



City of Richmond

Report to Committee

To: Public Works and Transportation Committee **Date:** March 6, 2007
From: Dave Semple **File:**
Director of Parks & Public Works Operations
Re: Water Services Section Benchmarking Findings/Level of Service Review

Staff Recommendation

1. That the Water Service Section's operations and maintenance levels of service be revised to reflect the National Water/Wastewater Benchmarking Initiative; and
2. That \$361,200 savings resulting from the revised service level adjustment be transferred to the Water Utility's replacement reserve in future water utility budgets.

← For

Dave Semple
Director of Parks & Public Works Operations
(3350)

Att. 3

FOR ORIGINATING DEPARTMENT USE ONLY			
ROUTED TO:	CONCURRENCE	CONCURRENCE OF GENERAL MANAGER	
Budgets	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>		
REVIEWED BY TAG	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	REVIEWED BY CAO	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>

Origin

One of the key principles of the City's long term financial strategy challenges staff to be innovative and seek efficiencies in the operation and maintenance of city infrastructure. Through participating in the National Water/Wastewater Benchmarking initiative and comparing our methods, programs, and costs with 28 other water distribution systems across Canada, we are able to identify and create best management practices, while maintaining overall utility performance. This report deals with the potential cost savings and makes recommendations where the resulting funding should go.

Background

The City of Richmond's operating cost per kilometre of water main is \$4,900/km; significantly above the national average of \$4,400/km and higher than any other benchmarking participant. This above average operating cost/km can be attributed to a number of factors:

- Levels of service above the national average: particularly for water main flushing, preventative hydrant maintenance, and valve exercising ;
- Significant challenges in maintain water quality in the distribution system due to Richmond's flat terrain, which acts as a sediment basin between Vancouver and Delta. This creates the need to respond to approximately 270 water quality issues per year resulting in demand flushing of the distribution system;
- A high number of demand repairs for water service connections, valves, and fire hydrants; resulting from acidic soil/drinking water in Richmond.

Discussion

The attached document (*Attachment 2*) provides a more detailed review of the NWWBI findings, and includes the following staff recommendations to improve and reduce our operating cost per km of water main. These service level reductions will not have a negative affect on the water utility's performance.

- Reduce the Water Services over budgeted portion of the operating budget by \$140,200;
- Reduce programs for nut and bolt renewal on hydrants and valves to be more in line with industry standards (-\$180,000);
- Reduce preventative maintenance for fire hydrants from 1 service per year to 1 service every two years. This reflects the national average. (-\$52,000);
- Reduce the number of P.R.V. station inspections from 3 per week to 2 per week on P.R.V stations upgraded with S.C.A.D.A remote monitoring systems (-\$11,100);
- Increase our level of service for water main flushing to match best management practices, and combat our high number of water quality complaints (+\$22,100);

If these recommendations are adopted, there will be a reduction of \$361,200 from the Water Services maintenance and operating budget. No effect on regular full-time staffing levels will result from these changes as increased demand for water services staff from capital and receivable construction projects will compensate for the revised number of man-hours resulting from these service level revisions. Given the funding shortfall identified in the 2006 aging infrastructure report, it would be prudent to divert these savings to the water utility replacement reserve.

Staff are confident that further levels of service adjustments may be possible and will be reviewed every year prior to submission of the annual operating budget.

Financial Impact

The recommendations in this report outline a net decrease of \$361,200 to the Water Services operating budget. This reduction represents \$221,000 of service level reductions, and \$140,200 in over budgeted programs. This funding will be allocated permanently to the water main replacement reserve.

Conclusion

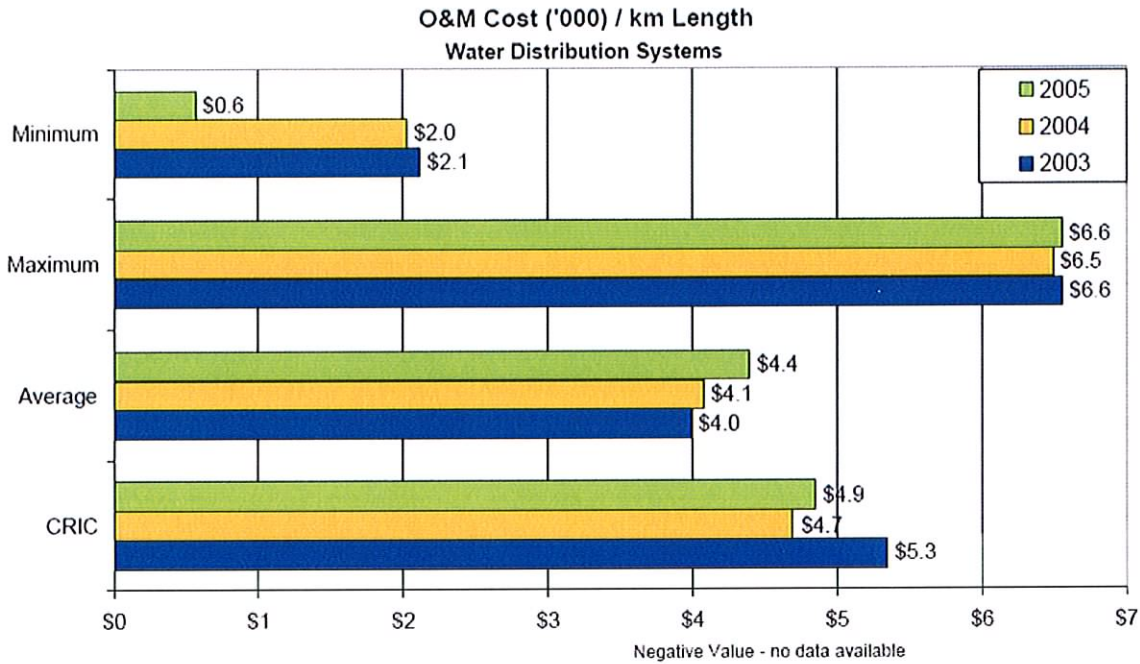
The City's long term financial strategy prompted staff to review our current levels of service utilizing information from the National Water/Wastewater benchmarking initiative. This revision to our service levels will reduce the Water Utility's operating budget by \$361,200 per year, and allow the transfer of this savings to the water utility's reserve to provide funding for future water main replacement.

A handwritten signature in blue ink that reads "Steve McClurg". The signature is written in a cursive style with a large, looped "C" at the end.

Steve McClurg
Manager, Water Services
(1209)

Figure 1a : Water Services Total Operating Cost per KM of Water Main

The following chart compares the city of Richmond to the minimum, maximum and average of participating Water Distribution Systems in the National Water/Wastewater Benchmarking Initiative.



Water Services Department : Level of Service Review

Introduction

In response to the findings of the National Water/Wastewater Benchmarking Initiative the following document provides a detailed review of the operational programs currently in the Water Utilities Budget. Each section is divided into 3 areas

- A description of the work performed under this budget including applicable unit costs
- A comparison to similar programs in other water distribution using information provided by the National Water/Wastewater Benchmarking Initiative; and/or reference to relevant industry standards or “best management” practices
- A recommendation for the future level of service for the program in question

P.R.V Maintenance

2007 Budget : \$124,300

1.1 P.R.V Maintenance

2007 Budget : \$ 124,300

Description/Current Service Level

This program covers the maintenance of Pressure Reducing Valves Stations (P.R.V's). P.R.V's regulate the flow of water arriving into the Richmond from the GVRD. The current service level for this program includes:

- Inspect P.R.V stations 3 times per week (\$50.00 per Inspection)
- Clean P.R.V stations, back flush system and calibrate water quality monitoring equipment 1 per week
- Demand repairs as required (Approx. 6 Demand Repairs per year)

National Benchmarking Comparisons/ Best Management Practices.

The National Water/Wastewater Benchmarking initiative does not allow comparison in terms of service levels regarding P.R.V maintenance. This area will be focused on in the future

Recommended Service Level

As P.R.V stations throughout Richmond are updated to automated S.C.A.D.A systems, the need for regular inspections has reduced. This service level should be decreased so that all P.R.V stations with S.C.A.D.A systems receive only two inspections per week. This would result in a reduction of -\$11,100 to the current budget for P.R.V maintenance.

Water Mains Maintenance

2007 Budget : 1,325,100

2.1 YVR – Billing Program

2007 Budget: \$ 99,300

Description/ Current Service Level

The City of Richmond currently has an agreement with Y.V.R. In exchange for a wholesale water rate Y.V.R pays one 100 percent or 50 percent of maintenance costs for the sections of Richmond's water distribution systems near to the airport. This ensures that Y.V.R only pays for maintenance on the infrastructure it uses directly, while providing revenue for the city. This program is a cost centre to accurately track these repairs

Recommended Service Level:

The service level for this program should remain unchanged. The cities agreement with Y.V.R provides revenue for the City and promotes partnership with the federal government.

2.2 Pipe Maintenance

2007 Budget: \$ 642,400

Description/ Current Service Level

This program is for repairing city water mains. The current service level for this program allows a 1 hour response time to water main breaks. The service level for this program includes:

- approx. 35 water main breaks per year (\$15,000 each)
- Contingency for two major water main breaks (\$ 25,000 each)

National Benchmarking Comparisons/Best Management Practices.

The National Guide to Sustainable Municipal Infrastructure recommends timely repair of water mains to prevents costly emergency repairs, and possible contamination of the water system. Through our participation in the National Water/Wastewater Benchmarking initiative, we know the City of Richmond receives a below average number of water main breaks compared to other municipalities (*Figure 1a*) This is due to our capital replacement program, and proactive replacement/testing of asbestos concrete water main.

Recommended Service Level:

The service level for this program should be adjusted to reflect the three-year, year-end trend for spending in this program. This will result in a reduction of \$51,700 to this budget.

2.3 Salvage Yard

2007 Budget: \$50,000

Description/ Current Service Level

The service level for this program covers the salary of one salvage worker. It includes programs to reuse salvage materials and operate a tool management system.

Recommended Service Level

The program to operate a salvage yard should remain unchanged. This program allows the Water Services department to reuse materials, and maintain a tool management system. This provides a cost savings to the city, and ensures control of city owned assets.

2.4 Leak Detection

2007 Budget \$ 75,300

Description/Current Service Level

The current service level for this program is to conduct a leak survey on the cities water system every 10 years (70km per year). Leak surveys are an important way to prevent costly emergency repairs, and lost revenue through unbilled water use.

National Benchmarking Comparisons/Best Management Practices.

The International Water Works Association, American Public Works Association, and National Guide to Sustainable Municipal infrastructure highlight leak detection as a best management practice. Of the 28 water distribution systems in the National Water/Wastewater benchmarking initiative 10 municipalities have some kind of leak detection program in place.

Recommended Service Level

The current level of service for this program should remain unchanged. Provisions should be adopted to perform this service externally if trained staff are not available.

2.5 Cathodic Protection

2007 Budget: \$ 14,000

Description/Current Service Level

Cathodic protection is an electromechanical system used to prevent corrosion to steel water mains throughout Richmond. The service level for Cathodic Protection is to inspect 6 Cathodic protection sites, 12 times per year. This program also contains funding for consultant fees and demand repairs as required.

Recommended Service Level

The service level for this program should be adjusted to reflect the three-year, year-end trend for spending in this program. This will result in a reduction of \$2,400 dollars to this budget.

2.6 Program Flushing

2007 Budget: \$110,400

Description/Current Service Level

This program covers prescheduled high velocity flushing of water mains to improve water quality. This reduces water quality complaints, turbidity, and other water quality issues. The service level for this program includes:

- An annual unidirectional flush of 80% of the water distribution system (\$80 per km)
- Weekly Flushing Program (2 areas flushed weekly)
- Monthly Flushing of problem areas with known water quality issues (\$420 dollars per km)

National Benchmarking Comparisons/Best Management Practices.

The British Columbia Water Works Association, and the National Guide to Sustainable Municipal Infrastructure recommend the implementation of a unidirectional flushing program with provisions for spot flushing in problem areas. Due to the frequency of our weekly and monthly flushing programs, Richmond currently flushes more water main than any water distribution systems in the National Water/Wastewater Benchmarking Initiative. (*Figure 1b*) The location and topography of Richmond serves as a natural settling point for the regional water system resulting in an increased need for water main flushing.

Recommended Service Level

The service level for this program should be increased to allow for unidirectional flushing of the entire system annually in accordance with commonly accepted best management practices. Additional automatic flushing stations will be installed in addition to the current test site. This will result in an increase of \$22,000 dollars to the current budget for this program.

2.7 Demand Flushing

2007 Budget : \$106,000

Current Service Level

The service level for this program covers unscheduled high velocity flushing of water mains due to high bacteria count, turbidity, or other water quality issues. The city responds to approximately 270 water quality complaints per year. 210 result in demand flushing(\$400 per spot flush).

National Benchmarking Comparisons/Best Management Practices.

The British Columbia Water Association recommends demand flushing in response to low chlorine residuals, failed water quality tests, or customer complaints. Although no information from the National Water/Wastewater Benchmarking Initiative concerning demand flushing is available, the City of Richmond receives a higher number of water quality complaints than average.

Recommended Service Level

The service level for this program should be adjusted to reflect the three-year, year-end trend for spending in this program and to offset the increase to the program flushing program. This will result in a reduction of \$22,100 from this budget.

2.8 Mapping and Inventory (Asset Collection)

2007 Budget : \$ 210,300

Current Service Level

This program is for maintaining of the water section of the Richmond's Hansen and GIS asset management systems, in addition to updating/creating a water asset plate map book . This map book is an easy to use field guide for water services staff.

National Benchmarking Comparisons/Best Management Practices.

The National Guide to Sustainable Municipal Infrastructure suggests the collection of a large variety of utility information. Maintaining a proper inventory of water assets is essential to daily operations, and proper capital planning.

Recommended Service Level

The service level for this program should remains as is. As the cities GIS and Hansen systems become better integrated this service level can be reduced. New functionalities in our GIS system will allow the valve book to be generated automatically rather than being maintained separately by water services staff.

2.9 Downtime

2007 Budget : \$17,300

Current Service Level

This program is a cost centre for downtime related to inoperable equipment/machinery and other outside factors.

Recommended Service Level

The service level for this program should be adjusted to reflect the three-year, year-end trend for spending in this program. This will result in a \$400 increase to this budget.

Valve Maintenance

2007 Budget : 473,400

3.1 Valve Chamber Maintenance

2007 Budget: \$79,000

Current Service Level

This program is for preventative maintenance to valve chambers and other underground structures. Richmond's acidic soils lead to increased need for preventative maintenance to underground infrastructure. The service level for the program includes servicing and cleaning of valve chambers once every three years. (approx. 30 chambers per year)

Recommended Service Level

The current service level for this program should be maintained. Additional confined space training is required to conduct valve chamber maintenance on a regular basis.

3.2 Valve Maintenance – Preventative

2007 Budget: \$71,600

Description/Current Service Level

This program is for preventative maintenance to water control valves. The service level for this program includes

- Exercise, clean, inspect and paint all valves/lids on a 4 year cycle
- Cycle all valves yearly (budgeted through program flushing budget)

National Benchmarking Comparisons/Best Management Practices

The National Guide to Sustainable Municipal Infrastructure recommends an active program of exercising system valves, with provisions to exercise critical valves more frequently. Active servicing of valves ensures their proper operation during emergency shut downs, and prevents possible contamination of the water system.

Recommended Service Level

Better systems are being developed to track this service level. The current program, in compliance with the annual flushing program, ensures that all valves in the system are cycled at least once per year. It should be maintained at its current level.

3.3 Valve Maintenance – Demand

2007 Budget: \$196,200

Current Service Level

This program is for demand valve repairs. The service level for this program includes:

- Major Repairs - 10 per year at a unit cost of \$8,100
- Minor Repairs- 10 per year at a unit cost of \$1,400
- Valve Box Repairs – 200 per year at a unit cost of \$500
- Vegetation Control (Brush cutting around valve boxes as required)

National Benchmarking Comparisons/Best Management Practices

Information from National Water/Wastewater Benchmarking Initiative demonstrates that the City of Richmond experiences a larger than average number of inoperable valves per year than other water distribution systems. This is likely due to problems with the definition of an inoperable valve as well as soil conditions in Richmond.

Recommended Service Level

The service level for this program should be maintained at its current level to gauge the effectiveness of reducing the Valve Nut and Bolt Renewal program.

3.4 Valve – Nut and Bolt Renewal

2007 Budget: \$126,000

Current Service Level

This program covers the proactive replacement of Valve Nut and Bolts due to Richmond's unique soil conditions. The service level for this program covers the renewal of approximately 40 valves (\$3,200 per renewal).

National Benchmarking Comparisons/Best Management Practices

Proactive repairs and replacement of Water Services infrastructure is considered a best management practice, the unique nature of this program makes comparison/reference to specific best practices difficult.

Recommended Service Level

This program is unique to Richmond it should be reduced to better reflect industry standards. The current level of service for valve Nut and Bolt renewal should be reduced by seventy five percent or \$94,900 dollars

Water Connection Maintenance

2007 Budget: \$ 962,000

4.1 Demand Water Connection Maintenance

2007 Budget: \$ 935,000

Current Service Level

This program covers repairs to water service connections. The current service level allows a response time of 1 hour for emergency repairs. The service level for this program is divided into 3 areas:

- Approximately 270 service connection repairs (\$1,900 per repair)
- 210 service inquiries over ½ hour in a year
- 200 service inquires under ½ hour per year

National Benchmarking Comparisons/Best Management Practices

Through our participation in the National Water/Wastewater Benchmarking Initiative it is known that the City of Richmond experiences a higher than average number of service connection repairs than average(*Figure 1c*). This is due to a number of factors including acidic soils, low quality service connections installed during the 1960's/70's, and the former practice of not replacing water service connections during capital infrastructure replacement.

Recommended Service Level

The service level for this program should be adjusted to reflect the three-year, year-end trend for spending in this program. This will result in an increase of \$24,000 dollars to the current service level for this program.

4.2 Locating Service Connections

2007 Budget: 27,200

Current Service Level

This program currently covers staff time to locate service connections; either to facilitate meter installations for the residential metering program, or during downtime.

Recommended Service Level

The service level for this program should be adjusted to reflect the three-year, year-end trend for spending in this program. This will result in a reduction of \$8,500 dollars to this budget.

Fire Hydrant Maintenance

2007 Budget: \$834,400

5.1 Fire Hydrant Relocations

2007 Budget: \$15,800

Current Service Level

This program covers the proactive replacement of Hydrant Nut and Bolts due to Richmond's unique soil conditions. The service level for this program covers the renewal of approximately 40 valves (\$3,200 each).

National Benchmarking Comparisons/Best Management Practices

Relocation of fire hydrants in dangerous locations is a health and safety issue concerning all Richmond residents, this program prevents costly insurance claims and emergency repairs.

Recommended Service Level

The service level for this program should be increased reflect actual work accomplishments. This will allow for the relocation of 3 to 4 hydrants per year. This represents an increase to this budget of \$2000.

5.2 Fire Hydrant: Nut and Bolt Renewal

2007 Budget: \$113,500

Current Service Level

This program is for the proactive replacement Hydrant Nut and Bolts due to Richmond's unique soil conditions. The service level for this program allows for the replacement of 32 Hydrants nut and bolts per year (\$3,500 per repair).

National Benchmarking Comparisons/Best Management Practices

Proactive repairs and replacement of Water Services infrastructure is considered a best management practice, the unique nature of this program makes comparison/reference to specific best practices difficult.

Recommended Service Level

This program is unique to Richmond and does not reflect current industry standards. The current level of service regarding Valve Nut and Bolt renewal should be reduced by a factor of seventy five percent or \$85,100 dollars.

5.3 Fire Hydrant Maintenance – Preventative

2007 Budget: \$196,700

Current Service Level

This program is for preventative servicing of fire hydrants, its current level of service includes:

- Level "A" service to all City Hydrants - full breakdown and inspection of hydrant, greasing and replacement of worn parts (\$47.00 per service)
- Level "B" service to all City Hydrants (budgeted through and included in the annual flushing program) – operation of hydrant, pressure test and inspection
- Paint all Hydrants on a 5 year cycle
- Perform Vegetation Control as required (Brush Cutting near hydrants)

National Benchmarking Comparisons/Best Management Practices

When the annual flushing program is performed Richmond is close to average in terms of the number of hydrants it inspects/checks in year(*Figure 1d*). The National Guide to Sustainable Municipal Infrastructure recommends an active program of exercising and preventive maintenance on fire hydrants. This service level is regulated by the National Fire Code of Canada which sets guild lines for the maintenance of fire hydrants.

Recommended Service Level

The service level in this area should be reduced to ensure that all Fire Hydrants receive one “A” Level Service per year and one “B” Level service every two years. This service level is inline with the national average. This will result in a reduction of \$52,000 dollars to the budget for this program.

5.4 Fire Hydrant Maintenance – Demand

2007 Budget: \$410,200

Current Service Level

This program is for demand fire hydrants repairs. These repairs can be broken down into two categories

- Demand Repairs – identified as a result of the Preventative Maintenance Program (400 per year, approximate Unit Cost - \$120.00)
- Large Scale/Emergency repairs requiring excavation, due to inoperable hydrants (Approximately - 10 per year, Approximate Unit Cost - \$ 4500)

National Benchmarking Comparisons/Best Management Practices

According to the National Water/Wastewater Benchmarking initiative the Water Services department for the City of Richmond experiences an above average number of demand hydrant repairs compared to other Water Distribution systems. This is likely due to our preventative maintenance programs, which identifies demand repairs that would otherwise go unnoticed.

Recommended Service Level

The service level for this program should be kept as in order to gauge the effectiveness of reducing the service level for the Hydrant Nut & Bolt Renewal program.

5.5 Fire Hydrant MVA

2007 Budget: \$73,300

Current Service Level

This program is for demand repairs to fire hydrants caused as a result of motor vehicle accidents not covered by ICBC. (Approximately 30 hydrant MVA repairs take place in a year at a cost of \$1900 each)

Recommended Service Level

The service level for this program should be adjusted to reflect the three-year, year-end trend for spending in this program. This will result in an increase of \$2,400 dollars to the budget for this program.

5.6 Hydrant Adapters/Cross Connection Control Program

2007 Budget: \$24,900

Current Service Level

This program covers the provision of fire hydrant adapters to members of the public as required, in order to prevent possible cross contamination of the Water Distribution system.

Relevant Best Management Practices

Both the National Guide to Sustainable Infrastructure and the BCWWA recommend the careful control and regulation of Hydrant use. Controlling access to fire hydrants by third parties is important in order to ensure their continued operation and that improper use does not result in unnecessary repairs to hydrants, backflow or cross contamination.

Recommended Service Level

The service level for this program should be adjusted to reflect the three-year, year-end trend for spending in this program. This will result in a increase of \$6,000 dollars to this program

Meter Maintenance

2007 Budget: \$754,300

6.1 Meter Reading

2007 Budget: \$ 65,100

Current Service Level

This program is for meter reading on *Industrial, Commercial and Institutional* (ICI) meters. In order to ensure accurate billing, meter reading is conducted on a quarterly basis. Large and high use meters are read more. Staff read approximately 14,900 meters per year (\$3.00 per meter read)

Recommended Service Level

The service level for ICI metering should remain at its current level, with the budget adjusted to reflect the 3-year, year-end average for spending. This will result in a reduction of \$25,100 dollars to this budget.

6.2 Meter Maintenance – Demand

2007 Budget : \$ 397,100

Current Service Level

This program covers demand repairs to water meters. There are currently approximately 1900 minor meter repairs, and 180 meter upgrades performed each year (\$100 per repair). The upkeep of city water meters is necessary to prevent lost revenue from improper meter reads

Recommended Service Level

The service level for this program should be adjusted to reflect the three-year, year-end trend for spending in this program. This will result in reduction of \$35,100 to this budget.

6.3 Supply New Meters

2007 Budget : \$22,300

Current Service Level

This program is for the purchase and delivery of new meters. The delivery of new meters is required to ensure the accurate billing of water use. Costs are recovered through meter rental rates.

Recommended Service Level

The service level for this program should be adjusted to reflect the three-year, year-end trend for spending in this program. This will result in reduction of \$22,300 to this budget.

6.4 Backflow Prevention

2007 Budget: \$1,300

Current Service Level

This program covers the provision and maintenance of backflow prevention devices under the jurisdiction of the water services department. The prevention of cross contamination is essential to the continued integrity of the cities water distribution system.

National Benchmarking Comparisons/ Best Management Practices.

The National Guide to Sustainable Municipal infrastructure and the BCWWA recommend the careful control of access to the cities water distribution system system. This is important to ensure that improper use does not result in unnecessary repairs, backflow, or contaminants entering the water system.

Recommended Service Level

The service level for this program should be adjusted to reflect the three-year, year-end trend for spending in this program. This will result in increase of \$100 to this budget.

6.5 Meter Testing

2007 Budget: \$14,000

Current Service Level

This program is for testing ICI meters. Large meters are tested annually, with smaller meters tested as needed basis.. Approximately 140 meters are tested in a year. The continued upkeep city water meters is essential to prevent lost of revenue due to improper meter reads.

Recommended Service Level

The service level for this program should be adjusted to reflect the three-year, year-end trend for spending in this program. This will result in reduction of \$5,700 to this budget.

6.6 Residential Metering

2007 Budget: \$122,400

Current Service Level

This program serves as a cost centre for actions/and activities related to the implementation of the Residential Water Metering Program.

Recommended Service Level

A service level for this program has not been determined, as the total impact of the residential metering program on the operational budget of the water services department is not known at this time as it is still in the implementation face. This service level should be maintained until such time as this impact is fully known.

Other Maintenance Programs

Total Budget: \$854,600

8.1 Repairs Bins

2007 Budget: \$ 14,100

Current Service Level

This bins program is a cost centre for vehicle repairs, not covered by the fleet department. Also includes time spent to clean and restock trucks.

Recommended Service Level

The current service level for this program should be maintained. Average spending in this program remains congruent with the current budgeted service levels.

8.2 Water Quality Sampling

2007 Budget: \$73,100

Current Service Level

This program is for taking water quality samples as regulated by the provincial health authority. Water Quality Samples are taken once per week from 31 sites throughout the City of Richmond, these samples are provided to the GVRD lab for analysis.

National Benchmarking Comparisons/ Best Management Practices.

The National Guide to Sustainable Infrastructures recommends frequent monitoring of water quality trends. According to the data from the National Water/Wastewater benchmarking initiative the City of Richmond currently receives a higher than average number of water quality customer complaints per population than other water distribution systems. This is due to our location and the nature of our water distribution system.

Recommended Service Level

The provincial health authority regulates this service level. However, the budget for this program should be adjusted to reflect the 3-year average for year-end budget spending. This will result in a reduction of \$4,100 dollars to the current budget for this program

8.3 Project Wet/Open House

2007 Budget: \$15,800

Current Service Level

This program represents a cost centre for costs associated with Water Services Staff assisting with the annual public works open house and Project wet educational/community outreach programs. These programs are important in order to demonstrate the important services the Engineering and Public Works department provides to all Richmond residents.

Recommended Service Level

The service level for this program should be maintained at its current level, in order to ensure accurate tracking of costs associated with the annual public works open house and project wet program.

8.4 Service Connection Renewals

2007 Budget: \$204,800

Current Service Level

This program is for proactive replacement of service connections in specifically identified problem areas due to Richmond's soil conditions and prior practices. The budgeted service level for this program currently covers the renewal of approximately 50 service connections throughout the system. (\$3,100 per renewal).

National Benchmarking Comparisons/ Best Management Practices.

Proactive repairs and replacement of Water Services infrastructure is considered a best management practice, the unique nature of this program make comparisons/reference to specific best management practices difficult.

Recommended Service Level

The current level of service for service connection renewals should not be reduced to reflect past spending trends, in an attempt to combat the cities above average number of emergency service connection repairs. This is a significant cost benefit over our current level of costly emergency service connection repairs.

8.5 Blow off/Scour Valve Installations

2007 Budget: \$31,400

Current Service Level

This program is for the installation/replacement of blow off valves throughout the city. These valves are installed at points in the system where no fire hydrant is available for flushing, and water quality is a issue. The current service level for this program budgets for the replacement of 4 blows off valves per year

National Benchmarking Comparisons/ Best Management Practices.

The National Water/Wastewater benchmarking initiative does not currently allow for the comparison of blow off repairs/replacements

Recommended Service Level

The current service level for this program should be maintained. On average spending in this program remains congruent with the current budgeted service levels.

8.6 Water Conservation - Rain Barrels

2007 Budget: \$ 47,000

Current Service Level

This program covers the joint program to sell and distribute rain barrels to Richmond Residents. This program is administered by the Environmental programs department. Its aim is to promote water conservation throughout the city in an effort to be environmentally sustainable and reduce demands on the water distribution system.

National Benchmarking Comparisons/ Best Management Practices.

The operation of a rain barrel program is a promotional opportunity for the Water Services department to encourage water conservation throughout the city. It is also highlighted as contributing to the cities readiness in the case of an emergency, allowing for an emergency water supply in the event of a major disruption to the water distribution. A number of other water distribution systems currently participating in the National Water/Wastewater benchmarking initiative currently operate water conservation programs of some kind.

Recommended Service Level

The service level for this program should maintain at its current level, this program not only promotes environmental awareness but also highlights the city as a leader in terms of emergency preparedness, water conservations and sustainability.

8.7 New Valve Installations

2007 Budget: \$52,400

Current Service Level

This program is for the installation of new isolation valves. Additional valves are installed in areas of high density or in locations where the supply of water is critical. The current service

level for this program provides funding to install approximately 14 new valves per year (\$3,900 per installation.)

Recommended Service Level

The service level for this program should be maintained at its current level. Given plans for additional development in City Centre the installation of additional isolation valves will be essential as higher density will result in additional numbers of people being inconvenienced in the event of an emergency water shut off.

8.8 Shoring Maintenance

2007 Budget: \$14,300

Current Service Level

This program is a cost centre for the maintenance and purchase of additional shoring equipment for water services staff. Proper shoring practices are essential to the operation of a safe and effective work site; shoring regulations are maintained and enforced by Work Safe B.C

Recommended Service Level

The service for this program should be maintained at its current level. Current budget for this program has a minimal impact on the overall water services operational budget.

8.9 Barricade Rental

2007 Budget: \$10,100

Current Service Level

This program covers the supply and maintenance of barricades and flashers to secure work sites. Proper signage and barricades are essential to the operation of a safe and effective work site; regulations are maintained and enforced by Work Safe B.C

Recommended Service Level

The service for this program should be maintained at its current level. Current budget for this program has a minimal impact on the overall water services operational budget.

9.10 Pave Water Cuts

2007 Budget: \$137,200

Current Service Level

This service level covers costs for the Roads and Construction Services department to maintain and reconstruct receivable and flat rate water service utility cuts that have settled/lowered. The Water Services department maintains responsibility for water cuts for up to one year after the work was originally completed. (Approximate Unit Cost. \$1600 per cut)

Recommended Service Level

The service level for this program should be maintained at its current level. This program should be carefully tracked to ensure maintenance of the cities road surface is in compliance with our current paving policy.

9.11 Manufacturing Water Parts

2007 Budget: \$6,100

Current Service Level

This program covers labour costs for city welders to manufacture specific parts required for the continued operation/ maintenance of the City of Richmond's Water distribution system.

Recommended Service Level

The service level for this program should be kept at its current level, program has little impact on the overall Water Services operational budget but provides a useful cost centre for the manufacturing of specific parts

9.12 Meeting Expenses

2007 Budget: 32,800

Current Service Level

This program is a cost centre in order to track time spent by Water Services staff, attending safety and other operational meetings.

Recommended Service Level

The service level for this program should be maintained at its current level. With the budget adjusted to reflect the 3-year average for year-end spending in this program. This will result in a decrease of \$5,600 dollars to the current budget for this program.

9.13 Inspections

2007 Budget: \$57,900

Current Service Level

This program is for safety and other operational inspections performed by water services staff as a part of day-to-day operations.

National Benchmarking Comparisons/ Best Management Practices.

The service level for should be adjusted to reflect the 3-year average for year-end spending in this program. This will result in an increase of \$4000 dollars to the budget for this program.

9.14 S.C.A.D.A

2007 Budget: \$ 117,900

Current Service Level

This program currently provides for the Water Services Departments section of maintaining/operating the cities *Supervisory Control And Data Acquisition* (S.C.A.D.A) system. This system allows for the collection of real-time data concerning water quality and the cities water distribution system.

National Benchmarking Comparisons/ Best Management Practices.

The National Guild to Sustainable Municipal Infrastructures highlights the operation a S.C.A.D.A system as a best management practice.

Recommended Service Level

The service level for this program should be maintained at its current level. With the budget adjusted to reflect the 3-year average for year-end spending in this program. This will result in an increase of \$14,300 dollars to this budget.

Water Standby *Total Budget: \$38,000*

7.0 Water Services Standby **2007 Budget: \$ 38,000**

Current Service Level

This program is a cost centre for standby for water services staff. The current service level involves 1 Forman during regular off hours and 1 standby crew for the long weekends. This program ensures adequate response time to issues with the water distribution system by qualified staff

National Benchmarking Comparisons/ Best Management Practices.

The National Water/Wastewater benchmarking initiative does not currently allow for comparisons concerning the amount of standby time in operation for other water distribution systems.

Recommended Service Level

The current service in this program should adjusted to reflect the three-year, year-end trend for spending trends. This will result in a reduction of \$500 dollars from the budget for this program.

Total 2007 Water Services Operating Budget: \$5,339,300

Proposed Reduction: -\$361,200

Proposed 2008 Base Level Budget: \$4,978,100

References

1. BCWWA. (2004). *Distribution System Cleaning/Uni-Directional Flushing*. Retrieved Feb. 2007 from www.bcwwa.org
2. BCWWA. (2004). *Cross Connection Control, Best Management Practice*. Retrieved Feb. 2007 from www.bcwwa.org
3. National Guide to Sustainable Municipal Infrastructure. (2003). *Deterioration and Inspection of Water Distribution Systems*. Retrieved Feb. 2007 from www.infraguide.ca .
4. National Guide to Sustainable Municipal Infrastructure. (2003). *Water Use and Loss in Water Distribution systems*. Retrieved Feb. 2007 from www.infraguide.ca .
5. National Guide to Sustainable Municipal Infrastructure. (2003). *Developing a Water System Renewal Plan*. Retrieved Feb. 2007 from www.infraguide.ca .
6. National Guide to Sustainable Municipal Infrastructure. (2003). *Best Practice for Utility Based Data(Water, Wastewater, Storm water)*. Retrieved Feb. 2007 from www.infraguide.ca .
7. National Guide to Sustainable Municipal Infrastructure. (2003). *Monitoring Water Quality in the Distribution System*. Retrieved Feb. 2007 from www.infraguide.ca .

Figure 1a - # of Main Breaks per 100 km

The City of Richmond Water Services Department receives a below average number of main breaks per year when compared to the national average.

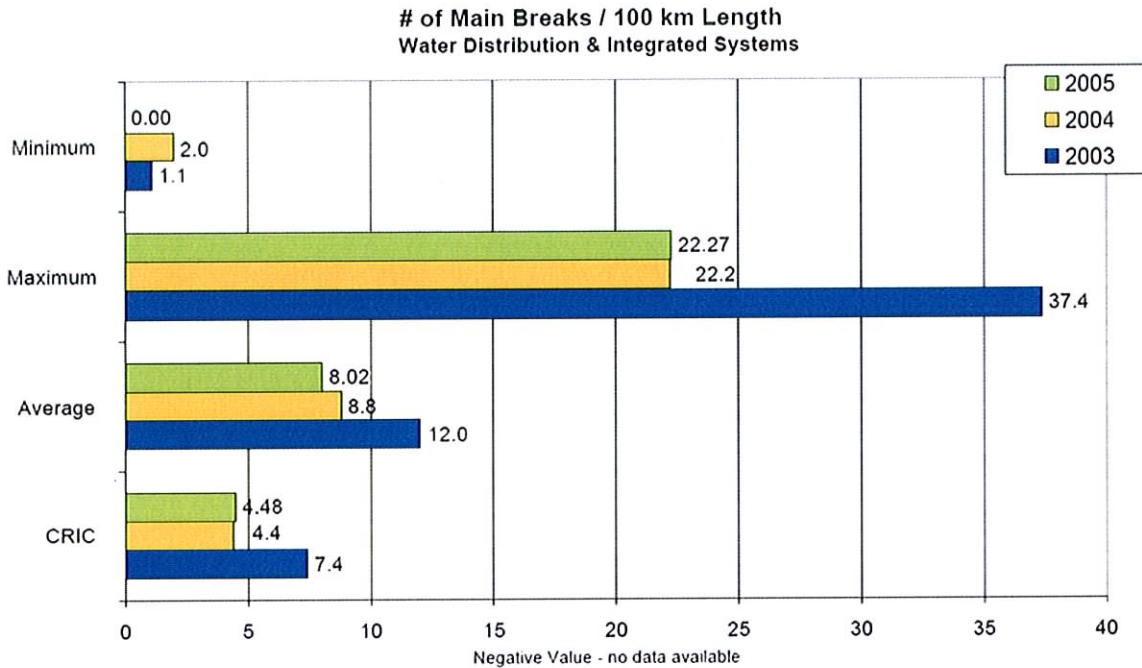


Figure 1b – Percent of System Cleaned (Water main Flushing)

The City of Richmond Water Services Department currently flushes cleans more water main than any participant in the National Water/Wastewater Benchmarking Initiative.

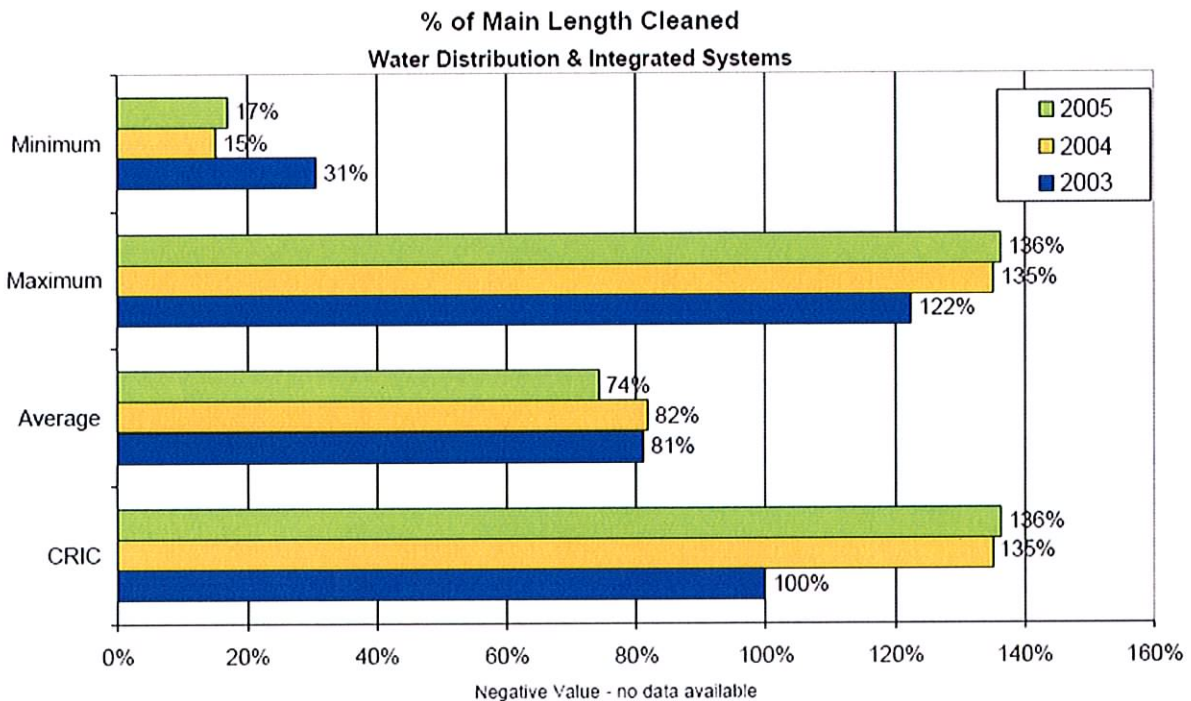


Figure 1c – Water Service Connection Repairs

The city of Richmond performs a higher number of Water Service Connection repairs than the majority of other benchmarking participants

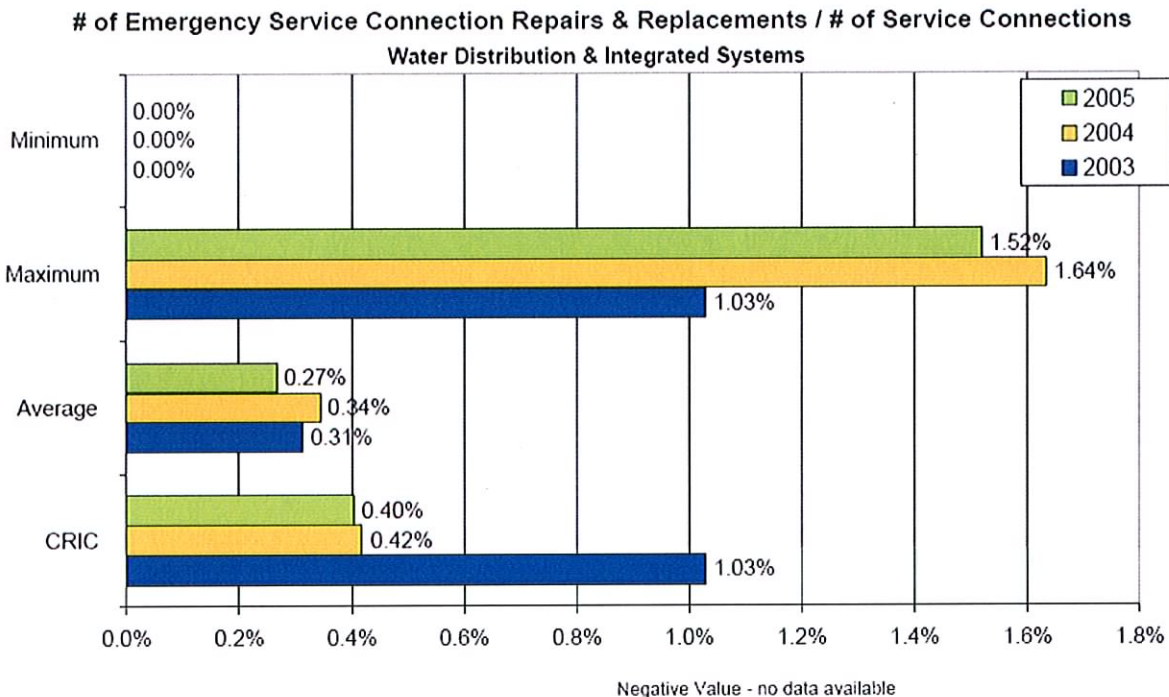


Figure 1d – Fire Hydrant Preventative Maintenance

The cities current work accomplishments are close to the national average in terms of Fire Hydrant preventative maintenance

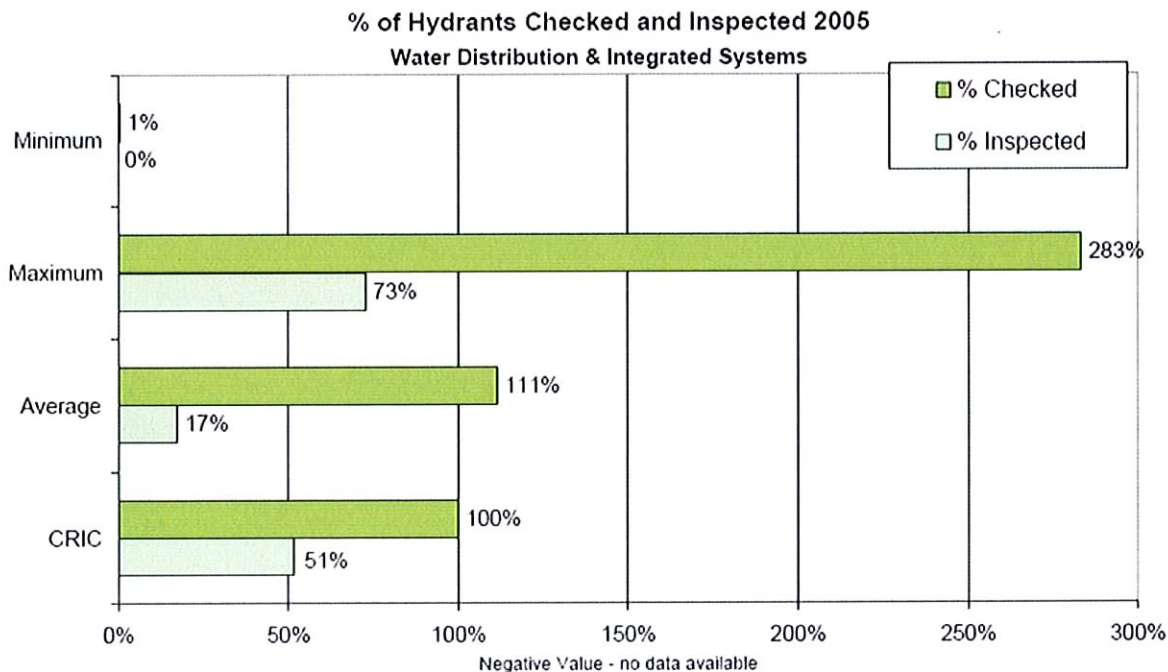


Figure 1e – Capital Infrastructure Replacement

The city of Richmond has an industry leading capital replacement program. Current 80 year replacement cycle is in compliance with best management practices.

