



ITEM 7

City of Santa Barbara
Public Works Department
Interoffice Memorandum

DATE: December 8, 2011
TO: Chris Toth, Wastewater System Manager
FROM: Manuel Romero, Wastewater Collection Superintendent
SUBJECT: CCTV CAMERA AND TRANSPORTER UPGRADE REQUEST

Over the past several decades the Wastewater Collection section of the Water Resources Division has been operating a closed circuit television inspection (CCTV) system to perform a variety of underground pipeline inspection work. This work includes;

- Pipe condition assessment – used for quantifying the need for repairs/rehabilitation and prioritizing.
- Pipe cleaning QA/QC – used to ensure proper pipe cleaning is being performed by cleaning crews throughout the system on a spot check basis.
- Tool evaluation – used to observe various cleaning tools in live cleaning exercises to provide empirical data for use in purchasing or using tools differently for better results.
- Repair support – used to aid in spot repairs and other projects requiring a high degree of accuracy in excavation or placement of tools/patches that are needed to restore pipe integrity.
- Smoke/Dye testing – used to find sources of cross connections, illicit connections, and inflow/infiltration into the system of extraneous surface and ground water.
- Emergency use – used in pipes that have experienced a sanitary sewer overflow (SSO) to determine the cause, or are suffering a blockage that cannot be assessed from the street.

These systems have progressed over the years, for which the City has been through several types of systems, replacing them as they wear past their usable service life or as technology obsolescence makes them impractical to use and difficult to service.

The Wastewater Collection section currently uses a 1994 RS Technical Services Pipeline Inspection Camera System. In 2008 the system was upgraded to enable higher technology use. This consisted of the cable reel/winch, cameral controls and related electronic gear, and the on board computer for viewing and data management. The camera itself was not upgraded at this time due to cost considerations and having a few years remaining in the life of the camera and transporter.

In 2010 a new van was acquired and the CCTV components were moved into this van, which accommodates the equipment and necessary tools for operation and maintenance very well. With these two improvements, the camera and transporter remains the last of the original equipment manufacturers (OEM) product. The camera and transporter is approaching 18 years in age, which is excellent longevity, but has reached the end of its service life and needs to be replaced.

Besides being of very old technology the camera and transporter is approximately 3.5 feet long and hinged to allow insertion into manholes and entry into pipes from the manhole trough. The camera and transporter is extremely heavy for this type of gear, its hinged nature makes it very difficult to carry by hand or pass it over to another operator as it tends to hinge up or down when turned slightly. Its weight and length make this camera difficult to position in tight areas, such as backyard easements and where footing issues or high care is necessary to avoid damaging landscaping plants. Further, the camera and transporter is not able to fit into some pipes due to the size of the access at the manhole, or nature of offsets inside the pipe itself.

Beyond mechanical limitations of the camera and transporter, the technology of the camera optics and controls are very dated and are in need of upgrade. The viewing technology is paramount to detailed inspections and assessment coding, the higher this resolution, the more accurate the inspections are.

The Department has looked into this matter from three perspectives;

- Replacing the entire system
- Modifying the system with a non OEM camera/transporter
- Replacing the camera/transporter with an OEM product

Follows is a brief explanation of each of these options, represented in the table below;

Option Type	Cost	Down Time	Warranty
Replace w/new	\$165,000.00	90 – 120 days	Point source
Non OEM modification	\$70,000.00 plus unknowns	60 – 90 days	Confused due to modification
OEM replacement	\$30,000.00	2 days estimated	Point source

Replacing the entire system:

Replacement of the camera system would include the full system; camera and transporter, all supporting hardware used in operation, including the cable reel/winch, gear hauling, electronic control interfaces on board electrical system to meet the needs of a different manufacturer, a new computer system to accommodate different data capture software, and gutting/rebuilding of the van due to different component footprints that require different positioning and access.

There is a wide range of systems that can be considered, providing the most depth in terms of selection options. With this broad spectrum of systems the cost varies from approximately \$95,000.00

at low end with very simple technology, up to \$250,000.00 for the most advanced system currently available on the market. The estimated cost of a system that would meet our needs and provide suitable options is \$165,000.00, without a new van purchase.

Beyond cost issue, the van would have to be sent to the manufacturer, which most are located quite a distance from our area. This would mean we would be without CCTV coverage for an extensive period of time. Estimates of the time necessary for this range, however, a 90 to 120 day period seems to be midrange in this consideration. Warranty would not be a concern and would be single source.

Modifying the system with a non OEM camera/transporter:

There are few options for the installation of another manufacturer's camera and transporter to the current system. This option is the least preferred in terms of providing a camera that would be compatible with our existing system and carries a high risk of hidden added costs in replacement of non compatible technology.

There are few manufacturers who want to perform this work, unless they can equip the van with most of their hardware. This work will require some compatibility change outs in our existing system, which may be extensive. This would include new cable and a new cable and reel assembly, camera control hardware, and computer software for operation of the image viewer and recording of inspection data.

There is a high risk that a non-OEM source may believe they are compatible, but find they cannot provide full camera function with the existing components and require new or add on components to get the camera into operational condition at a substantial cost. Once the CCTV van is in their facility, we would not have many options should this occur. Estimates are difficult to obtain due to the compatibility issue of hardware and electronics, however it can be assumed there will be a camera and transporter cost, new cable, and electronic interface either by means of a new control panel or modifications to the existing one. The best estimate is approximately \$70,000.00 with the presumption this minimal work is needed with the new camera and transporter. It would be a higher price if other components are needed.

Out of service time is also a consideration. Fitting one manufacturer's electronic technology to another is not easy, nor fast. Best estimate of time we would be without our CCTV equipment would be 60 to 90 days, assuming the very best case scenario.

Unlike a new purchase, the warranty would be an issue. If there are glitches in the operation system or electronics, there would be some confusion in responsibility if the camera is working well off the other manufacturer's bench. Modifications to existing electronic components are not warranted and may result in serious costs in post upgrade repairs or diagnostics.

Replacing the camera/transporter with an OEM product:

Replacing the camera and transporter with the OEM will not require modification of the system we currently operate, nor will there be any appreciable down time associated with the new installation. When the system upgrade was performed in 2008, we purchased a "steering" module for eventual use with a steerable transporter. This allows the transporter and camera to negotiate turns in manholes and pipes that operators have difficulty accessing to assist the camera around. Our current camera is not steerable, however an upgraded camera would be and we could utilize the module.

The OEM camera we would use is far smaller than the existing camera, able to utilize a variety of wheel sizes and types, is steerable, and has higher end optics. Further, we would not have to replace

any components in the cable, cable reel system, camera control interface, electronics of the system, electrical system in the van, or the computer software. This camera is estimated to cost approximately \$30,000.00.

Down time of the CCTV van would be marginal. The camera and transporter should be "plug and play" with our system, only requiring a new connection at the end of our existing cable.

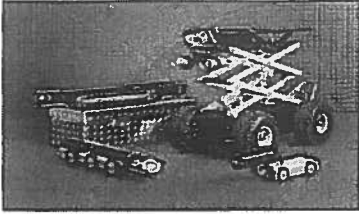
Summary:

The need for a new camera and transporter has been growing for several years and we have reached a point where operational capabilities require us to be able to view every pipe, which is currently not able to be done due to the camera and transporter size.

Reliability is going to become an issue as the camera and transporter continue to age and the OEM may not be able to support the equipment much longer. Our operations and training consultant has also recommended a new camera and transporter be purchased for the system, which provides an objective validation.

We are recommending we move forward with the OEM camera replacement, as this is the least expensive option having the least amount of lost CCTV time. RS Technical Services is on the Water Resources Divisions Approval of Equipment Standardization list which was updated and approved by council in March of 2011. This product matches the current system exactly and will allow the use of the steering module that is currently not utilized. It also provides a source that would be familiar with the electronics used throughout the system along with the operational hardware, having the best opportunity for success in a fast upgrade that is relatively problem free. The issue of the single source warranty is of high concern given the complexity of these electronic systems, which this option satisfies.

Currently, we have funding in the Wastewater Fund in the Sanitary Sewer Overflow Compliance Program budget for this purchase specifically. Specifications for the camera and transporter have been provided with this memorandum for review and comment.



City of Santa Barbara
Dale Escobar



Design and Manufacture of Video Pipeline Inspection Systems

1327 Clegg Street
Petaluma, CA 94954
(707) 953-7185 Fax: 707/ 676-8051
chrisr@rstechserv.com
<http://www.rstechserv.com>

Quote Number:
110394

Shipping Address:

Date: 12/1/2011
Expiration: 1/30/2012
Salesperson: Tim Kennedy

Sales Quotation

Part #	Description	Price	Qty	Extend
010-01655-30	Camera & Tractor TrakSTAR II Pan & Tilt Zoom Camera, NTSC, Single Conductor (1) - TrakSTAR II rotating head zoom camera, 6 pin, with LED lighting (1) - Camera case	\$16,750.00	1	\$16,750.00
032-02500-10	TranSTAR II Steerable, Inspection Transport Vehicle, Single Conductor (1) - Mainline steerable tractor, 6 pin (1) - Tractor to camera power cable (6) - Standard tires (1) - Tractor extension kit (1) - TranSTAR Insertion/Retrieval Assembly (1) - Tractor storage rack (1) - Tractor operations manual	\$12,500.00	1	\$12,500.00
950-18224	Warranty, Months Additional Options Not Included in Quotation Price		12	
052-36988	Location Detector/Receiver, Metrotech Model EASY-LOC-RX	\$1,575.00		
806-37583	Cable, 3 Pin X 6 Pin With Sonde Transmitter, NovaSTAR or TrakSTAR Camera version	\$390.00		
950-18263-1	Pan and Tilt Zoom Camera, 12 month extended warranty	\$925.00		
950-18263-3	TranSTAR Transporter, 12 month extended warranty	\$625.00		
	Quote does not include Federal, State or Local Taxes Quote does not include any applicable shipping charges.			

Sub-Total \$29,250.00
Tax

Total \$29,250.00