



Toowoomba City Council

Toro-IRRInet™ Radio Control System

The Success of Radio Controlled Irrigation:

A Case Study ©

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Introduction

The City of Toowoomba is well known for its parks, gardens and scenic views and is identified with its carnival of flowers. This beautiful city is home to 90,000 people and is set 700 meters above sea level on the edge of the Great Dividing Range, 90 minutes west of Brisbane.

In the '94-95 council budgets, Parks and Gardens were allocated \$225,000.00 for the first stage to begin installation of an automated city wide irrigation system. The whole system was to be controlled from the Parks and Gardens Depot in Stephens Street via a personal computer. Toro-IRRInet™ was selected as the control system of choice which utilized radio technology for communications.

Since the first installation, the Toro-IRRInet™ system has expanded throughout the city and demonstrated amazing cost savings to the city. To this end, the Toowoomba City Council has plans to extend the system as projects are initiated.

This case study is to outline the success of the Toro-IRRInet™ system for the city of Toowoomba and to highlight some of the advantages of the system as seen through the eyes of the Parks and Gardens Department, Mr. Lindsay Petersen, who is the Coordinator of Sport and Active Recreation .

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From The Initial Installation

In the '94-95 council budgets, Parks and Gardens were allocated some \$225,000.00 for the first stage to begin installation of an automated city wide irrigation system. The whole system was to be controlled from the Parks and Gardens Depot in Stephens street via a personal computer. Toro-IRRInet™ was selected as the control system of choice which utilized radio technology for communications.

Of the \$225,000.00 allocated for this first stage of this project, \$45,000.00 was spent on the Toro irrigation and control system. The components that made up the Toro-IRRInet™ Control System was one central computer and central software package, 1 Irrinet field interface unit, 5 remote Scorpio radio units, 1 weather station and software and irrigation.

The system irrigated a 5 hectare park with 113 electric valves. The whole project took around 3 months to install, although the control system itself was completed inside a couple of weeks.

Communication to the centre was UHF radio with absolutely no line of site to the base antenna. In fact the communication “path” is through the city with irrigation site and base station at either sides of the city.

Today's system

AS of September, 2004, today's system is markedly different from the early days. The central computer has been upgraded to latest technology. The software in use is version 13.0.119. From the original 2 irrigated sites in the city to now boast some 35 sites irrigated and automated through the Toro-IRRInet™ system.

The system now comprises the following components:

Central computer and software package

1 Weather station comms via telephone modem utilizing Toro T-Weather software

8 Irrinet

49 Scorpio™ RTU

10 single station Impacts™

5 ground moisture sensors

12 rain sensors

12 DTMF radios

3 Remote Keypads with displays

Upgrade to system

The system was increased and added to as funds became available. In July, 2004, the system was upgraded with the installation of new CPUs bringing the system in line with the latest technology. Previously, each IRRInet™ satellite could control up to 200 stations with 200 programs remotely. With the upgrade to XL, the satellites can now control 500 stations with 500 programs with irrigation and filters.

This gives the Toro- IRRInet™ system great advantages in that none of the previously purchased product was redundant. It was all usable within the new system. It increased the capacity of each satellite and therefore the system coverage could be increased with the installation of lower cost remote units.

Further Aspirations for the System

The system will be expanded significantly with the implementation of two major projects planned for the city.

One project is budgeted for AUS\$90m where 4 IRRInet™ with extended chassis will be installed to control the irrigation. These extended chassis have five slots to the normal 3 slots for various irrigation control modules.

The other major project identifies between 9-13 sports field complex to be developed. This project will utilize another IRRInet™ with an additional 7 Scorpios™.

Till these projects eventuate, the system will grow at a slower pace as additional funds and needs arise.

Savings Attributed to the Toro-IRRInet™ System

Since the introduction of the Toro-IRRInet™ system, Toowoomba City Council is seeing massive savings in water consumption. Savings of around 50% have been experienced within this system.

Before the installation, the City irrigated 2 sites and was being charged approximately \$180,000.00 per year. This figure includes water charges, any access fees and other regulatory sums. Since the installation of the Toro-IRRInet™ system, the number of sites being irrigated has bloomed to around 35 and the actual total water costs are approximately \$40,000.00 per year. With the additional fess and all, the total figure comes in at approximately \$90,000.00, for the whole system. As Lindsay Petersen happily reports, “We don’t waste the water and we know where it is all going.”

The system is also credited with supplying massive labour savings as well. Council workmen used hand watering techniques for the beautiful array of flowers and shrubs throughout the Botanical Gardens. Since the installation of the Toro-IRRInet™ system, the council is saving approximately 4 days a week across 2 x 10 staff teams. Mr. Petersen says, “The maintenance teams are also more proactive in their responsibilities and are able to test irrigation far more easily than ever before. This in itself allows for more savings in that problems can be detected before they become serious.”

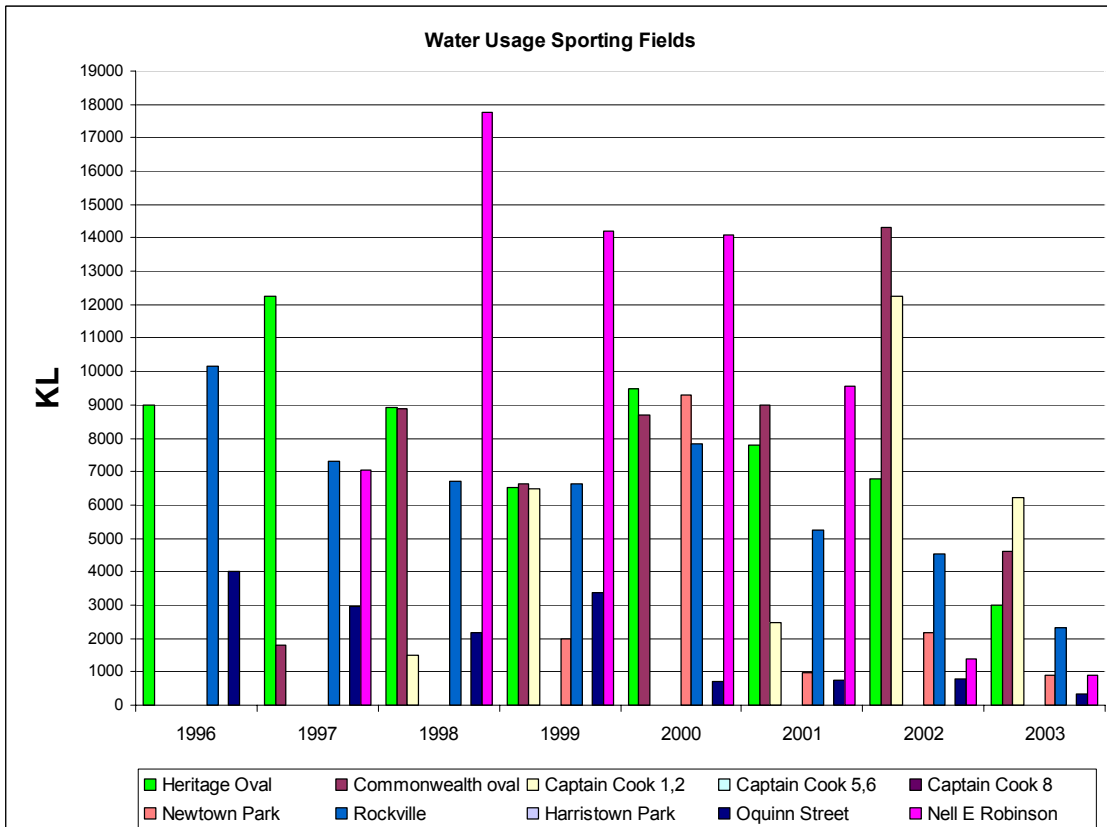
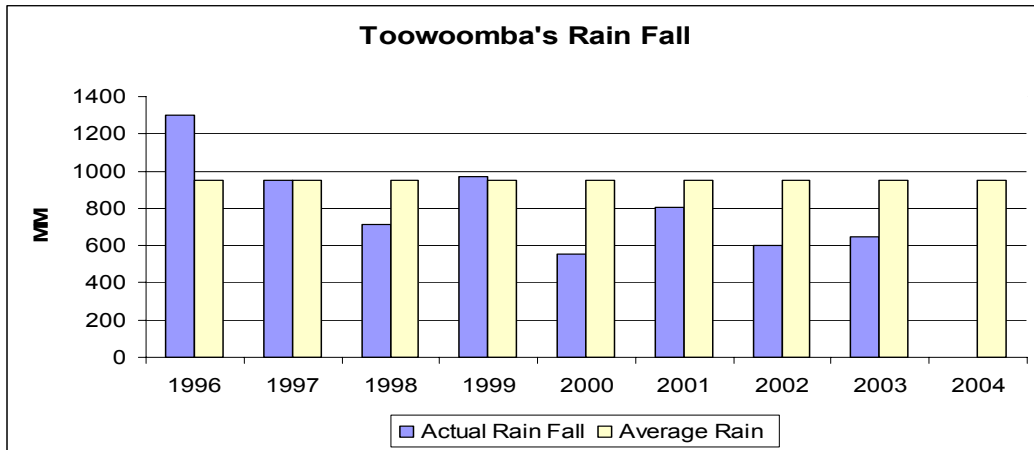
Lindsay's Top Ten

As a summary to the case study of the Toro-IRRInet™ system at Toowoomba City Council, Lindsay Petersen who is the “owner” of the system was asked for his top ten impressions.

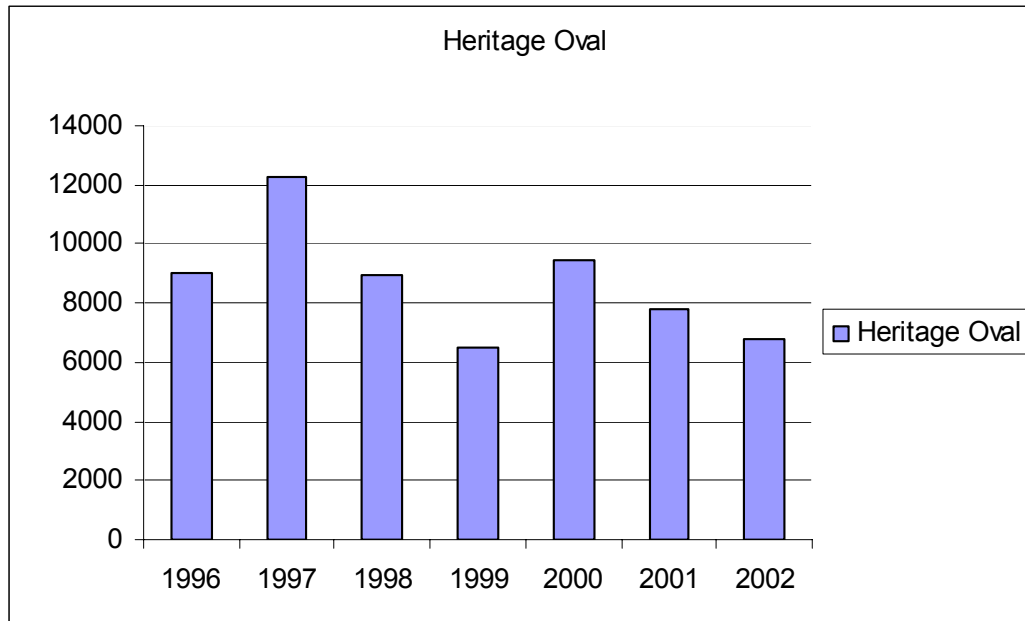
- ◆ Really good on saving water and the labour costs.
- ◆ It was very easy to convert what we had to radio.
- ◆ The monitoring ability of the system is simply superb.
- ◆ Just the system's total ability. Never ceases to amaze me.
- ◆ The system has a unique programming function but once I used it, it was really easy to navigate.
- ◆ I am really impressed with the reliability of the radio system. No need for a second telephone system to support the radio. Especially now with the new features of the XL Irrinet.
- ◆ Good for the reports I can generate.
- ◆ I am able to access the system from other computers.
- ◆ Saves on leakages and therefore erosion issues.
- ◆ The alarms the system can generate. It is possible to even have them sent to my mobile phone if it is that important.

As Lindsay puts it, “I give it my thumbs up!”

Appendix A Rainfall and Total Water Usage

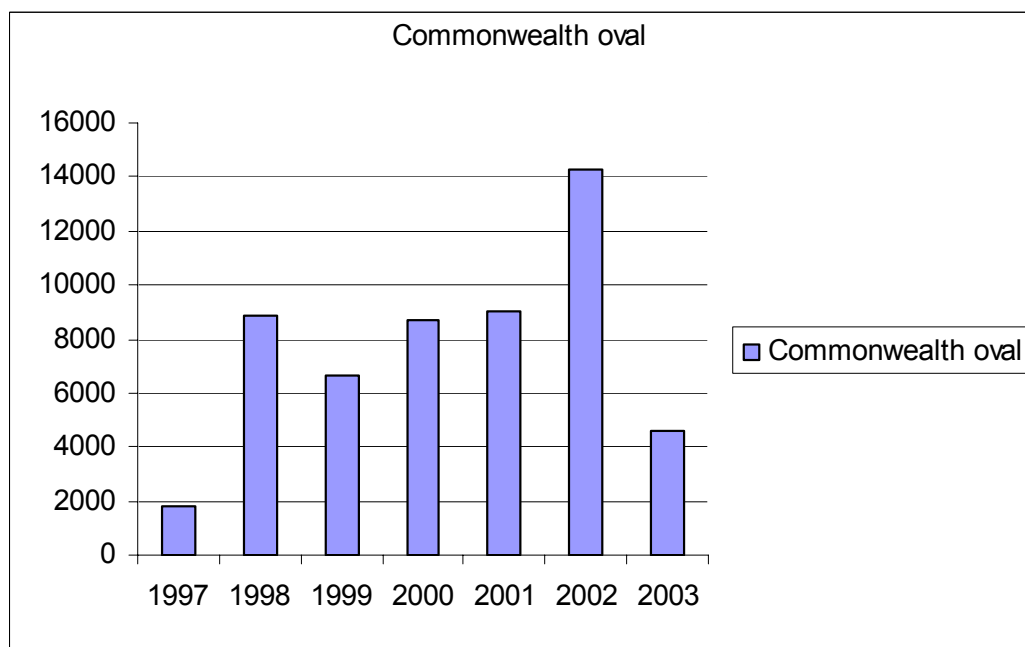


Appendix B Water Usage



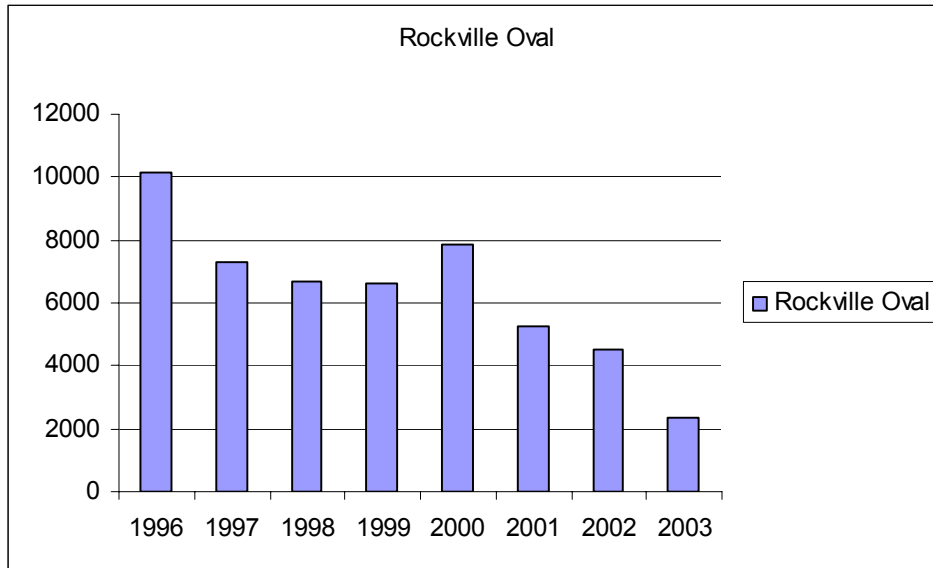
Notes:

The increase in water at Heritage Oval in 1997 was due to a reconstruction of the whole field prior to an International cricket match between the West Indians and Queensland. Heritage Oval is Council premier sporting field.

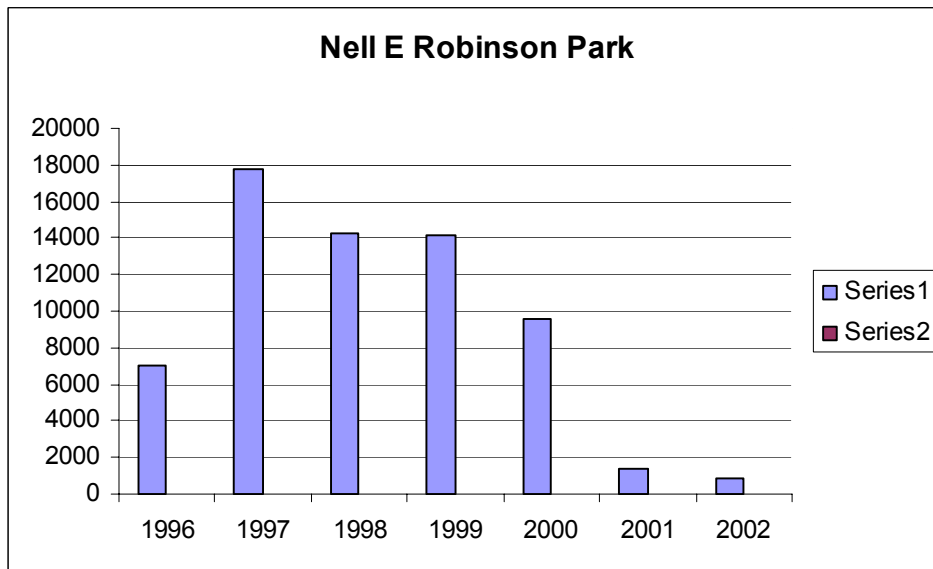


Notes:

Commonwealth ovals water increase in 2002 was from the reconstruction of one-hectare soccer field inside the Velodrome.



Notes:
 Rockville Park 1996 water consumption was high in its first year and settled down until 2000, which was a dry year. Since then the water consumption has reduced below the 1999 except for 2003, which has only half of the year's water consumption.



Notes
 Nell E Robinson from 2000 onwards there is a meter reading problem or a computer malfunction, which has not given us the true water consumption. From 1996 to 1997 Council joined the entire park to one meter, which covers shrubs, lawn and sporting fields.