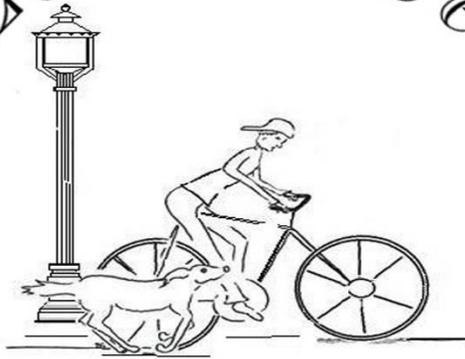


Lawrence



See You There!

Water System
Capital Improvement Plan
2019 through 2039

**Village of Lawrence Water System
Capital Improvement Plan
2019 through 2039**

The requirement for capitol budgeting for the following ten fiscal years is found in the Michigan Planning Enabling Act (Public Act 33 of 2008, as amended). Capitol Budgeting has two elements. The first is a Capital Improvement Plan, and the second is the incorporation of that plan into the annual budget and future budgeting forecasts. The Capital Improvement Plan is a twenty-year schedule of all proposed major capital improvement projects including project priorities, cost estimates, methods of financing, and estimated operation and maintenance costs for the proposed projects. Each year the Capital Improvement Plan is revised for the next fiscal year.

Including the Capital Improvement Plan in the annual budget, and future budget forecast, is primarily for the purpose of adjusting the multi-year program of projects to change needs and circumstances. It also insures that projects completed during that year are removed from the plan and additional year's projects are added. The Capital Improvement Plan is designed to be amended on an annual basis. Projects can be added or subtracted as the needs and resources of the community adjust.

An effective and ongoing Capital Improvement Plan is beneficial to elected officials, staff, and the general public. Among the benefits that can be received from the adopted and well-maintained Capital Improvement Plan are:

1. Coordination of the community's physical planning with its fiscal planning capabilities.
2. Ensuring that the public improvements are undertaken in the desirable order of priority.
3. Assisting in the stabilization of tax levies over the period of years.
4. Producing savings in total costs by promoting a "pay as you go" policy of capital financing thereby reducing additional interest and other extra costs.
5. Providing adequate time for planning and engineering of proposed projects.
6. Ensuring the maximum benefit of the monies expended for public improvements.
7. Permitting municipal construction activities to be coordinated with those of other public agencies within the community. Capital Improvement Planning and budgeting allow officials and citizens to set priorities for capitol expenses and ensure maximum physical benefit for a minimum capital expenditure through an orderly process of project development, scheduling and implementation.

A wide range and variety of capital improvements are included in the Capital Improvement Plan. Listed below are several criteria to aid in the review of potential projects.

1. Requirement to fill any federal or state judicial administration requirements.
2. Relationship to source and availability of funds.
3. Impact on annual operating and maintenance costs.
4. Relationship to overall fiscal policy and capabilities.
5. Project's readiness for implementation.
6. Relationship to other projects.
7. Relationship to other projects.
8. Distribution of projects throughout the community.
9. Relationship to other communities.

These factors are all relevant and must be considered in order to ensure that the best quality of service is delivered to our residents in the most fiscally prudent manner. Most importantly the proposed list of capital projects has to reflect the overall goals and vision of the community’s adopted Master plan.

Manager’s Executive Summary

The Village of Lawrence water system dates back to the late 1970’s. Water system pipes are constructed of approximately 25% plastic mains, 60% ductile iron mains, 10% asphalt cement and 5% asbestos cement lined mains. There are approximately 121 hydrants located on the system, and the Water Department performs hydrant flushing three times a year on each hydrant for the purpose of cleaning debris and rust from the water mains. In addition, there are approximately 300 main line valves on the system which the Water Department does exercise (turn) on an annual basis.

The Village water system currently covers approximately one (1) square mile in the Village of Lawrence and is supplied through a water distribution network consisting of more than 14 miles of water main ranging from 1 inch to 4 inch in diameter.

The Village of Lawrence supplies water to customers throughout the village limits via three wells, which are designated Wells #1, #2 and #4. Wells #1 and #2 are located southwest of the intersection of the former Kalamazoo & Chicago Railroad and County road 365 (South Paw Paw). Well 4 is located at the south end of Blackman Street on the east side of the Village as shown in **Figure 1**. The Village also owns a well designated as Well #3 that was constructed in 1994. However, when the Clean Water Act regulations changed regarding arsenic, the water supply from the well had elevated Arsenic levels. Therefore, it was studied for water treatment or replacement. It was determined to be more effective to drill well #4 at a shallower depth and pump water with a lower arsenic concentration than to treat water from well #3. Well #3 was taken off line in 2007 prior to the startup of well #4. The three wells are rotated weekly from lag to lead. **Table 1**, shown below, summarizes selected data from each of the wells and corresponding well pump.

Table 1 – Well Summary Data

| Well | Year Drilled | Diameter/Inches | Depth | Designed Duty Point | Current Rated Duty Point |
|------|--------------|-----------------|-------|---------------------|--------------------------|
| 1 | 1944 | 12 | 74 | 500 gpm @ 180 ft. | 425 gpm @ 181 ft |
| 2 | 1947 | 12 | 80 | 500 gpm @ 180 ft | 475 gpm @193 ft |
| *3 | 1994 | 12 | 117 | N/A | N/A |
| 4 | 2007 | 12 | 75 | 520 gpm @ 174 ft | 600 gpm @ 175 ft |

The design duty for Well #3 prior to taking it out of service was 550 gpm at 255 ft.

It should be noted that the current status of well 3 is that the well casing is still in place, the pump shaft is still inserted in the well and the motor is still mounted on the casing. There is a blind flange placed on the discharge elbow and the electrical service to the motor has been disconnected. It is the intent of the Village to have this well remain in its current state. In the event the arsenic levels become more elevated above 10 parts per billion (ppb) in well #4 in the future, the Village will have the flexibility to treat the water from either Well #3 and/or Well #4 at that time.

Water pumped from the Village wells is treated with chlorine and phosphate injection prior to entry into the distribution system. The three wells alternate manually and a portable backup generator provides emergency power to keep the wells operating during power outages.

The Village has two (2) elevated storage tanks located in the Village limits. The first tank, known as the LPZ (Low Pressure Zone) downtown tower was erected in 1977 and has a storage capacity of 150,000 gallons. A spheroid elevated tank, it stands approximately 137 feet tall, and has a head range of roughly 40 feet. The wet interior of the tower was inspected and repainted in September 2015. Horizon Brothers completed the following work.

- Clean and paint the exterior of the tank
- Clean and seal coat the wet interior of the tank
- Clean and repaint the dry exterior of the tank
- Prepare the tank for the future addition of a submerged cathodic protection system
- Re-welded the overflow pipe and replace the overflow screen
- Replaced the roof hatches with 30-inch diameter units

The Villages second elevated storage tank is located in the industrial Park on the south side of the Village adjacent to I-94. The second tank, known as the HPZ (High Pressure Zone) Industrial Park Tower was constructed in 2008 and is a spheroid elevated tank with a storage capacity of 200,000 gallons, a diameter of 40'-6", stands approximately 116 feet tall, and has a head range of roughly 30 feet. This tank should be inspected in 2019 or 2020.

With an elevated water storage tank located in each of the pressure zones within the system, the operation of the system gains flexibility. Water can be transferred from one tank to another as demand dictates, either by internal pressure (high to Low Pressure) or via pumps in the booster station. This is further discussed below in the "control" section of this plan.

The well houses

A booster station is also a part of the Villages and is located on County Road 365 (South Paw Paw Street), approximately 5000 feet south of the main intersection in the Village. The booster station is used to boost water pressure to the industrial park and other future customers that may develop along county road 365 near the I-94 interchange. This general area is higher than ground elevation than the village.

Meter reading of all meters in the system takes place on a monthly basis by the DPW employees. The Village bills its customers on a monthly basis. All meters in the system were replaced in 1999 with Sensus Iperal's with remote read touch pads. Since that time, the Village has regularly replaced defective meters, at a rate of approximately 10% of the meters in the system each year starting with their 2013/2014 budget that began March 1 2013.

The Village of Lawrence currently employees three operators and contracts with Dan Faulkner to provide a S-3, D-3 Licensed MDEQ operator to oversee the Village's distribution system. The Village provides customers with high-quality drinking water which meets all regulations established by the State Safe Drinking Water Standards. Operators routinely test for contaminates in the water distribution system according to Federal and State laws. A summary of the water quality is presented in the Village of Lawrence Consumer Confidence Report published Annually and located on the Village web-site or at the Village Hall.

In the Fall of 2015 the Village reviewed a Water Rate Study presented by the Michigan Rural Water Association. Results of the Study as follows; The Village of Lawrence operates as an enterprise fund. All costs for the Water Distribution, including day to day operations, routine maintenance, and capital improvements are funded through user fees and ready to serve charges. As such the Village has increased its basic and usage rates three percent per year since 2015.

Listed below is a history of improvements to the Water Distribution System:

- 1944 Well #1 drilled.
- 1947 Well #2 drilled.
- 1977 LPZ tower was constructed.
- 1986 LPZ tower wet interior was repainted.
- 1994 Well #3 drilled.
- 1997 Booster station constructed.
- 2002 Well #1, House and Well #2, House were built out of Masonry Block.
- 2006 Well #2 overhauled.
- 2007 Well #4 drilled.
- 2007 Well #3 taken out of service.
- 2008 Well #1 overhauled.
- 2008 HPZ tower constructed.
- 2009 LPZ Tower inspected.
- 2015 Well #1 inspected.
- 2015 Well #2 inspected.
- 2015 Well #4 inspected
- 2015 LPZ Tower inspected, repainted and seal coated the interior.
- 2015 Corwin Meadows loop completed.
- 2016 Well #2 overhauled and VFD installed.
- 2017 Well #4 overhauled and VFD installed.
- 2018 Well #1 overhauled and VFD installed.

LPZ Water Tower

Located near Red Arrow Highway (St. Joseph St.) and Paw Paw Street, was constructed in 1977. The wet interior and exterior of the tank were repainted in 2015.

HPZ Water Tower

Located in the Village of Lawrence Industrial park on the South Side of the Village adjacent to I-94. The tank was constructed in 2008 and set to have its first inspection in 2019 or 2020.

Well House #1

Well #1 house was constructed 2002 out of masonry block and is located southwest of the intersection of former Kalamazoo & Railroad and county Road 365 (South Paw Paw Street) adjacent to Well #2. Well 1 was drilled in 1944 and the last over hall was in 2018. At present, the well has a specific capacity of 24.6 gallons per foot draw down as compared to 21.7 during the test ran in October of 2016. This is an increase of 7.7% and it means the well is in good shape.

Well House #2

Well #2 was constructed 2002 out of masonry block and is located southwest of the intersection of former Kalamazoo & Railroad and county Road 365 (South Paw Paw Street) adjacent to Well #1. Well #2 was drilled in 1947 and the last over haul was in 2016. At present, the well has a specific capacity of 22.4 gallons per foot draw down as compared to 24.3 during the test ran in October of 2015. The pump in this well was last overhauled in 2015, and is currently operating only 1.1% below its rate design condition. The pump remains in good shape and no further work is required.

Well #3

Well #3 is located at the south end of Blackman Street on the east side of the Village in the same well house as #4. Well #3 was drilled in 1994 and taken off line in 2007.

Well House #4

Well #4 was constructed in 1994 out of masonry block located at the south end of Blackman Street on the east side of the Village in the same well house as well #3. Well #4 was drilled in 2007 and the last inspection was in 2015. At present the well has a specific gravity of 22.4 gallons per foot draw down. As stated in the past Peerless Midwest reports, this well is off 18.8 % from its original specific capacity. This level of decrease is where the it is typically recommended a chemical well cleaning to prevent permanent lose in well production.

Booster Station

A booster station is also a part of the Villages and is located on County road 365 (South Paw Paw Street), approximately 5000 feet south of the main intersection in the Village. The booster station was constructed in 1997 out of masonry block.

Meters

The Village of Lawrence supplies water Sensus water meters to its customer at a rate of 20 per year. The meters are read with a Sensus hand held reader with touch pad and radio read capabilities. The hand held reader is currently out dated and not supported by the manufacturer.

Village of Lawrence Water Fund CIP Summary:

Assumptions:

- The CIP for the Village of Lawrence Water Fund corresponds to Capital Projects (A-L) completed during the ten-year time frame, 2018/2019- 2038/2039
- Anticipated water revenues are based on an annual billable water usage of 25,573 thousand gallons/year, considering a rate increase for 2016/2017 to \$18.53 base rate, and a continued 3% rate increase each year thereafter.
- Based on the water rates the water fund would generate \$529,000 to support the system and any future improvements.

As the water CIP will be reviewed and updated each year and to facilitate long range planning for the following capital projects needed to be considered.

- These recurring projects are projected in the model for the ten (5) fiscal years 2018/2019 – 2023/2024:

| | | | |
|-------------------|-----------------|------------------|-----------|
| HPZ Water Tower | Inspect | Every Five Years | 4,500 |
| LPZ Water Tower | Inspect | Every Five Years | 4,500 |
| Booster Station | Inspect | Every Five Years | 1,000 |
| Reliability Study | Update | Every 5 years | 10,000 |
| Well #1 | Clean & Inspect | Every 5 years | \$30,000 |
| Well #2 | Clean & Inspect | Every 5 years | \$30,000 |
| Well #4 | Clean & Inspect | Every 5 years | \$30,000 |
| Valves (10) | Replace | Every 5 years | \$10,000 |
| Hydrants (5) | Replace | Every 5 years | \$10,000 |
| Total | | | \$130,000 |

- The following projects are projected in the model for a ten (20) fiscal years 2018/2019 - 2038/2039

| | | | |
|------------------------------------------------------------|--------------|------|-------------|
| Chemical Feed Pumps | Replace | 2020 | 5,000 |
| Install Pressure Gauge Well #4 | New | 2020 | 5,000 |
| Roof Well House#2 | Replace | 2022 | 10,000 |
| Wells #1 and #2 Control Panel | Replace | 2024 | 100,000 |
| Chemical Feed Pumps | New | 2024 | 5,000 |
| HPZ Water Tower | Repaint | 2026 | 250,000 |
| Replace 4" Main E. St. Joseph Street Elizabeth to Exchange | Replace | 2028 | 300,000 |
| Replace Valves (45) | Replace | 2029 | 45,000 |
| Main Street | Replace Main | 2034 | 250,000 |
| Elevation Valve Loop Industrial Park | New | 2036 | 450,000 |
| LPZ Water Tower | Repaint | 2038 | 200,000 |
| Total | | | \$1,620,000 |

- Other Long Term Capital Improvement Projects as identified by the Water Reliability Study, annual set-aside amounts will be needed to meet these future expenses.

| | | | |
|-------------------|--------------|--|--------|
| Radio read meters | Installation | | 90,000 |
|-------------------|--------------|--|--------|

THE FOLLOWING CODES ARE USED THROUGHOUT THE DOCUMENT TO INDICATE THE SOURCE OF FUNDING FOR THE PROPOSED PROJECTS

DO-Donations

FG- Federal Grant

GF- General Grant

GO- General Obligation Bonds

RB- Revenue Bond

LS- Local Street Fund

MS- Major Street Fund

SA- Special Assessment

SM-Special Millage

WF- Water Fund

SF- Sewer Fund

PSP- Property Sale Proceeds

LDFA-Local Financial Development Authority

Water Fund Capital Improvement Projects

| | |
|-------------------------------------------------------------------|-------------|
| (A) Chemical Feed Pumps | \$5,000 |
| (B) Install Pressure Gauge between check valves at Well #4 | \$5,000 |
| (C) Roof Well House #2 | \$10,000 |
| (D) Well House #1/#2 Control Panel | \$100,000 |
| (E) Chemical Feed Pumps | \$5,000 |
| (F) HPZ Water Tower Repaint | \$250,000 |
| (G) Replace 4' Main Elizabeth to Exchange on east St. Joseph | \$300,000 |
| (H) West St. Joseph Street Main replacement from Main 4 to School | \$300,000 |
| (I) Radio Read Meters with new Hand Held Reader | \$90,000 |
| (J) West Main Street | \$250,000 |
| (K) Elevation Valve Loop Industrial Park | \$450,000 |
| (L) LPZ/Tower Repaint | \$200,000 |
| Total: | \$1,460,000 |

Village of Lawrence
 Capital Improvement Plan – Executive Summary
 2019-2039
 2019-2020

| Project | Costs | Funding Source |
|---------------------------------------|---------------|----------------|
| (A) Chemical Feed Pumps | \$5,000 | WF |
| (B) Install Pressure Gauge Well #4 | \$5,000 | WF |
| Total | 10,000 | |

2021-2022

| Project | Cost | Funding Source |
|------------------|-----------------|----------------|
| (C) Roof Well #2 | \$10,000 | WF |
| Total | \$10,000 | |

2023-2024

| Project | Cost | Funding Source |
|----------------------------------|------------------|----------------|
| (D) Wells #1/#2 Control Panel | \$100,000 | WF |
| (E) Chemical Feed Pumps | \$5,000 | WF |
| Total | \$105,000 | |

2025-2026

| Project | Cost | Funding Source |
|--------------------------------|------------------|----------------|
| (F) HPZ Water Tower Repaint | \$250,000 | LDFA/GO |
| Total | \$250,000 | |

2027-2028

| Project | Cost | Funding Source |
|-----------------------------------------------------------------|------------------|----------------|
| (G) Replace 4' Main Elizabeth to Exchange East St. Joseph | \$300,000 | GO |
| Total | \$300,000 | |

2029-2030

| Project | Cost | Funding Source |
|-------------------------------------------------------------------------|------------------|----------------|
| (H) West St. Joseph Street Main replacement from Main 4 to School | \$300,000 | GO |
| Total | \$300,000 | |

2031-2032

| Project | Cost | Funding Source |
|----------------------------------------------------|-----------------|----------------|
| (I) Radio Read Meters with new Hand Held Reader | \$90,000 | WF |
| Total | \$60,000 | |

2033-2034

| Project | Cost | Funding Source |
|----------------------|------------------|----------------|
| (J) West Main Street | \$250,000 | GO |
| Total | \$250,000 | |

2035-2036

| Project | Cost | Funding Source |
|---------------------------------------------|------------------|----------------|
| (K) Elevation Valve Loop Industrial Park | \$450,000 | GO |
| | \$450,000 | |

2037-2038

| Project | Cost | Funding Source |
|-----------------------|------------------|----------------|
| (L) LPZ/Tower Repaint | \$200,000 | GO |
| Total | \$200,000 | |