Infrastructure Services Division

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The Infrastructure Services Division is responsible for the design, construction, operation 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. Through consolidation and efficiencies, the Division has been reduced by roughly 350 positions over the past 11 years to a level of 909. In 2006, 801 Alderman Service Requests were received.

ADMINISTRATION AND TRANSPORTATION SECTION

ADMINISTRATION AREA

The Administration Unit 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 Unit coordinates accounting functions along with the Department of Public Works Administration Services Division and the Comptroller's Office. The accounting services provided by the Unit include establishing projects, recording payments, monitoring costs, and closing project budgets and expenditures for the Transportation Unit and Environmental Unit in coordination with the Construction Unit. In addition, the Unit is involved in accumulating, categorizing, recording and reporting operation and maintenance expenditures for the Division. The Unit 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 2006, the Unit administered Capital Improvement and Grant and Aid Programs in excess of $50.8 million, Operations and Maintenance budgets of over $52.1 million, with payrolls of $24.2 million. The 2006 expenditures for all contract payments totaled over $28.3 million. In addition to processing payments and monitoring construction contracts, the Administration Unit provides

support to the other areas of the ISD on financial matters. The Unit 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 2006, Highway Aids in the amount of $22.8 million were received by the City of Milwaukee. The net expenditures related to DPW-Infrastructure activities resulted in approximately $15.1 million of aid received. In addition, $749,252 was received for reimbursement of costs incurred in maintaining and operating lift bridges on the connecting highway system program. Also, $1.9 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.

The Administrative Unit completed the annual 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 Computer Services group within the Administrative Section of Infrastructure Service provides support for day to day operations of the computer systems within the Division and acts as liaisons with the other computer support areas within the City. The support includes providing hardware and software maintenance for approximately 100 GIS/CADD units, 200 general-purpose units and 30 special purpose units within the Division and providing assistance to Division staff as necessary.

During 2006, significant effort was expended supporting the SCADA system, used to monitor and control the flow of water in the City's storm sewers and the equipment used to control traffic signals. In addition, older hardware, which would otherwise have been disposed of, was reconditioned, reconfigured, updated and reinstalled where practical. The group also generated various ad-hoc reports from data contained in the Division's databases and began the process of upgrading the office automation software used by the Division.

The group prepared to migrate the Infrastructure users on the Novell Server network to a Microsoft Server system. In addition, the group is leading the effort to convert the Division's obsolescent database software into current web based applications. To date, major portions of the ASR tracking, Contract Letting, Special Privilege, Project Programming and Special Assessments systems have been redeveloped. Finally, applications are under development for processing Paving Contract Payments using a completely new procedure and for displaying the status of the Capitol Paving Program on a map available through the City's web site.

In the coming year, further effort is required on redeveloping the database applications for Special Assessments, Estimating, Construction monitoring, Walk Contract administration, Special Privileges, and Traffic Engineering. In addition, the effort to upgrade the office automation software will be completed in 2006.

TRANSPORTATION AREA

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

PROJECT PROGRAMMING UNIT

Administration of the City of Milwaukee's $5.6 million capital paving budget by the Project Programming Unit resulted in approval of 28 street paving and 7 alley projects in 2006, and the award of $4.2 million in contracts for local streets and alleys.

In 2006, the Project Programming Unit prepared 299 estimates and verified 72 city certified paving projects for improvement in the City of Milwaukee. The formal estimates prepared include 106 street paving projects (five (5) of which were sponsored by the State of Wisconsin) and 20 alley-paving projects. The verified certificates include 43 street paving projects, of which eight (8) were sponsored by the State of Wisconsin and 29 alley paving projects.

Project Programming staff appeared before the Common Council's Public Works Committee for public hearings on 67 assessable 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 2006, the unit issued 3200 bills resulting in $3,210,000 in revenue to the City.

MAJOR PROJECTS UNIT

The Major Projects Unit coordinated the completion of nine Federal and/or State Major Arterial Street and Bridge projects at a total cost of $14,292,432.73 of which the City's portion was $3,116,645.45. The Major Federal and/or State paving and bridge projects completed in 2006 include the following:

- The reconstruction of the West Mill Road Bridge over the Menomonee River
- The reconstruction of the West Bradley Road. Bridge over the Little Menomonee River
- The resurfacing of South 20th Street from West Layton Avenue to West Grange Avenue
- The resurfacing of South Clement Avenue from East Howard Avenue to South Whitnall Avenue.
- The reconstruction of West Capitol Drive from North 35th Street to North 60th Street
- The reconstruction of North 91st Street from West Mill Road to West Flagg Avenue
- The resurfacing of West Silver Spring Drive from North 43rd Street to North 68th Street
- The reconstruction of South 11th Street from West Bruce Street to West Windlake Avenue
- The reconstruction of East North Avenue from North Booth Street to North Bremen Street

Construction is ongoing on the State Street Bridge over the Milwaukee River. This project is 100% funded by the Wisconsin Department of Transportation. The State Street Bridge is a "Milwaukee Type Bascule" bridge and is listed in the National Register as a historically significant structure. The rehabilitation of the bridge includes the entire removal of the superstructure and all mechanical and electrical components, which occurred in 2005. In 2006, replacement of the superstructure was ongoing, including the rehabilitation of the adjacent bridge houses. The project is scheduled for completion the summer of 2007.

Preliminary engineering was completed in 2006 for the Kilbourn Avenue Bridge over the Milwaukee River. The structure, located several hundred yards downstream of the State Street Bridge, is also listed in the National Register as historically significant and will have significant upgrades to its mechanical, electrical, and structural components. The project was let to contract on September 12, 2006, and construction will begin when the State Street Bridge reopens to traffic. The project is currently scheduled for completion in 2008.

Coordination with several Milwaukee County roadway projects that lie within the City of Milwaukee is in progress. South 13th Street between West Rawson Avenue and West College Avenue, South 76th Street from the north city limits of Greenfield to West Oklahoma Avenue, a bridge rehabilitation project on West Oklahoma Avenue over the Honey Creek, and West College Avenue between South Howell Avenue and South Pennsylvania Avenue.

The Major Projects section is working with the Wisconsin Department of Transportation's design consultant, Kapur & Associates, Inc. on the ongoing planning and design of West Clybourn Street, West Street Paul Avenue, North 5th, 4th, 3rd, and 2nd Streets, which have sustained damage as a result of the construction of the Marquette Interchange and are being rehabilitated and repaired by the Wisconsin Department of Transportation, as a result of this damage.

The Major Projects group also is involved in two Hazard Elimination Safety projects located at the intersections of North 40th Street /West Vliet Street and West National Avenue/ South Layton Boulevard. Both of the intersections have a history of an abnormally high number of accidents. Grant money was secured under the Hazard Elimination Safety program to improve both locations for vehicular and pedestrian safety. A multi-phased construction approach will be utilized to upgrade the signage and signals at each intersection, coupled with median reconfigurations to direct pedestrians and motorists through each intersection at the safest locations. Both of the projects are slated for construction in late 2007 and/or early 2008.

In 2006, the Major Projects group helped to facilitate significant streetscape elements in two major street improvement projects. On West Silver Spring Drive between North 43rd Street and North 68th Street the local Business Improvement District, headed by Havenwoods Investment Corporation, will be supplementing the decorative concrete placed between North 65th Street and North 57th Street and the expanded median area between North 68th Street and North 60th Street with decorative lighting, gateway monuments, neighborhood identification banners, and plantings in 2007. Similarly, West Capitol Drive between North 35th Street and North 60th Street incorporated decorative concrete at the North 60th Street intersection and the West Fond du Lac Avenue intersection. These treatments will be supplemented by future improvements to be undertaken by the Midtown Business District, which will include decorative lighting, additional decorative private sidewalks, and other pedestrian amenities yet to be determined in 2007.

Preliminary engineering was in progress for eight (8) Federal and/or State Aided Major Street paving projects, two (2) Congestion, Mitigation Air Quality (CMAQ) landscaping/ lighting projects, two (2) Hazard Elimination and Safety (HES) project to improve roadway geometrics, six (6) Local Bridge Replacement Program projects and two (2) State Trunk Highway Bridge Replacement/Rehabilitation Project.

Major Projects continues to work with the Wisconsin Department of Transportation (WISDOT) in their efforts to rehabilitate 4.5 miles of North 76th Street (USH 181). Construction is scheduled for the spring/summer of 2007 for the portion of North 76th Street from West Florist Avenue to West Clinton Avenue, which was let December 12, 2006, at an overall cost of $8.8 million. Construction is scheduled for the spring/summer 2008 for the portion of North 76th Street from West Clinton Avenue to West County Line Road.

Finally, the unit continues to work with the WISDOT in their efforts to design and coordinate work on the Marquette Interchange. Phase II of the Interchange (North Leg) from North Avenue to approximately the Hillside Interchange started construction in 2005 and was completed in 2006. Construction of both the South Leg, from the Menomonee River to approximately the South Menomonee Canal, and the Core Interchange, from Marquette University to Water Street, was initiated in 2005. The West Leg is to be complete in 2007 and the Core is to be complete by the end of 2008.

TRAFFIC DESIGN UNIT

Approximately 314 miles of lane lines, centerlines, and edge lines were painted in 2006 to maintain adequate visibility of pavement markings and to provide positive guidance to motorists. Crosswalks were painted at 967 locations and 222 special arrow and "only" markings were painted.

During 2006, the unit coordinated the signing, maps, and traffic control for approximately 1000 special events which included bike races, festivals, filming, marches, parades/processions, parking events, runs, walks, block parties, and many other activities affecting the use of City streets. The unit also coordinates the traffic control for all utility and construction work in City streets, making sure that special events and construction work do not overlap.

In 2006 the unit was involved with implementing the conversion of the following streets from one way to two way traffic:

West Wells Street from North 6th Street to North 11th Street
West State Street from North 6th Street to North 11th Street
East/West St. Paul Avenue from North 2nd Street to North Water Street

This unit also planned and implemented a temporary traffic control plan that was used to operate West Canal Street at Miller Park using a reversible lane pattern for the Milwaukee Brewers baseball games and other special events for traffic coming to and from the ballpark. This work was done while the permanent reversible lane traffic control equipment was being designed and fabricated for installation in 2007.

Five new traffic signals were installed in 2006 in conjunction with changes to the local street system and new freeway access points associated with the Marquette Interchange Project.

The City continued its program of replacing older electro-mechanical traffic signal controllers with new microcomputer based solid-state signal controllers to improve reliability, to provide flexibility of operation, and to reduce maintenance costs. Six electro-mechanical controllers were replaced in 2006. There are now only three more electro-mechanical controllers remaining to be replaced, with upgrades now completed at 99 percent of all traffic signal installations.

The City continued its program of installing fire vehicle traffic signal preemption on primary fire response routes. As the fire vehicles approach, vehicular traffic at signalized intersections is cleared for approaching emergency vehicles and a continuous green signal indication is displayed on the emergency approach route until the emergency vehicle clears. This program improves response times for these emergency vehicles while improving safety for emergency vehicles as well as pedestrian and vehicular traffic at affected intersections. The signal preemption devices were made operational at 16 locations under this program in 2006.

Six, Wisconsin Department of Transportation, sponsored paving projects, which started in 2006 impacted traffic signals requiring hardware modifications and signal retiming. In addition, work for the Marquette Interchange Reconstruction project continued in 2006. Along with installing the five traffic signals mentioned above, the Traffic Design Unit has worked to insure that the additional traffic diverted from the freeway system onto City streets due to the construction moves as efficiently as possible. Major detour routes were set up for when the freeway system ramps or freeway lanes are closed. Traffic signals along the routes were optimized by changing their timing, and in some instances, modifying hardware to facilitate new traffic patterns. There were over 49 work orders issued in 2006 for traffic signal work solely to accommodate changing traffic patterns caused by the Marquette Interchange Reconstruction Project. In 2006, the North Contract of the Marquette Interchange Reconstruction project ended and the Core Contract heated up.

In 2006, over 140 traffic signals had their incandescent bulbs changed to energy saving light emitting diodes (LEDs). LEDs have a six-year warranty, compared to an average lamp life of one year for incandescent bulbs, which is expected to save labor costs on the replacement of burned out bulbs. Additionally, these LED signal indications are expected to improve intersection safety by improving the overall appearance and visibility of signal displays.

For the first time in the City of Milwaukee, a radar speed board was installed in advance of a curve on West Atkinson Avenue near North 32nd Street. The radar speed board is a permanent installation that shows drivers how fast they are driving into the curve in an attempt to slow them down as necessary to safely negotiate the curve with their vehicle.

Two area wide signal systems were retimed to reduce stops and delay for motorists by making improvements in signal synchronization. On the Northwest side, an area along West Appleton Avenue and West Lisbon Avenue from North Sherman Boulevard to North 84th Street was optimized. On the near south side, an area from South 35th Street to South Layton Boulevard and from West National Avenue to West Lincoln Avenue was optimized.

In support of the Milwaukee Police Department, the Division assisted in the installation of surveillance cameras and related equipment at three pilot test sites. It is anticipated that the project will be expanded in 2007 to cover many additional areas of the City.

In 2006, approximately 4,400 traffic signs were replaced throughout the City as part of our sign maintenance program to replace faded, vandalized, damaged, deteriorated or missing signs. Also, 1,700 traffic signs (new installation) were installed throughout the City, now bringing the total amount of traffic signs in the City to 102,398.

Two separate Grants were approved in late spring from the Wisconsin Department of Transportation, Bureau of Transit and Local Roads, under the fiscal year 2005/2006 Traffic Signing and Marking Enhancement Grant Program. Implementation of both projects is anticipated to occur by late spring, 2007.

The first project approved under the program will be used to fund improvements to the Downtown street crossings associated with the Downtown Riverwalk. Under this project, crosswalk pavement markings will be upgraded, and mast-arm mounted pedestrian crossing signs will be installed at all Riverwalk crossings. These improvements are intended to increase the conspicuity of the pedestrian crossings in an effort to improve motorist compliance with current traffic laws and promote safety for pedestrians using the Riverwalk crossings.

Under the second Grant, the City will begin the second phase of a pilot program to evaluate the use of in-street yield to pedestrian signs. The project will provide funds to install the signs at 55 marked crosswalks and school crossings on two lane undivided arterial roadways, to provide further experience with the use of these types of signs on pedestrian and vehicular traffic operation and safety, and to determine the feasibility of further expansion of this type of signage as another traffic control alternative to preserve or improve pedestrian safety.

Also in the summer of 2006, the Common Council of the City of Milwaukee passed an Ordinance prohibiting engine compression braking on any street within the City of Milwaukee. The engineering and installation of traffic signs to advise truckers of this restriction were begun in 2006, and completion of citywide installation of these signs is anticipated in 2007.

The Common Council also approved the implementation of a Residential Permit Parking Program in the University of Wisconsin – Milwaukee Campus area. This program, which is part of a comprehensive program developed to address parking and traffic related issues in the Campus area, will allow on-street parking on one side of the street to be dedicated for use only by residents with valid permits. Regulatory signs implementing these parking restrictions will be installed on affected streets prior to the start of the program in late August 2007.

STREET LIGHTING DESIGN UNIT

As part of the City's Capitol Improvement Program, plans were prepared for street lighting alterations and upgrades that were to be done in conjunction with 45 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 new street lighting cable and the upgrade of electrical circuitry and components. Also in 2006, minor circuit conversion projects to replace obsolete electrical circuitry were initiated in conjunction with major paving projects, such as on South 20th Street from West Layton Avenue to West Grange Avenue.

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 2006, a total of 1,117 streetlights in the City were converted to high-pressure sodium lighting. With this work, approximately 95 percent of the 67,742 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 2006, grant funds or private funding was used to provide historical lighting as part of neighborhood and business district improvement projects. Specialty lighting projects initiated in 2006 include lighting upgrades on East Wisconsin Avenue from North Milwaukee Street to the intersection of North Prospect Avenue and East Mason Street, West Capitol Drive from West Fond du Lac Avenue to North 60th Street, and on West Silver Spring Drive from North 57th Street to North 68th Street. Also as part of the Milwaukee Central Business District Primary Pedestrian Corridors Project, engineering was completed for lighting upgrades on West Wisconsin Avenue from North 4th Street to North 10th Street. Construction on the West Wisconsin Avenue project began in late 2006, and is anticipated to be completed in 2007.

Work has continued on the installation of street lighting on City streets affected by roadway improvements made in conjunction with the Marquette Interchange Reconstruction Project, which started in 2005. Temporary and permanent street lighting improvements are being coordinated with Wisconsin Department of Transportation contractors as work on the interchange project progresses. Construction will continue in 2007 for the upcoming phases with completion anticipated in 2008.

In 2005, a major circuit cutover to replace aging and unreliable electrical circuitry was started at the west side of the City between the area bounded by North Hawley Road to North 77th Street and West Bluemound Road to West Dickinson Street. Work continued in 2006 on this area wide upgrade, with all work to be completed in 2007 for the remaining segments of the project. Also as part of this project, another circuit cutover was also included in this project in the area bounded by West Adler Avenue, the south City limits, South 84th Street and South 95th Street.

In 2006, work has continued on the replacement of the City's Master Street Lighting Control System. An operational prototype has been developed and is now in service. The reliability of the current system, which was developed using World War II era technology to turn the street lights on and off, is declining due to its age. Technological advancements will not only provide more reliable activation of street lights, but will also provide monitoring capabilities of system performance and assist in more efficient repair and maintenance of street lighting facilities. Engineering began in 2006 for the replacement of the existing control circuitry on the southwest and west central portions of the City. Construction of this portion of the system will start in 2007. When this project and the circuitry upgrade project described above is completed the entire area between Wauwatosa and West Allis, and North Hawley Road to a point east of Highway 100 will have totally been converted to state of the art street lighting facilities.

Lighting was upgraded in two County Parks at the request of the Milwaukee County Parks Department, who provided funding for lighting upgrades in Dineen and Sherman Parks in 2006.

Street lighting personnel continue to maintain and operate outlet circuitry for 15 local business districts and other organizations to provide power for Christmas decorations, and for other yearly neighborhood celebrations and events. Also in 2006, street lighting personnel installed and will maintain and operate circuitry to supply power to the first City of Milwaukee Gateway sign on South Howell Avenue near Mitchell field. Expansion of this program is anticipated to occur in 2007.

City street lighting personnel also installed and will maintain and operate circuitry to supply power to WI-FI ports in conjunction with the initial deployment of the wireless system in a pilot test area located in the Central portion of the City. More locations will be added as further expansion of the wireless system occurs.

PLANNING AND DEVELOPMENTS UNIT

The Planning and Developments Unit undertakes a variety of tasks related to transportation planning, ranging from non-traditional projects such as traffic calming to arterial roadway and freeway improvements. This unit is involved in almost every major private development and public improvement that occurs Citywide. This unit works closely with other City departments, elected officials, state and county departments, private organizations and the general public. The following is a sampling of work activities that were undertaken in 2006.

In 2006, assistance was provided to the Wisconsin Department of Transportation (WISDOT) with regard to traffic mitigation and administration during the North Leg, and South Leg phases of the reconstruction of the Marquette Interchange. This unit attended numerous meetings concerning Marquette Interchange construction phasing, utility relocation and coordination, traffic mitigation and elected official and public outreach in 2006. All of these efforts were directed at keeping downtown Milwaukee open for business during all phases of the Marquette Interchange construction and minimize the impacts of diverted traffic from the interchange during construction. Assistance was further provided on the Intermodal Passenger Facility construction; 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); and the implementation and testing of an Integrated Corridor Operations Program (ICOP).

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

During 2006, the unit worked closely under a three-party design contract with Edwards and Kelsey, Inc. on the Summerfest Shuttle Bus Advanced Parking Guidance system. Draft Agreements between the City of Milwaukee and the participating Parking Structure owners were modified to incorporate changes and concerns of the owners and reconveyed to the owners for

their consideration. The City plans to let a construction contract for this project in late summer or fall of 2007 with construction anticipated to begin later that year and operation of the system in early 2008. This system will provide information to drivers headed for Summerfest about available parking in garages located near the shuttle route in the downtown area. It is hoped that this initial deployment will spur the development of a more comprehensive downtown parking management system. In 2006, the City was given funding approval for a CMAQ grant to expand the Advanced Parking System in downtown to parking garages, which serve the Bradley Center, Midwest Airlines Convention Center, and other parking garages near the Summerfest Shuttle Bus route and Downtown Trolley route. It is hoped that design engineering for this project can begin in 2007.

The unit was involved in several bicycle and pedestrian related projects again in 2006. The first is the StreetShare pedestrian safety program designed to educate motorists and pedestrians about the law regarding crossing streets. StreetShare also encourages motorists to allow pedestrians to cross the street in a crosswalk. The grassroots program includes a website, brochures, vehicle magnets and balloons. It works through participatory partnerships, including DPW fleet drivers, We Energies fleets, and other large employers. The program was funded by a WISDOT BOTS grant and has been extremely well received by citizens groups. This program was developed by the Bicycle and Pedestrian Coordinator with assistance from the City's Bicycle and Pedestrian Task Force. The Task Force was active in 2006 fulfilling its mission to recommend to City policy makers ways to make the City of Milwaukee more bicycle and pedestrian friendly.

Planning and Development has also worked with Wisconsin Walks using WISDOT BOTS funding to hold a walking workshop (Pedestrian Roadshow) in the Walnut Way neighborhood. These workshops are designed to get neighborhood input and produce a plan to improve the pedestrian environment from an aesthetic and safety perspective. We have held these workshops in other areas in previous years and the plans have resulted in dramatic improvements such as the bump outs and in-street yield to pedestrian (R1-6) signs on Brady Street. In 2006, the City also received a $400,000 Safe Routes to School for the Forest Home/Manitoba area as a result of a previous Walking Workshop.

The unit continued its efforts in implementing the City's Bike Rack Assistance Program. This program, funded by a Transportation Enhancements grant, provides local business with free bike racks. In 2006, the City contracted to install 700 new bike racks across the City. To date, over 1500 free bike racks have been distributed since 2000. The unit will likely close out the program by installing the remaining racks in 2007.

In 2006, the unit worked with the Bicycle Federation of Wisconsin (BFW) to finish the Off-Street Bikeway Study. This project, funded by the STP-Discretionary program, involves the evaluation of off-street corridors that potentially could accommodate a paved bike trail. The City Bicycle Pedestrian Coordinator also distributed over 20,000 new bicycle route maps.

Engineering continued on the Kinnickinnic River Bike Trail over the former Union Pacific Railroad right of way between South 6th Street and East Washington Street. The City retained Bloom Consultants, Inc. to design a new bicycle bridge over South Chase Avenue. Construction of this CMAQ funded bridge and trail is anticipated to begin in 2007.

In 2006, real estate acquisition, planning and final design continued on the Transportation Enhancement funded Beer Line Bike/Recreational Corridor project (Burleigh Street to Keefe Avenue). Construction is anticipated in 2007.

During 2006, this unit continued to work in a cooperative effort with the Department of Natural Resources (DNR) to implement remaining segments of the Hank Aaron State Trail (HAST). The HAST projects are funded primarily with CMAQ grants previously secured by this unit. The entire segment of the HAST between South 6th Street and Miller Park was completed in 2006. Furthermore, this unit provided technical assistance to the DNR in the planning for 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 East Pittsburgh Avenue.

In 2006, this unit worked cooperatively with the Construction Section to complete construction of the West Canal Street Extension project between 25th Street and Miller Park in the Menomonee Valley. This project includes construction of a new roadway from North 25th Street to Miller Park through the west end of the Menomonee Valley, a new access road serving Falk Corporation, and construction of portions of the Hank Aaron State Trail. Construction on this project began in 2005 and includes ½ mile of elevated roadway, 20,600 tons of concrete, 2.7 miles of bridge girders, 250 tons of reinforcing steel, and 14.6 miles of bridge pilings. 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.

In 2006, this unit worked cooperatively with the Construction Section to complete construction of a Lift Station/Bioretention Facility located at 25th St. and Canal Street. This project is partially funded through an MMSD partnership and provides stormwater treatment for Canal Street between 16th Street and 25th Street as well as adjacent private land in the central Menomonee Valley. This unit also worked with the Environmental Section to perform monitoring and performance evaluation of the lift station and bioretention facility. This project is the first element of a comprehensive plan to treat virtually all stormwater generated in the Menomonee Valley with regional treatment facilities. This unit also continues to assist the Environmental Section in the preliminary development of the Stockyards bioretention facility being developed by the City in partnership with the Menomonee Valley Partners.

In 2006, construction began on the Miller Park Reversible Lanes/Variable Message (VMS) Sign Project. This project provides the necessary traffic control equipment including overhead sign structures, static signage, pavement markings, ITS equipment, and a variable message sign to allow efficient parking lot operations and two-way traffic operation on Canal Street during stadium events. This project is expected to be completed in 2007.

This unit also continues to work cooperatively with the Department of City Development (DCD) and the Menomonee Valley Partners business group in their efforts to redevelop the Menomonee Valley in an environmentally sensitive and sustainable fashion. In 2006, this unit participated in planning efforts for the public spaces within the Menomonee Valley Industrial Center including the development of an extensive plan to improve bike and pedestrian access from the near south side neighborhoods. Furthermore, this unit is implementing the local infrastructure to support the development of the Menomonee Valley Industrial Center. The infrastructure is funded by a

federal Economic Development Administration grant and TID funds. South 33rd Ct., which provides access to the Menomonee River and the Palermo's Pizza development was completed in 2006. Design engineering for the underground utilities in Milwaukee Road, Wheelhouse Road, and South 36th Street, which provide service to remaining parcels within the Menomonee Valley Industrial Center including Badger Railing, Caleffi North America, and Taylor Dynomometer, was performed in 2006 with construction scheduled for early 2007. Roadway design and construction will also be performed in 2007.

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 fixed guide way transit improvements linking multiple tourist and business venues. The Alternatives Analysis is expected to be completed during 2007 with selection of a Locally Preferred Alternative. With local consensus, the project could advance to the preliminary engineering phase of project development. In 2006, this unit provided technical assistance to the Mayor's Office in the development of the Mayor's Transit Plan for consideration in the Milwaukee Downtown Transit Connector Alternatives Analysis.

In 2006, this unit continued participation in the Kenosha-Racine-Milwaukee Commuter Rail Alternatives Analysis / Project Development/ EIS Phase was initiated. This study, sponsored by the Counties and Cities of Kenosha, Racine and Milwaukee, the Wisconsin Department of Transportation (WISDOT) and the Southeastern Wisconsin Regional Planning Commission, is intended to produce a Draft Environmental Impact Statement (DEIS), refine the previous alternatives analysis, and develop further a commuter transportation project within the corridor. This study will continue into 2007.

In 2006, this unit completed participation in the 2035 Regional Transportation System Plan being undertaken by SEWRPC. This unit also continued participation in the Milwaukee County Transit System Plan: 2007-2011 being undertaken by SEWRPC. Development of this plan is expected to be completed by Summer of 2007.

In 2006, this unit performed coordination of the construction of the Potawatomi Casino parking structure connection to the 16th Street bridge. This work is being funded and undertaken by the Potawatomi Tribe under permit but required extensive conduit, communication, street lighting, and traffic signal work performed by City forces.

During 2006, 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 Columbia/St. Mary's Hospital, the Harley Davidson Museum, Potawatomi Casino expansion, Manpower development, the Milwaukee County Grounds development and the Pabst Brewery redevelopment project. This unit also worked on several residential developments in and around the central business district in 2006.

This unit 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.

This unit continues to assist the DCD with the expansion of the Riverwalk system, including planning for roadway and streetscape improvements to complement the adjacent riverwalk.

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. In 2006 this unit processed 872 utility permits, 242 DPW permits, 59 boring permits, 9 hollow sidewalk and 390 building permits. The unit also reviews applications for special privileges and air/subterranean space leases, and writes resolutions for Common Council action. In 2006 123 special privilege resolutions were prepared by this unit. Additionally, one Air Space Lease was prepared and processed for the Manpower Development.

During 2006, 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. This unit also continued its role in reviewing the condition of hollow sidewalks that may be impacted by planned paving projects.

In 2006, this unit continued to provide technical assistance to the Board of Zoning Appeals (BOZA). This unit provides membership to the Zoning Administration Group (ZAG), which provides comprehensive and timely reviews of special use and zoning variance requests in front of the Board. In 2006, approximately 700 new requests were submitted to the Board office and reviewed by the ZAG. This unit also provides staff at each BOZA meeting to present the DPW report on cases in front of the Board. This unit also provides technical assistance to the City Plan Commission with regard to DPW concerns on proposed General and Detailed Planned Developments, as well as proposed zoning changes. Both written comments and oral testimony are provided to the City Plan Commission in 2006.

During 2007 the Planning and Developments Unit will continue to work closely with other City, State, County, Federal, and private entities in continued improvement and maintenance of our arterial street and bridge infrastructure with the given resources and funding programs at our disposal. We will also work similarly in implementing streetscape and bicycle enhancements. New initiatives will commence on dynamic parking control and information, 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 WISDOT on continued study involving Freeway Traffic Management and in evaluating a pilot program to integrate signal systems of complementary arterial and freeway corridors.

CENTRAL DRAFTING AND RECORDS UNIT

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, bridge plans, street lighting plans, circuit maps, traffic signal plans, traffic control and pavement marking plans, underground conduit 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 review of certified survey maps and subdivision plats; the assignment of addresses; the review of street name change 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 Transportation and Administration Section.

In 2006, 28 plans and petitions for the vacation of public ways were processed. The Unit also processed 11 subdivision plats and 60 certified survey maps, produced 154 paving plans for 106 separate paving projects, 8 bridge structure projects and 14 state paving projects, conducted 5 traffic counts and a cordon count and acted upon 38,429 requests from Diggers Hotline to locate the City's underground electrical and water main facilities and 644 requests for utility plan information.

The City was honored with the *Federal Highway Administration 2006 Excellence in "Utility Relocation and Accommodation"* award in the category of *Relocation for Projects Greater than $100,000,000* for the Marquette Interchange Project. This was a City wide effort from all of our City staff charged with relocation of City utilities during this construction project. The successes regarding the utility relocations were also a direct result of the leadership of the Marquette Transportation Partners and the Wisconsin Department of Transportation.

During 2006, an additional 19,504 lineal trench feet of conduit was installed, 5,188 lineal feet of conduit replaced and 2,131 lineal feet of conduit abandoned.

City forces installed conduit in South Delaware Street from East Oklahoma Avenue to East Russell Street, West Bradley Road from North 94th Street to North 91st Street, as well as a lateral installation at the intersection of North 68th Street and West Silver Spring Drive. The City's bridge contractor installed conduit on the Bradley Road Bridge west of North 92nd Street. These were new installations that were done in conjunction with the paving of those streets. City forces installed conduit in East North Avenue from North Bremen Street to North Holton Street in conjunction with the paving of that street to replace conduit that was abandoned with the removal

of the Kilbourn Park Reservoir. City forces also installed conduit in West Capitol Drive from North 51st Street to North 35th Street in conjunction with the paving project to increase the capacity of the conduit system that exists within this street.

As part of the Marquette Interchange Project, City forces installed new conduit in the approaches of the West Wisconsin Avenue, West Winnebago Street, West Highland Avenue, and West Walnut Street bridges. The Department of Transportation's contractor replaced the City's conduit on those four bridges over I-43. The WISDOT's contractor also installed conduit for the City in West Winnebago Street from North 10th Street west to the east abutment of the Winnebago Bridge over I-43. City forces replaced the conduit in West Highland Avenue from North 9th Street to North 10th Street, which had been removed by the WISDOT's contractor for the installation of a sewer. City forces also repaired conduit in North 10th Street from West Wisconsin Avenue to a point 278 feet south of Wisconsin Avenue that had been damaged by the WISDOT's contractor. These projects were funded 90% by WISDOT and 10% by the City. Members of the Underground Conduit staff continue to attend weekly meetings for the Marquette Interchange Project.

City forces installed conduit in West Street Paul Avenue from South 25th Street to South 27th Street as part of the WISDOT's Street Paul Bridge project. WISDOT's contractor installed the conduit on the Street Paul Bridge over I-94. This project was funded 90% by WISDOT and 10% by the City.

Conduit was installed in West Canal Street from North 25th Street to Miller Park baseball stadium by the paving contractor. This installation was included in and funded by the paving contract.

Conduit was installed in East/West State Street beneath the Milwaukee River by the bridge contractor as part of the State Street Bridge project. City forces installed conduit in West State Street from North Old World Third Street east to the bridge and from North Edison Street west to the bridge over the Milwaukee River.

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 sewer 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.

In addition, the Section, through its Underground Operations Unit, is responsible for the inspection, maintenance, and repair of the City's sewer mains, manholes, catch basins and storm inlets. The construction and maintenance of the underground conduit system is also performed by Underground Operations.

Following are highlights of the work performed in 2006 by the Environmental Section.

SEWER DESIGN AREA

The Section designed and let to contract 1.96 miles of new sanitary sewers, 1.78 miles of new storm sewers, 7.61 miles of replacement sewers and 3.49 miles of sewer lining for a total cost of $27.83 million. These projects included:

Box Sewer Replacement project:
This project was performed to replace the existing combined sewer located in a sewer easement through the property of Miller Brewing Company from West State Street to West Highland Avenue. The existing sewer was constructed in 1893 and was structurally deteriorated and hydraulically inadequate. Approximately 1,040 feet of 10-foot high x 7-foot wide combined box sewer was installed for a total cost of $1,743,000.

North 27th Street sewer project:
A contract was awarded for the rehabilitation of a large diameter combined sewer located in North 27th Street from West Juneau Avenue to West Walnut Street. This project was undertaken to reinforce a structurally deteriorating 96-inch diameter combined sewer that was constructed in 1883. Approximately 1,935 feet of 78-inch diameter glass fiber reinforced mortar pipe was inserted inside the existing host sewer. The exceptional smoothness of the 78-inch diameter pipe provided comparable flow capacities as the existing sewer. The trenchless methods used to install this sewer minimized impacts to traffic as well as nearby residents and businesses. The total cost of this project is $2,651,000.

West Brown Street sewer project:
A contract was awarded for the replacement of a 78-inch diameter combined sewer located in West Brown Street from North 20th Street to North 26th Street that was constructed in 1887. This project was performed to replace the structurally deteriorating and hydraulically inadequate combined sewer. Approximately 2,416 feet of 78-inch diameter combined sewer was installed. The total cost of this project is $4,609,000

South 38th / West National / South 39th Street storm sewer project:
This project involved the rehabilitation of existing large diameter storm sewers located in South 38th Street from West Scott Street to West National Avenue, West National Avenue from South 38th Street to South 39th Street, and North 39th Street from West National Avenue to the Menomonee River. The storm sewer is approximately 50 feet deep and was in poor structural condition. The work included installing 2,582 feet of 60-inch, 66-inch and 72-inch diameter cured-in-place liner was inserted inside the existing host sewers. The smoothness of the lined sewer will provide comparable flow capacities as the existing sewer. The trenchless methods of installation minimized impacts to traffic as well as nearby residents and businesses. The total cost of this project is $2,090,000.

STORM WATER MANAGEMENT AREA

Storm Water Management Plan Review:
On November 10, 2006, the Common Council adopted revisions to the Storm Water Management Ordinance, Chapter 120 of the Code of Ordinances. The revisions were made to better define when a SWMP (Storm Water Management Plan) is required. A SWMP will now be required if there will be disturbance of 1 acre of land or if there will be a net increase of 0.5 acres of impervious surface. The land disturbance requirement replaces a SWMP being required based on the area under a common ownership. The revised ordinance will also require a reduction of 10% in the peak flows from a site, which will enhance the runoff quality.

The City has received a total of 1037 SWMPs since the implementation of the program in 1993. In 2006, the Section reviewed 90 storm water management plans, with 82 approved that same year.

Illegal/Illicit Discharge Testing:
Field-testing of storm sewer 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 760 dry weather tests during 2006. Of these tests, 455 were at the outfall and 305 were at points upstream from the outfall.

Storm Water Information & Education:
In 2006, using a grant from the Milwaukee Metropolitan Sewerage District, we developed an information and education module for the bioretention facility located at 25th and Canal Streets. Keep Greater Milwaukee Beautiful, Inc was contracted to develop the module that would provide information and education to the public on the bioretention facility. The module includes brochure with photos, a PowerPoint presentation and the design and installation of an

informational sign. Staff has conducted several information and education presentations at the site for developers, site owners, consulting firms, City and other government agencies officials to promote and publicize the environmental benefits of the bioretention facility.

The website dedicated to storm water management, which was developed by the Environmental Section in 2005, still provides information on storm water pollution prevention, storm water management plans, and construction site erosion control. It can be accessed through links on the City's main website or directly at www.milwaukee.gov/stormwater.

I /I Reduction Pilot Project:
To further reduce infiltration and inflow of clear water into the sanitary sewer system, the City in 2006 designed and awarded a contract to perform a foundation drain disconnection demonstration project. The Northlawn public housing complex was selected as the project area for the foundation drain disconnection project. In this pilot project, the effectiveness of removing clear water from the sanitary sewer by disconnecting the foundation drains of existing buildings and directing this water to the storm sewer will be studied. Pre-project and post-project sewer flow monitoring will be analyzed to determine the effectiveness of the project.

INFILTRATION AND INFLOW REDUCTION PROGRAM AREA

Sanitary Sewer Flow Monitoring:
A total of 19 sanitary sewer systems were monitored in 2006 for various reasons. Flow monitoring data is analyzed to determine the quantity of I/I in a system, flow restrictions, MIS surcharges, and other problems that may lead to backwater complaints and/or overflows. Seventeen of the systems were monitored as a result of the stipulation agreement reached between the State of Wisconsin and the communities within the Milwaukee Metropolitan Sewerage District (MMSD) service area.

Manhole Inspection and Rehabilitation Program:
In order to meet the requirements of the stipulation between the Wisconsin Department of Justice and all 29 communities served by the Milwaukee Metropolitan Sewerage District, communities will be required to inspect all sanitary manholes within 5 years and make all required repairs. To accomplish this requirement, the city has been divided into five areas, with the areas being inspected on a rotating 5-year schedule.

In 2006, we awarded an inspection contract worth more than $ 200,000.00 for approximately 5000 sanitary manholes. This work will provide us with a more accurate assessment of our existing manhole facilities.

A separate contract was let in 2006 for the repair of 1,502 sanitary sewer manholes at a cost of $1,101,000. The rehabilitation consists of replacing lids, installing chimney seals and repairing defective brick work in the manholes. This work will reduce the amount of I/I entering sanitary manholes.

By-pass Pump Rehabilitation:
In the 2006 construction year, we awarded two by-pass pump rehabilitation contracts totaling more than $420,000.00. This work consists of the replacement of the existing facilities with new; structures, pumps, valves, transmitters, lids and frames, discharge pipes, and shear gates. This work is a continuing effort to up grade our aging facilities to better serve the public and the public good.

Supervisory Control and Data Acquisition (SCADA) System:
A Supervisory Control and Data Acquisition (SCADA) system that provides remote monitoring and control of the City's five lift stations, 83 sanitary bypass pumps and 15 rain gauges is now managed and updated by City staff. The SCADA system allows staff to remotely control the lift stations and bypass pumps if necessary. In addition, it provides real time information on the operational status of each lift station and bypass pump. Rainfall information is also collected in real time and is provided to the Milwaukee Metropolitan Sewerage District for their use.

AUTOMATED MAPPING AND DRAFTING AREA

This section drafted a total of 176 sewer construction plans in 2006. These plans are used in the installation, replacement, or rehabilitation of sanitary, storm, and combined sewers at various locations throughout the City.

In 2006, significant additional progress was made in the conversion of sewer maps and other records from paper files and/or microfilm to digital documents. These electronic documents and databases enable staff to access information from their workstation, as well as update and edit the documents with greater speed and accuracy than before. The documents can also be easily shared with other departments.

The "transformation" of our digital sewer maps by staff to conform to GIS standards was completed in 2006. This transformation process corrects any discontinuity at the adjoining borders of each sewer quarter section map and gives a fully unified map of the City sewer system.

In 2006, this area processed 260 building permits and 860 Deferred Sewer Charge statements.

Other responsibilities of the Unit include:

- Provide the public and other City departments with maps and information regarding City sewers.
- Draft CAD sewer construction plans for capital program work
- Assist citizens and plumbing contractors with sewer and sewer lateral questions
- Determine and collect deferred sewer assessment
- Continually update graphic city sewer records
- Prepare sewer construction sketches for public hearings
- Draft sewer easement plans for construction projects and street vacations
- Process utility, plumbing, and building permits

UNDERGROUND OPERATIONS UNIT

Underground Operations is responsible for cleaning, inspecting and repairing the City of Milwaukee's sanitary, combined and storm sewers, manholes, catch basins and storm inlets. This includes responding to and investigating complaints of backwater and street ponding throughout the City of Milwaukee. In addition, Underground Operations inspects and repairs sanitary, combined, storm sewer and communication manholes, catch basins, and storm inlets on streets prior to the paving work being completed.

During 2006, 96.2 miles of sewers were examined, 394 miles of sewers were cleaned and 8,683 catch basins and 25,734 storm inlets were cleaned. Cleaning the catch basins and storm inlets maintains the surface water drainage during storm events and reduces the amount of storm water ponding on streets. In addition, we responded to 8,747 service calls, which included backwaters, clogged catch basins and storm inlets, and other sewer related complaints.

In 2006, the major underground conduit installation projects performed by Underground Operations were:

- 32,000 feet of conduit in West Capital Drive from North 36th Street to North 51st Street
- 24,000 feet of conduit in South Delaware Avenue from East Russell Avenue to East Oklahoma Avenue.

Other installation projects in 2006 included:

- 663 feet of conduit in West Bradley Road from North 91st Street to North 94th Street
- 1,168 feet of conduit installed in East North Avenue from North Bremen Street to North Holton Street
- 412 feet of conduit in West St Paul Avenue to North 25th Street to North 27th Street
- 400 feet of conduit in West Highland Avenue from North 9th Street to N 10th Street.

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 catches a large portion of street debris material that is vacuumed out by large specialty equipment on a yearly basis before it gets in the sewer system and ultimately creeks, channels, rivers and Lake Michigan. This effort is being done to meet the requirements of our Storm Water Discharge Permit issued by the Wisconsin Department of Natural Resources.

Debris Dewatering:
As a part of the cleaning of sanitary and combined sewers, catch basins, and storm inlets, Underground Operations is also responsible for the disposal of the debris removed. In 2006, a contract was awarded to United Water, Inc. for disposal of the wet material collected in the cleaning process.

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:

- Maintenance of the City's streets, alleys and sidewalks.
- Design, construction and inspection of street, alley, sidewalk and bridge improvement projects.
- Construction and maintenance of all public way lighting, traffic control signals, traffic signage and pavement markings.
- Operation and maintenance of the City's moveable and fixed bridges and viaducts.
- Operation of the Inventory/Stores function for Street Maintenance, Sewer Maintenance, Underground Services, Electrical Services, and Water Works including materials, parts, tools and supplies.
- Inspection of permitted utility construction and occupancy in the public way.

CONSTRUCTION UNIT

The Construction Unit administers all facets of paving, sewer, water, and grading projects. This includes construction inspection, materials administration inspection, labor compliance, contractor payments, pavement construction erosion control plan approval and inspection, as-built plans of record, maintaining a 156,000 record Road Life data base and construction management. The Field Engineering Unit performs existing roadway surveys, designs, as-built certificates and construction staking. In 2006 the Field Engineers started operating out of the new DPW Field Headquarters.

Sewer and Water Construction:
Sewer construction totaled $18.2 million for 45 contracts covering 9.55 miles. Water main construction consisted of 24 contracts that totaled 11.8 miles of water main relay at a cost $9.1 million. Inspection was also provided for 0.53 miles of suburban and private water main installation.

Local Paving Construction:
In 2006 local paving work consisted of 14 contracts that totaled 5.87 miles of roads and 1.17 miles of alleys. The total local paving contract cost was $7.7 million. In addition, Street Maintenance resurface paving work consisted of one contract that totaled 1.8 miles of roads and Private Development paving work that totaled 0.2 miles of roads.

State Paving Construction:
The Construction Section also performs administrative duties on Wisconsin Department of Transportation (WISDOT) projects within the City of Milwaukee. These functions include construction management, design, inspection, contractor payment estimates, materials monitoring

and reporting, as-built measuring and certificate completion, and wage/labor verification. For select projects, survey and design duties were also performed. Nine WISDOT paving projects were constructed this year at a 2006 contract cost of a $15.2 million covering 7.77 miles. They include the following:

West Canal Street – Miller Park to North 25th Street
West Capitol Drive – North 60th Street to North 35th Street
South Clement Avenue – South Whitnall Avenue to East Howard Avenue
North Hawley Road - West Valley Forge Drive to West Vliet Street
East North Avenue – North Booth Street to North Bremen Street
West Silver Spring Drive – North 68th Street to North 43rd Street
South 11th Street – West Windlake Avenue to West Bruce Street
South 20th Street – West Grange Avenue to West Layton Avenue
South 33rd Court – West Roundhouse Road to a point south
North 91st Street – West Flagg Avenue to West Mill Road

State Bridge Construction:

Five bridge projects were completed and one bridge project (West State Street) continued construction in 2006 at a total 2006 contract cost of $21.8 million. These WISDOT projects were administered by the City of Milwaukee:

West Bradley Road over the Little Menomonee River
West Canal Street over the Menomonee River
West Canal Street viaduct over the Menomonee Valley / CP Rail ROW (2005 start)
North Hawley Road viaduct and ramp over the Menomonee River / CP Rail ROW / West State Street (2005 start)
West Mill Road over the Menomonee River (North 124th Street)
West State Street over the Milwaukee River (2005 start)

In addition, construction on seven bridges over Interstate 43 was completed as part of the continuing Wisconsin Department of Transportation (WisDOT) Marquette Interchange (Mchange) Core replacement, North - South Leg, and East – West Leg projects. This work was under WisDOT contracts and administration. Six bridges replaced were: West Highland Avenue, West Walnut Street, West Wells Street, West Wisconsin Avenue, and West Winnebago Street, West State Street. The West Juneau Avenue Bridge was removed only and will not be replaced.

Menomonee Valley Project Construction:

West Canal Street - North 25th Street to Miller Park Ring Road.

As the Menomonee Valley renewal process continues, this new asphalt road links the 2005 reconstructed West Canal Street (North 6th Street to the North 25th Street roundabout) to the Miller Park Stadium. Many other projects in and around this project's limits were constructed prior and during its construction. The main portion of this complex project was the construction of a 4000 foot asphalt road. This road will also serve as an alternate east west route during the Marquette Interchange project. A bridge and a viaduct were constructed within the project and included concrete decking, walk, curb, and various retaining walls. Road work included the construction of concrete curb and walk. Also, a portion of West Greves Street was removed and a cul-de-sac was constructed.

Prior to paving, 2000 feet of storm sewer, 5600 feet of sanitary and combined sewer, and 5800 feet of water main were installed. The excavating and grading required in this historically industrial area made soil remediation necessary for debris hauled away. This was done in accordance to State Environmental Investigation and Remediation of Environmental Contamination regulations under the City's environmental consultant review. Removal of railroad tracks, a railroad bridge, an access bridge, and ramps were completed with required testing and asbestos abatement. Conduit and vaults where installed for the City's street lighting system.

Hank Aaron State Trail Phase II - Miller Park Ring Road to 25th Street:
This asphalt bicycle path was constructed along Canal Street behind the curb line and along the Menomonee River. This phase links the 2005 Phase I portion to the east with Miller Park stadium to the west.

West Roundhouse Road - South 33rd Court to West Canal Street:
A 569 foot long asphalt road with concrete curb and gutter.

South 33rd Court - West Roundhouse Road to point north:
A 587 ft long asphalt road with concrete curb and gutter.

South 33rd Court - West Roundhouse Road to point south:
A 602 ft long concrete road with concrete driveway, walk, and curb and gutter.

Bio-Retention Facility and Lift Station - West Canal St east and west of North 35th Street:
Construction of this facility to improve and protect water quality and storm water management for the eastern Menomonee Valley drainage basin was completed in 2006. This system incorporates the 2005 storm diversion main which conveys storm water via a pump house to a fore-bay pond. When the water reaches a certain elevation it is allowed to enter a bio-retention pond. The fore-bay helps to purify the water through settlement. The bio-retention pond retains the water to reduce the volume of discharge and also allows settlement. Both ponds were constructed with a clay lining. The bio-retention pond included a peat / sand fill and special plantings such as aquatic plants and native species.

W. Capitol Dr. – N. 60th St. to N. 36th St.:
The City of Milwaukee in conjunction with the Wisconsin Department of Transportation constructed this 1.47 mile project in 2006 at a cost of $ 3.5 million. The work on this project consisted of removing the existing pavement structure and replacing it with a new 8.5-inch thick concrete dowelled pavement. Concrete curb, gutter and driveway approaches were replaced throughout the length of the project. Sidewalks were replaced at areas where it was needed. In addition, stamped and colored concrete resembling brick was placed at two intersections. During construction, West Capitol Drive remained open to traffic in both directions by staging work in two stages. During Stage I, the south half (eastbound roadway) was constructed while traffic continued to travel in both directions on the north half (westbound roadway). During Stage II, the north half was constructed while traffic continued to travel in both directions on the newly constructed south half. All major intersections remained open to traffic during construction.

Prior to the start of construction, all businesses on West Capitol Drive were contacted and access arrangements were made. Special signage was placed throughout the project corridor to indicate that businesses were open during construction.

N. Hawley Road Viaduct / N. Hawley Rd. – W. Valley Forge Dr to W. Vliet St:
These two projects were constructed during the same time period, beginning in 2005 and completed in 2006 under a $5.2 million Wisconsin Department of Transportation contract. The road was reconstructed with 8-inch concrete pavement and the viaduct was rehabilitated. Traffic on North Hawley Road was maintained by staging construction and traffic control during construction. Staging included the network of ramps to and from North Hawley Road and West State Street and coordination with the Canadian Pacific Railroad that included flagging requirements when the railroad underpass was affected. During the rehabilitation of the viaduct the deck was removed and replaced with a reinforced concrete deck. The existing metal structure was prepared by abrasive blast cleaning and a complete coating system was installed. A weather station was installed on the west end of the project to help monitor the condition of North Hawley Road.

W. Silver Spring Dr. – N. 43rd St. to N. 68th St.
This Wisconsin Department of Transportation contracted asphalt resurfacing project was completed in stages to allow two-way traffic throughout construction on this busy commuter and truck route. Streetscape items installed for this project were stamped and colored concrete walk and tree wells. The pavement operations included cracking and seating of existing concrete pavement into a stabilized base for the installation of two layers of asphalt pavement. Concrete replacement included walk, driveway, curb, bus stop pavement pads, and median revisions. Asphalt resurfacing occurred with four key operations: portions of existing concrete or asphalt was removed by milling (via mobile grinders), the lower course asphalt binder was placed, manhole adjustment work was done, and to complete the project a top course of asphalt with permanent pavement markings was placed. Pavement markings included the addition of bicycle lanes. This project had a contract cost of $1.75 million.

E. Wisconsin Ave. – N. Milwaukee St. to N. Prospect Ave.
W. Wisconsin Ave. – N. 4th St. to N. 10th St.
The streetscape and asphalt resurfacing of East and West Wisconsin Avenue involved the main arterial of an important business area located in the heart of downtown Milwaukee. The project east of North Milwaukee Street was completed and the project west of North 4th Street was 30% constructed with completion planned for 2007. The total 2006 contract costs are $4.3 million.

Asphalt resurfacing was placed in stages to allow two-way traffic and parking throughout construction. In addition to concrete bus pavement pads and curb placement, special joint patterned walk was installed according to an overall Architectural streetscape design. Intersections were constructed with stamped and colored pavement to complement crosswalks with special jointing patterns. Other streetscape features installed were tree wells, granite planters with wrought iron railing, and black iron trash receptacle and bike racks. Specialty kiosks and harp street lighting installation is planned. As expected in an older commercial area, there was hollow walk present. These underground vaults directly under sidewalk may be an extension of

existing historic buildings' basements and had to be dealt with in a manner unique to each building before or during construction.

W. Bradley Rd. - Bridge over the Little Menomonee River
W. Mill Rd. - Bridge over the Menomonee River
The West Mill Road and West Bradley Road bridges were replaced under two Wisconsin Department of Transportation contracts at a cost of $1.25 million and $790,000 respectively. The West Mill Road project involved the removal of two structures and the construction of one structure with Asphaltic pavement approaches and the addition of bike lanes. The West Bradley bridge replacement included concrete pavement approaches and the placement of stamped and colored concrete median areas.

STREETS AND BRIDGES UNIT

Street Maintenance Area
The Street Maintenance Section administers three types of maintenance contracts; pavement seal coating, crack-filling and asphalt pavement resurfacing. 2006 marked the eighth season of the "Slurry Seal" method of seal coating asphalt pavements which has received favorable public and Aldermanic reaction while receiving very few complaints. City streets received 202,448 square yards of "Slurry Seal" in 2006. Under the Crack-filling Contract a contractor crack-filled 300,208 square yards of pavement throughout the city utilizing a rubberized joint seal. In additionally, a trial program was implemented using a new method of crack-filling called Mulch Seal which involves filling cracks with a crack-fill material and then covering it with an organic material such as mulch which acts as a filler material. Approximately 15,000 square yards of Mulch Seal were placed along West Roosevelt Drive.

Asphalt resurfacing occurred on North 124th Street between West Brown Deer Road and West County Line Road, North 51st Street at the intersection of West Fairmont Avenue, West Locust Street between North Teutonia Avenue and North 27th Street, North 27th Street Between West State Street and West Vliet Street and South 35th Street between West National Avenue and West Greenfield Avenue where 4,100 tons of asphalt were placed. In an effort to eliminate most of the rutting and shoving that is typically seen at intersections and in high traffic areas superpave asphalt was utilized on this projects.

Street Maintenance Section field crews placed an additional 9,800 tons of asphalt on city streets. Repair projects included asphalt shims on roadways, asphalt shims on sidewalks, small asphalt patches and pothole repairs.

The new DPW Field Headquarters building at North 35th and West Capital Drive was completed in early 2006. At this time all three street repair districts (north, center and south districts) moved into this new Headquarters' building. This created some efficiency relative to personnel. It was easier to adjust and share crews as the workload throughout the City flocculated on a daily basis. Additionally, some crews that did not have immediate access to support personnel such as the mechanics and the Tool Room now had this access and support.

Street Maintenance Section has continued to make improvements in the tracking of customer requests. All service requests phoned into the City of Milwaukee are answered by the Call Center at (414) 286-CITY. Telephone calls for pothole complaints, offsets along sidewalks, guardrail problems and pavement concerns are recorded into a database by the Call Center. Our supervisors access this data, via computer, a minimum of twice daily. Utilizing the services of the Call Center has improved our record keeping and improved the tracking of complaints, Aldermanic Service Requests and City Attorney Claims. Printing pothole patching lists for crews can now be done directly from the Call Center data base.

Street Maintenance crews continued to utilize a sidewalk grinder on offsets along city sidewalks and to correct water flow problems along curb flanges, within alleys and along approached to bridges.

Bridge Maintenance Area

This Section is responsible for over 220 structures maintained by the City of Milwaukee, including routine daily and seasonal maintenance, and response to bridge emergencies 24 hours a day, 7 days a week. These structures span navigable waterways, the extended watershed, and highway or railroad grade separations. Most critically, the City operates 21 movable bridges on a year round basis.

In 2006 most of the Bridge Maintenance crews (Carpentry/Masonry crews, Painter crews and Ironworker crews) moved into the new DPW Field Headquarters building at North 35th and West Capital Drive while the two groups that work closely with the downtown movable bridges were relocated to 1540 West Canal Street. The Bridge Operator Maintenance Crew and Bridge Electricians remained near the downtown area where they are readily accessible for any problems and emergencies that may impact the movable bridges.

The Bridge Maintenance crews are responsible for regular and preventative maintenance associated with our movable bridges, fixed bridges and viaducts. These duties include snow removal from the sidewalk area of our bridges and viaducts, graffiti removal from City owned structures, weed removal & grass cutting along bridge approaches, cleaning of drains along our bridges, cleanup of pedestrian bridges and the cleaning of expansion joints at the ends of our bridges & along the entire length of our viaducts.

In 2006, scheduled bridge maintenance projects included the removal and replacement of the open steel grating, replacement of the timber bumpers, approach span repairs, and pier repairs of the Cherry Street Bascule Bridge. Other bridge maintenance work included tension cable repairs along the Wisconsin Avenue Viaduct, guardrail repair at West Buffalo Street and North Water Street, placement of monuments along the Hank Aaron Trail, conversion of St. Paul Lift Bridge from a one way roadway to a two way roadway, retaining wall repairs at East Greenfield Avenue and bridge deck repairs at the West Beecher Street Bridge. Expansion joints were replaced on the West Cameron Street Bridge, South 35th Street over the Kinnickinnic River and the 35th Street Viaduct.

Bridge Maintenance crews performed work for other DPW divisions and other City Agencies. Repair work and painting were performed at the Linnwood and Howard Avenue Purification Plants. Repair work was performed on Police Department buildings, Fire Department buildings, City Hall, DPW Parking Structures and Health Department buildings. Work was also performed within Forestry yards, Sanitation yards and within the city facility at North 15th Street and West Canal Street.

BRIDGE OPERATIONS AREA

In 2006 bridge operators conducted 13,338 bridge openings for commercial and recreational traffic. Eight of the twenty-one movable bridges can be remotely operated from a hub bridge. Winter operations were consolidated with the Broadway Bridge without a drop in service. They continue to update bridge electrical layouts and circuit designs to current practices thereby eliminating an increasing trend of unreliability. The Bridge Operator Maintenance Crew and Bridge Electricians have moved into the City facility located at 1540 West Canal Street.

Inspections Area

The Inspection Section handled nearly 11,900 construction permits in 2006. 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 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 a Special Event.

Structural Design Unit

The Structural Design Unit designs and prepares contract documents and performs construction administration for a wide variety of projects involving bridges, retaining walls, parking structures, riverwalks, and other structures. The unit develops a Capital Improvement Program and performs safety inspection for all city maintained bridges and city owned parking structures. It also maintains plans and other records for the city's bridges, parking structures, retaining walls, dock walls, riverwalks, and other structures.

Bridge Design and Construction

Work on the rehabilitation of the State Street Bascule Bridge over the Milwaukee River continued in 2006. The State Street Bridge has been designated a historic structure, is the oldest remaining Milwaukee style trunnion bascule bridge, and was the first bridge in the city to exhibit architectural features to enhance the bridge aesthetics. The rehabilitation, which is scheduled to be completed in summer of 2007, will rehabilitate the structural, mechanical, electrical, and architectural elements of the bridge.

The Kilbourn Avenue Bascule Bridge was also designated a historic structure and an outside consultant was selected to prepare final plans to rehabilitate the structural, mechanical, electrical components of the bridge and restore the aesthetic features that warrant the historical designation. The contract was let in September and preliminary construction work is expected to start in

January, 2007. Closure of the Kilbourn Bascule Bridge will not occur until after the State Street Bridge is reopened to traffic. Rehabilitation work is expected to be completed in November of 2008.

Work on the rehabilitation of the Hawley Road Viaduct continued in 2006. The project consisted of redecking the bridge, painting the superstructure, and repairing extensively damaged concrete substructure. The two stage construction, which allowed traffic to remain on the bridge during rehabilitation, was completed in July.

A contract for the replacement of the West Mill Road Bridge over the Menomonee River was let in January and construction started in March. The new single span prestressed girder bridge replaces two adjacent deteriorated bridges at the site. The Mill Road Bridge was opened to traffic in August.

A contract for the replacement of the West Bradley Road Bridge over the Little Menomonee River was let in May and construction started in July. The new single span prestressed girder bridge replaced a load restricted bridge at the site. The new structure features a wide sidewalk for a multiuse trail connecting to area bike paths and a longer and higher span to allow for river flood flow. The Bradley Road Bridge was opened to traffic in December.

Final plans and specifications were prepared for the rehabilitation of the West Bluemound Road Bridge over Honey Creek. The project consists of concrete repairs to the super and substructure and replacing the timber and steel railing with decorative, crash tested concrete railing. Final contract documents were submitted in August with construction expected in 2007.
Final plans and specifications were prepared for the rehabilitation of the Teutonia Avenue Bridge over the Union Pacific Railroad. The project consists of re-decking the bridge, painting the superstructure, repairing the concrete substructure, providing new bridge railing, and asphaltic slope paving. Final contract documents were submitted in November with construction expected in 2007-2008.

Preliminary plans and specifications were submitted for the South 29th Street Bridge over the Union Pacific Railroad (UPRR). The existing deteriorated bridge will be replaced with a single span cast-in–place rigid fame bridge, increasing the vertical railroad clearance under the bridge. The project is scheduled for construction in 2007.

Preliminary engineering continued for the replacement of the Highland Boulevard Bridge over the Canadian Pacific Railway (CPRR). Construction of this project is expected to occur in 2008-2009.
Preliminary plans were submitted for the replacement of the Humboldt Ave. Bridges over Riverboat Road and the Milwaukee River. The Riverboat Bridge will provide increased vertical clearance under the bridge while maintaining an adjacent ramp for access to the Riverboat Road. The two bridge replacements and associated retaining wall work will be let as one project so as to minimize traffic disruption to the area. Construction of these bridge projects is expected to occur

in 2008-2009. Preliminary engineering was started for the rehabilitation of the N. Prospect Ave. Bridge over Oak Leaf Trail. The work will consist of replacing the concrete filled steel grating with a new concrete deck, painting the structural steel, and making repairs to the substructure elements. Work is scheduled for construction in 2008.

A Request for Proposal was prepared, and an outside consultant was selected, for performing an engineering analysis, cost estimates, and recommendations for the rehabilitation of the North Teutonia Avenue Bridge over Silver Spring Drive. The propose scope includes replacing the bridge slab, replacing the steel railing with crash tested rails, and performing a structural and traffic analysis for the incorporation of a single point intersection to reduce the traffic accidents at the site. Rehabilitation of the bridge is expected in 2008.

Final plans, specifications, and cost estimates were reviewed for the construction of a bicycle bridge over Chase Avenue and the rehabilitation of the abandoned Union Pacific Railroad bridges over Greenfield Avenue and Kinnickinnic Avenue. The acquired railroad bridges and new bicycle bridge will eventually become part of the Kinnickinnic River Bicycle Trail funded through a Congestion Mitigation and Air Quality grant. Construction of the bridge is expected in 2007. The Canal Street Bridge over the CPRR and the Canal Street Viaduct over the Menomonee River were opened to traffic in April. The bridges are part of the Canal Street extension from 25th Street to Miller Parkway. The bridges and roadway provide access to the former Milwaukee Railroad yard and shops for development and accommodate a continuous roadway and multi-use trail from 6th Street to Miller Park.

Bridge Inspection

This unit performed inspection on 154 bridges for which the City is the maintainer of the bridge. The bridge inspection reports were entered into the Highway Structures Inventory System (HSIS) database and copies were submitted to Milwaukee County and WisDOT. The bridge inspections were performed in accordance with the State of Wisconsin Structure Inspection Manual and National Bridge Inspection Standards. Copies of the reports and photos of the deficiencies were given to Bridge Maintenance for their use in scheduling and prioritizing repair work

Parking Structures

Final plans and specifications were prepared and a contract was let for expansion joint replacement and waterproofing of selected areas for the 1000 N. Water Street Parking Structure. The work required shutting down the entire upper levels of the parking structure to allow the work to be completed. The contractor successfully completed the majority of the work over the July 4th weekend, resulting in minimal disruption to parking patrons.

Final plans and specifications were prepared and a contract was let for work on the MacArthur Square Parking Structure. This work consisted of painting the walls, columns, and lane striping of the westerly half of the lower level, painting of the lobby areas on the 9th Street level, and concrete repairs to the columns, walls, and on-grade slab in the painted areas. This work was completed in September and is a continuation of a multi year program to provide a safer and brighter appearance for the parking structure.

In accordance with the City of Milwaukee's façade critical examination ordinance, reports were prepared and submitted for both the Milwaukee-Michigan and 4th and Highland parking structures. The inspections classified both structures as safe, with minimal maintenance required to maintain the structural integrity of the façade.

Using information gathered from the unit's 2005 inspection of the City owned parking structures, recommendations were given both for short and long term repair needs to Parking Administration. This information was used to prepare a recommended Capital Improvement Program for the parking structures.

Miscellaneous Structures

This unit continued to provide engineering review and contract administration for the Department of City Development in connection with the Milwaukee Riverwalk initiative. The unit's responsibility included review and recommendations for approval on all contracts, plans and specifications, construction budgets, change orders and payments, shop drawings and construction field reports for the Riverwalk development. The following riverwalk projects had activity in 2006.

Construction was completed for the Riverwalk System Upgrade Project, which included installation of new riverwalk signage and ornamental trellises for the Downtown Riverwalk system, and the 2060 N. Humboldt Riverwalk adjacent to the Humboldt Street Bridge on the north side of the Milwaukee River. The Phase 1, Phase 2, and Downstream Parcel portion of the Harborfront Riverwalk adjacent to Erie Street at the mouth of the Milwaukee River was substantially completed. Conceptual plans and estimates were reviewed for the riverwalk for the North End project generally bounded by N. Water Street, the Milwaukee River, E. Cherry Street, and E. Pleasant Street and the riverwalk at First Place located at 100 W. Seeboth along the Milwaukee River. Plans, specifications, and budget were reviewed for the River Renaissance Riverwalk at 102 North Water Street and construction on that segment of riverwalk started with completion expected in summer of 2007.

Structural analysis was performed for various repair and construction projects including bridges, hollow walks, public buildings, firehouses and bridges with overload vehicles. The following is a summary of some of those projects. A structural inspection, analysis, and estimate were prepared for a replacement lift elevator at the City Hall main entrance. A structural inspection and recommendations were given for the replacement of the floor slab of the Milwaukee Fire Department Engine House #2. Structural analysis was performed and details were prepared for reinforced foundations for eccentrically loaded street light poles. A structural inspection and recommendations were given for damage caused from vehicle impact for a support column at the Milwaukee Police Department Police Station #6 and Milwaukee Fire Department Engine House #4. Final plans were reviewed for the proposed Potawatomi Casino connector bridge with the 16th Street Viaduct. Estimates were prepared for a proposed bridge over the Canadian Pacific Railroad for the Menomonee Valley Rail Transit and a series of pedestrian bridges over the Menomonee River in the Menomonee Valley.

A contract was let for the repair of the steel piling for the Becher Street Bridge over the Kinnickinnic River. Construction is expected to be completed in 2007.
Analysis of bridges by this unit for permit overload vehicles has increased yearly as the numbers of permit applications and enforcement has increased. 516 bridge analyses of overload vehicles were performed in 2006. The overload review and analysis process was streamlined by this unit to allow a timely response to the permit desk to avoid trucking delays.

ELECTRICAL SERVICES UNIT

Electrical Services serves the City of Milwaukee by overseeing the operation, maintenance and installation of facilities and equipment related to street and alley lighting, traffic control signals and street signage. In addition, in 2006 the Traffic Sign and Machining Shops were transferred to this unit.

Traffic Signal Services **:**
The Traffic Services area operates and maintains 722 controlled intersections in the City of Milwaukee. This unit performed the required traffic signal work to accommodate various construction improvement projects including:

- W. Capital Dr (N. 36th St to N. 60th St)
- S. Clement Ave (E. Howard Ave to S. Whitnall Ave)
- N. 91st St (W. Flagg Ave to W. Mill Rd)
- N. 11th St (W. Windlake to W. Bruce St)
- S. 20th St (W. Grange Ave to W. Layton Ave)
- W. Wisconsin Ave Streetscaping improvement – Phase III and IV featuring countdown pedestrian heads.
- Marquette Interchange project
- Temporary overhead wiring was installed at various intersections to accommodate various construction projects.

In addition, various maintenance activities are required to maintain existing City facilities in good operating condition:

- Hazard elimination project at 27th & National. This involved the addition of 12" signal heads, mast arms, reflective backboards located behind signal heads, upgraded to LED and countdown pedestrian heads.
- Two-way conversion of State St. and Wells St. from 6th St. to 11th St. and Saint Paul from Water to 2nd St.
- Hazard response project at W. Atkinson Ave and N. 32nd St. The project included a radar detection unit which displays current vehicle speed and blinking Chevron signs.
- Installation of a dual pedestrian crossing at 6750 W. Industrial Rd. featuring blinking LED pedestrian signs mounted on mast arms.
- Installation of audible pedestrian crossing at the intersections of W. Reservoir St. and N. 6th N. Hawley Rd. and W. Bluemound Rd.
- Cabling and hardware was completed for an additional 9 intersections for the Milwaukee Fire Department Opticom (traffic signal interruption) system.

- Completed the new upgrade of 140 signaled intersections from incandescent lights to LED technology for improved energy savings.
- Ongoing response to signal outages and damaged facilities.

Street Lighting Services:
Street Lighting operates and maintains over 72,000 street lights and 12,000 alley lights and associated facilities to ensure City neighborhoods and roadways are well-lit. Personnel responded professionally around the clock to citizen requests, Alderperson's service requests, contractor damages and departmental priorities.

In 2006, approximately 2,400 underground troubles were reported and repaired, 2,000 light pole knock downs were replaced or repaired, 4,300 street lighting lamps were replaced in grouping or scattered locations and 2,100 alley lights were replaced or repaired.
This unit performed the required street lighting work to accommodate various major construction improvement projects including:

- W. Capital Dr (N. 36th St to N. 60th St)
- S. Clement Ave (E. Howard Ave to S. Whitnall Ave)
- N. 91st St (W. Flagg Ave to W. Mill Rd)
- N. 11th St (W. Windlake to W. Bruce St)
- S. 20th St (W. Grange Ave to W. Layton Ave)
- W. Wisconsin Ave. Streetscape (N. 4th St to N.10th St)
- W. Wisconsin Ave. Streetscape (N. Milwaukee St. to E. Mason St.)
- East North Avenue (N.Breman St to N. Booth St)
- Marquette Interchange including various bridge lighting components
- W. Canal St (N.25th St to Miller Park)
- Josey Heights new subdivision

Work commenced on street lighting conversions/replacements including the WX 7-8 circuit onversion where transclosures were installed and energized along with the entire job being bored awaiting cutover. A portion of the west side of the City had lighting cabling converted.

Traffic Sign Shop:
The Traffic Sign Shop oversees the fabrication, inventory, installation and maintenance of all the traffic, parking and specialty signage in the City as well as the painting maintenance of all traffic centerlines and lane lines and crosswalks. In 2206, the following was accomplished

- Completed 1800 conversions/replacements of the school crossing sign program.
- Completed 375 conversions/replacements of the stop signs program.
- Printed over 300 signs for the Election Commission
- Designed and printed 500 blue plastic "Construction Signs"
- Designed, printed and installed folding traffic signs for Miller Park.

Machine Shop:
The Machine Shop provides the support for routine and specialty machining services for the Electrical Services group including:

- Designed and fabricated a new mast arm for the "JR-Poles."
- Repaired numerous poles and bases for the Marquette project
- Built over 20 new JR style mast arms for the Traffic Signal Shop
- Repair of boring machines used by Electrical Services

GENERAL STATISTICS - 2006

Streets, improved and unimproved
Net change in 2006: plus 25.296 acres
Total area at end of 2006 ..... 11,810.961 acres
or
18.455 square miles

Alleys, improved and unimproved
Net change in 2006: minus 0.060 acres
Total area at end of 2006 ..... 928.598 acres
or
1.451 square miles

Pedestrian ways and malls, improved and unimproved
Net change in 2006: minus 0.768 acres
Total area at end of 2006 ..... 28.846 acres
or
0.045 square miles

State and County rights-of-way, improved
Net change in 2006: minus 0.951*
Total area at end of 2006 ..... 1,797.620 acres
or
2.809 square miles

*West State Street and U.S. 41
West Grantosa Drive and Fond du Lac Freeway

Area of City:
At end of 2006 ..... 95.859 square miles
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 – 2006

Paving plans produced
- 106 separate paving projects 154
- The paving plans included:
- Background drawings 87
- Cross-sections transferred... 39
- New designs transferred…. 86

Election Commission map revisions 10
Number of structural design projects for which plans were prepared…. 8
Number of State of Wisconsin paving projects for which plans were prepared* 14
Color maps prepared for Summerfest and other annual special events. 28
Miscellaneous drawings and maps prepared for various City departments 11

*Includes paving plans, streetscape plans and bridge approach plans.

ONE-QUARTER SECTION MAPS, STREET MAPS, SUBDIVISION PLATS, AND CERTIFIED SURVEY MAPS, THE OFFICIAL MAPS, ALDERMANIC DISTRICT MAPS, OTHER PLANS -2006

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… 101
Number of revisions to the one-quarter section maps 178
One-quarter section maps transformed, reviewed and corrected* 68
Number of one-quarter section maps remicrofilmed 111
Number of revisions to City of Milwaukee single and double line street maps 85
Number of revisions to Aldermanic District/Ward maps 16
Certified Survey Maps processed……. 60
Subdivision plats processed…….. 11
The Official Map one-quarter section maps;
- scale: 1” = 200’, on file (86 of these maps were
- revised with a total of 194 revisions) 445

Final Official Map one-quarter section plots made 73

*One quarter section engineering maps that serve as the base maps for all City utility maps are being redrawn through a computer transformation program. These transformed maps are being reviewed and corrected when necessary and will more accurately show the actual location of the features they depict.

TRAFFIC AND STREET LIGHTING ACTIVITIES – 2006

Street lighting circuit maps on file* 508
Street lighting one-quarter of one-quarter section maps on file 1,228
Revisions to street lighting circuit and one-quarter section maps 566
Special lighting maps on file* 175
Revisions to and creating special lighting maps 11
Signal records updated 159
Traffic count studies conducted (includes cordon count) 6
Revisions to street lighting data base 146
One-quarter section curbline maps prepared for street lighting digitizing project 134
¼ sections digitized and issued 31

*Smaller ineffective circuits have been combined into larger more efficient circuits thus reducing the numbers of circuits, which translates to fewer files.

ADDRESS ASSIGNMENTS AND SALES - 2006

Address assignments 49
Sales Summary:
Maps, plats and plan sales $12,727.63

SUPPLY SERVICES - 2006

Dollar amount of supplies requisitioned by Administration and
Transportation Sections $9,955.26

REPRODUCTION SERVICES - 2006

Approximate quantity of paper used for electrostatic printing done in house* .....81,333 square feet

Approximate quantity of paper used for plotters:
Large format bond paper .....97,200 square feet
Vellum .....1,800 square feet

Approximate quantity of electrostatic printing done under contract
by a private printer .....234,843 square feet
Total Reproduction Services .....415,176 square feet

*Xerox 6204 machine, and reader/printer for aperture cards

LAND ACQUISITION, STREET DEDICATION, PUBLIC WAYS VACATION AND MISCELLANEOUS ACTIVITIES - 2006

Dedications of City property for public right-of-way 0
Acquisition of rights-of-way by accepting deed reservations or by quit-claim 1
Reject reservations 1
Release access restriction 0
Vacation of public ways
- Street vacations 15
- Alley vacations 13

Prepare easement and private road descriptions 2
Annexations to the City of Milwaukee 0
Transfer right-of-way jurisdiction (County to City) 0
Various title reports for vacation projects and/or sewer and water easements 7
Street name change ordinances 1
Designate honorary street names 2
Designate private streets 1
Latitude and longitude locations compiled for the public 0
Oversize and overweight load routes checked for the Department of Public Works, Contract and Permits Office and private trucking companies 1,740
House moving permit applications processed for the Department of Public Works 4

DIGGERS HOT LINE - 2006

Hot line requests 38,429
Utility information requests 644
Out-of-City requests 8,070
Total hot line requests 47,143

UNDERGROUND CONDUIT ACTIVITIES - 2006

Lineal trench feet of conduit installed 24,692
Lineal trench feet of conduit abandoned 2,131
New manholes installed 43
Manholes replaced 1
Manholes repaired 37
Manholes abandoned 19
DPW permits reviewed 987

UNDERGROUND CONDUIT STATISTICS - 2006

Miles of conduit 556.1
Active manholes 7,48