INFRASTRUCTURE SERVICES DIVISION
Department of Public Works

REPORT ON 2002 ACTIVITIES

The Infrastructure Services Division is responsible for the design, construction, operations and maintenance of all streets, alleys, bridges, public way lighting, traffic control signs and signals, sewers and underground conduit systems; and overseeing the construction of water facilities. This Division is the largest of the six Divisions of the Department of Public Works (DPW), with a work force that expands in excess of 1,000 employees during the construction and repair season.

ADMINISTRATION SECTION

The Administration Section is responsible for business operations, budget coordination, computer network software and hardware administration, personnel administration, accounting and clerical functions, and the Equal Employment Opportunity administration for the Infrastructure Services Division.

The Section coordinates accounting functions along with the Department of Public Works Administration Services Division and the Comptrollers Office. The accounting services provided by the Section include establishing projects, recording payments, monitoring costs, and closing project budgets and expenditures for the Transportation Section and Environmental Section in coordination with the Construction Section. In addition, the Section is involved in accumulating, categorizing, recording and reporting operation and maintenance expenditures for the Division. The Section also acts as the accounting resource for tracking and monitoring projects; supports the accumulation of accounting data used in the development and measurement of project estimating and performance; and assists in the development and programming of financial reports for use by managers in the Division.

In 2002, the Section administered Capital Improvement and Grant and Aid Programs in excess of $47.6 million, an Operations and Maintenance budget of over $16 million, and payroll of nearly $32 million. Capital expenditures for the 2002 Sewer program were just under $19 million. The Section processed over 230 payments to contractors for sewer capital projects and 470 payments for other City projects. The 2002 expenditures for these contract payments totaled over $40 million. In addition to processing payments and monitoring construction contracts, the Administration Section provides support to other areas of the ISD on financial matters. The Section recorded and monitored expenditures that included payments to contractors, cost of City provided materials used in projects, as well as the salaries and benefits of City employees involved in the planning, implementing, and managing of the projects.

In 2002, Highway Aids were received by the City of Milwaukee in excess of $24 million. Using a 6-year average of 58.7% applied to this total, approximately $14 million related to DPW-Infrastructure activities. Over $550,000 was received for reimbursement of costs incurred in maintaining and operating lift bridges on the connecting highway system program. In addition, almost $2 million was received for Connecting Highways within the City of Milwaukee. Administration personnel were involved in the retrieval of information and gathering of support documents to produce the reports necessary to submit requests for these aids.

In 2002, the Administration Section worked with the Comptroller's office to develop a Request For Proposals (RFP) to implement the requirements of GASB 34 for all of the City. The RFP was awarded to American Appraisal Associates. The Section coordinated activities with all of Infrastructures Services to collect necessary data for the 2001 analysis in such a way that the data can be updated annually.

The Administrative Section completed the first report of the Mid-Year Review of the financial condition of the Sewerage System. The Commissioner of Public Works is required to file this report with the city clerk on or before July 1st of each year as stated in the Master Resolution for the Sewer Maintenance Fund to secure bonds. The Section works in conjunction with the Budget Office and the Financial Division of the Comptroller's office to evaluate data for this report. The Sewerage System has a required Debt Service coverage of 1.2 times net revenues. The report determined the Sewerage System is in compliance with the covenant as found in Article VIII of the Master Resolution.

The Section also provides support for the day-to-day operations of the computer systems within the Division and acts as liaison with other computer support areas within the City. This support includes hardware maintenance of the 90 GIS/CADD units and 197 general-purpose units within the Division as well as maintenance of the software for those units and the Network Servers. During the past year, the Section set up and installed 34 new GIS/CADD units and 13 new general-purpose units for Division users. In addition, hardware was reconditioned, reconfigured, updated and reinstalled for many Division users. This section also installed new anti virus software on the Division's workstations, took part in the evaluation of a new email system for DPW, generated ad-hoc reports from data contained in the Division's Roadlife system and various other data bases, maintained the database system that is used by the Transportation and Construction Sections to administer paving and walk contracts, and updated the software and methods used to transfer data between the Divisions' systems and the City's "Main Frame" system.

ENVIRONMENTAL SECTION

The Environmental Section is financed through the Sewer Maintenance fund and is responsible for the engineering work required for the programming, funding, design and installation of sanitary, storm and combined sewer facilities. The Section is also responsible for preparing plans and specifications for building sewers and water services and maintaining the sewer records. The Section also handles the administration and implementation of the City's two Wisconsin Pollutant Discharge Elimination System permits. This includes reviewing storm water management plans, testing storm system outlets for illicit connections and reporting sanitary to storm system crossover activity. In addition, the Section performs activities as part of the infiltration and inflow reduction program on flow monitoring, smoke testing, TV inspections, building inspections and manhole inspections and rehabilitation.

Following are highlights of the work performed in 2002 by the Environmental Section.

Sewer Design Area

The Section designed and let to contract 0.10 miles of new sanitary sewers, 12.46 miles of replacement sewers and 0.53 miles of sewer lining for a total cost of $21.10 million. These projects included:

- **East Fernwood Avenue Replacement Sewer**

A $1.31 million contract was awarded for the construction of a pre-cast reinforced concrete combined box sewer in the area generally bounded by East Fernwood Avenue, East Oklahoma Avenue, South Illinois Avenue and South Delaware Avenue. The size of pipe varies from 5 feet wide by 5 feet high to 6 feet wide to 6 feet high. This sewer will replace the existing 60-inch diameter combined sewer to provide adequate hydraulic capacity and it also accommodates approximately 200 acres of drainage from the city of St. Francis. This project will be completed by the summer of 2003.

- **South 19th Street Sewer Project**

A $754,000 contract was awarded in September of 2002 for the construction of 66-inch and 72-inch diameter combined sewers to replace the existing 54-inch diameter combined sewer located in South 19th Street from West Burnham Street to West Becher Street. The existing sewer was constructed in 1893 and was in poor structural condition. This project is in conjunction with the 108-inch diameter combined sewer constructed in West Becher Street in 2001 and will reduce backwater occurrences by increase the hydraulic capacity. A telephone package, gas main, and water main were required to be relocated in order to provide proper separation between the sewer and these utilities. The project is under construction and will be completed by May of 2003.

- **West Galena Street Slip Lining Project**

This combined sewer rehabilitation project is located in West Galena Street from North 4th Street to North 10th Street. The project was awarded in October 2002 and involves using the slip lining technique to rehabilitate the existing sewer. Slip lining is when a smaller diameter pipe is inserted into the larger diameter existing pipe. After completion of the pipe insertion, the remaining space between the new and existing pipes is filled with a cementitious grout.

Approximately 1800 feet of 43-inch diameter pipe is being slip lined into the existing 54-inch diameter combined sewer, which was constructed in 1887. Although the diameter of the sewer is reduced, the sewer will be able to convey the required flows due to the new pipe walls being very smooth. This rehabilitation method minimizes surface disturbances and disruptions to the area residents since the work is done within the existing pipe. The total cost for the project is $1.05 million.

- **North Hubbard Street Cured-in-place Lining Project**

This combined sewer rehabilitation project is located in North Hubbard Street from East Reservoir Avenue to East Lloyd Street. The cost of the project was $870,000. The project involved utilizing a cured-in-place liner technique of sewer rehabilitation. This method involves inserting a liner tube inside the existing sewer and then expanding and curing the liner to the inside of the existing sewer. Approximately 1000 feet of cured-in-place liner was installed in the existing 72-inch diameter combined sewer, constructed in 1930 and in poor structural condition. This rehabilitation method also minimizes surface disturbances and disruptions to the area residents since the work is done within the existing pipe.

- **West Vliet Street Cured-in-Place Lining Project**

This combined sewer rehabilitation project is located in West Vliet Street from North Hawley Road to North 60th Street. The cost of this project was $692,000. The project also involved utilizing the cured-in-place liner technique of sewer rehabilitation. Approximately 1168 feet of cured-in-place liner will be installed in the existing 78-inch diameter combined sewer, constructed in 1914 and in poor structural condition. This rehabilitation method also minimizes surface disturbances and disruptions to the area residents since the work is done within the existing pipe.

Storm Water Management Area

Storm Water Management Ordinance

The City adopted a revised storm water management ordinance that took effect as of January 1, 2002. The ordinance was revised to reflect regulations imposed by both the Wisconsin Department of Natural Resources (DNR) and the Milwaukee Metropolitan Sewerage District (MMSD). As a result of the revisions, a storm water management plan is now required for construction or reconstruction activity on parcels of land greater than one acre or were there will be an increase of 0.5 acres of impervious surface.

Storm Water Management Plan Review

In 2002, 103 storm water management plans were submitted and reviewed, with 96 being approved. Due to the new regulations by the MMSD, 18 of the storm water management plans also had to be submitted to the MMSD for their review and approval. MMSD has approved 16 of these plans, with the other 2 pending.

Illegal/Illicit Discharge Testing

Field-testing of storm water outfalls for illegal/illicit discharges continued throughout the City. The dry weather testing consists of a visual and chemical test for pollution at each outfall. The section performed a total of 1,086 storm water tests in 2002, Of these tests, 598 were at the outfall and 488 were follow up tests to identify sources of storm water pollution.

Twenty-three locations were identified as being potential sources of pollution. Dye testing has been performed at 11 of these locations and 6 cases of the sanitary building sewer being connected to the storm sewer were found. No illegal/illicit connections were identified at the other 5 locations dye tested. Of the 12 remaining location, 4 will be smoke tested and the other 8 we are working with the property owners to schedule the testing.

Lyons Creek Study

The City is continuing a cost sharing agreement with the United States Geological Survey (USGS) to conduct a three-year study in the Lyons Creek area. This study will determine the effectiveness of storm water pollution prevention information and education (I&E) programs on reducing pollutants found in urban streams. The sample site in the watershed is located at South 55th Street and West Holt Avenue. A control site for the study was established at South 18th Street and West Ramsey Avenue. In 2002, base sampling occurred to identify the existing pollutant loads in the creek. Thirty-two storm samples were taken and analyzed from the creek and 13 storm water samples were taken at the control site.

Infiltration and Inflow Reduction Program Area

Sanitary Sewer Flow Monitoring

Flow monitoring was performed in order to evaluate the performance of sanitary sewer systems in various wet weather conditions. In 2002, 69 sanitary sewer systems were monitored. The section collected data from March through October in 33 systems. A consultant was hired to collect data from April through July in 36 systems. The data was then used to determine if the performance of a system warrants further investigation.

Sanitary Sewer Evaluation Surveys

A consulting firm was contracted to perform smoke testing in 212 sanitary sewer systems in 2002. These systems were identified as having high rates of I/I through previous flow monitoring studies conducted by either the City of Milwaukee or the Milwaukee Metropolitan Sewerage District. The primary task of the surveys was to identify defects that have the potential to allow I/I into the sanitary sewer systems. The data from these surveys will be used to correct illegal connections, prioritize the maintenance and reconstruction of sewers and prepare rehabilitation contracts. The total cost of the survey work done in 2002 was $682,400.

Manhole Rehabilitation Program

In order to conform to the Milwaukee Metropolitan Sewerage District's 2010 Facilities Plan goal of reducing infiltration and inflow in the sanitary sewer system, the Section began a sanitary manhole inspection and rehabilitation program in 1998. In 2002, a contract was let for the repair of 2,118 sanitary manholes at a cost $2,087,706. The rehabilitation consists of replacing lids, installing seals and repairing defective brick work in the manholes.

Downspout Disconnection Project

In 2000, the City of Milwaukee received a $50,000 grant from the Milwaukee Metropolitan Sewerage District (MMSD) to study the effectiveness of disconnecting downspouts from a combined sewer system. The purpose of the project was to study a method of reducing the amount of clear water in the combined sewer system. A project was set in motion to disconnect downspouts from a system on the east side of Milwaukee.

In 2001, the City received an additional $50,000 to study downspout disconnection in a second combined sewer system. Each building in the study area was examined to determine which downspouts could be safely disconnected from the sewer and allowed to discharge to the surface.

Both studies have been completed. A report detailing the effort expended and the results achieved is being prepared for submittal to the MMSD.

Supervisory Control and Data Acquisition (SCADA) System

In 1998, a consulting firm was engaged to design, furnish, install, implement and test a new Supervisory Control and Data Acquisition (SCADA) System. This system provides remote monitoring and control of the 5 lift stations, 83 sanitary bypass pumps and 15 rain gauges in the City. The system is nearing completion and the contract is expected to be closed-out in 2003.

Automated Mapping and Drafting Area

In 2002, a consultant completed a study to define the procedures necessary to write a GIS program to move sewer record maintenance and reference maps entirely to the computer graphics system. The study provided detailed definitions specifying sewer lateral placement, updating plat pages, tracking and sorting, and supervisory tracking. Further issues with the Milwaukee County's MCAMLIS transformation project and the Microstation V8 upgrade were added to the study.

When this program is written, the section can begin digitizing the house sewer laterals and other remaining plat information, and progressively retire the hand drawn sewer plat pages and eliminate the duplication of effort in maintaining them. The completion of the digital plat pages is expected to be a multi-year effort.

Work began on the digitized sewer quarter section maps to restore graphic elements moved in the MCAMLIS transformation project. This project will bring all city-digitized maps into conformance with the State of Wisconsin coordinates. When work is complete, maps will be more accurate and seamless across quarter section boundaries. They can then be shared by all City departments as well as other municipalities or utilities.

Responsibilities of the Unit include:

- Provide the Sewer Design Area with street and utility information for new and replacement sewer projects
- Draw sewer construction plans for capital program work
- Assist citizens and plumbing contractors with sewer and sewer lateral questions
- Determine and collect sewer assessment income for the City from new land developments
- Update and provide sewer system plans for design studies and general reference
- Review completed sewer construction reports and update original plans with "as-built" information
- Prepare sewer construction sketches for use at public hearings
- Provide easement plans for sewer construction
- Maintain record retention schedules for sewer construction projects
- Process plumbing and building permits

Underground Conduit Area

During 2002, City forces installed an additional 0.6 miles of conduit and 7 additional manholes. An additional 1.6 miles of conduit and 15 manholes were installed for the City by others.

City Forces installed new conduit in West Mitchell Street from South Layton Boulevard to West Muskego Avenue. This conduit will service existing City facilities in addition to alleviating conduit congestion that existed in the area.

City Forces installed new conduit in West Congress Street from North 35th Street to North 37th Street. This conduit replaces the conduit that was lost with the removal of the North 37th Street Bridge over Lincoln Creek. MMSD's bridge contractor also replaced conduit in both the North Sherman Boulevard Bridge and the West Teutonia Avenue Bridge over Lincoln Creek. The Milwaukee Metropolitan Sewerage District funded these three installations as part of their Lincoln Creek Rehabilitation Project.

City forces installed conduit into the new Washington Park Library. The installation was requested and funded by the Milwaukee Public Library Department.

Conduit was installed for the City as part of the 6th Street Viaduct project. Upon completion, the City not only gained a vital connection between the north & south sides of the City but a connection into the Menomonee Valley at West Canal Street.

Conduit is being installed as part of the Park East Freeway project. Upon it's completion, the City will have a vital conduit connection in East Knapp Street/West McKinley Boulevard from South Milwaukee Street connection into West Fond du Lac Avenue thus providing a continuous conduit connection from the downtown area out to the far northwest side of the City.

As of December 31, 2002 there are 546.3 miles of underground conduit lines and 7,387 manholes in active service.

TRANSPORTATION SECTION

The Transportation Section is responsible for programming street, alley, and bridge improvements using city, state and federal funds; design of public way lighting, traffic control signals, signing and pavement markings; transportation planning; reviewing utility easements; coordinating public improvements in tax incremental districts; reviewing building permits and processing permits for street encroachments; locating bus passenger loading areas, designing handicapped access ramps in sidewalks; maintaining various city maps; operating a "Diggers Hotline" service; coordinating reviews of subdivision plats, certified survey maps, and opening and closings of public rights of way; coordinating transportation improvements with other governmental agencies and railroad companies; representing the City Engineer and/or the Department of Public Works on transportation issues; and undertaking engineering studies and investigations for the Common Council and other city departments.

The Section inspects and makes recommendations for Capital Improvements for all city maintained bridges and city owned parking structures. It also maintains plans and other records for the city's bridges, parking structures, dams, retaining walls, dock walls, and other structures; designs and prepares contract documents, and performs construction administration for a wide variety of projects involving structures.

The Section is also responsible for administering the city's local street and alley capital paving programs.

Project Programming Area

Administration of the City of Milwaukee's $5.3 million capital paving budget by the Project Programming Unit resulted in approval of 25 street paving and 30 alley projects in 2002, and the award of $3.6 million in contracts.

In 2002, the Project Programming Unit prepared 302 estimates and verified 108 city certified paving projects for improvement in the City of Milwaukee. The formal estimates prepared include 97 street paving projects (6 sponsored by the State of Wisconsin) and 63 alley-paving projects. The verified certificates include 78 street paving projects, of which twelve were sponsored by the State of Wisconsin and 18 alley paving projects.

Project Programming staff appeared before the Common Council's Public Improvements Committee for public hearings on 94 paving, new sewer and new water projects. In addition, resolutions were prepared to authorize construction for approximately 210 non-assessable public improvement projects. Upon completion of the work, the Unit reviews assessments, prepares and issues the associated special assessment bills to property owners affected by the work. In 2002, the unit issued 8,576 bills resulting in $4,767,000 in revenue to the City.

Major Projects Area

The Major Projects Unit coordinated the completion of six Federal and/or State Major Arterial Street projects at a total cost of $6,800,000, of which the City's portion was $1,400,000. The Major Federal and/or State paving projects completed in 2002 include the following:

- The reconstruction of East Kenwood Boulevard from North Oakland Avenue to North Downer Avenue.
- The reconstruction of North 12th Street from West Wisconsin Avenue to West Wells Street
- The reconstruction of East and West Center Street from North Dr Martin Luther King Jr. Drive to North Humboldt Boulevard.
- The reconstruction of West Howard Avenue from South 13th Street to South 27th Street.
- The resurfacing of North 16th Street from West Clybourn Street to West Wisconsin Avenue.
- The resurfacing of West Wisconsin Avenue from North 11th Street to North 20th Street.

As part of and in conjunction with the West Wisconsin Avenue/North 12 Street/North 16th Street projects, the Major Projects unit worked with Marquette University to incorporate streetscape items on these streets as part of the paving projects. The streetscape is part of the University's efforts to aesthetically enhance the appearance of the campus area. The streetscape items included reconstructing the intersection of North 12th Street and West Wisconsin Avenue with stamped colored concrete, providing a special surface jointing pattern throughout the project, particularly on the newly constructed pavements and sidewalks and other paving related treatments. This unit further worked with Marquette University toward completing the required preliminary engineering requirements associated with a Congestion Mitigation/Air Quality (CMAQ) Grant received from the Wisconsin Department of Transportation (WISDOT) for additional pedestrian lighting, landscaping and other streetscape items in and around the campus area.

The Major Projects Unit also coordinated the preliminary engineering work for the rehabilitation of the North Teutonia Avenue Bridge over the Lincoln Creek and the replacement of the South Chase Avenue Bridge over the Kinnickinnic River. These bridge projects were completed in 2002.

Preliminary engineering was in progress for 26 Federal and/or State Aided Major Street paving projects, 12 Local Bridge Replacement Program projects and two State Trunk Highway Bridge Replacement/Rehabilitation Projects.

In 2002, this unit completed the coordination and management of the Design-Build project to replace the Sixth Street Viaduct over the Menomonee Valley. This project was the first design-build bridge project in the State. The project opened to traffic in September of 2002 and the project continues to draw accolades and awards. The project estimate was $56 million. The final Design-build contract came in under estimate at $52.5 million dollars and was completed within the project's desired schedule.

Working with Federal, State, County staffs and private consultants, the unit continued the process to remove the Park East Freeway. The project involves the removal of the existing freeway and replacement with an at-grade roadway facility and a new movable bridge over the Milwaukee River at a total estimated cost of $25,000,000. The first construction contracts were let in 2002 and the work is progressing for an overall project completion in the spring of 2004. This unit continues to work with City and County staff in developing the redevelopment plan and streetscaping work for the lands formerly occupied by the Park East Freeway.

Major Project's staff also coordinated the City's efforts to assist the Southeast Wisconsin Regional Planning Commission in their preparation of the Transportation Improvement Program (TIP). This program is part of the Statewide Transportation Improvement Plan, which involves not only transportation planning efforts but also analyzing whether the State's air quality will meet future goals. This major effort involves compiling and updating project information on all Federal/State aided projects proposed for the TIP period.

As one of the City's major liaisons with the WISDOT, the Major Projects Unit was involved in several major efforts in 2002. These include the planned reconstruction and extension of West Canal Street in the Menomonee Valley. Agreements were negotiated with the WISDOT to partially fund this major street improvement in the Valley, which in addition to providing an alternate route for traffic during the reconstruction of the Marquette Interchange, will open up the Valley for development.

The unit is also working with the WISDOT in their efforts to design and coordinate work on the Marquette Interchange. This multimillion-dollar project will have a significant impact on the City, its citizens and its facilities.

In 2002, this unit again coordinated work undertaken with a WISDOT grant under the Local Roads Improvement Program (LRIP). This grant provides 50% State funds for construction work on City local streets. In 2002-2003, the City's entitlement was $1,067,000.

Structural Engineering Area

Preliminary engineering is in progress for the rehabilitation of the State Street Bascule Bridge over the Milwaukee River, the West Bradley Road Bridge over the Little Menomonee River, the Hawley Road Viaduct over the Canadian Pacific Railroad, the Highland Boulevard Bridge over the Canadian Pacific Railroad, the North 35th Street Bridge over Lincoln Creek, and the West Mill Road Bridge over the Menomonee River.

Milwaukee Gateway Partners, the design-build organization for the South 6th Street Viaduct over the Menomonee River Valley, continued construction in 2002. This was the first design build contract for a State and Federal aided bridge project between the State of Wisconsin Department of Transportation and the City of Milwaukee. Many new processes and some enabling legislation were required to bid, award, and complete this project. There were many other innovative ideas and firsts incorporated into the design and construction of this bridge. The bridge incorporates two cable stayed and two double leaf bascule spans which replaced the old 6th Street Viaduct. The new bridge slopes down to the floor of the Menomonee River Valley forming an at-grade intersection with Canal Street. The Viaduct was closed for 15 months and the new 6th Street Viaduct was opened to traffic in September of 2002.

The Sherman Boulevard Bridge over Lincoln Creek was completed and open to traffic in the fall of 2002. Final work was completed on the Chase Avenue Bridge over the Kinnickinnic River and it was open to traffic in December of 2002. The Chicago and Northwestern Railroad Bridge over South Chase Avenue was removed in June of 2002.

Final plans and specifications for the renovation of the North Teutonia Avenue Bridge over Lincoln Creek were completed and Lunda Construction Co. was awarded the construction contract. The major portion of the renovation work was completed and the bridge was reopened for traffic. Also, the North 35th Street Bypass Culvert over Lincoln Creek was completed as part of the Lincoln Creek Flood Control Project.

Other Lincoln Creek work performed in 2002 included review of the plans, specifications and construction details for the North 35th Street Bypass Culvert, the North 37th Street Pedestrian Bridge over Lincoln Creek and review of the channel work performed at all locations where City bridges cross Lincoln Creek.

Zenith Tech started construction of a new Knapp Street Lift Bridge one block north of Juneau Avenue in place of the elevated Park East Freeway bridges over the Milwaukee River. The bridge connecting a new widened West McKinley Avenue to East Knapp Street is scheduled for completion in the spring of 2004.

A critical inspection was performed for the City Hall Fire Escape and repair recommendations were proposed. Contract work was completed for deck sealing, expansion joint replacement, joint sealant repairs, crack repair, and parking stall striping work for the North 4th Street and West Highland Boulevard parking structure. A contract with plans and specifications was advertised for the painting of the North 4th Street and West Highland Boulevard parking structure.

A concept definition report was prepared and submitted for North Farwell Avenue over the Milwaukee County Bike Trail.

A contract for design services with Engineering Specialists, Inc. progressed with plans, specifications, and an estimate provided for a remote control bridge operating system to allow operation of the St. Paul Bridge from the Michigan Street Bridge.

Bridge inspections were performed during 2002 in accordance with the Federal and State guidelines. The guidelines include quantifying all major structural maintenance items on each bridge. A total of 180 routine bridge inspection reports were completed. Bridge rating calculations were also performed to determine the operating and inventory ratings of various bridges. The draft of the WISDOT structure inspection manual was reviewed.

Structural analysis was performed for various repair and construction projects involving street light poles, hollow walks and bridges with overloaded vehicles. Similarly, structural analysis was performed on the floor systems of two firehouses to assess their capacities to carry heavier firefighting vehicles.

Structural inspections, reports and reviews were made for various structures including a number of sewer structures and the effects of new utilities and connections to City bridges.

Emergency structural repairs were developed and implemented for the northeast retaining wall failure at the Highland Boulevard Bridge.

Plans were prepared for the Modular Retaining Wall on South 6th Street as part of the South 6th Street repaving.

This unit provided construction administration and inspection for the Department of City Development in connection with the Milwaukee River Walk initiative. The unit's responsibilities include review and recommendations for approval on all contracts, plans and specifications; construction budgets, change orders and payments, shop drawings and construction field inspections for projects not in the public way. The dock wall and river walk for Trostel Square and the River Homes residential project in the Beerline "B" Redevelopment project area had activity during 2002. In addition, the preliminary plans for the Kilbourn Landing/Milwaukee Rowing Club riverwalk and site development were reviewed and construction started. Construction work started on the Historic Third Ward Riverwalk with completion expected in spring of 2003.

Contract documents were prepared for the Kilbourn Park extension to North Commerce Street. The park will consist of walking and bike paths crossing the slope with concrete retaining walls added to support the slope embankment. A pedestrian stair will be added at Booth Street to create an overlook for the park and provide direct access to North Commerce Street.

Preliminary engineering and review of design options were analyzed for the North Avenue Dam Bridge and the Holton Street Marsupial Bridge. Request for Proposals were developed and consultants were selected for the design of these two unique bridge initiatives.

Planning and Development Area

This unit provided technical assistance to the Southeastern Wisconsin Regional Planning Commission with regard to the Transportation Improvement Program, the Regional Freeway Reconstruction Study, an amendment to the Regional Bicycle and Pedestrian System Plan, and the Kenosha-Racine-Milwaukee Corridor Transit Alternatives Analysis (a.k.a. WISERIDE).

Activities also included providing plan review and utility coordination to the Wisconsin Department of Transportation (WISDOT) on freeway maintenance projects, on the improvement of the ramp metering, variable message signing, and vehicle detection systems phases of MONITOR (The Freeway Traffic Management Plan), and on various freeway bridge rehabilitation projects.

In conjunction with reconstruction/resurfacing activity on the Freeway System within Milwaukee County, traffic mitigation plans for local streets were developed and implemented to minimize the impacts of traffic diverted from the freeway system during construction. Local street traffic mitigation plans include changes in traffic signal timing and other operational adjustments, as well as designs and implementations of signing and pavement markings to change traffic flow patterns and regulate local street traffic

Assistance was also provided to the WISDOT with regard to the planned resurfacing of the Milwaukee Freeway system along IH-894 from the Belton Overpass to the Mitchell Interchange. Assistance was further provided on the Intermodal Passenger Facility location study; the alternatives study and preliminary engineering for the Marquette Interchange; the application of Intelligent Transportation System technology (ITS) in the Gary-Chicago-Milwaukee (GCM) Corridor; a study of incident management on southeast Wisconsin's freeways (TIME); the implementation and testing of an Integrated Corridor Operations Program (ICOP); and on the Local Roads & Streets Council (LR&SC), an initiative to better coordinate and create a more efficient relationship between local jurisdictions and the state Department of Transportation. This unit also participated in the WISDOT Marquette Interchange Mitigation Advisory Committee, the Transit and Travel Demand Management Subcommittee, and the Local Roads Subcommittee and prepared numerous traffic mitigation proposals designed to maintain mobility during reconstruction of the Marquette Interchange.

The unit coordinated projects being completed under the Congestion Mitigation and Air Quality (CMAQ) Program, the Statewide Multi-Modal Improvement Program (SMIP), and the Transportation Enhancement (TE) Program, all of which were continued under the Transportation Equity Act for the 21st Century (TEA-21), as well as the Transportation Demand Management (TDM) Program, and the Transportation Economic Assistance (TEA) Program funded by the Wisconsin Department of Transportation. These programs generally provide up to 80% Federal and/or State funding for eligible projects.

Participation on behalf of the City of Milwaukee was completed on a major initiative with the Wisconsin Departments of Transportation and Commerce and the Village of Menomonee Falls to affect necessary street and highway improvements that will encourage economic growth and jobs creation in the area of West Good Hope Road, North 124th Street, and their interchange with STH 41-45. This $13,550,000 "Jobs Corridor" initiative was carried out utilizing $7.2 million in Federal/State Highway funds, and $6.35 million in local funds, including $2.178 million from each the City of Milwaukee and the Village of Menomonee Falls, a $1,000,000 State of Wisconsin TEA grant, and a $1,000,000 State of Wisconsin Department of Commerce Public Facilities Economic Development grant. Construction activities that began in 2000 were completed in 2002.

Data collection and preparation of computer model inputs continued for several computerized signal optimization projects, which utilize CMAQ grants. Included were studies of the Milwaukee central business district, the near south side, and the West Appleton Avenue/West Lisbon Avenue signal system.

Grant funds have been provided to develop a Bicycle Publicity Plan for the City of Milwaukee and a contract has been entered into with the Bicycle Federation of Wisconsin. A Publicity Plan was developed and implemented in 2002. The plan included various advertising schemes including a video that was run as a public service announcement. The City of Milwaukee Bicycle Route Map continued to be distributed through 2002. The Bike Rack Assistance program was continued through a CMAQ grant, to provide local business the ability to acquire free bike racks if they agree to install and maintain them. The distribution of approximately 600 bike racks has taken place since 2000. Work continued to fabricate and install bike route signs along City streets that were selected as bicycle routes. This unit also provides membership and staff assistance to the City's Bicycle Task Force. This unit participated in the WISDOT's Citizen Advisory Committee for the Bay View to Downtown Bicycle Route Study.

During 2002 this unit was very active in the planning and implementation of several off-road bicycle trail segments. This unit continues to work in a cooperative effort with the DNR to implement remaining segments of the Hank Aaron State Trail (HAST). During 2002 this unit negotiated responsibilities between the City and DNR to implement three segments of the HAST – the North 44th Street segment (Doyne Park to Miller Park), the CMC/CP segment (Miller Park to North 25th Street), and the Canal Street segment (Emmber Lane to North 6th Street). These projects are funded primarily with CMAQ grants previously secured by this unit. Furthermore, this unit provided technical assistance to the DNR to secure an additional CMAQ grant for the construction of a bike ramp structure from the 6th Street Viaduct down to grade along the south bank of the South Menomonee Canal and trail connection to Pittsburgh Avenue. Work on the CMAQ projects is anticipated to begin in 2002. Furthermore, CMAQ funding was secured for the Kinnickinnic River Bike Trail on abandoned Union Pacific Railroad Company right-of-way between South 6th Street at West Rosedale Avenue and East Washington Avenue and for the Beerline "B" bicycle trail between East Pleasant Street and East Humboldt Avenue. A short segment of this trail was constructed in 2001. A Transportation Enhancement grant was obtained to extend the Beerline "B" trail to East North Avenue. Engineering on these projects is expected to be completed with construction starting in 2003.

This unit continues participation in a study of downtown transit improvements known as the Milwaukee Downtown Transit Connector Alternatives Analysis. This study, sponsored by the City, Milwaukee County, the Metropolitan Milwaukee Association of Commerce and the Wisconsin Center District, is investigating alternative downtown transit improvements linking multiple tourist and business venues. The Alternatives Analysis and draft Environmental Impact Statement are expected to be completed during the summer of 2003 with Preliminary Engineering commencing shortly thereafter.

In 2000, this unit made application and secured funding under the Transportation Enhancements Program for shoreline protection improvements and construction of a bicycle/pedestrian trail along Lake Michigan adjacent to the Milwaukee Art Museum. In 2001, engineering was performed for the project and a bid package was prepared. Bids were solicited during the summer of 2001 and, unfortunately, the low bid exceeded authorized funding levels. Efforts were made to reduce project costs and the project was re-bid in early 2002 with construction completed in summer 2002.

In 2002, this unit coordinated the writing and submission of six applications under the Transportation Enhancements Program. In late 2002, the City was awarded two of the six grants totaling $ 866,000 including $ 716,000 for acquisition and recreational improvements of the former Beerline rail right-of-way extending north from East Chambers Street to North Holton Street and $ 150,000 for updating the City of Milwaukee Bicycle Plan.

In 2002, this unit developed conceptual plans and cost estimates for the Canal Street Reconstruction/Extension project in the Menomonee Valley. This project includes relocation of an existing railroad spur within Canal Street, reconstruction of West Canal Street between North 6th Street and North 25th Street on the existing alignment, construction of a new roadway from North 25th Street to Miller Park through the west end of the Menomonee Valley and construction of portions of the Hank Aaron State Bike Trail. This project is expected to provide a catalyst for redevelopment of the Menomonee Valley as well as provide an alternate traffic route during reconstruction of the Marquette Interchange. A Request for Proposals (RFP) was issued to secure consultant services for engineering and plan preparation for the project with input provided by numerous partners and stakeholders. Engineering is expected to commence in early 2003.

In 2002, this unit provided technical assistance to the Mayor's office in the development of alternative configurations for the Marquette Interchange that attempt to achieve project goals in a more cost effective manner as compared to the alternative currently being pursued by the WISDOT.

In 2001, this unit worked closely with the City Attorney's office and the Potawatomi Tribe to negotiate agreements with affected property owners and develop plans to extend West Pittsburgh Avenue in the Menomonee Valley. This project is necessary to improve traffic conditions at the recently expanded casino. In addition, this unit secured Office of the Commissioner of Railroads (OCR) authority for a new railroad crossing included in the project. This work completed and opened to traffic in 2002.

In 2001, this unit coordinated the writing and submission of eight applications under the Congestion Mitigation Air Quality grant program. In 2002 the City of Milwaukee was awarded in excess of $ 9,400,000 in Federal funds ($11,800,000 total projects cost) for six initiatives, including Way Finding signage, Marquette University campus amenities, the Marsupial Bridge project (a pedestrian and bicycle facility hung beneath the Holton Street viaduct) and $ 6.0 million in additional federal funding for the Downtown Pedestrian Corridors project. CMAQ grants totaling nearly $ 5.0 million were previously received for the Corridors project to implement intersection treatments, plantings, art work, and other street amenities along major downtown pedestrian corridors. A contract was let in late 2002 for a demonstration project to improve a portion of West Wisconsin Avenue. The Marquette University work was ongoing in late 2002 and a Request for Proposals was issued in late 2002 to secure professional services for the Marsupial Bridge project.

In 2002, this unit made application for a Hazard Elimination grant in the amount of $510.000 for the purpose of reconfiguring the East North Avenue curve between North Holton Street and North Humboldt Boulevard. If successful in obtaining this grant, it is anticipated that engineering for this initiative will start in 2003.

Traffic count data was collected under a grant provided by the Wisconsin Department of Natural Resources through the WISDOT to meet travel-monitoring requirements for the Southeastern Wisconsin Ozone Non-attainment area.

During 2002 this unit continued its role as liaison with the various railroad entities doing business in the City in matters of crossings, structures, and right-of-way improvements.

The unit coordinated Infrastructure Services Division and Department of Public Works activities for several major development projects, including Kilbourn Tower, The Boardwalk (Metro Center), St. Lukes Regional Medical Center, the Milwaukee Art Museum Expansion, River Homes, Trostel Square, Humboldt Ridge, Brewers Hill Commons, Warren Manor, Marquette University, Highbridge River Bridge and the Humboldt Yards Redevelopment. Other development projects include the Third District Police Station, the Indian Council for the Elderly combined housing and activities center Reed Street Yard Redevelopment, Lakeshore State Bank, USF Holland, and the Midtown Retail Center at the site of the former Capitol Court Shopping Center. This unit also participated in several predevelopment roundtable conferences with DCD in which DPW's comments and concerns were identified at an early stage in the development process.

The unit worked closely with several Business Improvement Districts (BID's), Tax Incremental Financing Districts (TID's), and General Planned Developments (GPD's). Major developments include the East North Avenue (East Side BID) streetscape improvements; the Brady Street (BID 11) plaza along the Holton Street Bridge; Avenues West (BID 10) streetscape improvements; the Beerline "B" (TID 22) Vine Street Stairway and the design and construction of Kilbourn Park and the Park Place GPD work, including the construction of North Liberty Drive. This unit also worked closely with the Menomonee Valley Partners business group in their planning efforts including participation in a National Design Competition for the "Green Development" of the former Milwaukee Road Shops site.

During 2002 this unit coordinated or assisted in the design and implementation of several minor streetscape and traffic calming projects. These projects included East North Avenue, East Capitol Drive, Marquette University, Avenues West BID and the Cambridge Woods neighborhood.

This unit continues to assist the Department of City Development with the expansion of the Riverwalk system, including planning for roadway and streetscape improvements to complement the adjacent riverwalk. Work continued in 2002 on planning of a southerly extension of the Riverwalk system into and through the Historic 3rd Ward as well as a Riverwalk extension north of West Pleasant Street along the Beer Line "B" redevelopment area to the former North Avenue Dam including a new pedestrian bridge across the former dam weir connecting the Beerline "B" area to Caesars Park on the east side of the River. Construction also commenced in 2002 on a number of Riverwalk segments along the east side of the Milwaukee River extending from Clybourn Street to Broadway in the Historic Third Ward, as well as a number of segments along the Beerline "B".

This unit is responsible for the Division's review of various permits, specifically as the proposed work relates to the public's use of the right-of-way. This includes utility permits, building permits, and DPW excavation permits. The unit also reviews applications for special privileges and air/subterranean space leases, and writes resolutions for Common Council action.

During 2002 this unit continued its role of assessing impacts to the public way through the review of local and state legislation, and encroachments and obstructions affecting various public improvement projects. This unit also continued to provide public service assistance to our citizens by investigating a variety of traffic, roadway, and railroad grade crossing condition complaints, and private drainage complaints.

Over 600 weekday or weekly traffic counts were taken on arterial streets, at key count stations, and at other locations on an as-needed basis. Continuous count stations (key counts) are operated by the City at 24 permanent installations at selected arterial locations throughout the City. Seven-day counts are extracted on a monthly basis to monitor travel patterns in the City. Various manual traffic counts and speed checks are performed by unit staff in response to new development proposals, site access management, traffic complaints, and requests for additional traffic control.

Technical assistance, including testimony at public hearings and meetings, was provided to other City agencies and organizations, including the Bicycle Task Force, the Railroad Commission, the Menomonee Valley Partners Infrastructure Committee, the City Plan Commission and the Board of Zoning Appeals. This unit participates with the Department of City Development, the Department of Neighborhood Services and the Board of Zoning Appeals in the Zoning Administration Group (ZAG) to provide consistency of review and timely processing of the special use/variance cases referred to us. This unit also participates in three subcommittees of the Local Roads and Streets Council – the Education and Communication subcommittee, the Infrastructure Management subcommittee and the Regulatory, Environmental, and Legislative (REAL) subcommittee. This unit also represents the City's interests in promoting and deploying intelligent transportation technology regionally as a representative on the Gary-Chicago-Milwaukee ITS Corridor Deployment Committee and statewide as a member of the Wisconsin ITS Alliance.

In 2002, this unit continued the implementation of the Pavement Management Administration (PMA) system, which provides a computerized method for evaluating and comparing the characteristics of more than 19,000 segments of the City's paved roadways. Based on information obtained in 2000 and 2001 through a Visual Pavement Condition Evaluation Survey, the PMA was re-calibrated to accurately reflect the present condition of our streets and to predict the rate at which our roadways will deteriorate.

During 2003 the Planning and Development Unit will work closely with other City, State, and private entities in coordinating efforts in the acquisition of and conversion to recreational corridors of former rail right-of-ways along the KK River/Chase Avenue corridor on the south side and along the Beerline north from East Chambers Street to North Holton Street on the north east side, construction of the Marsupial Bridge Project (a pedestrian & bicycle facility hung below the Holton Street Viaduct) and construction of a pedestrian bridge across the former weir at the North Avenue Dam site, extension of a Riverwalk system in the Historic 3rd Ward, final design of Canal Street from 6th Street to Miller Park, reconfiguration and redevelopment of the Park East Freeway Corridor, continued evaluation of alternatives for the rehabilitation of the Marquette Interchange, continued evaluation of alternatives for upgrading the regional freeway system, implementation of ($5,000,000.00) in streetscape improvements and the programming of another ($ 7, 500,000) of improvements on West Wisconsin Avenue, North Water Street and West Kilbourn Avenue, continued evaluation of alternatives in the Downtown Connector Study, Kilbourn Park, and the Metro Center. New initiatives will commence on parking, bicycle facilities, pedestrian mobility, and market strategies geared at continued enhancement of the central and surrounding business districts. This unit will also work closely with the WISDOT on continued study involving Freeway Traffic Management and in evaluating a pilot program to integrate signal systems of complementary arterial and freeway corridors.

Traffic and Lighting Area

Six new traffic signals were installed at the following locations:

- West Canal Street and South/North 6th Street
- West Canal Street and South 20th Street
- West Clarke Street and North Dr. Martin Luther King, Jr. Drive
- West Evergreen Lane and South Layton Boulevard
- West Kinnickinnic River Parkway and South 43rd Street
- Park East Freeway Ramp and North 6th Street (Temporary)

In addition, twenty-six existing traffic signals were reconstructed:

- West Appleton Avenue and North 76th Street
- West Becher Street and West Windlake Avenue
- West Capitol Drive and North 1st Street
- West Capitol Drive and North 2nd Street
- East Capitol Drive and North Fratney Street
- East Capitol Drive and North Holton Street
- East Capitol Drive and North Humboldt Boulevard
- East Capitol Drive and North Richards Street
- East Center Street and North Holton Street
- East Center Street and North Humboldt Boulevard
- West Center Street and North Dr. Martin Luther King, Jr. Drive
- South Chase Avenue and South 1st Street
- West Clybourn Street and North 6th Street
- West Congress Street and North 76th Street
- West Hampton Avenue and North 76th Street
- West Hope Avenue and North 60th Street
- East Kenwood Boulevard and North Downer Avenue
- East Kenwood Boulevard and North Maryland Avenue
- East Kenwood Boulevard and North Oakland Avenue
- West Layton Avenue and South 6th Street
- South Layton Boulevard and West Mitchell Street
- West Mill Road and North 60th Street
- West Mitchell Street and South 21st Street
- West Mitchell Street and South Muskego Avenue
- East Oklahoma Avenue and South Pine Avenue
- West Virginia Street and South 6th Street

Five intersections were upgraded to type 170 traffic signal controllers:

- North Downer Avenue and East Hartford Avenue
- East Hartford Avenue and North Maryland Avenue
- North Dr. Martin Luther King, Jr. Drive and West Wright Street
- West Oklahoma Avenue and South 51st Street
- West Wright Street and North 7th Street

Bicycle Lanes were installed at the following locations:

- East Center Street, North Dr. Martin Luther King, Jr. Drive to North Humboldt Boulevard
- East Kenwood Boulevard, North Downer Avenue to North Oakland Avenue
- East North Avenue, West Humboldt Boulevard/Avenue to North Oakland Avenue
- North 16th Street, West Clybourn Street to West Wisconsin Avenue

Angle Parking was installed in the following location:

- West Virginia Street, South 6th Street to South 5th Street

The Traffic and Lighting Design unit sought and received Federal funding through the Wisconsin Department of Transportation, Bureau of Transportation Safety, to conduct a 3-day training workshop. The workshop specifically covered the state of the practice of designing modern roundabouts based on the British method of analysis and design. Thirty-four individuals from village/city/county/state agencies and private consultants attended the workshop in Waukesha. The City of Milwaukee sent two staff engineers. The training grant provided $6,564 for this workshop.

Robert Barry Crown, RODEL Software Ltd. and Staffordshire County Council, United Kingdom, presented the workshop. Mr. Crown developed the RODEL Roundabout Analysis software and is an internationally recognized roundabout expert.

The unit in partnership with Traffic and Parking Control Company, Inc. has received permission from the Federal Highway Administration to experiment with flashing Light Emitting Diodes (LEDs) within the School Crossing Sign's borders. The prototype for these signs was completed in 2002 and will be installed and their impact assessed in 2003.

As part of the City's Capital Improvement Program, plans were prepared for street lighting system alterations and upgrades that were to be done in conjunction with 96 paving projects. Lighting work done in conjunction with these projects included the installation of overhead circuitry prior to construction to maintain adequate light levels during construction, protecting and adjusting facilities during construction work, and where required, the installation of new street lighting cable and the upgrade of electrical circuitry and components.

In 1987, an initiative was begun to convert all mercury vapor and incandescent street lighting in the City of Milwaukee to more energy efficient high-pressure sodium lighting. In 2002, a total of 1,333 streetlights in the City were converted to high-pressure sodium lighting. With this work, approximately 88 percent of the 66,871 streetlights in the City of Milwaukee have now been converted to high-pressure sodium.

Historic Milwaukee lanterns and harp lights continue to be installed in conjunction with streetscape, redevelopment and neighborhood and business district beautification projects. In 2002, grant funds, special assessments or private funding was used to provide historical lighting as part of neighborhood or business district improvement projects. Examples of projects completed this year are North Downer Avenue from East Webster Place to East Park Place, East North Avenue from North Cambridge Avenue to North Oakland Avenue, West Wisconsin Avenue from North 16th Street to North 20th Street, and East Capitol Drive from North 2nd Street to North Humboldt Avenue. Harps and Lanterns have also been incorporated into development and redevelopment of the Hilton Hotel and the Carver Park housing sites.

Engineering was completed for the installation of Milwaukee lanterns and harps in 2003 in conjunction with streetscape projects funded through the Wisconsin Department of Transportation using Federal Congestion Mitigation/Air Quality or Transportation Enhancement Funds for West Wisconsin Avenue, West Capitol Drive, and West National Avenue.

Central Drafting and Records Area

The Central Drafting and Records Unit is responsible for maintaining the one-quarter section maps of the area within the corporate limits of the city, and those areas outside of the city in which the Milwaukee Water Works provides service and maintains facilities. The maintenance of these maps, along with maintenance of the official maps, aldermanic district maps, police district maps, address assignment maps; and the preparation of state and city paving plans, structure plans, street lighting plans, circuit maps, traffic signal plans, and other specialty maps and exhibits are accomplished with the use of an interactive computer graphics system.

Additional duties of Central Drafting and Records includes: the operation of a "Diggers Hotline" service to assist in the location of City of Milwaukee facilities in the public way; the preparation of legal descriptions and maps for openings or closings of public rights-of-way; maps for annexation to or detachment from the City of Milwaukee; the preparation and/or review of certified survey maps and subdivision plats; the assignment of addresses; the preparation of street name ordinances; checking and optimizing routes for oversize and overweight loads; sales of maps; performing traffic counts and surveys; providing reproduction services for various City departments; and maintaining an office supply facility for the Infrastructure Services Division.

In 2002, 20 plans and petitions for the vacation of public ways were processed. The Unit also processed one subdivision plat and 68 certified survey maps, produced 293 paving plans for 72 separate paving projects, seven structures projects and six state paving projects, and acted upon 43,880 requests from Diggers Hotline to locate the city's underground electrical and water main facilities.

Work continued on the Milwaukee County Automated Mapping and Land Information System (MCAMLIS) project, which will bring together property and utility information for all of Milwaukee County in a digital format to create cadastral maps. Central Drafting continue to assist the City of Milwaukee Geographic Information Systems (GIS) Section with its MCAMLIS work by compiling 67 one quarter section files containing subdivision and certified survey map outlines and by redrawing portions of 23 engineering quarter sections and cadastral maps. Milwaukee County will be responsible for the future maintenance of this material. When the MCAMLIS project agreements are completed by Central Drafting and GIS the ability to efficiently access utility and property information in Milwaukee and the surrounding suburbs will be a powerful tool for both the public and private sectors.

ELECTRICAL FACILITIES DIGITIZING PROJECT

The Central Drafting and Records Section maintains and distributes records of underground conduit, street lighting and traffic signal facilities to the appropriate design, field operations and digger's hotline personnel. Current work processes based on a combination of paper and digital records have not kept pace with the volume of changes that occur. During 2002, the existing work processes were examined to determine where the system short falls exist, and users were interviewed to obtain first hand knowledge of how the system operates and what can be done to improve it.

A considerable amount of mapping has been done over the years using micro station. Some data files exist that track inventory. There is value in linking mapped information with data files, as it will allow information to be quickly utilized (i.e. inputted, reviewed, updated, displayed, distributed and analyzed). To this end, GeoMedia Pro software is being examined to determine if this is the best way to link existing mapping and data information as well as being the appropriate tool for future growth and applications.

The pilot study continued through 2002, as the GeoMedia software was used to develop the links between the existing maps and the data files.

CONSTRUCTION SECTION

The Construction Section provides administration and inspection for contracts involving the construction of streets, sidewalks, alleys, storm and sanitary sewer, water main, and house services. Two District Engineering Units design the street and alley pavements and have field crews that measure final contract quantities for payment purposes. A Technical Services Unit tests all sewer and water main pipe to be installed and monitors all other materials testing performed by a private contractor.

In 2002, local paving work consisted of 22 contracts that totaled 7.91 miles. In addition there was 1.87 miles of alleys. The total contract cost was $4.23 million. Two walk repair contracts cost $1.08 million. Sewer construction totaled $16.84 million for 43 contracts covering 9.26 miles. Relay of 13.96 miles of water main cost $7.03 million on 27 contracts. Inspection was also provided for 1.44 miles of suburban water main installation. Six minor building service contracts had work totaling $220,699.

State Paving

The Construction Section also performs administrative duties on WISDOT projects within the City of Milwaukee. These functions include construction management, contractor payments, and wage/labor verification and monitoring. Six WISDOT paving projects were constructed this year at a cost of $8.43 million, covering 4.63 miles. They include the following:

- West/East Center Street – North Dr. Martin Luther King Jr. Drive to North Humboldt Boulevard
- West Howard Avenue – South 13th Street to South 27th Street
- East Kenwood Boulevard – North Oakland Avenue to North Downer Avenue
- West Wisconsin Avenue – North 11th Street to North 20th Street
- Park East Freeway – Hillside Connection to North 6th Street (Temporary Ramp Connection)
- Park East Freeway – Hillside Interchange to North Jefferson Street (Freeway Demolition and Local Street Improvements)

Three bridge projects were also constructed this year at a cost of $3.83 million. They include the following:

- South Chase Avenue Bridge over the Kinnickinnic River
- North Sherman Boulevard Bridge over Lincoln Creek
- North Teutonia Avenue Bridge over Lincoln Creek

The following are some of the unique projects the Construction Section administered in 2002:

- **WEST WISCONSIN AVENUE - NORTH 11TH STREET TO NORTH 20TH STREET**

The resurfacing and streetscaping project on West Wisconsin Avenue from North 11th Street to North 20th Street was completed in 2002. In the Marquette University Campus area, from North 11th Street to North 16th Street, several unique features were included to enhance the campus area and improve pedestrian safety. Concrete curb and decorative railings with a black enamel finish were installed along the perimeter of the median islands. These curbs and railings prevent illegal jaywalking and enhance the island appearance. At intersections, concrete within the crosswalk area was jointed in three-foot by three-foot panels to further delineate the pedestrian crossings from the intersections. Tree cutouts were constructed for future tree plantings. At the intersection of West Wisconsin Avenue and North 12th Street, a stamped and colored concrete intersection was constructed with a slate pattern. The pecan color was selected to match the façade of Gesu Church adjacent to the intersection. At the radius corners west of the Marquette University Campus area, stamped walk with a red herringbone brick pattern was constructed.

- **PARK EAST FREEWAY**

The removal of the Park-East Freeway Spur and the construction of the new West McKinley Avenue have been called the "Gateway to Development" of the freeway corridor area, availing 27 acres of land for commercial and residential development. Work on this project began in April 2002, and should be completed in May of 2004. Included in this project was the construction of a temporary asphalt access ramp to the Hillside Interchange; the demolition of the freeway from the Hillside Interchange to North Jefferson Street; the improvement of several Local Streets; the construction of access ramps to the Hillside Interchange; and the installation of a vertical lift bridge over the Milwaukee River.

Work completed in 2002 included the demolition of the westbound lanes of the Park East Freeway, the reconstruction of West McKinley Avenue from a 50' roadway to a boulevard with three 11' lanes in each direction, and the construction of the west half of North Old World Third Street from West Juneau Avenue to West McKinley Avenue.

Concrete from the freeway demolition was crushed on site and was reused as base course beneath the new concrete pavement. Approximately 20,000 tons of concrete was recycled. In addition 2,500 tons of steel from the old freeway was salvaged, and 60,000 cubic yards of dirt have been removed from the project.

Work on the project will continue during the entire year of 2003.

- **WISCONSIN AVENUE STREETSCAPE PROJECT**

Phase I of the Downtown Pedestrian Corridors, namely the segment on West Wisconsin Avenue between North 2nd Street and North 4th Street, commenced in late summer. The enhancement project is intended to promote pedestrian use of Downtown streets by creating pleasant surroundings. The project featured the construction of small paneled, exposed aggregate walk, a granite block intersection at North 3rd Street, and tree and flower planters over hollow recessed walks. Once the project is complete, granite planter walls with wrought iron railings, new double harp lights, lantern lights, kiosks, and directional signs will enhance the sidewalk areas.

- **EAST/WEST CAPITOL DRIVE - NORTH HUMBOLDT BLVD TO NORTH 2ND ST**

This streetscape project was constructed in conjunction with the Riverworks Business Improvement District (BID). Plazas, planters, and stamped & colored concrete were constructed at various corners, medians, and tree borders throughout the project limits. Construction of this project started in August of 2002 and is to be completed in the spring of 2003.

The 40,000 square feet of stamped and colored concrete walk for the streetscape was constructed in several steps to look like antique red brick and required an experienced contractor. Limestone slabs from a Lannon quarry were used for landscape walls at the plazas and planters. Plazas include patterned "red brick" concrete, limestone inlays and planters. Medians will include harp lights and signs in addition to the "red brick" concrete, limestone walled planters, and clock tower already constructed.

- **KILBOURN PARK BEAUTIFICATION PROJECT**

The beautification of Kilbourn Park started in early fall of 2002. The 8-acre park is located along North Commerce Street between the Holton Bridge and North Humboldt Avenue. All concrete and wood walls and part of the railroad trestle were removed. New walking and biking trails were graded and will be paved in Phase II. In order to create an open Vista and to connect Upper Booth Street to Booth Street at the Commerce Street level, approximately 19,000 cubic yards of debris were hauled off site along with 40,000 cubic yards of dirt. Phase II will feature new Booth Street stairs, native prairie plants through out the slopes, an amphitheater, and new retaining walls along North Glover Street.

- **KILBOURN AVENUE MEDIAN**

As a pilot project, terraced decorative planter walls were constructed in the median on East Kilbourn Avenue between North Water Street and North Broadway. The planters, surrounded with new concrete walk, enhance the median and replace the high maintenance grass area.

- **MEDIAN IN NORTH CAMBRIDGE AVENUE, EAST KANE PLACE, AND NORTH BARTLETT AVENUE INTERSECTION**

A new median was constructed in the intersection of North Cambridge Avenue, East Kane Place, and North Bartlett Avenue. The approximately 2200 square foot median was paved using salvaged cobblestone obtained from Humboldt Yard. The decision was made in order to preserve the granite blocks and to avoid having them become private property.

- **INDIAN COUNCIL FOR THE ELDERLY/ WEST WATERFORD AVENUE PROJECT**

In order to accommodate the construction of the new Indian Council For the Elderly, new water and sewer mains, and new concrete pavement were constructed along West Waterford Avenue between South 60th Street and a point west. The project also included the construction of a retention pond for storm water management and an Asphalt parking lot.

- **LINCOLN CREEK FLOOD CONTROL IMPROVEMENTS**

The MMSD project on Lincoln Creek has been nearly completed. The Construction Section was involved in the project by inspecting the removal and construction of culverts, roadways, and sewer and water main adjustments. The work has spanned several years. It has included the removal and replacement of 3 roadway culverts, the construction of 2 new by-pass culverts and 2 pedestrian bridges, the removal and replacement of 2 siphons, and the realignment of a 48" water main. It also included the removal and construction of approximately 1.5 miles of roadway and the adjustment of numerous water mains and storm sewer outfalls.

A major portion of the roadway construction was West Congress Avenue from North 35th Street to North Sherman Boulevard on both the north and south sides of the creek. The unique roadway design called for narrowing the roadway from 26 feet to a variable width of 18 to 20 feet. The new roadways will be one-way with parking on one side of the street.

FIELD OPERATIONS SECTION

The Field Operations Section operates, maintains and repairs the many infrastructure facilities located in the public way and river system. Responsibilities of the Field Operations Section are wide ranging and include:

- Inspection, maintenance and repair of the City's sewer system.
- Maintenance of the City's streets, alleys and sidewalk.
- Construction and maintenance of all public way lighting, traffic control signals, signing and
- Pavement markings.
- Construction and maintenance of the underground communication conduit system.
- Operation of the Municipal Asphalt Plant and the Traffic Sign Shop.
- Inspection of permitted utility construction in the public way.
- Operation and maintenance of the City's moveable and fixed bridges and viaducts.

Streets and Bridges Unit

Street Maintenance Area

Street Maintenance Section has tried two new maintenance techniques in 2002. On West Lapham Street between South 11th Street and South Cesar Chavez Drive a stress relief interlayer was placed on the south half of the roadway. This interlayer is designed to prevent reflective cracking in the asphalt overlay. Also, several streets on the east side of Milwaukee (approx. 15,590 square yards) were sealed with a new product called "Flex Seal". Flex Seal is similar to our normal Slurry Seal process, however Flex Seal uses recycled tires as their aggregate.

Street Maintenance Section completed its fourth season of "Slurry Seal" method of sealing City streets. Again this years' program was a success, receiving favorable public and Aldermanic reaction while receiving very few complaints. City streets received 257,707 square yards of "Slurry Seal" this year.

The Street Maintenance Section also had maintenance contracts for Asphalt Resurfacing and Crackfilling. Asphalt resurfacing occurred on West Layton Avenue, North 107th Street, North 28th Street, West Burleigh Avenue, West Walnut Street and West Lapham Street where 8,590 tons of asphalt were placed. 307,073 square yards of pavement throughout the city were crackfilled with rubberized joint seal under the Crackfilling Contract.

Street Maintenance Section field crews placed an additional 10,500 tons of asphalt on city streets. Repair projects included asphalt shims on roadways, asphalt shims on sidewalks, small asphalt patches and pothole repairs. In addition, field crews crackfilled 469,361 square yards of pavement with rubberized joint seal.

Street Maintenance crews have already started preparing for Harley Davidson's celebration of their 100-Year Anniversary in 2003.

A new dowel-drilling rig was purchased in 2002. Street Maintenance crews started doweling permanent concrete repairs. A change in the 2003 Construction Specification will require all contractors to dowel new concrete pavement into the existing pavement. The dowel should eliminate uneven settlement between existing concrete pavement and repair areas.

Street Maintenance Section has improved our tracking of incoming customer requests. All phoned in service requests are answered by the Call Center. Our supervisors access the Call Center database and respond to the request by dispatching a crew to patch a pothole, shim a sidewalk, repair a guardrail, etc.

Bridge Maintenance Area

The Bridge Maintenance Section operates, maintains and repairs twenty movable bridges over the Milwaukee, Menomonee and Kinnickinnic Rivers. There were roughly 13,488 openings. We took over operation of the 6th Street Viaduct in September. The two new bascule bridges on the 6th Street Viaduct are lower in elevation than the old viaduct. Therefore, the bascule bridges on the new viaduct will experience an increase in the number of openings.

Substantial completion of the new 6th Street Viaduct was reached in September. The bascule bridges on the viaduct will be remotely operated from the Water Street Bridge. Presently six of the twenty movable bridges can be remotely operated from another bridge(s), namely the Emmber Lane, Plankinton Avenue, Clybourn Street, South 1st Street, North 6th Street and South 6th Street bridges. Additional remote operations are planned for Highland Avenue and St. Paul Avenue bridges.

Bridge Maintenance Crews completed concrete repairs on the Highland Avenue retaining wall, Bradley Road deck, North 25th Street Bridge approaches, Buffalo Street abutment, South 35th Street expansion joint, and Hawley Viaduct pier. A new pedestrian railing was installed along West Pittsburgh Avenue east of South Plankinton Avenue. New permanent barricades were placed along the pedestrian way between West Kiley Avenue and North Sherman Boulevard. A few hundred bicycle racks were install at various locations throughout the city.

The Bridge Maintenance Section again spent 4,000 labor hours on the City's assault on graffiti. Efforts involved removal with a small sand blaster, painting over vandalized structures and graffiti wipes. Security cameras were installed which will hopefully curb the amount of graffiti placed on City structures.

Inspections Area

The Inspection Section handled over 9400 construction permits in 2003. There was a reduction in the number of Fiber Optic permits from what we experienced the previous year. In addition to construction permits, the Inspection Section reviews Special Event Permits such as block parties, walk/runs and parades. Contractors working in the location of these Special Events are notified of the event and directed to complete their work or close up their excavations so as to cause little or no disruption to the Special Event.

Underground Operations Unit

The Underground Operations Unit is responsible for the activities associated with maintaining the City's sewer systems and appurtenances. These activities are financed through the Sewer Maintenance Fund. The Unit also is responsible for installing and maintaining the City's communication, traffic and lighting conduit system.

Beginning in 2003, Underground Operations will be merged with the Environmental Section.

STORM INLETS

In order to reduce street debris run-off from entering the rivers and creeks in the City and affecting water quality, sump storm inlets are being constructed in place of the bowl type inlets. The sump will catch a large portion of material before it gets in the sewer system and ultimately creeks, channels, rivers and Lake Michigan. In addition, partial bulkhead walls were constructed on 7 storm sewers that outlet into the Lincoln Creek. These partial walls catch debris before it could enter the creek and is removed by personnel on a regular basis. These efforts are being done to meet our Storm Water Discharge Permit issued by the Wisconsin Department of Natural Resources.

DRAINAGE CHANNELS

Along 2 drainage channels on the City's Northwest side, extensive brush removal was completed in 2002. The removal of brush helps to maintain flows through the channels during large storm events.

Electrical Services Unit

Electrical Services personnel performed as a team throughout 2002 to provide the City of Milwaukee well-lit neighborhoods and roadways. With priorities changing often, personnel responded professionally around the clock to citizen requests, Alderperson Service Requests and departmental directives. Electrical Services collaborated with the several Streetscape projects to include; Hilton (5^{th}- 6^{th}, Wisconsin-Michigan); Downer, Webster-Park Place; North Avenue, Oakland – Milwaukee River; Capitol Drive, 2^{nd} – Humboldt; Kilbourn, Water-Broadway. Other high profile projects completed were; 6^{th} Street Viaduct; Pittsburgh-Canal, 16^{th} –20^{th} (Potowatami). There were a total of 47 projects that were completed in 2002 by Electrical Services.

An impressive accomplishment from the 2002 construction season was the installation of an in-ground junction box and conduit system [closed loop system]. This is a significant change in the way that Traffic Services and Street Lighting installs its equipment. With a closed loop system several advantages are attained. The closed loop system enables system repairs in many instances without disruption of the surface. This conserves on trouble-shooting cable problems and the associated surface restoration costs. There are more installations of decorative surfaces throughout the city that enhances neighborhoods and business locations where restoration costs could be significant. The closed loop system provides a better-finished product. The cables are protected from the ground's environment and can be easily accessed. Also, many of the injuries incurred from digging because of damages and/or troubles will be reduced, thereby saving on Workman's Compensation claims. Finally, future expansion is easier accomplished with a closed loop system because additional equipment can be installed with minimal labor. This year there were three projects where this type of system was installed: West Capitol Drive from North Humboldt Boulevard to North 2^{nd} Street, West Wisconsin Avenue from North 11^{th} Street to North 20^{th} Street and the North side of West Wisconsin Avenue from North 2^{nd} Street to North 4^{th} Street.

The six members of the management team were relocated centrally to enhance internal communications and to promote effective project coordination and collaboration in achieving shared objectives of Electrical Services.

STREET LIGHTING

Street lighting personnel maintained a system of 66,419 streetlights and 8,790 alley lights and completed the following:

- Electrical Mechanics replaced or repaired 93% of 1,091 alley lights as inoperable
- Replaced 201 deteriorated poles
- Repaired 1901 of 1944 circuit troubles (98%) in 24 hours
- Repaired 2,294 of 2,823 single unit troubles (81%) within 30 days
- 9,170 streetlights relamped as part of the Annual Group Replacement program
- 3,863 units were relamped at scattered outages
- Utility locators completed 32,322 hotline requests

TRAFFIC & SIGN SERVICES

The Traffic Services professionals maintained 701 signal intersections in the City of Milwaukee in addition to the previously mentioned 2002 Paving Program projects. Other Operations and Maintenance totals included:

- Group replaced 7,659 signal lamps
- Replaced 3,264 signal lamp outages
- Repaired/restored 96% of 410 controller troubles within one day
- Repaired 81% of 213 circuit troubles in one day
- Repaired/replaced 275 controller/signal knockdowns in 2002
- Maintained and repaired/replaced 1,996 permanent signs
- Maintained and repaired/replaced 458 street name signs
- Installed 7,709 Temporary signs
- Provided traffic control at 678 Special Events
- Conducted annual pavement marking program

The continued goal for Traffic Services is to provide a safe environment for the citizens and visitors of Milwaukee for pedestrian and vehicular traffic.

Electrical Services is proud to serve the City of Milwaukee by overseeing the operation, maintenance and installation of facilities and equipment related to street lighting, traffic control and street signage.

Support Services Unit

Support Services staff at the City's Asphalt Plant produced 15,118 tons of mix in 2002. The various mixes were used by Street Maintenance crews for their pavement repair programs. The Water Department and Sewer Maintenance were also major users of the mixes for temporary repairs to their pavement excavations.

The operation of the Asphalt Plant gives the Division the ability to provide its field crews with the proper type and amount of material on an as needed basis.

2002

GENERAL STATISTICS

Streets, area of (improved and unimproved)
Net change in 2002: plus 12.735 acres
Total area at end of 2002 ..... 1,741.458 acres
or
18.346 square miles

Alleys, area of (improved and unimproved)
Net change in 2002: minus 0.025 acres
Total area at end of 2002 ..... 928.562 acres
or
1.451 square miles

Pedestrian ways and malls,
Area of (improved and unimproved)
Net change in 2002: None
Total area at end of 2002 ..... 29.614 acres
or
0.046 square miles

State and County rights-of-way, area of (improved)
Net change in 2002: minus 0.593 acres
Total area at end of 2002 ..... 1,815.074 acres
or
2.836 square miles

Area of City:
At end of 2002 ..... 95.859 square miles
At end of 1993 ..... 95.828 square miles
At end of 1969 ..... 95.773 square miles
At end of 1945 ..... 44.188 square miles
At end of 1919 ..... 25.851 square miles
At incorporation, January 31, 1846 ..... 7.408 square miles

CONSTRUCTION PLANS AND SPECIAL DRAWINGS

Paving Plans produced
- 72 Separate Paving Projects 293
- The Paving Plans included:
  - Background Drawings 127
  - Cross-Sections Transferred 99
  - New Designs Transferred 67

Final Official Map one-quarter section plots made 128
Election Commission Aldermanic District Ward Maps and
- Single and Double Line Street Maps Revised 135

Number of Structural Design Projects for which plans were prepared 6
Number of State of Wisconsin paving projects for which plans were prepared 6
One-quarter section map final plots prepared 182
Color maps prepared for Summerfest and other annual special events 30
One-quarter section maps prepared for MCAMLIS/GIS project 67
One-quarter section maps redrawn for the MCAMLIS project 5
Sanitation district and area maps prepared 9

ONE-QUARTER SECTION MAPS, STREET MAPS, SUBDIVISION PLATS, AND CERTIFIED SURVEY MAPS, THE OFFICIAL MAP, ALDERMANIC DISTRICT MAPS, OTHER PLANS - 2002

One-quarter section maps on file, in the graphics system
- and on file on microfilm aperture cards maintained on a continuous basis 524

One-quarter section maps reproduced to a scale of
- 1" = 200' and bound in atlases 524

One-quarter section maps revised 112
Number of revisions to the one-quarter section maps 182
Number of one-quarter section maps remicrofilmed 112
Street maps of the City updated (only area within City of Milwaukee
- Revised from 2001 map-change data):
- A single-line map, size: 36"x60", scale: 1" = 1,800'
- A double-line map, size: 42"x90", scale: 1" = 1,500'

Certified Survey Maps processed 68
Subdivision Plats processed 1
The Official Map one-quarter section maps;
- Scale: 1" = 200', on file (106 of these maps were revised with a total of 272 revisions) 445

LAND ACQUISITION, STREET DEDICATION, PUBLIC WAYS VACATION AND MISCELLANEOUS ACTIVITIES - 2002

Dedications of City Property for public right-of-way	3
Acquisition of rights-of-way by accepting deed reservations or by quick-claim deed.	7
Reject Reservations	0
Release access restriction	0
City property to be sold	0
Vacation of Public Ways	20
Prepare easement and private road descriptions	3
Annexations to the City of Milwaukee	1
Transfer right-of-way jurisdiction (County to City)	1
Various title reports for vacation projects and/or sewer and water easements	18
Street name change ordinances prepared	0
Designate private streets	2
Latitude and longitude locations compiled for the public	4
Oversize and overweight load routes checked for the Department of Public Works, Contract and Permits Office and private trucking companies	348
House moving permit applications processed for The Department of Public Works	2
State subpoenas received for criminal felony cases	7
Drawings prepared for use as evidence in criminal trials	1
Appearances in court as a witness under State subpoena for criminal trials	1

DIGGERS HOT LINE - 2002

Hot line requests	33,843
Utility information requests	478
Out-of-City requests	9,559
Total Hot Line Requests	43,880

TRAFFIC AND STREET LIGHTING ACTIVITIES - 2002

Street Lighting Circuit Maps on file	715
Street Lighting one-quarter of one-quarter section maps on file	1,228
Revisions to Street Lighting circuit and one-quarter section maps	684
Special Lighting Maps on file	223
Revisions to and creating special lighting maps	5
Problem signal records processed	55
Traffic count studies-manual	9
Revisions to pavement marking records*	0
Revisions to Street Lighting Data Base	12,413

ADDRESS ASSIGNMENTS AND SALES - 2002

Address assignments	17
Sales Summary:	
Maps, Plats and Plan Sales	$10,365.19

SUPPLY SERVICES - 2002

Dollar amount of supplies requisitioned by Central Drafting and Records $9,004.51

REPRODUCTION SERVICES - 2002

Approximate quantity of electrostatic printing done in house	131,980 square feet
Approximate quantity of microfilm aperture card copy machine paper used	22,500 square feet
Approximate quantity of paper used for plotters:	
Large format HD's bond paper	86,400 square feet
Vellum	2,700 square feet
Approximate quantity of electrostatic printing done under contract by a private printer	224,110 square feet
Total Reproduction Services	467,690 square feet

FIELD OPERATIONS - 2002

Bridges, viaducts and pedestrian overpasses	220
Bridges, movable	20
Bridges, number of openings	13,488
Pavement seal coating (square yards)	257,707
Asphalt surface by contract (miles)	2.95
Production of asphalt mixes (tons)	15,118
Inspection of permits	9,408
Sewers examined (miles)	81.5
Sewers cleaned (miles)	500.2
Structures cleaned	20,697
Service calls answered	6,784