

City of Beacon Asset Management and Capital Planning Guide

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Delaware Engineering, D.P.C
28 Madison Avenue Extension
Albany, NY 12203

Hudson Valley Pattern for Progress
3 Washington Center
Newburgh, New York 12550

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1.0 EXECUTIVE SUMMARY

Public assets – pavement, water and sewer pipes, buildings, facilities, vehicles, etc. – are enormously valuable investments, many of which are inherited from previous generations of taxpayers. Maintenance and investment decisions today will affect the lives of city residents, businesses and visitors for decades to come. Every municipal investment decision involves trade-offs and prioritization among competing needs. Asset management is the practice of managing infrastructure and capital assets to minimize the total cost of owning and operating these assets while delivering the desired service levels. Asset management applied to municipal infrastructure assists communities in ensuring that maintenance, repairs, upgrades and replacements are conducted when needed, not only during a crisis, and that funds are available to make these vital investments. Accurate, comprehensive and accessible information on assets is critical to this process. While few small cities and towns in the Hudson Valley have created asset management inventories and processes, these undertakings are increasingly being used in larger better-resourced governments.

Municipalities undertake asset management improvement efforts to overcome the deficiencies typical of traditional asset management. Asset management is often “siloed” by department – each department keeps its own information and department managers cannot easily see how their work may align with that of another department. Municipal leaders then cannot easily access information about the different classes of assets for financial planning purposes. The public, for its part, has little information about the true value and extent of public assets and the challenges staff and elected officials face in prioritizing funding decisions. These conditions limit the municipality’s ability to plan infrastructure projects, estimate budget needs, make informed decisions and demonstrate the financial needs behind decisions.

The City of Beacon Asset Management and Capital Planning effort is intended to assist the City in maintaining infrastructure and public assets in condition to meet the needs of the public at a reasonable cost. The products of this effort are an Excel database Tool, a User Manual and this Asset Management and Capital Planning Guide.

The asset database Tool is the product of collaboration between consultants and City staff through a series of working meetings between December 2018 and September 2019. The initial and most

intense activity conducted was gathering, verifying, managing and manipulating data regarding the nature, condition and location of various assets of the City. The database Tool integrates data on City assets into a single database, including worksheets for basic project cost analyses. The Tool is intended to assist in maintaining information about the assets of the City. The Tool is a resource for, not a substitute for, management decision-making amidst the inevitable trade-offs among competing priorities in meeting public needs and spending public funds. The User Manual recommends processes by which the database Tool is to be updated as the City repairs, replaces, inventories and adds relevant information about its assets. This Guide provides an overall asset management and capital planning framework.

2.0 INTRODUCTION

Once a manufacturing center, the historic City of Beacon is experiencing an artistic and economic renaissance, primarily due to forward thinking planning by City leaders. The City's identity has been redefined as a cultural and recreational destination, and a Hudson River community that is a desirable place to live, work and play. In order to ensure that Beacon's public assets and infrastructure will continue to support future growth and development, the City has caused the preparation of an Asset Management and Capital Planning program.

As a result of these efforts, for the first time the City has a comprehensive list of its most valuable assets in one place, and a plan for keeping this list updated and using it to support financial and operational planning. The diagram below (Figure 1) illustrates how asset management connects to the broader municipal planning strategy. This strategy encompasses assembling asset information and connecting this information to target levels of service for each, capital investment planning on a 1- to 5-year timeframe, long-term financial planning, and to the City's overall vision and long-term strategic and financial goals.

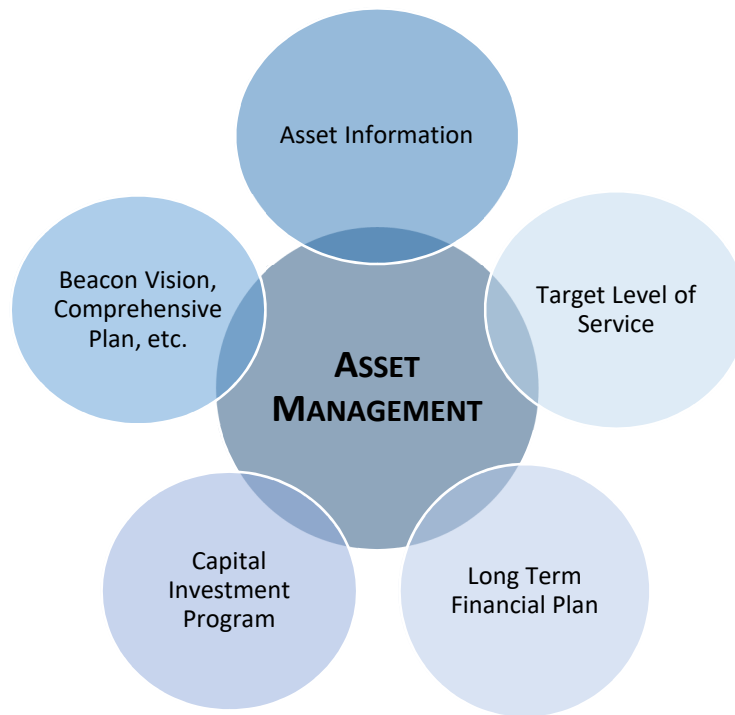


Figure 1: The Comprehensive View of Asset Management

2.1 BUSINESS CASE

The business case for asset management is powerful – it saves money and reduces risk of failure.

First, it is critical that the City be in a position to view its physical assets in an integrated way, as changes in one class of assets, say pavement, must be aligned with changes in others, such as underlying pipes, and choices of equipment and vehicles.

Second, the integration of asset management information helps the City move from a reactive to proactive mode of management in order to save money. There is no more expensive way to manage assets than to constantly be spot-repairing and responding to emergencies due to failure, especially considering the disruption to business, travel and community reputation these failures cause.

Third, the asset management database Tool supports continuity of operations and lowers risk of failure by making institutional memory easily shared, rather than leaving it siloed by department or even locked away in the personal memories of long-serving City employees, and thus subject to loss with their eventual retirement. The asset inventory will support decision-making by

assisting in prioritization of critical infrastructure such as water and wastewater facilities, the failure of which severely disrupt community life and business operations.

Lastly, the adoption of an asset management program is increasingly a requirement of federal funding programs, for the obvious reason that the federal government, too, is concerned to use its money in the most cost-effective way possible. The state, which also administers federal funds, will likely soon follow suit with its own funding.

The City did not previously have a comprehensive inventory of its assets. Prior to this effort, asset information was dispersed across dozens of different documents, data sets and maps, as well as located only in the memories of certain long-term public servants and officials. This asset inventory Tool is the essential foundation of management control and planning with regard to assets of great value and criticality. The inventory is a major step forward to continuity of institutional knowledge as older, very knowledgeable workers may retire, taking their knowledge with them, and leaving the City vulnerable to making decisions with insufficient information.

2.2 METHOD

The Asset Management and Capital Plan was prepared through a collaboration between City staff and management, Delaware Engineering, D.P.C, and Hudson Valley Pattern for Progress (Pattern).

Principle tasks included:

- Collection and review of existing data on City assets, including insurance records, GIS data, and City department records, mainly highway, water and wastewater.
- Field review of water, wastewater and building assets to evaluate current conditions.
- Working meetings of City staff, management, Delaware Engineering and Pattern, to identify data sources, prioritize features of assets to include in the database Tool, include the knowledge of City staff relevant to these features, and choose among various options for organizing and recording asset information in the database Tool.
- Follow-up with the City to close data gaps where possible within the project timeframe and to the extent practical.

- Population of the database Tool with data obtained from the City, noting data gaps for follow-up.
- Production of database Tool with worksheets for cost calculation and metadata, User Manual, and Asset Management and Capital Planning Guide.
- Trial use of the draft database Tool by City staff to identify organizational and process issues for incorporation of the Tool into the management framework.
- Submission to City and City Engineer of shapefiles and data otherwise produced through the above.

2.3 USE OF THE DATABASE TOOL

The database Tool contains lists of assets on Excel worksheets within an Excel workbook. Assets are those things owned by the City that are considered to be relatively expensive and durable, ranging from water and wastewater treatment facilities and piping, to roads, streetlights, stormwater piping, vehicles, parking lots, buildings, recreational facilities and more. The Tool was created in Excel to allow the City to easily add and manipulate data and potentially upload that data into a Geographical Information System (GIS) or other future management software. Through such functions as sorting and filtering, specific lists of assets of interest can be created for planning discussions and/or mapped in a Geographical Information System (GIS). For example, staff may want to;

- List water, sewer and stormwater lines along a particular road segment to aid in the planning of road reconstruction projects
- Sort water or sewer pipes by material to aid in prioritizing pipe replacement projects
- List vehicles by department or by age to assist in budgeting for replacement
- Find the linear feet of sidewalk along a segment of road to calculate repair costs
- Extract summary data on assets for use in grant applications

The Tool includes a cost analysis worksheet with pre-loaded formulas and places to insert bid information to facilitate project budgeting. For example, one can estimate the cost of paving a certain length of road or how much road can be paved given a certain level of funding, both of which aid in project planning.

An accurate inventory of important assets with significant data attached is the most basic building block of asset management, asset control and decision-making on investments in those assets. It will be the City's responsibility to maintain the Tool and ensure that its asset data is up-to-date in order to continue its usefulness.

3.0 STATE OF CITY INFRASTRUCTURE AND OTHER ASSETS

As a historic, small and full-service city, Beacon has a wide range of assets. These assets vary in terms of their age, condition, criticality and the amount of information that is currently available about them. The Database Tool is a compilation of basic information on the City's assets deemed most useful to asset management. The Tool requires continual updating to maintain its usefulness and is a major component of capital planning. Table 3.0 summarizes the contents of the database Tool and demonstrates the variety and extent of the City's assets.

Given the variability in asset types, ages, and condition information available, an overall status rating of City infrastructure is not useful information. Nor is it possible to make a summary statement as to whether or not the City has been investing the right amount of money in asset maintenance. Determinations of priority must be made on a case-by-case basis, based on the best available information, trends in repair history, asset criticality and available funding. The database Tool is intended to support decision-making with better information than previously available.

Table 3.0 Summary of City of Beacon Assets

ASSET	DESCRIPTION
Wastewater treatment system	\$28.7 million assessed value
Wastewater collection system	Approx. 47 miles of pipe
Manholes	1282
Water treatment system	\$16 million assessed value
Water distribution system	Approx. 21 miles of pipe
Fire hydrants	Approx. 500
Stormwater structures	Approx. 2070 catch basins
Roads	Approx. 54 miles
Parking lots	705 spaces
Bridges	6
Sidewalks	Approx. 60.5 miles
Vehicles	109
Generators	10
Streetlights	1450
Traffic signals	12
Wayfinding signs	5
Buildings	\$27.8 million assessed value
Recreational Facilities and Lands	7 sites, assessed value \$4.55 million; approx. 330 acres of parks
City Lands	76 parcels listed, \$88.8 million assessed value
University Settlement Camp	44 structures with pool

Note: estimates based on the Tool, existing City of Beacon GIS, City staff

In general, the database Tool contains more condition information on assets that have been recently upgraded. Other asset types such as water lines are impossible to view without specific equipment (unless there is a water line break or road reconstruction), and are variable in terms of materials of which they are made; the environment, age and the material affect the asset condition and potential life span. Records of the existence of old piping materials in both the water and sewer systems indicate aging infrastructure. As these systems age they are more prone to breakage, but the condition of these pipes has not been generally assessed. There are also several assets that are regularly inspected through regulatory programs such as Department of Transportation bridge inspection and inspections required through the Municipal Separate Storm Sewer System (MS4).

Other assets such as the structures at the University Settlement Camp were assessed for condition approximately ten years ago (Master Plan, 2009). The current condition, or what upgrades have been made since then is unknown at this time. The University Settlement Camp structures were included in the database Tool as assets the City manages through agreements, though the City does not own these structures.

As part of this effort, Delaware Engineering performed walkthrough condition assessments of City buildings, water treatment facilities and wastewater treatment facilities. The resulting condition ratings are included on the appropriate worksheet within the database Tool and note several components that are in need of repair or replacement.

Other available documents also provide information. For example, the 2017 update to the City of Beacon Comprehensive Plan stated that “water supply issues have more to do with maintaining Beacon’s aging infrastructure, rather than having enough supply for existing and new development.” The Plan recommends replacing water distribution pipes from the 1940s and 1950s whenever roads are upgraded throughout the City. As illustrated in Figure 1.0, these types of plans and information integrated with the Asset Tool allow a more comprehensive Asset Plan.

4.0 FRAMEWORK FOR IMPLEMENTATION PLANNING

Using the accumulated data with appropriate maintenance and the tools provided, the City of Beacon will have fact-based information upon which to make decisions regarding budgeting and spending. The difference between budgeting and spending is significant and worthy of discussion. Budgeting, from an infrastructure perspective, is a forward-thinking plan that attempts to predict the amount of money needed over a period of time to provide a service. Spending is the act of committing money on an immediate basis to conduct an activity or purchase a product. Ideally, budgeting has a reasonable alignment with spending. However, if budgeting fails to consider repairs and maintenance, spending may not match budgeting. The classic situation is the need to repair more broken water lines than planned in any given fiscal year.

Implementation planning using the database and tools will assist the City in aligning budgeting and spending. The City has flexibility in terms of how to conduct implementation planning using top down or bottom up approaches. While there are other means to conduct implementation planning, this Guide provides an overview of these methods as a starting point.

Top down implementation planning for the City's asset management would be conducted by establishing an initial overall budget figure for each relevant major asset class based on factors that could range from overall tax burden in any given year (e.g. the tax cap calculation), anticipated change in expenses outside of the control of the city (e.g. the cost of power, chemicals, human resources, solid waste disposal, etc.), budget windfall, or overall consumer sentiment regarding the ability to pay for City services.

Once the initial overall budget figures are established for relevant asset classes under the top down implementation planning approach, City staff would use the Tool to evaluate priorities in each asset class and determine how much maintenance or replacement work could be achieved for each asset class, and how much priority work would remain unfunded, and thus, not conducted, in the fiscal year.

Critical to informed budgeting is an understanding not only of the work that would be conducted in a given year, but also the implications of deferring other priority work to future fiscal years. For example, the City prioritizes replacement of 1,000 feet of water line on a particular street together with road reconstruction as restoration due to poor service conditions (e.g. frequent breaks,

discolored water, poor pavement condition due to undermining and patching from water breaks, etc.). However, only 500 feet are replaced due to the initial top down budget figure. During the fiscal year, as predicted based on the aforementioned condition assessment, breaks occur on the remaining 500 feet of road. Repairing these breaks is now an unplanned, unbudgeted emergency spending scenario, and the costs of emergency repairs are typically much higher than planned and coordinated reconstruction. In the end, the entire 1000 feet of road is reconstructed and the underlying pipes replaced, but the total cost could exceed that of budgeting to replace the entire 1000 feet of water line with road reconstruction in the first place.

Thus, the recommended steps in top down implementation planning include but are not limited to:

1. Initial overall budget for each relevant asset class
2. Determining which specific priorities will be addressed with the initial budget and which will be deferred
3. Reviewing the implications in terms of cost and level of service resulting from deferring priority work for which budget does not exist in the initial overall budget
4. Review and adjustment of overall budget figure to ensure alignment with priorities and to clearly define risks of deferring priority work

Bottom up implementation planning involves City staff utilizing the database and tools to develop priorities for each relevant asset class to determine the amount that should be budgeted to meet high priority needs. In conducting this work, priorities would be clearly defined in order to keep annual budget costs reasonable. This method of planning prioritizes the City's infrastructure needs over considerations such as the tax cap or citizen sentiment regarding the cost of City services.

With a list of priorities and associated costs determined for each asset class, the next step would be to calculate the user cost impact to meet the high priority needs. In addition to this mathematical step, it is critical that the value derived from the expense is well defined. For instance, using the 1000 feet of water line replacement and road reconstruction example, if given the options of paying a \$100 tax increase to fix half of the distance and potentially suffer more water main breaks, service outages, emergency construction, discolored water and a bumpy road versus a \$150 tax increase to fix the problem for good, citizens may well support the \$150 increase.

Thus, the recommended steps in bottom up implementation planning include but are not limited to:

1. Evaluate and list high priority work including costs for each relevant asset class
2. Determining user cost impact to meet high priority needs
3. Reviewing the implications in terms of cost and level of service resulting from meeting needs versus deferring priority work
4. Determine the appropriate budget figure to ensure alignment with priorities and to clearly define risks of deferring priority work

In reality, the City of Beacon may find that a combination of top down and bottom up implementation planning may achieve the best result in attempting to align budgeting with spending and to ensure that the assets of the City receive the level of investment needed to avoid the pitfalls of costly deferred maintenance and emergency repairs.

5.0 GUIDELINES FOR FINANCE PLANS

Regardless of the nature of the asset management activities undertaken by the City of Beacon (e.g. maintenance, repair, replacement, upgrade, reconstruction, expansion, etc.), the source of funds to support the work is generally derived from the tax payers of the City with the exception of grant funds (which are tax dollars aggregated by higher levels of government and redistributed) or land developer or benevolent foundation investments. Given that the majority of revenue used to support asset management is taxpayer generated, it is important to understand that how the tax revenue is spent makes a difference in the value that every dollar brings.

There are two fundamental means of evaluating the value of each dollar invested in asset management, namely what is the dollar funding and how is that dollar funding the asset. With respect to what is funded, the useful life of the asset should be considered. In the City's water system, there is equipment at the City water plant that supports the treatment of drinking water. The assets at the City's water plant include pumps to move water against gravity. The pumps are critical to the operation of the water plant; however, they have a relatively short service life due to wear and tear associated with constant operation. Even in a situation where there may be a series

of pumps that are operated in turn to provide redundancy and opportunities for maintenance, a pump could require a major re-build of its motor or drive (parts that wear during operation) every ten years. A dollar invested today in a pump has a value that decreases over time towards the approximately ten-year mark when additional funds will be required to restore operability and extend useful life. Pumps are an asset with a rapid depreciation schedule.

Similarly, the City's water system requires water mains to transmit and distribute water to the City's residents and businesses. A ductile iron pipe (DIP) water main is just as vital to providing water service as the pump at the City's water plant; however, a dollar invested today in a DIP water main is an asset that may not appreciate in a traditional sense, but it has a lengthy depreciation schedule, a minimum of 50 years, with many water lines in service over 100 years.

In these ways, it is important to understand what each dollar is funding when considering plans of finance for asset management. Similarly, it is important to understand how each dollar is spent. A dollar in tax revenue that is received in a fiscal year, held in the City's treasury for a short duration, and invested in vital infrastructure with a long depreciation schedule could be considered an investment with almost immediate return that will continue to generate a reasonable return for the service life of the asset in which it was invested. The same dollar received by the City and used to fund a payment on a bonded debt for which interest is paid to the bond holder also funds a long-term investment with return in terms of service, but some portion of that dollar is not a direct investment in City infrastructure. Rather, a portion of this dollar funds fees associated with the bonding as well as the interest rate paid back to the bond holder.

Another aspect of what is paid for is the availability of options for finance outside direct tax-payer support. For instance, the City owns several dams. Due to restrictions in both the federal and state legislation, low-cost financing and grants are rarely available to pay for dam infrastructure work. However, if a dam is associated with a park or recreational area, it may be possible to seek grants from the State Office of Parks, Recreation and Historic Preservation to offset tax-payer support for necessary improvements. Another example of assets that are difficult to fund as stand-alone infrastructure are water tanks. While a water tank may be used to provide pressure and fire flow to the City, as a stand-alone asset in the competitive world of water infrastructure financing and grants, low cost financing and grants for stand-alone water tank improvements are rare. As with

dams, water tank projects may be bundled with other, more compelling related projects aimed at improving human health to obtain grants and low-cost financing for the water tank.

With these basic concepts in mind, developing plans of finance for asset management should be considered in a customized fashion. This Guide provides considerations regarding several methods of finance that may be employed by the City including pay-as-you-go, debt financing, lease-purchase agreements, grants, fee for service, public-private partnerships, and investment by land developers. It is by no means intended to describe every potential financial opportunity that may exist; however, the following information and Table 5.0 provide a framework for decision-making.

Methods of Finance to Consider;

Pay-as-you-go – the use of revenues derived from line items in the budget to fund the work. This is direct financing of asset management activities from the taxpayer to the work being conducted.

Debt financing – the issuance of bonds or securing of loans to fund the work, the repayment of which is derived from revenues secured through a line item for debt repayment in the budget. This is indirect financing of asset management activities from a taxpayer perspective because the costs paid by the taxpayer include fees and interest that do not directly contribute to the conduct of the work.

Lease-purchase agreements – obtaining equipment or real property through execution of a lease with an option to purchase rather than an outright purchase. Lease-purchase agreements can act as a financing instrument for large purchases in that there is generally a schedule of payments over time. This is indirect financing of asset management activities from a taxpayer perspective because the costs paid by the taxpayer include fees and interest that do not directly contribute to the conduct of the work.

Grants – sources of funding from outside entities that are provided without a required repayment. Grant funds may be distributed as a line of credit to provide working capital during implementation of the work, reimbursement upon completion of the work or principal forgiveness the latter of which reduces the total amount of long-term debt secured to complete the work. Grants do not require taxpayer support; however, it is noted that the source of many grants is the redistribution of tax dollars and grants often require local match funding.

Fee for service – charges to users of a particular service the revenues from which are used for the work (e.g. water and sewer fees, or a fee to use a public park, the revenue from which is used for asset management). This is direct financing of asset management activities from the taxpayer to the work being conducted.

Public-private partnerships (PPP) – a long term agreement between a governmental entity and a private company for the provision of goods or services. PPPs related to asset management may include any combination of design, build, own, operate or financing of infrastructure. This is indirect financing of asset management activities from a taxpayer perspective because the costs paid by the taxpayer include profit for the private entity that does not directly contribute to the conduct of the work.

Development-based Infrastructure – land developers are either required to invest in municipal infrastructure to provide proper level of service to their development work or investments are made in municipal infrastructure as mitigation for impacts caused by development. Investment by land developers does not require taxpayer support; however, to bring taxpayers value, investment by land developers must not only meet the needs of the development, but also consider the needs of the community at large (e.g. a water main interior to a property meets the developers needs but a water main along the public road meets the needs of the developer and the community).

TABLE 5.0: Plans of Finance Framework

	Asset Management Activity		
Methods of Finance to Consider	Repair & Maintenance	Replacement & Upgrade	Expansion & New
Pay as You Go	X	X	
Bonded Debt/Loan		X	X
Lease/Purchase			X
Outright Grant	X	X	X
Fee for Services	X	X	X
Public Private Partnership	X	X	X
Development-based Infrastructure		X	X

6.0 POTENTIAL EXTERNAL FUNDING SOURCES

Each low-cost financing or grant program is operated by an agency under a program specific timeline for announcements of availability of funds, application due dates, award notices and execution of agreements for assistance which allows the grantee to obtain funds from the grantor. A general description of the timeframes for each aspect of selected programs is described herein; however, it is noted that programmatic changes do occur and it is prudent to review each low-cost financing or grant opportunity annually to ensure the most up to date information is considered.

▪ *State Revolving Loan Fund (Loan and Grant Program)*

The Drinking Water and Clean Water State Revolving Loan Funds (DWSRF and CWSRF) programs fund the vast majority of municipal water and sewer infrastructure in the State for which outside sources of funds are sought. The programs function on a Federal Fiscal Year

(FFY) calendar, with an Intended Use Plan (IUP) published effective on October 1 of each year listing projects for which funds may be encumbered during the following fiscal year. In order to receive program funds, a project must be listed on the Annual List which requires submission of a listing form, a Preliminary Engineering Report (PER), and a Smart Growth Assessment generally in late August or early September.

Once a project is listed on the Annual List and a community determines it will proceed with the project, an application for financing is submitted in the summer or early fall of the following year.

The application for financing must include an application form, documentation that the State Environmental Quality Review Act (SEQRA) has been conducted, the State Historic Preservation Office has been consulted, and any special districts have been created among other requirements. If a Special District is required to be formed, documentation that the district has been formed, including review by the Office of the State Comptroller if necessary, is required. And, a bond resolution with referendum period concluded is also required.

Once a complete application is submitted, financing can usually be closed with four to six months. Short-term financing is available to support project development and construction costs at no cost or very low interest rate for two to three years after which long-term financing is established with interest rates ranging from zero percent interest through market rate financing. To the extent that the community qualifies for a grant (based on environmental/public health need and ability to pay), the community borrows less over the long term, reducing annual debt service and impacts to the customer rates.

The SRF program accommodates adjustments to project cost and scope through submission of engineering amendments and budget updates. If project costs change beyond anticipated contingency, it may be necessary for the community to issue short-term borrowing; however, all eligible, approved project costs are rolled into long-term financing and any additional short-term borrowing is decreased.

Generally, the SRF process requires approximately 18 months from initiation any given spring (preparation of an engineering report and associated documents) through to the late end of the

following year. Because the program has hard deadlines, there is no opportunity to speed the application process.

▪ ***State Water Infrastructure Improvement Program (Grant)***

The NYS Legislature initially committed \$400 million in grant funds in the State Budget towards the Water Infrastructure Improvement Program over three fiscal years spanning 2015, 2016 and 2017. In 2017, the Legislature expanded the program through the Water Infrastructure Improvement Act (WIIA) and Intermunicipal Grant (IMG) programs to \$2.5 billion over a five-year period for a variety of programs focused on water quality. The WIIA program works in concert with the SRF programs discussed herein with application materials for projects intending to make use of SRF funds for the balance of project costs mirroring the SRF financing requirements. However, communities may also submit applications for grant without SRF financing if other sources of funds will be used to

For funding rounds to date, up to 60% or \$3 million of eligible drinking water project costs and up to 25% or \$5 million of eligible wastewater project costs have been awarded to recipients. While public health, environmental impact and consumers ability to pay for improvements are considered, this grant program is unique in that it may be awarded to projects that do not achieve a high ranking based on IUP scoring criteria but that are vital to the long-term sustainability of public infrastructure.

▪ ***US Department of Agriculture Rural Development (Loan and Grant Program)***

The USDA accepts pre-applications for loan and grant packages to support community infrastructure on a rolling, invitation basis. Submission of a pre-application incorporates an application form, engineering report, environmental review and other fiscal and legal documentation. Upon receipt of a completed pre-application, the USDA will invite submission of a full application. Once a complete application is submitted and accepted, closing on financing occurs within several months' time.

The overall process to obtain USDA RD funding is a multi-step process without hard timeframes, so it can be difficult to predict the timeframe for agency reviews. The agency's workload fluctuates but staffing does not and staffing is geographically assigned, so if there

are many projects being submitted in the same geographic area, it can take time for the agency to review all materials.

The USDA RD program does not accommodate project scope and budget changes per se. Minor modifications within the overall scope and contingency are acceptable, but significant changes in scope or budget are generally not accommodated by the RD program. Therefore, appropriate and detailed project planning is key to a successful USDA RD project.

- ***Consolidated Funding Applications: DOS Local Waterfront Revitalization, OCR Community Development Block Grants, DEC Water Quality Improvement Program, DEC Green Infrastructure Grant Program, OPRHP Parks Grant Program, ESD Infrastructure Investment, New York State Energy Research and Development (NYSERDA)***

The Consolidated Funding Application (CFA) process was borne from the State combining the grant activities of over ten state agencies administering nearly 30 grant programs into a single, annual action, directed by regional councils and under the review and approval of the agencies and the Governor's Office. This process has operated for a number of years, aggregating between \$800 million and nearly \$1 billion dollars annually in state aid through various programs.

The application schedule involves a call for applications in the early summer each year, with applications due towards the end of summer. Grant awards have been announced in December, with State Assistance Agreements executed in the spring nor summer of the following year and funds available thereafter in the same year. The overall schedule from application to funding is about a year, driven by the state's process.

7.0 RECOMMENDATIONS FOR ADDITIONAL DATA CAPTURE

While an overall framework for data capture and management has been created, there are assets for which additional information is needed to apply the full functionality of the Tool to every asset class. The database has been established in such a manner that it should be straightforward for City staff to add information and update information as the City determines it is needed or

appropriate. Most often there will be a need to update data as specific work projects or inspections are completed. Recommendations for basic database Tool updates are included in Section 8.2, and technical guidance is provided in the User Manual.

Specific needs for data capture identified include entry of hydrant replacement and re-numbering information that currently exists in handwritten form. The hydrant data provided in the database Tool is taken from the City of Beacon Access Database compiled by Lanc and Tully Engineering and Surveying PC. This information is outdated due to hydrant replacements between 2002 and 2009; however, the Tool includes a worksheet of the hydrant locations to assist the City in updating this information.

The City may also consider compilation of data that was not available to Delaware Engineering during the creation of the Tool, such as the department assignment for vehicles, area of each parking lot, current condition of structures at University Settlement Camp and dates of installation for sewer and water lines as they are replaced.

The database Tool is not designed to be used for logging of routine maintenance activities. There are other software solutions currently available for work orders and/or site inspections. However, information from regular maintenance activities and staff knowledge should be integrated with the asset data for planning purposes. For example, the Notes columns can be used for stating if a particular segment of water main has experienced breaks with a higher than usual frequency based on City work records. This information may be useful in prioritizing road and water line work. Regular agency inspections for bridges, and inspections/maintenance required for stormwater infrastructure under MS4 regulations will provide updated Condition information with which the City should update the database Tool.

8.0 BEST PRACTICES TO UPDATE THE TOOL

The database Tool is not a static report, but an evolving resource. City staff must develop new routines around using the database to plan asset management, updating the database with new asset information, etc., as well as preserving a quality database intact for use by various departments.

The User Manual was developed to aid the City in the use, maintenance and preservation of the database Tool.

The City of Beacon is responsible for the maintenance of this Tool, both in document control and data updates. The database Tool workbook can be protected and “locked” so that no changes can be made, however, filtering and sorting are not possible on a locked worksheet. It is the decision of the City to whom to assign the responsibility of data management and document control. That individual/individuals may assign specific update tasks as needed, while always maintaining a “Master” version of the database for recovery/to prevent accidental deletions or corruption of the Tool. A copy of the database, renamed with a department specific name, may be given to various City departments, as needed, for their use. Changing the name of each copy that is created/distributed will help avoid confusion with the “Master”.

For example, other departments may take a copy of the Tool for their own use but the copy will be renamed something different from the Master File name so that it is not returned to Master File status by mistake. “Asset Tool Beacon 07072019”, may be copied to the DPW and called “DPW Asset Tool copy 07072019”. Thereafter that copy is the DPWs. Not to be confused with the current Master File.

The database has been populated with as much data on as many priority assets as possible during the development process. It is the responsibility of the City to add data for those assets for which information is not complete as the City continues regular work and/or project work.

City staff assigned primary roles in determining who may edit the database and upon what occasions will maintain the current Database Master File on the City network and maintain current back-up. When someone is assigned the update duty, they will be the only one making changes at that time. Each Department should submit update needs and request updates (hydrants replace under X project, vehicles disposed of, etc.) to the person responsible for the database. Decisions can then be made as to when and how that information will be updated in the Tool. Any such updates or changes made will be recorded in the Change History worksheet, and new information, such as source of new data, added to the Metadata.

8.1 CHANGE HISTORY

When changes are made the Master File keepers should ensure that the Change History is completed and return the updated database to Lock. This table will allow the City to keep a record of database Tool updates and maintain the current version of the Tool. See the Change History form instructions in Section 8.0 of the User Manual.

8.2 UPDATES TO ASSET INFORMATION

The Asset Management Tool includes information on many different types of assets. These assets are utilized by or maintained by different City departments. The maintenance needs and schedules for the different assets are different and therefore the need for updating data will also differ by asset type.

Table 8.0 Update Schedule by Asset Type

Asset Type	Update Schedule
Water lines, stormwater, sewer lines, hydrants, water treatment facility, wastewater treatment facility	Data update after replacement projects are completed
Roads, sidewalks	Data updated after pavement or reconstruction projects, especially important to update water, sewer and stormwater system work done at the same time in those worksheets
Vehicles	Update when a vehicle is added to or removed from the fleet
Streetlights, traffic lights, way-finding signs	Update when replaced
Buildings, City Land, University Settlement	Update when projects are completed or property ownership changes
Bridges, Stormwater	Update asset when inspected under regulatory programs

9.0 DISCUSSION OF TRENDS TO CONSIDER

Beacon’s investment in asset management occurs in the context of several other important trends affecting the city and the region. These trends, discussed briefly here, include:

- Economic developments, especially housing and tourism
- Alignment of capital planning with comprehensive planning
- Burgeoning regulatory requirements, especially affecting water quality
- Technological innovation in municipal management, especially the digital transformation of administrative and record keeping processes

9.1 ECONOMIC, DEMOGRAPHIC AND HOUSING TRENDS

Beacon is a small historic city on the banks of the Hudson River and within commuting distance of lower Westchester and Manhattan. Like most small cities in the Hudson Valley, Beacon has transitioned from being a center of industrial growth and commerce, through urban renewal demolition of historic buildings in the 1860s and severe economic downturns of the 1970s and 1980s, to an economic rebound over the last thirty years. Beacon is now regarded as one of the premier examples of successful urban revitalization in the Hudson Valley.

The current period is one in which New York City housing prices and demographic trends, along with Beacon’s various attractions, are producing increased demand for market rate housing in the City. The demand for affordable housing is growing as well, given the growth in low-income population, escalating costs of living and wage stagnation. There is also a broad concern to preserve social diversity in the face of a wave of market rate investment that pushes up housing costs, especially in the rental market. Since 2000, the median rent in Beacon has increased by 20% when adjusted for inflation, while median income has decreased, and median home values have leapt 44%. The overall result has been a recent “boom” in new apartment construction. In 2017, for example, there were 673 residential units under construction or in the approval process (Parks and Recreation Fee Study, 2017). Recent examples include:

- West End Lofts on Wolcott Avenue – 90 affordable/workforce units
- 248 Tioronda Ave – 100 units

- Hip Lofts on Mason Circle – 144 artist live/work units
- Beacon Theater conversion – 32 units
- Lofts at Beacon Falls – 68 units

Despite these highly visible changes, the city's overall population growth has been modest at most, having increased less than 1% per year over the last two decades to reach 14,289 in 2016. Over this period city demographics have followed regional trends, with the population aging and becoming more diverse, led by a 20% increase in the Hispanic population, which now accounts for at least 20% of the city population (Hudson Valley Pattern for Progress, Urban Action Agenda, Housing Profiles, City of Beacon, 2016). A recent parks and recreation study projects modest population growth in the coming years, with the city reaching 16,237 by 2025 (Parks and Recreation Fee Study, 2017). Despite a low population growth trend, a recent Beacon Water Supply Plan anticipated a modest growth in water demand, well within the city's water system capacity by 2035 (Cusack, LBG Hydrogeologic Engineering Services, Beacon Water Supply Plan).

The impact of new housing construction on the city's infrastructure is mitigated in part due to the location of most recent housing construction in the downtown area, whereas earlier periods of housing construction were more suburban in nature, leading to expansions of the city's roads, drainage, water and sewer systems in the 1960s, '70s and '80s. About 35% of housing units in Beacon were built after 1970, but new construction essentially ended with the Great Recession of 2008 until the pickup in recent years (Hudson Valley Pattern for Progress, Urban Action Agenda, Housing Profiles, City of Beacon, 2016). Homestead assessed value declined from the Great Recession until 2014, when it hit a low of \$808 million overall, but has been increasing in recent years. This indicates the tax base is increasingly capable of paying for needed capital improvements, almost reaching its overall pre-Recession value (City of Beacon, 2018 City Budget, October 2, 2018).

Beacon's location on the MetroNorth rail line has been critical to its economic wellbeing, but it must be recognized that only about 8% of the city's workers commute via public transit, with the vast majority getting to work via driving alone in a car. Only about 20% of city residents work within the City of Beacon, and about half of city residents commute outside of Dutchess County

to work (Pattern for Progress, Urban Action Agenda, Community Profiles, City of Beacon, 2018). The City will continue to need to maintain and invest in pavement.

Tourism is a growing sector of the Hudson Valley regional, state and global economies. Regionally, tourism growth is strongest in New York City. Weekend outbound ridership on MetroNorth from NYC to Beacon and other popular destinations on the Hudson Line, such as Cold Spring, Breakneck Ridge and Poughkeepsie, is increasing far more rapidly than inbound commuter ridership. In general, places that attract visitors also attract permanent residents, and vice versa. Beacon's public and private investments in the wheeled trolley, visitor's center, and various food, arts and entertainment promotional events and publications, makes sense in light of the tourism trend. The City should continue to find ways to align its asset management and capital investments with the goal of connecting the city to the rail station, water front and Dia:Beacon.

9.2 ALIGNMENT OF CAPITAL PLANNING WITH COMPREHENSIVE PLANNING

The asset management plan is meant to aid both city staff in managing existing infrastructure and assets and city management in planning and prioritizing capital investments. In this latter sense of supporting the city's capital improvement planning, it is important to maintain awareness of how asset management can and must support the vision for city development contained in the city's Comprehensive Plan. This alignment is important because sometimes infrastructure is paid for by private investment, such as development-based infrastructure work, resulting from land use planning and zoning decisions that are guided by the comprehensive plan, and because without proper investment in infrastructure, the vision of the comprehensive plan is unlikely to be realized. However, such alignment of capital and comprehensive planning is challenging due to the fact that capital investment decisions are driven by emerging maintenance needs and funding opportunities managed within the timeframe of the annual budget process, and by finance and public works officials. Comprehensive planning encompasses a much longer timeframe and different responsible parties. Drawing connections between these two areas of municipal management is a recognized trend and priority (Greathouse, Integrating Capital Improvements Planning with the Comprehensive Plan, American Planning Association, September/October 2018).

The City has commissioned planning studies in recent years, the insights and priorities of which should be incorporated into asset management decisions, especially as they relate to capital investments. These studies include:

- Comprehensive Plan Update (2017)
- Parks and Recreation Fee Study (2017)
- Report: Site Selection for a New Fire Station (2017)
- Complete Streets Guidelines (2016)
- Beacon Center City Parking Analysis (2014)
- Reservoir Safe Yield Analysis and Groundwater Supply (2014)
- Fishkill Creek Greenway and Heritage Trail Master Plan (2013)
- City of Beacon LWRP (2012)

Short of a full evaluation of opportunities for alignment of capital and land use planning in Beacon, which is outside the scope of this study, it is useful to point out a number of ways in which the newly developed asset management database Tool can be helpful to the comprehensive planning process, and vice versa. For example, the 2017 Plan calls for a focus on transit-oriented development and improved connections between Main Street, the waterfront/rail station area, and Dia:Beacon, including improved streetscapes, a wheeled trolley service, pocket parks and the development of the Beacon Line as a ped-bike path with potential for future commuter service. These priorities in the Plan should weigh heavily in asset management and capital investment decisions. For its part, the Parks and Recreation Study provides a needs assessment listing \$1.8 million in capital projects for Beacon parks. The asset management Tool pulled all park assets into a single inventory that can be used to further analyze and prioritize investments.

9.3 BURGEONING REGULATORY REQUIREMENTS

While it is difficult to predict the timing and exact nature of regulatory changes that will influence the nature and cost of infrastructure in the City of Beacon, there are a number of areas whereby the City will be prudent to be mindful. While there are likely many regulatory changes that will affect City infrastructure, such as the recent change to the length of slope of accessible sidewalk

to pavement, the areas with the most major cost implications are likely to include drinking water, wastewater treatment and stormwater management.

With respect to drinking water, regulation of Emerging Contaminants is underway or under serious federal and state consideration. The discovery of Per- and polyfluoroalkyl substances (PFAS) in drinking water sources in Newburgh and in Hoosick Falls have raised awareness that the drinking water standards are adequate for most situations, but vigilance and common sense in terms of historic land uses that may have contaminated soil and water should be applied in terms of testing and regulation. The State has created a Drinking Water Quality Council whose charge is to determine which substances shall be recommended as emerging contaminants for which regulatory standards should be considered. The emerging contaminants to be considered, at a minimum, are:

- A. unregulated contaminants monitored pursuant to the federal Safe Drinking Water Act (42 USC § 300g-1) as amended from time to time;
- B. substances that require regulation or monitoring when present in drinking water in other jurisdictions outside the state of New York;
- C. pesticide chemicals for which the United States environmental protection agency has set human health benchmarks for drinking water;
- D. substances found at sites in remedial programs located inside and outside the state of New York, including but not limited to inactive hazardous waste sites; and
- E. waterborne pathogens and microbiological contaminants.

As a result, the City should be mindful of discussions at the state and federal level regarding Emerging Contaminants through on-going dialogue with contacts at the Department of Health.

With respect to wastewater treatment, there is a current focus on nutrient reduction targeting both phosphorus and nitrogen (including ammonia (NH₃)). Nitrogen is generally reduced through the biological treatment process of a wastewater treatment plant, whereby phosphorus is reduced to some degree through biological uptake, the most robust treatment method is filtration. With proper planning, a regulatory demand to reduce either or both of these constituents would not be overly

costly. There are other state-wide programs influencing wastewater treatment including mercury minimization and reduction in chlorine discharged to the environment. These are also not overly costly to address given proper planning. Aside from these trends, it would be prudent for the City to maintain open lines of communication with the Department of Environmental Conservation. It is rare that new criteria are foisted upon the regulated community. Rather, the process generally involves first a request to monitor a particular constituent and later, after data is captured, a regulatory requirement. By maintaining an open dialogue with the regulatory community, the City can avoid surprises and plan for required improvements.

Stormwater is the final area where regulatory changes could have significant financial implications to the City of Beacon. The preference towards green infrastructure will influence redevelopment projects within the City which will assist in achieving regulatory standards; however, it may be prudent or necessary to undertake conversion projects to eliminate gray infrastructure (catch basins and storm drains with direct discharges to the River) in favor of green infrastructure (practices that utilize natural systems to slow and treat stormwater with an emphasis on infiltration into groundwater rather than point source discharges). Current stormwater regulations generally require treatment as close to the source as possible, green infrastructure when possible, maintenance of volume pre- and post-development, elimination of trash, and reduction in sediment carried to waterbodies. In addition, there has been regulatory discussion regarding the need to reduce nutrients carried to waterbodies with a preference towards the use of natural systems to do so. As the City plans reconstruction of public spaces, attention should be paid to the use of natural systems to achieve these objectives. In addition to being ahead of a future regulatory curve, there is current funding available to implement such systems.

9.4 TECHNOLOGICAL INNOVATION IN ASSET MANAGEMENT

This asset management database Tool and associated User Manual, worksheets and Guide, are critical steps forward in the digital transformation of municipal administrative and work processes. Beacon, like every other municipality, has adopted computer-aided processes widely, but incompletely. Opportunities are proliferating for the further automation of clerical labor processes, generation of useful data and analytics, and the use of this information to improve asset management. The creation of a comprehensive inventory of assets via this current effort, and

linking this inventory to public works and financial planning, is a necessary first step. A five-year strategic plan for asset management could include further digitization of paper records, such as maps and repair histories, access to these records by workers in the field via tablets, and the integration of GIS capability into routine operations.

For example, a public works employee would log asset maintenance activities, including photos and notes, on a tablet while in the field, and the tablet would be armed with a barcode reader to easily identify barcode-tagged assets. This same employee may soon be able to pull up maps of rights-of-way to know, for example, if a damaged tree is more likely located on public or private property. These activities will generate digital records that can be searched and analyzed for the labor and material costs associated with the maintenance of any asset, and these results presented both in tables, trendlines and on maps, via integration with GIS, to be used for planning purposes. The City is currently exploring use of WebDPW for work orders and the City's engineer maintains the City's GIS data.

One important way to ensure the City stays on track with its asset management goals is to formulate and adopt formal policies for guiding asset management and capital investment decision-making.

9.5 ADOPTING POLICIES TO GUIDE ASSET MANAGEMENT AND CAPITAL IMPROVEMENT PROGRAMS

The asset management database Tool, as noted earlier, is part of a larger effort to use asset data to plan and coordinate management and investment activities to yield the lowest possible asset lifecycle costs at desired levels of service. Such an effort, like the working group assembled to complete this project, is of necessity interdisciplinary, innovative and made urgent by organizational leadership. The adoption of an asset management policy is one important way that the City can institutionalize asset management as an organizational priority at the highest possible level, as part of organizational culture, and insure its continuation. Such a policy should be drafted at the request of the city council by the city's asset management team or steering committee, involving staff from relevant departments, supported by finance and IT personnel. An effective asset management policy should address the following areas, at a minimum:

- Scope and purpose – the policy should be a statement by the city council that sets a high priority for all staff to continually seek to steward the public’s valuable assets according to principles and procedures in the adopted asset management policy, ie, at lowest possible lifecycle cost.
- Inventory of assets – the policy should establish that all physical assets shall be inventoried and the inventories regularly updated, and then provides guidance on how to do this, including definitions. For example, many cities include items worth at least \$5000. Other, often less costly, assets, such as tablets, guns, tools or cell phones, should be considered for inventory and tracking precisely because they are small, attractive and have a heightened risk of loss or theft.
- Additions, transfers, disposals and losses of assets and keeping the inventory up to date—the policy should provide guidance for updating asset inventory with changed asset status, surplusage and auctioning assets, reporting of theft, etc., and establishes timeframes and standards for periodic inventory and condition assessment.
- Maintenance and repair of assets – all assets should be managed with an understanding and analysis of total life-cycle costs in an effort to minimize these costs. The policy may set standards for measuring levels of service, and expectations for the life expectancy of various assets. The policy should establish the collection and analysis of digital data on asset maintenance and performance as an organizational priority.
- Funding of assets – the policy should provide for stable, long-term funding to renew or replace assets before excessive costs are incurred due to age and deterioration and unplanned repairs. Consider fiscal policies for management of debt and capital improvements, the process by which a capital improvement program is developed, including how candidate projects are evaluated, use of reserve funds, restriction of debt periods to the expected useful lives of the improvements so financed, how frequently the city intends to issue debt, and so on.

Effective asset management requires leadership and the development of new organizational cultures focused on data-driven decision-making. A powerful tool for showing leadership and expressing organizational culture is the creation and adoption of an asset management policy. The

policy articulates the general principles and specific goals of the asset management process and calls upon all city staff to incorporate these principles and goals into their work.