



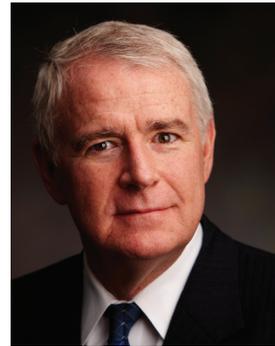
2011 ANNUAL REPORT





2011 Milwaukee Common Council

left to right: Joe Davis - 2nd District, Robert W. Puente - 9th District, Nik Kovac - 3rd District, Willie C. Wade - 7th District, Joe Dudzik - 11th District, James A. Bohl, Jr. - 5th District, Tony Zielinski - 14th District, President Willie L. Hines, Jr. - 15th District, Milele A. Coggs - 6th District, Robert J. Bauman - 4th District, Michael J. Murphy - 10th District, James N. Witkowiak - 12th District, Robert G. Donovan - 8th District, Ashanti Hamilton - 1st District, Terry L. Witkowski - 13th District



Mayor Tom Barrett

THE DEPARTMENT OF PUBLIC WORKS' MISSION

is to promote the health, safety, mobility and quality-of-life for all City of Milwaukee residents and visitors by providing: Safe, attractive and efficient surface infrastructure systems. Solid waste collection, disposal, recycling, and waste reduction. Safe, aesthetically pleasing and sufficient drinking water. Storm water and waste water conveyance. Support services and facilities for the Department of Public Works (DPW) and other city departments

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Ghassan Korban,
Commissioner of Public Works

The Groundhog Day Blizzard of February 2nd 2011 was a defining moment for the Department of Public Works and for the City of Milwaukee. With snowfall totals of 19.7 inches blanketing our City, DPW staff worked around the clock for 72 hours plowing streets, keeping our city open for business. I offer my deepest gratitude to each and every employee who played a role in managing one of the most severe snow events in Milwaukee history. In recognition, the Department received kudos from Mayor Tom Barrett and the Common Council on a "job well done".

Showing our commitment to elevating our department to a model department for other cities, several initiatives were implemented in 2011 that have had a positive impact on the residents of Milwaukee.

The We Tip Illegal Dumping Hotline Campaign was launched in June by the Sanitation Section with assistance from Alderman Hines. In 2010, the City spent \$175,000 removing illegally dumped debris from 1,250 city-owned vacant lots.

Single-Sort Collection and the expansion of recyclable materials was introduced to residents. Single-sort recycling is a convenient system requiring only one sort of recyclables from trash, allowing papers to be mixed together with cans and bottles.

A groundbreaking ceremony was held for one of the Compressed Natural Gas (CNG) refueling stations that will be located at the Lincoln Avenue Garage. The Department's new refueling stations will offer CNG to commercial fleet vehicles, CNG equipped cars, and trucks at the Lincoln Avenue Garage site. CNG equipped vehicles typically operate at one-third below the cost of gasoline and diesel fueled vehicles.

The Infiltration and Inflow demonstration pilot project was launched in 2011. The purpose of the project is to reduce basement backups by rehabilitating private building sewers. The program will be expanded in the future. It is funded by Milwaukee Metropolitan Sewerage District and the City of Milwaukee.

Community and Neighborhood partnering projects that involve our Forestry Section included the Enderis Park Triangle beautification project. It was a collaborative effort between the residents of Enderis Park East and the Enderis Park Neighborhood Association who contributed professional landscape design services, personal cash donations and many volunteer hours. The Seebooth Triangle, installed this summer was also a collaborative project jointly funded by the Department of City Development and DPW with considerable neighborhood input to create a welcoming and attractive greenspace. On both projects the neighborhood is assuming maintenance responsibility. Phase II of Hartung Park was completed last summer with the assistance of the Hartung Park Community Association and our Recreational Facilities Section. The park now includes a playground, picnic area, demonstration rain garden, a detention pond and a labyrinth.

This is only a small sampling of the myriad of worthy projects that were undertaken by the Department of Public Works staff to improve the quality of life of the citizens of Milwaukee. We have a proud and dedicated workforce in the Department of Public Works. I am honored to be in the position to help lead the charge of making the City of Milwaukee a cleaner, safer and sustainable city, thanks to the efforts of the hard working staff of the Department of Public Works.

A handwritten signature in black ink that reads "Ghassan Korban". The signature is fluid and cursive.

Ghassan Korban, Commissioner
City of Milwaukee – Department of Public Works



DEPARTMENT OF PUBLIC WORKS

Commissioner of Public Works Ghassan Korban
 Director of Operations Preston Cole

ADMINISTRATIVE SERVICES

Administrative Services Director Shirley Krug
 Finance and Planning Manager Patrick Hartmann
 Parking Enforcement Manager Thomas Sanders
 Parking Financial Manager Cindy Angelos
 Coordination Manager Mike Loughran
 Personnel Administrator Dan Thomas
 Permits and Communications Manager Cecilia Gilbert

OPERATIONS DIVISION

Sanitation Services Manager Wanda Booker
 Forestry Services Manager David Sivyer
 Fleet Operations Manager Jeffrey Tews
 Administrative Services Manager Paul Klajbor

INFRASTRUCTURE SERVICES

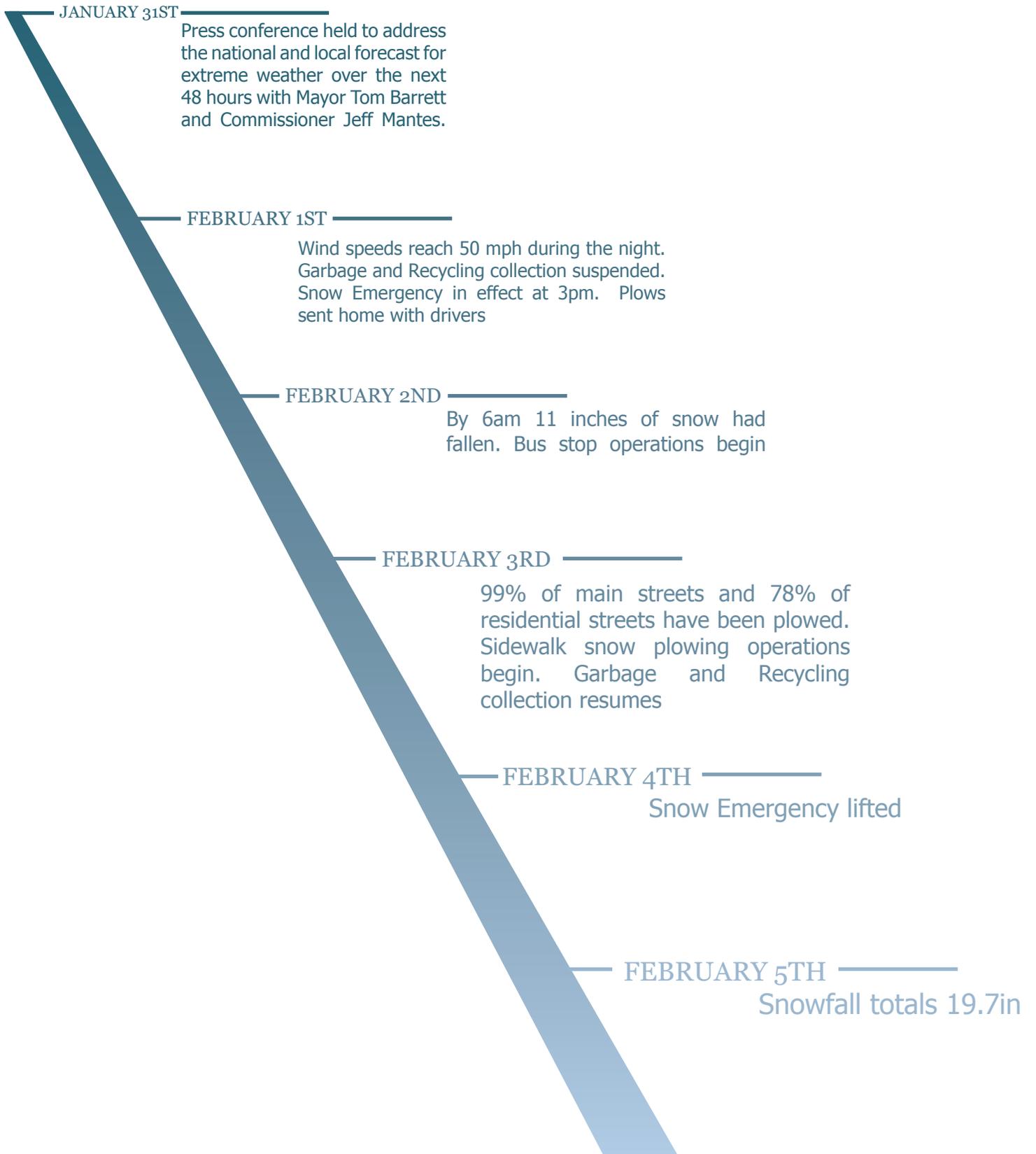
City Engineer Jeffrey Polenske
 Administration & Transportation Design Manager Clark Wantoch
 Engineer-In-Charge, Environmental Section Martin Aquino
 Infrastructures Operations Manager Dale Mejaki
 Facilities Director Venu J. Gupta

WATER WORKS

Superintendent Carrie Lewis
 Administration & Projects Manager Laura Daniels
 Business Manager Earl Smith
 Plants Manager – North Dan Welk
 Plants Manager – South John Gavre
 Distribution Manager Dave Goldapp
 Engineering Manager Dinah Gant
 Water Quality Manager Lon Couillard

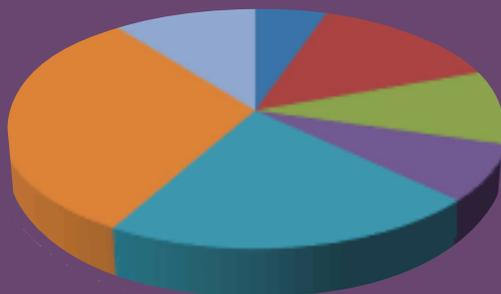
BACK ROW: (L-R)
 Preston Cole,
 Jeff Polenske
FRONT ROW: (L-R)
 Shirley Krug,
 Ghassan Korban,
 Carrie Lewis

GROUNDHOG DAY BLIZZARD



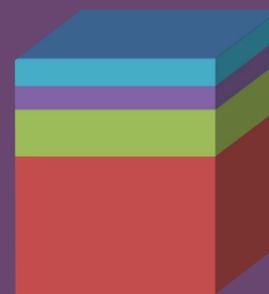
	2009	2010	2011	2011 v. 2010
Personnel				
Full time equivalents	1,956.3	2,127.0	2,119.5	-7.5
Positions authorized	3,042	3,035	2,992	-43
Expenditures				
Department of Public Works	\$ 122,460,659	\$ 108,824,667	\$ 114,406,962	\$ 5,582,295
Water Works	\$ 88,883,658	\$ 102,832,804	\$ 98,274,906	\$ -4,557,898
Parking	\$ 44,789,528	\$ 56,642,216	\$ 54,603,800	\$ -2,038,416
Sewer Maintenance Fund	\$ 82,013,049	\$ 73,810,755	\$ 88,663,496	\$ 14,852,741
Total	\$ 338,146,894	\$ 342,110,442	\$ 355,949,164	\$ 13,838,722

TAX LEVY OPERATION BUDGET BY FUNCTIONAL AREA



- Administration
- Streets
- Street Electrical Services
- Facilities
- Fleet Services
- Sanitation
- Forestry

TAX LEVY BUDGET IN REVENUES AND OTHER PAYMENTS



- Tax Levy
- Revenues
- Parking Contribution
- Water Works PILOT
- Sewer Payment

99.6% of DPW Tax Levy Budgeted Expenditures are offset by charges for services and other payments from DPW's Enterprise Funds of Water Works, Parking and Sewers



THE ADMINISTRATIVE SERVICES DIVISION SERVES as department liaison to elected officials and the public and coordinates major transportation, environmental and economic development-related projects.

This division is responsible for coordinating the department’s operating budget, financial account management, payroll and personnel administration, employee safety and contract management.

The Administrative Services Division also manages all communication responsibilities, including media relations; special event permits; DPW Call Center; and all data and voice telecommunications for infrastructure.

The division is also responsible for the coordination of contracts for all City

infrastructure projects. It also contracts for several major public service functions including solid waste recycling, public parking structure operation, vehicle towing, and parking meter revenue collection.

The Administrative Services Division manages all parking and parking-related activities including parking enforcement, parking information desk, city tow lot, towing contracts, citation processing contract, parking structures and lots, parking permits and parking meters.

Shirley Krug,
Director

Thomas Sanders,
Parking Enforcement Manager

Patrick Hartmann,
Finance and Planning Manager

Cindy Angelos,
Parking Financial Manager

Michael Loughran,
Coordination Manager

Dan Thomas,
Personnel Manager

Cecilia Gilbert,
Permits and
Communications Manager



WHAT'S NEW IN ADMINISTRATION

The division oversaw the remodeling of its call center facility and the installation of a new Citizen Relationship Management (CRM) system for use by the city's new Unified Call Center in 2012. In 2012, division staff will be transferred to the Unified Call Center, along with customer service staff from the Parking Fund to provide consolidated and improved customer service to city residents.

The improvements will include the following:

- Giving citizens a single phone number to call to access non-emergency city services.
- Allowing citizens to connect to an operator 24 hours a day, 7 days a week.
- Answering citizen questions and logging their service requests without having to transfer the customer to a different department. This "first call resolution" should approach 70% within three years of implementation.
- Reducing "wait" times and abandonment rates in city call centers.
- Providing the Mayor, Common Council, departmental managers, and the public with

regular reporting on the volume, type, and geographic distribution of customer calls for services, and departmental response to those calls.

- Providing the Mayor and Common Council with data on the volumes and types of information questions.

The Administration's Technology Support Services section has made several changes to the call center application. It is now the DPW Services application, with the call center now part of the Unified Call Center and supported by third-party software. Functionality was added to the DPW Services application to support the Sanitation accountability initiative, providing immediate notification of requests, tracking, and reporting features. Recycling and winter garbage pickup estimated schedules are now online with the information updated in real-time. Staff also created software to monitor road surface temperatures which was migrated to a custom website, integrating additional data from the State.



FINANCE AND PLANNING

In 2011, the department’s operating budget (excluding enterprise funds) totaled \$114.4 million. This represented a \$5.6 million, or 5.1 percent increase from 2010, due largely to the increased budgeted cost of fringe benefits for employees, primarily health care.

Expenditures are estimated to exceed the budgeted amount by \$3.6 million, due largely to the snow storm of February 2nd, 2011, during which the city received 19.6 inches of snow in a 48 hour period. The department’s initial response and subsequent clean-up put the city’s snow costs well ahead of the \$6.5 million budgeted for 2011. However, the majority of these costs were recovered through a Federal Emergency Management Grant of \$1.1 million and an increase to the city’s Snow and Ice Removal charge generating \$1.4 million. In 2012, the city’s budget for snow and ice has been increased to \$7.9 million.

Public Works and the City: server/desktop computing, application development and citywide telecommunications infrastructure.

An on-line request for desktop support help was implemented to supplement the desktop support phone line. Additional storage capacity was added to the DPW domain, as well as an upgrade of the domain backup system. Domain access for desktop PCs was extended to several bridge houses. Several application-specific servers were consolidated to web-based services or to existing servers.

In 2011, the core data network software version was upgraded to resolve an issue with random communications failures. The wireless network was upgraded city-wide to support increased speeds, as well as expanded to the fleet repair garage. Network and telephone support was provided for new or remodeled facilities including the Water Meter Shop on Cameron Avenue, the new Villard Square library, and the new Unified Call Center

Parking Operations (including structures, lots, meters, citations, towing, and permits) generated \$44,955,674 in revenues

CALL CENTER

At the end of 2011, the division oversaw the remodeling of its call center facility and the installation of a new Citizen Relationship Management (CRM) system for use by the city’s new Unified Call Center in 2012. In 2012, division staff will be transferred to the Unified Call Center, along with customer service staff from the Parking Fund to provide consolidated and improved customer service to city residents.

TECHNOLOGY SUPPORT SERVICES

The Technology Support Services (TSS) section has responsibility for three areas of technology for the Department of

PARKING

For the first time, the DPW solicited proposals rather than bids for the management of its four public parking garages. The Request for Proposal (RFP) process allowed consideration of factors such as experience, marketing ideas, and staff expertise in addition to cost. The new contract will include:

- A marketing manager who will procure new business at each of the garages.
- Provision of on-line, prepaid special event parking to reduce wait times at garages for fee payment.
- Rate studies to maintain competitive market rates.
- An off-peak hour call center to provide customers an immediate response for assistance at entrance and exit gates.
- “Secret shoppers” to test for quality control.
- Partial compensation will be based upon evaluations by City staff and customers regarding the quality of services.

Photos (L-R): Harley Parade, Pedestrian Drama, Plankinton Construction

The percentage of overnight parking permits purchased on-line continues to increase compared to in person purchase. Approximately 19% of all night permits were purchased on-line in 2011, compared to 8% in 2009, the first year this service was offered. On-line purchase is more convenient for the purchaser and provides reduced wait times for those residents choosing to buy permits in person.

DPW administers four contracts for towing vehicles and one for recycling vehicles. Of the 26,004 vehicles towed in 2011, approximately 87% were returned to owners, 9% were recycled, and 3% were sold at junk-bid auctions. Revenues generated from all towing activities totaled over 5 million dollars.

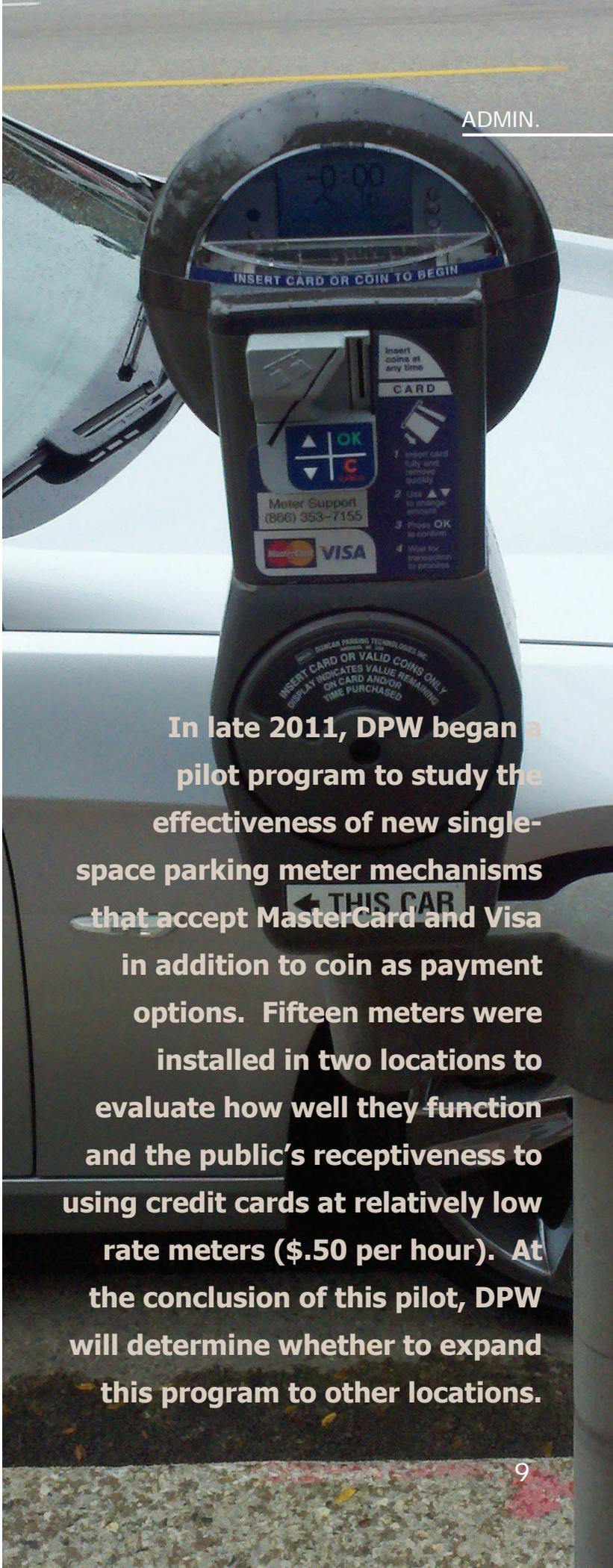
SUPPORT FOR BUSINESS

The City of Milwaukee Department of Public Works and Mayor Tom Barrett developed the Support for Business program in 2010 because of the need to think about road construction in a new and positive way. The service provided by the Support for Business program is one of the many ways the City of Milwaukee contributes to maintaining a healthy business community and providing a source of sustainable jobs for residents.

West National Avenue, from 27th Street to 39th Street, was a streetscape program designed to improve the attractiveness of the area with new lighting, plantings, medians, and other elements. On this project the liaison was able to work with the Silver City Main Street program to reach out to businesses in the area. During the early stages of the project, the Silver City Main Street program worked with the contractor to make sure the street was in good shape for the “Silver City Trick or Treat Street Event”, an annual event designed to market the area.

South 2nd Street, from National Avenue to Menomonee River, was another extensive streetscape project. It included removal of existing pavement and railroad ties, installation of new curbs, gutters, lighting, etc. This project relied on the assistance of the Support for Business program due to the many viable businesses in the area that were affected by the construction. Signage in the area was very important to inform the public that businesses were open. A vacant lot was utilized to replace the on street parking that was removed during construction. Stakeholders were provided construction updates via email and newsletters. Once the project was completed, a celebration was held that included Mayor Tom Barrett, Alderman Jim Witkowiak, DPW staff that worked on the project, and business owners.

The Plankinton Avenue Project, from Wells Street to Wisconsin Avenue, consisted of underground utility work, (sewer and water replacement) and street reconstruction and was fairly disruptive. Due to the number of businesses, Mo’s – A place for Steaks, Mo’s Irish Pub, Rock Bottom Restaurant, the Riverside



In late 2011, DPW began a pilot program to study the effectiveness of new single-space parking meter mechanisms that accept MasterCard and Visa in addition to coin as payment options. Fifteen meters were installed in two locations to evaluate how well they function and the public’s receptiveness to using credit cards at relatively low rate meters (\$.50 per hour). At the conclusion of this pilot, DPW will determine whether to expand this program to other locations.



Theater, the Empire Building and River Loft condominiums, a Support for Business liaison was needed. The liaison sent almost weekly email updates on the project. Early in the project, the contractor worked with the Westtown Association to make sure the street was cleared for the staging of the St. Patrick's Day Parade, and accommodations were also made on behalf of the Riverside Theater throughout the project.

Howell Avenue (which will allow Lulu's restaurant to have outdoor seating). In addition, plans are being made to widen the sidewalk area along South Kinnickinnic Avenue in this area. The resulting center triangle island that was created at this intersection will be the location of a monumental sculpture that incorporates solar, wind and "people power" for the heart of Bay View.

A total of 1,156 permits were issued and \$389,346 in permit fees were assessed.

DPW worked closely with the Silver City business association in the development of a streetscape project on West National Avenue between South 27th Street and South 39th Street. The project was constructed in 2011, which includes a landscaped median at South 35th Street, decorative street lights, and decorative crosswalks.

SPECIAL PROJECTS

The Housing Authority of the City of Milwaukee (HACM) worked in conjunction with the Department of Public Works regarding the planning and construction of new public infrastructure at the Westlawn housing development. The Westlawn neighborhood is just south of West Silver Spring Drive, between North 60th Street and North 68th Street. The redevelopment plan provided a new roadway network throughout the neighborhood, which required significant public infrastructure work. DPW negotiated an Out-of-Program agreement with HACM for the first phase of this work, totaling almost \$1 million dollars. In 2011, new streets, water mains and roadways were constructed at Westlawn, under the guidance of DPW.

Another streetscape project was the reconstruction of the intersection of South Kinnickinnic Avenue, East Lincoln Avenue, and South Howell Avenue. Working with the area businesses, the roadway geometrics through this intersection were modified to provide significantly wider sidewalk areas along both East Lincoln Avenue (which facilitated the development of an Alterra Coffee restaurant), and along South

DPW continued its relationship with the Riverwalk BID and the Department of City Development in the routine maintenance of the City-owned segments, as well as the continuing upgrades to satisfy the American with Disabilities Act settlement with the Department of Justice. The settlement requires the City of Milwaukee and the owners of riverwalk segments to construct ramps or lifts to provide wheelchair access to the riverwalk.

In 2011, construction on the Edison Parkway occurred. The Edison Parkway is a small public park adjacent to North Edison Street, the Highland pedestrian bridge, and the Milwaukee River. The Edison Parkway is a vital link in the riverwalk network which provides a relaxing experience for visitors along the river's edge.

SPECIAL EVENTS

As described in the City's Code of Ordinances, "Special Event" means any planned extraordinary, temporary use of the public right-of-way or public premises of 25 people or more including but not limited to parades, processions, demonstrations, bicycle or foot races, festivals and block parties.



Applications for use of the public right-of-way in conjunction with special events must be reviewed and approved by the District Alderperson, Milwaukee Police Department, and DPW Traffic Division. Once approvals are obtained, a permit is written to reflect the agreed upon conditions of the event. It is paramount to this office that the citizens of Milwaukee are kept informed, safe and mobile when permits are approved and issued.

When these conditions are met, great events are established including: Veterans' Day Parade, Summerfest, Bastille Days, Milwaukee Holiday Parade, Westtown and East Town Farmers Markets, Pride Parade, Komen Race for the Cure, US Bank Fireworks, Irish Fest, Polish Fest, German Fest, Mexican Fiesta, Indian Summer Festival, African World Festival, Milwaukee Air and Water Show, Brigg's and Al's Run, Memorial Day Parade, Mitchell Street's Sun Fair, city-wide 4th of July parades, African American Health Walk, Bay View Bash, Center Street Daze, Locust Street Festival, South Shore Frolics, along with 379 block parties - just to name a few events which occur annually in "The City of Festivals". Special Events have become an integral part of the fabric and culture of daily life in the City of Milwaukee.

CONTRACT ADMINISTRATION

DPW contracts for all City infrastructure projects. It also contracts for several major public service functions, including solid waste recycling, public parking structure operation, vehicle towing and parking meter revenue collection. Through its contracts, DPW leverages employment opportunities for City

residents. This initiative is formally known as the Residents Preference Program (RPP).

Under the program, at least 40 percent of all hours worked on individual city contracts must be allocated to unemployed or underemployed city residents.

DPW also requires that contractors use Emerging Business Enterprises (EBE) in their contracts. EBE firms, typically small firms owned by one or more individuals who are at an educational, social, economic or other disadvantage, are certified by the City and are mandated by ordinance to be involved in at least 25 percent of all work contracted by the department.

DPW also applied the Local Business Enterprise ordinance which allows certified local businesses a 5% advantage on their bids.

CONTRACTS COUNT VALUE

Admin	1	\$629,355.31
Buildings	7	\$2,453,528.80
Forestry	2	\$68,328.50
Parking	2	\$97,934.94
Paving	55	\$16,660,422.51
Rec. Facilities	1	\$47,645.00
Sanitation	1	\$0.10
Sewer	61	\$34,347,801.45
WATER Underground	2	\$1,795,430.00
WaterPlants	2	\$223,792.00
TOTAL	134	\$56,324,238.61

Photo: Eddison
Parkway



THE OPERATIONS SERVICES DIVISION IS DEDICATED, year-round, to keeping Milwaukee clean, manicured and safe. The Operations Division provides Fleet, Forestry, and Sanitation Services.

The Operations Services Division is responsible for solid waste collection and disposal, recycling and waste reduction, trees and landscaping, fleet maintenance and dispatch, and snow and ice control.

Reliable garbage and recycling collection, scheduled street and alley sweeping and efficient snow and ice clearing are just a few of the essential services that Sanitation delivers in a cost effective manner every day.

Forestry Services is responsible for the design, planning, planting, and management of street trees, boulevards, landscapes, greenspaces, and beautification projects within the City of Milwaukee.

The goal of Fleet Services is to provide responsive, flexible, efficient and comprehensive fleet services and dispatch operations to support the delivery of public programs and services for the City of Milwaukee.

Preston Cole,
Director

Jeffrey Tews,
Fleet Services Manager

Wanda Booker,
Sanitation Services Manager

Paul Klajbor,
Administrative Services
Manager

David Sivyer,
Forestry Services Manager



WHAT'S NEW IN OPERATIONS

In 2011, DPW fast-tracked plans to convert to single-stream recycling, amending its recycling contract and rapidly adjusting operations to accommodate the new system. Single-sort recycling requires residents to simply separate or sort recyclable material from trash. Sorting between recyclables such as paper and plastic is no longer necessary. The change to single-sort recycling increases the types of materials accepted in the recycling program. New materials accepted include aseptic and gable-top cartons, #4 and #5 plastic tubs and lids, #2 rigid plastics of any size, aluminum foil and baking pans and metal pots and pans. The transition to single-sort recycling has increased recycling tonnages over the previous year. Switching to a single-sort program aligns with the vision of the Milwaukee Common Council and Mayor Tom Barrett, who has set a goal of reaching 40% landfill diversion by 2020.

The changes in recycling presented both tremendous challenges and opportunities to public education. The existing Recycle For Good promotional campaign swiftly switched gears to address newly accepted materials, highlight the added convenience of single-sort recycling and describe how the program works. The education campaign featured a high-profile launch event with the

Milwaukee Brewers at Miller Park. Milwaukee has a long history of being a very clean city.

Unfortunately, not everyone appreciates the value of a clean neighborhood. The City has experienced a rash of illegal dumping of trash and debris on both city and private lots. Illegal dumping impacts the quality of life for all Milwaukee residents and costs over \$175,000 per year to remediate.

To combat this issue, the Mayor and Common Council increased the illegal dumping fine to up to \$5,000 and provided \$25,000 in special funding to establish a tip line where residents can report illegal dumping. The City partnered with WETIP, a national crime reporting hotline that allows callers to anonymously report illegal activity and potentially receive up to a \$1,000 reward for providing information that leads to the arrest and or conviction of an illegal dumper.

By having residents take a more active role in monitoring and reporting illegal dumping, DPW believes that neighborhoods will be cleaner and in the long term, safer as residents have more pride in the area where they live.



SANITATION

City residents and visitors alike directly benefit from the various municipal services that Sanitation provides. Reliable garbage and recycling collection, scheduled street and alley sweeping and efficient snow and ice clearing are just a few of the essential services that Sanitation delivers in a cost effective manner every day.

Snow is arguably one of the most critical services that a municipality has to manage. The Groundhog Day Blizzard tested the resolve and wits of many as staff combated the fourth greatest snowfall in a 24 hour period. The snow started on January 31st and didn't stop until February 2nd, dumping nearly 20 inches of snow across the City.

The City renegotiated its recycling contract to increase the revenue share to the highest it's ever been. In 2012, staff anticipates the City's recycling revenue will exceed \$1.5 million.

Students from the Bruce Guadalupe School assisted Mayor Tom Barrett with a little spring cleaning by tidying up the area around the United Community Center on Milwaukee's south side. Sanitation's annual spring cleanup, Project Clean & Green, is a citywide program created in 2005 for residents to get rid of unwanted household items during a designated 7 week period. Crews removed over 1,815 tons of debris this spring, which represents an 8% increase since the program began.

**Sanitation collected
22,837 tons of residential
recyclables, an increase
of 3.5% since 2010**

Aggressive resource recovery programs are providing a boost to diversion. New Self-Help Center collection programs were implemented for residential carpet and used cooking oil recycling in 2011. From August through December, 80 tons of carpet was diverted from the landfill. Since October, 560 gallons of used cooking oil were recovered for use in the production of biodiesel, which is utilized to "green" the City's fleet of diesel engine vehicles. Both programs support local companies.

The Groundhog Day storm will go down in the record books of one of the fiercest storms fought by Milwaukee snow fighters. Staff can proudly state that in the man against snow fight on Groundhog Day 2011 – we won. The final cost of cleaning up from that storm was \$3.2 million, some of which was offset by FEMA Disaster Relief funding.

Single-sort (single stream) recycling was implemented this fall, making recycling better than ever. Residents no longer need to separate papers from plastic, metal and glass containers. All recyclable items can be mixed together in the cart eliminating the need for separate bins or bags in residences. City crews are gradually removing the dividers from recycling carts to maximize cart capacity. New recycling carts will not have dividers but will have a recycling label on the top lid.

FORESTRY

In 2011, the Forestry Section partnered with Milwaukee Public Schools Recreation Division to create a Native Tree Walk at Hawthorn Glen Outdoor Environmental Education Center located at 1130 N. 60th Street. A 23-acre urban nature center, Hawthorn Glen hosts thousands of MPS students and public visitors each year. The Hawthorn Glen Native Tree Walk is a self-guided trail planted with trees native to Wisconsin. The trail includes 25 tree stations outfitted with interpretive signage that provides tree identification and characteristics. A trail guide and map were produced to provide more complete educational information on each native tree species along the trail. The Native Tree Walk was commemorated on Arbor Day, April 29th, 2011 as part of the City of

Photos (L-R):
Snow Removal,
Enderis Park
Fall Leaf
Collection



Milwaukee's 46th Arbor Day Celebration – “Celebrating Wisconsin’s Native Trees and Ecosystems”.

In 2011, Forestry continued a multi-faceted public awareness campaign to communicate the benefits of Milwaukee’s urban forest and raise community awareness of the risk and mitigation alternatives for Emerald Ash Borer. A marketing firm, 2-Story Creative was hired to develop a campaign to deliver Milwaukee’s tree canopy benefits information in a creative, fun and meaningful manner. The public awareness campaign included 3 radio ads each with a key message focused on storm water reduction, air quality and EAB. The 7-week radio campaign aired on 14 Milwaukee-market radio stations July 11, 2011 – August 27, 2011. A total of 1,160 radio spots were aired.

In addition, the public awareness campaign included an interactive website launched on July 11, 2011 at www.milwaukeetrees.milwaukee.gov. The website featured animated videos with new videos posted weekly, a “Name that tree game”, animated banners that communicated tree benefits and tree selection information, mp3 files of the radio ads and a web survey to measure public awareness of urban tree canopy benefits and Emerald Ash Borer. The campaign also utilized social media with Facebook and Twitter components. The website remains posted to extend the life of the public awareness campaign indefinitely. In 2011, the Forestry Section completed a two-year urban forestry training initiative, Strengthening Diversity in Urban Forestry Service Delivery to prepare low-income Milwaukee residents for jobs in tree care.

The purpose of the program was to improve diversity in the urban forestry profession and to connect those that need jobs with the green economy. The urban forestry profession is a long-standing green industry that provides family-supporting jobs with a range of career opportunities.

Strengthening Diversity in Urban Forestry Service Delivery recruited and trained 40+ low-income Milwaukee residents for work in tree care and assisted placement of 16 with industry employment. Trainees participated in a rigorous 32-week program to gain the knowledge and technical skills needed to work in the tree care industry. The training program was designed to prepare participants to work in urban forestry with no prior arboriculture experience. City Forestry staff trained participants in tree climbing, pruning, rigging, tree removals, hazard tree assessment and aerial rescue.

To increase their value to employers, participants also received training and testing for a State of Wisconsin Class B Commercial Driver’s License. Trainees also earned industry credentials including the Tree Care Industry Association Tree Care Academy™ Tree Climber Specialist and Ground Operation Specialist Certificates of Completion; Electrical Hazards Awareness Program (EHAP) training and Basic Life Support (CPR).

FLEET

The Fleet Services section consists of two groups, Operations and Repairs. The goal of Fleet Services is to provide responsive, flexible, efficient and comprehensive fleet

Photo: Students
at Arbor Day
Celebration at
Hawthorn Glen
Native Tree Walk



services and dispatch operations to support the delivery of public programs and services for the City of Milwaukee. Fleet Services Section also provides vehicle and equipment specifications, purchasing services and equipment disposal services for most City departments.

Fleet has continued to move toward an automated fueling system for all new vehicles. The Fuel Focus automated fueling system uses only the employee ID card, and no longer requires the driver to manually enter information such as the vehicle number and odometer reading. This system has been installed on a total of 775 vehicles as of the end of 2011. Each of these vehicles are now equipped with RFID technology to automatically capture mileage and other data, providing more accurate fueling information and cost tracking.

As global non-renewable energy stocks dwindle and fuel prices increase, Fleet Services continually seeks ways to improve air quality while exercising sound financial management and promoting environmental sustainability. Fleet is involved in many facets of “Greening the Fleet”.

In 2011 the City purchased 19 refuse packers with Compressed Natural Gas engines. Previous experience with the City’s two CNG refuse packers revealed that the cost of CNG is approximately 40% less than diesel fuel. The City also broke ground on two CNG refueling stations in the fall of 2011, one at the Lincoln Avenue facility, the other at Northwest Garage. These stations will fuel the City’s growing CNG fleet as well as provide high capacity CNG fueling for the public. The CNG refuse packers are much quieter and cleaner than their diesel counterparts.

The City added five hybrid-electric vehicles in 2011, bringing the total number in the fleet to 33. These hybrids greatly reduce fuel consumption through the use of electric-assist propulsion, and shutting off the engine when not needed. The

regenerative braking systems in these vehicles harness the power generated when stopping a vehicle, super-charging the on-board batteries while braking.

New Equipment Purchases in 2011 include:

- Six CNG powered refuse packers with dual-side, automated loading arms.
- One aerial lift used by Forestry, with 10-yard dumping body for hauling tree chips.
- One sign service truck with clean diesel engine.
- One 40-foot aerial lift with utility body, used by Infrastructure-Electrical Services.
- Two street sweepers equipped with updated design for improved visibility for the operator, plus an automatic lubrication device, to reduce required maintenance and increase service life.
- Two pickup trucks equipped with hydraulic tailgate lift and snow plow.
- Two 16-yard tri-axle dump trucks, for hauling debris from larger excavations.



THE INFRASTRUCTURE SERVICES DIVISION IS THE largest of the six divisions of the Department of Public Works, with a workforce that increases to over 1,000 employees during the construction and repair season.

Infrastructure Services Division is a front-line operations department that is responsible for the design, construction and maintenance of streets and alleys, bridges, traffic signals and signs, street and alley lighting, and sanitary and storm sewers.

This Division undertakes a variety of tasks related to transportation planning, ranging from non-traditional projects such as traffic calming to major roadway improvements. Additionally, this Division is involved in almost every major private development that occurs citywide as it schedules projects and provides services that are vital to the growth, safety, comfort

and quality of life within our community.

Some of the quality of life improvements the Infrastructure staff has implemented has included remodeling playgrounds for neighborhood children, installing bicycle facilities to make the bicycle commute easier and safer, as well as installing bicycle corrals in the public right of way for parking. More traffic calming measures were installed to assist in making neighborhoods safer and staff has continued to utilize sustainable measures to save energy and money while maintaining City structures.

Jeffrey Polenske,
City Engineer

Clark Wantoch,
Administration &
Transportation Design
Manager

Martin Aquino,
Engineer- In - Charge
Environmental Section

Dale Mejaki,
Infrastructure Operations
Manager

Venu Gupta
Facilities Director



WHAT'S NEW IN INFRASTRUCTURE

The City of Milwaukee, in conjunction with the Wisconsin Department of Transportation undertook the reconstruction of South 2nd Street from West National Avenue to the Menomonee River in the summer of 2010. This project employed a complete street design technique that narrowed the overall width of the roadway to allow incorporation of a new tree-filled terrace area, as well as decorative lighting poles and fixtures and a marked bike lane in each direction of travel. This project was completed in the spring of 2011.

In order to determine costs associated with private property plumbing rehabilitation the City chose to rehabilitate five-City owned homes. The project consisted of rehabilitating the existing sanitary sewer laterals, disconnecting the foundation drains, removing the palmer valves and installing backflow preventers. This project was completed in April 2011 and the rehabilitation averaged \$18,600 per home.

The program to change incandescent light bulbs to energy-efficient Light Emitting Diodes signal indicators (LEDs) was nearly completed in 2011, bringing the total number of intersections operating with LED traffic signals to 752. LEDs use less energy, which in turn reduces air pollution, and are brighter than incandescent bulbs. Only two traffic signals remain to be upgraded in 2012 to complete the citywide conversion.

Seven new traffic signals were installed in 2011 at the following intersections:

- West Clybourn Street and North 25th Street
- North Prospect Avenue and East State Street
- West Bradley Road and North Granville Road
- West Bolivar Avenue and North 20th Street
- North Humboldt Avenue, East Kane Place, and North Water Street
- West Keefe Avenue and North 51st Boulevard
- South Cesar Chavez Drive and West Mineral Street



ADMINISTRATION

The Administration Unit is responsible for business operations, budget coordination, personnel administration, accounting and clerical functions for the Infrastructure Services Division. The accounting services include establishing projects, recording payments, monitoring costs and closing project budgets and expenditures for the Transportation and Environmental Units' in coordination with the Construction Unit.

The Administration Unit provides support to the other areas of the Infrastructure Services Division on financial matters. Responsibilities include recording and monitoring expenditures that include payments to contractors, cost of City of Milwaukee 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.

TRANSPORTATION

The Major Projects Unit coordinates the funding and design of arterial streets and bridges funded with State/Federal Aid, contracted by the State Department of Transportation and constructed within the City of Milwaukee. Construction was completed on Fond du Lac Avenue Streetscaping project funded with Congestion Mitigation and Air Quality Funds and on the Downtown to Bay View Bike Path. Design is near completion or completed on several other major arterial street projects; including West Morgan Avenue, North 91st Street and North Port Washington Avenue.

Major Projects continues to be involved with the utility coordination and traffic mitigation related to the Wisconsin Department of Transportation North-South Corridor-Mitchell Interchange project. Freeway traffic was reopened to the IH 894 bypass going west and the tunnels were completed at the Interchange in December of 2011.

The Project Programming Unit handles administration of the City of Milwaukee's \$15.3 million capital paving budget which resulted in the approval of 65 street paving and 8 alley

projects in 2011, and the award of \$10 million in contracts for local streets and alleys.

The Project Programming staff appeared before the Common Council's Public Works Committee for public hearings on 75 assessable paving, sewer and water projects. In addition, resolutions were prepared to authorize engineering and construction on approximately 515 assessable and non-assessable public improvement projects. Upon completion of the work, the unit reviews assessments, prepares and issues the associated special assessment bills to the property owners affected by the work. In 2011, the unit issued 4,353 bills resulting in \$2.4 million in revenue to the City.

Work continued on automating the programming, estimating and billing processes using an Oracle data base. Extensive work was done on evaluating how much engineering time is necessary to complete major street projects. In 2011 staff also worked to implement an updated version of the pavement management system utilizing maintenance activities.

The Street Lighting Unit created plans that were prepared for street lighting alterations and upgrades in conjunction with regular paving projects. Lighting work done in conjunction with the Department's Capital Improvement Program included the installation of overhead circuitry prior to construction. This was done to maintain adequate lighting levels during construction and to protect and adjust facilities plans during construction work. Also where necessary, included the installation of new street lighting cable and the upgrade of electrical circuitry and components.

In 1987, an initiative was begun to convert all mercury vapor and incandescent street lighting in the City of Milwaukee to more energy efficient high-pressure sodium lighting. In 2011, a total of 143 streetlights in the City were converted to high-pressure sodium lighting. With this work, approximately 96 percent of the 68,381 streetlights in the City of Milwaukee have now been converted to high-pressure sodium.

Photos (L-R):
Fond Du Lac
Avenue banner,
Raised bike
lane, Fond Du
Lac Avenue
Streetscape

In 2011 the City replaced an aging series circuit and High Pressure Sodium lighting units on South Indiana Avenue between East Oklahoma Avenue and East Morgan Avenue with energy efficient LED fixtures and modern circuitry. The Westlawn Redevelopment is implementing LED street lighting exclusively throughout the development.

The Street Lighting Unit is in the process of upgrading the present lighting control system with a modern digital system providing the capability to not only turn the street lights on and off, but to monitor system performance and provide a local backup in the event of a communications system failure. Phase two of this long term project was completed in 2011, bringing the total number of substations and enclosures controlled by the system to 51 of the 249 existing stations

A Rectangular Rapid Flashing Beacon was installed at the intersection of East Kilbourn Avenue and North Market Street in an effort to improve safety of pedestrians crossing East Kilbourn Avenue. When activated by a pedestrian, rectangular yellow beacons mounted at the crosswalk flash at a higher frequency than a normal flashing traffic signal to better attract the attention of drivers and remind them of their responsibilities to yield right of way to pedestrians wishing to cross the street.

The Traffic Signs Section replaced approximately 5,611 traffic signs throughout the City as part of the sign maintenance program due to fading, vandalism, damage or otherwise missing signs. Throughout Milwaukee, 1,003 new traffic signs were installed; bringing the total number of traffic signs to 108,141.

Audible pedestrian signals were installed at four locations. These provide an audible prompt for vision impaired pedestrians to let them know when it is safe to cross the street

The Transportation Section continued to work with the neighborhood associations like Alameda Place, Clarke Square and Watertower to install “Neighborhood Identification Signs”, as a way to assist these neighborhoods in instilling a sense of community and togetherness with people living and doing business in these areas.

Also, the Traffic Sign Section initiated a “Traffic Sign Retroreflectivity Management Policy” in 2011 to monitor sign sheeting performance for determining the need for sign replacement. This is done in two ways, by monitoring sheeting on an outdoor test rack, and by measuring the retroreflectivity of existing signs in service. As a result of this policy, approximately 850 deficient traffic signs were replaced in 2011.

The Traffic Control Unit continued its program of installing fire vehicle traffic signal preemption devices on primary fire response routes. As the fire vehicles approach, a continuous green signal indication is displayed on the emergency route to clear the vehicular traffic at signalized intersections and give the approaching emergency vehicles unobstructed travel through the intersection. 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 28 locations under this program in 2011, for a total of 303 intersections with fire vehicle preemption active throughout the City.

The Traffic Operations Unit completed approximately 157 miles of lane lines and edge lines along with 99 miles of bike lines, 172 miles of center lines, in 2011 to maintain adequate visibility of pavement markings and to provide positive guidance to motorists. Crosswalks were painted at 906 locations and 317 locations were painted for special arrow and “only” markings along with bike symbols.

The City has been installing pedestrian countdown timers at traffic signals to improve pedestrian safety by providing the amount of time remaining in the flashing “Don’t Walk” prior to the start of the yellow change interval. By the end of 2011, 125 traffic signals had pedestrian countdown timers installed.

The unit coordinated the signing, maps, and traffic control for approximately 1,000 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 2011 approximately 2,634 requests for the installation of Temporary No Parking signs were processed along with 834 permit requests for occupancy of the right of way. Also 161 sewer and water plans were reviewed for proper traffic control.

During 2011 North 2nd Street from West Michigan Street to West Wells Street and East/West Wells Street from North 6th Street to North Prospect Avenue were converted to two way streets in order to provide better traffic flow in the downtown area due to the repair work that is being done on the Wisconsin Avenue Bridge over the Milwaukee River.

The Planning & Developments Unit adopted the City of Milwaukee Bicycle Master Plan in 2010. The Unit worked in 2011 to implement several recommendations contained in the plan. In addition to maintaining the bicycle lane network, the City installed two significant bicycle facility improvements in 2011. The first is the only raised bicycle lane in the Midwest on Bay Street. The raised bicycle lane provides bicyclists with additional protection from motor traffic. The second significant bicycle improvement was the installation of in-street bicycle parking within bicycle corrals at four locations. In addition, the Riverwest bike trail received significant landscaping in 2011, and federal funds were secured to extend this trail northerly to Capitol Drive.

Also in 2011, the Planning & Developments Unit continued to work with business districts in planning and the construction of streetscape improvements. The National Avenue

streetscape was completed in 2011, which provides landscaped medians at 35th Street and decorative crosswalks, using a new product known as Duratherm. In 2011 the first phase of the Bronzeville streetscape was completed on North Avenue, with the second phase planned for 2012.

The Central Drafting & Records Unit maintains the one-quarter section maps 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 official maps, election ward maps, aldermanic district 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 includes: the operation of a "Diggers Hotline" service to assist in the location of City of Milwaukee utilities in the public way; the preparation of legal descriptions and maps for openings or closings of public rights-of-way; the review of certified survey maps and subdivision plats; the review of honorary and official street name changes; checking and optimizing routes for oversize and overweight loads; and providing printing services for various City departments.

ENVIRONMENTAL ENGINEERING

The Sewer Design Unit prepared plans and special provisions for 91 sewer relay, lining, and inspection projects, 12.6 miles of sewer



relay and 25 miles of rehabilitation by trenchless methods were designed and contracts were awarded.

In order to reduce basement backups, the City chose a demonstration area to rehabilitate private building sewers to reduce Infiltration and Inflow (I/I). Notices were sent to 563 residents for the inspection of their sanitary sewer laterals. Based on the inspection, right of entry permission was requested to rehabilitate the sanitary lateral for all consenting residents. As of January 6, 2012, 453 residents had consented for rehabilitation. Currently, this project is under construction and is expected to be completed May 2012.

As part of the City's ongoing program to reduce I/I in the sanitary sewer systems more than 25 miles of sanitary sewers were rehabilitated citywide with a cured-in-place lining method. By lining sanitary sewers staff can reduce the amount of clear waters entering the sanitary systems, thus reducing the possibility of sewer backwaters into homes and minimizing sanitary sewer overflows into adjacent rivers and streams.

The North 26th Street, West Tamarack Street, and West Clarke Street Sewer Relay Project consisted of approximately 3,300 feet of 60-inch to 84-inch diameter combined sewer replacement work. The existing sewer was mainly constructed with brick and was over 110 years old showing signs of deterioration. The total cost of this project was \$4.1 million and was completed in late 2011.

In order to provide storm water drainage for South Harbor Drive, the City constructed 4,500 feet of storm sewers. This project provided drainage and prevented surface flooding. The total cost of this project was \$700,000 and was completed in August 2011.

The Storm Water Management Unit reviewed and approved 36 plans, one of which was a \$23,000 contract that was awarded to dredge the ditch located west of North 107th Street at West Lawn Avenue. The ditch, which was originally constructed in 1960 had filled up over the years and was causing severe flooding. The ditch is an extension of the 42-inch storm sewer that discharges into the Menomonee River. The City awarded a contract in the amount of

\$418,000 to construct nineteen bioinfiltration facilities at South 6th Street between West Howard Avenue and West Grange Avenue, and at the triangle median bounded by North 85th Street and West Auer Avenue. The South 6th Street project consisted of fifteen bioinfiltration beds located between the sidewalk and the roadway curb, and the North 85th Street location consisted of four bioinfiltration beds within the North 85th Street triangle. The bioinfiltration facilities were designed to treat storm water runoff from the adjacent streets and return cleaner water into the City's storm sewer system. The facilities were constructed with an engineered soil mixture to treat the storm water runoff and a storage layer to promote infiltration into the native soil. Pollutants would be trapped and captured in the engineered soil before the storm water makes it back to the streams and rivers.

Dry weather testing consists of visual and chemical tests for pollution at each outfall. The Section performed a total of 1,637 dry weather tests during 2011, including the testing of 428 outfalls. The dry weather testing identified 485 locations in 27 areas as being potential sources of pollution. Private property inspections, smoke testing of the sanitary sewers and dye testing were performed at these locations to narrow down the individual properties resulting in referrals to the Department of Neighborhood Services for further action. The properties identified are in the process of being corrected.

In 2011, an inspection contract in the amount of \$150,000 to inspect 4,608 sanitary manholes was awarded. This work provides a more accurate assessment of the City's existing sanitary manholes and helps to identify defects that may cause infiltration and inflow and other structural defects. A contract was awarded for the repair of 2,233 sanitary sewer manholes at a cost of \$1,372,000. The rehabilitation consists of replacing lids, installing chimney seals and repairing defective brick work in the manholes. This work reduces the amount of I/I entering sanitary manholes.

In 2011, the unit awarded two sanitary bypass station rehabilitation contracts in the amount of \$552,000. The scope of work on these projects

Photos: Ditch at West Lawn Avenue before and after



involved the replacement and installation of submersible pumps, discharge piping, valves, level transmitters, control cabinets, and construction of new bypass pump manholes at 4 sanitary bypass pump sites.

The unit awarded a contract for the monthly inspection of all sanitary bypass pump stations and sanitary lift stations. This contract also includes testing of sanitary bypass pump stations by isolating the pump manholes and filling them with water to simulate a large rain event. This comprehensive method of testing has provided valuable information on the readiness of our bypass pump system.

The Automated Mapping and Drafting Unit drafted a total of 274 sewer construction plans in 2011. These plans are used in the installation, replacement, or rehabilitation of sanitary, storm, and combined sewers at various locations throughout the City. Starting in March 2011, the Unit started producing contract plans in digital format (including electronic signatures) and that eliminated the need to print the plans on Mylar media; thus resulting in savings and a more efficient operation. Also new in 2011, all sewer plans and specifications were made available for online viewing and download.

In 2011, the Unit continued its efforts to convert sewer maps and other records from paper files and/or microfilm to digital documents, which enable staff to access information from their workstations, as well as update and edit the documents with greater speed. Staff also continued to move forward on digitizing of sewer laterals and other geographic features onto Department maps.

The Underground Operations Unit is responsible for the complete maintenance and repair of over 2,400 miles of sanitary, combined, and storm sewer systems. The unit also maintains over 100,000 structures (manholes, catch basins, storm inlets, etc.), and 55 miles of drainage channels within the City of Milwaukee.

The unit also responds to service requests for sewer related issues such as basement back-ups and/or surface flooding complaints.

In 2011 the Underground Operations Unit replaced and/or installed 43 additional structures in 2011 to catch more storm water in several areas with previous surface flooding issues. As a result, the number of surface flooding complaints have been reduced.

FACILITIES DEVELOPMENT & MANAGEMENT

The Operations and Maintenance (O&M) Sections provides building services for DPW facilities keeping City buildings safe & comfortable. In 2011 this section completed over 15,000 preventive maintenance tasks and 1,500 demand maintenance requests necessary to ensure that our buildings run efficiently and the occupant's needs are met.

The O&M section also continued various energy efficiency projects to control operating costs. Staff has reduced DPW building energy consumption in 2011 by nearly 15% and are well on our way to sustain meaningful energy reduction moving forward into the future.

The Architectural & Construction Unit is made up of Architects, Engineers, Drafting Techs and Support personnel. These professionals are responsible for all capital projects funded through the Facilities Section as well as capital projects funded through other city departments and agencies.

Along with the new Unified Call Center, this unit also revamped the Lower Parking Area. During 3 summer months of 2011, the entire Lower Parking floor was replaced, providing a structural floor slab and wearing surface that is watertight, drains properly and is lighted efficiently. Project was on time and 11% under budget.

The Mechanical Engineering Unit consists of engineering professionals who design and construct new mechanical systems

Photos:
Lower parking
garage before
and after



for all City owned buildings. Staff provides engineering design services for HVAC, plumbing, fire suppression, fire detection, elevator modernization, asbestos abatement, lead paint abatement and renewable energy projects.

Compressed Natural Gas or CNG is an up and coming clean fuel and Facilities is proud to be constructing two CNG stations, one at Lincoln Garage and one at Northwest Garage. Construction began in 2011 and will be completed by summer.

In 2011 Facilities designed and installed solar hot water heaters for the Fire Department at four different Engine Houses and one 20 KiloWatt Photo Voltaic system at Central Repair Garage

The Communications Unit consists of journeyman electrical mechanics, electrical workers and laborers, and provides and maintains the City's copper cable plant and fiber optic backbone for data and telephone transmission. Staff also installs all new phone and data installations in City buildings.

The Electrical Services Unit is made up of skilled electricians, most of whom hold the Master Electrician credential. DPW Electricians are constantly working on energy savings initiatives and have installed hundreds of motion sensors, high efficient light fixtures, and other electrical devices to reduce energy costs. Additionally, staff does all electrical installations associated with capital projects citywide.

The Recreational Facilities Unit provides the City of Milwaukee with neighborhood green spaces in which residents can enjoy a variety of activities. The Recreational Facilities Section takes pride in operating, maintaining and reconstructing 61 play areas citywide.

In 2011, the Recreational Facilities Unit collaborated on various projects involving many groups and agencies. The 29th & Melvina project consisted of replacing old tennis courts, basketball courts and planting areas were restored. Helping out were: DPW, MPD, Rock the Lakes, DCD, NW Side CDC, City on a Hill and the neighborhood. Additionally, work continued to progress at Hartung Park as mountains of fill got shaped and sculpted, incorporating rain gardens, retention ponds, pathways, bike racks, signage and play equipment.

The Security Unit is responsible for services and solutions aimed at managing risk and mitigating loss and damage to the City of Milwaukee's property and personnel. The Security Section reports on incidents, analyzes data and identifies trends. Information gained from this analysis can provide a basis for security system improvements citywide.

FIELD OPERATIONS

The Street & Bridges Unit administers four main types of maintenance contracts; pavement seal coating, crackfilling, asphalt pavement resurfacing, sidewalk replacement and traffic calming contract. Contractors performing crackfilling on our contracts completed roughly 1,306,276 square yards of pavement throughout the city utilizing a rubberized joint seal. On newer asphalt pavements the cracks are expanded, this allows the crackfilling material to adhere better to the asphalt pavement.

Staff has completed the twelfth season of the

“Slurry Seal” method of seal coating asphalt pavements. Again this year’s program was a success, receiving favorable public and aldermanic reaction while receiving very few complaints. City streets received 218,413 square yards of “Slurry Seal” in 2011, compared to 182,877 square yards of “Slurry Seal” in 2010.

The Street Maintenance Section issues contracts to eliminate uneven sidewalks. This sidewalk project was concentrated in and around the area of the Historic 3rd Ward. This technique is particularly effective in areas that see a lot of foot traffic such as the Historic 3rd Ward during the festivals held on the Summerfest Grounds. Instead of grinding off the offset of the raised concrete area the concrete area is removed utilizing a concrete saw. A vacuum is attached to the concrete saw so there is virtually no dust while staff is sawing the concrete sidewalk. In addition to this contract, Street Maintenance crews utilize a sidewalk grinder to remove some offsets along city sidewalks. This sidewalk grinder has also been used to correct water flow problems that sometimes occur along curb flanges, within alleys and near bridge approaches.

Field crews placed approximately 9,400 cubic yards of concrete, sawed 33,500 linear feet of pavement and placed roughly 8,500 tons of asphalt on city streets. Repair projects included asphalt shims on roadways, and sidewalks, small asphalt patches and pothole repairs. In addition to utilizing asphalt patch trucks, Street Maintenance continues to utilize two Roadpatchers. These Roadpatchers are a one person vehicle that can patch potholes. This vehicle uses compressed air and blows out any debris from a pothole; then an asphaltic emulsion is then sprayed into the pothole; followed by a mixture of emulsion and stone. This repair is finally topped with limestone chips that allow traffic to immediately drive over the repair.

Customer requests for pothole patching are tracked through City of Milwaukee’s Call Center. Telephone calls for pothole complaints, offsets along sidewalks, guardrail problems and pavement concerns are recorded into a database by the Call Center.

Asphalt repairs are preformed utilizing “The Pavement Planer”. This piece of equipment gives crews flexibility to repair stretches of asphalt pavement that are generally in good condition but have a few areas where repairs are needed. Bad asphalt areas are removed with the Pavement Planer and asphalt is placed in the cut out areas. This equipment gives crews the ability to complete larger asphalt repairs in a shorter amount of time. Crews can repair pushups and

showing of asphalt that is common at bus stops and it allows staff to repair joints in an asphalt that have become deteriorated.

The Bridge Maintenance Unit, worked in conjunction with the private contractors renovating the Clybourn Street Vertical Lift Bridge. The in house team rewired the bridge, delivering their work on time for the busy summer season.

The Water Street and Broadway Bascule Bridges flank new residential condominium developments along the Milwaukee River. The City has had periodic complaints regarding noise from the Water Street and Broadway Bascules. Terra Engineering, Ltd., of Chicago, was brought in to provide structural engineering evaluation services for the Water Street and Broadway Bascule Bridges. Two options were proposed; one to adjust the centerlocks with thin shim plates, the second option involved replacing wear plates and shims, the internal components that form the transfer point. Terra recommended option two, replacing the wearing plates to reduce the impact and prolong the life of the bridges. New components were designed, fabricated, installed, and adjusted this fall. These fine adjustments were as small as 1/4 to 3/8 of an inch. In addition, City crews replaced fasteners on bridge sidewalk plates, reducing the rattling that occurred with transit of heavy vehicles.

11,760 calls came into the City’s Call Center regarding pothole repairs, which is up 23% from the previous year

Crews manage snow removal from the sidewalk areas of our bridges and viaducts, weed removal and 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 and along the entire length of our viaducts.

The Bridge Maintenance Unit now supervises the Building Carpenters and Masons. Crews remodeled City offices including the Municipal Building Basement Records Office and the Keenan Health Center.

The newly combined team began renovations of the Municipal Building 10th floor Call Center



and City Hall 7th Floor Employee Relations offices. Cabinet and countertop installations were performed at the Police district stations. At the end of the year office construction also began at the Howard Avenue Water Treatment Plant.

In 2011, carpenters installed concrete pads and benches and kiosk at Hartung Park, replaced doors at all city owned parking structures, trench drains at the Municipal Equipment Central Repair facility, installed over 2,000 feet of guardrail, repaired over 300 cross-pieces, replaced large drainage culverts, added access hatches to all salt domes, made concrete repairs at the Linnwood water treatment plant, converted the City Hall phone booth into an information kiosk, repaired Tot Lots including extensive work on 29th and Melvina, and performed over 5,000 board ups for the Police Department or Neighborhood Services. The Unit coordinates special services such as portable stages, needed equipment, and seating for public events.

A vehicle and two painters are assigned to abate graffiti within the public right-of-way and on City owned structures by blasting, paint-over, or by using green chemical cleaners. They respond to complaints called in to the Graffiti Hotline, direct calls from citizens, other City managers, and referrals from Alderman. These painters also perform blasting and painting operations on City owned bridges or building structures, including a fresh top coat for the 29th Street Bridge. They blast and paint the bearings below the bridges and the railings along the sidewalks. The Section provides logistical support for MPD and DNS.

The Inventory Unit has completed the cold storage building and this space is now being utilized for the storage of the larger inventory items that must be protected from the elements and ultraviolet light. Inventory

staff has continued to improve the bar-coding system and has incorporated items in the Canal Street inventory area. This system continues to improve the tracking of materials used by Street Maintenance, Bridge Maintenance, Sewer Maintenance, Building Maintenance, Electrical Services, Construction Section and the Water Department.

The Inspection Unit handled nearly 12,250 construction permits in 2011. In addition to construction permits, the Inspection Section also reviews occupancy permits which allow individuals, companies or businesses to place materials, equipment, dumpsters, etc. within the public right-of-way. An example of these occupancy permits are permits issued for a sidewalk café.

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. The unit also investigates and provides condition reports and recommendations for City owned buildings and structures. It also maintains plans and other records for the city's bridges, parking structures, retaining walls, dock walls, riverwalks, and other structures.

The Bridge Design and Construction Unit rehabilitated the Clybourn Street Vertical Lift Bridge over the Milwaukee River. The work for the rehabilitation of the 1968 built structure included structural steel replacement of the majority of the lift span, approach span repairs, concrete pier and abutment repairs, expansion

joint replacement, replacement of the mechanical and hydraulic components, and upgrades to the electrical system. The bridge is the second oldest of the Milwaukee style vertical lift bridges which are unique by having the counterweights hidden in the piers as compared to the common overhead tower designs found elsewhere. Construction work for this project started on July 26, 2010 and the bridge was opened to traffic on June 15, 2011.

A contract for the replacement of the County Line Road culvert structure over the Little Menomonee River was awarded on July 9, 2010. The project start date was delayed until spring of 2011 to allow the bridge and a separate roadway project to be constructed together to minimize traffic disruptions. The project consisted of replacing the culvert structure with a bridge meeting the necessary hydraulic and roadway geometrics while incorporating improved aesthetics. The bridge was closed to traffic on March 21 and the bridge was opened to traffic on July 8, 2011.

The Bridge Inspection Unit performed inspections on 99 bridges. The bridge inspection reports were entered into the Highway Structures Inventory System 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.

The Parking Structures Unit assisted DPW Parking Administration with recommendations for short and long term repair needs for the City owned parking structures and this information was used to prepare a six-year Capital Improvement Program for the parking structures.

Final plans and specifications were prepared for the application of a water repellent sealer for the concrete floor slabs of the 1000 N. Water Street Parking Structure. The work involves shot blasting the concrete, applying the sealer to minimize intrusion of harmful deicing chemicals, and providing new lane striping for all eight levels of the parking structure.

New traffic deck membrane was prepared on the 5th and 6th level concrete decks of the Milwaukee-Michigan Parking Structure. The work consisted of shot blasting the concrete, applying the traffic deck coating to waterproof the concrete slabs and providing new lane striping.

The Miscellaneous Structures 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 contracts, plans and specifications, construction budgets, change orders and payments, shop drawings, and periodic construction field reports for the RiverWalk development.

Analysis of bridges by this unit for permit overload vehicles in excess of 150,000 pounds continued as the numbers of permit applications and enforcement has increased. Two hundred sixty-three bridge analyses of overload vehicles were performed in 2011. The overload review and analysis process has been streamlined by this unit to allow a timely response to the permit desk to avoid trucking delays.

The first installation of raised bike and parking lanes were constructed on East Bay Street

Construction Management Unit is in charge of inspection and project management services that were provided for 30 sewer construction contracts totaling \$30 million and 3 water main construction contracts totaling \$1 million. In 2011, local paving work consisted of 43 street paving contracts totaling a contract cost of \$20 million. The Construction Unit also performs contract administrative duties on Wisconsin Department of Transportation 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. For select projects, survey and design duties were also performed.

Construction was completed on the City's first "Green Alley" initiative located between West Morgan Avenue, West Ohio Avenue, West Verona Court, South 22nd Street, South 24th Street, Union Pacific Company Right of Way. The work in this multi-leg alley consisted of different types of porous technologies incorporated into the concrete alley pavement to minimize and reduce surface runoff. Environmental and Field Design Sections collaborated with the inclusion of pavers and pervious concrete pavement in the final design.

The Field Engineering Unit provides the required technical paving project design function

along with all associated field survey services for sewer, water and street improvement projects. In addition, construction as-built certificates and construction staking activities were performed as needed. An evaluation of various paving design software applications was conducted during 2011 with a goal for full implementation in 2012.

ELECTRICAL SERVICES

The Traffic Signal Unit operates and maintains over 750 controlled intersections in the City of Milwaukee. 2011 accomplishments included:

- Installation of four new controlled intersections.
- Installation of power service for the Milwaukee Police Dept security camera project at West National Avenue and South Cesar Chavez Drive
- Installation of five accessible pedestrian signals.
- Installation of new “Rapid Flash Pedestrian Crossing” technology on East Kilbourn Avenue and North Market Street
- Installation of 45 overhead mast arms for traffic signals throughout the City
- Installation of traffic signal modifications for the two-way conversion of East/West Wells Street from North Prospect Avenue to North 6th Street.
- Installed temporary overhead wiring facilities at 25 locations to accommodate paving and other construction projects.

The Machine Shop Unit provides the support for routine and specialty machining services for the Electrical Services Unit. 2011 accomplishments include:

- Repaired numerous poles and bases for the freeway projects.
- In-house repair of directional boring machines for additional cost savings to the Department of Public Works.
- Continued support of Electrical Services crews with fabrication of materials for construction and maintenance activities.

The Traffic Sign Shop Unit 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 center lines, lane lines and crosswalks. The Traffic Sign Shop accomplished the following in 2011:

- Completed the painting of 1,190 locations of pedestrian crosswalks and 1,285 specialty pavement markings.

- Maintained and replaced/repaired 2,200 permanent street traffic signs.
- Maintained and replaced/repaired 985 street name signs.
- Installed traffic control and signage required for 1,095 special events throughout the City.
- Installed over 12,000 temporary parking signs.
- Installed over 450 specialty neighborhood and church signs.
- Installation of traffic lane markings, crosswalks and street signage for the two-way conversion of E/W Wells Street from North Prospect Avenue to North 6th Street.

The operation of full printing capabilities for the fabrication of various traffic and street signs is both cost-effective and timely for the City. This included over 3,000 temporary parking signs for city operations, specialty signs and special event signs.

The Traffic Sign Shop continued full utilization of the efficient and state of the art long line painting vehicle acquired the previous year. This equipment is critical in order to effectively maintain the increased demand and frequency for pavement markings in the City including roadway centerlines, lane lines and bike lane markings. Efficiencies have been gained in production by the improved systems, increased reliability and increased installation speeds of the new vehicle. In 2011, this allowed the successful painting of all existing bike lane marking in the City (including an additional 90 miles of new bike lanes) and painting of all traffic lines through the City over 1.5 times.

The Street Lighting Unit operates and maintains more than 76,000 street and alley lights and associated facilities to ensure Milwaukee’s neighborhoods and roadways are safe and well-lit. In total, Street Lighting is responsible for nearly 1,300 miles of lighted streets in the City. Accomplishments in 2011 include:

- Replacing three major street lighting system trans-closures including new cabling, service and metering pole connections.
- Responded to and completed emergency repairs to a major underground electrical substation after a severe fire damaged that facility.
- Completed 19 new street lighting installations in conjunction with major street, bridge and freeway construction projects.
- Completed the new installation of underground cable and conduit in conjunction with various local City paving projects.



THE MILWAUKEE WATER WORKS IS A NATIONAL LEADER in providing high-quality drinking water and monitoring water quality. While contributing to a healthful quality of life, the water works provides to water-related business and research a reliable supply of pure water at a low price.

The Milwaukee Water Works (MWW) is the publicly owned utility of the City of Milwaukee. Policy is set by the Mayor and Common Council. The utility is regulated by the Environmental Protection Agency and the Wisconsin Department of Natural Resources (DNR) for facilities, operations, and water quality; and the Public Service Commission of Wisconsin (PSC), for rates and accounting.

The Milwaukee Water Works serves wholesale clients who operate their own water utilities, bill customers, and maintain distribution systems in Brown Deer, Butler, Greendale, Menomonee Falls, Mequon, New Berlin, Shorewood, Thiensville, Wauwatosa,

West Allis, and the Milwaukee County Grounds. Retail customers receive full water service, including customer billing and distribution system maintenance: Greenfield, Hales Corners, St. Francis, Franklin (a portion); West Milwaukee receives billing services from MWW and maintains its own distribution system.

The Milwaukee Municipal Services Bill includes charges for Milwaukee city services and Milwaukee Metropolitan Sewerage District (MMSD) services. The Milwaukee Water Works manages the billing and forwards the collected charges to the City Treasurer for distribution to other city departments and the MMSD.

Carrie M. Lewis, M.Sc.
Superintendent

Laura Daniels,
Administration and
Projects Manager

Earl Smith,
Business Manager

Dan Welk,
Plants Manager – North

John Gavre,
Plants Manager – South

Dave Goldapp,
Distribution Manager

Dinah Gant,
Engineering Manager

Lon Couillard,
Water Quality Manager



WHAT'S NEW IN MILWAUKEE WATER WORKS

As water use and revenues fall, the Milwaukee Water Works has focused on reducing costs and making operational efficiencies. The strategy results in savings in energy, chemicals, manpower, and other costs to maintain low and reasonable water rates.

Part of this strategy is to practice supply-side conservation. The utility has conserved over one billion gallons of water alone from 2006 to 2011 through operational changes in treating and distributing water, flushing mains and hydrants. It would take decades of conservation by utility customers to equal this amount of water savings.

The Milwaukee Water Works is helping customers find and fix leaks, too. The “Use Water Wisely” program, in collaboration with Clean Wisconsin, won the 2011 Utility Special Achievement Award from the Wisconsin Water Association. Utility employees work with customers to understand their water bills, find and fix leaks, reduce wasted water, and control their water costs. Customer Service staff look at billing data to identify customers with high water use. They mail these customers a brochure with instructions for finding and fixing leaks; toilet leak-detecting dye tabs, and a postage-paid feedback card.

Customer Service staff provide over-the-phone counseling to help the customer find and fix leaks. Water meter services staff investigate leaks and high water use at customer locations and during routine meter replacement visits. In 2011, Meter Services sent over 10,000 letters concerning multiple estimates, 3,000 letters regarding high use, and performed 500 actual investigations for high usage.

For more information, visit: <http://city.milwaukee.gov/water/usewaterwisely>

Mayor Tom Barrett has pledged City of Milwaukee collaboration to encourage water research and business development. In June, he launched the Milwaukee Water Works’ WAVE Rate (Water Attracting Valued Employers). Also known as an Economic Development Rate, the WAVE is intended to encourage business growth and retention. The rate is available to new and existing business customers in the utility’s service area for a period of five years in exchange for increased water usage and creation and retention of at least 25 jobs. The rate was designed by the Public Service Commission. The utility is conducting marketing outreach to publicize the WAVE Rate.



INFRASTRUCTURE MAINTENANCE

The Capital Improvements Program provides for long term improvements to utility infrastructure to ensure a reliable supply of high quality water. The program includes treatment process facilities, laboratories, pumping and water storage, equipment, water mains, hydrants, and meters. The current emphasis is on the distribution system, including remote pumping and storage facilities and water mains and backup power generation. Preventive maintenance is an important component of MWW's assurance that all components of the infrastructure are in top functional condition. While public health is the primary consideration in the delivery of water, the Milwaukee Water Works systems were designed to provide sufficient water to suppress major fires.

MAJOR PROJECTS OF 2011

A multi-year project to provide backup electric power generation at five locations of critical infrastructure reached a hallmark in 2011 with the substantial completion of the project at the Riverside Pumping Station. Three 2500-kW diesel generators stand ready to power the pumps at the station in the event of an electrical outage. The Florist Station on the northwest side was the second location addressed, with design 90% complete in 2011. Also in 2011, design began at the Linnwood Water Treatment Plant.

The Grange Pumping Station is an integral part of water service to customers in the southwest pressure district of the distribution system. An existing five-million-gallon-per day (mgd) capacity pump had reached its useful life and the station needed upgrading to meet increased demands and to reduce pressure fluctuations in the district. The upgrade in 2011 included demolition of the old pump and installation of two 12-mgd pumps, and associated valve, piping, electrical, concrete, and steel work. The variable frequency pumps will provide energy savings. The Milwaukee Water Works upgrade project was awarded a cash incentive from the Focus on Energy Program Industrial Sector.

Another project completed in 2011 was the painting and repair of the two million-gallon water storage tank in the Grange-Oklahoma

pressure district. The tank, located in the City of Greenfield, was showing significant deterioration of the exterior and interior coatings with delamination and corrosion on the surface. The tank's appurtenances were upgraded for improved safety. Containment tarps were installed around the entire tank to prevent dust and overspray from escaping while the tank was being abrasive-blasted and painted.

Another upgrade of equipment took place at the Linnwood Water Treatment Plant. The existing storage and chemical feed systems for the addition of fluoride to the treated water were replaced.

MWW tests source and treated drinking water for over 500 contaminants even though the EPA requires tests for only 90

METER REPLACEMENT PROGRAM

The Milwaukee Water Works is replacing 155,967 water meters in single-family homes and dwellings of four and fewer units, and small businesses. Customers with meters sized one inch or smaller receive a new meter, automated meter reading device (AMR), and battery. The original meters were installed in 1996 and the batteries are reaching the end of their useful life. The replacement project will take place over the next seven to eight years to allow the utility to continue normal meter service operations and maintenance. At the end of 2011, replacement was 12% complete.

Meters mechanically measure the water as it moves through the device. The AMR device, a radio transmitter powered by a battery, is connected to the meter. As the meter reading van passes by the building on the street, a data-collecting device records the meter reading transmitted from the AMR.

Photos (L-R):
Storage tank
before painting
begins, Meter
with new AMR,
AMR Reader
Truck

DEPARTMENT OF PUBLIC WORKS STATISTICS

INFORMATION ABOUT MILWAUKEE

Altitude (City datum)	581.2 feet
City Area	95.9 square miles
Geographic Center..... N. 42nd Street and W. North Avenue	
Shoreline of Lake Michigan in City.....	10.2 miles
Incorporated by Wisconsin Charter	January 31, 1846

BASIC INFORMATION ABOUT MILWAUKEE'S INFRASTRUCTURE

Number of Buildings	233
Number of recreational facilities	95
Pumps.....	195
Demand maintenance (requests) performed.....	16,130
Preventative maintenance (scheduled) performed.....	1,622

FORESTRY

Trees on city streets	193,000
Trees planted	2,780
Trees removed (all causes)	3,180
Trees pruned	26,346
Boulevard medians and green spaces maintained	476 acres
Stumps removed	2,662
Flowers (annuals/perennials) produced).....	300,000
Signature beds installed (2008-09)	276
Landscaped boulevard medians	121.8 miles
Green spaces maintained	59
Tot lots maintained.....	57
City properties maintained	20
Service Requests	25,003

FLEET SERVICES

Repair Orders.....	23,629
Preventive Maintenance Inspections Performed	7,034
Tires Mounted.....	3,035
Field Service Calls, Tires	3,210
Field Service Calls, Other	10,020
Stockroom Activity.....	\$5,034,798
Vehicles Serviced	
Automobiles.....	100
Vans.....	192
Pickups.....	303
Police Units.....	788
Parking Enforcement	51
Packers, Rear Load.....	130
Packers, Front Load and Roll-Off Trucks	17
Packers, Recycling	51
Tractors	58
Street Sweepers.....	22
Sewer Cleaners, Flushers, etc.....	21
Construction Equipment.....	304
Trucks, All Other	501
Compressors.....	71
Sub-Total	2,609
Non-Automotive Equipment	1,871
Total Serviced	4,480

SEWERAGE

Sewers examined	147.88 miles
32 Sewers cleaned	586.18 miles
Replacement sewers.....	12.6 miles

Sewer lining.....	25 miles
Service calls answered.....	6,150 calls

SANITATION

Total recyclables (residential tons).....	25,100
Household/curbside materials.....	22,837
Other residential materials	2,262
Leaves and Yard trimmings composted (tons).....	31,349
Total residential tons diverted from landfill	56,449
Garbage to landfills (total tons)	230,366
Residential garbage	194,099
Other garbage	36,266
Residential landfill diversion rate.....	23%
Snowfall (January to December).....	54.8 inches
General snow plowings	5
Ice control operations.....	27
Salt usage (tons).....	53,604
Service Requests.....	96,392
Self-Help users.....	213,989

STREET AND BRIDGE MAINTENANCE

Freeways.....	40.13 miles
Paved city streets	1,417 miles
Unpaved streets	16.58 miles
Total city streets.....	1,432 miles
Alleys	415 miles
Miles of lighted streets	1,290.55 miles
Number of lighting units	77,193
City-maintained bridges	204
Movable bridges.....	21
Total bridge openings	14,851
Streets with interim lighting	81.96
Unlit streets	43.45
Street lighting units	68,381
Alley lighting unit	8,815
Traffic control signs	108,141
Bus stop signage maintained.....	4,233
Bridges, inspected	99
Bridges, number of openings.....	13,962
Pavement seal coating (sq. yards)	218,413
Asphalt surface by contract (tons)	3,949
Asphalt patching (tons).....	8,500
Crack filling (sq. yards)	1,306,276

MILWAUKEE WATER WORKS

Howard Ave. Treatment Plant rated capacity	105 million gallons per day (MGD)
Linnwood Treatment Plant rated capacity	275 MGD
Average Daily Pumpage	101 million gallons (MG)
Total Annual Water Sales	32 billion gallons (BG)
Water mains, total length.....	1,956 miles
Water meters in service	161,611
Hydrants.....	19,487
Population served.....	861,249 in Milwaukee and 15 communities
Area served	196 sq. mi.
Residential water use.....	46 gallons per person per day
Cost of drinking water	5.8 gallons cost one cent, or 100 cubic feet (748 gallons) cost \$1.68



City of Milwaukee, DPW
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