

INFRASTRUCTURE SERVICES DIVISION
Department of Public Works

REPORT ON 2001 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

Administration is responsible for all business operations, budget coordination, personnel administration and clerical functions of the Division and shares responsibility for accounting with the DPW's Administration Services Division. The Section is responsible for daily operations and routine maintenance of the Division's microcomputer network and acts as the Division's primary information systems liaison with other areas.

In 2001 the Section administered Grant and Aid and Capital Improvement Programs of just under \$46 million, a city Operations and Maintenance Budget of nearly \$6.5 million, a Sewer Operations and Maintenance Budget of over \$6.6 million and an annual payroll of nearly \$28.5 million.

ENVIRONMENTAL SECTION

The Environmental Engineering 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 record books. 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.

The Environmental Section also has oversight responsibility for the Administration's Underground Conduit Unit. This unit is responsible for all phases of engineering work required for the City-wide programming and design of Underground Communications, Traffic Signals and Street Lighting electrical conduit and manhole systems. The work group is also responsible for the review of private utility and sewer plans, preparation of construction plans involving electrical conduit lines and manholes and maintaining City-wide underground conduit maps. It is also responsible for administering the rental of available City conduit space to various telecommunication companies.

Following are highlights of the work performed in 2001 by the Environmental Section.

Sewer Design Area

The Section designed and let to contract 0.30 miles of new sanitary sewers, 1.65 miles of new storm sewers, 6.79 miles of replacement sewers and 1.15 miles of sewer lining for a total cost of \$18.02 million.

West Becher Street Relief Sewer

The Becher Street Sewer project was completed on October 31, 2001. This project involved the installation of a segmented tunnel liner 108-inches in diameter and was completed without the need for any additional work shafts, other than those required to connect the existing sewer system to the new sewer. The method of installing the segmental tunnel sewer sections worked very well. Its use on future projects will be economical by eliminating the need for construction shafts. In addition, it can reduce inconvenience to property owners and drivers.

The new sewer replaced an existing 96-inch diameter combined sewer constructed in 1892. The increased capacity will reduce backwater occurrences in the service area bounded by South 5th Street, South 34th Street, West Greenfield Avenue and West Lincoln Avenue. The total cost of the project was \$14.45 million.

West Meinecke Avenue Lining Project

In March of 2001, 2,285 feet of cured-in-place lining was installed in an existing 72-inch diameter combined sewer in West Meinecke Avenue from North 30th Street to North 37th Street. The existing sewer, constructed in 1926, was in poor structural condition. The lining will structurally rehabilitate the existing sewer, while not reducing its hydraulic capacity.

In what is a world record for this construction method, the contractor installed the liner for the entire length of the project in a single pass. This allowed the contractor to eliminate additional work shafts along the project's length, minimize surface disturbances, minimize disruptions to area residents and reduce the cost of the project as compared to a typical trench method of installation. The total cost of the project was \$1.99 million.

East North Avenue Sewer

In 2001 a \$3.06 million contract was awarded for the construction of an 84-inch diameter sewer to replace an existing 66-inch diameter combined sewer that was constructed in 1902. The existing sewer is in poor structural condition and is no longer large enough to handle flows in the area.

In order to provide the required outlet for the new sewer, a portion of the Milwaukee Metropolitan Sewerage District's (MMSD) combined sewer overflow is being rebuilt along with the City sewer. The City designed the District's sewer in conjunction with the City's new sewer, with MMSD providing the funding for their portion of the project.

The new sewer is being constructed from the east bank of the Milwaukee River to North Bartlett Avenue, and involves the installation of 818 feet of 84-inch diameter sewer by a tunnel-boring machine, with fiberglass mortar pipe installed in the ring and lagging tunnel section. In addition, the high-level service sewer was rehabilitated by slip-lining a new pipe inside the existing pipe rather than replacing the sewer by digging it up. This greatly reduced traffic disruptions on East North Avenue. The project will be completed before paving of this street begins in spring.

South 16th Street Replacement Sewer

A \$2.08 million contract was awarded for the construction of a new 84-inch storm sewer outlet to the Kinnickinnic River. The new sewer, located in South 16th Street and in West Manitoba Street, will replace an existing rising outlet located west of South 17th Street and north of Manitoba Street. Currently the rising outlet allows water trapped within the sewer to drain through a 6-inch orifice into a combined sewer. The new sewer will eliminate this storm water from entering the combined sewer, improving the performance of the combined sewer. The project is under construction and should be operational by spring 2002.

North 30th Street Shotcrete Project

A \$1.54 million contract was awarded in February 2001 for the rehabilitation of 2,120 feet of 120-inch diameter brick combined sewer in North 30th Street between West Brown Street and West Meinecke Avenue. The sewer, constructed in 1898, was in need of structural repairs. The sewer was rehabilitated by installing shotcrete on the inside of the pipe and did not require the street pavement to be removed. The shotcrete method involves spraying a concrete mix over reinforcing steel. For this project, a 6-inch layer of concrete was used with the reinforcing steel to provide the required structural stability. The project was completed in December of 2001.

Storm Water Management Area

As part of the City's storm water permit from the Department of Natural Resources (DNR), the City was required to revise the City's storm water ordinance. The City requested and received from the DNR an extension to revise the ordinance in 2002 in order to include requirements of the Milwaukee Metropolitan Sewerage District newly adopted storm water management rule. A draft of the revised storm water ordinance was completed in December.

One major activity of the city's Storm Water discharge permit is the requirement for a storm water management plan for development and redevelopment projects on parcels of land five acres in size or larger. During 2001, 76 storm water management plans were reviewed.

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 pollutants at each outfall. The tests identified a total of 18 possible illegal/illicit discharges in 2001. Ten were reported to the Department of Neighborhood Services for further investigation and correction. The other 8 will continue to be investigated.

Nonpoint Source Program

Construction was completed on the installation of storm water treatment devices in the Historic Third Ward area. This pilot project will reduce the amount of pollutants entering the river through runoff. The Department of Natural Resources provided more than 50% of the funding for this project, with the remaining funding coming from the Historic Third Ward.

The City has entered into 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 programs on reducing pollutants found in urban streams. A control site at South 18th Street and West Ramsey Avenue was chosen. Base sampling will begin at both the control site and the study site located at South 55th Street and West Holt Avenue.

Last year, a contract was awarded and work was completed to install a storm water sampling station in the Lyons Creek area. As an additional part of the contract, a survey was prepared for distribution to residents in the area. This survey will determine the existing level of understanding residents have on storm water pollution issues.

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 2001, 69 sanitary sewer systems were monitored at a total cost of \$242,000. The section monitored 33 of the systems and a consultant was hired to monitor the remaining 36. Flow monitoring data was collected from April through October in the form of a sewer system evaluation survey (SSES) to identify sources of infiltration and inflow. The data was then used to determine if the performance of each system warrants further investigation. The total cost for flow monitoring in 2000 was \$242,800. Twenty-three systems require SSES work, which can consist of smoke testing, manhole inspections, televising, dyed water flooding and building inspections. Actual methods used were dependent upon the conditions of each system.

Sanitary Sewer Evaluation Surveys

A consulting firm was contracted to determine the sources of inflow/infiltration (I/I) in sanitary sewers systems. These systems were identified as having high rates of I/I through 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 main methods of determining defects are inspecting the manholes and smoke testing the sewer mains. 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 2001 was \$625,776.

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 2001, a contract was let for the repair of 3,247 sanitary manholes at a cost \$2,292,920. The rehabilitation consists of replacing lids, installing seals and repairing defective brick work in the manholes.

Downspout Disconnection Project

In late 2000, the City of Milwaukee received a \$50,000 grant from the Milwaukee Metropolitan Sewerage District (MMSD) to determine cost effective methods of reducing storm water flow in sanitary and combined sewer systems. In 2000 and 2001, a combined system was studied as to the effects of disconnecting downspouts from the sewer system and allowing the roof runoff to be infiltrated into surrounding grassed areas. The study will be completed in 2002.

In 2001, the City received an additional \$50,000 grant from MMSD to study the effects of downspout disconnection in a second system. Preliminary engineering has begun in the second system. Each building within the study system will be examined to determine which downspouts can be safely disconnected from the sewer and routed to the surface. In addition, various methods of disconnection and surface treatments are being studied.

For the downspouts that are disconnected, the storm water runoff that previously went into the combined sewer system will now be directed to large grass or garden areas, which will infiltrate the water into the ground. Flows in the sewer system are being measured for before and after conditions to determine the amount of reduction in flow due to the disconnected downspouts.

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. The system will replace the existing sanitary bypass pump, lift station and rain gauge monitoring system. During 2001, the consulting firm completed installation of some additional adjustments to the system. It is anticipated that the system changes will be completed and the system fully operational by spring of 2002.

When fully operational, the new SCADA system will automate several functions, currently performed by staff, by recording the data electronically instead of on paper. Electronic recording will allow for real time analysis and processing of the data. This in turn will result in real time reporting of bypass pump and lift station operations internally and to the Department of Natural Resources (DNR) as is required by the City's bypass pump permit. The system also monitors the operational status of the bypass pumps and lift stations thus reducing the need for field visits to these sites.

Automated Mapping and Drafting Area

In 2001, a service order for professional services was initiated to examine the existing sewer graphic mapping format and establish a schedule to complete it's development. The study will provide the department with a report detailing each phase of the work and a prioritized schedule for completing the project. Detailed estimates will allow the City to program the remaining steps of the project within the constraints of the budget.

The benefits to the City include an easy to maintain sewer graphic mapping system and the completion of the digital plat page. The digitizing of house sewer laterals and other remaining plat information are expected to be a multi-year project. The completion of this work will allow the city to retire the hand drawn sewer plat pages and eliminate the duplication of effort in maintaining them.

The City of Milwaukee and the Milwaukee Metropolitan Sewerage District made the first exchange of digitized files of their sewer graphic and database information. This provides each agency with an instant reference to each other's files, saving many hours formerly spent in obtaining information on existing underground facilities for sewer studies and design projects for both utilities. Sharing this information permits the City's Building Services Section to enhance the sewer plat reference pages with the addition of the District's information.

Underground Conduit Area

During 2001, City forces installed an additional 3.16 miles of new underground conduit and 17 additional manholes.

New conduit was installed in West Fond du Lac Avenue from North 19th Street to North 36th Street, thus completing a vital link to the northwest side of the City. This conduit will serve police stations and firehouses as well as other City facilities. New conduit was also installed in the intersection of North 6th Street and West Canal Street, tying in the conduit being installed in the 6th Street Viaduct and the anticipated conduit installation in West Canal Street.

Additional conduit was installed in West State Street from North 35th Street to North 46th Street. This project was requested by Traffic Engineering and funded by both Traffic Engineering and Underground Conduit. Traffic also requested and funded the installation of conduit laterals at the intersection of North Dr. Martin Luther King, Jr. Drive and North Port Washington Road.

Conduit was installed in West North Avenue from North 35th Street to North 47th Street. This installation was requested and paid for by the Police Department. This was the last segment of conduit needed to connect Police District 7 to the new Police District 3 Data Center.

Approximately 0.55 miles of conduit was installed from the Water Street Bridge over the Milwaukee River to the intersection of vacated North 5th Street and West Florida Street as part of the 6th Street Viaduct project. The conduit will be used to connect the Water Street Bridges to the two proposed bridges on 6th Street for remote bridge operations. Conduit will be installed for the City in 6th Street from West Virginia Street to West Clybourn Street as part of this project as well, thus giving the City of Milwaukee a vital link between the North and South sides.

As of December 31, 2001 there are 544.1 miles of underground network conduit lines and 7,365 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 \$4.5 million capital paving budget by the Project Programming Unit resulted in approval of 26 street paving and 17 alley projects in 2001, and the award of \$3.8 million in contracts, which includes developer sponsored projects.

In 2001, the Project Programming Unit prepared 306 estimates and verified 82 city certified paving projects for improvement in the City of Milwaukee. The formal estimates prepared include 98 street paving projects (11 sponsored by the State of Wisconsin) and 52 alley-paving projects. The verified certificates include 44 street paving projects, of which six were sponsored by the State of Wisconsin and 32 alley paving projects.

Project Programming staff appeared before the Common Council's Public Improvements Committee for public hearings on 75 paving, new sewer and new water projects. In addition, resolutions were prepared to authorize construction for approximately 170 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 2001, the unit issued 5,501 bills resulting in \$3,775,500 in revenue to the City.

Major Projects Area

The Major Projects Unit coordinated the completion of 13 Federal and/or State Major Street Program projects at a total cost of \$18,276,500, of which the City's portion was \$3,400,500. The most significant of the 13 major Federal and/or State paving projects completed in 2001 include:

- The reconstruction of West Fond du Lac Ave (STH 145) from North 36th Street to North 19th Street.
- The reconstruction of North 35th Street from West Highland Boulevard to West North Avenue.
- The reconstruction of North Dr. Martin Luther King, Jr. Drive from West Burleigh Street to West Keefe Avenue.
- The reconstruction of West State Street from the West City Limits to North 35th Street. The resurfacing of North 76th Street (STH 181) from West Appleton Avenue to West Grantosa Drive.
- The resurfacing of West Blue Mound Road (USH 18) from the Zoo Freeway to North Glenview Avenue.
- The resurfacing of East Oklahoma Avenue from South Chase Avenue to South Clement Avenue.

As part of and in conjunction with the West State Street paving project, this unit worked with the Department of City Development and the Miller Brewing Company in securing and implementing a Transportation Enhancement Grant to provide streetscape features through the West State Street/Miller Valley corridor. The streetscape items include specialty paving treatments and lighting, overhead monument signs and a canopy over the sidewalk to provide a covered walkway for the Miller Brewery tours. This work started in 2001 with the paving project and will be completed in 2002.

Preliminary engineering was in progress for 34 Federal and/or State Aided Major Street paving projects, 10 Local Bridge Replacement Program projects and 3 State Trunk Highway Bridge Replacement Projects.

In 2001, this unit continued to coordinate the Design-Build project to replace the Sixth Street Viaduct over the Menomonee Valley. This \$49,500,00 project is the first design-build bridge project in the State and its completion is scheduled for the fall of 2002.

Working with Federal, State, County staffs and private consultants, the unit continued the process to remove a segment of 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. This unit will continue in this role with the project through its scheduled completion in early 2004.

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.

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 Haley Road Viaduct over the Menomonee River, the Knapp Street Bridge over the Milwaukee River, the Highland Boulevard Bridge over the Canadian Pacific Railroad, the Teutonia Bridge over Lincoln Creek, the Green Bay Road 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, began construction in 2001. This is 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 and award this contract. There are 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 will replace the old 6th Street Viaduct. The new bridge will slope down to the floor of the Menomonee River Valley forming an at-grade intersection with Canal Street. The Viaduct will be closed for 15 months and the entire project is expected to last 25 months.

Zenith Tech., Inc. was awarded the construction work for the removal and replacement of the North Sherman Boulevard Bridge over Lincoln Creek. Construction began in November of 2001 with a scheduled completion time of 132 days.

Six railroad bridges were acquired on the abandoned Chicago Northwest Railroad Line. Five of these bridges will be renovated and used for a future bike trail. The bridge over Chase Avenue will be removed to provide adequate vertical clearance over Chase Avenue as part of the new Chase Avenue Bridge construction project.

Lunda Construction Co. was awarded the construction work for the removal and replacement of the South Chase Avenue Bridge over the Kinnickinnic River. Initiation of construction was delayed while the City acquired property rights from the Union Pacific Railroad to allow removal of the existing Railroad Bridge over Chase Avenue.

The Good Hope Bridge over the Menomonee River was completed. Final work was completed on the 35th Street Viaduct rehabilitation. The North 6th Street pedestrian bridge at West Galena Street was removed. The North Teutonia Avenue Bypass Culvert was completed as part of the flood control project. Both of the new Lincoln Creek Bridges at 51st and Woolworth were left closed to traffic to accommodate the heavy construction equipment needed for the flood control work in Lincoln Creek. The 51st and Woolworth Street Bridges were opened in 2001. The West Green Tree Road Bridge over Lincoln Creek project was completed and opened to traffic in 2001.

Other Lincoln Creek work performed in 2001 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.

The city plans to complete construction of a new Knapp Street lift bridge one block north of Juneau Avenue in place of the elevated Park East Freeway bridges (which will be removed) 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. The preliminary engineering was completed and final engineering started for the Knapp Street Bridge.

Structural modifications to the City Hall Fire Escape were completed. A contract was let for deck sealing, expansion joint replacement, joint sealant repairs, crack repair, and parking stall striping work for the 4th & Highland parking garage. Renovation of the Milwaukee-Michigan Parking Structure was completed. This renovation included re-cladding the building and structural repairs.

Inspections were performed and reports were prepared during 2001 on five City owned parking structures. The roof on 1000 North Water Street parking garage was repaired. A project to repair the concrete spalling on the MacArthur Square parking garage northbound freeway tunnel was incorporated into the WISDOT let 1-43 Resurfacing Project.

The Hubbard St. retaining wall was pressure washed, and the surrounding areas were graded, and landscaped to complete the project.

Concept definition reports were prepared and submitted for the following projects:

- North 29th Street over the Milwaukee River
- North 45th Street over the Menomonee River
- West Cameron Avenue over Lincoln Creek
- North 27th Street over the Union Pacific railroad
- West Brown Street over the Canadian Pacific railroad
- The new West Canal Street bridges needed to extend West Canal Street to Miller Park

A contract for design services with Engineering Specialists, Inc. was authorized for a remote control bridge operating system to allow operation of the St. Paul Bridge from the Michigan St. Bridge.

Bridge inspections were performed during 2001 in accordance with the Federal and State guidelines. The guidelines include quantifying all major structural maintenance items on each bridge. A total of 14 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.

Following the December 13, 2000 failure of the Hoan Bridge, the City took inventory of all its bridges in order to identify those bridges with some similar structural design or construction features. It was determined that no city bridges had features identical to the Hoan Bridge. Of those with some similarity, no structural problems were found in the steel girders.

Structural analysis was also performed for various repair and construction projects involving street light poles, hollow walks and bridges with overloaded 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.

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 2001. In addition, the preliminary plans for the Harley-Davidson/Warner Cable river walk and site development were reviewed. Work also continued on the Highland Avenue Vertical Lift Pedestrian Bridge with construction nearly completed. The project had been delayed to make repairs to damage caused from a contractor accident. Design work progressed on the preparation of plans and specifications for the Historic Third Ward River Walk and construction was completed on the dock wall upgrades. The Buffalo St. dock wall on the east bank of the Milwaukee River was repaired in preparation for the new river walk proposed for the Historic Third Ward.

Preliminary engineering and review of design options were started for the development of the Kilbourn Park extension to Commerce Street. Soil sampling, material testing, and preliminary engineering analysis was performed on the existing concrete walls to check structural integrity.

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, the Kenosha-Racine-Milwaukee Corridor Transit Alternatives Analysis (a.k.a. WISERIDE), and the Park East Reconfiguration Environmental Assessment traffic analysis as it related to decommissioning of the Park East Freeway.

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. Additionally, emergency measures were taken in conjunction with the unscheduled closure and subsequent repair of the Hoan Bridge.

Assistance was also provided to the WISDOT with regard to the planned resurfacing of the Milwaukee Freeway system along I-43/94 from the Mitchell Interchange to Silver Spring and I-894 from the Belton Overpass to the Mitchell Interchange. Assistance was further provided on the Intermodal Passenger Facility location study; the alternatives study 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 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.

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 continued 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 began in 2000, with all construction anticipated to be 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/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. It is anticipated that a Publicity Plan will be developed and implemented in 2002. The City of Milwaukee Bicycle Route Map continued to be distributed through 2001. 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 270 bike 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 2001 this unit was very active in the planning and implementation of several off-road bicycle trail segments. Work was completed on a 1.1-mile segment of the Hank Aaron State Trail (HAST) along the south side of the Menomonee River between North 25th Street and Emmer Lane using a Wisconsin Coastal Management Program grant. This unit continues to work in a cooperative effort with the DNR to implement remaining segments of the HAST. During 2001 this unit negotiated responsibilities between the City and DNR to implement 3 segments of the HAST – the 44th Street segment (Doyle Park to Miller Park), the CMC/CP segment (Miller Park to N. 25th Street), and the Canal Street segment (Emmer Lane to 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 2002.

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 is anticipated to be re-bid in early 2002 with construction completed in summer 2002.

In 2001, 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 drafted 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 2002.

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 is expected to be completed in 2002.

In 2001, this unit coordinated the writing and submission of eight applications under the Congestion Mitigation Air Quality grant program. It is anticipated that in 2002 the City of Milwaukee will be 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. It is anticipated that a contract will be let in early 2002 for a demonstration project to improve a portion of West Wisconsin Avenue.

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 2001 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 Miller Park, the Milwaukee Art Museum Expansion, River Homes, Trostel Square, Humboldt Ridge, Brewers Hill Commons, Warren Manor, Jefferson Block in the Historic Third Ward, Marquette University, Highbridge and the Humboldt Yards Redevelopment. Other development projects include the Third District Police Station, Heritage Meadows, Heritage Woods, Cherokee Point, Reed Street Yard Redevelopment, Lakeshore State Bank, USF Holland, the Midtown Retail Center at the site of the former Capitol Court Shopping Center and the development of sites for two new Wal-Mart stores and two new Super K-Mart outlets. 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 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.

During 2001 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 2001 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. It is anticipated that construction will commence 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 2001 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 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 two subcommittees of the Local Roads and Streets Council – the Education and Publicity subcommittee and the Technical Users Advisory Group. This unit also represents the City's interests in promoting and deploying intelligent transportation technology statewide as a member of the Wisconsin ITS Alliance.

In 2001, 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. By late 2001, the PMA was functioning to the point where it could assist us in determining the most cost-effective pavement rehabilitation strategies and development of our annual paving program. Finalization of the PMA allowed the City of Milwaukee to easily submit its pavement condition evaluation to the WDOT for its Statewide WISLR (Wisconsin Inventory of Streets and Local Roads) initiative, which will allow statewide evaluation of the state and local investment in our highway transportation system. Additionally, the capabilities of the PMA will provide the City a great tool in compiling and reporting information for the GASB 34 initiative, a federally mandated program to assess the value of City of Milwaukee infrastructure, as it relates to streets and roadways.

During 2002 the Planning and Development Unit will work closely with other City, State, and private entities in coordinating efforts in the initiation of the Marsupial Bridge Project (a pedestrian & bicycle facility hung below the Holton Street Viaduct), initiation of a Riverwalk system in the Historic 3rd Ward, 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 Wisconsin Avenue, North Water Street and West Kilbourn Avenue, continued evaluation of alternatives in the Downtown Connector Study, the Harley Davidson Museum, 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

Five new traffic signals were installed at the following locations:

East Bay Street and South Lenox Street
West Main Street and South 76th Street
West Virginia Street and South 2nd Street
West Edgerton Avenue and South Howell Avenue
West Galena Street and North 6th Street

In addition, one existing traffic signal was reconstructed:

West Blue Mound Road and North 52nd Street

Two new flashing beacons were installed at the following locations:

West Forest Home Avenue and South 29th Street
West Grantosa Drive and North 82nd Street

One City neighborhood received Neighborhood Identification Signs. Twenty-three signs were installed in the Wedgewood Park area.

Bicycle Lanes were installed at the following locations:

East Capitol Drive, West Humboldt Boulevard to Estabrook Parkway
East North Avenue, West Humboldt Boulevard/Avenue to North Oakland Avenue

Angle Parking was installed in the following locations:

South 5th Street, West Pierce Street to West Washington Street
North Milwaukee Street, South of East Wisconsin Avenue
West Bruce Street, South 5th Street to South 6th Street
South 15th Place, West Mitchell Street to West Burnham Street
North 44th Street, South of West Congress Street
North 46th Street, South of West Congress Street

The Traffic and Lighting Design unit sought and received Federal funding through the Wisconsin Department of Transportation, Bureau of Transportation Safety, to conduct two 3-day training workshops. The workshops specifically discussed the state of the practice of designing modern roundabouts based on the Federal Highway Administration's informational guide on Roundabouts. Thirty-two individuals from village/city/county/state agencies and private consultants attended the workshop in Milwaukee and 37 in the Wisconsin Dells. The City of Milwaukee sent three staff engineers. The training grant provided \$25,230 for these workshops.

Brian Ray and Lee Rodegerdts of Kittelson & Associates, Portland, Oregon presented both workshops. The Kittelson firm was the prime contractor for the production of the Federal Roundabouts guide.

The unit continues to evaluate the energy savings for six hundred Light Emitting Diode (LED) traffic signal indications installed last year at 38 intersections. The new indications consisted of a variety of manufacturers red and pedestrian indications. The LED indications use approximately 90 percent less energy and have an expected life of between 5 and 10 times that of regular incandescent signal indications. Preliminary results from six intersections show an average energy savings of \$43 per month per intersection.

As part of the City's Capital Improvement Program, plans were prepared for street lighting system alterations and upgrades were to be done in conjunction with 100 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 2001, a total of 2,508 streetlights in the City were converted to high-pressure sodium lighting. With this work, approximately 87 percent of the 66,419 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 2001, federal Transportation Enhancement Funds were provided through the Wisconsin Department of Transportation for the installation of historic lighting on portions of South Kinnickinnic Avenue, North 35th Street, West Wisconsin Avenue and West Bluemound Road. In addition, Enhancement Funds were used to install the historic lighting fixtures on portions of West Fond du Lac Avenue and West State Street as part of streetscape improvements installed in conjunction with paving projects.

Grant funds, special assessments or private funding were used to provide historical lighting as part of neighborhood or business district improvement projects. Examples of these types of projects completed in 2001 include lighting on West Vliet Street from North 47th Street to North 60th Street; West Wisconsin Avenue from North 20th Street to North 26th Street, West Lisbon Avenue and the St. Joseph's Hospital Campus. Harps and lanterns have also been incorporated into development and redevelopment projects such as the new District 3 Police Station, the Marshall Fields Building Renovation, the Walk of Fame constructed adjacent to the U.S. Cellular Arena, the Tannery site development in Walker's Point, Parklawn, Commerce Street and the Metplex site.

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 for openings or closings of public rights-of-way; 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 2001, 30 plans and petitions for the vacation of public ways were processed. The Unit also processed three subdivision plats and 61 certified survey maps, produced 370 paving plans for 103 separate paving projects, six structure projects and seven state paving projects, and acted upon 45,253 requests from Diggers Hotline to locate the city's underground electrical and water main facilities.

The Milwaukee County Automated Mapping and Land Information System (MCAMLIS) is a new project that will bring together property and utility information for all of Milwaukee County in a digital format to create cadastral maps (A map showing boundaries and land ownership). The Central Drafting and Records Unit compiled five digital map files of U.S. Public Land Survey one-quarter Sections in 2001 as part of a MCAMLIS project agreement with the Southeastern Wisconsin Regional Planning Commission (SEWRPC). Central Drafting also assisted the City of Milwaukee Geographic Information Systems (GIS) Section with its MCAMLIS work by compiling 117 one quarter section files containing subdivision and certified survey map outlines. 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. Central Drafting completed its project to redraw 40 engineering quarter sections and create cadastral maps. Central Drafting will continue to assist GIS as necessary with their transformation project to create cadastral maps for the remaining quarters.

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 2001, the existing work processes were examined to determine where system short falls exist, and users were interviewed to obtain first hand knowledge of how the system operates and what improvements could be made.

A considerable amount of mapping has been done over the years using micro station. Electronic database files also exist to track miscellaneous inventory quantities. There is value in linking mapped information with these data files. 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 information as well as being the appropriate tool for future growth and applications.

A pilot project was begun and completed by the end of the year. GeoMedia Pro proved to be a good product to link existing data, reduce duplicate record keeping thus providing a better more accurate work product. The digitizing project is scheduled to begin in 2002.

CONSTRUCTION SECTION

The Construction Section administers and provides 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 will test all sewer and water main pipe to be installed and monitors all other materials testing performed by a private contractor.

In 2001, local road paving work consisted of 21 contracts that totaled 10.47 miles. In addition there was 2.16 miles of alleys. The total contract cost was \$4.07 million. Three walk repair contracts cost \$1.25 million. Sewer construction totaled \$11.26 million for 37 contracts covering 5.84 miles. Relay of 9.83 miles of watermain cost \$4.93 million on 30 contracts. Inspection was also provided for 1.44 miles of suburban watermain installation. Seven minor building service contracts had work totaling \$94,000.

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. Eleven WISDOT paving projects were constructed this year at a cost of \$15.88 million, covering 11.31 miles and include the following: West State Street from North 35th Street to North 60th Street; West Fond du Lac Avenue from North 19th Street to North 36th Street; North Dr. Martin Luther King Drive from West Burleigh Street to West Keefe Avenue; North 76th Street from West Appleton Avenue to West Grantosa Boulevard; West Green Tree Road, from North 76th Street to North Industrial Rd; North Industrial Road from West Green Tree Road to West Mill Road; South Whitnall Avenue from South Clement Avenue to South Brust Street; East Oklahoma Avenue from South Chase Avenue to South Clement Avenue; North 35th Street from West Highland Boulevard to West North Avenue; West Bluemound Road from the Zoo freeway to North Glenview Avenue; and East Bay Street from South Bay Street to South Kinnickinnic Avenue.

Residential/Industrial Developments

Approximately 2.5 miles of new roads, along with sewer and water mains were installed to provide service and access to new residential and commercial developments throughout the City. These newly developed areas include, Heritage Meadows (North 110th and West Kiehnau), Liberty Place (North 107 and Park Place), and Riverwoods (North 91st and West Acacia Street) on the north side, and Trostel Square (North Commerce Street) and Beerline Development in the near downtown area.

W. Fond du Lac Avenue (N.19th Street to N. 36th Street)

The construction of West Fond du Lac Avenue was undertaken in two stages. Stage I consisted of constructing the north half from North 19th Street to North 36th Street and Stage II consisted of constructing the south half. The four major intersections at West North Avenue, North 27th Street, West Locust Street, and North 35th Street were constructed in multiple stages in order to maintain traffic flow in all directions at all times. Access to business properties was maintained at all times during construction.

Construction activities on West Fond du Lac Avenue started in Mid June of 2001 and were completed by early December of 2001.

As part of the West Fond du Lac Avenue Streetscape plan, tree cutouts were provided in the sidewalk and street lighting fixtures and harp lights were installed on this project.

This 1.64-mile project through an inner city business district cost \$4.3 million to construct.

W. State Street (N. 35th to W. City limits).

The construction of West State Street was undertaken in three stages. Stage I construction from North 35th Street to the west City limits near North 60th Street covered construction of the north half of the road. Stage II construction was from the West City limits to North 45th Street on the South half of the road. Stage III construction was from North 45th Street to North 35th Street on the south half of the road.

Access to all businesses on West State Street was maintained at all times during construction activities.

The use of exposed aggregate concrete sidewalk, stamped concrete, and brick and granite pavers were utilized in the area between North 45th Street and North 35th Street. This work was done in conjunction with the Miller Valley State Street Streetscape improvement plan.

West State Street was 1.6 miles in length and cost \$3.2 million to construct.

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.

In 2001, responsibilities of the Field Operations Section were accomplished with a total annual budget of \$24.7 million, including \$7.79 million from the Sewer Maintenance Fund.

Streets and Bridges Unit

Street Maintenance Area

Street Maintenance Section purchased a small scarifier in 2000. This scarifier allows Street Maintenance to complete minor repairs to existing sidewalks. Existing sidewalks having offsets that are less than 1½" can be milled down to match existing adjacent sidewalk. In most cases milling down an offset provides a better fix than placing asphalt shims.

Street Maintenance Section completed its third 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 385,000 square yards of "Slurry Seal" this year.

The Street Maintenance Section also had maintenance contracts for Asphalt Resurfacing and Crackfilling. Asphalt resurfacing occurred on St. Paul Avenue, Lincoln Avenue, Michigan Street, Villard Avenue, Morgan Avenue, Tory Hill Court and 9th Street where 4,300 tons of asphalt were placed. 332,704 square yards of pavement throughout the city were crackfilled with tar under the Crackfilling Contract.

Street Maintenance Section field crews placed an additional 8,670 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 1,039,381 square yards of pavement with tar.

Bridge Maintenance Area

The Bridge Maintenance Section operates, maintains and repairs twenty movable bridges over the Milwaukee, Menomonee and Kinnickinnic Rivers. There were roughly 12,500 openings. Construction of the Highland Avenue Bridge and record low water levels resulted in a drop in the number of bridge openings for the second straight year. 57% of the openings were between 7:00 a.m. and 3:00 p.m., while 34% occurred between 3:00 p.m. and 11:00 p.m. and 9% occurred between 11:00 p.m. and 7:00 a.m.

Construction of the new Ember Lane Bridge was completed in July. This bridge will be remotely operated from the Broadway Bridge. Four of the twenty movable bridges can be remotely operated from another bridge, namely the Ember Lane, Plankinton Avenue, Clybourn Street and South 1st Street bridges. Additional remote operations are planned for Highland Avenue, St. Paul Avenue, South 6th Street and North 6th Street bridges.

Construction began on the new 6th Street Viaduct in December. The viaduct will be closed to traffic in March or April of 2001. The Bridge Maintenance Section assisted with the design of the new Viaduct. Most of our input concerned the design of the two bascule bridges that are part of the new viaduct. Electricians and maintenance crews provided information for electrical design, mechanical components, bridgehouse design, remote operation and long-term maintenance considerations. Early in the year the viaduct withstood a collision by a cement barge.

Repairs were completed on the 35th Street Viaduct. These repairs included painting of the structure, structural repairs and a new asphalt surface. Construction was completed on the new Walnut Street Bridge over the Railroad.

Bridge Maintenance Crews installed new wire rope cables on the St. Paul Avenue Bridge. Bridge Maintenance Crews also performed concrete work on a new plaza being constructed at the southeast corner of the Holton Street Viaduct. Several painting operations were completed on bridges along the Milwaukee River.

The Bridge Maintenance Section again spent 4,000 labor hours on the City's assault on graffiti. We received a small sand blaster from the Department of Neighborhood Services. Some new security measures were added which will hopefully curb the amount of graffiti placed on City structures.

Inspections Area

The Inspection Section handled over 9000 construction permits in 2000. There were a record number of Fiber Optic companies installing cable and conduit throughout the city, with the downtown area receiving the majority of the fiber optic cable. This year the Inspection Section started performing "condition inspections" of streets, rivers and creeks prior to MMSD projects.

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. In 2001 there were over 800 Special Event Permits.

Underground Operations Unit

The Underground Operations Unit functions under two different budgets. Activities associated with maintaining the City's sewer systems and appurtenances 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. The latter function is financed through the traditional operations and maintenance budget or capital improvement programs.

RAINSTORMS

After four consecutive years in which major rainstorms occurred, 2001 had no severe storms, however the annual rainfall total was still above average. The MMSD improvements to Lincoln Creek has had a very positive affect

STORM INLETS

In order to reduce street debris run-off, sump storm inlets will be replacing 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 general, the DNR is tightening regulations regarding erosion control and storm water management regulations and enforcement.

SAFETY

Lost time due to injuries was the lowest in several years. Equipment purchases, training, awareness and supervisor participation are key factors

UNDERGROUND CONDUITS

Conduit crews had another banner year, with extensive projects in West Fond du Lac Avenue and West State Street. Crews accomplished these installations despite extremely restrictive conditions.

Electrical Services Unit

The Street lighting personnel responded in professional fashion yearlong and added to the quality of life providing the comfort of well-lit neighborhoods and roadways.

- Performing repairs on 2,034 area street lighting outages and 98% within 24 hours.
- 153 Street lighting poles were replaced.
- Responded to 3,028 unit troubles and 86% were repaired in 30 days.
- 4,546 scattered lamps were replaced
- 9,279 lamps were group replaced
- 891 alley lights repaired

Traffic Services Area

The traffic services group performed admirably providing safe signal controls for drivers and pedestrians alike. Some of their accomplishments were:

- Replaced 3,581 traffic lamp outages
- Group replaced 3,663 lamps
- Replaced 490 Electro-mechanical controllers
- Repaired 98% of controller troubles within one day
- Repaired 81% of circuit troubles in one day
- Repaired/ replaced 283 controller/signal knockdowns
- Completed traffic signal installations for major Capital Improvement projects

Sign Shop Area

A workforce of steady performers that provided for safety through signage that provided information and promoted safe operation of motor vehicles as well as safe pedestrian traffic.

- Maintained and repaired 3,371 signs
- Repaired and replaced 1,271 vandalized signs
- Installed 4,059 temporary signs for events, safety, etc.
- Completed signage and roadway painting for major Capital Improvement projects in a timely manner. The major signage projects completed in 2001 were:
 - Walk of Fame (N. 4th St./ W. State to W. Kilbourn)
 - Jewel Osco- Metplex (33rd – 37th/W. North – W. Meinecke)
 - Fond du Lac Avenue/ 19th – 36th (AUP)
 - W. State St/ 35th – 46th (AUP)
 - Tannery District (W. Bruce/ 6th – 8th)
 - W. Liberty Drive
 - W. Vliet St./ 47th – 60th
 - Wisconsin Avenue/ 19th – 26th
 - S. Layton Blvd
 - W. Good Hope/ 115th – 124th
 - 111th - 114th/Brown Deer – W. Donna

Support Services Unit

The Support Services Unit is responsible, in part, for the Stores areas in the Field Operations Section. The 2001 current value of the store's area was \$2,592,677 as compared to \$2,992,170 at the end of 2000. This reduction of almost \$400,000 in inventory was due in large part to the way we charge materials out to various projects and a very concerted effort by stores personnel to diminish obsolete materials. This unit will continue to make progress in reducing the current values in our inventory.

2001

GENERAL STATISTICS

Streets, area of (improved and unimproved)
Net change in 2001: minus 1.752 acres
Total area at end of 2001 1,738.549 acres
or
18.341 square miles

Alleys, area of (improved and unimproved)
Net change in 2001: minus 0.352 acres
Total area at end of 2001 928.587 acres
or
1.451 square miles

Pedestrian ways and malls,
Area of (improved and unimproved)
Net change in 2001:
Total area at end of 2001 29.614 acres
or
0.046 square miles

State and County rights-of-way, area of (improved)
Net change in 2001: plus 6.635 acres*
Total area at end of 2001 1,815.667 acres
or
2.837 square miles

Area of City:
At end of 2001 95.828 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

*Land acquisition by State to support the West Good Hope Road and
US 41/45 Interchange

CONSTRUCTION PLANS AND SPECIAL DRAWINGS

Paving Plans produced	
103 Separate Paving Projects	370
The Paving Plans included:	
Background Drawings	130
Cross-Sections Transferred	143
New Designs Transferred	97
Final Official Map one-quarter section plots made	85
Election Commission Aldermanic District Ward Maps and	
Single and Double Line Street Maps Revised	126
Number of Structural Design Projects for which plans were prepared	6
Number of State of Wisconsin paving projects for which plans were prepared	7
One-quarter section map final plots prepared	131
Color maps prepared for Summerfest and other annual special events	20
One-quarter section maps prepared for MCAMLIS/GIS project	117
One-quarter section maps redrawn for the MCAMLIS project	5

ONE-QUARTER SECTION MAPS, STREET MAPS, SUBDIVISION PLATS, AND CERTIFIED SURVEY MAPS, THE OFFICIAL MAP, ALDERMANIC DISTRICT MAPS, OTHER PLANS - 2001

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	131
Number of revisions to the one-quarter section maps	184
Number of one-quarter section maps remicrofilmed	131
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	61
Subdivision Plats processed	3
Certified Survey Maps prepared	0
Plats of Survey prepared	0
The Official Map one-quarter section maps; Scale: 1" = 200', on file (75 of these maps were revised with a total of 193 revisions)	445

**LAND ACQUISITION, STREET DEDICATION, PUBLIC
WAYS VACATION AND MISCELLANEOUS ACTIVITIES - 2001**

Dedications of City Property for public right-of-way	0
Acquisition of rights-of-way by accepting deed reservations or by quick-claim deed. ...	5
Reject Reservations	0
Release access restriction	2
City property to be sold	0
Vacation of Public Ways	30
Prepare easement and private road descriptions	6
Various title reports for vacation projects and/or sewer and water easements	21
Street name change ordinances prepared	2
Designate private streets	2
Latitude and longitude locations compiled for the public	1
Oversize and overweight load routes checked for the Department of Public Works, Contract and Permits Office and private trucking companies	304
House moving permit applications processed for The Department of Public Works	3
Distances between drug arrest scenes and schools or parks given to the District Attorney's office, The Milwaukee Police Department, The Milwaukee County Sheriff's Department and The Wisconsin Department of Justice*	631
State subpoenas received for criminal felony cases	105
Drawings prepared for use as evidence in criminal trials	105
Appearances in court as a witness under State subpoena for criminal trials	6

DIGGERS HOT LINE - 2001

Hot line requests	36,855
Utility information requests	404
Out-of-City requests	7,994
 Total Hot Line Requests	 45,253

* Central Drafting and Records will no longer provide this information to the County because they have no funds to reimburse City time.

TRAFFIC AND STREET LIGHTING ACTIVITIES - 2001

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	588
Special Lighting Maps on file	223
Revisions to and creating special lighting maps	34
Problem signal records processed	55
Traffic count studies-manual	11
Revisions to pavement marking records*	0
Revisions to Street Lighting Data Base	37,345

*This year, the Traffic & Lighting Design Unit updated pavement-marking records.

ADDRESS ASSIGNMENTS AND SALES - 2001

Address assignments	15
Maps, Plats and Plan Sales	\$14,360.79

SUPPLY SERVICES - 2001

Dollar amount of supplies requisitioned by Central Drafting and Records \$4,263.78

REPRODUCTION SERVICES - 2001

Approximate quantity of electrostatic printing done in house	154,140 square feet
Approximate quantity of microfilm aperture card copy machine paper used	22,125 square feet
Approximate quantity of paper used for plotters: Large format HD's bond paper	72,000 square feet
Vellum	2,700 square feet
Approximate quantity of electrostatic printing done under contract by a private printer	197,950 square feet
Total Reproduction Services	448,915 square feet

FIELD OPERATIONS - 2001

Bridges, viaducts and pedestrian overpasses	220
Bridges, movable	20
Bridges, number of openings	11,739
Pavement seal coating (square yards)	262,969
Asphalt surface by contract (miles)	3.05
Production of asphalt mixes (tons)	17,266
Inspection of permits	12,503
Sewers examined (miles)	96.6
Sewers cleaned (miles)	604.8
Structures cleaned	22,576
Service calls answered	8,163