

ANNUAL REPORT
OF THE
CITY ENGINEER
1985

CITY OF FREDERICTON

PUBLIC WORKS DEPARTMENT

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

Ladies 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 1985 01 01 to 1985 12 31 and is written for the purpose of maintaining an accurate record on file of the activities and costs associated with the various operations.

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

Concrete Curb and Gutter	6.670 km
Sidewalk Reconstruction	2.024 km
New Concrete Sidewalk	2.092 km
New Street Construction	1.990 km
New Pavement - Type "B" Asphalt Concrete	1.895 km
Resurface - Type "D" Asphalt Concrete	11.131 km
Resurface - Type "E" Asphalt Concrete	3.108 km
Gravity Sanitary Sewer Mains	6.318 km
Storm Sewer Mains	4.014 km
Water Mains	5.468 km
Double Chip Sealed Streets	2.507 km

ALSO

- 201 Water services were installed
- 200 Sanitary sewer services were installed
 - 1 Sprinkler line was installed
 - 21 Water services were renewed
 - 1 Sanitary sewer service was renewed
 - 210 New water meters were installed
 - 8 Existing services were extended

Contractors under contract with the Engineering Department of the City of Fredericton in 1985 constructed, completed construction or began construction, on the following projects:

- Wendell Thomas & Sons Ltd. - supply and delivery of bedding sand
- Wendell Thomas & Sons Ltd. - supply and delivery of topsoil

- Northside Ready Mix
 - supply and delivery of concrete
- John MacBean
 - supply and delivery of granular material
- Gorman Construction 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 Paints (A Division of Ibis Products Ltd.)
 - supply of traffic lane striping paint
- P.D. Moore Landscaping Ltd.
 - supply and delivery of cover material at sanitary landfill
- Gerard Burns
 - bulldozing services - sanitary landfill
- Shell Canada Ltd.
 - supply and delivery of furnace oil
- Rockwood Construction Ltd.
 - installation of sanitary sewer - Garden Creek - T.C.H. Trunk
- Rockwood Construction Ltd.
 - supply and installation of sanitary sewer and water mains - Regent Street and U.N.B. Woodlot
- Charmac Construction Co. Ltd.
 - installation of sanitary sewer and water mains on River Street
- John Kilburn & Sons Ltd.
 - installation of storm sewer on the Back Drain
- Callaghan Contracting Ltd.
 - installation of storm sewer on Hemlock Avenue, Willis Street and Forestview Ct.
- Maritime Sanitation Services
 - garbage collection services
- E. W. Clowater & Sons Ltd.
 - supply and installation of ventilation system for St. Mary's Street Depot.
- Atlantic Colas Limited
 - supply and placement of double chip seal

General Fund expenditures for the period 1985 01 01 to 1985 12 31 were as follows:

Item	Budget	Net Expenditure	Over	Under
<u>COMMON SERVICES (Public Works)</u>	\$ 2 136 766	\$ 2 097 715	\$ -	\$ 39 051
<u>ROAD TRANSPORT SERVICES</u>				
Administration	28 145	25 376	-	2 769
Roads & Streets	1 017 775	951 536	-	66 239
Sidewalk Maintenance	54 732	57 085	2 353	-
Culverts, Ditching	41 770	38 889	-	2 881
Storm Sewer Maintenance	132 795	122 715	-	10 080
Street Cleaning	246 999	286 744	39 745	-
Spring Cleanup	21 110	25 858	4 748	-
Sanding & Salting & Snow Control	892 170	780 843	-	111 327
Street Lights	468 200	464 173	-	4 027
Traffic Services	322 658	256 528	-	66 130
<u>ENVIRONMENTAL HEALTH SERVICES</u>				
Garbage & Waste Disposal	338 150	410 001	71 851	-
Garbage & Waste Collection	331 000	330 091	-	909
<u>PUBLIC HEALTH SERVICES</u>				
Old Burial Ground	13 050	16 886	3 836	-
Loyalist Burial Ground	333	284	-	49
<u>PARKS & TREES SERVICES</u>				
Wilmot Park	34 888	35 045	157	-
Odell Park	51 437	57 893	6 456	-
Carleton Park	13 675	11 303	-	2 372
Riverfront Greens	36 157	36 748	591	-
Development of Park Areas	2 145	7 210	5 065	-
Other Parks	12 350	17 900	5 550	-
Trees	314 728	272 748	-	41 980
Greens, Benches, etc.	48 028	47 988	-	40
TOTALS	\$ 6 559 061	\$ 6 351 559	\$140 352	\$ 347 854

* UNDER: \$ 207 502

* Does not reflect machinery rentals.

Utility Fund expenditures for the period 1985 01 01 to 1985 12 31 were as follows:

Item	Budget	Net Expenditure	Over	Under
<u>COMMON SERVICES</u>				
General Equipment	\$ 214 400	\$ 213 760	\$ -	\$ 640
Safety & Benefits	156 400	168 963	12 563	-
Administration	99 300	99 084	-	216
<u>WATER</u>				
Purification & Treatment	236 700	243 022	6 322	-
Source of Supply	363 250	340 992	-	22 258
Power & Pumping	68 100	33 095	-	35 005
Maintenance of Equipment (Plant)	23 722	29 882	6 160	-
Transmission & Distribution (Oper)	176 800	184 347	7 547	-
Transmission & Distribution (Maint)	644 600	594 028	-	50 572
Billing & Collection	186 500	162 909	-	23 591
Meters	188 600	173 778	-	14 822
<u>SANITARY SEWER</u>				
Operation (Lift Stations)	127 850	86 171	-	41 679
Maintenance	417 900	320 804	-	97 096
Treatment & Disposal	959 757	930 064	-	29 693
Other (Insurance)	700	250	-	450
TOTALS	\$3 864 579	\$3 581 149	\$32 592	\$316 022

* Under: \$ 283 430

* Does not reflect debt charges, revenue, or machinery rentals.

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	89.681	4.457	6.722	100.860	20.067	2.583	22.650	22.234
Fredericton North	19.224	0.090	1.128	20.442	4.770	-	4.770	3.701
Nashwaaksis	39.190	2.100	9.088	50.378	2.533	-	2.533	8.214
Marysville	16.151	0.426	4.919	21.496	8.216	-	8.216	3.460
Barker's Point	3.119	-	3.288	6.407	4.671	-	4.671	1.275
Silverwood	3.473	0.085	0.644	4.202	-	-	-	2.757
Garden Creek	7.061	1.789	6.790	15.640	6.294	-	6.294	8.771
Douglas	-	0.191	3.910	4.101	2.554	-	2.554	-
Lincoln	2.923	1.494	3.032	7.449	1.332	-	1.332	-
Lower St. Marys	1.138	-	0.832	1.970	-	-	-	-
Killarney Road	0.332	-	-	0.332	4.230	-	4.230	-
TOTALS	182.292	10.632	40.353	233.277	54.667	2.583	57.250	50.412

TOTAL (Municipal and Designated Routes) = 290.527 km

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

Respectfully submitted,



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

COMMON SERVICES (PUBLIC WORKS)

The total net expenditure under this heading was \$ 2 097 715 made up as follows:

Administration	\$ 51 491
Engineering Services	177 502
General Equipment	1 019 773
Service Depots	324 442
Safety & Benefits	<u>524 507</u> \$ 2 097 715

ROAD TRANSPORT SERVICES

Road Transport Services is made up of the following items:

Administration	\$ 25 376
Roads & Streets	2 263 670
Street Lighting	464 173
Traffic Services	256 528
Recovery Account - Rentals	<u>(666 085)</u> \$ 2 343 662

- (a) Administration: The total net expenditure under this heading amounted to \$ 25 376 for wages, pensions, general services, etc.
- (b) Roads & Streets: The total net expenditure under this item was made up as follows:

(1) Roadway Surfaces (maintenance)	\$ 951 536
(2) Sidewalk Maintenance	57 085
(3) Culverts & Ditching	38 889
(4) Storm Sewer Maintenance	122 715
(5) Street Cleaning & Flushing (includes Spring Cleanup)	312 602
(6) Snow Control (snow & ice removal)	500 929
(7) Sanding & Salting	<u>279 914</u> \$ 2 263 670

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 \$ 951 536 was made up as follows:

Gravel Roads & Chip Seal	\$ 108 465
Paved Streets Maintenance	313 179
Asphalt Resurface Program	368 311
Curb & Gutter Repair	79 794
Driveway Entrances	5 701
Rights-of-way Maintenance	<u>76 086</u>
	\$ 951 536

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

The following streets were double chip sealed in 1985:

Location	Length (metres)
Case Street	623
Highland Avenue	1129
Piercy Crescent	481
Springhill Road	200
Wellington Court	<u>74</u>
Total -	2507

2507 metres = 2.507 km

Paved Streets Maintenance - 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 "D" (13 mm) asphalt concrete in 1985.

Location	Length (metres)
Golf Club Road - Golf Club to Woodstock Road (west)	1800
Greenwood Drive - Marysville By-Pass to City Limits	558
Lamson Court	206
Marshall Street - Bridge Street to Coronation Street	134
Queen - Carleton Intersection	20
Quinn Court	130
Rainsford Lane - Golf Club Road to T.C.H.	396
Ramey Street	129
Ross Terrace	732
Secretary Lane	110
St. Mary's Street - Union Street to Dedham Street	229
St. Mary's Street - Union Street to Bowlen Street	110
Sunset Drive - Wilkins Avenue to Currie Avenue	1051
Watson Drive	147
TOTAL	5752

5752 metres - 5.752 km

Sections of Brookside Drive, McLeod Hill Road, and Rainsford Lane (T.C.H. to Hanwell Road) were also paved with Type "D" asphalt in 1985.

Also under this item, the following streets were resurfaced with Type "E" (10 mm) asphalt concrete in 1985.

Location	Length (metres)
Campbell Street - behind Federal building	76
Clark Street - Union Street to MacLaren Avenue	442
Devon Avenue	335
George Street - Smythe Street to York Street	602
McEvoy Street	649
Regent Street - Queen Street to Brunswick Street	240
Saunders Street - Smythe Street to Northumberland Street	214
Smythe Street - Saunders Street to R. R. Tracks	320
St. John Street - Queen Street to King Street	114
Westmorland Street - King Street to Brunswick Street	116
TOTAL	3108

3108 metres = 3.108 km

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

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

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 \$ 57 085 for sidewalk repairs was made up as follows:

Personnel (labour, pensions, workmen's compensation)	\$ 27 297
Materials	21 759
General Services (trucking & equipment). <u>8 029</u>	\$ 57 085

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

The net expenditure of \$ 38 889 was made up as follows:

Personnel (labour, pensions, workmen's compensation)	\$ 22 339
Materials	4 893
General Services (trucking & equipment). <u>11 657</u>	\$ 38 889

(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 \$ 122 715 was made up as follows:

Personnel (labour, pensions, workmen's compensation)	\$ 71 979
Materials	20 632
General Services (trucking & equipment). <u>30 104</u>	\$ 122 715

(5) Street Cleaning and Flushing - The City of Fredericton used two sweepers #49 and #51 and Vac-all unit #54 for street cleaning purposes in 1985. These pieces of equipment worked a combined total of 1166.5 hours in this operation.

The net expenditure under this heading amounted to *\$ 312 602 and was made up as follows:

* Includes an amount of \$ 25 858 for Spring Cleanup.

Personnel (labour, pensions, workmen's compensation)	\$ 174 070
General Services (trucking & repairs & contract services)....	128 764
Gas, oil, grease	15
Brooms - main & gutter	3 815
Brooms - hand	-
Anti-litter cans	2 158
Dust Control	<u>3 780</u>
	\$ 312 602

(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)	\$ 74 960
General Services (vehicle repairs) ...	39 909
Materials (salt and sand)	126 806
Fixed Assets (new equipment)	<u>10 520</u>
	\$ 252 195

Sidewalks:

Personnel (labour, pensions, workmen's compensation)	\$ 14 992
General Services (vehicle repairs) ...	7 982
Materials (sand)	<u>4 745</u>
	\$ 27 719

(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 \$ 418 680 and was made up as follows:

Personnel (labour, pensions, workmen's compensation)	\$ 278 404
General Services (repairs & maintenance of vehicles, hired trucks & machinery)	133 140
Fixed Assets (new equipment)	<u>7 136</u>
	\$ 418 680

The City of Fredericton was responsible for plowing, sanding, and salting 307.416 km of roads and streets in 1985 (147.190 km on the north side and 160.226 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)	\$ 353 364
General Services (repairs & maintenance of vehicles, hired trucks & machinery)	173 049
Fixed Assets (new equipment)	17 656
Materials (salt & sand)	<u>126 806</u>
	\$ 670 875 (1)

Sidewalks:

146.936 km of sidewalk were plowed during the winter months of 1985. (49.331 km on the north side and 97.605 km on the south side)

The total net expenditure for plowing amounted to \$ 82 249 and was made up as follows:

Personnel (labour, pensions, workmen's compensation)	\$ 55 680
General Services (repairs & maintenance of vehicles)	<u>26 569</u>
	\$ 82 249

The overall net expenditure for plowing and sanding sidewalks was \$ 109 968 made up as follows:

Personnel (labour, pensions, workmen's compensation)	\$ 70 672
General Services (repairs & maintenance of vehicles)	34 551
Materials (sand)	<u>4 745</u>
	\$ 109 968 (2)

TOTAL NET COST OF SNOW CONTROL - ADD (1) & (2)

\$ 780 843

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

1981	Agriculture Canada Airport Weather Office	282.30 cm 249.10 cm
1982	Agriculture Canada Airport Weather Office	305.10 cm 297.20 cm
1983	Agriculture Canada Airport Weather Office	139.30 cm 179.20 cm
1984	Agriculture Canada Airport Weather Office	297.50 cm 332.90 cm
1985	Agriculture Canada Airport Weather Office	178.9 cm 198.2 cm

(c) Street Lighting

The multiple lighting system for the City of Fredericton as of 1985 12 31 consisted of:

4-100	Watt H.P. Wood	@ \$ 138.09	per light per year
1-150	Watt H.P. Wood	@ \$ 184.16	per light per year
64-100	Watt H.P. Sodium	@ \$ 107.38	per light per year
1-180	Watt L.P. Sodium	@ \$ 208.33	per light per year
36-400	Watt L.P. Sodium	@ \$ 245.97	per light per year
10-125	Watt M.V. Wood	@ \$ 115.05	per light per year
2-175	Watt M.V. Conc.	@ \$ 163.40	per light per year
201-175	Watt M.V. Wood	@ \$ 138.09	per light per year
350-175	Watt Ref. M.V.	@ \$ 107.38	per light per year
12-250	Watt M.V. Conc.	@ \$ 205.44	per light per year
4-250	Watt M.V. Wood	@ \$ 180.13	per light per year
1710-250	Watt M.V.	@ \$ 149.42	per light per year
573-400	Watt Ref. M.V.	@ \$ 209.21	per light per year
1-500	Watt Ref. M.V.	@ \$ 180.89	per light per year
2-400	Watt Flood Lights	@ \$ 0.67	per watt per year
1-150	Watt H.P. Sodium	@ \$ 153.45	per light per year

The total street lighting costs for 1985 were as follows:

Salaries	\$ 1 087
Multiple Lighting System Contract	453 975
Government Services (Other Power)	509
New Poles	<u>8 602</u> \$ 464 173

(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 \$ 23 229 made up as follows:

Personnel (labour, pensions, workmen's compensation)	\$ 3 578
General Services (repairs & maintenance)..	1 384
Goods (posts, street sign purchases, etc). <u>18 267</u>	\$ 23 229

(2) Paint Department

The net expenditure under this heading was \$ 96 218 made up as follows:

Personnel (labour, pensions, workmen's compensation)	\$52 546
General Services (equipment repairs, vehicle maintenance, rent, etc.)	9 512
Goods (paint, misc. supplies, signs)	<u>34 160</u> \$ 96 218

(3) Traffic Signals

The net expenditure under this heading was \$114 078 made up as follows:

Personnel (labour, pensions, workmen's compensation)	\$38 022
General Services (vehicle maintenance, etc.)	4 190
Government Services (electric power)	58 487
Goods (materials)	8 660
Fixed Assets (new equipment)	<u>4 719</u> \$ 114 078

(4) Railway Crossings

The net expenditure under this heading was \$23 003 for maintenance.

ENVIRONMENTAL HEALTH SERVICES

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 1985, the net amount paid for the garbage and waste collection operation was \$330 091 made up as follows:

General Services (Contract Services)	\$ 91
General Services (Advertising)	<u>330 000</u>
	\$ 330 091

(2) Garbage and Waste Disposal - Sanitary Landfill

The net expenditure under this section was \$ 410 001 made up as follows:

Personnel (labour, pensions, workmen's compensation)	\$ 13 959
General Services (equipment services, diversion fees and land rentals)	153 223
Government Services (taxes)	1 391
Goods (gravel and cover material)	<u>241 428</u>
	\$ 410 001

PUBLIC HEALTH SERVICES

The following items are included under the above heading:

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

(1) The Old Burial Ground

The net expenditure under this section was \$ 16 886 made up as follows:

Personnel (labour, pensions, workmen's compensation)	\$ 14 359
General Services (trucking & equipment). .	410
Government Services (lighting)	538
Goods (materials)	<u>1 579</u>
	\$ 16 886

(2) The Loyalist Burial Ground

The net expenditure under this section was \$ 284 made up as follows:

Personnel (labour, pensions, workmen's compensation)	\$ 274
General Services (trucking & equipment). .	<u>10</u>
	\$ 284

PARKS AND TREES SERVICES

The following items are included under the above heading:

- | | |
|-----------------------|-------------------------------|
| (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

The net expenditure for this item was \$ 35 045 made up as follows:

Personnel (labour, pensions, workmen's compensation)	\$ 24 656
General Services (machinery, equipment repairs)	5 377
Government Services (water & sewer rates, lights & power) ..	2 360
Goods (gas & oil, materials)	<u>2 652</u> \$ 35 045

(2) Odell Park

The net expenditure for this item was \$ 57 893 made up as follows:

Personnel (labour, pensions, workmen's compensation)	\$ 41 984
General Services (telephone, machinery, equipment repairs)....	9 801
Government Services (water & sewer rates, lights & power)....	667
Goods (fuels & lubricants, materials) ..	<u>5 441</u> \$ 57 893

(3) Carleton Park

The net expenditure for this item was \$ 11 303 made up as follows:

Personnel (labour, pensions, workmen's compensation)	\$ 6 440
General Services (trucking & equipment & land rental).....	3 780
Goods (materials)	<u>1 083</u> \$ 11 303

(4) Riverfront Greens

The net expenditure for this item was \$ 36 748 made up as follows:

Personnel (labour, pensions, workmen's compensation)	\$ 22 390
General Services (trucking & equipment)	4 923
Goods (materials, new trees)	<u>9 435</u>
	\$ 36 748

(5) Development of Park Areas

The net expenditure for this item was \$ 7 210 made up as follows:

Personnel (labour, pensions, workmen's compensation)	\$ 1 506
General Services (trucking & equipment)	606
Goods (materials)	<u>5 098</u>
	\$ 7 210

(6) Other Parks

The net expenditure for this item was \$ 17 900 made up as follows:

Personnel (labour, pensions, workmen's compensation)	\$ 10 318
General Services (trucking & equipment, repairs & maintenance)	3 779
Goods (materials)	<u>3 803</u>
	\$ 17 900

(7) Trees

The net expenditure for this item was \$272 748 made up as follows:

Personnel (labour, pensions, UIC, workmen's compensation).....	\$209 026
General Services (trucking & equipment maintenance, building rental).....	37 571
Goods (gas & oil, materials, new trees, small tools)	<u>26 151</u>
	\$ 272 748

In 1985, 150 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 1985:

<u>Species</u>	<u>Number Removed</u>
Spruce	3
Ash	2
Birch	1
Elm	96
Maple	19
Oak	5
Willow	2
Poplar	18
Hemlock	2
Basswood	1
Pine	1
TOTAL	150

In 1985, 77 trees were removed with Dutch Elm Disease in the City of Fredericton.

Following is a summary of Elm trees removed from 1964 to 1985:

<u>Year</u>	<u>No. Lost To Dutch Elm Disease</u>	<u>% Lost To Dutch Elm Disease</u>	<u>Other Causes</u>	<u>Total</u>
1964	14	29	34	48
1965	8	24	25	33
1966	12	21	44	56
1967	18	20	73	91
1968	33	16	174	207
1969	30	21	108	138
1970	49	39	78	127
1971	57	42	77	134
1972	61	42	84	145
1973	92	46	108	200
1974	132	33	266	398
1975	75	19.6	307	382
1976	118	28.2	300	418
1977	681	91.6	62	743
1978	680	92	56	736
1979	937	91.8	84	1021
1980	1146	95.7	51	1197
1981	500	59.7	327	827
1982	487	90.7	50	537
1983	133	36.5	231	364
1984	121	63.4	70	191
1985	77	80.2	19	96
TOTALS	5461	67.5	2628	8089

Trees were planted (first planting) at the following locations in 1985:

Location	Number of Trees
King St. - Westmorland St. to York St.	18
Hargrove Court	34
Birch Crescent	40
Church St. by Queen Square	14
Sewell Street	40
Foster Street	26
Tower Road	19
St. John Street	15
Garden Creek Lagoon	71
Emmerson Street	17
Blair Street	8
Ascot Drive	38
Ascot Court	15
Union Street	15
79 Kent Street	1
31 & 37 Mulberry Court	2
736 & 740 McLaren Avenue	2
189, 280, 305 & 313 Canada Street	7
Mitchell Street Extension	7
Riverfront (North)	43
Gregory Avenue	2
244 Argyle Street	1
425 Waterloo Row	1
Waterloo Row	2
329 Aberdeen Street	1
15 & 52 Eagle Court	2
11 Spruce Terrace	1
207 Longwood Drive	1
34 Mountain Drive	1
124 Mooers Drive	1
Riverfront (South)	47
Dundonald City Yard	8
Odell Park	18
Wilmot Park	13
Waterloo Row Ball Field	26
Marysville Cenotaph	10
McMinniman Court Sewer Lift	2
Brunswick Street	4
Nashwaaksis Junior High	10
Essex Street	5
336 Forbes Street	1
Hatheway Street	5
TOTAL	594

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

90 trees were planted on the Riverfront Drives. (Included in first planting)

A number of trees were also trimmed in 1985. The number and class of trees were made up as follows:

- (a) Trees above 14 m in height - approximately 300 mixed species.
- (b) Trees 6 m to 14 m in height - approximately 700 mixed species.
- (c) Trees under 6 m in height - approximately 3000 mixed species.

Stumps removed, topsoiled and seeded - 105

Shrubs planted on the Riverfront Drive - 74

Shrubs planted in other locations - 491

(8) Greens, Benches & Other

The net expenditure for this item was \$ 47 988 made up as follows:

Personnel (labour, pensions, workmen's compensation)..	\$ 22 041
General Services (communications, trucking & equipment, equipment maintenance)	8 662
Goods (gas & oil, materials, small tools)	10 905
Fixed Assets (new equipment)	<u>6 380</u> \$ 47 988

UTILITY FUND

The above item is made up of the following headings:

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

(1) COMMON SERVICES

The net expenditure for this item in 1985 was \$ 481 807. This expenditure was made up as follows:

General Equipment	\$ 213 760
Safety & Benefits	168 963
Administration	<u>99 084</u>
	\$ 481 807

(2) SANITARY SEWER

In 1985 the net expenditure for this item was \$1 741 400 made up as follows:

Operating: Lift Stations

Personnel (labour, pensions, workmen's compensation)	\$ 49 658
General Services (repairs & maintenance, trucking & machinery)	16 665
Government Services (light & power)	13 544
Goods (materials)	<u>6 304</u>
	86 171

Maintenance:

Personnel (labour, pensions, workmen's compensation)	\$ 206 289
General Services (truckng & machinery)	64 199
Government Services (telephone)	1 137
Goods (materials)	<u>49 179</u>
	320 804

Sewage Treatment & Disposal:

Personnel (labour, workmen's compensation) ..	\$ 3 741
General Services:(repairs & maintenance	12 839
Treatment (F.P.C.C.)	877 231
Government Services: Water & Sewer Rates ...	2 850
Lights & Power	<u>33 403</u>
	930 064

Debt Charges:

Principal	\$ 222 253	
Interest	<u>181 858</u>	404 111

Other:

General Services (Insurance)	<u>250</u>
TOTAL	\$ 1 741 400

New customers connected to the City sewer system in 1985 200

The Fredericton sanitary sewer system consists of approximately 244 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	9.747	32.586	17.027	7.559	109.336	176.255
200 mm F.M.	0.254	-	0.314	-	0.064	0.632
250 mm	1.959	3.158	0.851	0.298	8.478	14.744
250 mm F.M.	1.178	-	-	-	-	1.178
300 mm	1.267	3.200	1.006	1.868	14.484	21.825
300 mm F.M.	0.420	-	-	-	0.739	1.159
350 mm	0.287	0.686	-	-	0.713	1.686
350 mm F.M.	-	-	0.528	-	0.254	0.782
375 mm	0.874	2.163	0.500	0.174	2.449	6.160
400 mm	0.018	0.076	-	-	0.193	0.287
450 mm	1.039	0.031	1.350	-	3.463	5.883
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
TOTALS	20.222	43.908	22.429	9.967	147.656	244.182

NOTE: Fredericton includes the Lincoln area.

The above kilometragess 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 sewer system which has approximately 11.4 kilometres of main.

(3) WATER

There are at present 23 active wells, 16 reservoirs, and 5 booster stations in the City of Fredericton water supply system as noted below.

Location	Wells	Reservoirs	Booster Stations
South Fredericton System	6	8	5
Hanwell System	1	1	0
Rainsford Park Area	1	0	0
Silverwood System	2	1	0
North Fredericton Low Level System	8	4	0
Killarney System	2	1	0
Marysville System	3	1	0
TOTALS	23	16	5

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 (Billing & Collection)	\$ 162 909
(2)	Water Ordinary (including meters)	952 153
(3)	Water Treatment Facility & Well Production Costs.	646 991
(4)	Debt Charges - Principal	408 206
(5)	Debt Charges - Interest	<u>334 134</u> \$ 2 504 393

(1) WATER ADMINISTRATION (BILLING & COLLECTION)

The net expenditure of \$ 162 909 was made up as follows:

Office salaries & benefits	\$ 79 539
Postage	24 840
Machinery Rental	3 216
Professional Services	15 189
Materials	10 497
New Equipment	<u>29 628</u> \$ 162 909

(2) WATER ORDINARY (INCLUDING METERS)

The net expenditure of \$ 952 153 was made up as follows:

Transmission & Distribution (Operation)

Labour - Boosters	\$ 70 029
Trucking and Machinery	10 668
Equipment Maintenance - Boosters	6 153
Power - Boosters	53 448
Taxes - Boosters	10 218
Materials - Boosters	<u>33 831</u> 184 347

Transmission & Distribution (Maintenance)

Personnel (labour, pensions, etc.)	285 790
Workmen's Compensation	9 137
Distribution Repair Parts	50 341
Trucking & Machinery	109 571
Materials & Tools	122 306
Hydrant Parts	16 820
Fixed Assets (new equipment)	<u>63</u> 594 028

Meters

Personnel (labour, pensions, etc.)	\$ 83 515
Meter Parts	9 822
Miscellaneous Parts & Tools	4 591
Trucking	15 966
Fixed Assets (new meters)	<u>59 884</u>
	173 778
TOTAL	\$ 952 153

On 1985 12 31 there were 11127 water services on meter and 315 on flat rate, making a total of 11442.

210 new meters were installed in 1985, 232 regular meters changed to TRT or RRT, and 132 ARB meters changed to TRT or RRT. 10 flat rate services were metered.

In 1985, 17 discontinued services were excavated and shut off at the main, 158 stopped meters replaced and 31 frozen meters replaced.

The following sprinklers were installed in 1985:

Maritime Forestry Complex - Regent Street

There are in the City as of 1985 12 13, 1373 hydrants situated in the following areas:

Fredericton South	643
Fredericton North	143
Nashwaaksis	251
Marysville	136
Barker's Point	66
Silverwood	<u>22</u>
Sub Total ..	1261
Located on private property ..	<u>112</u>
TOTAL ..	1373

Hydrants were installed or added to City totals at the following locations in 1985:

LOCATION	NUMBER
Aberdeen Street	1
Broad Street	1
Centennial Court	1
Crocket Street	2
Derby Court	1
London Court	3

LOCATION	NUMBER
Marlborough Drive	3
Pederson Crescent	1
Pettigrove Crescent	2
Regent Street	1
Regent Street Depot	1
Ridgewell Place	1
U.N.B. Woodlot	1
TOTAL	19

Distribution System

New Services installed in 1985	201
Old Services relayed in 1985	21
Frozen Services that had to be thawed	37

The Fredericton Distribution System consists of approximately 259 kilometres of water main, made up as follows:

Size	Marysville	Nashwaaksis	Barker's Point	Silverwood Garden Creek	Fredericton	Total
32 mm	-	0.153	-	-	-	0.153
38 mm	-	0.072	-	-	-	0.072
50 mm	-	-	-	0.154	-	0.154
75 mm	-	-	-	-	0.435	0.435
100 mm	0.753	2.232	-	2.508	10.401	15.894
150 mm	12.208	20.721	3.915	4.072	56.754	97.670
200 mm	5.849	18.236	0.954	2.791	38.783	66.613
250 mm	2.951	6.546	5.163	0.964	19.628	35.252
300 mm	0.616	2.074	0.031	4.558	25.325	32.604
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	0.146	-	-	-	-	0.146
TOTAL	22.523	50.241	10.063	15.047	161.266	259.140

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 TREATMENT FACILITY & WELL PRODUCTION COSTS

The net expenditure of \$ 646 991 was made up as follows:

Source of Supply

Labour - Wells	\$ 57 506
Trucking & Machinery	8 645
Maintenance - Wells	29 321
Telephone Co. Services	9 758
Power - Wells	219 348
Materials - Wells	<u>16 414</u>
	\$ 340 992

Power & Pumping (Plant)

Labour	\$ 21 370
Workmen's Compensation	1 015
Telephone Co. Services	981
Light & Power	2 500
Diesel Fuel & Lubricants	838
Supplies	3 518
Miscellaneous	<u>2 873</u>
	33 095

Maintenance of Equipment (Plant)

Labour	\$ 2 502
Insurance (Plant)	10 442
Maintenance (Equipment)	9 278
Taxes (Plant)	2 777
Materials	<u>4 883</u>
	29 882

Purification & Treatment

Labour	\$ 125 205
Maintenance of Equipment	6 327
Power	21 328
Provincial Taxes	21 606
Goods (Chlorine, Soda Ash, Lime, etc.)	<u>68 556</u>
	243 022

TOTAL

\$ 646 991

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

Year	Cubic Metres Produced	Production Expenditure	Production Cost per cubic metre (kL)
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
1984	7 368 351	523 393.00	7.10 cents
1985	7 880 000	646 991.00	8.21 cents

The total amount of water pumped from 1985 01 01 to 1985 12 31 for the entire City was 7 880 000 cubic metres divided as follows:

Fredericton South (Wilmot Park)	5 303 000
Hanwell	37 000
Fredericton North	511 000
Nashwaaksis	801 000
Marysville	396 000
Barker's Point	26 000
Duval	377 000
Silverwood	60 000
Rainsford Lane Park	15 000
Killarney	354 000
TOTAL	7 880 000

The total net water expenditure (operating) for the City from 1985 01 01 to 1985 12 31 was determined from the following:

Source of Supply	\$ 340 992
Power & Pumping	33 095
Maintenance of Equipment	29 882
Purification & Treatment	243 022
Transmission & Distribution (operation)	184 347
Transmission & Distribution (maintenance) ...	<u>594 028</u>
	\$ 1 425 366

Therefore, the net operating cost to pump and deliver to the customer one cubic metre of water from 1985 01 01 to 1985 12 31 was:

$$\frac{\$ 1 425 366}{7 880 000} = 0.181$$

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

Total Net Administration, Production & Operating Costs...	\$ 1 762 053
Principal and Interest	<u>742 340</u>
TOTAL	\$ 2 504 393

Principal and interest costs per cubic metre (kL):

$$\$ \frac{742\ 340}{7\ 880\ 000} = 0.094$$

Administration, production and operating costs per cubic metre(kL):

$$\$ \frac{1\ 762\ 053}{7\ 880\ 000} = 0.224$$

The total cost of water per cubic metre (kL) which includes administration, operating, production and debt servicing costs:

$$\$ \frac{2\ 504\ 393}{7\ 880\ 000} = 0.318$$

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 1985:

COSTS PER CUBIC METRE (kL)

Year	Net Operating	Administration, Production & 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
** 1984	0.162	0.205	0.097	0.302
** 1985	0.181	0.224	0.094	0.318

* Total Cost = Administration, Production & Operating + Principal & Interest

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

S U M M A R Y

WATER AND SEWER REVENUE & EXPENDITURES

1985

Item	Net Expenditure	Revenue
<u>COMMON SERVICES (WATER & SEWER)</u>		
General Equipment	\$ 213 760	\$ 236 376
Safety & Benefits	168 963	
Administration	99 084	
<u>WATER</u>		
Water Administration (Billing & Collection)	162 909	
Water Ordinary (Including Meters)	952 153	3 177 279
Water Treatment Facility & Well Production Costs	646 991	
Debt Charges - Principal & Interest	742 340	
<u>SANITARY SEWER</u>		
Operating & Maintenance	406 975	
Sewage Treatment & Disposal	930 314	2 416 526
Debt Charges	404 111	
TOTALS	\$ 4 727 600	\$ 5 830 181

SURPLUS: \$ 1 102 581

NOTE: \$ 309 259 of the above noted surplus was appropriated for Utility Capital Expenditures.

CAPITAL PROGRAMS

The following gives brief descriptions of capital projects begun or completed in 1985. Some of these projects were begun in 1984 and finalized in 1985 while others will be finalized in 1986.

WATER:

In 1985, in conjunction with the Main Street Revitalization Program, the water main on King Street between York Street and Westmorland Street was upgraded. Upgrading of the water main on River Street from Allen Street to Civic #86 was also done.

New mains were installed on Regent Street and the UNB Woodlot, Pine Acres Phase II Subdivision (London Court, Derby Court, Nottingham Street), Pederson Crescent Subdivision, Gardiner Realty Subdivision (Marlborough Drive and Ridgewell Place), Neill Subdivision (Crocket Street and Pettigrove Crescent) and Chippin Subdivision (Broad Street, Wiggins Drive, Evans Street, Estey Lane, and Staples Court).

Following are lengths and sizes of mains installed in 1985:

Location	LENGTH OF MAINS - metres				
	100 mm D.I.	150 mm D.I.	200 mm D.I.	250 mm D.I.	300 mm D.I.
* Regent St.-U.N.B. Woodlot			7	17	1940
** Pine Acres Subdivision-Phase II		234	416		
** Pederson Crescent		4	179		
** Gardiner Realty Subdivision		35	523		
** Neill Subdivision		26	476		
** Chippin Subdivision (Broad, Wiggins, etc.)- incomplete		26	861		
✓**** River Street		25		486	
✓*** King St.-York St. to Westmorland	55				
***** Fairlawn Ct.	55				
***** Woodbine Ct.					
***** Centennial Ct.		103			
TOTALS	110	453	2462	503	1940

OVERALL TOTAL = 5468 metres or 5.468 kilometres

- * Project cost shared with Federal and Provincial agencies.
- ** Entire cost paid by developers through Local Improvement Agreements.
- *** Upgrading in conjunction with the Main Street Revitalization Program. (Approximately 184 m of old 150 mm main was removed from service)
- **** Upgrading of mains.
- ***** Done under Utility Fund O & M Budget.

SANITARY SEWER:

In 1985, the sanitary sewer main on River Street from Allen Street to Civic #86 was upgraded. A portion of Hemlock Avenue was also upgraded in conjunction with storm sewer construction.

New mains were installed on Regent Street and the U.N.B. Woodlot, Garden Creek-T.C.H. Trunk, Pine Acres Phase II Subdivision (London Court, Derby Court, Nottingham Street), Pederson Crescent Subdivision, Gardiner Realty Subdivision (Marlborough Drive and Ridgewell Place), Neill Subdivision (Crocket Street and Pettigrove Crescent) and Chippin Subdivision (Broad Street, Wiggins Drive, Evans Street, Estey Lane and Staples Court).

The remaining work associated with the Garden Creek Sewage Treatment facility was also finalized in 1985.

Following are lengths and sizes of mains installed in 1985:

Location	LENGTH OF MAINS - metres				
	200 mm PVC	250 mm PVC	300 mm PVC	375 mm PVC	450 mm PVC
* Regent St.-U.N.B. Woodlot	166	24	1815		
**** Garden Creek -TCH Trunk	7			874	239
** Pine Acres Subdivision - Phase II	518				
** Pederson Crescent	157				
** Gardiner Realty Subdivision	356	129			
** Neill Subdivision	202	244			
** Chippin Subdivision (Broad, Wiggins, etc.)- incomplete	783				
*** Hemlock Avenue	215				
**** River Street	486				
***** Centennial Ct.	103				
TOTALS	2993	397	1815	874	239

OVERALL TOTAL = 6318 metres or 6.318 kilometres

- * Project cost shared with Federal and Provincial agencies.
- ** Entire cost paid by developers through Local Improvement Agreements
- *** In conjunction with storm sewer construction. Portions of existing sanitary mains had to be upgraded.
- **** Cost shared through agreement with Environment New Brunswick.
- ***** Upgrading of mains.
- ***** Done under Utility Fund O & M Budget.

STORM SEWER:

1985 saw the installation of new storm sewer mains in the Hemlock Avenue - Willis Street - Forestview Court area, the Back Drain near York Street, Pine Acres Phase II Subdivision (London Court, Derby Court, Nottingham Street), Pederson Crescent Subdivision, Gardiner Realty Subdivision (Marlborough Drive and Ridgewell Place), Neill Subdivision (Crocket Street and Pettigrove Crescent) and Chippin Subdivision (Broad Street, Wiggins Drive, Evans Street, Estey Lane, and Staples Court).

Following are lengths and sizes of mains installed in 1985:

LOCATION	LENGTH OF MAINS - metres									
	250 mm CONC. PVC	300 mm CONC. PVC	375 mm PVC	450 mm PVC	600 mm CONC. PVC	750 mm CONC.	900 mm CONC.	1050 mm CONC.	1500 mm CONC.	
Hemlock Avenue										
Willis St. - Forestview Ct.		45 21	144 160	53 62	81	164				
Back Drain										
* Pine Acres Subdivision-Phase II		76 19	341 163				94		65 247	
* Pederson Crescent	107	20			416 230 377				49	
* Gardiner Realty Subdivision			202							
* Neill Subdivision		100 20	109	102			244	73		
* Chippin Subdivision (Broad, Wiggins, etc.) incomplete			156							
** Dundonald St.										74
TOTALS	107	281	20	1275	217	1104	164	338	73	312
										49
										74

Overall Totals = 4014 metres or 4.014 kilometres

* Entire cost paid by developers through Local Improvement Agreements.

** Installed under General Fund Storm Sewer O & M Budget.

CURB AND GUTTER:

Concrete curb and gutter was constructed at the following locations in 1985:

LOCATION	LENGTH (metres)
Bailey Avenue	553
Clanfield Street	578
Dundonald Street - Northumberland St. to Smythe St.	322
* Gibson Street - Ashfield St. to Murray Ave.	995
* Greenwood Drive - Carman Ave. to Victory Ave.	971
** King Street - York St. to Westmorland St.	419
MacPherson Street - Grant St. to Stafford Dr.	486
McGrand Court	255
Regent St. - Priestman St. Intersection (south east corner)	119
*** Regent St. - Montgomery St. Intersection (south east corner)	113
Rosewood Drive	269
Stafford Drive	526
Talisman Crescent - Rosewood Dr. to Booster Station	654
Terra Nova Court	260
Willis Street - Bailey Ave. to McGrand Court	150
TOTAL	6670

6670 metres = 6.670 kilometres

* Designated Route Program

** Done in conjunction with the Main Street Program

*** Done under Traffic Management (Intersection Improvements)

PAVING:

In 1985, Gorman Construction Limited was awarded a contract to supply and place asphalt concrete 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 concrete:

- 1) Binder Course (20 mm) - Type "B" @ \$39 and \$40.50 per tonne in place
- 2) Surface Course (13 mm) - Type "D" @ \$41 and \$42.67 per tonne in place

(1) BINDER COURSE - TYPE "B"

The following streets were paved with Type "B" asphalt concrete in 1985:

LOCATION	LENGTH (metres)
Bailey Avenue	285
Clanfield Street	300
MacPherson Street - Grant St. to Stafford Dr.	233
McGrand Court	120
Rosewood Drive	154
Stafford Drive	263
Talisman Crescent - Rosewood Dr. to Booster Station	335
Terra Nova Court	115
Willis Street - Bailey Ave. to McGrand Ct.	90
<hr/>	
TOTAL	1895

1895 metres = 1.895 kilometres

(2) SURFACE COURSE - TYPE "D"

The following streets were paved with Type "D" asphalt concrete in 1985:

LOCATION	LENGTH (metres)
Dundonald Street-Northumberland St. to Smythe St.	213
** Gibson Street - Ashfield St. to Murray Ave.	495
** Greenwood Drive - Carman Ave. to Victory Ave.	543
* King Street - York St. to Westmorland St.	183
** Lincoln Road - P.M. Bridge to R.R. Tracks near Research Station	2179
** Regent Street - Albert St. to Montgomery St.	973
** Waterloo Row - Elmcroft Place to P.M. Bridge	793
TOTAL	5379

5379 metres = 5.379 kilometres

- * Done in conjunction with the Main Street Program
- ** Designated Route Program

CONCRETE SIDEWALKS:

Sidewalks were constructed at the following locations in 1985:

LOCATION	LENGTH (metres)
Bailey Avenue	277
* Canada Street - Ramsay St. to Murray Ave.	701
* Gibson Street - Ashfield St. to Murray Ave.	463
Gloucester Crescent	309
* Greenwood Drive - Carman Ave. to Victory Ave.	493
** King Street - York St. to Westmorland St.	367
MacPherson Street - Grant St. to Stafford Drive	253
Murray Ave. (Completion of 1984 construction)	15
Prospect Street - Canadian Tire to Wandlyn Motel	297
Reading Street	168
Rosewood Drive	140
Stafford Drive	249
Talisman Crescent - Rosewood Dr. to Booster Station	317
Willis Street - Bailey Ave. to McGrand Ct.	67
TOTAL	4116

4116 metres = 4.116 kilometres

- * Reconstruction of existing (2.024 km including King Street)
- ** Reconstruction of existing in conjunction with the Main Street Program

WORKS FACILITIES:

In 1985 a new salt storage shed was constructed at the St. Marys Street depot. The granular base pad for this facility was placed in 1984.

TRAFFIC MANAGEMENT (SIGNALS):

In 1985, work was finalized for the upgrading of traffic light installations which were begun in 1984. These intersections included Brunswick Street - Westmorland Street, Brunswick Street - Regent Street and Regent Street - George Street. A new installation at St. Marys Street - Union Street intersection begun in 1984 was also finalized.

In 1985 upgrading was also done at the intersections of Brunswick Street - St. John Street, Brunswick Street - Carleton Street, Brunswick Street - Northumberland Street, and Regent Street - Montgomery Street.

A complete new installation was made at the intersection of Riverside Drive and Watters Drive.

TRAFFIC MANAGEMENT (INTERSECTION IMPROVEMENTS)

In 1985, a slip-off lane was constructed at the southeast corner of the Regent Street - Montgomery Street intersection.

MAIN STREET PROGRAM

1985 saw the continuation of upgrading streets in the downtown area of the City through the Main Street Program. This upgrading included new concrete curb and gutter, asphalt resurfacing, concrete and brick sidewalks, the planting of trees and the installation of new traffic lights and street lights on the block of King Street between York Street and Westmorland Street including the placement of concrete and brick in the York Street - King Street intersection.

Work also commenced on the Phoenix Square component of the project. This work will continue in 1986.

NEW STREET CONSTRUCTION:

The following new streets were constructed in 1985:

LOCATION	LENGTH (metres)
Broad Street	165
Crockett Street	242
Derby Court	171
London Court	319
Marlborough Drive	405
Mitchell Street	118
Nottingham Street	110
Pederson Crescent	167
Pettigrove Crescent	188
Ridgewell Place	106
TOTAL	1990

1990 metres = 1.990 kilometres

Construction also began on Wiggins Drive, Evans Street, Estey Lane and Staples Court in the Chippin Subdivision. This construction will be finalized in 1986.

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

DESIGNATED ROUTES

The City of Fredericton has a total of 57.250 km of provincial designated highways within its boundaries. In 1985, the Provincial Government paid \$290.62 and \$73.33 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, the Provincial Government may assist the City in paying for the construction should finances be available.

The following authorized projects were undertaken in 1985:

1)	Resurfacing - Route 102 - Lincoln Road from Forest Hill Road to CNR Tracks	\$ 166 203.40
2)	Installation of Curb & Gutter & Resurfacing - Route 8 - Gibson St. - Canada St. from Ashfield St. to Murray Avenue	125 763.76
3)	Resurfacing - Route 101 - Regent Street from Albert Street to Montgomery St.	49 852.89
4)	Installation of Curb & Gutter & Resurfacing - Route 10 - Greenwood Drive - Carman Ave. to Victory Ave.	109 880.40
5)	Resurfacing - Route 10 - Greenwood Dr. from the Marysville By-Pass to the City Line	16 482.99
6)	Resurfacing - Route 105 - St. Mary's Street from Union St. to Dedham St.	7 272.25
7)	Resurfacing - Westmorland Street from King St. to Brunswick St.	<u>3 088.34</u>
	TOTAL	\$ 478 544.03

CAPITAL PROGRAMS

SUMMARY OF EXPENDITURES

Item	Budget	Expenditure	Remarks
<u>UTILITY</u>			
Garden Creek Sewage Treatment	700 000	\$ 1 613 056	Budget reflects 50% of cost continued from 1984
Engineering for Lamson Court Services	20 000	-	Continued from 1984
Cleaning and replacement of old mains (water)	100 000	79 157	Continued from 1984
South Regent St. & U.N.B. Woodlot (Water & Sanitary)	800 000	705 584	
River Street (Water & Sanitary)	70 000	71 812	
Lincoln Booster Station (Water)	150 000	44 022	
King St.-York to Westmorland (Water)	120 000	61 065	
Land for reservoir (Smythe-TCH)	40 000	39 400	
Garden Creek-TCH Trunk (Sanitary)	400 000	220 629	Some cleanup work to be finalized in 1986
<u>GENERAL FUND</u>			
Willis St.-Forestview Ct. (Storm Sewer)	70 000	39 554	
Hemlock Avenue (Storm Sewer)	140 000	112 641	
Terra Nova Ct.(Curb & Gutter & Paving)	26 000	26 545	
York St.-Queen St. to Campbell St.-eastside Curb & Gutter & Paving & Sidewalk	30 000	-	Will be done in future in conjunction with Main Street Program
Dundonald St. - Northumberland St. to Smythe St.- Curb & Gutter & Paving	50 000	39 338	

Capital Programs
Summary of Expenditures (continued)

Item	Budget	Expenditure	Remarks
<u>GENERAL FUND (continued)</u>			
Bailey Ave.-Willis St.-McGrand Ct. Curb & Gutter & Paving & Sidewalk	120 000	100 903	
Clanfield St.- Curb & Gutter & Paving	60 000	44 575	
MacPherson St.- Curb & Gutter & Paving & Sidewalk	55 000	43 277	
Stafford Dr.- Curb & Gutter & Paving & Sidewalk	65 000	53 126	
Rosewood Dr.- Curb & Gutter & Paving & Sidewalk	40 000	32 789	
Talisman Cres. - Curb & Gutter & Paving & Sidewalk	80 000	66 827	
Canada St. - Gilbert to Murray Ave. (sidewalk)	30 000	38 157	
McGloin St. (sidewalk)	20 000	-	Work will be done in conjunction with work proposed by Dept. of Transportation
Gibson St.- Ashfield St. to Murray Ave. (sidewalk)	60 000	20 558	
Prospect St.- F'ton. Mall to Wandlyn - sidewalk	20 000	21 401	
Gloucester Crescent - Sidewalk	15 000	14 458	
Reading Street - Sidewalk	15 000	9 299	Component by City park land not installed
Works Facilities - Salt Storage Shed (St. Marys Depot)	120 000	89 062	Includes granular base component from 1984
Brunswick St. & St. John St.- Traffic Signals	30 000	23 234	

Capital Programs
Summary of Expenditures (continued)

Item	Budget	Expenditure	Remarks
<u>GENERAL FUND (continued)</u>			
Brunswick St. & Carleton St. - Traffic Signals	30 000	20 302	
Brunswick St. & Northumberland St. Traffic Signals	30 000	25 393	
Riverside Dr. & Watters Dr.- Traffic Signals	30 000	21 305	
Intersection Improvements - Hanwell Rd. & Woodstock Rd.	60 000	-	Requires land acquisition
Intersection Improvements - Regent St. & Priestman St. (S.W. corner)	60 000	-	Requires land acquisition
Intersection Improvements - Regent St. & Montgomery St. (S.E. corner)	40 000	18 647	
Canada St.-Civic #129 to Gilbert St. - Sidewalk	20 000	15 465	Continued from 1984
Back Drain Phase III - Storm Sewer	100 000	66 224	Continued from 1984
Regent-Priestman Intersection- Curb & Gutter & Paving	40 000	22 323	Continued from 1984
Murray Ave.-Canada St. to Grant St.- Sidewalk	40 000	29 274	Continued from 1984
Brunswick St. & Westmorland St. Traffic Signals	30 000	30 452	Continued from 1984
Brunswick St. & Regent St. - Traffic Signals	30 000	29 987	Continued from 1984
Regent St. & George St. - Traffic Lights	30 000	28 392	Continued from 1984
St. Marys St. & Union St.- Traffic Lights	30 000	27 492	Continued from 1984
Preliminary Engineering	30 000	8 191	Continued from 1984
Regent St. & Montgomery St. - Traffic Signals	30 000	24 225	

CAPITAL PROGRAMS
SUMMARY OF EXPENDITURES

Item	Budget	Expenditure	Remarks
<u>MAIN STREET PROGRAM</u>			
King St.-York St. to Westmorland St. and Phoenix Square	200 000	287 230	Shared funding through Federal & Provincial Agreements
<u>DESIGNATED ROUTES</u>			
Rte. 102-Waterloo Row-Lincoln Rd. (Forest Hill Rd. to R.R. Tracks near Research Station)-Resurface	160 000	166 203	
Rte. 8- Gibson St.- Ashfield St. to Murray Ave.- Curb & Gutter & Paving	100 000	125 764	
Rte. 101 - Regent St.-Albert St. to Montgomery St. - Resurface	60 000	49 853	
Rte. 10- Greenwood Dr.-Carman Ave. to Victory Ave. - Curb & Gutter, Paving & Sidewalk	130 000	125 367	

WATER QUALITY - 1985

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 are 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. All samples were tested for total coliform by the membrane filtration technique.

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

Date	Location	No. Coliform
85 03 04	McGloin St. Well	2
	Silverwood #2 Well	1
85 04 01	Silverwood Reservoir	1
85 06 10	Highland Well	2
	MacLaren Fire Hall	1
	Silverwood #2 Well	1
85 07 06	Silverwood #2 Well	1
85 09 30	Highland Well	5
	Greenwood #2 Well	1
	Silverwood #2 Well	3
85 11 12	Highland Well	2
	MacLaren Fire Hall	3
	Silverwood #2 Well	4
	Silverwood #3 Well	4
85 11 14	Highland Well	2
	MacLaren Fire Hall	3
85 11 18	Cameron Court Well	2
	Silverwood #2 Well	10
	Highland Well	5

WATER QUALITY - 1985

In most cases, positive tests were followed by negative tests for each location, and those locations which had consecutive positive tests have since produced negative results.

The increase in positive tests from the previous year may be due to the following factors:

- a) Poor sampling conditions
- b) Less care in sampling
- c) New staff
- d) Increased involvement of operators in laboratory

These factors will be closely monitored and other possible reasons for positive tests at the above locations will be investigated during 1986.

WATER TREATMENT PLANT

Fredericton's new water treatment plant was put on line in July of 1984 and is now treating 92% of the water produced on the south of Fredericton and 67% of the City's potable water. The plant removes iron and manganese and raises the pH of approximately 8 pH units, thus decreasing corrosion rates. The chlorine content of the effluent is 0.80 mg/L measured as free chlorine. This water is odourless, colourless, and has an agreeable taste when it leaves the plant.

Impurities which may coat the inside of pipelines can combine with this water to form trichloramines, which may have a metallic or chemical taste, and an odour similar to that given off by bleaching agents. This effect seems to be occurring in Fredericton and is expected to decline over a two year period. We expect to be left with a free chlorine residual throughout our system, without objectionable tastes.

CHEMICAL ANALYSIS

Samples for chemical analysis were taken from all wells in July 1985 and analysed by Environment New Brunswick's laboratory. Results are displayed on the following page.

Two columns concerning the 1985 pumpages are added for quick reference. The first column gives the actual pumpages, while the second proportions each output to the total 1985 City supply. These are not intended to be indications of the maximum possible output of each well.

