

**ANNUAL REPORT  
OF THE  
CITY ENGINEER  
1990**

**CITY OF FREDERICTON**

**PUBLIC WORKS DEPARTMENT**

## INDEX

|   | <u>PAGE</u> |
|---|-------------|
| Letter of Transmittal .....                 | 1           |
| Capital Programs .....                      | 35          |
| Common Services General Fund .....          | 7           |
| Environmental Health Services .....         | 16          |
| Parks and Trees Services .....              | 18          |
| Public Health Services .....                | 17          |
| Road Transport Services .....               | 7           |
| Utility Fund (Sanitary Sewer & Water) ..... | 23          |
| Water Quality - 1990 .....                  | 52          |

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

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

This report covers the period from 1990 01 01 to 1990 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 .....                 | 12.895 km |
| Sidewalk .....                                 | 7.457 km  |
| New Street Construction .....                  | 3.419 km  |
| New Pavement - Type "B" Asphalt Concrete ..... | 6.207 km  |
| Resurface - Type "D" Asphalt Concrete .....    | 0.848 km  |
| Resurface - Type "E" Asphalt Concrete .....    | 5.000 km  |
| Gravity Sanitary Sewer Mains .....             | 4.699 km  |
| Storm Sewer Mains .....                        | 4.010 km  |
| Water Mains .....                              | 6.980 km  |
| Double Chip Sealed Streets .....               | 4.840 km  |

ALSO

- 208 Water services were installed
- 208 Sanitary sewer services were installed
- 4 Sprinkler lines were installed
- 9 Water services were renewed
- 232 New water meters were installed
- 5 Existing water service installations were extended
- 5 Existing sanitary sewer service installations were extended
- 6 Frozen services were thawed
- 178 Storm sewer services were installed

Contractors under contract with the Engineering Department of the City of Fredericton in 1990 supplied materials, completed construction or began construction, as follows:

|                                      |  |
|--------------------------------------|--|
| GALLANTS CONTRACTING (1990) LTD.     | - installation of water main, sanitary sewer, and roadway - Hodgson Road Extension                     |
| WARREN H. DUNN                       | - installation of water and sewer services - Douglas area  |
| WENDELL THOMAS & SONS LTD.           | - supply and delivery of bedding sand  |
| NORTHSIDE READY MIX                  | - supply and delivery of winter sand   |
| CHARMAC CONSTRUCTION COMPANY Limited | - supply and delivery of topsoil   |
| GORMAN PAVING INC.                   | - supply and delivery of concrete  |
| PROSPECT CONTRACTORS LTD.            | - installation of water mains- Prospect Street from Smythe Street to Greenfields Drive                 |
| AKZO SALT LTD.                       | - supply and placement of asphalt concrete   |
| LAURENTIDE CHEMICALS                 | - construction of Wilmot Park Well No. 6 well house  |
| TRIUS TAXI LTD.                      | - supply and delivery of highway salt  |
| ATLANTIC COLAS LIMITED               | - supply of traffic lane striping paint  |
| BEMROSE & KILBURN LTD.               | - garbage collection services  |
| R.C. BIRD CONSTRUCTION LTD.          | - Brunswick Street trunk sewer and water main upgrading  |
| GORMAN PAVING INC.                   | - installation of sanitary and storm sewer - Regent Street from Montgomery Street to Priestman Street. |
|                                      | - installation of water mains- Regent Reservoir South and T.C.H. - Smythe Street to Regent Street.     |
|                                      | - installation of curb and gutter and sidewalk   |

- JOHN MACBEAN - supply and delivery of granular material
- KWI - construction of Regent Tower Reservoir
- WILSON BUILDERS (1978) LTD. - upgrading of Regent Street between Montgomery Street and Priestman Street
- J. G. HARTLING LIMITED - Montgomery East Reservoir - interior coating and repairs

General Fund expenditures for the period 1990 01 01 to 1990 12 31 were as follows:

| Item                                  | Budget             | Net Expenditure    | Over             | Under            |
|---------------------------------------|--------------------|--------------------|------------------|------------------|
| <b>COMMON SERVICES (Public Works)</b> | <b>\$3 500 170</b> | <b>\$3 481 747</b> | <b>\$ -</b>      | <b>\$ 18 423</b> |
| <b>ROAD TRANSPORT SERVICES</b>        |                    |                    |                  |                  |
| Administration                        | 280 100            | 270 879            | -                | 9 221            |
| Roadway Surfaces                      | 1 082 100          | 1 115 150          | 33 050           | -                |
| Sidewalk Maintenance                  | 450 000            | 471 227            | 21 227           | -                |
| Culverts, Ditching                    | 39 600             | 46 571             | 6 971            | -                |
| Storm Sewer Maintenance               | 152 100            | 178 761            | 26 661           | -                |
| Street Cleaning                       | 416 500            | 406 072            | -                | 10 428           |
| Spring Cleanup                        | 42 000             | 31 536             | -                | 10 464           |
| Sanding & Salting & Snow Control      | 1 206 200          | 1 306 445          | 100 245          | -                |
| Street Lights                         | 528 540            | 530 890            | 2 350            | -                |
| Traffic Services                      | 438 315            | 382 491            | -                | 55 824           |
| <b>ENVIRONMENTAL HEALTH SERVICES</b>  |                    |                    |                  |                  |
| Garbage & Waste Disposal              | 266 800            | 244 543            | -                | 22 257           |
| Garbage & Waste Collection            | 462 000            | 496 271            | 34 271           | -                |
| <b>PUBLIC HEALTH SERVICES</b>         |                    |                    |                  |                  |
| Old Burial Ground                     | 14 780             | 14 980             | 200              | -                |
| Loyalist Burial Ground                | 356                | 306                | -                | 50               |
| <b>PARKS &amp; TREES SERVICES</b>     |                    |                    |                  |                  |
| Wilmet Park                           | 34 800             | 32 544             | -                | 2 256            |
| Odell Park                            | 84 800             | 101 087            | 16 287           | -                |
| Carleton Park                         | 11 900             | 14 316             | 2 416            | -                |
| Trees                                 | 350 975            | 341 911            | -                | 9 064            |
| Greens, Benches,<br>other parks, etc. | 154 600            | 180 045            | 25 445           | -                |
| <b>TOTALS</b>                         | <b>\$9 516 636</b> | <b>\$9 647 772</b> | <b>\$269 123</b> | <b>\$137 987</b> |

OVER: \$ 131 136

Utility Fund expenditures for the period 1990 01 01 to  
1990 12 31 were as follows:

| Item                                   | Budget             | Net Expenditure    | Over             | Under            |
|--|--------------------|--------------------|------------------|------------------|
| <b><u>COMMON SERVICES</u></b>          |                    |                    |                  |                  |
| General Equipment                      | \$ 633 900         | \$ 646 195         | \$ 12 295        | \$ -             |
| Safety & Benefits                      | 233 600            | 208 794            | -                | 24 806           |
| Administration                         | 124 400            | 124 540            | 140              | -                |
| <b><u>WATER</u></b>                    |                    |                    |                  |                  |
| Purification & Treatment               | 284 600            | 207 150            | -                | 77 450           |
| Source of Supply                       | 460 500            | 372 554            | -                | 87 946           |
| Power & Pumping                        | 52 300             | 39 125             | -                | 13 175           |
| Maintenance of Equipment<br>(Plant)    | 96 000             | 60 611             | -                | 35 389           |
| Transmission &<br>Distribution (Oper)  | 330 800            | 352 460            | 21 660           | -                |
| Transmission &<br>Distribution (Maint) | 649 600            | 559 443            | -                | 90 157           |
| Billing & Collection                   | 227 300            | 212 205            | -                | 15 095           |
| Meters                                 | 192 000            | 166 098            | -                | 25 902           |
| <b><u>SANITARY SEWER</u></b>           |                    |                    |                  |                  |
| Operation (Lift Stations)              | 143 400            | 77 725             | -                | 65 675           |
| Maintenance                            | 410 100            | 387 592            | -                | 22 508           |
| Treatment & Disposal                   | 1 395 100          | 1 448 836          | 53 736           | -                |
| <b>TOTALS</b>                          | <b>\$5 233 600</b> | <b>\$4 863 328</b> | <b>\$ 87 831</b> | <b>\$458 103</b> |

UNDER: \$ 370 272

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

| LOCATION          | MUNICIPAL ROADS & STREETS |              |               |                |               | DESIGNATED ROUTES |               |               | T.C.H.,<br>BY-PASSES<br>& RAMPS |
|-------------------|---------------------------|--------------|---------------|----------------|---------------|-------------------|---------------|---------------|---------------------------------|
|                   | Asphalt                   | Gravel       | Chip Seal     | Total          | Asphalt       | Chip Seal         | Total         |               |                                 |
| Fredericton South | 100.200                   |              | 8.352         | 108.552        | 20.073        | 2.523             | 22.596        |               | 25.610                          |
| Fredericton North | 20.167                    | 0.029        | 0.653         | 20.849         | 9.000         |                   | 9.000         |               | 3.701                           |
| Nashwaaksis       | 47.029                    | 0.934        | 7.970         | 55.933         | 2.533         |                   | 2.533         |               | 8.214                           |
| Marysville        | 18.163                    | 0.304        | 4.178         | 22.645         | 7.556         |                   | 7.556         |               | 6.125                           |
| Barker's Point    | 6.643                     |              | 1.669         | 8.312          | 2.963         |                   | 2.963         |               | 1.317                           |
| Silverwood        | 4.343                     | 0.085        | 0.184         | 4.612          |               |                   |               |               | 2.757                           |
| Garden Creek      | 13.298                    | 1.101        | 3.037         | 17.436         | 6.294         |                   | 6.294         |               | 8.771                           |
| Douglas           | 1.855                     | 0.191        | 2.315         | 4.361          | 2.571         |                   | 2.571         |               |                                 |
| Lincoln           | 5.256                     | 1.314        | 0.879         | 7.449          | 1.332         |                   | 1.332         |               |                                 |
| Lower St. Marys   | 1.138                     |              | 0.832         | 1.970          |               |                   |               |               |                                 |
| <b>TOTALS</b>     | <b>218.092</b>            | <b>3.958</b> | <b>30.069</b> | <b>252.119</b> | <b>52.322</b> | <b>2.523</b>      | <b>54.845</b> | <b>56.495</b> |                                 |

TOTAL (Municipal and Designated Routes) = 306.964 km

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

Respectfully submitted,

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

### COMMON SERVICES GENERAL FUND

The total net expenditure under this heading was \$3 481 747 made up as follows:

|                            |                             |
|----------------------------|-----------------------------|
| Administration .....       | \$ 69 606                   |
| Engineering Services ..... | 460 705                     |
| General Equipment .....    | 1 893 322                   |
| Service Depots .....       | 430 088                     |
| Safety & Benefits .....    | <u>628 026</u> \$ 3 481 747 |

### ROAD TRANSPORT SERVICES

Road Transport Services is made up of the following items:

|                                 |                               |
|---------------------------------|-------------------------------|
| Administration .....            | \$ 270 879                    |
| Roads & Streets .....           | 3 555 762                     |
| Street Lighting .....           | 530 890                       |
| Traffic Services .....          | 382 491                       |
| Recovery Account - Rentals .... | <u>(920 881)</u> \$ 3 819 141 |

- (a) Administration: The total net expenditure under this heading amounted to \$270 879 for personnel costs, general services, etc.
- (b) Roads & Streets: The total net expenditure under this item was made up as follows:

|  |                               |
|--|-------------------------------|
| (1) Roadway Surfaces (maintenance) .....               | \$ 1 115 150                  |
| (2) Sidewalk Maintenance .....                         | 471 227                       |
| (3) Culverts & Ditching .....                          | 46 571                        |
| (4) Storm Sewer Maintenance .....                      | 178 761                       |
| (5) Street Cleaning (includes<br>Spring cleanup) ..... | 437 608                       |
| (6) Winter Maintenance .....                           | <u>1 306 445</u> \$ 3 555 762 |

The expenditures for the above items, as well as a brief description of work done, are summarized as follows:

(1) Roadway Surfaces (maintenance)

The net expenditure of \$ 1 115 150 was made up as follows;

|                                |                            |
|--------------------------------|----------------------------|
| Gravel Roads .....             | \$ 80 551                  |
| Paved Streets .....            | 865 235                    |
| Curb & Gutter Repair .....     | 68 697                     |
| Driveway Entrances .....       | 6 086                      |
| Right-of-way Maintenance ..... | <u>94 581</u> \$ 1 115 150 |

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

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

The following streets or portions of streets were double chip sealed in 1990:

| Location   | Length (metres) |
|--|-----------------|
| * Alison Boulevard - Gillis Rd. to Doak Rd. ....   | 892             |
| ** Bamberg Court .....                             | 36              |
| ** Brentwood Drive .....                           | 322             |
| ** Carrington Lane .....                           | 36              |
| Chase Street .....                                 | 141             |
| ** Chartwell Court .....                           | 234             |
| ** Coburn Court .....                              | 172             |
| ** Coburn Drive - existing to Coburn Ct. ....      | 39              |
| ** Douglas Avenue - Carrington to Lexington ....   | 176             |
| ** Jeremy Street .....                             | 53              |
| ** Jewett Street - existing to Sunset Drive ....   | 390             |
| ** Kimberley Street .....                          | 522             |
| ** Lexington Lane .....                            | 480             |
| ** Mannington Lane .....                           | 329             |
| ** Marlborough Drive - existing to Southall Ct.... | 211             |
| ** Mason Avenue - Cowperthwaite to the end ....    | 160             |
| ** Randolph Street .....                           | 53              |
| ** Rosemere Drive .....                            | 173             |
| ** Southall Court .....                            | 128             |
| ** Wesbett Street .....                            | <u>293</u>      |
| TOTAL ....   | 4840            |

4840 metres = 4.840 kilometres

- \* Supplied and placed by Department of Transportation forces.
- \*\* Paid for by Developers through Local Improvement Agreements

The following streets or portions of streets were resurfaced with Type "D" asphalt concrete in 1990.

| <u>Location</u>                           | <u>Length (metres)</u> |
|---|------------------------|
| Gilbert St. - Canada to R.R. Tracks ..... | 213                    |
| Hamilton Court .....                      | <u>180</u>             |
| TOTAL .....                               | 393                    |

393 metres = 0.393 kilometres

Also, selected sections of St. Marys Street, Wilsey Road (South of Vanier), Canada Street, McLeod Hill Road, Rainsford Lane, River Street, Springhill Road, Doak Road/Flanagan Road, Hearne Street, Kimble Drive and Wetmore Road, were padded with Type "D" asphalt concrete utilizing a spreader.

The following streets were resurfaced with Type "E" asphalt concrete in 1990.

| <u>Location</u>                                       | <u>Length (metres)</u> |
|---|------------------------|
| Argyle Street .....                                   | 588                    |
| Barker Street .....                                   | 639                    |
| Bowlen Street .....                                   | 162                    |
| Brookside Drive - R.R. Tracks to Hawkins Street ...   | 305                    |
| Burse Court .....                                     | 76                     |
| Cliffe Street - Union Street to Bowlen Street .....   | 128                    |
| Dayton Court .....                                    | 88                     |
| Forest Acres Court .....                              | 486                    |
| Friel Street .....                                    | 305                    |
| Gulliver Drive - Noble Street to Walker Street .....  | 290                    |
| Kennedy Court .....                                   | 70                     |
| Leverman Street .....                                 | 46                     |
| Minue Terrace .....                                   | 149                    |
| Montgomery Street - Smythe St. to York Street .....   | 595                    |
| Smythe Street - Montgomery Street to Priestman Street | 529                    |
| Smythe Street/Prospect Street Intersection .....      | 203                    |
| York Street - Queen Street to King Street .....       | 108                    |
| York Street - Saunders Street to George Street ....   | <u>233</u>             |
| TOTAL .....   | 5000                   |

5000 metres = 5.000 kilometres

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

(2) Sidewalk Maintenance

The net expenditure of \$ 471 227 for sidewalk repairs was made up as follows:

|  |                           |
|--|---------------------------|
| Personnel Costs .....  | \$ 47 675                 |
| Materials .....  | 63 039                    |
| General Services (use of equipment.....<br>& new construction) | <u>360 513</u> \$ 471 227 |

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

The net expenditure of \$ 46 571 was made up as follows:

|  |                         |
|--|-------------------------|
| Personnel Costs .....                    | \$ 23 169               |
| Materials .....                          | 4 145                   |
| General Services (use of equipment) .... | <u>19 257</u> \$ 46 571 |

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

The net expenditure of \$ 178 761 was made up as follows:

|  |                          |
|--|--------------------------|
| Personnel Costs .....                    | \$ 94 526                |
| Materials .....                          | 46 897                   |
| General Services (use of equipment) .... | <u>37 338</u> \$ 178 761 |

(5) Street Cleaning and Flushing

The City of Fredericton used a number of sweepers, trackless units and a Vac-all unit for street cleaning purposes in 1990. A contractor was also engaged to sweep business area streets on a regular basis in 1990.

The net expenditure under this heading amounted to \$ 437 608\* and was made up as follows:

|   |                         |
|---|-------------------------|
| Personnel Costs .....   | \$ 298 816              |
| General Services (use of equipment<br>& contract services)..... | 118 382                 |
| Brooms - main & gutter .....                                    | 11 109                  |
| Brooms - hand .....   | 1 596                   |
| Anti-litter cans .....  | 579                     |
| Dust Control .....  | <u>7 126</u> \$ 437 608 |

\* Includes an amount of \$ 31 536 for Spring Cleanup

(6) Winter Maintenance

(a) Sanding and Salting Streets and Sanding Sidewalks

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

(b) Snow Control

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

The City of Fredericton was responsible for plowing, sanding, and salting 323.853 km of roads and streets in 1990 (154.766 km on the north side and 169.087 km on the south side). Included in these figures is the Westmorland Street Bridge along with adjacent highways and ramps which are maintained through an agreement with the Department of Transportation.

During the winter months of 1990, 161.299 km of sidewalk were plowed and sanded. (55.629 km on the north side and 105.67 km on the south side)

Streets:

The total net cost for plowing streets amounted to \$690 557 and was made up as follows:

|  |                |
|--|----------------|
| Personnel Costs .....                                  | \$ 344 754     |
| General Services (use & maintenance of equipment)..... | <u>345 803</u> |
|  | \$ 690 557     |

The total net cost of sanding and salting streets amounted to \$415 459 made up as follows:

|   |              |
|---|--------------|
| Personnel Costs .....                                   | \$ 109 492   |
| General Services (use & maintenance of equipment) ..... | 67 017       |
| Materials (salt and sand) .....                         | 231 253      |
| Fixed Assets (new equipment) .....                      | <u>7 697</u> |
|   | \$ 415 459   |

The overall net expenditure of \$ 1 106 016 for plowing, sanding, and salting City roads and streets was made up as follows:

|   |                |
|---|----------------|
| Personnel Costs .....                                   | \$ 454 246     |
| General Services (use & maintenance of equipment) ..... | 412 820        |
| Fixed Assets (new equipment) .....                      | 7 697          |
| Materials (salt & sand) .....                           | <u>231 253</u> |
|   | \$ 1 106 016   |

Sidewalks:

The total net expenditure for plowing sidewalks amounted to \$138 111 and was made up as follows:

|   |               |
|---|---------------|
| Personnel Costs .....                                   | \$ 68 951     |
| General Services (use & maintenance of equipment) ..... | <u>69 160</u> |
|   | \$ 138 111    |

The total net expenditure for sanding sidewalks amounted to \$62 318 and was made up as follows:

|   |              |
|---|--------------|
| Personnel Costs .....                                   | \$ 21 899    |
| General Services (use & maintenance of equipment) ..... | 13 404       |
| Materials (sand) .....                                  | 18 520       |
| Fixed Assets (new equipment) .....                      | <u>8 495</u> |
|   | \$ 62 318    |

The overall net expenditure for snow plowing and sanding of sidewalks was \$ 200 429 made up as follows:

|   |              |
|---|--------------|
| Personnel Costs .....                                   | \$ 90 850    |
| General Services (use & maintenance of equipment) ..... | 82 564       |
| Materials (sand) .....                                  | 18 520       |
| Fixed Assets (new equipment) .....                      | <u>8 495</u> |
|   | \$ 200 429   |

TOTAL NET COST OF WINTER MAINTENANCE - ADD (1) & (2) = \$1 306 445

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

|      |                        |           |
|------|------------------------|-----------|
| 1986 | Agriculture Canada     | 193.10 cm |
|      | Airport Weather Office | 259.70 cm |
| 1987 | Agriculture Canada     | 212.80 cm |
|      | Airport Weather Office | 372.20 cm |
| 1988 | Agriculture Canada     | 139.20 cm |
|      | Airport Weather Office | 227.60 cm |
| 1989 | Agriculture Canada     | 218.60 cm |
|      | Airport Weather Office | 350.80 cm |
| 1990 | Agriculture Canada     | 151.00 cm |
|      | Airport Weather Office | 290.40 cm |

(c) Street Lighting

The multiple lighting system for the City of Fredericton as of 1990 12 31 consisted of:

|                           |    |                             |
|---------------------------|----|-----------------------------|
| 10 - 100 Watt H.P.S.      | at | \$138.09 per light per year |
| 6 - 150 Watt H.P.S.       | at | 184.16 per light per year   |
| 131 - 100 Watt H.P.S.     | at | 107.38 per light per year   |
| 1 - 180 Watt L.P.S.       | at | 208.33 per light per year   |
| 38 - 400 Watt L.P.S.      | at | 245.97 per light per year   |
| 10 - 125 Watt M.V.        | at | 115.05 per light per year   |
| 2 - 175 Watt M.V.         | at | 163.40 per light per year   |
| 203 - 175 Watt M.V.       | at | 138.09 per light per year   |
| 354 - 175 Watt Ref. M.V.  | at | 107.38 per light per year   |
| 12 - 250 Watt M.V.        | at | 205.44 per light per year   |
| 4 - 250 Watt M.V.         | at | 180.13 per light per year   |
| 1709 - 250 Watt M.V.      | at | 149.42 per light per year   |
| 567 - 400 Watt Ref. M.V.  | at | 209.21 per light per year   |
| 1 - 500 Watt Ref. M.V.    | at | 180.89 per light per year   |
| 2 - 400 Watt Flood Lights | at | 0.67 per Watt per year      |
| 7 - 150 Watt H.P.S.       | at | 153.45 per light per year   |

The total street lighting costs for 1990 were as follows:

|   |                       |
|---|-----------------------|
| Salaries & Benefits .....                                 | \$ 18 556             |
| Multiple Lighting System Contract .....                   | 488 754               |
| General Services - Maintenance of<br>Equipment .....      | 521                   |
| Government Services (Power to City<br>Owned Lights) ..... | 596                   |
| New Poles .....   | 21 771                |
| New Bulbs .....   | <u>692</u> \$ 530 890 |

(d) Traffic Services

The expenditure under this heading is made up as follows:

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

(1) Street Signs

Purchasing, repairing and installing street signs on City Streets.

The net expenditure under this heading amounted to \$79 788 made up as follows:

|  |               |
|--|---------------|
| Personnel Costs .....                      | \$ 33 596     |
| General Services (use of equipment) ...    | 7 443         |
| Goods (posts, street sign purchases, etc.) | <u>38 749</u> |
|  | \$ 79 788     |

(2) Painting & Striping

The net expenditure under this heading was \$ 83 885 made up as follows:

|   |               |
|---|---------------|
| Personnel Costs .....                                     | \$ 51 031     |
| General Services (use & maintenance of<br>equipment) .... | 10 784        |
| Goods (paint, misc. supplies, signs) ...                  | <u>22 070</u> |
|   | \$ 83 885     |

(3) Traffic Signals

The net expenditure under this heading was \$179 921 made up as follows:

|  |              |
|--|--------------|
| Personnel Costs .....                    | \$ 60 366    |
| General Services (use of equipment) .... | 16 456       |
| Government Services (electric power) ... | 40 473       |
| Goods (materials) .....                  | 52 667       |
| Fixed Assets (new equipment) .....       | <u>9 959</u> |
|  | \$179 921    |

(4) Railway Crossings

The net expenditure under this heading was \$38 897 for maintenance done by railway companies.

### ENVIRONMENTAL HEALTH SERVICES

The following items are included under the above heading:

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

(1) Garbage and Waste Collection

In 1990, the net amount paid for the garbage and waste collection operation was \$496 271 made up as follows:

|   |                           |
|---|---------------------------|
| General Services - (Contract Services) ...      | \$ 312 000                |
| General Services - (Advertising).....           | 36                        |
| General Services - (Recycling Collection). .... | <u>184 235</u> \$ 496 271 |

(2) Garbage and Waste Disposal

The net expenditure under this section was \$ 244 543 made up as follows:

|  |                         |
|--|-------------------------|
| General Services (recycling boxes & advertising, solid waste commission payments, and land rental) ..... | \$ 243 217              |
| Government Services (taxes) .....  | <u>1 326</u> \$ 244 543 |

PUBLIC HEALTH SERVICES

The following items are included under the above heading:

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

(1) Old Burial Ground

The net expenditure under this section was \$ 14 980 made up as follows:

|   |              |
|---|--------------|
| Personnel Costs .....                     | \$ 11 793    |
| General Services (use of equipment) ..... | 168          |
| Government Services (lighting) .....      | 545          |
| Goods (materials) .....                   | <u>2 474</u> |
|   | \$ 14 980    |

(2) Loyalist Burial Ground

The net expenditure under this section was \$ 306 made up as follows:

|                       |        |        |
|-----------------------|--------|--------|
| Personnel Costs ..... | \$ 306 | \$ 306 |
|-----------------------|--------|--------|

PARKS AND TREES SERVICES

The following items are included under the above heading:

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

(1) Wilmot Park

The net expenditure for this item was \$32 544 made up as follows:

|  |                        |
|--|------------------------|
| Personnel Costs .....  | \$ 22 775              |
| General Services (use & maintenance of equipment, building repairs)..... | 4 822                  |
| Government Services (water & sewer rates, light & power) ....            | 2 471                  |
| Goods (materials; fuels & lubricants)...                                 | <u>2 476</u> \$ 32 544 |

(2) Odell Park

The net expenditure for this item was \$ 101 087 made up as follows:

|   |                         |
|---|-------------------------|
| Personnel Costs .....   | \$ 49 336               |
| General Services (use & maintenance of equipment, communications; building repairs) ..... | 16 708                  |
| Government Services (water & sewer rates, lights & power) ...                             | 924                     |
| Goods (materials; fuels & lubricants)...  | <u>34 119</u> \$101 087 |

(3) Carleton Park

The net expenditure for this item was \$ 14 316 made up as follows:

|  |                        |
|--|------------------------|
| Personnel Costs .....                                  | \$ 9 292               |
| General Services (use of equipment & land rental)..... | 3 237                  |
| Goods (materials) .....                                | <u>1 787</u> \$ 14 316 |

(4) Trees

The net expenditure for this item was \$ 341 911 made up as follows:

|  |                         |
|--|-------------------------|
| Personnel Costs .....  | \$266 011               |
| General Services (use & maintenance of equipment) .....                        | 43 531                  |
| Goods (fuels & lubricants, materials, new trees, small tools & equipment) .... | <u>32 369</u> \$341 911 |

In 1990, 244 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 1990:

| <u>Species</u> | <u>Number Removed</u> |
|----------------|-----------------------|
| Elm            | 69                    |
| Maple          | 99                    |
| Linden         | 6                     |
| Poplar         | 40                    |
| Ash            | 2                     |
| White Pine     | 9                     |
| Oak            | 4                     |
| Other          | <u>15</u>             |
| TOTAL .....    | 244                   |

In 1990, 55 trees were removed because of Dutch Elm Disease.

Following is a summary of Elm trees removed from 1964 to 1990:

| Year          | No. Lost (% Lost) To<br>Dutch Elm Disease | No. Removed For<br>Other Reasons | Total No.<br>Removed |
|---------------|---|----------------------------------|----------------------|
| 1964          | 14 (29)                                   | 34                               | 48                   |
| 1965          | 8 (24)                                    | 25                               | 33                   |
| 1966          | 12 (21)                                   | 44                               | 56                   |
| 1967          | 18 (20)                                   | 73                               | 91                   |
| 1968          | 33 (16)                                   | 174                              | 207                  |
| 1969          | 30 (21)                                   | 108                              | 138                  |
| 1970          | 49 (39)                                   | 78                               | 127                  |
| 1971          | 57 (42)                                   | 77                               | 134                  |
| 1972          | 61 (42)                                   | 84                               | 145                  |
| 1973          | 92 (46)                                   | 108                              | 200                  |
| 1974          | 132 (33)                                  | 266                              | 398                  |
| 1975          | 75 (19.6)                                 | 307                              | 382                  |
| 1976          | 118 (28.2)                                | 300                              | 418                  |
| 1977          | 681 (91.6)                                | 62                               | 743                  |
| 1978          | 680 (92)                                  | 56                               | 736                  |
| 1979          | 937 (91.8)                                | 84                               | 1021                 |
| 1980          | 1146 (95.7)                               | 51                               | 1197                 |
| 1981          | 500 (59.7)                                | 327                              | 827                  |
| 1982          | 487 (90.7)                                | 50                               | 537                  |
| 1983          | 133 (36.5)                                | 231                              | 364                  |
| 1984          | 121 (63.4)                                | 70                               | 191                  |
| 1985          | 77 (80.2)                                 | 19                               | 96                   |
| 1986          | 45 (60.8)                                 | 29                               | 74                   |
| 1987          | 49 (53.8)                                 | 42                               | 91                   |
| 1989          | 47 (48.0)                                 | 51                               | 98                   |
| 1990          | 55 (79.7)                                 | 14                               | 69                   |
| <b>TOTALS</b> | <b>5700 (67.1)</b>                        | <b>2800</b>                      | <b>8500</b>          |

Trees were planted (first planting) at the following locations in 1990:

| <u>Location</u>                                    | <u>Number of Trees</u> |
|--|------------------------|
| Aberdeen Street                                    | 16                     |
| Angelview Court                                    | 18                     |
| Aquarius Street                                    | 7                      |
| Barton Crescent                                    | 5                      |
| Broad Street                                       | 1                      |
| Burpee Street                                      | 1                      |
| Byng Street  | 1                      |
| Carleton Park                                      | 14                     |
| Carleton Street Extension                          | 10                     |
| Centennial Court                                   | 10                     |
| Charlotte Street                                   | 15                     |
| Churchill Row                                      | 8                      |
| Clearview Avenue                                   | 3                      |
| Cowperthwaite Park                                 | 18                     |
| Crocket Street                                     | 34                     |
| Downing Street Park                                | 51                     |
| Dr. Everett Chalmers Hospital                      | 3                      |
| Dunn's Crossing Road                               | 4                      |
| Elliot Street                                      | 15                     |
| Embleton Avenue                                    | 15                     |
| Fredericks Square (Queen St.<br>& Westmorland St.) | 14                     |
| Ferry Avenue                                       | 2                      |
| George Street                                      | 5                      |
| Glengarry Place                                    | 69                     |
| Huron Avenue                                       | 16                     |
| Long Court   | 4                      |
| Marysville Pool                                    | 23                     |
| Odell Park   | 34                     |
| Page Street  | 11                     |
| Pettigrove Crescent                                | 20                     |
| Prospect St. Detention Pond                        | 12                     |
| Riverview Court                                    | 11                     |
| Rosewood Drive                                     | 5                      |
| Royal Road   | 5                      |
| Saunders Street                                    | 11                     |
| Spur Street  | 3                      |
| Talisman Crescent                                  | 25                     |
| Tapley Court                                       | 12                     |
| Union Street                                       | 3                      |
| Vanier Industrial Park                             | 25                     |
| Westmorland Street                                 | 1                      |
| Wilkins Avenue                                     | 11                     |
| Wilmot Park  | 41                     |
| Woodstock Road                                     | 1                      |
| <br>   |                        |
| <b>TOTAL .....</b>                                 | <b>613</b>             |

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

A number of trees were also trimmed in 1990. The number and class of trees were made up as follows:

- (a) Trees above 14 m in height - approximately 200 mixed species
- (b) Trees 6 m to 14 m in height - approximately 1100 mixed species
- (c) Trees under 6 m in height - approximately 4000 mixed species

Stumps removed, topsoiled and seeded - 155

Shrubs planted on City park land - 307

(6) Greens, Benches & Other Parks

The net expenditure for this item was \$ 180 045 made up as follows:

|  |                         |
|--|-------------------------|
| Personnel Costs .....  | \$ 78 079               |
| General Services (use & maintenance of equipment & special projects)..       | 36 431                  |
| Goods (fuels & lubricants, materials, small tools & equipment & new trees).. | 48 221                  |
| Fixed Assets (new equipment) .....   | <u>17 314</u> \$180 045 |

## **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 1990 was \$979 530.  
This expenditure was made up as follows:

|                         |                  |
|-------------------------|------------------|
| General Equipment ..... | \$ 646 196       |
| Safety & Benefits ..... | 208 794          |
| Administration .....    | 124 540          |
|                         | <b>\$979 530</b> |

(2) SANITARY SEWER

In 1990 the net expenditure for this item was \$ 2 104 266 made up as follows:

## **Operating: Lift Stations**

### **Maintenance:**

|  |               |
|--|---------------|
| Personnel Costs .....                                      | \$219 774     |
| General Services (use & maintenance of<br>equipment) ..... | 75 639        |
| Goods (repair parts & tools).....                          | <u>92 179</u> |
|  | \$387 592     |

Sewage Treatment & Disposal:

|                                      |                        |
|--------------------------------------|------------------------|
| Personnel Costs .....                | \$ 24 794              |
| General Services - use & maintenance |                        |
| of equipment .....                   | 2 928                  |
| - treatment (contract                |                        |
| services) .....                      | 1 389 386              |
| Government Services: Water & Sewer   |                        |
| Rates .....                          | 647                    |
| Lights & Power... .                  | 30 830                 |
| Goods (Miscellaneous Supplies) ..... | <u>251</u> \$1 448 836 |

Debt Charges:

|                 |                          |
|-----------------|--------------------------|
| Principal ..... | \$133 256                |
| Interest .....  | <u>56 857</u> \$ 190 113 |
| TOTAL .....     | \$2 104 266              |

The Fredericton sanitary sewer system consists of approximately 267 kilometres of mains made up as follows:

| Size        | Silverwood | Garden Creek | Nashwaaksis | Marysville | Barker's Point | Fredericton (Pre 1973) | Total   |
|-------------|------------|--------------|-------------|------------|----------------|------------------------|---------|
|             |            |              |             |            |                |                        |         |
| 100 mm      | -          | 0.158        |             | -          | -              | -                      | 0.158   |
| 100 mm F.M. | 0.013      | -            | -           | -          | -              | 1.103                  | 1.116   |
| 150 mm      | -          | 1.433        |             | 0.314      | -              | 0.253                  | 2.000   |
| 150 mm F.M. | 0.031      | 0.417        |             | 0.539      | 0.068          | 3.008                  | 4.063   |
| 200 mm      | 15.488     | 37.202       |             | 17.684     | 7.559          | 115.026                | 192.959 |
| 200 mm F.M. | 0.254      | 0.403        |             | 0.314      | -              | 0.064                  | 1.035   |
| 250 mm      | 1.959      | 3.158        |             | 0.955      | 0.298          | 9.383                  | 15.753  |
| 250 mm F.M. | 1.178      | -            |             | -          | -              | -                      | 1.178   |
| 300 mm      | 1.267      | 3.200        |             | 1.006      | 1.868          | 17.552                 | 24.893  |
| 300 mm F.M. | 0.420      | 0.397        |             | -          | -              | 0.739                  | 1.556   |
| 350 mm      | 0.287      | 0.686        |             | -          | -              | 0.713                  | 1.686   |
| 350 mm F.M. | -          | -            |             | 0.528      | -              | 0.254                  | 0.782   |
| 375 mm      | 1.138      | 2.163        |             | 0.500      | 0.174          | 2.816                  | 6.791   |
| 400 mm      | 0.018      | 0.076        |             | -          | -              | 0.210                  | 0.304   |
| 450 mm      | 1.039      | 0.031        |             | 1.350      | -              | 3.088                  | 5.508   |
| 500 mm      | 2.979      | -            |             | -          | -              | -                      | 2.979   |
| 600 mm      | 0.156      | -            |             | -          | -              | 2.274                  | 2.430   |
| 750 mm      | -          | -            |             | -          | -              | 0.322                  | 0.322   |
| 900 mm      | -          | -            |             | -          | -              | 1.432                  | 1.432   |
| TOTALS      | 26.227     | 49.324       |             | 23.190     | 9.967          | 158.237                | 266.945 |

NOTE: Fredericton includes the Lincoln area.

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

(3) **WATER**

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

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

| <b><u>SYSTEM</u></b>         | <b><u>SOURCE</u></b>  | <b><u>STORAGE</u></b> |
|------------------------------|---|-----------------------|
| South Low                    | 5 wells via W.T.P.,<br>1 emergency standby well                               | 18200 kL              |
| North Low                    | South Low via River<br>Crossing (same pressures)<br>7 emergency standby wells | 8540 kL               |
| South Intermediate           | South Low via booster   | 9090 kL               |
| South High                   | South Interim. via booster  | 2410 kL               |
| Golf Club Road               | South High via Pressure<br>Reducing Valve                                     | 0 kL                  |
| Rosewood                     | South Low via booster   | 0 kL                  |
| Lincoln                      | South Low via booster   | 3750 kL               |
| Vanier South<br>Intermediate | South High via Pressure<br>Reducing Valve                                     | 0 kL                  |
| Hanwell                      | 1 well direct *   | 270 kL                |
| Silverwood                   | 2 wells direct  | 245 kL                |
| Rainsford                    | 1 well direct   | 0 kL                  |
| Killarney                    | 2 wells direct  | 3750 kL               |
| Marysville                   | 2 wells direct<br>1 emergency standby well                                    | 2840 kL               |
| Canterbury                   | South High via Altitude Valve   | 910 kL                |

\* Supplied from South High via Pressure Reducing Valve starting Aug. 7, 1990.

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) .....               | \$        | 212        | 205 |         |
| (2) Water Ordinary (including meters) .... | 1         | 078        | 001 |         |
| (3) Water Treatment Facility & Well        |           |            |     |         |
| Production Costs ....                      | 679       | 440        |     |         |
| (4) Debt Charges - Principal .....         | 271       | 396        |     |         |
| (5) Debt Charges - Interest .....          | <u>94</u> | <u>120</u> | \$2 | 335 162 |

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

The net expenditure of \$212 205 was made up as follows:

|                                  |    |           |            |            |
|----------------------------------|----|-----------|------------|------------|
| Office salaries & benefits ..... | \$ | 107       | 748        |            |
| Postage .....                    |    | 19        | 175        |            |
| Machinery Rental .....           |    | 7         | 385        |            |
| Professional Services .....      |    | 17        | 314        |            |
| Materials .....                  |    | 7         | 480        |            |
| New Equipment .....              |    | 42        | 030        |            |
| Computer Lease Payments .....    |    | <u>11</u> | <u>073</u> | \$ 212 205 |

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

The net expenditure of \$1 078 001 was made up as follows:

**Transmission & Distribution (Operation)**

|  |    |           |            |            |
|--|----|-----------|------------|------------|
| Personnel Costs .....                                      | \$ | 81        | 627        |            |
| General Services (use & maintenance of equipment) .....    |    | 175       | 970        |            |
| Government Services (light & power, provincial taxes)..... |    | 82        | 827        |            |
| Goods (materials) .....                                    |    | <u>12</u> | <u>036</u> | \$ 352 460 |

Transmission & Distribution (Maintenance)

|   |                |
|---|----------------|
| Personnel Costs .....   | \$ 283 191     |
| General Services (use & maintenance of<br>equipment & hydrants) ..... | 88 686         |
| Goods (fuels & lubricants, tools,<br>materials, parts) .....          | <u>187 566</u> |
|   | \$ 559 443     |

Meters

|   |               |
|---|---------------|
| Personnel Costs .....                                 | \$ 112 578    |
| Meter Parts, miscellaneous supplies,<br>& tools ..... | 6 827         |
| Use of Equipment .....                                | 17 209        |
| Fixed Assets (new meters) .....                       | <u>29 484</u> |
|   | \$ 166 098    |
| TOTAL .....   | \$1 078 001   |

On 1990 12 31 there were 12201 water services on meter and 250 on flat rate, making a total of 12451.

230 new meters were installed in 1990, 6 regular register meters changed to RRT or KRT, and 11 ARB register meters changed to RRT or KRT. 2 flat rate services were metered.

In 1990, 23 discontinued services were excavated and shut off at the main, 135 stopped meters replaced and 24 frozen meters replaced.

The following sprinklers were installed in 1990:

- 64 Alison Boulevard (Bruncor)
- 71 Alison Boulevard (Sunbury Transport)
- 900 Hanwell Road (Carriage Place)
- 225 Woodstock Road (Sheraton Hotel)

There are in the City as of 1990 12 31, 1574 hydrants situated in the following areas:

|                                       |            |
|---------------------------------------|------------|
| Fredericton South .....               | 744        |
| Fredericton North .....               | 157        |
| Nashwaaksis .....                     | 287        |
| Marysville .....                      | 148        |
| Barker's Point .....                  | 66         |
| Silverwood .....                      | <u>23</u>  |
| <br>SUB TOTAL .....                   | 1425       |
| <br>LOCATED ON PRIVATE PROPERTY ..... | <u>149</u> |
| <br>TOTAL .....                       | 1574       |

Hydrants were installed at the following locations in 1990:

| Location  | Number   |
|---|----------|
| Brooks Court .....                                | 1        |
| Chartwell Court .....                             | 2        |
| Forest Hill Road (between Civic No's 9 & 19)..... | 1        |
| Hodgson Road Extension .....                      | 3        |
| Jewett Street .....                               | 3        |
| Kimberley Street .....                            | 2        |
| Marlborough Drive .....                           | 2        |
| Mason Avenue .....                                | 2        |
| McInnis Court .....                               | 1        |
| Prospect Street .....                             | 4        |
| Regent Reservoir .....                            | 1        |
| Regent Street by Woolco .....                     | 1        |
| Southall Court .....                              | 1        |
| Sunset Drive .....                                | 3        |
| T.C.H. (Hanwell Crossing) .....                   | 1        |
| Wesbett Street .....                              | <u>3</u> |
| <br>Sub-total (City Owned).....                   | 31       |

PLUS: PRIVATE HYDRANTS

|                                   |                     |          |
|-----------------------------------|---------------------|----------|
| Research & Productivity Council - | College Hill Road   | 1        |
| Bruncor Ltd.                      | - 64 Alison Blvd.   | 1        |
| Carriage Place Mall               | - 900 Hanwell Rd.   | 1        |
| Sunbury Transport                 | - 71 Alison Blvd.   | 2        |
| Sheraton Hotel                    | - 225 Woodstock Rd. | <u>1</u> |
|                                   |                     | 6        |

OVERALL TOTAL ..... 37

The Fredericton distribution system consists of approximately 291 kilometres of water main, made up as follows:

| Size    | Marysville | Nashwaaksis | Barker's Pt. | Silverwood   |             | TOTAL   |
|---------|------------|-------------|--------------|--------------|-------------|---------|
|         |            |             |              | Garden Creek | Fredericton |         |
| 32 mm   | -          | 0.153       | -            | -            | -           | 0.153   |
| 38 mm   | -          | 0.072       | -            | -            | 0.234       | 0.306   |
| 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  | 12.545     | 20.909      | 3.915        | 4.810        | 57.503      | 99.682  |
| 200 mm  | 6.267      | 22.229      | 0.954        | 7.253        | 43.766      | 80.469  |
| 250 mm  | 3.071      | 6.720       | 5.163        | 0.966        | 21.700      | 37.620  |
| 300 mm  | 1.050      | 3.189       | 0.031        | 7.776        | 28.219      | 40.265  |
| 350 mm  | -          | 0.207       | -            | -            | 4.538       | 4.745   |
| 400 mm  | -          | -           | -            | -            | 7.127       | 7.127   |
| 450 mm  | -          | -           | -            | -            | 1.965       | 1.965   |
| 500 mm  | -          | -           | -            | -            | 1.960       | 1.960   |
| 600 mm  | -          | -           | -            | -            | 0.395       | 0.395   |
| Unknown | 0.146      | -           | -            | -            | -           | 0.146   |
| TOTALS  | 23.832     | 55.711      | 10.063       | 23.467       | 178.243     | 291.316 |

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

The above figures 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 Doone Street housing development in Fredericton North.

(3) WATER PRODUCTION COSTS

The net expenditure of \$679 440 was made up as follows:

Source of Supply

|                           |                         |
|---------------------------|-------------------------|
| Personnel Costs .....     | \$ 125 348              |
| Use of Equipment .....    | 11 965                  |
| Maintenance - Wells ..... | 21 745                  |
| Communications .....      | 12 699                  |
| Power - Wells .....       | 192 324                 |
| Materials - Wells .....   | <u>8 473</u> \$ 372 554 |

Power & Pumping (Plant)

|                       |                        |
|-----------------------|------------------------|
| Personnel Costs ..... | \$ 28 163              |
| Light & Power .....   | 6 289                  |
| Supplies .....        | <u>4 673</u> \$ 39 125 |

Water Treatment Plant

|  |                          |
|--|--------------------------|
| Personnel Costs .....                  | \$ 99 581                |
| Insurance .....                        | 28 238                   |
| Maintenance of Equipment .....         | 40 109                   |
| Power .....                            | 12 733                   |
| Taxes .....                            | 31 607                   |
| Materials .....                        | 4 781                    |
| Goods (Chlorine, Soda Ash, Lime, etc.) | <u>50 712</u> \$ 267 761 |
| <b>TOTAL .....</b>                     | <b>\$ 679 440</b>        |

The total amount of water pumped into the City's distribution systems from 1990 01 01 to 1990 12 31 for the entire City was 8600 megalitres. The amount of water produced by the Water Treatment Plant in 1990 was 8150 megalitres or 95% of the total City demand. The average daily demand for the City is 23.6 megalitres.

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

#### WATER PRODUCTION COSTS

| <u>Year</u> | <u>megalitres Produced</u> | <u>Production Expenditure</u> | <u>Production Cost per megalitre</u> |
|-------------|----------------------------|-------------------------------|--------------------------------------|
| 1981        | 6907                       | \$ 355 321                    | \$ 51                                |
| 1982        | 7030                       | 432 326                       | 62                                   |
| 1983        | 7225                       | 435 929                       | 60                                   |
| 1984        | 7368                       | 523 393                       | 71                                   |
| 1985        | 7880                       | 646 991                       | 82                                   |
| 1986        | 7781                       | 732 141                       | 94                                   |
| 1987        | 8177                       | 712 102                       | 87                                   |
| 1988        | 8740                       | 743 604                       | 85                                   |
| 1989        | 8440                       | 734 658                       | 87                                   |
| 1990        | 8600                       | 679 440                       | 79                                   |

The total net expenditure for transmission and distribution of water for the City from 1990 01 01 to 1990 12 31 was determined from the following:

#### Transmission & Distribution:

|                   |                |
|-------------------|----------------|
| Operation .....   | \$ 352 460     |
| Maintenance ..... | <u>559 443</u> |
|                   | \$ 911 903     |

Therefore, the net expenditure for transmission and distribution of one megalitre of water from 1990 01 01 to 1990 12 31 was:

$$\frac{\$ 911 903}{8600} = \$ 106$$

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

**Transmission and Distribution Costs**

| <u>YEAR</u> | <u>NET EXPENDITURE per megalitre</u> |
|-------------|--------------------------------------|
| 1981        | \$ 70                                |
| 1982        | 74                                   |
| 1983        | 87                                   |
| 1984        | 92                                   |
| 1985        | 99                                   |
| 1986        | 88                                   |
| 1987        | 89                                   |
| 1988        | 93                                   |
| 1989        | 126                                  |
| 1990        | 106                                  |

The total net expenditure for administration costs and debt charges for the City from 1990 01 01 to 1990 12 31 was determined from the following:

**Water Administration**

|  |                           |
|--|---------------------------|
| (1) Billing & Collection .....                       | \$ 212 205                |
| (2) Meters (Installation,<br>Reading, Repairs) ..... | 166 098                   |
| <u>Debt Charges (Principal &amp; Interest)</u> ..... | <u>365 516</u> \$ 743 819 |

Administration costs per megalitre of water produced:

$$\frac{\$ 378 303}{8600} = \$ 43.99$$

Debt Charges per megalitre of water produced:

$$\frac{\$ 365 516}{8600} = \$ 42.50$$

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

Administration Costs and Debt Charges per megalitre  
(rounded to nearest dollar)

| <u>Year</u> | <u>Administration (Billing &amp; Collection &amp; Meters)</u> | <u>Debt Charges</u> |
|-------------|---|---------------------|
| 1981        | \$ 44   | \$ 100              |
| 1982        | 44  | 96                  |
| 1983        | 51  | 107                 |
| 1984        | 42  | 97                  |
| 1985        | 43  | 94                  |
| 1986        | 43  | 75                  |
| 1987        | 37  | 52                  |
| 1988        | 39  | 46                  |
| 1989        | 44  | 46                  |
| 1990        | 44  | 43                  |

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

Total Costs per megalitre

| <u>Year</u> | <u>Production Costs</u> | <u>Transmission &amp; Distribution Costs</u> | <u>Administration Costs</u> | <u>Debt Charges</u> | <u>*TOTAL</u> |
|-------------|-------------------------|--|-----------------------------|---------------------|---------------|
| 1981        | \$ 51                   | \$ 70  | \$ 44                       | \$ 100              | \$ 265        |
| 1982        | 62                      | 74   | 44                          | 96                  | 276           |
| 1983        | 60                      | 87   | 51                          | 107                 | 305           |
| 1984        | 71                      | 92   | 42                          | 97                  | 302           |
| 1985        | 82                      | 99   | 43                          | 94                  | 318           |
| 1986        | 94                      | 88   | 43                          | 75                  | 300           |
| 1987        | 87                      | 89   | 37                          | 52                  | 265           |
| 1988        | 85                      | 93   | 39                          | 46                  | 263           |
| 1989        | 87                      | 126  | 44                          | 46                  | 303           |
| 1990        | 79                      | 106  | 44                          | 43                  | 272           |

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

S U M M A R YWATER AND SEWER REVENUE & EXPENDITURES1990

| <u>Item</u>   | <u>Net Expenditure</u>  | <u>Revenue</u>          |
|---|-------------------------|-------------------------|
| <b><u>COMMON SERVICES (WATER &amp; SEWER)</u></b>   |                         |                         |
| General Equipment                                   | \$ 646 196              | \$ 616 113              |
| Safety & Benefits                                   | 208 794                 |                         |
| Administration                                      | 124 540                 |                         |
| <br><b><u>WATER</u></b>                             |                         |                         |
| Water Administration<br>(Billing & Collection)      | 212 205                 |                         |
| Water Ordinary (Including<br>Meters)                | 1 078 001               | 4 684 088               |
| Water Treatment Facility &<br>Well Production Costs | 679 440                 |                         |
| Debt Charges - Principal &<br>Interest              | 365 516                 |                         |
| <br><b><u>SANITARY SEWER</u></b>                    |                         |                         |
| Operating & Maintenance                             | 465 317                 | 2 797 666               |
| Sewage Treatment & Disposal                         | 1 448 836               |                         |
| Debt Charges  | 190 113                 |                         |
| <br><b>TOTALS</b>                                   | <br><b>\$ 5 418 958</b> | <br><b>\$ 8 097 867</b> |

1990 SURPLUS: \$ 2 678 910  
 SURPLUS @ BEGINNING OF 1990: 1 684 857  
 OVERALL SURPLUS: \$ 4 363 767

NOTE: \$3 013 909 of the above noted overall surplus was appropriated for Utility Capital expenditures.

### CAPITAL PROGRAMS

The following gives brief descriptions of capital projects begun or completed in 1990.

#### WATER:

In 1990, water mains were installed from the Regent Reservoir south to Regent Street; along the Trans Canada Highway from Smythe Street to Regent Street; on Prospect Street from Smythe Street to Greenfields Drive; on a portion of the Brunswick Trunk near the Waterloo Row underpass; into Wilmot Park Well #6; on Sunset Drive between Currie Avenue and Clements Drive and on Hodgson Road extension up to Civic No. 490.

On McInnis Court; River Street from Bridge Street to Allen Street; Queen Street from Phoenix Square to Civic No. 226; Westmorland Street from Queen Street to King Street and the Hanwell Reservoir Interconnection the water mains were upgraded or installed under the Capital System Replacement and Oversizing account.

New mains were also installed by developers across the Trans Canada Highway near Hanwell Road to facilitate future development; in the Garden Place Subdivision (Chartwell Court, Southall Court, Marlborough Drive); Stonegate Estates Subdivision (Wesbett Street); D. & R. Cowperthwaite Subdivision (Mason Avenue); Deerwood Subdivision (Jewett Street); Brookside Mini-Home Park (Jeremy Street, Kimberley Street, Randolph Street); and Waterloo Estates Subdivision (former Riverview Arms property). New water mains were also installed in the Devon Indian Reserve on Brooks Court.

Following are lengths and sizes of water mains installed in 1990.

LENGTH OF MAINS - metres

| LOCATION   | LENGTH OF MAINS - metres |                            |                |                |                |                |                |     |
|--|--------------------------|----------------------------|----------------|----------------|----------------|----------------|----------------|-----|
|  | 150 mm<br>D.I.           | 200 mm<br>D.I. &<br>P.V.C. | 250 mm<br>D.I. | 300 mm<br>D.I. | 350 mm<br>D.I. | 400 mm<br>D.I. | 500 mm<br>D.I. |     |
| Regent Reservoir South and T.C.H. -<br>Smythe St. to Regent St.                        | 7                        | 12                         |                | 17             |                | 1438           |                |     |
| Prospect St.- Smythe St. to<br>Greenfields Dr.   | 15                       |                            | 12             |                | 666            |                |                |     |
| Brunswick Trunk  |                          |                            |                |                |                |                |                | 129 |
| Wilmot Park Well #6  |                          |                            |                | 264            |                |                |                |     |
| Sunset -Clements Dr. Area  | 13                       |                            |                | 395            |                |                |                |     |
| * McInnis Court  | 98                       |                            |                |                |                |                |                |     |
| * River St.-Bridge St. to Allen St.  |                          |                            | 120            |                |                |                |                |     |
| * Queen St.-Phoenix Sq. to MacTavish<br>For Sports                                     |                          |                            | 263            |                |                |                |                |     |
| * Westmorland St.-Queen St. to King St<br>Hodgson Rd. Extension                        | 24                       | 711                        | 163            |                |                |                |                |     |
| ** T.C.H. Crossing (Llewellyn)   | 5                        |                            |                | 363            |                |                |                |     |
| ** Garden Place Subdivision (Chartwell<br>Court, Southall Court, Marlborough<br>Drive) | 30                       | 637                        |                |                |                |                |                |     |
| ** Stonegate Estates Subdivision<br>(Wesbett St.)                                      | 6                        | 304                        |                |                |                |                |                |     |
| ** D. & R. Cowperthwaite Subdivision<br>(Mason Ave.)                                   | 16                       | 161                        |                |                |                |                |                |     |
| ** Deerwood Subdivision (Jewett St.)   | 15                       | 407                        |                |                |                |                |                |     |
| ** Brookside Mini-Home Park (Jeremy St.,<br>Kimberley St., Randolph St.)               | 10                       | 450                        |                |                |                |                |                |     |
| *** Devon Indian Reserve (Brooks Ct.)<br>Hanwell Reservoir Interconnection             |                          | 84                         |                |                |                |                |                |     |
| TOTALS   | 384                      | 2766                       | 558            | 1039           | 666            | 1438           | 129            |     |

OVERALL TOTAL - 6980 metres = 6.980 kilometres

- \* Done under System Replacement and Oversizing. Queen Street and Westmorland Street done in conjunction with the Mainstreet Program.
- \*\* Entire cost paid for by Developers through Local Improvement Agreements.
- \*\*\* Paid for by the Department of Indian and Northern Affairs

**SANITARY SEWER:**

In 1990, sanitary sewer mains were installed on Regent Street between Montgomery Street and Priestman Street; on a portion of the Brunswick Trunk near the Waterloo Row underpass; on Sunset Drive between Currie Avenue and Clements Drive; and on Hodgson Road extension up to Apex.

On McInnis Court and the Marlborough Drive to Hanwell Road interconnection the sanitary sewer mains were upgraded or installed under the System Replacement and Oversizing account.

New mains were also installed by developers across the Trans Canada Highway near Hanwell Road to facilitate future development; in the Garden Place Subdivision (Chartwell Court, Southall Court, Marlborough Drive); Stonegate Estates Subdivision (Wesbett Street); D & R Cowperthwaite Subdivision (Mason Avenue); Deerwood Subdivision (Jewett Street); Brookside Mini-Home Park (Jeremy Street, Kimberley Street, Randolph Street) and Waterloo Estates Subdivision (former Riverview Arms property).

New sanitary sewer mains were also installed in the Devon Indian Reserve on Brooks Court.

Following are lengths and sizes of sanitary sewer mains installed in 1990:

| LOCATION   | LENGTH OF MAINS - metres |                  |                  |                  |                  |                    |                    |
|--|--------------------------|------------------|------------------|------------------|------------------|--------------------|--------------------|
|  | 150 mm<br>P.V.C.         | 200 mm<br>P.V.C. | 250 mm<br>P.V.C. | 300 mm<br>P.V.C. | 600 mm<br>P.V.C. | 200 mm<br>D.I.F.M. | 300 mm<br>D.I.F.M. |
| Regent St.-Priestman St. to Montgomery St.   |                          | 21               |                  | 542              |                  |                    |                    |
| Brunswick Trunk  |                          |                  |                  |                  |                  | 130                |                    |
| Sunset - Clements Dr. Area   |                          | 301              |                  |                  |                  |                    | 403                |
| * McInnis Court  |                          | 75               |                  |                  |                  |                    |                    |
| * Marlborough Dr. to Hanwell Rd. Interconnection   |                          |                  |                  | 312              |                  |                    |                    |
| Hodgson Road Extension   |                          | 318              |                  |                  |                  |                    |                    |
| * * T.C.H. Crossing (Llewellyn)  |                          | 69               |                  | 289              |                  |                    |                    |
| * * Garden Place Subdivision (Chartwell Ct; Southall Ct., Marlborough Dr.)                     |                          |                  |                  |                  |                  |                    |                    |
| * * Stonegate Estates Subdivision (Wesbett St.)  |                          | 441              |                  |                  |                  |                    |                    |
| * * D. & R. Cowperthwaite Subdivision (Mason Ave.)   |                          | 284              |                  |                  |                  |                    |                    |
| * * Deerwood Subdivision (Jewett St.)  |                          | 161              |                  |                  |                  |                    |                    |
| * * Brookside Mini-Home Park (Jeremy St., Kimberley St., Randolph St.)                         |                          | 359              |                  |                  |                  |                    |                    |
| *** Devon Indian Reserve (Brooks Ct.)  |                          |                  |                  |                  |                  |                    |                    |
| * * Waterloo Estates   | 145                      | 82               |                  |                  |                  |                    |                    |
| * * Carrington Lane Subd. Phase II (Rosemere Dr., Lexington Ln., Mannington Ln., Douglas Ave.) |                          |                  |                  |                  |                  |                    |                    |
| <b>TOTALS</b>  | <b>145</b>               | <b>2481</b>      | <b>312</b>       | <b>831</b>       | <b>130</b>       | <b>403</b>         | <b>397</b>         |

OVERALL TOTAL - 4699 metres = 4.699 kilometres

- \* Done under System Replacement and Oversizing.
- \*\* Entire cost paid for by Developers through Local Improvement Agreements.
- \*\*\* Paid for by the Department of Indian and Northern Affairs.

**STORM SEWER:**

In 1990, storm sewer mains were installed on Regent Street between Priestman Street and Montgomery Street; Cityview Avenue outfall; on Hollybrook Street from Canada Street to Cowperthwaite Street; on Sunset Drive between Currie Avenue and Clements Drive; on Queen Street between Westmorland Street and Lofood; at the Woodstock Road Sheraton Hotel outfall; at Duval Park; and along Canada Street from #405 to Daulphin Street.

New mains were also installed by developers adjacent to the Trans Canada Highway near Hanwell Road to facilitate future development; in the Garden Place Subdivision (Chartwell Court, Southall Court, Marlborough Drive); Stonegate Estates Subdivision (Wesbett Street); D. & R. Cowperthwaite Subdivision (Mason Avenue); Deerwood Subdivision (Jewett Street); Brookside Mini-Home Park (Jeremy Street, Kimberley Street, Randolph Street); and in front of the Youssef property (Woodstock Road).

New storm sewer mains were also installed in the Devon Indian Reserve on Brooks Court.

Following are lengths and sizes of storm sewer mains installed in 1990:

| LOCATION  | LENGTH OF MAINS - metres |             |            |            |            |           |           |
|---|--------------------------|-------------|------------|------------|------------|-----------|-----------|
|   | 250 mm                   | 300 mm      | 375 mm     | 400 mm     | 450 mm     | 500 mm    | 750 mm    |
| (i) Regent St.-Priestman to Montgomery<br>Cityview Avenue Outfall | 176                      | 6           | 34         |            | 533        |           | 25        |
| Hollybrook St. -Canada St. to<br>Cowperthwaite St.                | 16                       | 62          | 86         | 200        | 51         | 18        | 32        |
| (ii) Canada St.-#405 to Daulphin St.                              |                          |             |            |            |            |           | 179       |
| (iii) Sunset-Clements Dr. Area                                    |                          |             |            |            |            |           |           |
| (iv) T.C.H. Crossing (Llewellyn)                                  |                          |             |            |            |            |           | 77        |
| (v) Queen St.-Westmorland St. to Lofood                           |                          |             |            |            |            |           |           |
| Garden Place Subd. (Chartwell Ct.,                                | 14                       |             |            |            |            |           |           |
| Southall Ct., Marlborough Dr.)                                    |                          |             |            | 435        |            |           |           |
| Stonegate Estates Subd. (Wesbett St..)                            | 59                       |             |            |            |            |           |           |
| (iv) D & R Cowperthwaite Subd. (Mason Ave..)                      | 54                       | 284         |            |            |            |           | 16        |
| (iv) Deerwood Subd. (Jewett St..)                                 | 8                        | 135         |            |            |            |           | 62        |
| (iv) Brookside Mini-Home Park (Jeremy St.,                        | 36                       | 270         |            |            |            |           | 81        |
| Kimberley St., Randolph St.)                                      |                          |             |            |            |            |           |           |
| (vi) Woodstock Rd. (Youssef Property)                             | 72                       | 66          |            |            |            |           | 287       |
| (ii) Woodstock Rd. (Sheraton Outfall)                             |                          |             |            |            |            |           |           |
| (vii) Duval Park  |                          |             |            |            |            |           | 78        |
| (viii) Devon Indian Reserve (Brooks Ct.)                          | 22                       | 80          |            |            |            |           |           |
| <b>TOTALS</b>   | <b>457</b>               | <b>1379</b> | <b>927</b> | <b>18</b>  | <b>624</b> | <b>83</b> | <b>25</b> |
| OVERALL TOTAL -   | 4010                     | metres or   | 4.010      | kilometres | 287        | 25        | 210       |

- (i) Done in conjunction with Regent Street Upgrading.
- (ii) Done under O & M storm sewer.
- (iii) Done in conjunction with the installation of water and sanitary sewer.
- (iv) Entire costs paid for by Developers through Local Improvement Agreements.
- (v) Done in conjunction with the Mainstreet Program.
- (vi) Paid for by Developer as a condition of subdivision.
- (vii) Done in conjunction with work on the park.
- (viii) Paid for by the Department of Indian and Northern Affairs.

CURB AND GUTTER

Concrete curb and gutter was constructed at the following locations in 1990:

| <b>Location</b>   | <b>Length (metres)</b> |
|---|------------------------|
| Biggs Street .....  | 1045                   |
| Broad Street .....  | 314                    |
| * Canada Street-Hollybrook St. to Marysville St ..  | 358                    |
| ** Collett Court .....  | 269                    |
| Estey Lane .....  | 562                    |
| Evans Street .....  | 515                    |
| *** Gibson/Union Intersection .....   | 564                    |
| ** Golf Club Road- Duval Ct. to Coburn Dr. ....   | 1193                   |
| Kingswood Drive .....   | 899                    |
| ***** Legislature Area (Queen St.; St. John St.; King St.) .....                          | 334                    |
| *** Main/Sunset Intersection .....  | 158                    |
| ** McGloin Street - Bridge St. to former R.R.Tracks.                                      | 578                    |
| ** Morrison St./Allen St.-River St. to Morrison St..                                      | 722                    |
| ** Murray Avenue-Grant St. to the end .....   | 572                    |
| Pederson Crescent - existing to Montgomery St....   | 394                    |
| **** Regent Street - Montgomery St. to Priestman St.<br>and associated cross streets .... | 2668                   |
| Staples Court .....   | 409                    |
| *** St. Marys/Maple Intersection .....  | 393                    |
| * Waterloo Row - Forest Hill Rd. eastwards .....  | 348                    |
| *** Wilsey/Lincoln Rd. Intersection .....   | 49                     |
| Wiggins Drive .....   | 551                    |
| <b>TOTAL .....</b>  | <b>12895</b>           |

12895 metres = 12.895 kilometres

- \* Done in conjunction with sidewalk installation.
- \*\* Done under street upgrading.
- \*\*\* Done under Traffic Management.
- \*\*\*\* Special upgrading project. Cost shared with Department of Transportation and Tritor Development.
- \*\*\*\*\* Done under O & M budget.

**PAVING:**

In 1990, Gorman Paving Inc. was awarded a contract to supply and place asphalt concrete on a number of City streets.

The street preparatory work was done by City forces.

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

- 1) Binder Course - Type "B" at \$46.08 per tonne in place
- 2) Surface Course - Type "D" at \$49.45 per tonne in place

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

The following streets were paved with Type "B" asphalt concrete in 1990:

| <u>Location</u>                                    | <u>Length (metres)</u> |
|--|------------------------|
| * Alison Boulevard - Kimble Rd. to Gillis Rd. .... | 950                    |
| Biggs Street .....                                 | 525                    |
| Broad Street .....                                 | 140                    |
| Collett Court .....                                | 132                    |
| Estey Lane .....                                   | 302                    |
| Evans Street .....                                 | 275                    |
| * Gillis Road .....                                | 230                    |
| Golf Club Road - Duval Court to Coburn Drive....   | 600                    |
| Hodgson Road - Gillis Road to Apex Property ....   | 390                    |
| * Hodgson Road - existing to Gillis Road .....     | 210                    |
| Kingswood Drive .....                              | 433                    |
| McGloin St. - Bridge St. to former R.R. Tracks..   | 288                    |
| Morrison St./Allen St.- River St. to Morrison St.  | 420                    |
| Murray Avenue - Grant St. to the end .....         | 260                    |
| Pederson Crescent - existing to Montgomery St...   | 174                    |
| Staples Court .....                                | 204                    |
| Sunset Dr.- R.R. Tracks to Clements Dr. ....       | 419                    |
| Wiggins Street .....                               | <u>255</u>             |
| <b>TOTAL .....</b>                                 | <b>6207</b>            |

6207 metres = 6.207 kilometres

\* A top layer of Type "D" asphalt was also placed.

(2) SURFACE COURSE - TYPE "D"

The following streets were paved with Type "D" asphalt concrete in 1990:

| <u>Location</u>                    | <u>Length (metres)</u> |
|------------------------------------|------------------------|
| Gibson/Union Intersection .....    | 240                    |
| St. Marys/Maple Intersection ..... | <u>215</u>             |
| TOTAL .....                        | 455                    |
| 455 metres = 0.455 kilometres      |                        |

CONCRETE SIDEWALKS:

New sidewalks were constructed at the following locations in 1990:

| <u>Location</u>  | <u>Length (metres)</u> |
|--|------------------------|
| Beaverbrook Street - UNB Gates to Gymnasium .....  | 117                    |
| Biggs Street .....   | 448                    |
| Broad Street .....   | 166                    |
| Canada Street - Hollybrook St. to Daulphin Dr. ....                                      | 521                    |
| Charles Avenue .....   | 259                    |
| Estey Lane .....   | 300                    |
| Evans Street .....   | 265                    |
| Fairview Drive - Arlington St. to Mountain Dr. ....                                      | 401                    |
| Greenwood Drive - Marysville By-Pass Rd. to end<br>of curb .....                         | 198                    |
| Kingswood Drive .....  | 236                    |
| Legislature Area (Queen St.; St. John St.; King St)                                      | 455                    |
| Maple Street - St. Marys St. to Douglas Ave. ....  | 463                    |
| Maple Street - Douglas Ave. to Preston Dr. ....  | 81                     |
| Maple Street - Wallace Ave. to Oak Ave. ....   | 182                    |
| * McGloin Street - Bridge St. to former R.R. Tracks..                                    | 260                    |
| * Morrison St./Allen St. - River St. to Morrison St..                                    | 729                    |
| * Murray Avenue - Grant St. to the end .....   | 284                    |
| ** Regent Street - Montgomery St. to Priestman St. and<br>associated cross streets ..... | 1512                   |
| Waterloo Row - Forest Hill Road eastwards .....  | 365                    |
| Wiggins Drive .....  | <u>215</u>             |
| TOTAL .....  | 7457                   |

7457 metres = 7.457 kilometres

- \* Done under Capital Street Upgrading account.
- \*\* Done in conjunction with the Regent Street Widening.

### STREET UPGRADING

In 1990, a number of streets were upgraded with curb and gutter and paving and, in some instances, sidewalk. These streets included the Golf Club Road from Duval Court to Coburn Drive, Collett Court, Morrison Street/Allen Street, Murray Avenue from Grant Street to the end and McGloin Street from Bridge Street to the former R.R. Tracks. The upgrading of Murray Avenue and McGloin Street also included the complete reconstruction of the structural granular base of the street.

### TRAFFIC MANAGEMENT:

In 1989, work and/or design was begun for the Gibson Street-Union Street, St. Marys Street - Maple Street, and Sunset Drive - Main Street intersections. This work was finalized in 1990.

Also, in 1990 temporary signals were installed at the Lincoln Road/Wilsey Road intersection and land was purchased for future intersection improvements at Lincoln Road/Dunns Crossing Road.

### SPECIAL PROJECT:

In 1990, work began on the first phase of widening Regent Street between Montgomery Street and Prospect Street. This phase will be finalized in 1991. The second phase of the project will begin in 1991.

### MAINSTREET PROGRAM:

In 1990, the upgrading of the downtown area of the City continued. Work was finalized by the Barkerhouse development on Queen Street and the Frederick Square development on Westmorland and Queen Streets.

### ACOUSTICAL FENCE - KIMBLE DRIVE

The design for this fence was done in 1989, however, construction did not take place until 1990. The fence is located in the Birmingham Court - Derby Court - Canterbury Drive area of Kimble Drive.

**NEW STREET CONSTRUCTION:**

The following new streets or portion of streets were constructed in 1990:

| <b>Location</b>                             | <b>Length (metres)</b> |
|---|------------------------|
| * Bamberg Court .....                       | 36                     |
| ** Brooks Court (Devon Indian Reserve)..... | 105                    |
| * Carrington Lane .....                     | 36                     |
| * Douglas Avenue .....                      | 176                    |
| Hodgson Road Extension .....                | 274                    |
| * Jeremy Street .....                       | 53                     |
| * Jewett Street .....                       | 390                    |
| * Kimberley Street .....                    | 522                    |
| * Lexington Lane .....                      | 480                    |
| * Mannington lane .....                     | 329                    |
| * Marlborough Drive .....                   | 211                    |
| * Mason Avenue .....                        | 160                    |
| * Randolph Street .....                     | 53                     |
| * Rosemere Drive .....                      | 173                    |
| * Southall Court .....                      | 128                    |
| * Wesbett Street .....                      | <u>293</u>             |
| <br>TOTAL .....                             | <br><u>3419</u>        |

3419 metres = 3.419 kilometres

- \* Constructed by Developers through Local Improvement Agreements.
- \*\* Paid for by the Department of Indian and Northern Affairs.

DESIGNATED ROUTES

The City of Fredericton has a total of 54.648 km of provincial designated highways within its boundaries. In 1990, the Provincial Government paid \$ 323.76 (winter) and \$ 81.69 (summer) per lane kilometre towards maintenance of the routes respectively. If any improvements such as new curb and gutter, paving or storm sewer installations are done to these routes, authorization by the Department of Transportation is required.

The following authorized project was undertaken in 1990:

- (1) Route 101 - Regent St. (Montgomery  
to Priestman)  
Reconstruction and Widening ..... \$ 1 449 703

TOTAL ..... \$ 1 449 703

**CAPITAL PROGRAMS**  
**SUMMARY OF EXPENDITURES**

| ITEM   | BUDGET     | EXPENDITURE | REMARKS   |
|--|------------|-------------|---|
| <b><u>UTILITY FUND</u></b>                                     |            |             |   |
| Hodgson Road Extension - WATER & SANITARY SEWER                | \$ 160 000 | \$ 130 362  | Continued from 1989                               |
| Regent St. - Priestman to Montgomery SANITARY SEWER            | 150 000    | 111 753     |   |
| Regent Reservoir South - WATER                                 | 350 000    | 186 817     |   |
| Prospect Street - Smythe to Greenfields - WATER                | 300 000    | 245 506     |   |
| T.C.H. (Smythe to Regent) - WATER                              | 350 000    | 307 913     |   |
| Brunswick St. Trunk - WATER & SANITARY SEWER                   | 300 000    | 220 387     |   |
| Well #6 (Wilmot Park) - WATER                                  | 250 000    | 269 828     |   |
| Montgomery East Reservoir - WATER Repairs                      | 250 000    | 128 943     | To be finalized in 1991                           |
| Regent Reservoir - WATER                                       | 600 000    | 835 611     | Failed on first filling<br>To be replaced in 1991 |
| Sunset-Clements Dr. Area - WATER & SANITARY SEWER              | 400 000    | 453 190     |   |
| Dewitt Acres -WATER & SANITARY SEWER                           | 250 000    | 18 846      | Deferred - awaiting easement acquisitions         |
| System Replacement & Oversizing - WATER & SANITARY SEWER       | 400 000    | 187 487     |   |
| <b><u>GENERAL FUND</u></b>                                     |            |             |   |
| Hodgson Rd. Extension - STREET CONSTRUCTION AND RECONSTRUCTION | 310 000    | 325 918     | Continued from 1989                               |
| Back Drain (Regent to York) - STORM SEWER                      | 300 000    | 50 444      | Continued from 1989                               |
| Gibson/Union Intersection - TRAFFIC MANAGEMENT                 | 200 000    | 164 166     | Continued from 1989                               |
| St.Marys/Maple Intersection - TRAFFIC MANAGEMENT               | 120 000    | 93 731      | Continued from 1989                               |

CAPITAL PROGRAMS  
SUMMARY OF EXPENDITURES

| ITEM  | BUDGET    | EXPENDITURE | REMARKS                 |
|---|-----------|-------------|-------------------------|
| <b><u>GENERAL FUND (continued)</u></b>  |           |             |                         |
| Sunset/Main Intersection - TRAFFIC MANAGEMENT   | \$ 70 000 | \$ 51 359   | Continued from 1989     |
| Kimble Drive Acoustical Fence   | 40 000    | 62 600      | Continued from 1989     |
| Dewitt Acres - STORM SEWER  | 40 000    | -           | To be finalized in 1991 |
| Cityview Avenue Storm Sewer Outfall   | 50 000    | 81 329      |                         |
| Hollybrook St. (Canada to Cowperthwaite) - STORM SEWER                                | 30 000    | 23 079      |                         |
| Angelview Court - CURB & GUTTER AND PAVING  | 60 000    | 56 876      |                         |
| Garden Place Subdivision - CURB & GUTTER AND PAVING                                   | 82 000    | 82 000      |                         |
| Biggs St. - CURB & GUTTER AND PAVING  | 110 000   | 112 257     | To be finalized in 1991 |
| Broad St.; Evans St.; Wiggins Dr.; Estey Lane; Staples Ct. - CURB & GUTTER AND PAVING | 270 000   | 249 351     |                         |
| Kingswood Dr. - CURB & GUTTER AND PAVING  | 90 000    | 83 669      |                         |
| Pederson Cres. - CURB & GUTTER AND PAVING   | 40 000    | 38 617      |                         |
| Golf Club Rd. (Duval to Coburn) - STREET UPGRADING                                    | 160 000   | 181 679     |                         |
| Collett Court - STREET UPGRADING  | 30 000    | 31 245      |                         |
| Morrison St. - STREET UPGRADING   | 100 000   | 143 411     |                         |
| Murray Ave. - STREET UPGRADING  | 100 000   | 111 851     |                         |
| Forest Hill Rd. (Biggs to Kimble) - STREET UPGRADING                                  | 60 000    | 169         | To be finalized in 1991 |

CAPITAL PROGRAMS  
SUMMARY OF EXPENDITURES

| ITEM  | BUDGET    | EXPENDITURE | REMARKS   |
|---|-----------|-------------|---|
| <b><u>GENERAL FUND (continued)</u></b>  |           |             |   |
| McGloin St. (Bridge to former R.R.<br>Tracks) - STREET UPGRADING                          | \$ 90 000 | \$ 124 894  | The Province contributed<br>\$30 000 towards this<br>project. |
| Lincoln Rd./Dunn's Crossing Rd.<br>Property Purchase -<br>- TRAFFIC MANAGEMENT            | 80 000    | 80 000      |   |
| Temporary Signals - Lincoln/Wilsey<br>- TRAFFIC MANAGEMENT                                | 30 000    | 39 361      |   |
| Regent Street Widening<br>Special Project (Montgomery St.<br>to T.C.H.)                   | 1 650 000 | 1 449 703   |   |
| Mainstreet Program  | 100 000   | 73 637      |   |
| <b><u>NEW SIDEWALK (Done under O &amp; M Budget) and Local Improvement Agreements</u></b> |           |             |   |
| Canada St. (Hollybrook to Daulphin)   | 70 000    | 90 293      |   |
| Fairview Dr. (Arlington to Mountain)  | 30 000    | 44 953      |   |
| Charles Avenue  | 20 000    | 17 876      |   |
| Greenwood Dr. (Ring Rd. to end of<br>curb)  | 10 000    | 9 132       |   |
| Maple St. (Preston to Douglas,<br>South Side)   |           |             |   |
| Maple St. (Douglas to St. Marys,<br>North Side)   | 60 000    | 68 530      |   |
| Maple St. (Oak to Wallace,<br>South Side)   |           |             |   |
| Beaverbrook St. (University Gates<br>to Gymnasium)  | 15 000    | 9 819       |   |
| Waterloo Row (Forest Hill Rd.<br>eastwards)   | 60 000    | 60 319      |   |
| Forest Hill Road (Beaverbrook St.<br>westwards)   | 20 000    | 16 697      |   |

CAPITAL PRO RAMS  
SUMMARY OF EXPENDITURES

| ITEM   | BUDGET    | EXPENDITURE | REMARKS  |
|--|-----------|-------------|--|
| Dunn Acres Subd. (Biggs St.)   | \$ 33 000 | \$ 26 883   | Done under Local Improvement Agreement   |
| Chippins-Seymour Subdivision<br>(Broad St., Wiggins Dr.,<br>Evans St., Estey Lane) | 62 000    | 48 768      | Done under Local Improvement Agreement   |
| Golf Club Rd. Estates -Kingswood Dr.   | 27 000    | 13 413      | Done under Local Improvement Agreement.<br>Vacant Lots - Crusher<br>Dust Sidewalk Installed. |

WATER QUALITY - 1990GENERAL

Fredericton's Water Treatment Plant was put into service in July 1984, and with the commissioning of the pipeline to Fredericton North in late 1987, is now treating approximately 90% of the City supply. The plant removes iron and manganese and raises the pH to approximately 8 pH units, thus reducing the damage by corrosion to the water system. The chlorine content of the treated water is 0.9 - 1.1 mg/L measured as free chlorine. This water is odourless, colourless, and has an agreeable taste.

Layers of impurities and corrosion byproducts left in parts of the distribution system by previous water supplies tend to deplete the free chlorine residual until their own chlorine demand is satisfied. When the resultant chlorine residual is low, reaction byproducts with chemical or bleach like odours can be sensed. As chlorine residuals have continued to rise throughout the systems served by the Water Treatment Plant, complaints concerning objectionable tastes and odours have continued to decrease.

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

BACTERIAL ANALYSIS

Coliform bacteria counts are accepted as a good index of the degree of bacteriologic safety of water. Although they are not themselves disease producers, coliform bacteria are found in densities roughly proportional to the degree of fecal pollution in polluted water. When members of the coliform group are present, other kinds of microorganisms capable of causing disease may also be present. The absence of coliform bacteria from water is an indication that the water is bacteriologically safe for human consumption, since coliform bacteria are more hardy than disease-causing bacteria.

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

Tests showing positive with small numbers of coliform are not uncommon, and are usually attributed to poor sampling conditions, slight contamination of sample tap, or inexperience of sampler. In such cases, resampling and reanalysis is carried out. During 1990, no samples contained more than a few coliform and no location provided positive results on resampling.

#### CHEMICAL ANALYSIS

Samples for chemical analysis were taken from wells and the distribution system in January, 1991 and analysed by Environment New Brunswick's laboratory. Results are displayed on the following page.

One column concerning annual pumpage is added for quick reference.

| LOCATION                 | pH<br>pH units | Hardness<br>mg/L/CaCO <sub>3</sub> | Tot.Alk<br>mg/L/CaCO <sub>3</sub> | Ca<br>mg/L | Cl<br>mg/L | Cond.<br>µS/cm | Cu<br>mg/L | F<br>mg/L | Fe<br>mg/L | K<br>mg/L | Mg<br>mg/L | Mn<br>mg/L | Na<br>mg/L | N<br>mg/L | Pb<br>ug/L | S04<br>mg/L | Turb<br>NTU | Zn<br>mg/L | 1990 Pumpage<br>ML |
|--------------------------|----------------|------------------------------------|-----------------------------------|------------|------------|----------------|------------|-----------|------------|-----------|------------|------------|------------|-----------|------------|-------------|-------------|------------|--------------------|
| WILMOT #1 WELL           | 6.98           | 43.4                               | 53.0                              | 13.8       | 2.8        | 146            | .010       | .15       | .02        | .86       | 2.19       | .84        | 6.9        | .03       | .5         | 9.81        | .2          | .0         | 1700               |
| WILMOT #2 WELL           | 6.64           | 59.5                               | 43.3                              | 18.9       | 19.4       | 198            | .006       | .14       | .02        | .72       | 3.00       | 1.52       | 10.7       | .19       | .4         | 14.8        | .1          | .023       | 2260               |
| WILMOT #3 WELL           | 7.08           | 98.0                               | 78.5                              | 32.2       | 29.0       | 311            | .020       | .13       | .02        | 2.74      | 4.30       | .06        | 13.4       | .55       | .3         | 20.7        | .1          | .0         | 1280               |
| WILMOT #4 WELL           | 6.81           | 86.8                               | 47.7                              | 28.2       | 62.7       | 402            | .005       | .13       | .02        | 2.82      | 4.00       | .21        | 34.9       | 1.24      | .4         | 25.3        | .1          | .019       | 804                |
| WILMOT #5 WELL           | 7.06           | 40.4                               | 49.3                              | 12.9       | 2.5        | 134            | .034       | .12       | .04        | .79       | 2.01       | .83        | 5.1        | .01       | .27        | 9.09        | .2          | .025       | 2120               |
| WILMOT #6 WELL           | 6.88           | 39.2                               | 41.2                              | 12.1       | 10.4       | 154            | .0         | .19       | .03        | .60       | 2.20       | .57        | 8.7        | .20       | .7         | 9.54        | .1          | .0         |                    |
| WTP INFLOW               | 6.83           | 55.1                               | 52.9                              | 17.6       | 11.1       | 191            | .0         | .14       | .07        | 1.16      | 2.74       | .71        | 9.0        | .16       | .1         | 13.6        | .1          | .0         |                    |
| WTP EFFLUENT             | 7.96           | 79.6                               | 78.9                              | 26.9       | 14.8       | 248            | .0         | .15       | .00        | 1.13      | 2.98       | .02        | 10.9       | .27       | .0         | 14.7        | .4          | .0         |                    |
| RAINFORD PARK WELL       | 7.09           | 48.3                               | 59.3                              | 16.2       | .4         | 146            | .0         | .11       | .01        | .31       | 1.87       | .016       | 5.2        | .03       | .4         | 12.5        | .3          | .0         | 15                 |
| SILVERWOOD #2 WELL       | 7.88           | 183.1                              | 180.3                             | 32.7       | 18.7       | 438            | .0         | .14       | .06        | .78       | 24.66      | .0         | 19.0       | .03       | .1         | 22.7        | .6          | .039       | 12                 |
| SILVERWOOD #3 WELL       | 7.81           | 116.3                              | 113.6                             | 23.6       | .1         | 244            | .0         | .09       | .02        | .41       | 13.94      | .0         | 3.6        | .03       | .0         | 10.2        | .3          | .036       | 54                 |
| TOWER ROAD #1 WELL       | 7.56           | 91.5                               | 74.1                              | 30.9       | 8.5        | 291            | .003       | .18       | .0         | .45       | 3.47       | .03        | 13.1       | .03       | .2         | 45.0        | .5          | .0         | 122                |
| TOWER ROAD #2 WELL       | 7.20           | 81.5                               | 70.3                              | 26.3       | 24.3       | 266            | .0         | .16       | .02        | .50       | 3.86       | .01        | 13.1       | .03       | .1         | 14.7        | .1          | .011       | 294                |
| KILLARNEY KI WELL        | 7.45           | 68.8                               | 84.5                              | 22.9       | 1.9        | 220            | .028       | .16       | .05        | .47       | 2.81       | .01        | 9.1        | .03       | .5         | 17.4        | .1          | .0         | 275                |
| KILLARNEY K10 WELL *     | 7.93           | 61.7                               | 93.2                              | 22.2       | .7         | 216            | .017       | .24       | .00        | .41       | 1.52       | .13        | 18.3       | .03       | .3         | 13.9        | .2          | .0         |                    |
| CAMERON CT. WELL *       | 7.41           | 81.5                               | 105.8                             | 27.3       | 35.0       | 367            | .001       | .22       | .04        | .62       | 3.22       | .04        | 36.0       | .31       | .7         | 27.5        | .2          | .0         | 37                 |
| CLIFFE WELL *            | 7.52           | 64.3                               | 89.9                              | 23.1       | .4         | 209            | .0         | .13       | .04        | .52       | 1.63       | .15        | 8.8        | .01       | .1         | 12.8        | .3          | .021       |                    |
| HIGHLAND WELL *          | 6.89           | 72.8                               | 58.8                              | 24.8       | 14.8       | 219            | .007       | .12       | .05        | .59       | 2.62       | .04        | 9.3        | .03       | .3         | 28.3        | .2          | .024       |                    |
| MAPLE #1 WELL *          | 7.28           | 109.5                              | 93.9                              | 37.3       | 39.6       | 378            | .010       | .19       | .03        | .73       | 4.01       | .04        | 23.6       | .28       | .6         | 22.6        | .7          | .011       | 2                  |
| MAPLE #3 WELL *          | 7.61           | 94.0                               | 103.8                             | 33.0       | 27.9       | 353            | .0         | .16       | .01        | .69       | 2.80       | .02        | 18.0       | .01       | .6         | 24.2        | .2          | .0         |                    |
| MCGOLIN WELL *           | 7.73           | 62.6                               | 79.9                              | 20.4       | 10.1       | 240            | .0         | .22       | .11        | .66       | 2.84       | .14        | 14.6       | .24       | .3         | 20.0        | 1.7         | .013       | 1                  |
| GREENWOOD #1 WELL *      | 9.04           | 5.4                                | 122.1                             | 2.0        | 14.4       | 327            | .0         | .98       | .11        | .49       | .08        | .04        | 72.7       | .03       | .0         | 14.2        | 3.4         | .0         |                    |
| DUNAL WELL *             | 7.51           | 131.5                              | 131.0                             | 44.4       | 37.4       | 427            | .007       | .22       | .02        | .97       | 5.03       | .10        | 20.6       | .08       | .6         | 19.6        | .1          | .015       | 1                  |
| PARK ST. SCHOOL ***      | 7.40           | 68.0                               | 86.1                              | 22.6       | 3.1        | 222            | .010       | .16       | .01        | .46       | 2.80       | .012       | 9.2        | .01       | .2         | 17.1        | .1          | .004       |                    |
| NEHC BUNKER ***          | 7.25           | 81.5                               | 70.7                              | 26.5       | 20.5       | 274            | .019       | .16       | .03        | .49       | 3.71       | .00        | 13.1       | .03       | .5         | 24.7        | .1          | .0         |                    |
| TRUDELL BLDG., PEPIN *** | 7.82           | 68.7                               | 75.5                              | 23.2       | 13.1       | 230            | .043       | .15       | .02        | .92       | 2.65       | .04        | 12.3       | .09       | .6         | 14.1        | .2          | .0         |                    |
| WOODBRIDGE RELAY **      | 7.69           | 87.1                               | 77.7                              | 16.2       | 250        | 014            | .15        | .03       | 1.13       | 3.01      | .01        | 12.0       | .20        | .1        | 13.0       | .1          | .014        |            |                    |
| YORK MANOR, SUNSET ***   | 7.66           | 81.4                               | 77.1                              | 27.8       | 14.6       | 245            | .015       | .14       | .03        | 1.12      | 2.92       | .01        | 11.2       | .20       | .0         | 14.2        | .1          | .0         |                    |

TOTAL ..... 8979

|                                  |         |        |     |      |     |     |     |
|----------------------------------|---------|--------|-----|------|-----|-----|-----|
| Detection Limits                 |         | .05    |     | .01  |     | 2.0 |     |
| Aesthetic Objective              | 6.5-8.5 | 250    | 1.0 | 0.05 | 200 | 500 | 5.0 |
| Maximum Acceptable Concentration | 200     | 30-500 | 200 | 1.5  | 300 | 150 | 1.0 |

\* These wells are on emergency standby duty.

\*\* Sample points within distribution system.

Aesthetic objectives and maximum acceptable concentration are from guidelines for Canadian Drinking Water Quality, Health and Welfare Canada, 1987.