The net expenditure under this account amounted to \$660.43 in 1980 after Stimulation Grant was applied.

The above expenditure was primarily made up of Journal Vouchers for materials paid for by Capital Account Sanitary Sewer and charged to other City Departments, work done and materials sold to private parties, holdback payments from 1979 local improvement and capital construction projects, inspection and engineering costs associated with Brookside Place services, consultant costs associated with the possible upgrading of sewer on Brunswick Street and costs associated with the new Wilsey Road sewer lift station.

Sanitary sewer mains were installed at the following locations in 1980:

LOCATION	LENGTH - metres				
	150 mm A.C.	150 mm D.I.F.M.	200 mm P.V.C.	200 mm A.C.	250 mm A.C.
* Brookside Place (Brookside Dr.; Reynolds St.; McKnight St.)		417	801		
** Monteith Subdivision				699	
** Golf Club Road					412
Nashwaaksis (Bruce St. and Summer St.)			262		
Johnston Avenue	26			91	
TOTAL	26	417	1063	790	412

2708 metres of main = 2.708 kilometres

- * Paid for by the Rocca Group
- ** Expenditures charged to Service Development Projects

CAPITAL ACCOUNT STORM SEWER

The net expenditure under this account amounted to \$211 238.73 in 1980.

The above expenditure was primarily made up of Journal Vouchers for materials paid for by Capital Account Storm Sewer and charged to other City Departments, work done and materials sold to private parties, holdback payments from 1979 local improvement and Capital construction projects, inspection and engineering costs associated with Brookside Place services, and installation costs associated with mains in the Dobie Area.

Storm Sewer mains were installed at the following locations in 1980:

LOCATION	LENGTH - metres									
	250 mm	300 mm	375 mm	450 mm	600 mm	750 mm	900 mm	1050 mm	1200 mm	1500 mm
* Brookside Place	92		64	215	86		25	179	157	30
** Monteith Subdivision	84	361	127	193	162					
** Nashwaaksis 128-32	167	1413								
** Nashwaaksis 128-38	75	209	34	84	401					
Barton Cres. Easement	46									
Dobie Area	180		395	205	168	331				
TOTALS	644	1983	620	697	817	331	25	179	157	30

5483 metres of main = 5.483 kilometres

- * Paid for by the Rocca Group
- ** Expenditures charged to Service Development Projects

CAPITAL ACCOUNT WATER

The net expenditure under this account amounted to \$94 349.41 in 1980 after Stimulation Grant was applied.

The above expenditure was primarily made up of Journal Vouchers for materials paid for by Capital Account Water and charged to other City Departments, work done and materials sold to private parties, holdback payments from 1979 local improvement and capital construction projects, inspection and engineering costs associated with Brookside Place services, installation costs concerning Legere Street and costs associated with the refurbishing of number five well in Fredericton South.

Watermains were installed at the following locations in 1980:

LOCATION	LENGTH - metres				
	100 mm P.V.C.	100 mm	150 mm	200 mm	250 mm
* Brookside Place			36		1303
** Monteith Subdivision			456		526
** Rosewood Supply Lines					176
** Golf Club Road	414				
Legere Street			3	134	
*** Riverdale Court		58			
TOTALS	414	58	495	134	2005

3106 metres of main = 3.106 kilometres

- * Paid for by the Rocca Group
- ** Expenditures charged to Service Development Projects
- *** Expenditure included in operating budget

CAPITAL SERVICE DEVELOPMENT PROJECTS

In 1974, projects were begun to upgrade and extend services in the amalgamated areas. These projects are known as Capital Service Development Projects - C.S.D.P. In 1980 the Provincial Government allotted the City of Fredericton a Stimulation Grant of \$750 000 to be applied primarily to water and sanitary sewer services. Stimulation grants for 1974, 1975, 1976, 1977, 1978 and 1979 were \$1 500 000, \$1 250 000, \$1 000 000, \$1 000 000, \$1 000 000, and \$600 000 respectively.

Following is a summary of C.S.D.P. costs from 1974 to 1980 for the various services:

<u>GROSS EXPENDITURES</u>				
Year	Water	Sanitary Sewer	Storm Sewer	Totals
1974	\$ 563 987.05	\$ 169 761.70	\$ 494 027.15	\$ 1 227 775.90
1975	1 570 278.37	1 051 072.99	792 489.97	3 413 841.33
1976	827 814.68	468 296.19	588 338.30	1 884 449.17
1977	786 027.11	1 165 312.06	903 921.97	2 855 261.14
1978	300 561.65	362 441.90	1 214 097.67	1 877 101.22
1979	477 024.22	207 501.83	875 206.28	1 559 732.33
1980	442 954.24	251 344.27	843 874.56	1 538 173.07
TOTALS	\$4 968 647.32	\$3 675 730.94	\$5 711 955.90	\$14 356 334.16

Year	Service Depot & Equipment	Equipment Acquisition	Solid Waste Disposal	Totals
1974	\$ 13 873.23	\$ 479 053.44	\$ 3 153.34	\$ 496 080.91
1975	366 636.81	165 149.47	8 725.42	540 511.70
1976	556 806.34	189 961.50	15 121.10	761 888.94
1977	19 458.69	146 862.61	17 605.61	183 926.91
1978	61 042.81	56 368.95	30 220.05	147 631.81
1979	13 839.00	26 946.18	30 631.67	71 416.22
1980	500.00	28 962.14	43 978.20	73 440.34
TOTALS	\$1 032 156.88	\$1 093 304.29	\$ 149 435.39	\$ 2 274 896.56

Overall Gross Expenditure - \$16 631 230.72

Due to the implementation of a computer system, to maintain accounts, individual accounting for projects was not maintained. Therefore, a paragraph summary of major projects will be given for water, sanitary and storm sewer. It is hoped that individual accounts can be set up in 1981 for the various projects.

C.S.D.P. - Water

The above expenditure was primarily made up of holdback payments from 1979 construction projects, inspection and engineering costs and installation costs associated with Monteith Subdivision, inspection and engineering costs and installation costs associated with the Rosewood Supply Lines between Rosewood Booster Station and Monteith Subdivision, the supply and installation costs for pumping equipment for the Rosewood Booster Station, the supply and installation of telemetering equipment for the Rosewood Booster Station, professional services regarding the water supply and distribution study for the City of Fredericton and costs associated with the extension of watermain on Golf Club Road.

C.S.D.P. - Sanitary Sewer

The above expenditure under sanitary sewer was primarily made up of holdback payments from 1979 construction projects, inspection and engineering costs and installation costs associated with Monteith Subdivision, work in conjunction with the proposed sewage treatment facility for the western suburbs, costs associated with the extension of sanitary sewer on the Golf Club Road, and inspection and installation costs for new sanitary mains on Bruce and Summer streets in Nashwaaksis.

C.S.D.P. - Storm Sewer

The above expenditure for storm sewer was primarily made up of holdback payments from 1979 construction projects, inspection and installation costs associated with Monteith Subdivision, and inspection and installation costs with respect to further upgrading of streets in the Nashwaaksis area.

C.S.D.P. - Equipment Acquisition

The expenditure under this heading was for the acquisition of a highway striping paint machine, a sweeper and a one-ton truck.

C.S.D.P. - Solid Waste Disposal

The expenditure under this heading was for costs associated with the search for new disposal facilities.

DESIGNATED ROUTES

The City of Fredericton has a total of 62.869 km of provincial designated highways within its boundaries. In 1980, the Provincial Government paid \$1134 and \$300 per lane kilometre towards winter and summer maintenance of the routes respectively. If any improvements such as 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 1980:

1) Curb, gutter and paving of Route 10 - Greenwood Drive (CPR Tracks to Marysville By-Pass Road)	\$ 61 766.07
2) Installation of Storm Sewer - Route 105 Sunset Drive - Clearview Ave. to Bailey Ave.	38 259.42
3) Curb, gutter and paving of Route 640 - Hanwell Road (Former City Line to Prospect Street)	75 358.86
4) Ditching and Surface Upgrading of Route 650 - Wilsey Road	24 615.65
	TOTAL
	\$ 200 000.00

CAPITAL ACCOUNT GRAVEL ROADS

The net expenditure under this heading amounted to \$40 749.32. This was primarily for costs associated with grading and graveling in conjunction with the 1980 capital curb and gutter program.

CONCRETE SIDEWALK CONSTRUCTION

The net expenditure for sidewalk construction amounted to \$84 893.38 in 1980.

For the above expenditure, sidewalks were constructed at the following locations:

LOCATION	metres
Canterbury Drive - Essex St. to Liverpool St. (West Side)	237
Union Street - Crerar Ct. to Clark St. (South Side)	154
MacPherson Street - Murray Ave. to Grant St.	415
Allen Street	215
Greenwood Drive - C.P.R. Tracks to Marysville By-Pass Road	579
Burpee Street - Floral Ave. to Clearview Avenue	256
	TOTAL
	1856

1856 metres = 1.856 kilometre

CAPITAL ACCOUNT TRAFFIC LIGHTS

NET EXPENDITURE \$ 24 807.40

The above expenditure was for the purchase of an aerial boom truck with extras, purchase of a controller for Regent - Priestman intersection, purchase of flashing beacons, and payments to the minister of finance.

CAPITAL TRANSPORTATION

NET EXPENDITURE \$ 10 127.37

The expenditure under this account was for work regarding the overall transportation study for the City of Fredericton.

CAPITAL PERMANENT STREETS - RECONSTRUCTION

In 1980, the City of Fredericton continued its program of upgrading streets in the downtown urban core of the City. This upgrading took the form of curb and gutter reconstruction, sidewalk reconstruction, service relays and repaving.

Areas upgraded were Queen Street - York Street to Westmorland Street; Carleton Street - Queen Street to King Street; and the northern side of King Street - from Carleton Street to York Street.

The net expenditure in 1980 for this upgrading was \$104 637.50.

OTHER CAPITAL - WESTMORLAND BRIDGE

NET EXPENDITURE \$ 720.08

The above expenditure was for work in conjunction with the Department of Transportation regarding the new bridge.

CAPITAL ACCOUNT - VANIER INDUSTRIAL PARK

NET CREDIT \$ 10 551.76

The above credit resulted from the sale of lot VP-8-1 in the Vanier Industrial Park.

CAPITAL ACCOUNT - C.S.C.P.

NET EXPENDITURE \$ 8 177.59

The above expenditure came as a result of work around City Hall and on the Regent Promenade through the community services contribution program.

ENVIRONMENTAL HEALTH SERVICES

NET EXPENDITURE \$471 767.00

Under the above heading, the following items are included:

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

(1) Garbage and Waste Collection

In 1980, the amount paid for the garbage and waste collection operation was \$296 399 made up as follows:

Personnel (Labour, Pensions, Compensation).....	\$ 2 134
General Services (Advertising & Collection Contract) ...	294 265
TOTAL \$ 296 399	

(2) Sanitary Landfill - Disposal

The expenditure under this section was \$175 368 made up as follows:

General Services (Bulldozing Services Contract)	\$ 72 000
Goods (Gravel & Cover Material)	103 368
TOTAL	<u>\$ 175 368</u>

PUBLIC HEALTH SERVICES - CEMETERIES

Under this heading are included:

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

(1) The Old Burial Ground

NET EXPENDITURE \$ 7 168

The above expenditure was made up as follows:

Personnel (Labour, Pensions, Compensation)	\$ 6 375
General Services (Machinery)	142
Government Services (Lighting)	424
Goods (Materials, Tools, etc.)	227
TOTAL	<u>\$ 7 168</u>

(2) The Loyalist Burial Ground

NET EXPENDITURE \$ 166

The above expenditure was made up as follows:

Personnel (Labour, Pensions, Compensation)	\$ 94
General Services (Machinery)	72
TOTAL	<u>\$ 166</u>

CULTURAL SERVICES

Included under this heading are:

- (1) Wilmot Park
- (2) Odell Park
- (3) Carleton Park
- (4) Development of Park Areas
- (5) Other Parks
- (6) Public Works (Trees; Greens, Benches & Other)

(1) Wilmot Park

NET EXPENDITURE \$ 22 088

The above expenditure was made up as follows:

Personnel (Labour, Pensions, Compensation)	\$ 15 052
General Services (Repairs & Maintenance, Machinery, Insurance)	4 877
Government Services (Water & Sewer Rates, Lights & Power)	1 701
Goods (Materials, Gas & Oil)	458
TOTAL	\$ 22 088

(2) Odeill Park

NET EXPENDITURE \$ 26 698

The above expenditure was made up as follows:

Personnel (Labour, Pensions, Compensation)	\$ 22 705
General Services (Telephone, Insurance, Machinery, Repairs & Maintenance)	1 499
Government Services (Water & Sewer Rates, Lights & Power)	289
Goods (Fuels and Lubricants, Materials)	2 205
TOTAL	\$ 26 698

(3) Carleton Park

NET EXPENDITURE \$ 11 615

The above expenditure was made up as follows:

Personnel (Labour, Pensions, Compensation)	\$ 7 176
General Services (Machinery & Land Rental)	3 643
Goods (Materials, Gas & Oil)	796
TOTAL	\$ 11 615

(4) Development of Park Areas

NET EXPENDITURE \$ 5 243

The above expenditure was made up as follows:

Personnel (Labour, Pensions, Compensation)	\$ 3 803
General Services (Machinery)	1 202
Goods (Materials, Gas & Lubricants)	238
TOTAL	\$ 5 243

(5) Other Parks

NET EXPENDITURE \$ 3 628

The above expenditure was made up as follows:

Personnel (Labour, Pensions, Compensation)	\$ 1 932
General Services (Machinery, Repairs & Maintenance)	1 060
Goods (Materials)	636
TOTAL	<u>\$ 3 628</u>

(6) Public Works

NET EXPENDITURE \$ 175 197

The above heading is made up of the following:

- (1) Trees
- (2) Greens, Benches, & Other

(1) Trees

The net expenditure under this account amounted to \$147 057 and was made up as follows:

Personnel (Labour, Pensions, U.I.C., Compensation, Honorary)	\$ 100 139
General Services (Machinery & Trucking, Equipment Maintenance, Building Rental)	32 920
Goods (Gas & Oil, Materials, New Trees, Small Tools, & Equipment)	13 998
TOTAL	<u>\$ 147 057</u>

In 1980, 1217 trees were removed upon the recommendation of the Fredericton Tree Commission. The condemned 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 1980:

SPECIES	NUMBER REMOVED
Elm	1197
Birch	3
Maple	14
Mountain Ash	1
Willow	1
Fir	2
TOTAL	1218

In 1980, 1146 trees were removed with Dutch Elm Disease in the City of Fredericton.

Following is a list of trees (Elm) removed from 1964 to 1980:

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
TOTALS	4143	68.2	1931	6074

Permission for the removal of trees on private property, as well as a statement to the effect that no claim for damages will be filed by the property owners, are obtained before proceeding with this work.

Trees were planted at the following locations in 1980:

Location	Number of Trees
University Avenue	6
Cathedral	5
The Green	24
Waterloo Row	2
Front of Legislative Building	1
William Street	2
Haines Crescent	1
Wilmet Park	5
Fairview Drive	2
Mooers Drive	1
Odell Park	24
Carleton Street	7
Saunders Street	6
Aberdeen Street	15
Argyle Street	26
Victoria Street	23
Dundonald Street	16
Connaught Street	11
Odell Avenue	6
Northumberland Street	49

Location	Number of Trees
Westmorland Street	19
York Street	10
St. John Street	1
Alexandra Street	4
Scully Street	1
Chandler Drive	1
Wetmore Road	2
Inglewood Drive	1
Brookmount Street	2
Woodbine Court	1
Lynhaven Street	2
Oxford Street	1
Forest Hill Road	1
Folkstone Court	1
Leeds Drive	1
Colonial Heights	5
Lansdowne Avenue	5
Riverside Drive	1
Union Street	2
Kings College Road	1
Windsor Street	3
Elgin Street	2
Clayton Street	1
Queen Street	19
George Street	7
Carleton Park	12
Tourist Bureau	41
Charlotte Street	74
Regent Street	21
TOTAL	474

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

Trees purchased in 1980 were obtained from Connon Nurseries and Lansdowne Nurseries.

Total Trees Purchased & Donated	-	769
Less Trees in Stock or Sold	-	16
Total Trees Planted		<u>753</u>

A number of trees were also trimmed in 1980. The number and class of trees are as follows:

- (a) Large trees (14 m and over) - Approximately 150 mixed species
- (b) Medium trees (6 m - 14 m) - Approximately 480 mixed species
- (c) Small trees (2 m - 6 m) - Approximately 3000 mixed species

A number of stumps were also removed along City Streets.

Stumps Removed and Topsoiled 320

(2) Greens, Benches, Other

The net expenditure under this account amounted to \$28 140 and was made up as follows:

Personnel (Labour, Pensions, Compensation)	\$ 17 150
General Services (Communications, Machinery & Trucking, Equipment Maintenance)	3 566
Goods (Gas & Oil, Materials, Small Tools & Equipment)	2 137
Fixed Assets (Purchases of Equipment)	5 287
TOTAL	<u>\$ 28 140</u>

SANITARY SEWER

NET EXPENDITURE \$ 907 611 (*Excluding Debt. Charges*)

The above expenditure was made up as follows:

Operating:

Labour - Lift Stations	\$ 23 419
Power - Lift Stations	9 743
Maintenance - Lift Stations ..	2 820
Materials - Lift Stations	<u>2 012</u> \$ 37 994

Maintenance:

Labour	\$ 194 482
Compensation	3 232
Materials	26 530
Trucking Costs	30 652
Machinery Costs	<u>22 124</u> \$ 277 020

Treatment:

Fredericton Area Pollution Control Commission \$ 592 397

Debt Charges:

Principal \$ 102 451
Interest 77 134 \$ 179 585

Other:

Insurance Liability \$ 200
TOTAL \$1 087 197

New Customers connected to the City Sewer System in 1980 = 123

The Fredericton Sanitary Sewer System consists of approximately 145 kilometres of sewer mains and is made up as follows:

Size	Silverwood Garden Creek	Nashwaaksis	Marysville	Barkers Point	Fredericton	Totals
100 mm	0.013	0.098	-	-	-	0.098
100 mm F.M.	0.008	-	-	-	0.512 0.824	0.520
150 mm	-	x 0.900 1.433	0.195 0.314	-	0.067 0.108	1.162
150 mm F.M.	0.019 0.031	x 0.417 0.417	0.335 0.539	0.042 0.068	1.869 3.008	2.682
200 mm	x 6.117 9.418	x 19.347 30.824	10.455 16.825	4.697 7.559	65.472 105.364	106.088
200 mm F.M.	0.158 0.254	-	0.195 0.314	-	0.040 0.064	0.393
250 mm	x 0.951 1.279	1.791 2.882	0.377 0.607	0.185 0.298	5.173 8.325	8.477
250 mm F.M.	0.732 1.178	-	-	-	-	0.732
300 mm	0.275 0.443	1.904 3.064	0.625 1.006	1.161 1.868	7.929 12.760	11.894
300 mm F.M.	-	-	-	-	0.459 0.730	0.459
350 mm	0.099 0.159	0.426 0.686	-	-	0.443 0.713	0.968
350 mm F.M.	-	-	0.328 0.528	-	0.158 0.254	0.486
375 mm	-	1.344 2.163	0.311 0.500	0.108 0.174	1.630 2.623	3.393
400 mm	-	0.047 0.076	-	-	0.120 0.193	0.167
450 mm	0.496 0.798	0.019 0.031	0.839 1.350	-	2.176 3.502	3.530
500 mm	1.851 2.979	-	-	-	-	1.851
600 mm	0.097 0.156	-	-	-	1.062 1.709	1.159
750 mm	-	-	-	-	0.200 0.322	0.200
900 mm	-	-	-	-	0.890 1.432	0.890
TOTALS	10.803	26.293	13.660	6.193	88.200	145.149

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 Area Pollution Control Commission Collector Sewer System which has approximately 11.4 kilometres of main.

WATER

There are at present 25 Wells in the City of Fredericton Water System (23 active wells and 2 test wells) and 16 Reservoirs.

ACTIVE WELLS: North Side

Maple Street
Cliffe Street
Carleton Well 1963
Killarney Well
Nashwaaksis #1
Nashwaaksis #2
Nashwaaksis #3
Sunset Drive
Marysville #1
Marysville #2
Marysville #3
Barker's Point #1
Barker's Point #2
Killarney Rd. #1
Killarney Rd. #2

South Side

Fredericton #1
Fredericton #3
Fredericton #4
Fredericton #5
Hanwell Road
Silverwood #2
Silverwood #3
Duval

TEST WELLS ONLY: Nashwaaksis #4 and Silverwood #4

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

FREDERICTON SOUTH:

LOCATION	Number of Reservoirs	Total Capacity (Cubic Metres)
Silverwood	1	227
Regent Street	1	1 134
Montgomery Street	2	9 072
Smythe Street	2	18 144
Forest Hill (Canterbury Drive)	2	1 102
Flemming Road	1	3 742
Hanwell Road	1	454
	<hr/>	<hr/>
Sub-Total	10	33 875

FREDERICTON NORTH:

Nashwaaksis	2	2 858
Barker's Point	1	1 134
Marysville	1	2 835
Carleton Ward	1	4 536
Killarney Road	1	3 720
	<hr/>	<hr/>
Sub-Total	6	15 083
OVERALL TOTALS	<hr/>	<hr/>
	16	48 958

The Water Account includes all expenditures other than Capital Expenditures for water.

Water costs for the City of Fredericton are divided as follows:

(1) Water Administration (Salaries of office staff, Office Equipment, Billing & Collecting).....	\$ 142 764
(2) Water Ordinary (Includes Meters)	644 008
(3) Water Pumping Station & Well Production Costs..	360 611
(4) Debt Charges - Principal	344 935
(5) Debt Charges - Interest	386 322
	<hr/>
TOTAL NET EXPENDITURE	\$1 878 640

(1) WATER ADMINISTRATION

NET EXPENDITURE \$ 142 764

The above expenditure was made up as follows:

Salaries of Engineering Staff	\$ 21 222
Billing & Collecting: Office Salaries & Benefits	\$ 68 984
General Services: Postage	13 218
Telephone	457
Machinery Rental	34 880
Office Rental	4 003
	<u>121 542</u>
TOTAL	\$ 142 764

(2) WATER ORDINARY (INCLUDING METERS)

NET EXPENDITURE \$ 644 008

The expenditure under this heading was made up as follows:

Transmission & Distribution (Operation):

Labour - Boosters.....	\$ 38 841
Equipment Maintenance - Boosters	1 801
Power - Boosters	37 498
Materials - Boosters	<u>1 164</u>

\$ 79 304

Transmission & Distribution (Maintenance):

Labour - Hydrants	\$ 107 138
Labour - Maintenance	158 519
Workmen's Compensation	8 464
Distribution Repair Parts	17 796
Trucks (Maintenance)	7 777
Trucks (Operating - Gas & Oil)	3 246
Materials, Labour & Trucking	25 136
Hydrants - Parts	19 894
Fixed Assets - New Vehicles	<u>82 795</u>

\$ 430 765

Meters:

Labour - Reading	\$ 27 192
Labour - Installations	27 772
Repairs & Maintenance	14 988
Parts	4 435
Fixed Assets - New Meters	<u>59 552</u>

\$ 133 939

TOTAL

\$ 644 008

On December 31, 1980 there were 10 072 water services on meter and 765 on Flat Rate, making a total of 10 837.

324 meters were installed in 1980, 513 regular meters changed to TRT, and 20 ARB meters changed to TRT.

In 1980, 12 discontinued services were excavated and shut off at the main, 120 stopped meters replaced and 52 frozen meters replaced.

The following sprinklers were installed in 1980:

- (1) Direct Charge Co-Op - Doak Road
- (2) Brookside Place Mall - Brookside Drive
- (3) McFadzen Holdings Bldg. - Hanwell Road

There are in the City as of December 31, 1980, 1344 Hydrants, broken down in the following areas:

Fredericton South	640
Fredericton North	134
Nashwaaksis	236
Marysville	126
Barker's Point	63
Silverwood	27
Sub-Total	1226
Located on Private Property	<u>118</u>
TOTAL	1344

Hydrants were installed at the following locations in 1980:

LOCATION	NUMBER
Monteith Drive	4
Lily Street	1
Tulip Street	1
Brookside Drive	1
Reynolds Street	3
McKnight Street	3
Legere Street	1
Brookside Place Mall (Private)	3
Hanwell Place (Private)	2
Fredericton Mall (Private)	2
TOTAL	21

Distribution System:

New Services Installed in 1980	134
Old Services Relayed in 1980	31
Frozen Services that had to be thawed	29

The Fredericton Distribution System consists of 154.431 kilometres of watermain, made up as follows:

Size	Marysville	Nashwaaksis	Barker's Point	Silverwood Garden Creek	Fredericton	Total
31.25 mm	-	0.095 0.153	-	-	-	0.095
37.5 mm	-	0.045 0.072	-	-	-	0.045
50 mm	-	-	-	0.096 0.154	-	0.096
75 mm	-	-	-	-	0.270 0.435	0.270
100 mm	0.468 0.753	1.387 2.232	-	1.715 2.508	6.514 10.448	10.084
150 mm	7.268 11.696	12.846 20.651	2.433 3.915	2.614 3.929	34.996 56.317	60.157

Size	Marysville	Nashwaaksis	Barker's Point	Silverwood Garden Creek	Fredericton	Total
200 mm	3.331 5.361 10.342 16.643	0.593 0.954	1.603 2.580	22.970 36.884	38.839	
250 mm	1.532 2.465 4.411 6.305	3.208 5.163	0.865 0.964	11.777 18.952	21.793	
300 mm	0.383 0.616 1.073 1.727	0.019 0.031	2.832 4.558	14.118 22.720	18.425	
350 mm	-	-	-	-	1.904 3.064	1.904
400 mm	-	-	-	-	1.588 2.556	1.588
450 mm	-	-	-	-	0.980 1.577	0.980
Unknown	0.155 0.249	-	-	-	-	0.155
TOTAL	13.137	30.199	6.253	9.725	95.117	154.431

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

This does not include the watermains installed by the National Defence 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.

The supply system consists of 0.58 kilometres of 350 mm Cast Iron Pipe, extending from the well site at Wilmot Park to the pumping station; 0.26 kilometres of 300 mm Cast Iron Pipe extending from well on the south bank of the St. John River on Woodstock Road to the well site of #1 well at Wilmot Park; and 0.16 kilometres of 375 mm Steel Pipe extending from the in-take pier in the St. John River to the pumping station.

The following machinery was purchased in 1980 and charged to "Water Ordinary":

1 - Chevrolet 1/2 Ton - Asset No. 302

Cost	\$ 6 047.24
Plus 8% S.S.&E. Tax	483.77
License & Registration	<u>9.00</u>
TOTAL COST	\$ 6 540.01

1 - Chevrolet 3/4 Ton - Asset No. 304

Cost	\$ 6 947.97
Plus 8% S.S.&E. Tax	555.83
License & Registration	<u>9.00</u>
TOTAL COST	\$ 7 512.80

1 - Atlas Copco Portable Compressor

Cost	\$ 13 500.00
Less Invoiced Rental	3 600.00
Net Cost	<u>9 900.00</u>
Plus 8% S.S.&E. Tax	792.00
TOTAL COST	\$ 10 692.00

(3) WATER PUMPING STATION

NET EXPENDITURE \$ 360 611

The above expenditure was made up as follows:

<u>Source of Supply:</u>	Labour - Wells	\$ 32 980
	Maintenance - Wells	40 185
	Power - Wells	96 180
	Materials - Wells	<u>1 632</u> \$ 170 977

Power & Pumping (Plant):

Labour	\$ 101 691
Workmen's Compensation	3 962
Light & Power	38 037
Diesel Fuel & Lubricants	1 016
Heating	4 502
Supplies	1 197
Miscellaneous	<u>824</u> \$ 151 229

Maintenance of Equipment (Plant):

Labour	\$ 1 157
Insurance	5 221
Maintenance (Equipment)	15 240
Taxes	8 446
Materials	<u>645</u> \$ 30 709

Purification & Treatment:

Labour - Analyst	\$ 318
Chlorine	4 068
Chemicals	248
H.T.H. Tablets	194
Chlorinator (Parts)	<u>2 407</u> \$ 7 696
	<u>TOTAL</u> \$ 360 611

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

YEAR	COST
1971	\$ 810.45
1972	913.02
1973	961.12
1974	1 836.79
1975	2 132.89
1976	2 156.01
1977	2 176.81
1978	2 459.14
1979	3 141.97
1980	4 502.00

COMPARISON OF WATER PUMPED AND COSTS FOR
FREDERICTON SOUTH (FORMER BOUNDARY) FOR THE LAST TEN YEARS

Year	cubic metres produced	Production Expenditure	Production Cost per cubic metre
1971	3 826 424	\$ 76 827.46	2.0 cents
1972	4 188 272	81 585.18	1.9 cents
1973	4 280 068	81 478.87	1.9 cents
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

* Production costs for the entire amalgamated area.

The columns in the preceding comparison, showing cubic metres produced, do not include water used from wells in the other sections of the City prior to 1975.

The total amount of water pumped from January 1, 1980 to December 31, 1980 for the entire City was 7 037 407 cubic metres divided as follows:

Fredericton South	4 338 969.54
Fredericton North	603 344.51
Nashwaaksis	845 836.26
Marysville (Partially Estimated)	479 126.94
Barker's Point	208 974.76
Silverwood & Duval	413 683.85
Killarney	147 471.34
 TOTAL	 7 037 407.20

The total net water expenditure (operating) for the City from January 1, 1980 to December 31, 1980 was determined from the following:

Source of Supply	\$ 170 977
Power & Pumping	151 229
Maintenance of Equipment	17 042
Purification & Treatment	7 696
Transmission & Distribution (Operation)....	79 304
Transmission & Distribution (Maintenance)..	430 765
Other (Taxes & Insurance)	13 667
 TOTAL	 <u>\$ 870 680</u>

Therefore, the net operating cost to pump and deliver to the customer one cubic metre of water from January 1, 1980 to December 31, 1980 was:

$$\$ \frac{870\ 680}{7\ 037\ 407} = \$ 0.124$$

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

Total Net Administration & Operating Costs	\$ 1 147 383
Principal and Interest	731 257
TOTAL	<u>\$ 1 878 640</u>

Total Cost of Water per cubic metre:

$$\$ \frac{1\ 878\ 640}{7\ 037\ 407} = \$ 0.267$$

Principal and Interest Costs:

$$\$ \frac{731\ 257}{7\ 037\ 407} = \$ 0.104$$

Administration and Operating Costs:

$$\$ \frac{1\ 147\ 383}{7\ 037\ 407} = \$ 0.163$$

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 1980:

Costs Per cubic metre in Cents

Year	Net Operating	Administration & Operating	Principal & Interest	*Total Cost
1968	4.2	5.3	5.5	10.8
1969	6.4	8.0	3.9	11.9
1970	4.3	5.8	4.2	10.0
1971	4.7	6.1	4.9	11.0
1972	5.3	6.7	4.0	10.7
1973	4.1	6.4	4.0	10.4
**1974	6.4	9.2	5.1	14.3
**1975	7.3	10.6	5.9	16.5
**1976	7.5	11.4	10.8	22.2
**1977	8.1	11.9	13.2	25.1
**1978	8.8	12.5	12.5	25.0
**1979	10.3	14.5	11.9	26.4
**1980	12.4	16.3	10.4	26.7

* Total Cost = Administration & Operating + Principal & Interest

** Values from 1968 to 1973 are for pre-amalgamated City only while values from 1974 to 1980 are for the amalgamated City.

WATER AND SEWER REVENUE - 1980

WATER:

Item	Net Expenditure	Revenue
<u>Water Office Administration</u>		
(a) Administrative (Eng. Dep't Staff)	\$ 21 222	\$
(b) Billing & Collecting (Office)	121 542	
<u>Water Ordinary</u>		
(a) General-Operating & Maintenance	383 037	1 236 126.08
(b) Meters	133 939	48 073.25
(c) Hydrants	127 032	561 756.00
<u>Water Pumping Station</u>		
(a) General Costs - Wells, Plant Purification & Treatment, etc.	346 626	
(b) City Analyst	318	
(c) Taxes & Insurance	13 667	
<u>Principal & Interest</u>	731 257	
TOTALS	\$ 1 878 640	\$1 845 955.33

DEFICIT: \$ 32 684.67

SANITARY SEWER:

Item	Net Expenditure	Revenue
Sewerage Domestic - Maintenance & Installation	\$ 315 215	\$1 116 053.68
F.A.P.C.C. Sewage Treatment	592 397	
Principal & Interest	179 585	
TOTALS	\$ 1 087 197	\$1 116 053.68

SURPLUS: \$ 28 856.68

Accompanying this report is the report of Judy Mercer, City Analyst, on the Fredericton Water Supply from January 1, 1980 to December 31, 1980.

In 1980 monthly samples were taken at each of the wells for total coliform analysis. Any 100 ml sample containing four or more coliform organisms established by membrane filter tests indicates the need for immediate remedial action and additional examinations. There were no problems with any of the wells in this area.

Wilmot Park #5 well was down from March 27 to July 4 for acidizing to try to reduce manganese levels. Also, several test wells were drilled and tested. Following are the results of samples taken throughout this period. Additional testing was carried out by the drilling company, May 26.

Test Well #2 at Wilmot Park #5 (After Flushing)

	pH	Fe (mg/l)	Mn (mg/l)	Hardness (mg/l)	Cl (mg/l)	ALK (mg/l)	Sulphate
after 12 hours	6.7	< 0.05	1.7	44	70	39	53
after 24 hours	6.7	< 0.05	1.7	48	70	35	53
after 36 hours	6.7	< 0.05	1.7	44	70	39	53
after 48 hours	6.7	< 0.05	1.7	48	65	39	53

Wilmot Park Well #5 (After Acidizing)

Date	Mn (mg/l)	Fe (mg/l)	pH	Cl (mg/l)	Hardness (mg/l)
June 16	2.5	-	-	-	-
June 24	2.4	-	6.8	-	-
June 25	2.2	-	-	-	-
June 26	2.2	< 0.05	7.0	7.5	58
July 4	2.2	< 0.05	7.0	6.5	56
July 15	2.1	< 0.05	6.8	5.5	56
Oct. 24	1.8	-	-	-	-

Plant Raw Water

Date	Mn (mg/l)	pH	
July 4	0.7	6.8	(#5 just put into system)
July 7	0.7	6.8	
July 8	1.5	6.8	(after chlorination Mn=0.9 mg/l)
July 14	1.5	6.8	(after chlorination Mn=1.5 mg/l)

Following is a chronological list of sample locations and results for 1980 other than those showing nil coliform per 100 ml. Most locations were tested for the presence of the coliform group although some iron, manganese and hydrogen sulfide testing was done.

The locations include monthly samples from the Fredericton Wells, spot-checking throughout the system, individual problems and complaints and samples from new lines before they are put into the system.

All of the well samples (unless otherwise stated) are taken before chlorination.

Judy Mercer,
City Analyst

DATE	SAMPLE LOCATION	TOTAL COLIFORM/100 ml
Feb. 12	Wilmot Park Well #4	1 coliform/100 ml sample
March 26	Catherine Stairs (#25 odor in water)	H ₂ S = 0.1 mg/l
March 24	Lydia Kaine	Cold Water - Fe= 0.1 mg/l Mn= 0.3 mg/l Hot Water - Fe= 0.2 mg/l Mn= 0.2 mg/l
June 17	Silverwood Well #2 (back flushing)	2 coliform/100 ml
June 17	Hanwell Well	1 coliform/100 ml
June 24	Wilmot Park Well #5	lot of red colonies
June 23	239 Victoria (staining clothes)	Mn= 0.7 mg/l Fe= <0.05 mg/l
June 25	Wilmot Park Well #5	19 red colonies
June 26	247 Victoria	Mn= < 0.1 mg/l
June 26	244 Victoria	Mn= < 0.1 mg/l
June 26	Wilmot Park Well #5	10 red colonies
July 4	Wilmot Park Well #5	9 red colonies
July 4	1604 Lincoln Road	SS= < 1 mg/l
July 7	662 Hanwell Road (tastes bad after setting)	Chlorine residual = 0.2 mg/l
July 7	1604 Lincoln Road	Mn= < 0.05 mg/l Fe= 0.6 mg/l SS= < 1 mg/l
July 10	125 Riverside Drive (dirt in toilet tank)	13 coliform/100 ml
July 11	125 Riverside Drive	Mn= < 0.05 mg/l Fe= < 0.05 mg/l
July 15	Wilmot Park Well #5	10 red colonies
Aug. 12	St. Marys Street Well	5 coliforms/100 ml
Aug. 19	Silverwood Reservoir	red colonies
Aug. 19	Silverwood Well #2	red colonies
Aug. 19	Silverwood Well #3	red colonies
Aug. 19	344 Albert Street	Mn= 1.3 mg/l
Aug. 20	Silverwood Well #3	3 coliform/100 ml
Aug. 28	148 Jewett Street (staining)	Mn= <0.05 mg/l Fe= <0.05 mg/l
Aug. 28	Monteith Drive	8 coliform/100 ml
Aug. 28	Rosewood Booster	red colonies
Sept. 9	Lily Street	1 coliform/100 ml
Sept. 11	66 River Street	Mn= 0.9 mg/l Fe= 0.4 mg/l

DATE	SAMPLE LOCATION	TOTAL COLIFORM/100 ml
Sept. 24	Marysville Well #1	Mn= <0.1 mg/l Fe= <0.05 mg/l
Sept. 24	Marysville Well #2	Mn= <0.1 mg/l Fe= <0.05 mg/l
Sept. 24	Marysville Well #3	Mn= 0.7 mg/l Fe= 0.4 mg/l
Sept. 24	426 MacPherson St. (Staining)	Mn= 0.4 mg/l Fe= 0.05 mg/l
Sept. 25	Nashwaaksis Well #1	Mn= <0.1 mg/l Fe= <0.05 mg/l
Sept. 25	Nashwaaksis Well #3	Mn= <0.1 mg/l Fe= <0.05 mg/l
Sept. 25	Maple - McKeen Well	Mn= 0.5 mg/l Fe= 0.2 mg/l
Oct. 8	Nashwaaksis Well #2 (after being down two months)	red colonies
Oct. 10	Nashwaaksis Well #2 Before Chlorination	1 coliform/100 ml
	After Chlorination	nil
Oct. 14	Tulip Street 1st sample	8 coliform/100 ml
	Tulip Street 2nd sample	9 coliform/100 ml
Oct. 23	One Hour Martinizing (staining)	Mn= 0.8 mg/l Fe= <0.05 mg/l
Oct. 24	End of McKnight St.	coliform present
Oct. 24	0 + 00 Reynolds Street	coliform present
Nov. 5	Barker's Point Well #2	2 coliform/100 ml
Nov. 5	Nashwaaksis Well #2	1 coliform/100 ml
Dec. 3	415 Lisgar Street	Mn= 0.8 mg/l Fe= <0.05 mg/l
Dec. 10	St. Mary's Street Well	1 coliform/100 ml
Dec. 19	312 Inglewood Drive Hot Water	Mn= <0.1 mg/l Cl= 28.0 mg/l
	Cold Water	Mn= <0.1 mg/l Fe= 0.05 mg/l Cl= 26.5 mg/l