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# Vehicle Mounted 3D Survey System – Budget Adjustment Request

## Recommendation

That the Standing Policy Committee on Transportation recommend to City Council:  
That a budget adjustment in the amount of \$250,000 to Capital Project #1041 – Benchmark Rehabilitation funded from the Land Development - Prepaid Engineering Reserve in the amount of \$80,000 and from the Infrastructure Replacement – Water and Wastewater Reserve in the amount of \$170,000 be approved for the purchase of a Vehicle Mounted 3D Survey system, including associated software, and staff training.

## Topic and Purpose

The purpose of this report is to request City Council approval for a budget adjustment to Capital Project #1041 – Benchmark Rehabilitation. The funds are required to purchase a Vehicle Mounted 3D Survey (3D Survey) system to replace the current Geotechnical Positioning System (GPS).

## Report Highlights

1. Approval of \$250,000 from the Land Development - Prepaid Engineering Reserve and the Infrastructure Replacement– Water and Wastewater Reserve is being requested to fund the purchase of a Vehicle Mounted 3D Survey system.
2. A 3D Survey system, will be utilized to increase the safety of staff, and accuracy of location data, while reducing the need for road closures, detours, time and cost of surveys.

## Strategic Goals

This report supports the Strategic Goal of Continuous Improvement by ensuring internal processes and employee skills are continuously improving through the use of new innovative technology creating a safe and productive work environment.

This report also supports the Strategic Goal of Asset and Financial Sustainability by allowing for efficient collection of data to monitor and identify design issues, and more accurately determine roadway conditions without the need of road closures or detours.

## Background

Benchmarks are points, typically near a road or on a building, that have a known elevation and position which survey and construction crews can use for maintenance and construction. For several decades, annual funds have been allocated towards Capital Project #1041- Benchmark Rehabilitation. The funding allows for the existing network of over 600 active survey benchmarks located throughout the City to be inspected for accuracy and condition and either replaced, or re-positioned.

The previous contract for maintenance work was completed in 2011. Subsequent maintenance contracts have not been required due to the shift in industry towards GPS systems resulting in a need for fewer benchmarks.

### **Report**

Funding for this project has been made available by returning previously approved funding from Capital Project #1041 – Benchmark Rehabilitation to the Land Development – Prepaid Engineering Reserve and the Infrastructure Replacement – Water and Wastewater Reserve. The purpose is to utilize the accumulated funds for new survey equipment that will allow staff to survey large areas very efficiently and safely.

The Vehicle Mounted 3D Survey system allows for accurate and quick collection of precise surface data along existing roadways and new construction in the City. The data is collected while driving down the roads at normal speeds without the need to close lanes or have staff exit the vehicle to work in traffic. The system can collect 6,000 location points per minute while driving, whereas the current method which has a survey crew walking with GPS can collect approximately four points per minute.

The data collected from the 3D Survey system is processed using specialized computer software to create a precise 3D surface. The surface allows for the accurate detection of roadway defects, material quantities, and inspections for design accuracy.

Benefits of the 3D Survey system include:

- Eliminates the need for roadway surveys increasing safety for survey crews working in traffic;
- Reduces inconvenience to the public due to detours and road closures; and eliminates associated costs;
- Increases survey crews efficiency and flexibility;
- Increases the accuracy of surveys, and density of location information; and
- Allows City staff to develop new skills to stay relevant with rapidly changing technology.

Other uses for the equipment are expected to produce further time and cost efficiencies as staff become more familiar with equipment use.

### **Options to the Recommendation**

1. One option is to leave the funds in place for future benchmark maintenance and continue to undertake surveys using current methods. This is not recommended due to safety concerns with survey crews working near traffic, as well as the time and cost for survey crews to perform extensive surveys that could be performed more quickly and accurately using the 3D Survey system. The cost savings using this system compared to current methods is approximately \$1,000 per survey. The 3D Survey system is expected to substitute over 50 traditional surveys resulting in potential savings of \$50,000 per year.

2. The second alternative would be to contract the 3D Surveys to external contractors. This is not recommended as the City would lose the opportunity to develop the skills in-house and have multiple divisions utilize the data. Having the equipment in-house also allows for increased flexibility in scheduling surveys across multiple projects and divisions, and adapting to often dynamic construction schedules. Cost savings utilizing internal staff as opposed to contracted services to conduct the surveys, are expected to be approximately \$7,000 per survey.

**Financial Implications**

There is sufficient funding in the Land Development – Prepaid Engineering Reserve and the Infrastructure Replacement – Water and Wastewater Reserve due to the return of \$80,000 and \$170,000, respectively, from funds returned to reserve from Capital Project #1041 – Benchmark Rehabilitation.

**Other Considerations/Implications**

There are no public and/or stakeholder involvement, communications, policy, environmental, privacy, or CPTED implications or considerations.

**Due Date for Follow-up and/or Project Completion**

Following approval of funding as requested within this report, the Administration will issue a Request for Proposal from industry for the equipment, software and staff training prior to the end of 2018 in advance of the 2019 construction season.

**Public Notice**

Public Notice pursuant to Section 3 of Policy No. C01-021, Public Notice Policy, is not required.

**Report Approval**

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