Government of the
District of Columbia

District of Columbia
Status Report on Replacement Schedule for Capital Assets

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District of Columbia: Status Report – Replacement Schedule for Capital Assets

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Chief Financial Officer

District of Columbia: Status Report – Replacement Schedule for Capital Assets

Introduction

The purpose of this report is to provide an update on the status of the development of a Replacement Schedule for Capital Assets as required by Council legislation. In response to a legislative requirement, a strategic team initiated earlier this year the process of developing a method to inventory all District-owned assets, gather information on their condition, and determine the costs of either maintaining or replacing those assets. The process consists of various phases that will be described in further detail in this report. These phases include: (1) a pilot project phase to test the viability of an asset management software solution to assist in the gathering of the needed information and estimation of replacement costs, and (2) the development of a large-scale, District-wide implementation of such a solution to record the entirety of all District-owned assets accurately project the cost of replacement and maintenance of those assets.

This report is intended to assist the Mayor, Council, agency directors, and other policymakers in understanding the scope of the effort to identify and assess the condition all of the District's assets, and second, to determine the cost to replace critical infrastructure.

Background

As part of the Fiscal Year 2015 Budget Support Act, effective February 26, 2015, the Council included a legislative requirement for the Office of the Chief Financial Officer (OCFO) to develop and report on a Replacement Schedule for Capital Assets in October of each year. The Chief Financial Officer's strategic plan, which was released in August 2014, included an initiative to develop a long-range capital financing plan for the District. In order to accomplish this goal it is critical to first create a centralized database of all District-owned assets and their respective condition, so that a calculation of the costs to maintain or replace those assets can be performed. Therefore, the legislative requirement introduced by the Council coincided with, and was complimentary to, the necessary work in support of the strategic initiative.

Purpose of the Report

This Replacement Schedule for Capital Assets will provide for the first time a detailed inventory of all District-owned assets on an enterprise-wide basis. Currently, each agency maintains records of its assets, although the condition of those records varies greatly. Certain agencies such as the District Department of Transportation (DDOT) and the Department of General Services (DGS) have the most current and comprehensive information on their assets. Having a comprehensive inventory of all District-owned assets is a first step in being able to develop an estimate of the cost of replacing those assets. The District must have an inventory of these assets, and an understanding of the maintenance and replacement costs, at not just an agency level, but also at an enterprise-wide level, in order to have a full understanding of the scope of the challenge in financing the District's capital infrastructure needs. It is also worth noting that maintaining an asset inventory and conducting condition assessments are best practices in asset management promulgated by the Government Finance Officers Association. *A system for assessing assets is*

prerequisite to appropriately planning and budgeting for capital maintenance and replacement needs, in turn ensuring that assets are in conditions necessary to provide expected service levels.[1]

The inventory and assessment will allow the District to conduct better long-term asset management planning and financing to address the replacement of key infrastructure while minimizing negative impacts on residents, business owners, and on the District's financial stability. The benefits of a comprehensive asset management system include the following:

- Better prioritization of capital projects relative to long-term risks and costs
- Ability to determine optimal rehabilitation and maintenance schedules and processes
- Determination of financial impact of deferred capital maintenance
- Optimal timing of delivering new projects

A Phased Approach to Developing a Replacement Schedule for Capital Assets

In collaboration between the Mayor's office and the OCFO, initial meetings were held with key stakeholders to map out an approach to tackling this complex task. One of the first steps that occurred in this process was the creation of a steering committee to manage the development and implementation of the capital assets replacement schedule. The Steering Committee is comprised of various members from critical agencies with expertise in capital planning, information technology and finance. After numerous meetings and discussions by the steering committee on the current state of available asset data in the District, research on asset management plans of other jurisdictions and industry best practices, it was determined that the most effective approach would be to developed a phased implementation of the capital asset replacement schedule.

Furthermore, after extensive discussions with members of the District's capital budget team from both the OCFO and the Executive Office of the Mayor (EOM), it was determined that the availability of high-quality data on the type and condition of the District's assets varies widely from agency to agency. Since there is not currently a centralized system being used throughout the District to track these critical assets, it is left up to each agency to develop and maintain its own systems and procedures on how these assets are inventories and assessed. While some District agencies maintain their own extensive and up-to-date databases on their critical assets, other agencies have been less systematic in tracking their assets. Given this discrepancy in data quality between agencies, it was determined that it would most likely take between twelve and eighteen months to build a detailed and comprehensive database of all District-owned assets. Given the long-scope of that project it was determined that it was best for the District to proceed in this endeavor using a phased approach. This phased approach will allow the District to move forward with quickly building an asset database for those agencies that already have the proper quality of data in their existing records needed for this project, while simultaneously allowing the steering committee, and other stakeholders, to work with those agencies that will require more extensive work in order to improve the quality of their asset inventory data.

Phase 1: Capital Asset Replacement Schedule (Proof of Concept)

The steering committee determined that the District does not currently have an adequate software system in house to create a centralized database of all District-owned assets and their respective current conditions. As an initial step in developing a comprehensive database the District

[1] Government Finance Officers Association, *Best Practice: Asset Maintenance and Replacement*, approved by the GFOA Executive Board March, 2010. Retrieved from: http://www.gfoa.org/asset-maintenance-and-replacement on 9/26/15.

developed a limited proof of concept for a capital asset replacement system. The proof of concept was intended to test asset management software on a portion of the District's assets that currently has good quality data prior to a more comprehensive District-wide implementation of any software. The steering committee managed the competitive selection process for the software vendor, and engaged Riva Modeling ("Riva"). Riva's Decision Support (DS) system was engaged for this purpose in a project called the Capital Asset Replacement Scheduling System, or "CARSS."

The steering committee also managed the selection of which assets would be included in the proof of concept and secured the participation of the agencies with responsibility for the assets. For the proof of concept, three distinct asset groups were entered into the CARSS project in order to test the viability of Riva's software platform. These three asset groups were chosen to be representative of the majority of the District's asset types: 1) *street segments*, representing pavement, or horizontal infrastructure managed by DDOT; 2) *school buildings*, representing all District-owned buildings managed by DGS and District of Columbia Public Schools (DCPS); and 3) *school buses*, representing fleet or rolling stock managed by the Office of State Superintendent of Education (OSSE). These assets were also selected because the District already had existing, high quality data for these particular asset groups.

Street Segments

With the cooperation of DDOT staff, the District's street segment data was successfully loaded into the proof of concept centralized database representing over 17,000 unique street segments, which represents all of the street segments in the District. It is important to note that street segments are very similar in their characteristics to alleys and sidewalks, two large segments of horizontal infrastructure that will need to be inventoried at a later date.

As a result of this effort, the District now has very specific information on each street segment and its condition down to the length and width of the street segment, its current age and remaining useful life, as well as its last inspection date. Given this information, the District is now better able to model and predict when the individual street segments will need minor repairs such as slurry seals and more major repairs such as a full mill and resurface. Not only does this information allow DDOT to better prioritize which streets needs to be repaired, but it also allows for better financial planning and management around the cost and timing of those necessary repairs. A sample of the data on one street segment, including the projected cost and timing of repairs to that street segment, that is now captured in our centralized database can be seen below. The ability now exists to model the repair and replacement cycle for this street segment, and all others, from its major work completed this year through the next 50-plus years of its useful life. CARSS gives the District the ability to model and customize an assets repair and replacement schedules based on any number of replacement strategies, from fairly simple strategies such as useful life to infinitely more complicated computations based on individual probability of failure curves and other risk related analytics for each individual asset. The chart below reflects just a portion of the data that now exists in a centralized database for each street segment in the District.

Name	From Street	To Street	Active Date	Length (ft)	Width (ft)	Current Age	Useful Life	Inspection Date
22ND ST NW - FLORIDA AVE NW -> R ST NW	FLORIDA AVE NW	R ST NW	8/27/1964	391.67	14	51	15	4/27/2013
Florida Ave NW - 22ND ST NW -> 22ND ST NW, MASSACHUSETTS AVE NW	22ND ST NW	22ND ST NW, MASSACHUSETTS AVE NW	8/27/1964	125.66	48	51	15	8/11/2013
Maryland Ave NE - BLADENSBURG RD NE, MORSE ST NE -> NEAL ST NE	BLADENSBURG RD NE, MORSE ST NE	NEAL ST NE	11/1/1965	665.72	51	50	15	8/5/2013
WESTHALL DR NW - DEAD END NW -> RIDGEVIEW WAY NW	DEAD END NW	RIDGEVIEW WAY NW	7/27/1971	215.68	14	44	15	10/5/2013
Macarthur Blvd NW - RIDGEVIEW WAY NW -> LAVEROCK PL NW	RIDGEVIEW WAY NW	LAVEROCK PL NW	8/27/1964	320.11	24	51	15	7/22/2013
Macarthur Blvd NW - LINGAN RD NW -> RIDGEVIEW WAY NW	LINGAN RD NW	RIDGEVIEW WAY NW	8/27/1964	351.9	40	51	15	7/22/2013
Calvert St NW - LANIER PL NW -> CLIFFBOURNE PL NW	LANIER PL NW	CLIFFBOURNE PL NW	8/27/1964	267.36	24	51	15	7/9/2013
Calvert St NW - ADAMS MILL RD NW -> LANIER PL NW	ADAMS MILL RD NW	LANIER PL NW	8/27/1964	148.1	56	51	15	7/9/2013
Eads St NE - DEAD END NE -> 55TH ST NE	DEAD END NE	55TH ST NE	11/1/1965	440.19	34	50	15	6/28/2013
Harewood Rd NW - LINCOLN DR NW -> ROCK CREEK CHURCH RD NW	LINCOLN DR NW	ROCK CREEK CHURCH RD NW	11/1/1965	802.3	11	50	15	7/17/2013
New Mexico Ave NW - 43RD ST NW -> SUTTON PL NW	43RD ST NW	SUTTON PL NW	11/1/1965	148	24	50	15	7/22/2013
Stanton Ter SE - TOBIAS DR SE -> TUBMAN RD SE	TOBIAS DR SE	TUBMAN RD SE	8/23/1971	445.34	24	44	15	3/11/2013

School Buildings

Similarly, a decision was made to model school buildings in the proof of concept to represent the vertical infrastructure, or buildings, that are owned by the District, because of the quality of the data currently maintained by DGS and DCPS in their respective databases. The thought process being that modeling a school building is no different than modeling other District-owned buildings, such as the John A. Wilson building, the Martin Luther King Jr. Memorial Library or the Anacostia Recreation Center. Through the proof of concept Riva was able to model information on all of the school buildings in the District, representing approximately 125 unique buildings. The data includes information on buildings that have already been involved in the school modernization program, as well as those yet to be modernized. The chart below reflects just a portion of the data that now exists in a centralized database for each school building in the District.

Name	Bldg Square Footage	Current Age	Last Modernized Year	Replacement Cost ($)	Ward
ANACOSTIA HIGH SCHOOL - 1601 16TH STREET SE	247,900	3	1/1/2012	158,656,000	8
AMIDON ELEMENTARY SCHOOL - 401 I STREET SW	70,800	3	1/1/2012	45,312,000	6
BARRD ELEMENTARY SCHOOL - 430 DECATUR STREET NW	72,500	12	1/1/2003	46,400,000	4
BEERS ELEMENTARY SCHOOL - 3600 ALABAMA AVENUE SE	77,500	2	1/1/2013	49,600,000	7
BRENT ELEMENTARY SCHOOL - 301 NORTH CAROLI AVENUE SE	47,500	6	1/1/2009	30,400,000	6
BRIGHTWOOD EDUCATIOL CAMPUS - 1300 NICHOLSON STREET NW	86,120	11	1/1/2004	55,116,800	4
BUNKER HILL EDUCATIOL CAMPUS - 1401 MICHIGAN AVENUE NE	69,400	3	1/1/2012	44,416,000	5
BURROUGHS EDUCATIOL CAMPUS - 1820 MONROE STREET NE	63,900	6	1/1/2009	40,896,000	5
BURVILLE ELEMENTARY SCHOOL - 801 DIVISION AVENUE NE	95,000	5	1/1/2010	60,800,000	7
CARDOZO EDUCATIOL CAMPUS - 1200 CLIFTON STREET NW	355,400	2	1/1/2013	227,456,000	1
CLEVELAND ELEMENTARY SCHOOL - 1825 8TH STREET NW	53,000	11	1/1/2004	33,920,000	1
COLUMBIA HEIGHTS EDUCATION CAMPUS - 3101 16TH STREET NW	325,217	9	1/1/2006	208,138,880	1
DEAL MIDDLE SCHOOL - 3815 FORT DRIVE NW	143,700	5	1/1/2010	91,968,000	3
DREW ELEMENTARY SCHOOL - 5600 EADS STREET NE	72,800	5	1/1/2010	46,592,000	7
EASTERN HIGH SCHOOL - 1700 EAST CAPITOL STREET NE	288,800	5	1/1/2010	184,832,000	6

School Buses

Finally, the decision was made to model school buses in the proof of concept to represent the rolling stock, or fleet of vehicles, that are owned by the District, because of the quality of the data currently maintained by OSSE in their database. Riva was able to model all of the school buses

in the District's fleet, representing 621 unique vehicles. Furthermore, CARSS now provides the ability to separate the key, non-vehicle related components, such as the navigation systems and wheel chair lifts for their own separate maintenance and replacement schedules apart from the physical buses, since they will all degrade and require replacement on separate schedules. Being able to successfully separate out critical components from the vehicle in which they are housed will be key in successfully modeling other District fleet in the future that similarly have critical equipment that will need to be replaced on separate schedules from the vehicles that they are housed within, such as police, fire and EMS vehicles. As you can see from the information in the chart below, the system allows the user to track individual buses by their respective bus ID numbers or VIN numbers, as well as their active dates, mileage or storage lot location. This information will assist OSSE in developing more detailed assessments on when individual buses need to be replaced, either by useful life calculations or mileage or some combination of the two.

Bus Number	VIN	Active Date	Status	Useful Life	Vehicle Mileage	Location	Condition* (as of 2015)
5679	1GB3G2BG3E1205624	12/17/2014	Active	7	2,248	5th	99.83
5675	1GB3G2BG2E1207493	12/17/2014	Active	7	2,573	5th	99.83
5682	1GB3G2BG6E1206055	12/12/2014	Active	7	1,864	5TH	99.83
5696	1GB3G2BG4E1207284	12/10/2014	Active	7	1,034	5th	99.83
5698	1GB3G2BG8E1206820	12/10/2014	Active	7	1,674	5TH	99.83
5699	1GB3G2BG2E1207056	12/10/2014	Active	7	1,330	5th	99.83
5689	1GB3G2BG5E1205608	12/10/2014	Active	7	2,330	5th	99.83
5659	1GB6G5BG3E1201541	9/22/2014	Active	7	760	SW	99.83
5656	1GB3G2BGXE1201439	9/22/2014	Active	7	1,003	SW	99.83
5653	1GB3G2BGXE1200937	9/22/2014	Active	7	748	SW	99.83
5650	1GB3G2BG3E1200732	9/22/2014	Active	7	756	SW	99.83
5654	1GB3G2BG4E1200349	9/22/2014	Active	7	755	SW	99.83
5655	1GB3G2BGXE1201358	9/19/2014	Active	7	784	SW	99.83
5633	1FDEE4FL2EDA19354	2/18/2014	Active	7	10	Adams	99.83
5611	1FDEE4FL0EDA19384	1/31/2014	Active	7	6,679	NYA	99.83

* A condition of 100.00 equals a new vehicle.

Proof of Concept Summary

The proof of concept was completed and "went live" in mid-July, 2015. The software was successfully able to load the data of the various agencies from their existing varied databases into CARSS and run numerous queries and reports to test both the accuracy of the data and model the current maintenance and replacement strategies in use by the participating agencies. Since this was a proof of concept the data provided by the various participating agencies was loaded as one-time, static information, or flat-file data load. In the future when the full system is implemented, CARSS will be linked directly to the various databases currently maintained by the various agencies. This will allow for near instantaneous updates of information whenever each agency makes changes within their own individual databases.

Given the relatively short time frame of the proof of concept, the steering committee did not seek independent cost replacement strategies in this phase, rather the goal was to demonstrate the software's ability to accurately model the current repair and replacement strategies employed by the participating agencies. Representatives of Riva demonstrated the system and trained the various department users on the software analysis tools. To this point, feedback from all of the various agencies that participated in the proof of concept has been very positive. The steering

committee has conducted several follow up meetings with each agency, and has obtained from each agency a signed decision point memo indicating the agency's satisfaction with the proof of concept, and their willingness to recommend moving forward with the larger implementation of Riva's asset management software solution for the District's asset management and replacement needs.

Phase 2: Capital Asset Replacement Schedule (Full Implementation)

OCTO is preparing to release the detailed scope of work to finalize the contract with the software vendor to assist the District in the design and implementation of the full, bottom-up approach to a District-wide asset management software solution. This second, and much more granular, phase of the capital asset replacement schedule will gradually populate the CARSS system with all District-owned asset data. Coordinated by the steering committee, the selected software vendor and the various District departments will work together to add assets to CARSS, one category at a time. After each asset category has been added to the system, the software vendor will train the agency end-users on its use and full analytical capabilities.

Generally, the data population process will proceed in order of asset categories with the best data to those with the poorest data. Where adequate asset data does not exist, condition assessments will have to be performed based on specifications designed to meet CARSS requirements. This work can be in progress while the software vendor works with data that is already available. Since the quality of data for all of the District's various assets is unknown at this time, it is difficult to provide a timeline with any degree of certainty for the full implementation of CARSS District-wide. However, in consultation with Riva, the steering committee anticipates that full implementation will take between twelve and eighteen months. Below is a very general timeline for the implementation of CARSS District-wide, based on discussions with the software vendor Riva Modeling. This schedule is a realistic estimate of their best assessment of the complexity of this project, however the schedule could be delayed if the state of data on other District assets that has yet to be assessed proves to be deficient, requiring additional effort. Additionally, a project manager from within OCTO will be appointed to handle the technical implementation of the software on the District's servers, as well as acting as the technical liaison with the software vendor. The project manager will also be responsible for coordinating the integration of CARSS with the existing databases from each agency, so that as the respective data is tracked and updated by each agency in their respective systems, it is also seamlessly updated in the centralized database on a regular schedule.

Date	Task
October-15	Statement of Work made public/ contract awarded
November-15	Project Initiation
December-15	Solution Design Workshops with various agencies
February-16	(begin data gathering and identify agencies with deficient data)
March-16	Model Prototype Configuration
April-16	Initial Model Configuration
May-16	Integration design and development/ live link to source databases
July-16	
August-16	Data follow up for agencies identified with poor source data
September-16	Prototype reconfiguration
October-16	Project Final preparation
November-16	Data migration and final training
December-16	User acceptance training
January-17	
February-17	Project "Go Live"
March-17	Project support phase and additional training
May-17	

Role of CARSS in Development of a Long-Range Capital Financial Plan

Currently the asset management system includes detailed information on the District's school buildings, street segments and school buses, which constitute approximately 30% of the District's total assets. Significant effort will be required over the next 12 to 18 months to add the District's remaining assets such as sidewalks, alleys, bridges, public buildings, and other fleet and equipment required to fully utilize CARSS for developing annual capital plans, as well as the long-range capital financial plan.

In the future, when CARSS is completely populated, capital and financial plans will be developed using granular data that is derived from the rehabilitation or replacement needs of each capital asset in every agency, combined with needs for new capital assets. While CARSS will not be fully utilized until all of the detailed asset data is added to the system, the tool will be available to assist the Mayor's office in the fiscal year 2017 capital budget formulation for those assets already entered into CARSS. This added capability, along with the ability to add new capital assets, should significantly improve upon last year's process.

For the initial development of the long-range capital financial plan, the detailed asset data on street segments, school buildings and school buses will be used, along with high-level estimates of the other facilities, as well as an estimate of new capital needs for the next 15 years. In addition to the estimated future capital needs of the District, CARSS will also allow for the incorporation of future capital needs of the Washington Metropolitan Area Transit Authority ("WMATA"), which represents a significant portion of the District's annual capital expenditures. The model will be refined as the full compliment of assets are added to CARSS over the next 12 to 18 months, which will allow for more refined planning and sensitivity analyses, such as the impact of deferred maintenance, capital cost escalation and the impact of reduced operations costs for higher maintenance levels. Each year, as the detailed information is improved, capital planning should significantly improve.

By using CARSS, the project prioritization process will be able to be completed much more efficiently and more consistently. The system's "levelling" capacity will be used to "fit" projects within the revenue constraints of each year based on their relative priorities and phasing. CARSS will also allow the various projects to be summarized easily in various ways, with an easy-to-understand graphical representation, facilitating more meaningful analysis and changes based on a "big picture" view of total capital needs.

Final Project Results

The ultimate purpose of developing a District-wide capital asset replacement scheduling system is to allow the District, for the first time in its history, to have an accurate, up to date inventory of all of its critical assets, as well as a detailed schedule and strategy to maintain and replace those assets, and to track their related costs and risks. In the future, when CARSS is completely populated, capital plans will be developed in a "bottom-up" approach based on granular data – determined by the rehabilitation or replacement needs of each asset in every department, combined with needs for new assets. This system will be able to forecast the cost for the replacement of critical assets well in advance, so that the District can develop a strategy on how to finance the costs associated with replacing its aging infrastructure in a prudent and responsible manner that does not harm the financial well being, or credit ratings of the District, as well as place undue burdens on District businesses and taxpayers.

The development of the centralized database of District assets is absolutely critical in the development of a "best in class" asset management solution for the District. The successful development of this asset management solution will make the District a leader throughout the country in the development of a detailed long-range capital plan to address the financing of its critical infrastructure.