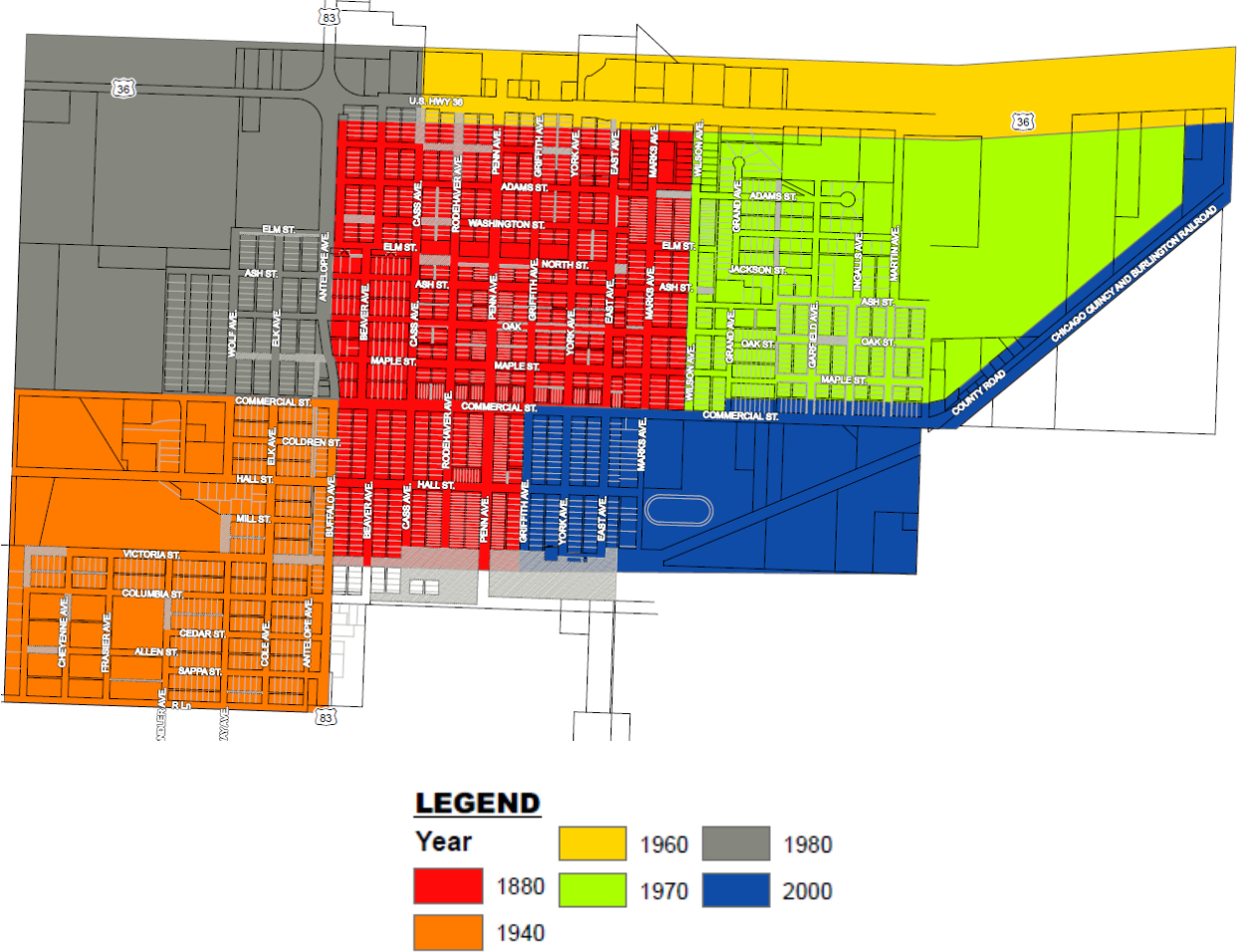


Oberlin Water Main Infrastructure Improvement Plan



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 8 years ago. Since then 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 street demo then leverage the funds to make street repairs. It is understood most of the remaining 1880 water mains run through the set back 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.

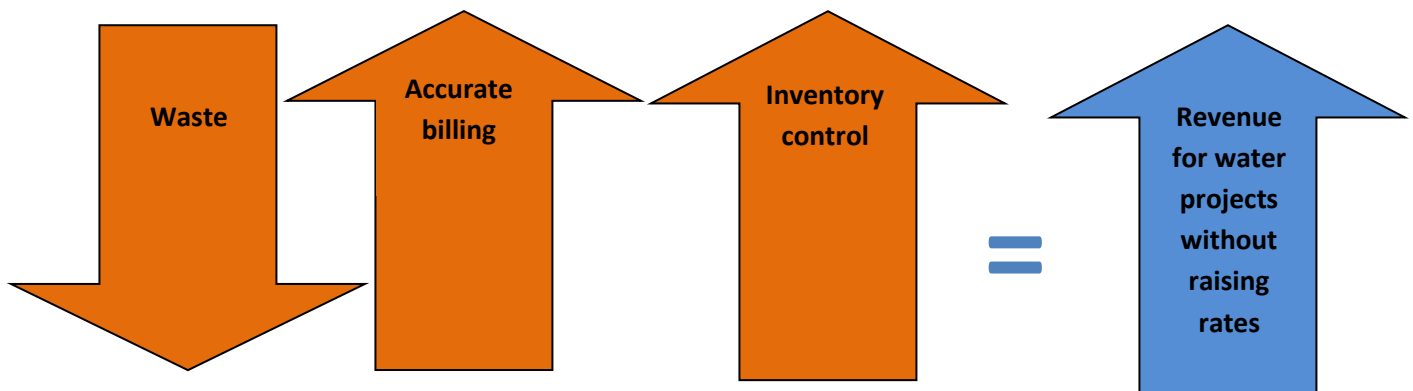
Funding: Water main projects are an expensive undertaking. The expense of a water main extends beyond the project itself; it includes the additional personnel for the project, administrative costs as well as required out of town meetings. An estimate of approximately \$1,000,000 is needed to complete 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 survey every 10 years in order to support the financial need of the region.
- 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)

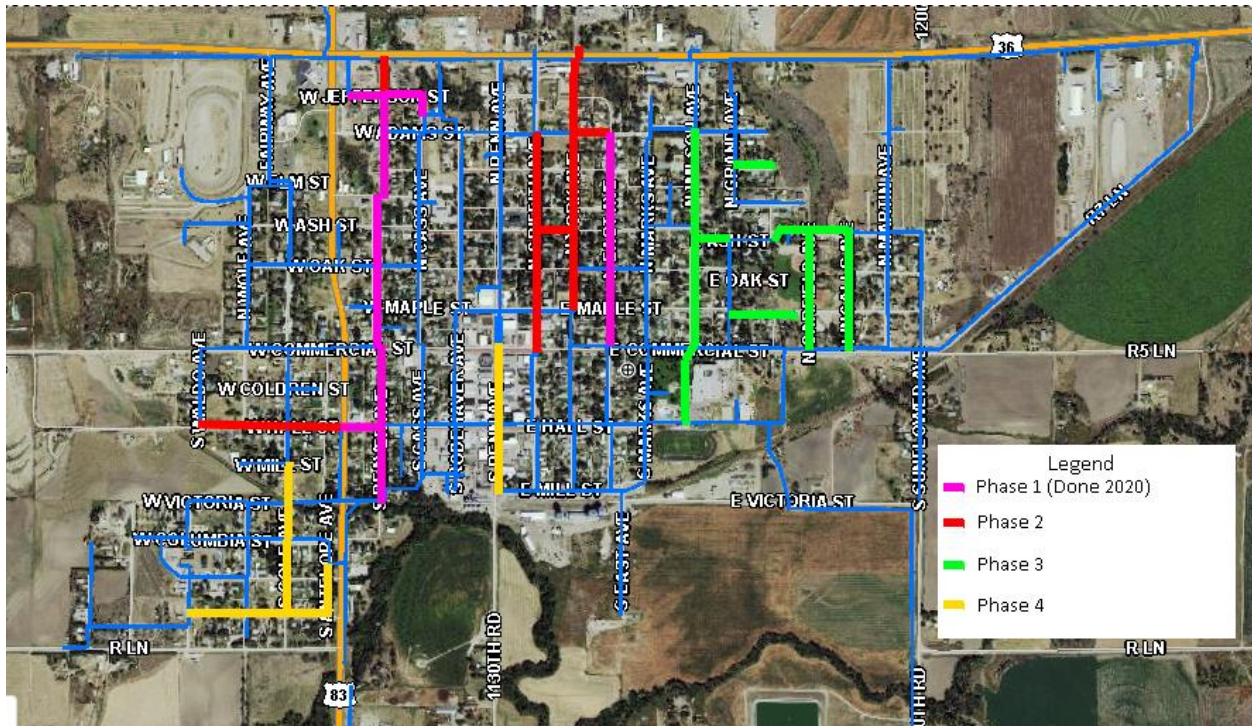
Budget planning

- 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 control of the product sold, as well as reduction of waste.

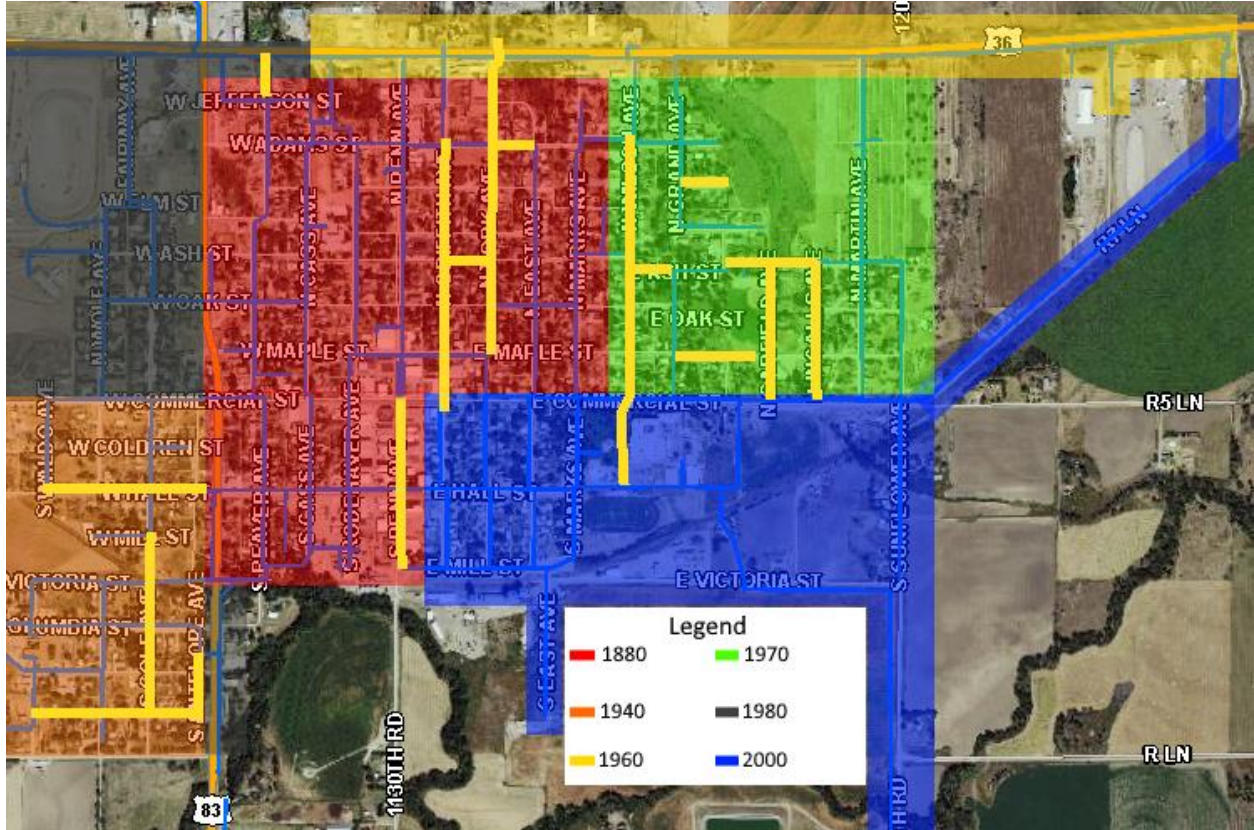


Timeline: Below is a graphic showing the projected plan for 1880 water main replacement. If the budget goal is met for CDBG required matching funds an aggressive schedule would be completion of the 1880 mains in 6 – 8 years. Key variables in addition budgeting is the continued funding of CDBG at the 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 completed and the 2021 is already awarded and will be completed next year. Now 2022 will be a year with no CDBG projects to build-up matching reserves and complete the survey. The thought now is to perhaps address manhole rehab while working with DOC to consider awarding funds for additional phases and then work on water again.



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



Manhole Revitalization and Lagoons and Lagoon liners

While Oberlin has been focused on water projects for over 10 years budgetary constraints have prevented any real attention to the maintenance of manholes. While manholes have yet to be a pressing concern for utility operations a proactive stance is needed to prevent future manhole failure from becoming a reality. Oberlin has 247 manholes, all in need of rehab.



Condition assessment: Poor, manhole rehab has been considered before. During this period approximately 4-5 years ago estimated costs ranged from \$8000 - \$9000 per manhole. Making this an over \$2 million project. The recommendation had been 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 since this is such a specialized repair. The plan is to still check with any contractors involved with any water and waste water projects in an effort to save money.

Funding: Budget funding for manhole rehab has proven to be difficult to keep focused on this project. Other infrastructure projects have, and rightfully so, taken precedence. While the condition of manholes in Oberlin is poor the need for rehabbed manholes has yet to out-weigh streets, water, or electric. Additional funding sources will need to be identified to meet this need.

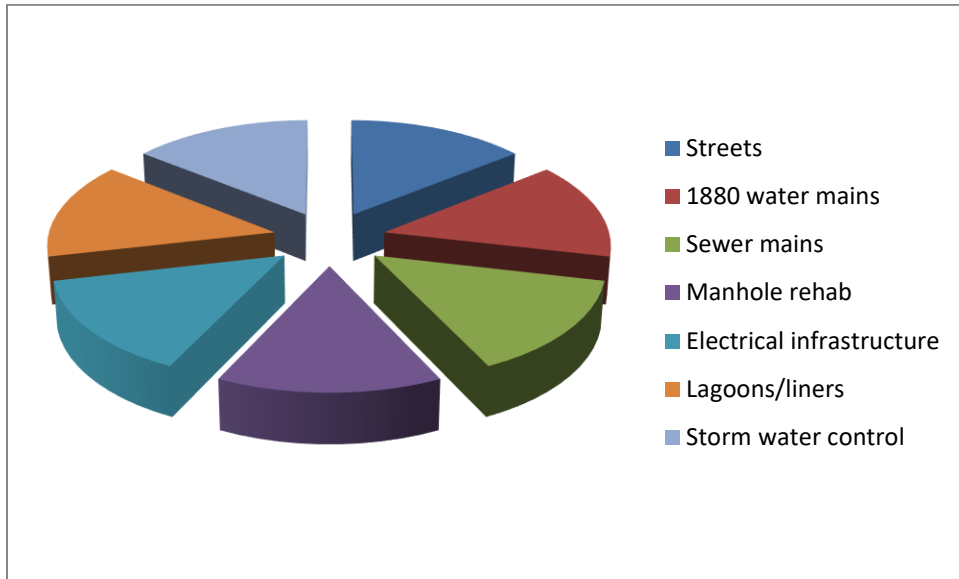
Manhole revitalization

Sewer is \$1 million – this funding has been specifically earmarked issues with liners in the future. Prevention

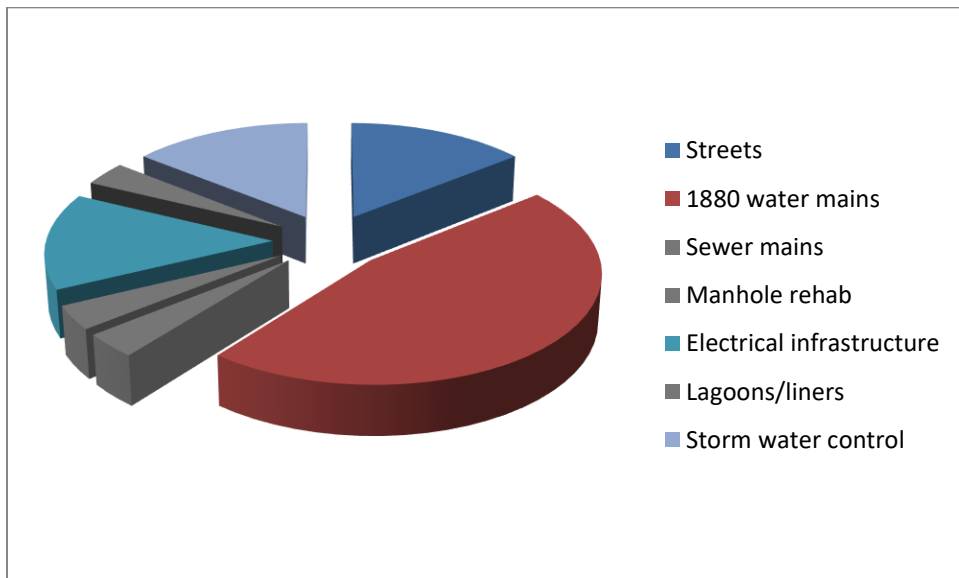
One aspect to research more is floating lagoons. Floating lagoons have a prefabricated foundation with plants on top and the root system below in the water. Floating lagoons have shown to reduce toxins by 7% and expedite the breakdown of solid waste.

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.

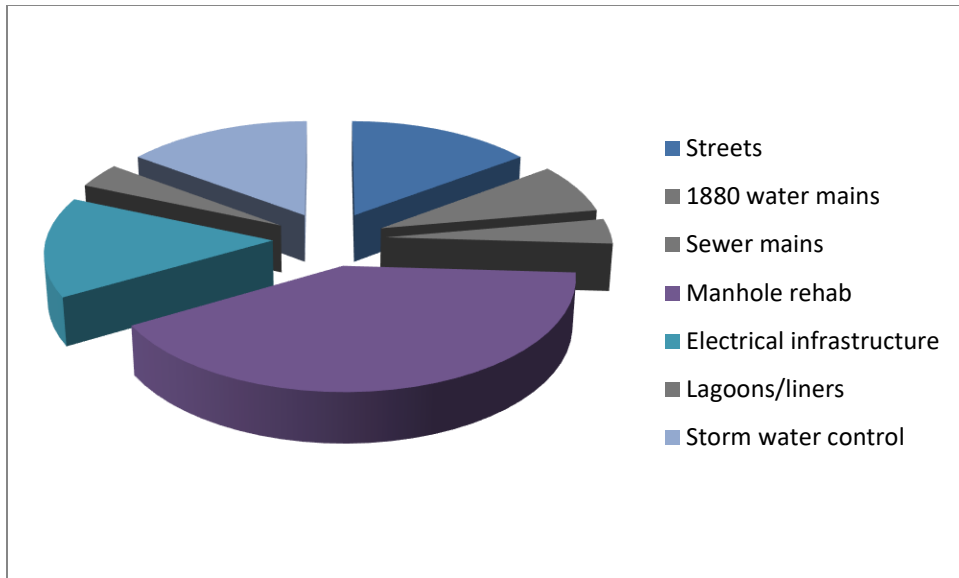
Scenario graphic of funding allocation and project concentration



*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. By strategically allocating funds toward a specific project it 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.

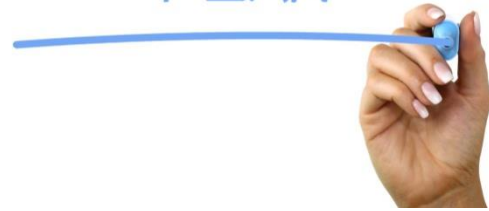


The above graph is a representation of how budget allocations could look when the 1880 water main projects are complete. Notice this continues to maintain the electrical infrastructure, 150K street project, and leaving more focus for water mains than for lagoon liners and sewer mains but still allows 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 leveraging them for other infrastructure projects seems appropriate.

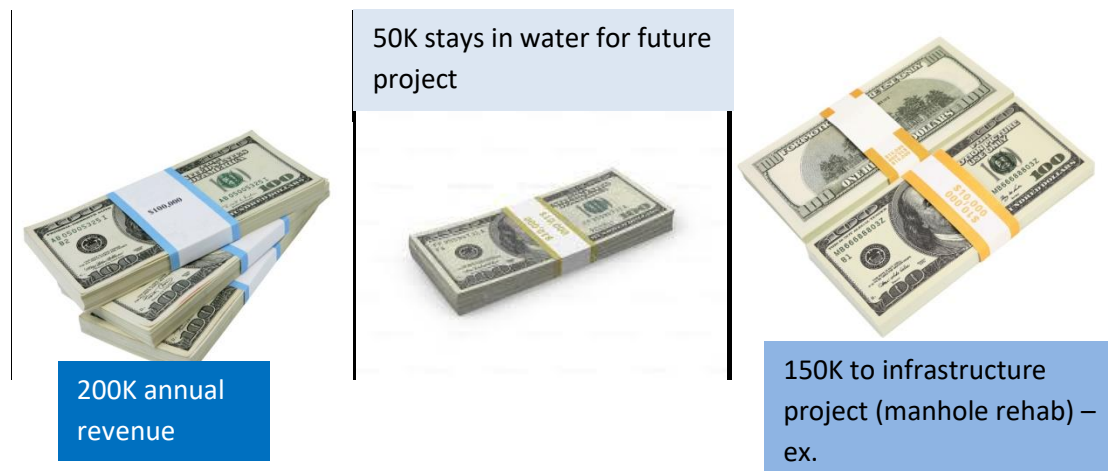
Again, these are options for the council to select, the flexibility of this model enables to council to adjust to the needs at a given time.

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.

CONTINGENCY PLAN



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



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 poles and line changed this year. For perspective prior to 2016 the average annual pole replacement was 8 poles, now it is about 75. This is only possible with the council's continued support of infrastructure improvement. With these great improvements Oberlin still has



approximately 55% of poles in aging condition, which is down 10% from last year. 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 creates:

- 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 kilowatts, leaving 2.5 million kilowatts 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 infrastructure 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 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 reduce kilowatt loss take top priority. 2019 does not show much improvement primarily due to the latest quadrant of line replaced and IES completing a 2



year project in 2020. As the electric department continues with upgrades it can crossover with economic development, companies will assess the reliability and availability of electric already in place. Quality infrastructure dramatically reduces start-up costs, making Oberlin more attractive for new and existing business.

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 time of electrical outage as a measurement 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 are 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 council's discretion.

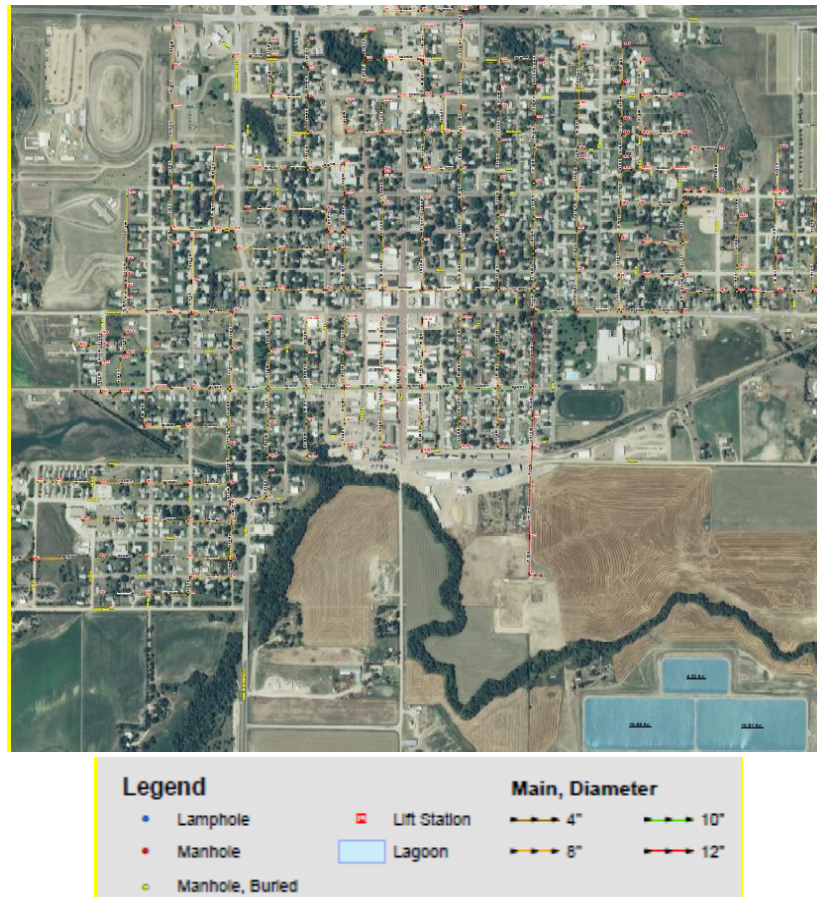
Energy study projects are anticipated to have a direct impact on the amount of electricity the purchases, and reduce this overall cost. This will also free up additional funds for projects. This is especially true if alternative energy models work as anticipated.

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 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





Above is a picture highlighting the sewer mains in Oberlin. The primary focus of the sewer and waste water 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 has 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 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

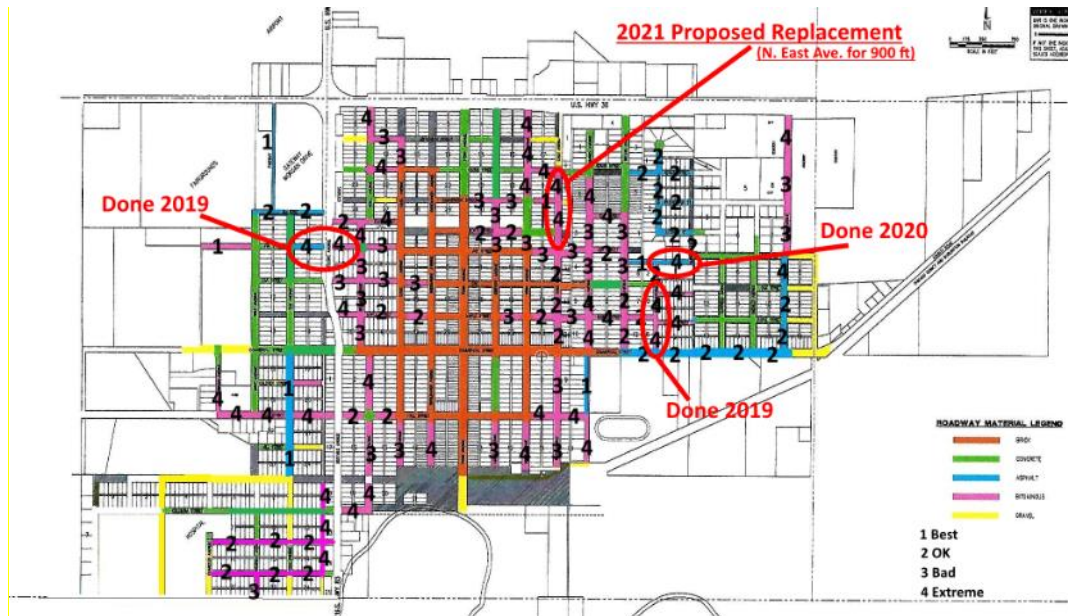
While this infrastructure system is working, it requires additional maintenance than what is typical to keep a sewer system operational. Even with this setback the sewer infrastructure system is at a higher operational level than others.

The hope is the system will continue to perform as it is now and dictate attention or funds to be redirected to other infrastructure projects. During this time a portion of revenue generated from sewer should stay with sewer and matching funds will be available for a major project.

The timing of above scenario would play a factor, when 1880 water mains are completed and portion of revenues staying with water surplus funds can be directed toward 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 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 a 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 non-revenue generating infrastructure system. The past three budget cycles have had \$150,000 dedicated toward street rehab. It is recommended this continues and is increased whenever possible.

Condition: streets are in poor condition.

Dirt roads: Oberlin is responsible for some dirt roads within the city limits as well. This year there is a concentrated effort to address these roads. All of the moisture this year has been incredibly taxing on these roads, and a longer wet season has prevented typical maintenance, the crew will be playing catch-up with these dirt roads.

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

Water main dirt road

This is a primary example of an infrastructure project being imposed on the city. With the extremely low temperatures and high winds it caused air release valves to freeze, which in turned caused a water leak. The water crew worked all weekend to cover the main back-up to protect it from freezing. This is an example of failing infrastructure costing more in materials and labor to maintain. In the last 5 years this main has been exposed and visable twice. The council included this road rebuild in the 2020 budget. The project has turned out to be more complicated than originally anticipated. Miller & Associates is working on a plan to include engineering specifications to ensure steep enough grades, and ditch construction to have required drainage.

Condition: dangerous, not only for the protection of the water main but for traffic as well.

Project crossover: water mains – the fix does not improve water main functionality but is imparative for the entire system to have this road repaired.

Repair recommendation: build-up the new road, with proper packing, gravel, road pitch, grading, and ditch construction.



Water main dirt road

Miller & Associates are working on engeeniring plans for the construction.

When engineering plans are completed then a call for bids will be made public for council's review.

Be prepared to move remaining funds to 2021 for project completion.

Storm water control

Storm water and drainage quickly becomes 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 has 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.

Above is a picture of how the height of the road impedes drain access.



Other aspects of storm water 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 storm water drainage, especially when winters have the weather we experienced this year with rain and snow. Having a snow ordinance that is easy to

implement and for the public to understand will greatly assist with storm water 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

This year the city saved \$45,000 on a power factor study and the council decided to use the saved funds to have a storm water drainage study conducted. Miller & Associates are performing the study and results will be presented to the council. The hope is dovetail storm water projects with street replacement projects.



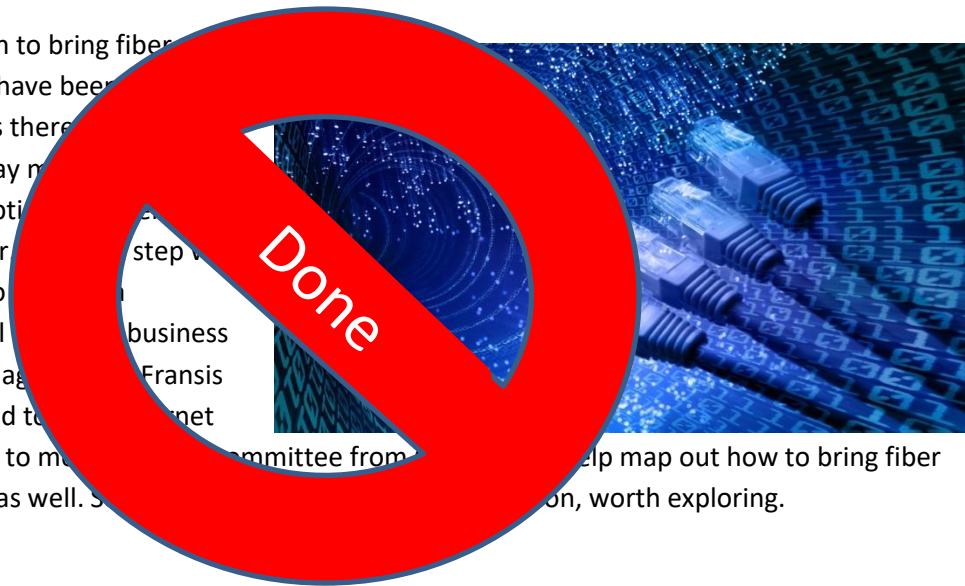
Additional saving/planning initiatives

Gateway/Building maintenance: The damage from the hailstorm addressed a lot of building maintenance for the city. This damage also highlighted there is no real plan in place for regular building maintenance. Energy efficient upgrades have been to the Gateway through performance contracting to get needed maintenance type of improvements without any upfront outlay.

Sappa Park road: The council has already started saving for the needed road work within Sappa Park. Last year \$5,000 was earmarked for this project. It is recommended to allocate more surplus funds to this project at the end budget years if possible. There have been conversations with major road crew companies to find ways to tie this project into another they might be doing in the area to cut down on mobility cost.

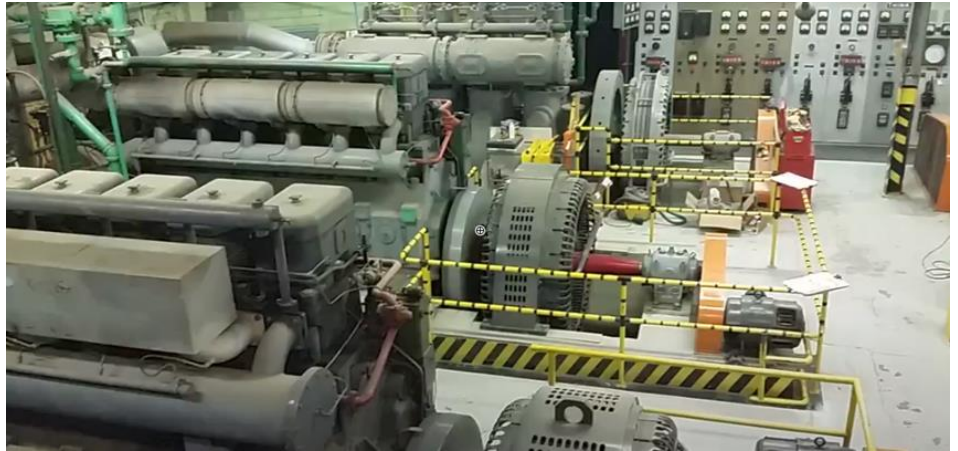
Fiber internet

The efforts put forth to bring fiber internet to Oberlin have been going. Good news is there has been some head-way made. There might be a viable option to work with a local provider. It might be for the council to take this step with a business committee. This will be an item on the council agenda. Francis has recently updated the fiber map and they are willing to meet with the committee from Oberlin to help map out how to bring fiber internet to Oberlin as well. So, worth exploring.



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 there of 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 serves 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 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 emergency only with KDHE and only allowed to run the power plant intermittently (outside of an emergency) making training even more unattainable.

The Green New Deal: This is simply anyone's guess. Since our nation still doesn't seem to be 100% set on the President elect a swing for Presidential Candidate Joe Biden could prove especially troublesome for Oberlin's power plant. Questions in the not to distant future for the Oberlin city council to contend with are what do with power plant, does the town need/want a power plant, if the decision is to have modern power plant how would it be paid for? The power plant issues are all difficult and if the community does not set the course either, obsolescence or legislative restrictions will and this could easily leave Oberlin with a huge expense and no plan, and no safety net in a power plant.