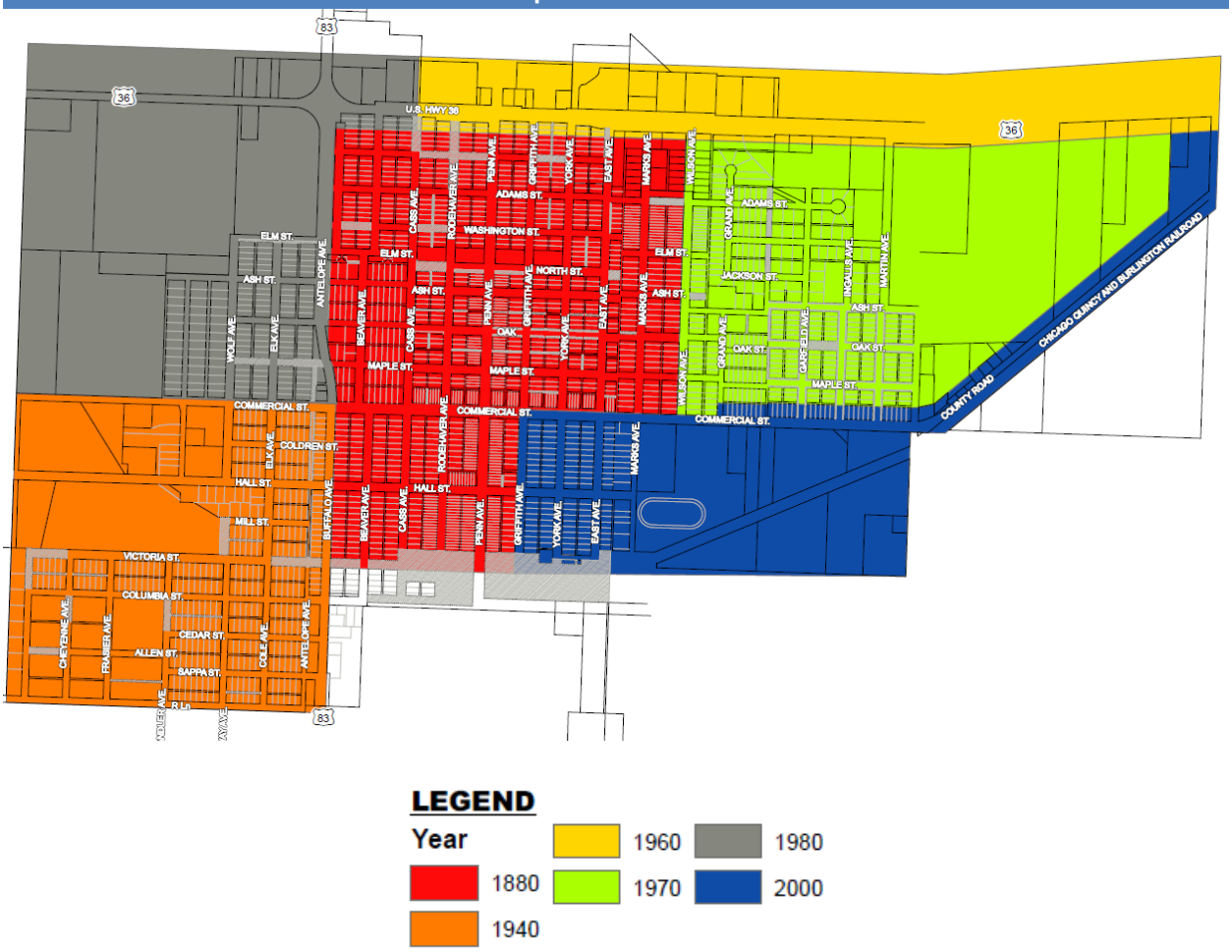
Oberlin Water Main Infrastructure Improvement Plan



Above is a map of all of Oberlin's water mains sectioned out in the timeframes they were installed. Oberlin has been on an aggressive water improvement plan since the well project 9 years ago. Since then, the council has been dedicated to continuing with the much need upgrades and repairs to the City's water main system.

Condition assessment: The condition assessment is the replacement of the 1880 water mains. These mains are well beyond the expected life span. The 1880 mains are beyond the condition where boring is an option, and replacement is the only solution.

Project Crossover: When replacing water mains, it is necessary to coordinate with any street project. The goal is to avoid replacing a street and then have to rip it out to replace an 1880 water main. The reverse is true, if a water main project requires a street demo then leverage the funds to make street repairs. It is understood most of the remaining 1880 water mains run through the setback area and not the streets, leaving this leverage point the exception rather than the rule. Even with this knowledge

operations will take advantage of every opportunity to repair streets if they are removed for a water main project in an effort to maximize all monies designated for infrastructure. Another crossover could be downtown sidewalk replacement when the water main is replaced.

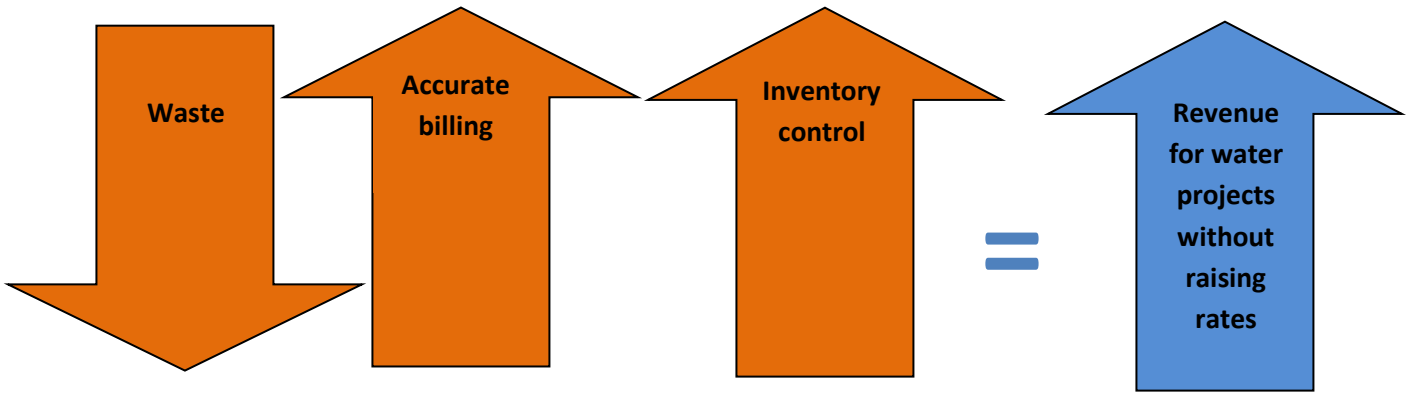
Funding: Water main projects are an expensive undertaking. The expense of the water main extends beyond the project itself; it includes the additional personnel for the project, administrative costs as well as required out-of-town meetings. An estimate of approximately $1,000,000 is needed to complete about 19 blocks is a basic measurement to gauge the magnitude of these projects. The City applies for Community Development Block Grants (CDBG) to assist with the cost burden.

CDBG Funding

- **To continue to qualify for CDBG funding Oberlin must complete a Low to Moderate Income (LMI) survey every 10 years in order to support the financial need of the region. The LMI was recently completed and Oberlin is in compliance for another 10 years.**
- **CDBG grant funding is a long process, typically over a year from request to funding.**
- **Oberlin must also have matching funds to complete a project approximately 60/40 (40% Oberlin)**

Budget planning

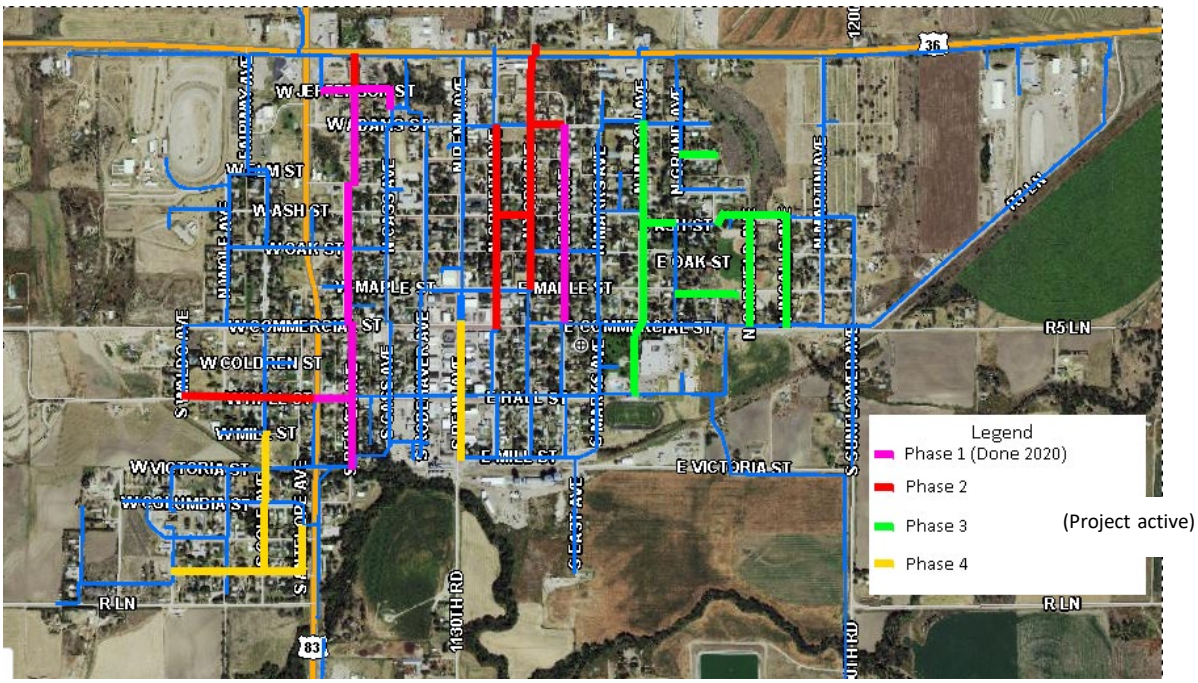
- **Save as much as possible in the water department with a goal of $250,000 annually designated for CDBG matching funds.**
- **Increase revenue margin through infrastructure upgrades – improved metering is a major aspect of this initiative. Improved meters ensure accurate billing and better water inventory control, as well as reduction of waste.**



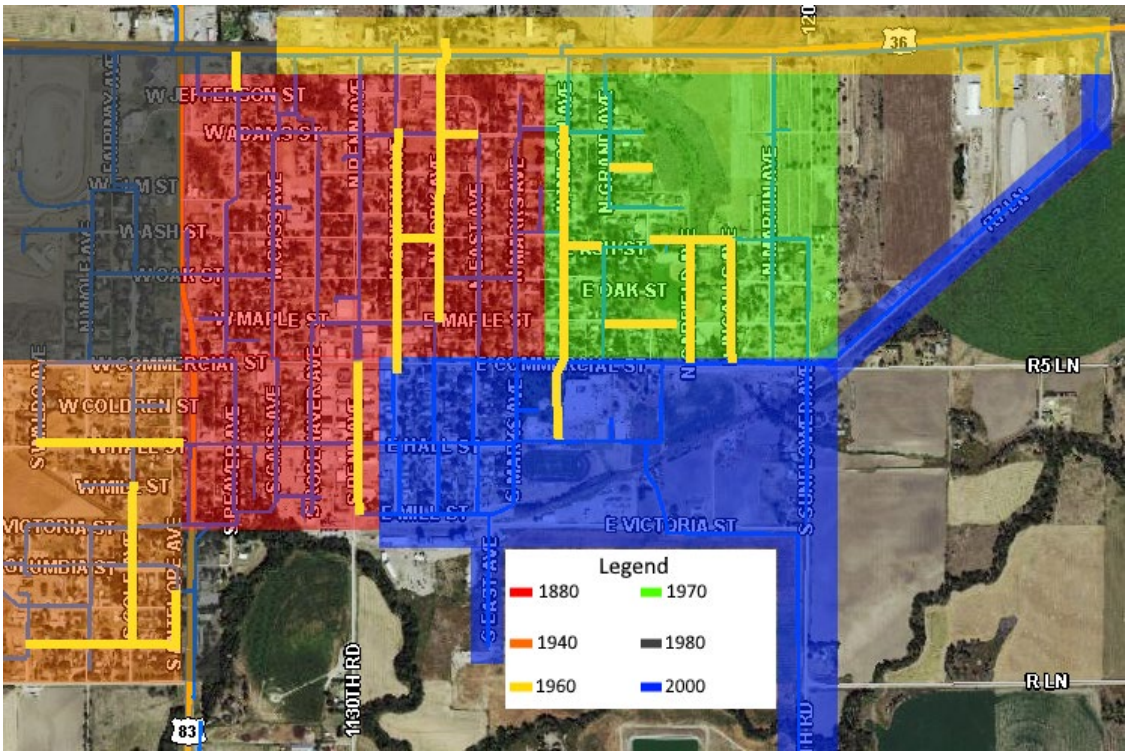
Timeline: Below is a graphic showing the projected plan for the 1880 water main replacement. Key variables in addition to budgeting are the continued funding of CDBG at the federal level as well as processing and application times.

New development: The Department of Commerce (DOC) administers CDBG grants on behalf of the federal government. Internally DOC has decided to only fund 2 phases of a project. Oberlin has a 5-phase plan to address the most critical water mains. The 2020 water main project is underway with a need to for an extension request due to supply chain breakdowns causing massive delays in being able to begin the project, as well as a scope of work change for an additional $100,000 of work. Now 2022 will be a year with no CDBG projects to build up matching reserves and complete the survey.

Federal infrastructure bill: With congress recently passing an unprecedented $1.2 trillion infrastructure bill the hope is additional funding availability will allow for more projects, and reduced restrictions from DOC, and while we are hoping reduced match requirements.



Supporting maps for Oberlin water mains showing the overlay of 1880 water main projects yet to be completed.



This map shows the completed project in 2020 but does not have the partial CDBG project being worked on now.

Manhole Revitalization and Lagoons and Lagoon liners

Oberlin has been focused on water projects for over 11 years, budgetary constraints have prevented any real attention to the maintenance of manholes. The CDBG grant was submitted for 2023 Manhole Rehab project and a decision should bee made sometime in January of 2022. Oberlin has 247 manholes, all in need of rehab.

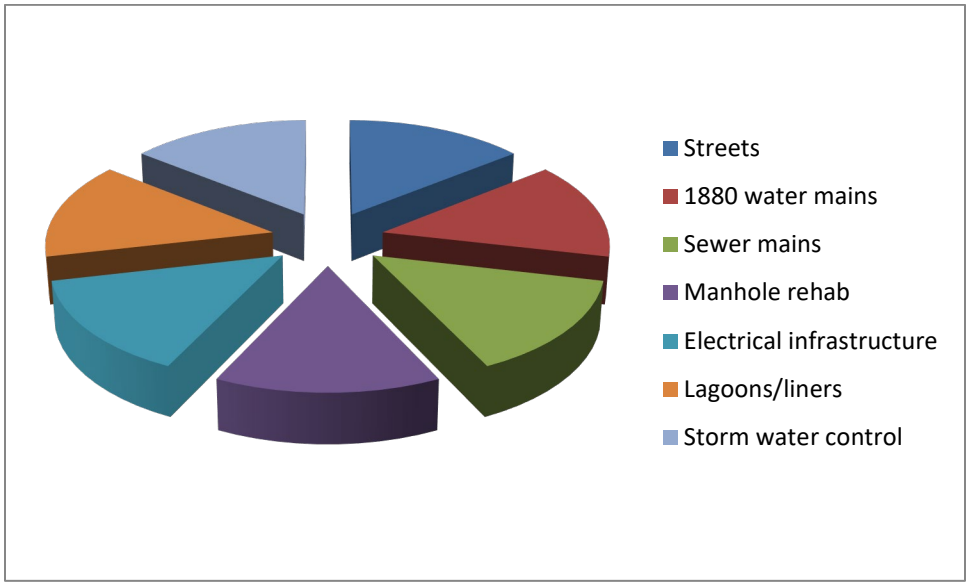
Condition assessment: Poor, manhole rehab has been considered before. During this period approximately 5-6 years ago estimated costs ranged from $8000 - $9000 per manhole. Making this an over $2 million project. The recommendation is to coat the manholes with a fiberglass sealant. This infrastructure project continues to lose out in priority to other utility projects. Now is a time to plan to address this issue before the issue itself dictates attention.

Project crossover: It is doubtful there will be opportunities for project crossover since this is such a specialized repair.

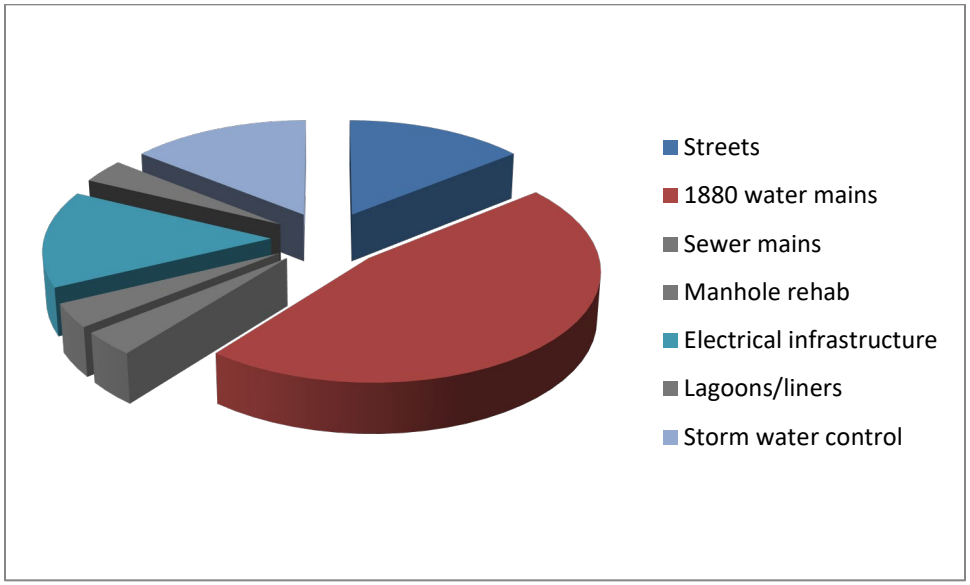
Funding: Budget funding for manhole rehab has proven to be difficult. Other infrastructure projects have taken precedence. Oberlin has been planning to address manholes for the last two cycles of water main projects to build up sewer reserves in preparation for the CDBG award.

Manhole revitalization
Sewer is $1 million – this funding was specifically earmarked issues with liners in the future.
Prevention
One aspect to research more is floating lagoons. Floating lagoons have a prefabricated foundation with plants on top and the root system below in the water. Floating lagoons have shown to reduce toxins by 7% and expedite the breakdown of solid waste.
The city is hoping to partner with the high school for the construction of floating lagoons. The desired outcome would be to extend or eliminate the need to replace lagoon liners and provide great real-world experience for students.

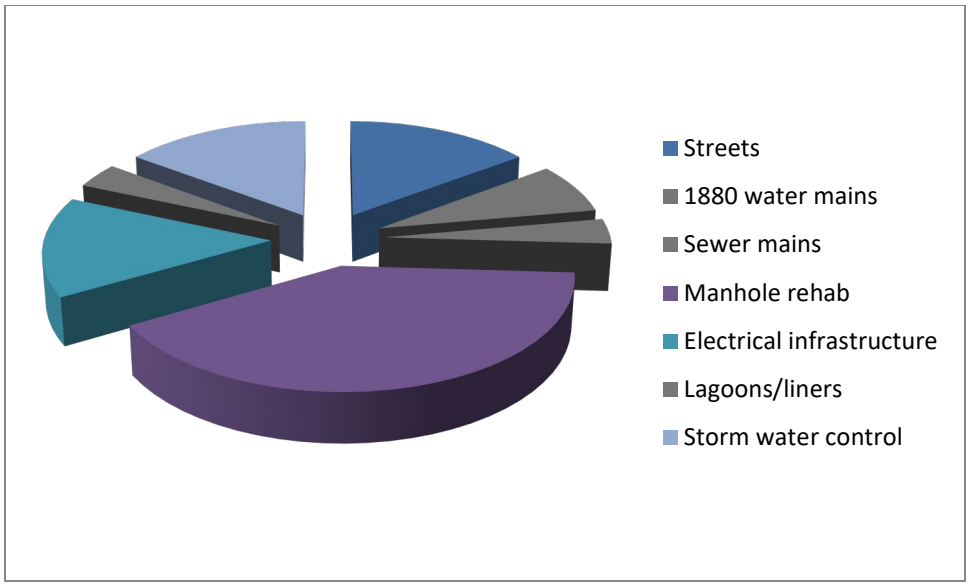
Scenario graphic of funding allocation and project concentration



*the graphic is for demonstration NOT representative of budget spending



The above scenario incorporates how we continue to maintain the progress the council has made with infrastructure projects; primarily electric. Additionally, this model also accounts for continued funding of 150K for street projects. Strategically allocating funds toward a specific project greatly accelerates the timeline of major infrastructure efforts. For example, if CDBG is awarded for water the timeline could change from 6 years to 3 years. With the caveat of project completion being contingent upon CDBG funding at the federal level and Oberlin being awarded funds.



The above graph is a representation of how budget allocations could look when the 1880 water main projects are complete. Notice this continues to maintain the electrical infrastructure, 150K street project, and leaving more focus for water mains than for lagoon liners and sewer mains but still allows for the majority of additional funding to now be focused on manhole rehabilitation. In these scenarios it is important to state and always reflect in the budget 500K would remain in reserves to address any imposed regulatory requirements for lagoon liners. Should KDHE mandate any changes in the lagoon liners Oberlin would have 500K in reserve for the project. Intentionally keeping this amount in reserve for this project would show Oberlin is serious about planning for the future and matching funds would be available. It is important to note the reason this entire option is now available should the council decide to leverage these funds is because lagoon #4 is complete, with no real cost to Oberlin. When this reserve fund was established, the thought was KDHE would either require an additional lagoon, which is now complete or changing of the liners. Since this regulatory requirement is met, and the regulation toward lagoon liners might not happen reducing reserve amounts by half and to leverage them for other infrastructure projects seems appropriate.

Again, these are options for the council to select, the flexibility of this model enables to the council to adjust to the needs at a given time.

Wait, what?? We were not awarded the CDBG funds for our project? The adaptability of this plan will support operational needs and infrastructure improvements without grant funding, it will simply be delayed. The push for continually applying for CDBG funding is time is working against Oberlin. Infrastructure is struggling and accelerating what can be accomplished with CDBG funds is vital to infrastructure updates, maintenance, and public safety. However, we should be prepared to not be awarded CDBG funds and still move infrastructure projects forward.

This would be a worst-case scenario: the water main project does not get awarded the CDBG funds. The estimate we can use as an example would be basing this off of having 275K in reserve with a projection of revenue at 200K. This would be typical and even conservative, making this a good example.

200K annual revenue

50K stays in water for future project

150K to infrastructure project

What this scenario does is provides for an infrastructure to get done even if CDBG funds are not awarded. True, the project will be different, in this example, a water main project was the goal for the CDBG funds, but if funds are not awarded a portion of water revenues could be reallocated to another infrastructure project, in this example manhole rehab. This also provides some congruity, it can feel 'uneasy' using funds from one department to pay for another, in this scenario the sewer reserve funds were used to accelerate the timeline for CDBG matching funds, and now returned or can be 'paid back' from water for sewer and sewer related projects. The primary thing to remember when moving or reallocating funds is transparency and disclosure, the same thing we do with every decision the council makes.

Electrical infrastructure

The electrical infrastructure in Oberlin has seen the biggest improvement of any utility department. This picture shows the 2021 IES project where two different sub-stations were replaced. IES will be back to finish a few more aspects of the project.

With the change from Sunflower to KMEA, it is anticipated the next electrical project will need to focus on Oberlin's main electrical tie-in. The tie-in line is miles out of town and Oberlin has a utility easement. Right now the clearing of the easement 30 feet, as regulations change the easement requirement is now 50 feet, and the city has numerous large trees to remove in order to be in compliance as well as the protection of our primary lines. The tie-in line is the equivalent to the water main under the south road the city is working to maintain and just completed a major repair. Both of these locations are the only point where Oberlin receives both of these resources. The 2022 budget is the first budget without an IES project, the line infrastructure is to a place now these projects can be done every other year, freeing up the funds for different projects. The commitment to invest $150,000 a year in electrical infrastructure updates has paid big dividends for Oberlin. This is particularly noticed with the reduced amount of outages. Reduced outages create:

- continual revenue
- reduced cost on personnel
- higher customer satisfaction
- safer quality of life for citizens and businesses

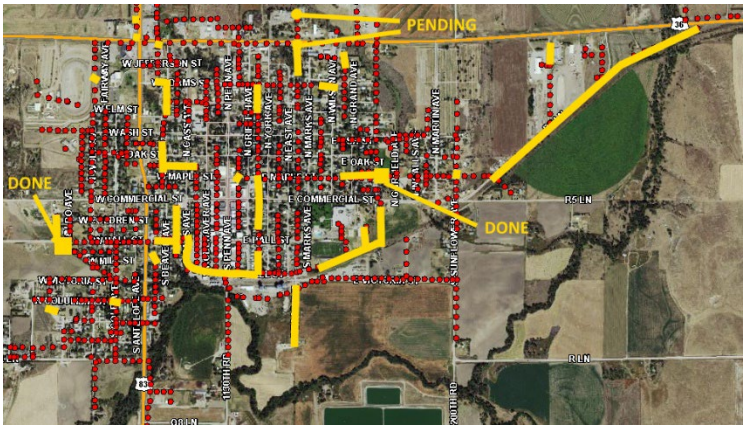
On average Oberlin purchases approximately 17 million kilowatts of electric from the power grid. Oberlin sells approximately 14.5 million kilowats, leaving 2.5 million kilowats of purchased power as lost inventory. A few ways to reduce this inventory loss is:

- Keeping trees trimmed to reduce line loss
- Updating wire
- Updated meters
- Updating transformers
- Updating fuses and switches

Lost kilowatts is unavoidable. There will always be some loss as electricity converts to heat energy as it moves through lines and transformers. As Oberlin continues to improve the electrical infrasture the expectation is to see this gap shrink. Reducing lost inventory, kilowatts purchased and not sold, will also increase the revenue generated by the electric department.

Condition assessment: The electrical department has quality equipment so they can actually accomplish the jobs needing to be done. The reliability of the electric system also speaks to the condition. With fewer outages, it shows the improvements already are making a difference.

Project crossover: Electric is specific and does not intersect with water or street projects. However, assessment of the system can reveal projects with bigger payoffs than others. Upgrades with a direct impact to reducing kilowatt loss take top priority. Typically, what we like to compare here is line loss improvement. However due to the extreme weather in February, and still some lack of clarity as to how Sunflower managed KW sales vs. output confidence regarding accuracy on what the numbers actually are is in question. Worst-case scenario Oberlin held at the same line loss with suspicions of line loss reducing but without being confident in Sunflower's account of KW it isn't worth using 2021 as a marker. Above, in yellow shows all the electrical line and pole updates from 2020 – 2021, as well as the remaining IES project to be completed. As the electric department continues with upgrades and training it can crossover with economic development, companies will assess the reliability and availability of electricity already in place. Quality infrastructure dramatically reduces start-up costs, making Oberlin more attractive for new and existing businesses.



The story: "*The U.S. Energy Information Administration (EIA) estimates that electricity transmission and distribution (T&D) losses average about 5% of the electricity that is transmitted and distributed annually in the United States*." The United States Department of Energy (DOE) states in a white paper titled, Electricity Distribution System Baseline Report. "*While the U.S. electric transmission and distribution system is among the most efficient in the world, roughly 6 percent of total generated electricity is lost in the system. One of the largest sources of loss is distribution transformers, which contribute roughly a third of the total losses, or 2 percent of all generated electricity in the United States*." In this paper, DOE also uses the time of electrical outage as a measurement of 200 hours per year to show system effectiveness.

[1] U.S. Energy Information Administration, "How much electricity is lost in electricity transmission and distribution in the United States" www.eia.gov/tools/faqs/faq.php?id=105&t=3

2 Electricity Distribution System Baseline Report, July 2016; WM Warwick, TD Hardy, MG Hoffman, JS Homer; pg V. www.energy.gov/sites/prod/files/2017/01/f34/Electricity%20Distribution%20System%20Baseline%20Report.pdf

Oberlin's utility distribution system has artificially high line loss. The reason for this many of the City's street lights is not metered. In the above graph, the unmetered street light electrical usage is not accounted for. This reduces the aggregate loss at a projected average of approximately 1.65%. While the electrical line still has improvements to make before it is performing closer to national averages of line loss it is evident the focus the council has had toward aggressively addressing infrastructure is paying off.

Funding

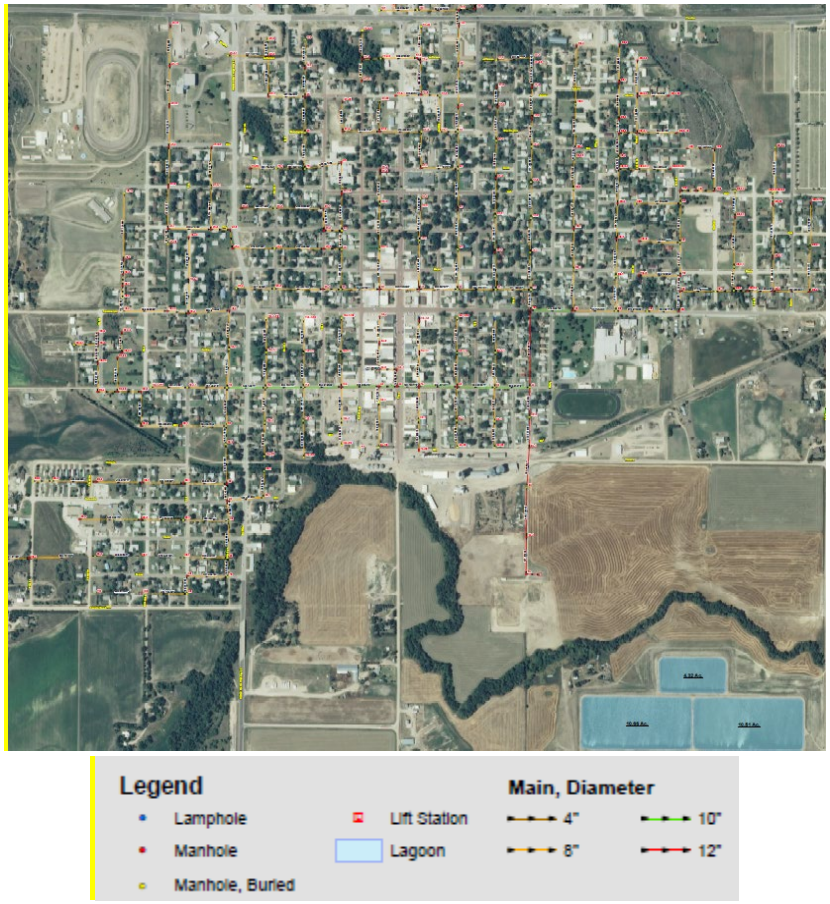
Electrical infrastructure funding
The annual operating budget has consistently funded 150K infrastructure project, and it is highly recommended this continue.
If the trend continues of reducing line loss this will generate more revenue for the City. The additional revenue can be assigned at the council's discretion.
Energy study projects are anticipated to have a direct impact on the amount of electricity they purchases, and reduce this overall cost. This will also free up additional funds for projects. This is especially true if alternative energy models work as anticipated.

Consideration

As the 10 year, electrical rehab project is moving to an end an option for consideration is electric line maintenance. The line condition is close to the point where the $150,000 budgeted annually for major line element replacement can transition every other year's maintenance. If the council chooses to move funds every other year from the line maintenance of the major electrical element replacement on the "off" years the $150,000 could be reallocated to other infrastructure and municipal needs:

- Streets
- Manholes
- Storm drainage
- Housing
- Sewer
- Power plant
- Debt paydown

Sewer maintenance



Above is a picture highlighting the sewer mains in Oberlin. The primary focus of the sewer and wastewater system has been the construction of lagoon #4. With this project now complete, it can free up funds to be allocated to other areas, as listed previously in this report. The sewer system is working and working well. This is also an infrastructure system not receiving much attention to the actual lines. Circumstances of other failing infrastructure systems have taken precedence over sewer mains. Oberlin has been proactive in terms of preparing for sewer projects. As recommended before keeping a 500K reserve to address regulatory requirements of liner changing is a necessary priority.

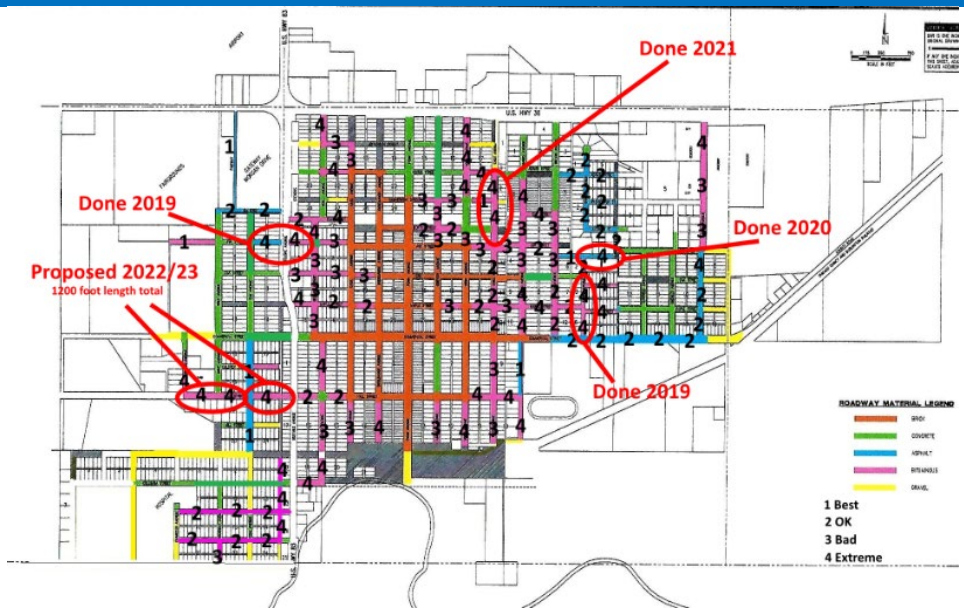
Oberlin has 13.5 miles of sewer main and no mains have been replaced in the last 20 years and is suspected never might even be the real answer. However, the city is required to conduct state-mandated maintenance and testing which has helped keep the system in better condition. The sewer system is functioning well and receiving regular maintenance, from a needs assessment this aspect of infrastructure can continue with regular maintenance and funds reallocated to other projects in more desperate need. Sewer-line cleaning and camera inspection are completed annually, the town is divided into a 5-year rotational cycle. Approximately $15,000 is spent annually for this process, which has proven helpful in maintaining sewer lines.

Condition assessment: Additional maintenance is required to keep it working properly. An example of the additional maintenance is the pumping approximately every 3 weeks to keep the lines cleared.

Project crossover: drainage for storm drains, manhole rehab

Sewer main funding
While this infrastructure system is working, it requires additional maintenance than what is typical to keep a sewer system operational. Even with this setback the sewer infrastructure system is at a higher operational level than others.
The hope is the system will continue to perform as it is now with the intention of attention and funds can be redirected to other infrastructure projects. During this time a portion of the revenue generated from the sewer should stay with the sewer and matching funds will be available for a major project. The timing of the above scenario would play a factor when 1880 water mains are completed and a portion of revenues staying with water surplus funds can be directed toward the sewer to fund upgrades.
CDBG funds are also a viable option for sewer upgrades – USDA sometimes has funding opportunities for rural areas and this should be considered as well.

Streets



The council has set an aggressive pace for street repair in Oberlin by annually budgeting $150,000 for total street replacement and the results are impressive. The streets in Oberlin have been an evolution. The roads traveled by horse and buggy are some of the same routes we use today. When the streets were eventually paved; I can only imagine what controversy and waste that must have seemed at the time it was done, the result was, it was a compromise. Fast forward to today and our streets are still compromised. This coupled with the challenge of maintaining brick streets with modern-day traffic demands, from larger vehicles, semis, and more travel takes a constant toll. But, we love our brick streets and do the extra work, they are one of the hallmarks of Oberlin. Funding for street repair feels especially painful because this is a non-revenue generating infrastructure system.

Condition: streets are in poor condition.

Dirt roads: Oberlin is responsible for some dirt roads within the city limits as well. In years past dirt road maintenance had "been on the list", and 2021 saw a lot of these projects completed.

Crossover projects: storm drainage, 1880 water main replacement

Street project funding
Continue funding 150K toward street projects annually
As other infrastructure projects are completed to a maintenance level reallocate funding to streets
As additional revenue is generated consider reallocating funds to street projects
Focus on staffing at all levels, full-time, seasonal, and summer help

Honorable Mention street project

The council had been saving for the Sappa Road project for 3 years, this savings coupled with another project unable to be completed the Sappa Road was able to be re-chipped sealed. The timing for this project has been great. The city has been working on improvements for Sappa Park with the generosity of GROW, Hansen, and Rotary grants; with the bulk of the funds coming from Dane G. Hansen. These improvements coupled with the massive rehab of the old youth ranch by Miriam's Hope the new road was needed and much appreciated this year's infrastructure report would fall short without mentioning this victory, which able to happen much faster than planned. The re-chip sealing was able to be done for $50,000 by partnering with engineering firms to reduce mobility expenses and the Oberlin street department was able to drastically reduce the cost by completing all the prep work for the chip seal!

Water main dirt road

What a relief to see this improvement! After an engineer consult studied the road and issues it is determined the plan for this road is regular maintenance. Money is already budgeted for the road maintenance and it is anticipated the funds should last 3 -5 years. The best road crews can do is manage any grading, in addition to gravel purchases. This is a huge win for road and water safety.

Condition: a drastic improvement moving from dangerous last year to safe; this road will require constant attention and maintenance. Given this road covers the main feeding all of Oberlin's water it is imperative this road remains a priority for any needed maintenance.

Repair recommendation: build up the new road, with proper packing, gravel, road pitch, grading, and ditch construction. This is a continuous maintenance project; not a 'fix'.

Water main dirt road

Miller & Associates assessed the road and determined there is no way to actually build the road in this location. Improved drainage is some areas might help but a "fix" to be maintained is simply not feasible. The focus is now maintaining this road in order to ensure safe travel, and safety of the only water main delivering water to Oberlin. Gravel and grading projects have been completed for 2021.

Storm water control

Stormwater and drainage quickly become an important part of overall street maintenance. Even if road work is completed inadequate drainage can literally wash the work away. Years of patching streets have caused a build-up of the road so high it often impedes water drainage into storm drains causing further road deterioration. This is a vicious cycle. The street crew has been working to address this specific issue and reclaiming storm drains.

Another aspect of stormwater drainage is repairing old drains. Anything keeping water off the streets and water exiting to the drainage system will help prolong street life. The street crew was able to reclaim 1 main storm drain on Cass and added new storm drains to the new street on Ash this summer.

Snow is also another aspect of street maintenance and stormwater drainage, especially when winters have the weather we experienced this year in February. Having a snow ordinance that is easy to implement and for the public to understand will greatly assist with stormwater drainage and overall public safety. If water from melted snow can drain properly it will not freeze and turn into ice, this is especially important for roads with a lot of vehicle and pedestrian traffic.

This photo with the yellow-painted curb shows a reclaimed storm gutter. A more secure metal grate is safer for all street traffic, and drainage is tremendously enhanced, providing longer life to the street.

Storm drainage study

Miller & Associates are performing the storm drainage study and results have been presented to the council. The hope is to dovetail stormwater projects with street replacement projects.

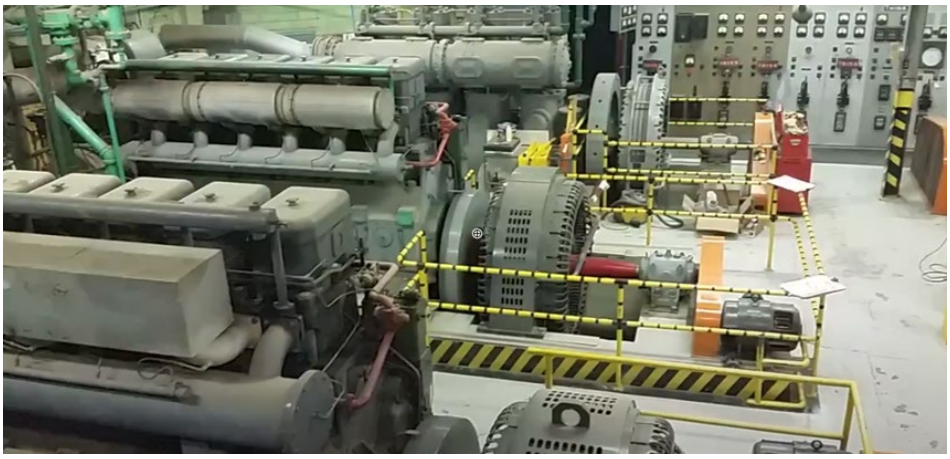
Fiber internet

The efforts put forth to bring fiber internet to Oberlin have been slow going. Challenges continue to persist. With the merging of Eagle, now Vevye hopes were high Oberlin's fiber internet issues would be a thing of the past. While there is a noticeable improvement fiber internet performance is not living up to the hype. There are some pieces we can do to help ourselves; assess individual plans, monitor performance, and report failures as well as successes, ensure household equipment can support improved internet capability. Yet even with these efforts, it seems apparent the fiber internet to households is lacking in capacity demands for remote learning and working. Remote work and remote education are needs as opposed to wants, there are simply some pieces missing from Oberlin's fiber internet solution. COVID made a new powerful distinction for the importance internet for our lives today. Internet was categorized as utility! During the height of the pandemic water and electricity could not be turned off because they are both a utility; and we saw the internet enter this category as well during the pandemic and there is no expectation for the categorization to ever drop off this essential list.

Options and opportunities:

The $1.2 trillion infrastructure bill passed by the federal government could provide the funds necessary to bring reliable fiber internet to Oberlin. What will be in Oberlin's best interest? Adding fiber internet as a utility or partnering with a provider?

Horizion issue – Power Plant



Issues for the Oberlin power plant continue to arise. In earlier reports and council discussions the power plant can be consolidated down into three key issues of capability:

Capability of operation: how long will the engines actually last. One engine is down permanently, and another was recently rebuilt.

Capability of knowledge: the power plant is old, literally has equipment from WWII used for operation today. There is no training available for equipment in the power plant. Everything in the power plant is incredibly manual, requiring 24/7 coverage when the power plant is operating. It is easier to think of operating the power plant as an art rather than a science. Manual adjustments are made to increase or reduce electricity onto the line by the pitch, whin, drag or lack thereof from an engine. Knowing what engine corresponds with what lever on the wall dictates how the electrical flow or load is released to the line. If the operator adjusts the lever incorrectly it very easily could burn up the entire line. Burn marks on the wall of the power plant serve as a reminder of how delicate of a system the plant is and the finesse required to operate the plant.

Capability due to legislation: it is common knowledge KDHE is not a fan of the Oberlin power plant. The city was able to negotiate a $30,000 fine to $998 due to environmentally conscious improvements but to be sure this was a tough fight. KDHE recently notified all cities with aged power plant their "…fee model is no longer sustainable…". This translates to an annual fine of $1,500 for simply having a power plant. Oberlin is registered as an emergency only with KDHE and only allowed to run the power plant intermittently (outside of an emergency) making training even more unattainable.

While all of the capability struggles remain the same, Oberlin is working with Kansas Municipal Energy Agency (KMEA) toward a solution to purchase a new power plant. At this time, the plant will consist of two standalone CAT generators. The plan at this point is KMEA will take a bond to purchase the generators and Oberlin will then pay KMEA through contract pricing of electricity. Oberlin is switching energy providers from Sunflower electric to KMEA. This transition will take place on January 1st, of 2022. Originally, Oberlin's purchase price for contracted electricity was going to decrease; a primary reason for switching to KMEA. If the bond purchase through KMEA is able to work then Oberlin's contract electricity will return to rates Oberlin is paying now with Sunflower. The end result is both KMEA and Oberlin are working toward is for Oberlin to have a newly upgraded power plant with no more additional expense than Oberlin is paying now. This purchase package equates to zero net expenditure to Oberlin and a new power plant.

CAT power generators are the primary company able to structure a purchase package of this kind. These are the same generators Colby is using to update their power plant. These new generators solve each of the city's capability issues listed above.

The Green New Deal: This is simply anyone's guess. President Biden's green new deal could prove especially troublesome for Oberlin's power plant. Questions in the not-too-distant future for the Oberlin city council to contend with are how can Oberlin incorporate more green elements into the infrastructure, and how to make these green elements yield results for the city. American Relief Plan Act (ARPA) could provide some financial space to help bring innovation to Oberlin. This is far from set at this point because regulations and restrictions for these funds are soft, to say the least and how this impacts approval is yet to be seen. The council advanced planning for these funds is placing Oberlin in the best position possible to leverage ARPA funds.