Infrastructure In-sourcing Feasibility Study

Department of Public Works

May 31, 2018

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Executive Summary

On December 19, 2017 the Common Council adopted Resolution File Number 171384 requiring the Department of Public Works to study the feasibility of performing infrastructure repairs and improvements using City staff.

This study has endeavored to identify and to quantify the resources that would be required and determine if it would be in the City's best interest to end its practice of using contractors for the construction of infrastructure projects. Evaluating the ability of the City to self-perform projects provided an excellent opportunity to evaluate past project implementation decisions. It has been a valuable exercise to challenge or confirm the assumptions that were used to justify utilizing contract forces to improve City infrastructure. The study also identifies challenges, barriers and risks the City would face if it were to implement a comprehensive in-sourcing initiative. Based on the information gathered and reviewed, it does not appear as though such an initiative would be beneficial to the City and it's residents.

The primary challenge that the City would face in implementing a large scale in-sourcing initiative for infrastructure projects is the financial limitations that the City currently faces. Levy limits imposed by the State of Wisconsin will constrain the number of employees that can be added to the City's operational budget. Although much of the construction work contemplated can appropriately be funded by issuing bonds, the additional administrative staff that would be required to support a significantly larger work force would be added to the City's O&M budget. As a matter of policy, the Common Council would need to decide whether to increase the tax levy which could jeopardize expenditure restraint funds from the State, or to reduce staff and services in other areas.

The City's capital budget also presents challenges. The amount of capital investment necessary to implement a comprehensive in-sourcing program is out of alignment with the City's long term debt management plan. To avoid escalating future debt service payments, the City's 2018-2023 Capital Improvements Plan (CIP) has established an annual target for levy-supported borrowing of $78 million. Issuing debt substantially above the target will result in unsustainably high debt service payments. A comprehensive in-sourcing initiative would require the purchase of over $62 million of construction equipment and the investment of nearly $88 million in new facilities. To accomplish this initiative while remaining within the CIP's levy-supported borrowing targets, nearly all levy-supported capital spending would need to be reallocated from existing projects and programs and dedicated to the construction of new facilities and the purchase of new equipment for at least two years. Levy supported programs include the local paving and other street related programs, major building projects such as the construction of new libraries and the repair of the City Hall Foundation, the replacement of critical IT infrastructure throughout the City, the purchase of fire fighting equipment, the maintenance of City owned *in rem* properties and many others. The delay of planned capital investments would have an extremely detrimental impact on the City's infrastructure, and would likely have unintended negative consequences for City residents.

The operational challenges of an in-sourcing initiative are not insignificant. The City awards contracts for hundreds of projects each year. The City currently lacks the expertise and staff required for effective project coordination, site logistics and scheduling on that scale. The efficient management and

utilization of hundreds of new employees and dozens of pieces of equipment on weather dependent projects will present an enormous daily challenge.

Although the fiscal challenges faced by the City make a comprehensive in-sourcing initiative fiscally and operationally unfeasible, some of the programs examined as part of this analysis warrant further study to determine whether it may be cost effective for City forces to take on some work currently performed by contractors. For example, the initial analysis indicates that there may be opportunities for Water Works staff to replace the utility-owned portion of lead service lines. It appears that with a modest investment in equipment and the addition of three crews, Water Works may be able to perform the work at a lower cost than contract forces. Water Works is requesting the additional equipment and position authority in the 2019 Budget. If a more detailed analysis shows that Water Works can complete this work more efficiently than contract forces, it will be included in the 2019 Proposed Budget for Common Council review and approval.

The Department will continue to evaluate its programs and activities to determine the best and most cost effective way to utilize the resources it has been allocated.

Methodology

The Department of Public Works utilized internal staff to collect data, review policies and formulate estimates. DPW partnered with staff in the Department of Administration and the City Clerk's Office for additional research and information review.

DPW began by identifying all of the work that is currently being contracted out. In some instances, a portion of the work is completed by department staff, with the remaining portion being performed by contractors. The department reviewed the amount of work that has been performed by contractors on the City's behalf for the last five years. Personnel and equipment estimates were developed as described below. Ancillary costs for equipment operation, maintenance and storage were developed using historical information from the City's current fleet and recent facility construction projects.

Although some equipment and personnel may be used by more than one department, for the purposes of this report, the needs of different operational areas were considered separately. The operational and budgetary re-organization of the Department of Public Works that would be required to minimize the number of new employees and the purchase of new equipment is beyond the scope of this study.

Approximately 15% of the identified private sector job titles do not have corresponding job titles in the city's position and salary ordinances. These titles would need classification studies by DER and Common Council approval. The cost of those studies and related legislation has not been included in this study.

Work and Productivity

The department defined the quantity of **Work** required to be performed, typically on an annual basis, for various types of projects. Units of work vary with the type of project.

Productivity was developed for each type of work using evidence from time sheets, inspector's reports, and interviews with construction managers and contractor. By utilizing time sheets and inspector's reports, emphasis was placed on avoiding overly optimistic rates.

The number of **Available Work Day**s was taken from a WisDOT published figure of probable work days in a given year. The figure accounts for typical production delays due to inclement weather and holidays. While some of the projects evaluated by this study can be performed year-round, there are certain activities that are less likely to be performed in the winter months. Thus the number of probable work days for those crews were adjusted accordingly. An adjustment factor of 0.85 was used to account for work absences such as vacation, sick leave, and injury.

Using Work, Productivity and Available Work Days, the department calculated the number of **Crews** that would be required on an annual basis for each type of project. Using historical job site information, the staffing and equipment requirements for each crew were developed.

Personnel

Using historical job site information, a list of private sector position titles was created. Corresponding job titles and pay ranges in the city's position and salary ordinance were identified. The minimum, maximum and mid-point in each pay range was charted for each position. For positions that do not

currently exist in the Salary Ordinance, data from the Economic Research Institute was used to find the mean salary for the Milwaukee area. For the small number of positions where reliable salary data was not available, private sector job postings were used to estimate the salary range. Indirect and fringe benefit cost were calculated by the Comptroller using the generally accepted practices currently in place for developing the annual City Budget.

Indirect and fringe benefit costs for personnel are based on past experience and reflect current budgeting practices. If the City were to hire a large number of new employees, the actual costs incurred for their benefits, pensions, and new facilities etc may be significantly different on a per employee basis than the current calculation reflects.

Equipment

Using historical job site information, a list of capital equipment for each type of crew was developed. Cost estimates to purchase new equipment were developed. For equipment types already in DPW's fleet, costs were based on past purchases. For other equipment information was generally taken from manufactures' literature and websites. Additional equipment costs for repair and maintenance were based on DPW Fleet's experience.

Facilities

Using historical information, DPW has estimated that in-sourcing its capital projects would require hiring approximately 900 employees and purchasing approximately 550 pieces of capital equipment. The City does not have existing facilities to accommodate the additional employees and equipment. DPW estimates that it will need additional shops, garage space, heated storage, unheated storage, office space, vehicle wash and prep areas, a fueling station and a soils canopy. The office/support areas include offices, open office workstations, conference area, toilet rooms, locker rooms, break rooms, and storage areas for approximately 900 employees.

The area required to accommodate staff and equipment was based on the 2004 construction of a similar facility on N. 35th Street. Construction costs were developed using RS Means data and are based on industry standards. The capital cost estimate also includes site development, project design, project administration, utility alterations, the extension of data/communication conduit and a 5% contingency.

Building site and maintenance cost estimates were developed using industry standards. Energy costs were estimating based on the annual gas and electric cost for the facility at 3850 N. 35 St.

The facility cost estimate does not include:

- Land purchase
- Environmental Testing
- Remediation
- Demolition
- Shop equipment

Supporting documentation can be found in the appendix.

Cost Comparison Challenges

The fundamental challenge is the inability to make direct cost comparisons between a well-established private entity and a municipal government. When the City contracts for a project, it is relatively easy to determine the city's cost for the project. The City makes payments to the contractor for an agreed upon amount. The City's financial management system can identify ancillary costs incurred by the City. The sum of these amounts is the total cost of the project. Private companies are not required to share detailed cost and profit information. Their corporate structure, ownership, overhead and motivation for bidding on public projects can vary considerably and have a significant impact on the bids they submit. The City has no way to know whether the payments received from the City covered the contractor's costs for the project.

In addition to having limited cost information from the contractor, the development of full cost estimates requires the use of multiple assumptions. Many of the assumptions were formulated with limited information or based on variables which are largely out of the City's control. Where possible a range of values was identified, and a moderate to conservative value was used for the cost calculation. For example, the study identified salary ranges for each job title. The midpoint of each range was used to calculate the estimates salary cost. Actual salaries would be dictated by the labor market and may vary significantly from the estimate.

In some cases a cost could be identified, but not quantified in a meaningful way. Examples would include increases in unemployment insurance, changes in workers comp claims, project damages and claims against the City. Because the City has little or no relevant historical basis for determining these costs, the estimates would be little more than speculation and this study has refrained from including them. The final report has attempted to highlight items that were not included in the cost estimate but that should be considered if the City were to move forward with an in-sourcing initiative.

This chart details some of the ways in which costs may differ between the City and a private contractor. It also identifies some of the limitations of developing internal cost estimates.

Cost Comparison Issues and Challenges		
Issue	**City of Milwaukee**	**Private Contractor**
Unit /Bid Prices	It is difficult to develop consistent unit prices for infrastructure projects because of the variability between projects. A project's length, location, complexity, and priority all contribute to the overall cost of the project.	Successful contractors often bid strategically to retain staff, maximize profits and gain market share. Over the course of a construction season, a contractor will generally be profitable, but bid prices on individual contracts do not necessarily reflect the contractor's actual costs.
Project Selection	The City develops its programs based on the requirements of its infrastructure systems. There is great variability between projects. In order to self-perform, the City must hire staff and purchase equipment to complete all the projects on its program.	Contractors have the ability to specialize. They review projects offered for bid and can choose the ones for which they are well suited or that are likely to be profitable.

Capital Expenditures	Self-performing construction projects will require a significant capital investment. For equipment used on a regular basis, the annual depreciation cost could be comparable to what a contractor would pay. However, the larger, more specialized equipment will only be used intermittently. The depreciation would result in excessive project costs.	Contractors bidding on City projects already own the equipment that they require. Because construction is their core competency, they can spread the cost of equipment over a larger number of projects.
Material Cost	The City will have to purchase materials from private suppliers. It is unknown, although in some instances it seems likely, if the City would be purchasing in quantities large enough to secure favorable pricing.	Contractors generally purchase construction materials in large quantities and have established relationships with suppliers. Larger quantities generally allow more favorable pricing. Contractors may also be vertically integrated. This would allow them to get materials at cost. The contractors bid price for materials may not reflect the contractor's actual cost – making it difficult to make cost comparisons with City prices.
Material Disposal	Many infrastructure projects produce construction waste in the form of old pavement, dirt or gravel. The City does not own the facilities necessary to dispose of or recycle these types of materials. The cost of disposal has not been included in this study.	The disposal of materials is included in the contract price. Contractors may own disposal or recycling facilities which allows them to recoup some of the cost of hauling the spoils from the project site.
Productivity	Because the City has not performed construction work before, City forces will not be as productive or efficient as contractors. DPW has made some reasonable assumptions about initial productivity rates, but even small variations in the actual productivity rate could cause significant cost differences. Experience will bring productivity gains, but how long that will take is also unknown. It is expected that early season productivity will be lower because new employees will need to be trained.	The contractor has experienced workers, and therefore will be more productive and efficient than City crews. The contractor is not limited to projects in the City of Milwaukee and therefore has the ability to extend the construction season for employees by taking various kinds of work in other locations. This minimizes skill loss over the winter season
Hiring	The City's hiring process can be a lengthy. Position approval, recruitment, testing, interviewing and hiring can be a lengthy process. With proper scheduling, it may be possible to begin the construction season fully staffed. However, at the beginning of the construction season the City will be competing with area contractors for staff. If the hiring process experiences any delays,	Contractors may have a much less formal hiring process, allowing them to staff up much more quickly. Because they are not limited to projects in the City of Milwaukee, their construction season may start earlier giving them an advantage in the labor market.

	the City may be unable to attract enough staff to complete its projects. Turnover during the construction season may create vacancies that cannot be filled before the end of the construction season and which will delay projects.	
Training	It is unknown if the City will be able to recruit enough skilled workers – and may have to invest significant time and money in training programs. The cost of training programs has not been included in this study.	The training expenditures and schedules for private contractors are not publicly available.
Employee Benefits	The City offers generous vacation, holiday, sick leave, health care and pension benefits. Decisions regarding the seasonality of new employees could greatly affect the cost of providing benefits.	Contractors may have more flexibility in their pay scale and the structure of their compensation packages. Overall compensation information is not publicly available for comparison.
Support Services	The City does not currently have the capacity to provide support services for a comprehensive in-sourcing initiative. Necessary resources include project management and coordination, employee supervision, payroll and human resources, vehicle repair and maintenance, and the construction of new facilities. Without historical experience, accurately allocating the cost of additional support services to particular projects is difficult.	Most of the contractors bidding on City projects are reasonably well established. They have support systems in place for contract administration, payroll and human resources etc. The contactor will incur no additional costs. They have historic data which allows them to accurately include the cost of support services in their pricing.
Unemployment Insurance	The City has some seasonal employees, but has never laid off employees on the scale that an in-sourcing initiative would require. The timing and number of the layoffs could dramatically affect the City's cost for Unemployment Insurance. It may be years before the true cost can be determined.	Most contractors have established patterns for seasonal layoffs and can predict the cost of Unemployment Insurance with reasonable accuracy.
Workers' Compensation	The construction of infrastructure projects is a new type of work for the City. It is more hazardous than many of the jobs currently performed by City staff. This could dramatically affect the City's costs for Workers' Compensation insurance. Because there is no experience, it may be years before the true costs are known.	Most contractors have a track record for Workers' Compensation claims on the type of projects for which they bid. This allows them to predict their costs with reasonable accuracy.

Outsourcing vs In-sourcing

The objective for the City of Milwaukee is to enhance the value that can be generated by its activities and maximize the use of limited resources. It is important to consider the suitability and feasibility of any method of project implementation. Using the appropriate method to perform operations or implement projects can reduce costs and increase performance. It can also result in greater responsiveness, job creation, and other benefits.

The most common terms used to describe when an organization performs operations or activities with its own employees are "in-sourcing" or "self-performance". The Wisconsin Administrative Code uses the term "force account work" to describe construction, or other project-specific activities performed by municipally paid employees, or using equipment owned by a municipality. "Outsourcing" is the process of delegating an organization's operations or activities to third parties or external agencies. Outsourcing can leverage benefits ranging from low cost labor and improved quality to product and service innovation.

Most organizations use some combination of in-sourcing and outsourcing based on their particular circumstances. There are many factors that influence performance choices. An organization's objectives and constraints will determine which factors are the most influential.

Legal Requirements

Any decisions regarding project or service delivery must take into consideration the legal requirements of the market in which the organization operates. This could include statutorily required services or restrictions on funding sources that require certain modes of delivery.

Example

The Clean Water Fund Program (CWFP) and the Safe Drinking Water Loan Program (SDWLP) are revolving loan programs that combine federal grants and state funding to provide financial assistance to municipalities in the form of subsidized loans. The CWFP can be used for wastewater and storm water projects. The SDWLP provides funding for drinking water projects. The City has received millions of dollars under these programs.

Implementation details for the Safe Drinking Water Loan Program and the Clean Water Fund are outlined in the governing Wisconsin State Statutes and Administrative Codes: (ss. 281.58 and 281.59 and 281.61, Wis. Stats. and chs. NR 162 and 166, Wis. Adm. Code). Except in limited circumstances, NR 162 does not allow "force account work" which is defined as construction, or other project-specific activities performed by municipally paid employees, or using equipment owned by the municipality. **The state requires that most infrastructure work funded by the SDWLP or the CWFP be performed under contracts or subcontracts awarded by the recipient of the funds.** The state may seek financial penalties if the City violates provisions of the CWFP or the SDWLP.

Effect on Core Functions

Every organization has core functions and operations. Outsourcing can allow an organization to focus on its core operations and processes, and redirect internal resources toward mission critical activities. By delegating responsibilities to external agencies, organizations can be relieved of functions that are difficult to manage and control, while still realizing the benefits of those operations.

Example

The mission of city government is to enhance the safety, prosperity and quality of life of all City residents. The City is committed to delivering services at a competitive cost and being responsive to the needs of its citizens. The strategic use of outsourcing can help the City focus on planning efforts and allow it to remain nimble enough to respond to emerging challenges.

Effect on Operating Costs

Lower operational and labor costs are among the primary reasons why organizations choose to outsource. When properly executed, outsourcing can deliver significant savings. Operational savings may be related to payroll, administration, human resources, maintenance, equipment, and utilities.

Example

The purchase of additional excavation equipment for sewer and water main projects will have a significant capital cost. In addition to the capital cost to purchase the machines, **the cost of maintaining, transporting, operating and storing the machines will increase the City's operating budget.** Some of the additional costs such as fuel, fluids and transportation costs will vary with the use of the equipment. Other costs, such as the construction of vehicle repair bays and garage space, are one-time, fixed expenses. Still others, such as the additional vehicle repair technicians and utility costs for garage facilities, will be permanent, ongoing expenses.

Seasonality of Workflows

Seasonal fluctuations in work load can be challenging to manage. For some projects and activities, the volume of work is cyclical or intermittent, and during certain periods it may exceed the capacity of the regularly appointed staff. In most situations, it is not cost effective to staff for peak production periods. Outsourcing can be an effective way to manage peak workloads without incurring long term costs. Contractors may be used in peak periods to complete projects in a timely manner, while minimizing the overall cost.

Example

Street paving projects utilize materials that are sensitive to temperature extremes. The peak paving season in Milwaukee generally runs from May through October. DPW would not be able to complete the projects on its paving program without approximately 75 additional staff in the summer. **In the winter, however, the department would be significantly over-staffed** unless it laid workers off.

Staff Availability

Staffing is often a primary consideration for project implementation. An organization needs to have sufficient staff to implement projects. However, it can be challenging to maintain adequate and stable levels of staffing. Worker mobility is increasing at a rapid rate leading to historically high levels of turnover in many industries. Tight labor markets for skilled positions may extend the amount of time it takes to fill internal positions. Benefits provided to full time, internal staff such as paid vacation, holidays, sick leave and family leave can also create temporary staffing shortages.

Outsourcing can help maintain critical workflows on a temporary basis. Outsourcing can also be especially effective if the project or activity will need to be ramped up in a relatively short time or if it requires high manpower resources.

Example

The number of traffic signals in the City has increased by nearly 40%, resulting in a much higher volume of replacement and maintenance activities. Controllers for traffic signals and street lights are more complex and require more time to install. Regulatory changes related to the Americans with Disabilities Act require the Department to install or retrofit accommodations in various public facilities. Timely performance ensures public safety and regulatory compliance. **Contractors are used to supplement the efforts of City staff** to ensure that necessary activities are performed in a timely manner.

Professional Expertise/Experience

Contracting can provide access to a broad range of knowledgeable professionals with extensive experience in their respective fields. This is especially true if the nature of the project or activity is short term in nature, highly specialized or required infrequently.

Example

City Hall is an historic building supported by wood pilings which have begun to rot. Differential settling which, if left unaddressed, would compromise the integrity of building, was observed. The City hired a consultant to analyze the building, design a solution and perform the work. **The consultant assembled a multi-disciplinary team** of professionals from around the country **many of whom have experience working on similar projects**.

Access to new technology and equipment

The Research and Development (R&D) of new materials, processes and technologies, is time consuming and expensive. Outsourcing allows organizations to tap into and leverage an industry-wide knowledge base and gain access to resources that are not available internally. If an organization operates in many different sectors, it is especially difficult to stay current with industry best practices. Using current best practices can improve product quality, extend project life, and lower overall costs.

The utilization rate for new equipment or technology is a primary consideration when choosing a project implementation method. One of the advantages of using contract labor is that it avoids the upfront cost

of purchasing equipment. This is an especially important consideration for equipment which is only used for very specialized tasks or is required for projects and activities that are performed infrequently.

Example

The City's streets are constructed of either asphalt or concrete. Over the last decade, the City has transitioned most of its Local Paving program to asphalt. Only a few projects are constructed in concrete each year. Paving a street with concrete requires a specialized piece of equipment for the pavement and another machine to construct the curb. **If the City were to purchase the necessary concrete machines, they would sit idle for most of the year.** In addition to the capital cost to purchase the machines, the cost of maintaining, transporting, operating and storing the machines will increase the operating budget.

Proprietary Knowledge, Expertise or Equipment

Contracting can be used to give the department access to expertise or technology that is proprietary in nature. Companies that invest in research and development may try to maximize their profits by limiting the use of the product, equipment or technology they develop to franchisees or licencees.

Example

DPW utilizes sewer lining as a cost effective means of extending the life sewer mains. **The lining materials and the installation technology are provided by a licensee of the manufacturer**.

Risk Management

Risk mitigation is often among the primary considerations for project implementation decisions. All projects and activities contain some level of risk. Risks can include natural calamities, accidents, technical crises or negligence. Contracting transfers risk to a third party. The contractor assumes much of the risk related to employee safety, property damage, construction errors, materials or poor workmanship.

When a contractor accidently causes damage to property during a construction project, the contractor alone is liable for the cost of repairing the damage. If the City were to take over construction activities from contractors, the City would be responsible for the cost of any necessary repairs. The use of contractors to limit an organization's exposure to liability is especially advantageous when the potential for loss is large.

The Department of Public Works does not have the authority to determine the City's liability and risk mitigation policy. The City currently self-insures in most circumstances. Therefore, the cost of purchasing liability coverage has not been included in this analysis

Example

In May 2017, a contractor working on a City project damaged an underground telecommunication line. Internet, landline and wireless services for dozens of businesses were interrupted. Repairs took nearly a week. **The cost to repair the cable, restore services and compensate businesses for their losses was paid for by the contractor.**

Labor and Business Markets

Consideration must be given to local business and labor markets. If there are not enough bidders for effective completion, it is unlikely that cost savings will be realized by outsourcing. If there is a shortage of local labor, in-sourcing may be less advantageous. Changes to established project implementation methods can have a broad impact on the affected markets. Market alterations that are counter to the organization's interest may occur.

Example

The City operates of number of programs whose purpose is to increase opportunities for small, locally owned and disadvantaged businesses. **Many small businesses have found success working as subcontractors on City infrastructure projects.** If the City were to self-perform infrastructure projects, these businesses would lose a major revenue stream. It is likely that many of the companies would go out of business or leave the City.

Policy and Political Considerations

An organization may have ideological preferences that affect project implementation decisions. When choosing whether to in-source or outsource a project or activity, an organization should consider whether its choices will advance the organization's objectives.

Example

The City has invested millions of dollars improving the access of City residents to family supporting jobs through its Resident's Preference Program. Self-performing infrastructure projects **would reduce the City's ability to influence employment opportunities for City residents.**

Capital Construction Equipment

The Department of Public Works currently owns and maintains a wide variety of vehicles and equipment. A comprehensive in-sourcing initiative would require the purchase of a significant amount of new construction equipment. The proper use of the appropriate equipment contributes to economy, quality, safety, efficiency and timely project completion.

Using historical program information, the Department estimated the number of crews that would be necessary to perform the anticipated amount of programed projects and then itemized the pieces of capital equipment that would be required.

Equipment costing more than $10,000 was included as a capital cost. For equipment types already in DPW's fleet, costs were based on past purchases. For other equipment, information was generally taken from manufactures' literature and websites.

It is anticipated that most construction equipment would be purchased with levy-supported borrowing. Interest rates are market driven and based on the timing and specific structure of each bond issue. The capital cost estimates in this study reflect purchase prices. Interest costs are not included.

Although some equipment may be used by more than one section in DPW, for the purposes of this report, the needs of different operational areas were considered separately. The operational and budgetary re-organization of the Department of Public Works that would be required to minimize the purchase of new equipment is beyond the scope of this study.

In total, approximately 550 pieces of additional capital equipment, with an estimated purchase price of $62.1 million would be required.

Two of the largest categories of construction equipment are excavating equipment and loading and hauling equipment. DPW estimates that it will need nearly 80 additional pieces of excavation equipment, including nearly 50 backhoes in various sizes, 10 Gradalls, a grader, a bulldozer and six hydro-excavators. The estimated purchase price is $17 million. Approximately 200 pieces of loading and hauling equipment would be required. This includes 90 dump trucks, 11 loaders, 26 skid steers, approximately 20 flatbed trucks and trailers, and 26 enclosed trailers for the storage and transport of tools and equipment. The estimated purchase price is $20.4 million. **For reference, major equipment types are identified and illustrated in the section below.**

Many of the vehicles identified in this study will be used by crews of skilled tradesmen such as masons, welders, and plumbers. Each trade requires specific tools and equipment. The cost of the specialized tools and equipment has not been included in the vehicle purchase price.

The size of the City's existing capital fleet varies each year, but it averages around 825 pieces of equipment. The value is approximately $145 million. Each year the department requests approximately $13 million to address replacement needs. The City's sustainable capacity for new levy-supported borrowing is $78 million. The replacement needs of the existing fleet represent 17% of the planned borrowing capacity. Other infrastructure priorities have limited Fleet's annual allocation to $6.4 million on average, roughly half of

its request. As a result, the average age of the fleet has increased from 9.3 years in 2009 to 12.5 by 2017

The addition of 550 pieces of equipment would increase the size of the capital fleet by nearly 70%, placing additional, long term presssure on the capital budget to support an adequate replacement cycle.

A list of estimated equipment needs can be found in the appendix.

Excavation Equipment

Backhoe

A backhoe is a hydraulic excavator consisting of a two part articulated arm with a digging bucket. They are normally mounted on the back of a tractor or front end loader. They are typically used for digging trenches, holes, and foundations. They can also be used for material handling and building demolition. Various attachments are available which expand their use.
Approximately 50 backhoes in various sizes would be needed.

Gradall

A Gradall is a hydraulic excavator with a telescoping boom. It is similar to a backhoe. It also comes in various sizes.
Approximately 13 gradalls would be needed.

Grader

A grader is a construction machine with a long blade which used to create a flat surface typical models have three axles. For street reconstruction projects, a grader is used to prepare the base course and to create a smooth, flat surface for the new pavement to be placed upon.
Approximately 1 grader would be needed.

Bull Dozer

A bulldozer is a continuous track vehicle equipped with a substantial metal plate called a blade. It is used to push large quantities of sand, rubble, or other material.
Approximately 1 bulldozer would be needed.

Hydro-Excavators

A hydro-excavator is typically a 3-axle truck with a large tank mounted on the back as well as a vacuum hose. It is used to excavate in areas which are congested with utilities and digging with a backhoe is not practical. **Approximately 6 hydro excavators would be needed.**

Loading & Hauling

Dump Trucks

These are trucks which are fitted with automatic unloading devices. The rear platform can be raised at the front end to enable the load to be discharged by gravity. The loading is normally done by loading shovels or loader. Dump trucks have varying capacities. Tri-axle and quad-axle are the most common type used on City construction projects.

Approximately 90 additional dump trucks would be needed.

Loaders

A loader is a heavy equipment machine often used in construction primarily use to lift material (such as asphalt, demolition debris, dirt, snow, gravel, logs, recycled materials, rock, sand or woodchips) into or onto another type of machinery such as a dump truck.

Approximately 11 additional loaders would be needed.

Skid steer Loader

Skid steers are typically four wheel, single person vehicles with a long shovel-like bucket on the front. The wheels are mechanically locked in synchronization on each side. The left side drive wheels can be driven independently of the right side drive wheels. Skid steers can be equipped with attachments for breaking concrete or sweeping roadways.

Approximately 26 additional skid steers would be needed.

Trucks and Trailers

Platform/Stake Trucks

Some pickup trucks have a longer bed, high sides and an open top so miscellaneous equipment can be stored properly. These vehicles would be used for water projects and paving projects.
Approximately 6 trucks would be needed.

Flatbed Trucks and Trailers

Flatbed trucks and trailers are used to transport large equipment and materials to the worksite.
Approximately 10 flatbed trucks/trailers would be needed.

Enclosed Trailers

Job site equipment is stored in enclosed trailers to ensure convenient access on the job site and to safe guard it against loss and damage. A typical trailer used on DPW projects is 20 feet long.
Approximately 26 additional trailers would be needed.

Work Shanty

Many public works projects take extended periods of time. A portable office allows for the storage of construction documents and provides work space. Shanties may be required by state/city code.

Pickup Trucks

A pickup is a light duty truck with an enclosed cab and an open cargo area with low sides and a tailgate. Standard pickup trucks can be outfitted with the gear and equipment for a particular trade.
Over 3 dozen pickup trucks would be needed.

Hoisting and Lifting

Forklift

A forklift is used to lift and transport materials. In a typical warehouse setting, most forklifts have load capacities between one and five tons. Larger ones can have a 50 ton capacity. Forklifts would primarily be used for water projects.
Approximately two forklifts would be needed

Bucket Lift

A bucket lift is a hydraulic crane with a railed in platform at the end for lifting people and materials. It is also commonly known as a "cherry picker" or boom lift. Although this type of lift is commonly used on large scale construction projects such as high rise buildings or major hospitals, it has many other uses in the construction industry. DPW uses them for bridge and paving projects.
Approximately 5 additional bucket lifts would be needed.

Mobile Cranes

A mobile crane is a hydraulic powered crane with a telescoping boom mounted on a truck-type carrier. They are designed for easy transport and use with different types of loads and cargo with little or no setup or assembly.
Approximately six 30 ton capacity cranes would be needed.

Passenger Vehicles

Vans

These would be similar to the vans which DPW has for street lighting or electrical repair workers. The model would be something similar to a GMC Savana Cargo Van or a Ford E350 or Transit Van. The van would be outfitted with gear for the trade using the van.
Approximately 28 additional vans would be needed.

Personnel

Staffing Requirements

Using Work, Productivity and Available Work Days, the department calculated the number of Crews that would be required on an annual basis to complete the anticipated amount of programed work for each type of project.

Using historical job site information, the staffing requirements for each crew were developed. Corresponding job titles and pay ranges in the City's Position and Salary ordinances were identified. The minimum, maximum and mid-point in each pay range was charted for each position. For positions that do not currently exist in the Salary Ordinance, data from the Economic Research Institute was used to find the mean salary for the Milwaukee area. For the small number of positions where reliable salary data was not available, private sector job postings were used to estimate the salary range. Indirect and fringe benefit cost were calculated by the Comptroller using the generally accepted practices currently in place for developing the annual City Budget.

The summary of new positions includes only personnel expected to be directly associated with construction projects.

Additional resources will likely be required in the Department of Employee Relations to manage eligibility lists for large numbers of seasonal employees. The cost of additional staff in DER has not been included in this study.

The 2018 Budget provides funding for 1,308 positions in the Department of Public Works in sections that were considered in this study. Authority is also included in the 2018 Budget for an additional 140 auxiliary positions which are unfunded. It is estimated that **the Department would need to hire approximately 900 additional staff in over 70 different position classifications** to complete the work currently done by contractors. This represents a staff increase of nearly 70%. The total cost of personnel expected to be directly associated with construction project is $75.4 million annually.

The $75.4 million in estimated City personnel costs is roughly equal to the combined amount the City typically budgets for sewer main, water main, local and high impact paving, and local bridge projects. Budgeted capital funding covers the cost of both contractor personnel and project materials.

New Position Summary						
	Sewers	Water	Paving	Electrical Services	Bridges & Buildings	**Total**
Number of Positions	176	340	73	199	118	**906**
Base Cost	$8,149,239	$16,562,619	$3,365,275	$9,215,471	$6,164,292	**$43,456,896**
Indirect Cost	$1,577,693	$3,989,935	$739,014	$2,023,717	$1,353,679	**$9,684,038**
Fringe Cost	$4,306,058	$7,787,743	$1,816,912	$4,975,433	$3,328,101	**$22,214,247**
Total	**$14,032,989**	**$28,340,297**	**$5,921,201**	**$16,214,621**	**$10,846,072**	**$75,355,181**

Because many of the construction companies that currently perform work on City projects are relatively small, their organizational structures tend to be flat which helps keep their overhead costs low. The consolidation of all construction activities in DPW would make the City of Milwaukee one of the largest, infrastructure construction operators in the area. The scope and the scale of the projects managed by DPW will require an organizational structure that is taller, with multiple levels of support and oversight which will increase overhead costs.

The department anticipates needing additional, payroll, accounting, purchasing, maintenance, human resources and safety related staff. **Twenty two positions, including 11 Vehicle Services Technicians, with a total cost of $3.1 million annually have been identified**. Because positions not directly related to construction projects should not be funded with borrowing, this would put significant pressure on the City's tax levy. As a matter of policy, the Common Council would need to decide whether to increase the tax levy which could jeopardize expenditure restraint funds from the State, or to reduce staff and services in other areas.

Average Salaries			
	Minimum	**Maximum**	**Mid-Point**
All Position Titles	$52,540	$61,435	$56,987
Titles in the City Salary Ordinance	$51,057	$60,215	$55,636
Titles NOT currently in City Salary Ordinance	$59,271	$66,972	$63,122

Fifty nine of the position titles are currently in the City's position ordinance. The remaining twelve titles would require classifications studies to establish the appropriate salary ranges. Approval for the new titles and salary ranges would be required by the Finance and Personnel Committee and the Common Council.

The average entry level salary for the additional positions is $52,540. The estimated average entry level salary for the newly created position titles is 16% higher than for existing City titles. However, the newly created titles represent only 25 positions, which is approximately 3% of the total positions required. If the two positions (Design Coordinator and Construction Inspection Coordinator) related to the MKE Parks program are excluded, the average salary for the newly created titles is approximately 2.5% above the average salary of existing titles.

A complete list of position titles and salary ranges can be found in the appendix.

Hiring

According to a recent survey by the Associated General Contractors of America, 73% of Wisconsin construction firms reported experiencing labor shortages. The shortage is affecting both skilled trades

and salaried positions. Half of the survey respondents reported difficulties filling management and supervisory positions. The shortage is changing the way firms operate, recruit and compensate. In Wisconsin, about 45 percent of firms reported that they have increased base pay rates and 5 percent have increased benefit contributions or improved employee benefits. This study assumes that the City will be able to hire employees at the mid-point of existing salary ranges. Competitive pressures may require that the City increase the ranges, resulting in long-term cost increases.

Given the increasing demand on the labor market from local construction projects such as the BMO Financial Center and the Couture as well as regional projects such as FOXCONN, **the City may find it difficult to recruit enough workers to meet its needs.**

In recent years, DPW has had difficulty recruiting for some positions. The number of vacancies varies between sections of DPW. (see chart) As of October 2017, there were 104 vacancies in the DPW sections reviewed by this study; this represents 8% of the budgeted positions. The highest vacancy rate (11%) was in the Water Works. The Department's estimate of filling 900 new positions will present a significant challenge to recruitment and retention efforts.

Retention is expected to be especially difficult because **approximately 75% of the new positions are likely to be seasonal.** Each spring, the department will be faced with the challenge of re-hiring approximately 675 workers. Skilled workers who are laid off from the City for the winter may be recruited by contractors whose projects are less weather dependent, making them less likely to return to City employment in the spring.

For many of the projects under consideration, it is critical to be fully staffed at the beginning of the construction season. For safety and quality assurance reasons, infrastructure construction projects often require a minimum number of people on a job site in order for work to continue. The inability to fill positions in a timely manner could result in the delay of projects. This could be especially problematic for the Water Department, which is under orders by the Public Service Commission to increase the rate at which it replaces water mains.

Vacant Positions

As of:	Sewers	Water	ISD	Total
Oct 2017	6	38	60	104
Oct 2016	16	36	47	99
Oct 2015	18	59	52	129
Oct 2014	19	39	32	90
Average	**14.75**	**43.0**	**46.2**	**106**
Budgeted Positions	144	406	758	1,308
% Vacant	**10%**	**11%**	**6%**	**8%**

The City's hiring process poses a unique challenge. The process is intended to provide opportunities for oversight and analysis of staffing decisions. The process is designed to be fiscally responsible, not operationally nimble. Positions cannot be filled without approval from the Finance and Personnel Committee and the Common Council. The Common Council meets on a three week cycle. Once approvals are in place, the Department can receive the names of eligible candidates from the Department of Employee Relations, conduct interviews and offer employment. Even using very optimistic assumptions, it is likely to take between 30 and 45 days to fill any vacancies.

Delays in the process can occur if there is no existing list of eligible employees. The Department of Employee Relations is responsible for developing eligibility lists for each job classification. The amount of time it takes to create each list is highly variable and may take several months. It is unlikely that DER's current eligibility lists contain enough candidates to meet the City's initial hiring goals.

The estimated cost of training programs or apprenticeships that have not been developed yet was too speculative to include in this study.

Delays can also occur if a position becomes vacant mid-season. The Common Council and its committees are in recess during the month of August. As a practical matter, a worker who separates from City employment after July 31 would be difficult to replace before early October. If no eligibility list exists, it would be virtually impossible to fill the position before the end of the constructions season.

Training

The productivity assumptions that were used to estimate the number of crews and personnel that would be required, factored in the lower productivity that would normally be expected at the roll out of a new initiative.

If DPW were to undertake all of the construction projects currently performed by contractors, the City of Milwaukee would be one of the largest infrastructure construction operators in the area. It would also be one of the least experienced. **The labor market in Milwaukee is very competitive right now and hiring experienced workers may be difficult.** If the City hires inexperienced workers, the assumed productivity rates will not be realized and the City's costs will be higher than was estimated. In addition, the City would have to invest a significant amount of resources in training programs. An internal training program could provide employment opportunities for low skilled individuals. The City runs the risk however, of investing heavily in training, only to have workers separate for more lucrative opportunities.

Property and Facility Requirements

In order to accommodate the new City employees that it would be necessary to hire for City crews to perform the work that is currently performed by contractors, the City would need to construct, purchase or lease a number of different types of facilities.

Vehicle Repair Facilities

The City's main repair garage is located on W. Canal Street in the Menomonee Valley. The City also has smaller repair facilities at the Northwest Garage (3025 W. Ruby Avenue) and the Tower Garage (3850 N. 35th Street). The Fleet Services Section of DPW maintains approximately 125 different types of equipment. Its garage facilities service and repair nearly 4,700 vehicles. Vehicle Service Technicians work in repair stalls which are equipped with the tools required for the typical repair and maintenance projects. To properly maintain an additional 550 vehicles, DPW would need to hire 11 more Vehicle Services Technicians (VST).

The current stall space at the Central, Northwest and Tower repair facilities would not be able to accommodate 11 more VSTs. Additional garage and stall space would be required. An engineering consultant would be needed to provide a more detailed cost analysis. However, based on the renovation estimate for the recent relocation of the Parking Division to the Lincoln Facility, the Department has made a **preliminary estimate that an expansion of the Central Repair Garage would cost $7 million.**

Field Building

In 2004, DPW constructed a new Field Headquarters at 3850 N. 35th Street. The facility houses over 500 employees. Hiring an additional 900 employees would require the construction of additional facilities. The study assumed that a single facility would be constructed to house all of the new employees. The study also assumed that the facility would need to be twice as big as the existing facility. Facility costs were determined using industry standards.

The new facility would be a multi-purpose building. It would have approximately 66,000 SF of office space. This area would include offices, open office workstations, conference areas, toilet rooms, locker rooms, break rooms, and storage areas for nearly 900 employees. Shops would occupy 179,500 SF. There would be 124,500 SF of garage space for vehicle parking and 55,000 SF of heated storage. The facility would also have a vehicle wash station. An unheated storage building and a canopy for storing soils would also be required. The total footprint would be about 470,000 SF. The estimated building cost is $58.5 million

The new Field Building would be located on a parcel of about 48 acres. The space will be used to warehouse tools and other inventory. It will also be used to store construction materials and additional equipment. A new fueling station would be constructed to accommodate the increased number of vehicles in the fleet. The site development cost estimate assumes that grading, storm water management, paving, ingress and egress, lighting, sidewalks, signage and landscaping will all be constructed as required by the Milwaukee Code of Ordinance. The total estimated site development cost is $13.1 million

Other additional costs include project design, project administration, and the installation of data/communication conduit. Including a 5% contingency, **the total estimated cost of a new Field Building is $80.9 million.** This estimate does not include land purchase or site remediation.

A detailed breakdown of the estimated costs can be found in the appendix.

Findings and Recommendations

Evaluating the feasibility of in-sourcing capital improvements work currently performed by contractors provided an excellent opportunity for DPW to evaluate decisions made in the past to utilize contract forces. Going through the exercise has been a valuable exercise to challenge or confirm the assumptions used to justify utilizing contract forces to improve City infrastructure.

The primary challenge that the City would face in implementing a large scale in-sourcing of work performed by contractors is the financial limitations that the City currently faces. The amount of capital investment necessary to implement a comprehensive in-sourcing program is out of alignment with the goals of the City's long term debt management plan. The City would need to purchase an estimated $62 million of equipment and invest $87.9 million in facility design and construction in order to implement such an initiative. The target for levy-supported borrowing over the course of the City's 2018-2023 Capital Improvements Plan is approximately $78 million each year. The City limits the amount of new levy-supported debt issued each year in order to manage future debt service payments. In order to accomplish the in-sourcing initiative while remaining within the levy-supported borrowing targets of the CIP, nearly all levy-supported capital would need to be dedicated to new facilities and new equipment for at least two years. In this scenario, for those years in which the City would purchase the facilities and equipment, there would be little to no levy-supported borrowing available for the ongoing capital improvements programs. This would have an extremely unfavorable impact on the City's infrastructure, and would have unintended negative consequences to current City programs and projects.

Some programs examined as part of this analysis warrant further study to determine whether it is feasible for City forces to take on work currently performed by contractors. Specifically, initial analysis by Water Works staff shows that in certain circumstances Water Works crews may be able to replace the utility-owned portion of lead service lines. Currently, Water Works contracts for replacement of the entire service line when the situation calls for a replacement. It appears that with a small investment in equipment and the addition of crews, Water Works may be able to perform the work at a lower cost than contract forces. Water Works is requesting the additional equipment and position authority in the 2019 Budget.

In DPW's Infrastructure Services Division, a crew was added in the 2015 Budget to the Transportation Operations section to repair and maintain the City's electrical and communications manholes. This work had been performed exclusively by contract forces prior to the City crew being formed. Thus far, the program has been a success, with the City crew performing the work more quickly and at less cost than contract forces.

It is important to note that in both of these instances, some work in each program will still be performed by contract forces. Because of the limited construction season in a climate such as Wisconsin's, construction activities peak during summer months. There are times when electrical and communications manholes at several paving projects in different locations need to be repaired or adjusted at the same time. In those instances, the City crews will take on the work that they are able to perform and the additional work is contracted out. In theory, crews could be added so that no contract forces would need to be utilized. However, these "peak work days" where there is too much work for one City crew are infrequent. Adding an entire additional crew and its necessary equipment to manage sporadic peak work days would be an inefficient use of City resources. In situations where workload

peaks on certain days in the construction season or where demand for emergency response spikes, utilizing contract forces can be much more cost effective than having City crews idle when the workload returns to normal.

The limited construction season presents another challenge. If the City were to in-source all work currently performed by contractors, as the construction season winds down in the fall, it would be impractical to keep all construction personnel on the payroll for the winter. This seasonal layoff would be difficult to avoid and it would amplify the current challenges the department faces in recruiting and retaining employees, especially in the skilled trades.

A contributing factor in the current recruitment and retention problem for skilled trades and labor positions is the higher wages that are available both in the private sector and other municipalities. The increase in construction activity in recent years has driven wages up for skilled trade positions. If the City were to take on an in-sourcing initiative, DPW would face the same challenges in recruitment and retention but on a much larger scale. Of the 906 positions that would be required to implement an in-sourcing initiative along the lines of what the Council asked to be examined, approximately one-third would be considered trades or skilled labor. Filling hundreds of new positions at current rates of pay would be very challenging. The costs associated with bringing City rates of pay closer to market rates are difficult to quantify at this point, but would negatively affect the feasibility of the comprehensive in-sourcing proposal.

Another challenge associated with adding the number of employees necessary for comprehensive in-sourcing is the ongoing administrative and logistical support that the new workforce would require. In DPW alone, it was estimated that this proposal would add another $3.1 million annually to the Department's operating budget for vehicle repair, payroll administration, accounting, human resources management and training. Additional costs would be incurred by other City departments for various administrative functions that are not estimated as part of this study.

In the analysis of the comprehensive in-sourcing proposal, a number of unintended consequences that could result from its implementation were identified. In theory, in-sourcing all of the work currently performed by contractors could have the effect of reducing the number of City of Milwaukee residents employed in making improvements to City infrastructure. On most publicly financed projects, the City's Residents Preference Program (RPP) requires that the contractor hire a certain percentage of RPP-certified, City of Milwaukee residents to work on those projects. Typically, projects will include a 40% RPP requirement. If all work currently performed by contractors was instead performed by City crews, it is possible that City of Milwaukee residents employed by contractors as a result of the RPP Program could lose work in favor of non-City residents. The elimination of the residency requirement for City employees could have the effect of more non-City residents being hired as City employees, displacing City residents who had jobs with contractors as a result of the RPP Program.

The intent of this initiative was for the City to have more control over the conduct of workers on City job sites. However, in-sourcing is likely to have an unintended consequence. If the City ends its practice of hiring contractors, the Residents Preference Program will end, and the City will lose its best leverage for providing stable, family supporting jobs to Milwaukee residents.

In summary, this report identifies a number of challenges facing a large scale in-sourcing initiative. The capital costs involved with equipment purchase, facility construction, and site acquisition to

accommodate the increase in City employees would reduce the capital funding available to make needed improvements to the City's existing infrastructure. This would add to the City's existing deferred maintenance backlog and limit financial flexibility in future budgets. The challenges in recruiting, retaining, training and administering the influx in City employees that would be necessary for the in-sourcing initiative would require substantial new funding and resources, and it is unclear from where additional operating funding to support the initiative would come.

The scope of this study made it difficult to perform. The broad range of projects, and the number of variables inherent in construction projects, made the development of solid cost assumptions challenging. This report recommends that future efforts be directed toward the periodic evaluation of individual programs. The Electrical & Communications Manhole Repair Program demonstrated that there are certain programs in which it may be preferable and more cost effective to have City crews perform work instead of contractors. The utility-side Lead Service Line Replacement Program has been identified as another program where in-sourcing may be beneficial. Narrowing the focus of a cost comparison allows a more thorough and accurate analysis. Estimates of all potential direct and indirect costs can be developed with a higher level of confidence. The Common Council can then make more informed decisions about how to best allocate the City's limited resources.

Appendix A – Equipment Requirements

Equipment	Purchase Price (new)	Total	TOTAL UNITS	Sewers	Water	Paving	T Transp. Oper..	Bridges & Bldgs	Re-decking
All-in-one Recycling unit C4HD	$750,000	$1,500,000	2					1	1
Pressure Wash/Sand-blast	$20,000	$40,000	2		2				
Shot Blaster	$16,593	$16,593	1					1	
Compressor	$22,000	$286,000	13		5	5	3		
Compressor - Large	$56,000	$224,000	4					2	2
Compressor - Trailer	$60,000	$120,000	2		2				
Generator	$20,000	$160,000	8		4			2	2
Generator with lighting tower	$75,000	$150,000	2		2				
Asphalt Roller 15 -Ton	$175,000	$875,000	5		1	4			
Asphalt Roller 8 - Ton	$135,000	$675,000	5		1	4			
Compactor	$10,000	$20,000	2			2			
Hydrostatic Vibratory Roller	$35,000	$35,000	1						1
Concrete Saw	$23,000	$46,000	2			2			
Concrete Saw - Pavement	$23,000	$103,500	5	4			1		
Concrete Saw - walk behind	$23,000	$46,000	2					1	1
Backhoe	$145,000	$580,000	4			2	2		
Backhoe - tracked	$150,000	$5,100,000	34		34				
Excavator	$180,000	$1,080,000	6		3		1		2
Excavator - Large	$275,000	$1,100,000	4	4					
Excavator - Small	$200,000	$800,000	4	4					
Excavator - Mini	$120,000	$120,000	1						1
Gradall	$336,000	$4,368,000	13		9	4			
Truck - Hydro-Vacuum Large	$425,000	$2,975,000	7		6		1		
Dozer w/blade	$200,000	$200,000	1			1			
Grader	$150,000	$150,000	1			1			
Derek Digger	$200,000	$400,000	2				2		
Boring Machine	$200,000	$200,000	1				1		
End Loader	$175,000	$2,100,000	12	4	2	4	1		1
Forklift	$60,000	$120,000	2		2				
Skid Loader/Skid Steer	$60,000	$1,590,000	27	13	6	6		1	1
Truck - Dump	$130,000	$3,640,000	28		5	14	3	3	3
Truck - Dump - Large	$150,000	$450,000	3				3		

Equipment Requirements -Cont'd

Equipment	Purchase Price (new)	Total	TOTAL UNITS	Sewers	Water	Paving	Transp. Oper.	Bridges & Bldgs	Re-decking
Truck - Dump - Tri-axle	$146,000	$3,358,000	23	3	16		4		
Truck - Dump - Quad-axle	$150,000	$6,750,000	45		45				
Truck - Dump with hoist	$150,000	$150,000	1				1		
Truck - Flatbed	$52,000	$260,000	5			5			
Truck - Flatbed Dual Axle	$95,000	$190,000	2		2				
Crane	$400,000	$1,200,000	3				1		2
Crane - 30 ton Truck Mounted	$450,000	$450,000	1		1				
Crane - Boom	$350,000	$1,050,000	3		3				
Manlift	$150,000	$600,000	4					2	2
Truck - Bucket Lift	$180,000	$360,000	2			1	1		
Concrete finishing tools (sets)	$50,000	$150,000	3		3				
Concrete Screed	$50,000	$250,000	5		3	2			
Stump grinder	$50,000	$50,000	1			1			
Asphalt Kettle	$25,000	$25,000	1		1				
Concrete/Mortar Mixer - Portable	$50,000	$100,000	2		2				
Paint truck/system	$60,000	$120,000	2					1	1
Pavement Marking Painter	$270,000	$540,000	2					1	1
Stringline (For curb/paver)	$56,000	$56,000	1			1			
Tar Sealer Rig	$50,000	$50,000	1			1			
Concrete Cure Rig	$50,000	$150,000	3			3			
Trimmer	$50,000	$50,000	1			1			
Road Plates			8			8			
Shielding and Shoring					15		6		
Trench Shields						5			
Barrels							1,000		
Barrels - with lights							400		
Barricades - Type III							500		
Barricades - Type II							2,000		
Cones							2,500		
Delineators							600		
Concrete Breaker	$30,000	$60,000	2			2			
Crack & Seat-Guitone 12,000Ft-Lb	$50,000	$50,000	1			1			
Asphalt Milling Machine	$177,000								
Milling Machine - 2 Ft.	$250,000	$1,000,000	4			4			
Milling Machine - Large	$500,000	$2,000,000	4		1	3			

Equipment Requirements - Cont'd

Equipment	Purchase Price (new)	Total	TOTAL UNITS	Sewers	Water	Paving	Transp. Oper..	Bridges & Bldgs	Re-decking
Asphalt Paver	$125,000	$812,500	7	2	1	4			
Asphalt Truck - 2 per crew	$130,000	$780,000	6	6					
Bid Well	$83,800	$83,800	1						1
Concrete Curb Machine	$100,000	$100,000	1			1			
Concrete mainline paver	$200,000	$200,000	1			1			
Trailer	$10,000	$30,000	3				3		
Trailer - 20' enclosed (tool storage)	$10,000	$260,000	26		26				
Trailer - Job Site	$36,000	$36,000	1		1				
Trailer - Maxi-dump	$48,000	$240,000	5			5			
Low Boy Tractor + Trailer	$170,000	$340,000	2					1	1
Low-boy - 1 per 3 crews	$100,000	$400,000	4	4					
Low-boy Hauler	$100,000	$200,000	2			2			
Semi with flat bed trailer	$170,000	$340,000	2		2				
Truck - Box	$77,000	$385,000	5			5			
Truck - Broom (power brooms)	$232,000	$1,624,000	7		2	5			
Truck - Foreman truck w/Tools	$42,000	$294,000	7			7			
Truck - masonry	$120,000	$240,000	2	2					
Truck - Pick-up	$36,000	$612,000	17			9		4	4
Truck - Pick-up - Crew Cab	$45,000	$225,000	5				5		
Truck - Tack (20' dual axle w/ heater)	$160,000	$160,000	1		1				
Truck - Tank (Tack/Water)	$160,000	$480,000	3			3			
Truck - Tar	$160,000	$240,000	2	2					
Truck - Tool	$125,000	$1,812,500	15	15					
Truck - Water	$100,000	$150,000	2	2					
Truck - Water Tanker	$160,000	$160,000	1		1				
Truck - Welding	$70,000	$70,000	1		1				
Truck (Stock w/forms $15,000)	$75,000	$225,000	3			3			
Truck/Van (Electrician)	$42,000	$84,000	2		2				
Truck/Van (mechanical)	$42,000	$168,000	4		4				
Trucks 1 Ton stake bed - 12'bed	$52,000	$260,000	5		3		2		
Truck 5 ton	$50,000	$50,000	1				1		
Truck 2.5 ton	$50,000	$50,000	1				1		
Truck - Epoxy/Arrow/Sign/mason	$50,000	$200,000	4				4		
Truck - Compressor	$50,000	$150,000	3				3		
Van (2300 series)	$50,000	$1,450,000	29		28		1		
Vehicle	$50,000	$100,000	2	2					

Equipment Requirements (Cont'd)

Equipment	Purchase Price (new)	Total	TOTAL UNITS	Sewers	Water	Paving	Transp. Oper..	Bridges & Bldgs	Re-decking
Barge	$75,800	$151,600	2					1	1
Chipping hammer	$500	$3,000	6					3	3
Crack Injection Pump	$3,000	$6,000	2					1	1
Dust collector DC45	$300,000	$600,000	2					1	1
Fire Hose	$100	$400	4					2	2
Scarifier	$19,500	$19,500	1					1	
Stone Blower	$1,185	$1,185	1					1	
Welding Equipment	$8,252	$16,503	2					1	1
Dowel Drill Rig -1 per crew	$20,000	$70,000	4	4					
Total		$62,169,081	540	71	258	132		31	36

Appendix B – Position Requirements

Position Title	Closest City Title	Sewers	Water	Streets	ES	B&B	Total Needed
Masons	Bricklayer, Buildings	2	2	1	4	4	13
Concrete Finisher	Cement Finisher	7	3	6	4	6	26
Civil Engineer II	Civil Engineer II	8	1				9
Civil Engineer III	Civil Engineer III		1				1
Engineering Drafting Tech IV	Engineering Drafting Tech IV		2				2
Construction Foreman	Infrastructure Repair Crew Leader	4		7		3	14
Repair Worker	Infrastructure Repair Worker	14					14
Construction Surveyor	No Current City Title		6	2			8
Surveying Crew Manager	No Current City Title		1				1
Equipment Operators	Operations Driver Worker	50	114	25	41	3	233
Top Man	Sewer Laborer II	8		1			9
Pipe Layer	Water Repair Worker	7		1			8
Formsetter	Infrastructure Repair Worker			6			6
Superintendent	No Current City Title			4			4
Electrician Manager	Electrical Services Manager		1		2		3
Welder	Electrical Services Welder		2				2
Advanced Electrical Laborers	Electrical Workers				6		6
Iron Worker	Ironworker				4	8	12
Laborers (Electrical Services)	Laborers (Electrical Services)					3	3
Construction Foreman	Municipal Services Electrician				6		6
Journeyman Electrician	Municipal Services Electrician	2	5		18	1	26
Electrical Laborers	Special Laborer (Electrical Services)				45		45
Traffic Sign Worker	Traffic Sign Worker				3		3
Building Maintenance Manager	Building Services Manager		1				1
Carpenters	Carpenter		4			6	10
Carpentry Manager	Carpenter Supervisor		1				1
Roofing Supervisor	Carpenter Supervisor					1	1
Cement Finisher Helper	Cement Finisher Helper					10	10
Mason Helper	City Laborer					2	2
Construction Management Engineer	Construction Management Engineer					2	2
Engineering Tech I	Engineering Tech I					1	1
Iron Worker Supervisor	Iron Worker Supervisor					1	1
Registered Land Surveyor	Land Surveyor					1	1
Controls Technician	No Current City Title					1	1
Coating Applicator	No Current City Title					4	4
HVAC/Plumbing Manager/Super	No Current City Title		1			1	2
Plumbers Apprentice	No Current City Title					1	1
Roofer	No Current City Title						0
Security Officers	No Current City Title		6				6
Painters	Painter		4		4	5	13
Painter Bridge and Iron	Painter Bridge and Iron					5	5
Painting Manager	Painter Supervisor, House		1			1	2
Special Equipment Operator II	Special Equipment Operator II					6	6
Special Equipment Operator III	Special Equipment Operator III					2	2
Urban Forestry Laborer	Urban Forestry Laborer					3	3
HVAC/Steamfitter	Water Plant Steamfitter/HVAC Specialist		7			2	9
Communication Assistant IV	Communication Assistant IV		3				3
Communication Assistant III	Communications Assistant III		2				2
Riggers/Crane Operator	Harbor Crane Operator		4			2	6
Concrete Saw Cutters	Infrastructure Repair Worker		3				3
Mechanical Repairperson	Machine Repair Person	9	17				26
Millwright	Machine Repair Person		2				2
Mechanical Projects Manager	Mechanical Engineer III		1				1
Plumbers MASTER	No Current City Title		5				5
Construction Foreman	Water Chief Repair Person		31				31

Feasibility Study -Position Requirements (cont'd)

Position Title	Closest City Title	Sewers	Water	Streets	ES	B&B	Total Needed
Operations Manager	Water Distribution Operations Manager		1				1
Scheduling Manager	Water Distribution Scheduling Manager		5				5
Field Supervisor	Water Field Supervisor		5				5
Automation Technicians	Water Plant Automation Controls		2				2
Automation Manager	Water Plant Automation Manager		1				1
Instrumentation Technicians	Water Plant Automation Technician		2				2
Management Level positions	Water Plant Maintenance Manager		3				3
Pipe Tappers	Water Repair Worker		4				4
Repair Worker	Water Repair Worker		12				12
Construction Foreman	Sewer Repair Crew Leader	17					17
Management Level positions	Sewer Services District Manager	4					4
Construction Laborer	City Laborer	44	74	20	62	14	214
Bridge Laborer I	Bridge Operator					9	9
Bridge Laborer II	Bridge Operator Lead Worker					7	7
Carpenter Leadworker	Carpenter Leadworker					1	1
MKE Park Design Coordinator	No Current City Title					1	1
MKE Park Const. Inspect. Coord.	No Current City Title					1	1

Appendix C – Salary Detail

Position Title	Closest City Title	Pay Range	City Min	City Max	Mid
Masons	Bricklayer, Buildings	7QN	$ 70,040.62	$ 70,502.90	$ 70,271.76
Concrete Finisher	Cement Finisher	7KN	$ 58,549.40	$ 59,389.72	$ 58,969.56
Civil Engineer II	Civil Engineer II	2GN	$ 58,372.00	$ 72,062.90	$ 65,217.45
Civil Engineer III	Civil Engineer III	n/a	$ 66,324.44	$ 81,844.36	$ 74,084.40
Engineering Drafting Tech IV	Engineering Drafting Tech IV	3NN	$ 44,948.54	$ 61,296.04	$ 53,122.29
Construction Foreman	Infrastructure Repair Crew Leader	8IN	$ 41,699.58	$ 47,076.90	$ 44,388.24
Repair Worker	Infrastructure Repair Worker	8FN	$ 38,350.00	$ 43,335.24	$ 40,842.62
Construction Surveyor	No Current City Title	n/a	$ 47,534.00	$ 59,268.00	$ 53,401.00
Surveying Crew Manager	No Current City Title	n/a	$ 53,585.00	$ 69,999.00	$ 61,792.00
Equipment Operators	Operations Driver Worker	8KN	$ 40,643.20	$ 53,000.22	$ 46,821.71
Top Man	Sewer Laborer II	8FN	$ 38,784.98	$ 43,335.24	$ 41,060.11
Pipe Layer	Water Repair Worker	8LN	$ 45,327.10	$ 51,517.44	$ 48,422.27
Formsetter	Infrastructure Repair Worker	8FN	$ 38,350.00	$ 43,335.24	$ 40,842.62
Superintendent	No Current City Title	n/a	$ 75,000.00	$ 75,000.00	$ 75,000.00
Electrician Manager	Electrical Services Manager	1GX	$ 66,434.68	$ 93,009.80	$ 79,722.24
Welder	Electrical Services Welder	7HN	$ 45,684.60	$ 52,049.14	$ 48,866.87
Advanced Electrical Laborers	Electrical Workers	7FN	$ 39,137.80	$ 48,402.38	$ 43,770.09
Iron Worker	Ironworker	7MN	$ 61,784.58	$ 63,002.94	$ 62,393.76
Laborers (Electrical Services)	Laborers (Electrical Services)	8EN	$ 37,502.40	$ 41,564.64	$ 39,533.52
Construction Foreman	Municipal Services Electrician	7QN	$ 63,169.34	$ 72,221.24	$ 67,695.29
Journeyman Electrician	Municipal Services Electrician	7QN	$ 63,169.34	$ 72,221.24	$ 67,695.29
Electrical Laborers	Special Laborer (Electrical Services)	8GN	$ 40,159.86	$ 44,399.16	$ 42,279.51
Traffic Sign Worker	Traffic Sign Worker	8GN	$ 40,159.86	$ 44,399.16	$ 42,279.51
Building Maintenance Manager	Building Services Manager	1CX	$ 51,468.82	$ 72,062.90	$ 61,765.86
Carpenters	Carpenter	7KN	$ 59,389.72	$ 59,389.72	$ 59,389.72
Carpentry Manager	Carpenter Supervisor	7ON	$ 65,755.04	$ 65,839.02	$ 65,797.03
Roofing Supervisor	Carpenter Supervisor	7ON	$ 65,755.04	$ 65,839.02	$ 65,797.03
Cement Finisher Helper	Cement Finisher Helper	8FN	$ 38,784.98	$ 43,335.24	$ 41,060.11
Mason Helper	City Laborer	8DN	$ 31,408.52	$ 40,450.02	$ 35,929.27
Construction Management Engineer	Construction Management Engineer	1IX	$ 75,478.26	$ 105,669.20	$ 90,573.73
Engineering Tech I	Engineering Tech I	3BN	$ 33,101.90	$ 39,969.80	$ 36,535.85
Iron Worker Supervisor	Iron Worker Supervisor	7NN	$ 65,839.02	$ 65,839.02	$ 65,839.02
Registered Land Surveyor	Land Surveyor	2IN	$ 66,324.44	$ 81,844.36	$ 74,084.40
Controls Technician	No Current City Title	n/a	$ 39,952.00	$ 39,952.00	$ 39,952.00
Coating Applicator	No Current City Title	n/a	$ 58,240.00	$ 58,240.00	$ 58,240.00
HVAC/Plumbing Manager/Super	No Current City Title	n/a	$ 63,119.00	$ 81,869.00	$ 72,494.00
Plumbers Apprentice	No Current City Title	n/a	$ 50,555.00	$ 50,555.00	$ 50,555.00
Roofer	No Current City Title	n/a	$ 38,153.00	$ 52,844.00	$ 45,498.50
Security Officers	No Current City Title	n/a	$ 29,761.00	$ 38,990.00	$ 34,375.50
Painters	Painter	7IN	$ 56,364.36	$ 56,364.36	$ 56,364.36
Painter Bridge and Iron	Painter Bridge and Iron	7JN	$ 57,877.04	$ 57,877.04	$ 57,877.04
Painting Manager	Painter Supervisor, House	7MN	$ 62,729.94	$ 63,002.94	$ 62,866.44
Special Equipment Operator II	Special Equipment Operator II	8ON	$ 58,759.48	$ 58,759.48	$ 58,759.48
Special Equipment Operator III	Special Equipment Operator III	8PM	$ 52,532.74	$ 60,382.40	$ 56,457.57
Urban Forestry Laborer	Urban Forestry Laborer	8EN	$ 37,502.40	$ 41,564.64	$ 39,533.52
HVAC/Steamfitter	Water Plant Steamfitter/HVAC Specialist	7JN	$ 53,162.20	$ 57,877.04	$ 55,519.62
Communication Assistant IV	Communication Assistant IV	6JN	$ 39,611.26	$ 44,545.54	$ 42,078.40
Communication Assistant III	Communications Assistant III	6HN	$ 37,830.26	$ 41,863.38	$ 39,846.82

Feasibility Study - Salary Detail – Cont'd

Position Title	Closest City Title	Pay Range	City Min	City Max	Mid
Riggers/Crane Operator	Harbor Crane Operator	8QN	$ 62,930.90	$ 68,582.80	$ 65,756.85
Concrete Saw Cutters	Infrastructure Repair Worker	8FN	$ 38,350.00	$ 43,335.24	$ 40,842.62
Mechanical Repairperson	Machine Repair Person	7JN	$ 47,588.32	$ 57,877.04	$ 52,732.68
Millwright	Machine Repair Person	7JN	$ 47,588.32	$ 57,877.04	$ 52,732.68
Mechanical Projects Manager	Mechanical Engineer III	2IN	$ 58,462.30	$ 81,844.36	$ 70,153.33
Plumbers MASTER	No Current City Title	n/a	$ 53,264.00	$ 67,028.00	$ 60,146.00
Construction Foreman	Water Chief Repair Person	1BX	$ 48,669.92	$ 67,615.60	$ 58,142.76
Operations Manager	Water Distribution Operations Manager	1GX	$ 66,434.68	$ 93,009.80	$ 79,722.24
Scheduling Manager	Water Distribution Scheduling Manager	1FX	$ 62,338.38	$ 87,270.30	$ 74,804.34
Field Supervisor	Water Field Supervisor	1BX	$ 48,669.92	$ 67,615.60	$ 58,142.76
Automation Technicians	Water Plant Automation Controls	2IN	$ 51,468.82	$ 72,062.90	$ 61,765.86
Automation Manager	Water Plant Automation Manager	1HX	$ 62,338.38	$ 87,270.30	$ 74,804.34
Instrumentation Technicians	Water Plant Automation Technician	3MN	$ 47,779.42	$ 54,669.42	$ 51,224.42
Management Level positions	Water Plant Maintenance Manager	1DX	$ 54,864.68	$ 76,806.08	$ 65,835.38
Pipe Tappers	Water Repair Worker	8LN	$ 45,327.10	$ 51,517.44	$ 48,422.27
Repair Worker	Water Repair Worker	8LN	$ 45,327.10	$ 51,517.44	$ 48,422.27
Construction Foreman	Sewer Repair Crew Leader	8KN	$ 44,188.82	$ 53,000.22	$ 48,594.52
Management Level positions	Sewer Services District Manager	1FX	$ 62,388.38	$ 87,270.30	$ 74,829.34
Construction Laborer	City Laborer	8DN	$ 31,408.52	$ 40,450.02	$ 35,929.27
Bridge Laborer I	Bridge Operator	8GN	$ 40,020.50	$ 44,399.16	$ 42,209.83
Bridge Laborer II	Bridge Operator Lead Worker	8IN	$ 41,699.58	$ 47,076.90	$ 44,388.24
Carpenter Leadworker	Carpenter Leadworker	7MN	$ 62,582.78	$ 63,002.94	$ 62,792.86
MKE Park Design Coordinator	No Current City Title	n/a	$ 93,600.00	$ 93,600.00	$ 93,600.00
MKE Park Const. Inspect. Coord.	No Current City Title	n/a	$ 101,441.60	$ 101,441.60	$ 101,441.60

Appendix D – Facility Estimate

Preliminary Estimate		New DPW Field Building: RS Means 2018 Square Footage Data		Comments
Multi-Purpose Building		S.F		**New Field Building for approx. 880 DPW employees. Current DPW Field Headquarters Building houses over 500 city employees. Assumptions made by doubling the building footprint square footages and site of the current DPW Field headquarters. 2018 RS Means used for square footage and unit cost estimates.**
RS Means	Shops @ $112.00/sf	179,500	$20,104,000	
RS Means	Garage @ $129.54/sf	124,500	$16,127,730	
RS Means	Heated Storage @ $101.40/sf	55,000	$5,577,000	
RS Means	Office/support @ $195.70/sf	66,000	$12,916,200	Office/ support areas include offices, open office workstations, conference areas, toilet rooms, locker rooms, break rooms, storage areas for 880 employees.
RS Means	Vehicle wash & prep.	Unit	$485,000	
Storage Building				
RS Means	Soils Canopy @ $66.00/sf	30,000	$1,980,000	
RS Means	Unheated Storage @ $90.06/sf	15,000	$1,350,900	
Sub-Total		470,000	**$58,540,830**	
Site Development				Cost of land purchase not included in this estimate.
Assumptions made by doubling site square footages of the current DPW Field headquarters.	Historical Multiplier based on 2004 cost compared to 2018 cost: RS Means	48 Acres	$12,600,000	Substantial soil remediation not included in this estimate. Site development assumes site preparation: grading. Storm water management, paving, ingress and egress, lighting, sidewalks, signage and landscaping required by Milwaukee Code of Ordinances.
Fuel Station	Historical Multiplier based on 2004 cost compared to 2018: RS Means		$485,990	
Sub-Total			**$13,085,990**	
Other				
Project Design, Project Administration	Design		$900,000	
	Construction Admin		$750,000	
	DPW Admin		$400,000	
Sub-Total			**$2,050,000**	
Contingency				
at 5%	Excludes right of way work and utilities		**$3,580,000**	
Utilities-Infra.				
	Historical Multiplier based on 2004 cost compared to		**$3,600,000**	Includes extension of utilities branches from street into property and City data/communication conduit into building (assume 10 city blocks to nearest existing conduit)
Total			**$80,856,820**	

Notes:
Cost of land purchase not included.
Cost for environmental testing and remediation not included.
Costs for demolition, extensive site preparation and unforeseen conditions not included.
Costs for new shop/special equipment not included.
Building and Site maintenance costs currently estimated at $90,000.00 annually for the first 5 years and then $190,000.00 annually thereafter.
Current year Energy Costs estimated at $310.575.00 annually based on annual gas and electric cost for 3850 N. 35th (X2)

Appendix E – Overhead Estimate

5/9/2018

Estimates based on additional 890 DPW employees and 551 additional pieces of equipment

Operations Category	Budget Source	Cost Type	Units	Base	Fringe	Total
Fleet Repair	Operating	Equipment Parts	N/A	$ 890,000	N/A	$ 890,000
Fleet Repair	Operating	Outside Vehicle Repair	N/A	$ 560,000	N/A	$ 560,000
Fleet Repair	Salaries	Vehicle Services Technicians	11	$ 47,351	$ 26,105	$ 808,015
Payroll Admin	Salaries	Personnel Payroll Assistant III	4	$ 40,501	$ 21,818	$ 249,274
Payroll Admin	Salaries	Mgt Accountant Sr	1	$ 48,670	$ 26,218	$ 74,888
Accounting/Invoices	Salaries	Accounting Asst II	2	$ 37,830	$ 20,379	$ 116,418
Accounting/Invoices	Salaries	Mgt Accountant Sr	1	$ 48,670	$ 26,218	$ 74,888
Human Resources	Salaries	Human Resources Rep	1	$ 54,865	$ 29,556	$ 84,421
Human Resources	Salaries	Safety Specialist-Sr	2	$ 48,670	$ 26,219	$ 149,777
Equipment Training	Aux Salaries	Fleet Training Supervisor	N/A	$ 120,000	N/A	$ 120,000
Total						$ 3,127,681