

Engineering Department

Christine Jamrose, PE, City Engineer/Director

The Engineering Department is responsible for planning, designing, bidding, funding and managing construction for all public works projects within the City of Mishawaka and review of all private development and utility company projects for conformance with engineering standards, such as stormwater management, sanitary construction and connection, and right of way access and improvements. Our office also manages the traffic signal system, traffic cameras, right of way records and as-built records for locating right of way infrastructure, such as the City fiber-optic system and the storm and sanitary sewer systems.

Engineering Staff

The Engineering Department staff includes the Director and Assistant Director of Engineering; a Construction Manager, a Project Manager, a Traffic Manager, an MS4 Coordinator; a Project Coordinator, an Office Manager and a Locate/Permit Coordinator.

The Director of Engineering is responsible for the day-to-day management of the Engineering Department. The Director also serves at the City's representative on the following boards and committees:

- President of Board of Public Works and Safety/Utility Board
- Technical Advisor & Member, City of Mishawaka Plan Commission
- Technical Advisor & Member, City of Mishawaka Traffic Commission
- Member of the City's Solid Waste Committee
- Member of the Transportation Technical Advisory Committee, Michiana Area Council of Governments

As of November 30, 2016, Gary West, the Director of Engineering for 32 consecutive years elected to retire. Mayor Wood appointed Christine Jamrose, PE, as City Engineer/Director effective December 1, 2016 after 22 years as Assistant Director. Mayor Wood also reassigned the duties of Deputy Mayor and President of Board of Public Works and Safety/Utility Board to the Director of Planning, Ken Prince. The search to replace the Assistant Director of Engineering continues into 2017.

The Assistant Director of Engineering's responsibilities include all site plan reviews including stormwater management, site access, sanitary sewer connections and construction plan reviews.

The Construction Manager oversees City construction projects within the Tax Incremental Financing (TIF) District to ensure compliance with construction documents and addresses construction concerns reported by the public.

The Project Manager is responsible for overseeing smaller public works projects, the curb and sidewalk program, the summer street paving project, assigns all City addresses in conjunction with the 911 emergency system and troubleshoots citizen complaints.

The Traffic Manager oversees the operation of the City's traffic signal management system and coordinates repairs by the City's maintenance contractor. The Traffic Manager is also

responsible for signal timings, traffic studies and traffic work orders for sign installation as well as for the management of emergency vehicle pre-emption systems and twenty-one (21) City traffic cameras.

The MS4 Coordinator is responsible for compliance with the IDEM/EPA Rule 5 and Rule 13 requirements. The MS4 Coordinator is the City's coordinator for the City MS4 Program and presents MS4 education programs. The MS4 Coordinator processes approval of erosion control plans and monitors their compliance during and following construction.

The Project Coordinator is responsible for coordinating and maintaining project files, processing payment applications, sanitary sewer construction and connection applications, utility, excavation and sewer permits, and other duties as required.

The Office Manager is responsible for managing phone and front counter inquiries from the public, maintaining sewer insurance records, updating the locate database, assisting with excavation permits and sewer permits and other duties as assigned. The Office Manager also serves as the Clerk for the Traffic Commission.

The Locate/Permit Coordinator is responsible for reviewing all locate emails, updating the locate database and gathering historic sewer as-built information to distribute to the Sewer staff to accurately locate the sewers in the field.

Engineering Services

In addition to engineering public works projects such as curbs, sidewalks, street improvements, traffic signals, school warning devices and sanitary and storm sewers, the Department also ensures compliance with job-site safety, maintenance of traffic, erosion control issues and restoration of City and public utility projects. Follow-up inspections ensure proper site restoration.

The Department also investigates complaints received from residents throughout the City to resolve concerns within their neighborhood including local and area-wide drainage, traffic and parking issues.

A significant responsibility is the underground public works utility locate service for the City. The facilities located are the sanitary trunk sewers, lateral connections, storm sewers, fiber optic interconnects, traffic signal control systems and the Metronet shared conduit system. In 2016 over 8,000 locate tickets were processed, resulting in over 1,200 sites which required underground facilities to be located. When these locates are required for an ongoing project, remarking of the facilities is required every 3 weeks.

Engineering ensures contractor and individual compliance with the City of Mishawaka Excavation and Public Works Bonding Ordinances and permitting requirements. The Department issues permits for all excavation within all City public rights of way to ensure protection of the motoring public and the existing infrastructure as well as ensuring proper restoration of all excavations within City rights of way. The Engineering Department provides engineering assistance for municipal utility projects on request and on other major public works capital improvement projects.

Excavation and Sanitary Sewer Connections

Sanitary Sewer connection fees are designed to assess a fee on the developer's site based on the size of the property and the impact the proposed development will have on the capacity of the sanitary sewer collection system and the Wastewater Treatment Plant. The money collected is used for oversizing and extending sanitary sewers, as well as making improvements at the Wastewater Treatment Plant.

In 2016 Engineering issued 570 Excavation Permits generating \$11,830.00 in fees for all categories of excavation, such as telephone, cable, gas, electric, fiber optic, boring, street, sewer, water and irrigation. This is an increase in fees from 2015 when \$10,710.00 was collected from 598 Excavation Permits. In addition, there were 124 Sanitary Sewer Connection and Inspection Permits issued in 2016 that totaled \$173,320.34 compared to \$178,139.23 collected from 133 permits in 2015. The Sewer Connection and Inspection Permits remained steady and is directly related to the pace of private property development.

Sewer Insurance Program

The Engineering Department maintains all sewer records and provides administrative assistance to the Sewer Lateral Insurance Program. This program, which began in 1986, protects single family owner occupied residents from paying catastrophic sewer lateral repair costs. The homeowner is responsible for paying all routine sewer lateral cleaning costs and if the lateral requires repair, they pay the \$250 deductible fee. The Sewer Insurance Fund pays all repair costs in excess of the \$250 deductible for the repair of a private sewer lateral connection from the foundation wall of the home to the trunk sewer main. The costs of removal and replacement of public streets, curbs and sidewalks as a result of the repair are included. The monthly fee for owner occupied residential sewer insurance is \$1.50 per month.

During 2016, the Engineering Department proposed an amendment to the Sewer Use Ordinance to expand the sewer insurance program. The proposed ordinance amendment was approved by the Mishawaka Common Council in December 2016. The amended ordinance allows the City to collect the monthly sewer insurance fee from all single family dwellings within the City, regardless of the type of occupancy. Therefore, when a covered sewer repair is performed on a single family rental property, a \$500 deductible was established.

The fund is also occasionally used to replace existing sewer laterals that are located within sewer main replacement projects to minimize the need to excavate a sewer lateral in a newly reconstructed street. Fees collected in 2016 totaled \$230,616.04 with expenses of \$334,440.91. In 2016, the Sewer Department received 279 complaints of sewer lateral issues where 64 residents signed up for the Sewer Insurance Program. Of the 64 residents, there were 46 residential contractor repairs performed with an ending balance in the fund of \$57,974.36.

Review of Industrial, Commercial and Residential Developments

2016 continued to experience steady commercial property development, existing industrial expansions and residential developments that range from multi-family/multi-story developments to final phase build-out of single family subdivisions. The City experienced a more balanced combination than in recent years between rehabilitation of existing sites and new construction. Examples of some site development projects approved in 2016 were the Centier Bank (7108

Gumwood Road), Longhorn Steakhouse (6402 Grape Road), McAllister Deli (5758 Grape Road), Chase Properties' two retail spaces (5720 and 5716 Grape Road), Potbelly Sandwich Shop and Pie Five Pizza Co. (5111 N. Main Street), Home2Suites by Hilton (211 E. Day Road), Hi-Spec Wheel & Tire Inc. (1655 E. Twelfth Street) and Zeeland Lumber (5321 E. Lincolnway). The single-family subdivision Rosetta Place initiated its final phase and the Villas at Reverewood initiated its second phase for development.

MS4 (Municipal Separate Storm Sewer System)

During 2015, IDEM performed their second audit of the City's Good Housekeeping practices at municipal facilities. While the results were highly favorable, the aging infrastructure was not designed with stormwater pollution controls in mind. Over the years, IDEM had identified several areas of concern within our old central services property. With the opening of the new Watson Central Services building in 2016, which was designed with up-to-date stormwater pollution controls, the City has permanently remedied infrastructure issues identified in previous audits. The new building represents a substantial capital investment that has significantly reduced stormwater pollution issues with our municipal facilities, which the MS4 program will be able to highlight in our next biennial report and during future audits.

The City contracted Lawson-Fisher Associates to create an adaptive GIS layer to assist developing, storing and retrieving MS4 program data. The GIS layer was further enhanced to include the locations of industries that have a potential to impact stormwater. The GIS layer will serve as a tool going forward to target areas for enhanced monitoring of illicit discharges and will also be a useful screening tool if an illicit discharge is detected. In addition, the Sewer Department has been enhancing the GIS to target maintenance of the City's sanitary and storm sewers. These activities are above and beyond the requirements of our MS4 permit and IDEM was impressed with the breadth of our sewer maintenance program and the City's integration of GIS with maintenance activities.

The City continued its participation in the Michiana Stormwater Partnership (MSP), which is a consortium of all MS4s within St. Joseph County, to ensure consistent messaging and a pooling of resources. MSP works collectively to implement the public education and outreach programs required by each entity's NPDES permit. During 2016, the MSP partnered with the Tippecanoe Partnership for Water Quality and other municipalities for the development of educational videos with messages targeted to statewide MS4 priorities. In April 2016, a video entitled "Stormwater Pond Maintenance for Homeowners" was released and a video entitled "MS4 for Elected Officials: Why is Stormwater Quality Important for Your Community?" was released in August 2016. Additionally, the City continued its partnership with St. Joseph County for SWPPP reviews.

The Indiana Association of Floodplain and Stormwater Managers (INAFSM), which supports MS4 education and outreach throughout Indiana, will be holding its annual state conference in South Bend in September 2017. This is the first time in many years that the organization has chosen to host the annual meeting in our area. As part of the conference preparation, City staff joined the local steering committee to assist with preparations and local planning for the conference.

2016 was the City's third year of the third NPDES five year permit term. IDEM has indicated their MS4 Permit Program may undergo restructuring that may bring changes to the MS4 programs, including the potential for revised permit requirements. Program efforts throughout 2017 will focus on continuing outreach education, erosion control permitting with construction site monitoring and educating City staff in making any necessary adjustments to the City's MS4 program that result from program changes made at IDEM.

Fats, Oils and Grease (FOG)

The Common Council approved revisions to the Sewer Use Ordinance to cover fats, oils and grease (FOG) in the summer of 2010, which established maintenance requirements and provided a regulatory framework for recovering costs incurred by the City to deal with problem facilities. The program is evaluated at the end of each calendar year to develop upgrades or modifications for implementation the following year. In a continued effort to educate restaurant operators about the City's expectations, the Wastewater, Sewer and Engineering staff updated and printed an educational pamphlet for distribution with the 2016 January restaurant license renewal. Additionally, permit applications and letters detailing program requirements were updated and provided to the Controller's office for distribution throughout 2016.

Traffic Engineering Services

Traffic Engineering is responsible for operation and maintenance of the 63 City-owned traffic signals, 13 school warning devices, as well as two intersections with four-way red flashers and two with all-way yellow warning flashers. Several requests were received for additional or modified signage from the Mishawaka Police Department, concerned motorists and citizens. In 2016, these requests were investigated and resulted in the issuance of 60 work orders for the installation of new or modified signage and pavement markings.

Traffic Signal and Flasher Maintenance

In 2016 one hundred thirty five (135) traffic signal maintenance repairs were completed in addition to repairs and maintenance of luminaires and guardrails. All 63 traffic signal cabinets received an annual cleaning to protect the cabinet electronics, which includes replacing air filters and evaluating the LED bulbs and battery back-up system. Several signal traffic controllers and associated conflict monitors required resetting from failure mode, which results in a 4-way flash mode of operation.

School Signage

The annual inventory was completed for all traffic control signage near public and private schools. This process involves replacing damaged, faded, or missing signs and repainting school crosswalks. This maintains safe and effective traffic control signage in compliance with Federal guidelines as outlined in the Indiana Manual on Uniform Traffic Control Devices for all schools in Mishawaka.

Disabled Parking and Dumpster Approvals

With the assistance of the Mishawaka Police Traffic Division, the Engineering Department coordinates the application process for designated disabled parking spaces on public streets. In

2016 the Board of Public Works and Safety approved the designation of 16 new disabled parking spaces and the removal of 6 spaces that were no longer required. In an effort to protect motorists and neighborhoods, placement of temporary dumpsters in rights of way are monitored. Forty one (41) Dumpster Permits were issued in 2016.

Traffic Studies and Activities

MACOG (Michiana Area Council of Governments) partners with the City to gather traffic count data for various corridors throughout Mishawaka. This data assists in documenting changes in traffic volumes and may be used to justify upgrades in infrastructure.

Requests are received for additional four-way stops, time limited parking and restricted parking which require a recommendation by the Traffic Commission and, in many instances, action by the Mishawaka Common Council before implementation. A thorough investigation and in some instances, a study is completed to determine the merits of each request. These studies are then presented to the Traffic Commission for review and recommendation to the Common Council.

During 2016, the Traffic Commission was presented revisions to the Traffic Ordinance which would designate a few intersections as all-way stops. Most of these intersections were temporarily all-way stops during nearby construction projects and was desirable to retain the all-way stops after the construction was complete. In addition, the Mishawaka Police Department asked that an all-way stop be considered at an intersection near Liberty School. With a favorable recommendation by the Traffic Commission, the proposed ordinance amendment was approved by the Mishawaka Common Council in December 2016 and designated the following intersections as all-way stops.

- Front Street at West Street
- Pine Street at Comfort Place
- Third Street at Race Street
- Forest Avenue at Wilson Boulevard
- Cedar Street at Merrifield Avenue
- Division Street and Pregel Drive

After completing speed studies in 2014 and 2015 within multiple major traffic corridors, the Traffic Commission was presented proposed speed limit modifications, which concluded in late 2015 with a favorable recommendation. Presented in 2016 to the Mishawaka Common Council for consideration, it was reviewed and approved. The Ordinance amendment was adopted in December 2016 and resulted in the changing of speed limits as listed in following table.

Corridor	Segment	Original Speed (MPH)	Revised Speed (MPH)
Grape Road	Northern City Limits to South Side Toll Road	30	40
	South Side Toll Road to Day Road	40	40
	Day Road to Edison Road	30	40
	Edison Road to McKinley Avenue	30	35
Main Street / Gumwood Road	Northern City Limits to Day Road	40	40
	Day Road to Catalpa Drive	30	35

	Catalpa Drive to McKinley Avenue	30	30
McKinley Avenue	Logan Street to Fir Road (former INDOT speed limits)	35	35
	Fir Road to Eastern City Limits	45	45
Edison Road	Logan Street to Main Street	30	35
Day Road	Filbert Road to Eastern City Limits	30	40 to match SJC
Dragoon Trail	Eastern City Limits to Western City Limits	30	35
Douglas Road	Western City Limits to Eastern City Limits	30	40
University Drive	Grape Road to Fir Road	30	35
Beacon Parkway	Fir Road to Capital Avenue (SR 331)	35	35
Bremen Highway	US 20 Bypass to Walter Street	35	40
	Chandler Boulevard to Dragoon Trail	35	35
Union Street	Dragoon Trail to Twelfth Street	30	35
Twelfth Street / Harrison Road	Eastern City Limits to Capital Avenue (SR 331)	35	35
	Capital Avenue (SR 331) to Merrifield Avenue	30	35
Ireland Road	Western City Limits to Bremen Hwy	30	35
Fir Road	Day Road to McKinley Avenue	30	35
Shanower Court	Jefferson Boulevard to Golf Course		20

Construction Projects

Engineering is responsible for plan development and construction management of public works projects. These construction projects are funded from several sources. In 2016 projects under construction were funded with Long Term Control Plan Funds, Tax Incremental Funds, Cumulative Sewer, Redevelopment CDBG Funds, Local Road and Street Funds, Sewer Maintenance Funds and INDOT/FHWA Funds. Construction completion in 2016 totaled approximately \$8.8 million. Specific details of the 2016 construction projects are highlighted in the following sections. In addition, projects that were in the design and land/easement acquisition phase during 2016 are also discussed with intent of future construction.

TIF Projects

Grove-Elizabeth-Mishawaka Avenue Improvements

This project consisted of sewer separation and full road reconstruction on Grove Street from Ann Street to Main Street as well as Elizabeth Street from Grove Street to Mishawaka Avenue. Also included was the milling and repaving of Mishawaka Avenue from Main Street to Liberty Drive. Additionally the project included construction of a new municipal parking lot, sewer lateral replacements, water service replacements, cured in place pipe (CIPP) sewer main rehabilitation, manhole rehabilitation, new signage, street lighting and overall beautification of the adjacent areas including landscaping and



trees. The project began in summer of 2015 and was completed in 2016. The total City investment was \$1.6 million.

Brick Road and Fir Road Water Main

Construction on the Brick Road and Fir Road Water Main project started in July 2015. A new 16 inch water main was installed on Fir Road between State Road 23 and Brick Road and on Brick



Road between Fir Road and Gumwood Road. This new water main was connected to the existing 12 inch water main on Gumwood Road. The new 16 inch water main, extending approximately 7,600 linear feet, was completed by late September 2015. Then the contractor began to work on the proposed pressure monitoring station located on the south side of Brick Road, just east of Prairie Vista Elementary

School. The precast building was delivered and installed in October 2015. Due to issues with AEP, power to the building was not provided until late December 2015. As a result, the proposed pressure monitoring station was not completed until January 2016. Final project completion and testing was complete in the spring of 2016 with an approximate City investment of \$1.6 million.

Trinity Place Realignment

In the summer of 2015, the US Department of Veteran’s Affairs chose a 14 acre site on Trinity Place for the location of a new 60,000 square foot VA Clinic. The site was appealing due to its proximity to the St. Joseph Regional Medical Center and the many amenities the City of Mishawaka has to offer guests. In order to provide sufficient space for an optimal site layout, the Ambrose Development Group and City of Mishawaka agreed to relocate a 1,400’ section of Trinity Place to the south. The street relocation will not only accommodate the new VA Clinic, but will also provide developable land for future projects.

The relocation was completed in four phases in order to expedite the process due to winter limitations, protecting services for existing customers connected to the utilities and completing work within the VA schedule. Phase I was constructed in October 2015 and included clearing the land for the new road alignment and installing sanitary sewer and conduit for electric. Phase II was constructed in November and December 2015 and included removal of the concrete pavement along the existing route and terminating all existing utilities. Phase III was constructed in December 2015 and installed a new water main along the relocated corridor and efforts were coordinated with Phase II to ensure water pressure at all times.



Construction of Phase IV commenced in the spring of 2016, which included construction of the concrete street within the new alignment and associated stormwater management. Other construction operations included 10' concrete sidewalk, concrete curbing, concrete approaches,



street lighting, pavement striping, conduit for Metronet and electric, and nursery sodding. Since the new pavement was still in the curing process, the City elected to have the newly constructed street remain closed until the spring of 2017 to avoid potential damage to the new 8" thick concrete pavement from heavy construction vehicle traffic for the VA Clinic. Phase IV total investment was \$600,000. All four phases provided an estimated total construction investment of \$1 million.

Fourth Street LTCP Improvements

Construction of the Fourth Street project was initiated in August 2016 and is an element of the City's Long Term Control Plan (LTCP) to improve the sewer collection system by reducing combined sewer overflows (CSO).

The project was substantially complete in November 2016 with the placement of the final asphalt surface course. Final project paperwork is in progress with final inspection and acceptance scheduled for the spring of 2017. The project consisted of asphalt pavement reconstruction of Fourth Street from Laurel Street to Pine Street and Pine Street from Third Street to Fourth Street. Other project construction included new storm sewer, sanitary sewer lateral replacement, water main and service replacements, CIPP lining, manhole rehabilitation, construction of a diversion chamber, sidewalk, concrete curb and gutter, and rehabilitation of segments of the existing field stone wall along the St. Joseph River in Battell Park. Total City investment is estimated to be \$2.1 million.



State Road 23/Cleveland Road Widening (Grape Road to Main Street)

This project is in response to the proposed new development at the northwest corner of the intersection of State Road 23/Cleveland Road and Main Street/Gumwood Road. State Road 23 was widened to include a center turn lane between Grape Road and Main Street while maintaining two through lanes for each direction. Dual left turn lanes were added for both eastbound and westbound traffic at the intersection of State Road 23 and Main Street.

A dedicated right turn lane was added for eastbound traffic at the intersection of State Road 23 and Main Street. In addition new water main, storm sewers, curb and gutter were installed, and the traffic signal at State Road 23 and Main Street was modified to accommodate the improvements. This project was completed in conjunction with INDOT's resurfacing project,

allowing the existing asphalt pavement in the widened areas to be milled and overlaid with the INDOT project saving the City these funds. Due to pavement marking changes, additional surface milling and resurfacing was completed with the City's project on Main Street between State Road 23 and University Drive and on University Drive for 1,300 feet east of Main Street. The project was substantially complete in December and the total City investment was approximately \$1.7 million.



TIF Design Projects

Cedar Street from Mishawaka Avenue to Edgewater Drive (Mishawaka Ave. Phase III)

Cedar Street is Phase III of the Mishawaka Avenue area projects which progressed to 95% complete in 2016. This project may be programmed for construction once the Cedar Street Central Service Facility is fully demolished. At that time the project will include sewer separation, street reconstruction, concrete curb and sidewalk with an estimated investment of \$1.2 million.

Douglas Road Improvements from Fir Road to Eastern City Limits

The City's recent annexation, subsequent acquisition of the Juday Creek Golf Course and plans for the proposed Northeast Well Field emphasized the need for improvements to Douglas Road from its current County configuration. The design of a five lane concrete street was initiated in August 2016. The design plans include two travel lanes in each direction with a center turn lane, stormwater management that is sensitive to the adjacent Juday Creek, sanitary sewer extension, water main extension, concrete curb and sidewalk, street lighting and buried utility conduits. Due to the complexity of the corridor, the improvements will be constructed with multiple construction phases. The initial phase will include utilities, stormwater management and subgrade preparation and is scheduled for bid in August 2017. The second phase of construction will include the concrete pavement, curb and gutter, and street lighting, and is scheduled for bid in early spring of 2018 with an estimated completion in the fall of 2019. The total City investment is estimated to be \$4.7 million.

Veterans Parkway and Northeast Well Field utility access

In conjunction with the Douglas Road improvements, the City has committed to provide utility

access for the proposed Northeast Well Field and construct Veterans Parkway, which will extend north from Douglas Road to Juday Creek. The design commenced in August 2016 where the improvements will construct a three lane section. The project will specifically include one travel lane in each direction with center left-turn lane, bridge over Juday Creek, gravity sanitary sewer main, sanitary lift station and associated forcemain, water main, stormwater management and street lighting. The service area for the proposed lift station will require design for 1 million gallon per day capacity upon total build-out.

Because of the land size, multiple land owners and intended use of the parcel, the parcels north of Douglas Road required platting, which encompassed the remaining time in 2016. The project design will continue through 2017 with a scheduled bid date for construction in summer of 2018. The City's total investment is currently estimated to be \$4 million.

Public Works Projects

Community Crossings Grant

In order to be eligible for the 2016 Community Crossings Grant Program, a city wide pavement rating system needed to be completed. Specifically, the City followed the Pavement Surface Evaluation and Rating system (PASER) and completed a rating of 1 to 10 for every street segment in the City. The PASER data was compiled using the recommended excel spreadsheet from LTAP and submitted in June 2016. By successfully completing this rating system, the City became eligible to submit for the Grant Program. In August 2016, we were successful in obtaining a \$767,500 grant which the City must match. The total funds are to be allocated for three project locations within the City: Grape Road from Indian Ridge Boulevard to Day Road including the intersection of Grape Road and Day Road, Dragoon Trail from the western City limit to the eastern City limit with the improved sections omitted and McKinley Avenue from Charlotte Street to the railroad and from Fir Road/Byrkit Avenue to Clover Road. Plans were designed in the fall of 2016 for all three projects. These projects are scheduled for bid in the spring of 2017 with an estimated total investment of \$1.535 million.

Summer Street Paving Program

With the completion of the pavement rating system, the Engineering Department and Street Department coordinated 28,965 linear feet of street milling, sealing and resurfacing project. The following table summarizes the streets that were resurfaced in 2016. All streets were either edge milled 6 feet along the curb line or the entire surface removed 1" to 1.5" to retain as much curb exposure as possible.

Alley Paving Program

The 2016 Alley Paving Program resurfaced 2,335 linear feet and surfaced 6,645 linear feet of alleys for an investment of about \$120,000. A field inspection of each alley is conducted to determine the feasibility of paving the alley. The residents along the alley benefit from this work because of the reduction of dirt and dust generated by traffic. The Street Department also benefits by not having to grade or apply dust palliative to the paved alleys. There are approximately 48.5 total miles of alley that are open to the public and a significant number of these have been paved by this program. In 2016, twenty-three alleys were surfaced or resurfaced with this program.

Curb and Sidewalk Program

Instituted in 1986, this program encourages single-family homeowners to repair or replace deteriorated public curbs and sidewalks adjacent to their property and provides for a 50/50 split of the repair cost of curbs, sidewalks and drive approaches between the homeowner and the City. Since the beginning of this program, the cost for reconstruction of approximately 107,721 linear feet of new curb and sidewalk has been shared by the City and its residents. Additionally, several areas of sidewalk and curb were replaced due to drainage issues, trip hazards or damages. This year a total of \$423,704.40 was invested in neighborhoods on curb and sidewalk improvements.

In addition, the Department of Redevelopment had funds available for curb and sidewalk improvements within the low to moderate income census tracts. With these funds, the City was able to replace 1,750 lineal feet of curb and sidewalk to meet the current ADA standards and installed new handicap ramps at 2 intersections. The improvements were made along the 200 block of W. Lawrence Street. The total investment was \$89,535.00 for these improvements.



Long Term Control Plan Projects

The City's Long Term Control Plan (LTCP) was endorsed by the Common Council in January 2014 and Final Judgment was filed on May 23, 2014 by the United States District Court. Late in 2014 the City began planning for the major element of the Long Term Control Plan, a 7,000 foot long, 10' diameter storage and conveyance tunnel to be located under either Third Street or Fourth Street approximately 30 feet deep extending from the Wastewater Treatment Plant (WWTP) to Merrifield Avenue. Following a review of subsurface soils investigations along both proposed alignments, engineers suggested lowering the depth of the tunnel from 30 feet to an average of 70 feet to provide clearance from underground utilities, boulders, locate the tunnel in more cohesive soils and overall be less invasive at the surface. In addition to the tunnel being lowered to 70 feet deep, engineers recommended the Third Street alignment instead of Fourth Street and that the tunnel be completed in one contract instead of two. All of these recommendations result in a reduction of construction costs. However due to the lowering of the tunnel, it was necessary to add a lift station at the WWTP as a control structure to elevate flows into the treatment plant.

In the fall of 2015, the City selected two design engineering teams to develop construction documents for the tunnel and lift station/control structure. These plans progressed through 2016 and are expected to be complete to 90% in the spring of 2017. Tunnel designers also evaluated the next element of the LTCP, which is micro-tunneling of a large diameter north interceptor sewer within Merrifield Avenue from the Third Street tunnel to Merrifield Park. They analyzed options to minimize costs and disruption from construction of a 40 feet diameter exit shaft, 70 feet deep, at the intersection of Third Street and Merrifield Avenue. This connection, approximately 30 to 40 feet deep, was coordinated with the tunnel construction to eliminate the need to excavate into Third Street at a later date. The north interceptor is high on the list of

LTCP projects as it conveys major storm flows into the tunnel minimizing the flooding of the south end of Crawford Park.

However, at the 60% plan completion in November 2016, the estimated project cost significantly exceeded the initial estimates causing the City to step back and re-evaluate the LTCP as a whole. Since we are bound by a schedule and specific elements within the 2014 Consent Decree, we will continue to progress the deep tunnel plans to 90% in good faith. However, technology has changed in the last ten years since the development of the LTCP and therefore, the city will re-evaluate options in parallel. If we find a combination of new elements, or are still bound by the deep tunnel, we anticipate re-opening negotiations with the US EPA and Department of Justice in 2017 in pursuit of relief. A summary of the current LTCP is included in the following table.

Long Term Control Plan - Recommendation and Implementation Plan						
Location	Project	Description	Capital Cost Estimate ¹ (\$ million)	Size ²	Start Date ³	End Date ⁴
Milburn Boulevard Area	Divisions A thru H	Sewer separation and rehabilitation of the area south of the St. Joseph River, bounded by Ironwood, Dragoon Trail, Panama and Logan Street	19.4	N/A	2007	Dec 2026
Wilson Boulevard Area	Wilson Boulevard	Parallel interceptor to redirect flows from CSO 004, 005, 006, 007 and 008 and consolidate into one overflow location at River Crossing RC-4. Upgrade RC-4 if needed based upon flow monitoring upon completion of interceptor. Closure of RC-3.	5.0	N/A	Oct 2011	Dec 2020
River Center CSO 009	Storage/Conveyance Tunnel	Storage/Conveyance Sewer from WWTP to Merrifield Avenue	59.2*	120"	Feb 2012	Dec 2020
	Lift Station/Control Structure	LS and Control Structure to transmit flows from Tunnel to WWTP	17.3*		Dec 2015	Dec 2020
	Storage/Conveyance Tunnel (Phase III)	Micro-tunnel for Storage/Conveyance Sewer from Third Street to Merrifield Park (Linden Ave)	5.7	60"-84"	Dec 2015	Dec 2023
East Area	Linden Area Sewer Separation (Phase I)	Sewer separation of approximately 152 acres north of Lincolnway East between Merrifield Park and Roosevelt	8.6*	N/A	Dec 2014	Dec 2028
	Linden Area Sewer Separation (Phase II)		8.6*	N/A	Dec 2016	Dec 2028
	Linden Area Sewer Separation (Phase III)		8.6*	N/A	Dec 2018	Dec 2028
	Linden Area Sewer Separation (Phase IV)		8.6*	N/A	Dec 2020	Dec 2028
	Alley Conveyance Sewer from Capital Ave. to Merrifield Ave.	Conveyance from the outfall of the Mariellen Lift Station to the storage/conveyance sewer along Merrifield Ave. at Third Street	5.8	30"-48"	Dec 2015	Dec 2028
Central Park Area	Northeast River Crossing to Merrifield Park (Linden Ave.)	Conveyance sewer which intercepts flow from the Daisy Road Lift Station Forcemain/Northeast River Crossing	2.3	42"-48"	Dec 2021	Dec 2031
	Daisy Road Lift Station, Forcemain and RC-5 (Phase I)	Lift Station and FM with 2.9 MGD capacity.	7	18"-24"	2011	Dec 2031

¹ Capital cost includes 20% contingency and 20% engineering, admin and legal costs. ENR 8000. Costs from Consent Decree Appendix A, unless updated by current information. Updated costs noted with *.

² The final facilities will be sized within the stated ranges to achieve zero overflows during the typical year (1992). The sizes shown were preliminarily determined by subbasin flow monitoring during preliminary design of each project component.

³ Engineer under contract to design the facility.

⁴ Facility is operational.

CSO Consolidation Phase II, Mishawaka Avenue

CSO (combined sewer overflow) consolidation construction along Wilson Boulevard began in 2013. The goal of the CSO consolidation is to help eliminate sanitary sewage flow into the river. Phase I of this project completed in 2014 included a 24” sanitary sewer within Wilson Boulevard from Clay Street to Forest Avenue. Phase II extended the newly installed 24” sanitary sewer main within Mishawaka Avenue



from Forest Avenue to Liberty Drive. Rehabilitation was completed for the remaining CSO outfall pipes and Battell Park. In addition, the project included traffic signal replacement at Mishawaka Avenue and Liberty Drive, Riverwalk upgrades, as well as beautification of the overall area. This project was completed in 2016. The total investment was approximately \$1.8 million.

Linden Area Long Term Control Plan

The Linden Area Sewer Separation is an element of the Long Term Control Plan (LTCP), which falls under the “East Area”. By completing the study, it further defined the sewer separation with individual projects scope, phasing and associated estimated costs. Specifically, the study evaluated the existing sewer system within the area south of the St. Joseph River roughly bounded by Merrifield Avenue, Roosevelt Avenue and East Fourth Street. It provided a recommended plan to address any deficiencies while defining the sewer separation that in part requires separation of 152 acres of existing combined sewers in the Linden Area. These improvements are part of a larger plan (LTCP) to eliminate combined sewer overflows to zero during the typical year within the City’s sewer system.



The recommended plan consists of three main components: rehabilitating the existing combined sewer system to act as a separated sanitary sewer system; construction of new separate storm sewer systems including a new storm outfall to the St. Joseph River; and converting the existing combined sewers in Byrkit Avenue (from Sixth Street to Linden Avenue), Indiana Avenue (from Linden Avenue to Joseph Street) and Joseph Street (from Indiana Avenue to CSO 015) to storm sewers. The proposed improvements can be divided into four major geographic elements: the Eberhart Stormwater Outfall and Storm Sewer Improvements, the Roosevelt Storm Sewer Improvements, the CSO 015 Storm Sewer Improvements in the Crawford Park area and the Byrkit Combined Sewer Conversion. However, these are further broken down into several phases to complete the entire system over the next several years.

Design of multiple divisions of the Linden Area Eberhart Stormwater Outfall and Storm Sewer Improvements were initiated in 2016: Division A, Division B and Division C (see Exhibit A). Construction of Division A – Phase I also began in 2016. This phase included large diameter (36” to 72”) trunk storm sewer on Club Boulevard from Miami Club Drive to the golf course, on Victoria Street from Club Boulevard to Linden Avenue and through the golf course. A significant portion of the work included twin 54” storm lines through the golf course from the east end of Club Boulevard to an outfall at the river. Additionally the project included the transition of the existing combined sewer to sanitary sewer, tree removal and installation of concrete curb, sidewalk and new pavement. This work could not begin until the conclusion of the prime golf season in 2016. The remaining work on Victoria Street will be completed in early spring of 2017. The total investment for Linden Division A – Phase I is anticipated to be \$1.6 million.



Construction of Division A – Phase II is scheduled for late spring of 2017. Division B and Division C are scheduled for the summer of 2017 in anticipation of the second phase of Twelfth Street Improvement Project, from Downey Avenue to Campbell Street. The improvements within Linden Area Divisions A, B and C not only complete elements of the LTCP, but will allow a storm outlet for the second phase of Twelfth Street Improvements. The Twelfth Street project is programmed through MACOG where 80% will be funded by INDOT/Federal Highway and the remaining 20% will be funded by a local match from the City. The Twelfth Street construction cost is currently estimated at \$7.1 million and has been programmed to bid in July 2018. It is critical to complete the Linden Area Divisions A, B and C projects as scheduled to not jeopardize the funding in place for the second phase of the Twelfth Street Improvements.

Wastewater Funds

Liberty Drive and Elizabeth Street Sewer Improvements

This project consisted of the installation of new sanitary sewer on Liberty Drive from Grove Street south to the alley and on Elizabeth Street from Lawrence Street south to the alley. These installations allowed for the separation of interconnected sanitary laterals. Also included was the improvement of the streets, sidewalks including ADA ramps and storm sewers for the intersections. This project was completed in 2016. The total investment was approximately \$500,000.

2016 LPA Design Project

Twelfth Street, Phase II (Campbell Street to Downey Avenue)

Phase II of the improvements on Twelfth Street, between Campbell Street and Downey Avenue, is currently being designed. The main goal is to widen the street from its present two lanes to three lanes including a continuous center two way left turn lane. The street will be reconstructed along with curb and gutter, storm sewer and street lighting. Currently there is insufficient right of way to construct this project; therefore, additional right of way was acquired along the length of

the project throughout 2016 with only three remaining City owned parcels to finalize in 2017. The construction is estimated to cost \$7.1 million, with 80% being federally funded. The project is presently finalizing the design phase. Due to the federal procedures for design and right of way acquisition, it is anticipated that this project will begin construction in late summer of 2018.

Future Projects

<u>Project</u>	<u>Completion Date</u>	<u>Estimated Cost</u>
<u>Wastewater Funded Area</u>		
Linden Area, Division A-I (LTCP), (River to Club/Victoria)	Nov 2017	\$1,250,000
Linden Area, Division A-II (LTCP), (Club, Byrkit, Victoria)	Nov 2017	\$2,000,000
Linden Area, Division B, (LTCP), (Victoria, Miami Club, Linden)	Nov 2017	\$2,240,000
Linden Area, Division C, (LTCP), (Byrkit Avenue)	Nov 2017	\$1,250,000
Milburn Area (Queensboro and Hendricks Streets)	June 2018	\$1,600,000
<u>TIF Area</u>		
Ironworks Extension (Spring St. to Hill St.)	Nov 2017	\$1,300,000
Hill Street Extension (Front St. to Ironworks Ave.)	Nov 2017	\$1,250,000
Douglas Road Widening (3000LF east of Fir Road)	Nov 2019	\$4,700,000
Veterans Parkway	Nov 2019	\$4,000,000
Cedar St. Improvements (Mishawaka Ave. to Edgewater)	Nov 2019	\$1,200,000
Douglas Road and Grape Road Intersection – additional turn lanes	Nov 2019	\$2,500,000
West St. Storm Relief Sewer – West St. (6th St. to 15th St.)	Nov 2018	\$2,450,000
West St. Storm Relief Sewer – 8th St. (West St. to Logan St.)	Nov 2019	\$1,850,000
West St. Storm Relief Sewer – 15th St. & 16th St. (Rose Park)	Nov 2020	\$3,200,000
<u>LPA Project, (City pays full cost for this portion)</u>		
Twelfth St. Ph II (Downey Ave. to Campbell St.) – Design & R/W Acquisition	Jan 2018	\$2,000,000
<u>LPA Project (FHWA w/ 20% Local Share)</u>		
Twelfth St. Ph II (Downey Ave. to Campbell St.) – Construction (80% Federal funds)	Nov 2019	\$7,100,000

Path: X:\Engineering\Department\Mapfiles\10_3_1\Mayor Year End\Figure 7 - Proposed Linden Area Sewer Separations-2 views.mxd
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*City of Mishawaka, Indiana
 Linden Area Sewer Improvement Study
 Division A, Phase 1 & 2
 Division B
 Division C*

Exhibit A