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Committee              Strategy and Policy Committee  
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## Real Time Information (RTI) Update

### 1. Purpose

This report has two purposes.

Firstly, it outlines the status of the Real Time Information (RTI) project. This includes completion of the major implementation elements, on-going performance management and the impact of the system on PT Group activities, and performance against budget.

Secondly, it incorporates a request that the Committee approves additional expenditure for the final components of the project.

### 2. Background

Greater Wellington entered into a contract with ACIS Ltd (now Vix Technology (Aust) Ltd) for the design, supply, installation and maintenance (for 5 years) of a passenger real time system, in September 2009. The total value of the contract as signed was \$9.7M.

The project scope included the provision of real time departure information for the majority of Metlink bus services (apart from those in Otaki and the Wairarapa), and for Metlink passenger rail services. It included the installation of RTI equipment in 450 buses, the installation of 190 display signs at bus stops and a further 60 at rail stations; integration with the Metlink website and mobile website; and development of an interface with the urban traffic control system in Wellington to enable selective bus priority at intersections.

Following the completion and evaluation of a pilot phase, implementation of the bus aspect of the system was carried out in further phases with each bus operator, and was completed in July 2012. Integration with the Metlink website was completed at the beginning of this programme, and the installation of on-street and station display signs was largely completed by September 2012.

Development of an interface with the urban traffic control system was completed late in 2012.

With the majority of the system established in operation, transition into the maintenance and support contractual phase of the project took place in July 2012. This followed agreement being reached on solutions for implementation of the outstanding elements (those for RTI for rail services and for Wellington CBD RTI display signs).

### **3. Project Status**

The RTI project is essentially complete, and a process of finalising the outstanding deliverables and closing down the implementation element of the project is in progress.

Work continues on the optimisation of some aspects of the system's performance, and on transition and integration into operational environments.

It was not possible to deliver two elements of the project within the original project plan or cost, due to the necessity to develop significantly different solutions to those originally anticipated. These two elements are RTI for rail services (delivered in October 2013) and the Wellington CBD RTI display signs (due for completion in March 2014).

The RTI maintenance and support agreement is in operation and applies until July 2017, when it may be extended by agreement for a further two years.

### **4. Significant contract changes**

#### **RTI for Rail Services**

The solution for rail RTI originally anticipated a direct data feed from existing KiwiRail systems, providing train position and service information.

However, the KiwiRail train position equipment programme was not extended beyond freight trains to the existing passenger train fleet as originally expected. In addition, investigation for development of the solution exposed a range of business support and customer communication activities that would need to be formalised and strengthened to support the operation of RTI. Together, these factors required the development of a significantly different approach to the rail RTI solution. Resource constraints meant that this could be initiated only once the bus solution was substantially complete.

Agreement was reached with KiwiRail in September 2012 on the detailed requirements for development of internal operational management systems, to supply a suitable data feed to the RTI system via a revised interface. This provides the constantly updated position of all trains and links them to the service information via a semi-automated process, supported by redefined and expanded operational roles.

Once the data feed is received, the rail RTI system (including display signs, customer messaging and management applications) operates exactly as the bus RTI system, which provides a range of benefits. The production of the data feed is also largely independent of both the RTI supplier and the train operator, minimising the alterations necessary should either of those change in future.

Matangi trains are fitted with the necessary positioning equipment at manufacture. A separate programme to retrofit the retained portion of the older GANZ train fleet was completed in March 2013, and was achieved cost-effectively by re-using equipment displaced from other KiwiRail vehicles.

Following trial and evaluation on the Johnsonville line, RTI for rail services was extended to the rest of the network on 1 October 2013. A small number of implementation refinements have been necessary, but the system is well supported by operational and business processes and has proved fundamentally robust. Rail RTI performance consistently meets or exceeds expected levels.

As a result of the way in which trains report their time and position when leaving from or arriving at terminus stations, the log data generated is not yet consistently suitable for reporting of on-time performance at some locations. Changes to the system's configuration of the terminus stops have generated improvements, and calibration of the system will continue until an acceptable result is achieved.

The revised approach to RTI for rail services represents a significant change in the original contract scope, adding \$123,952 to the RTI contract price and adding KiwiRail costs to equip the GANZ train fleet and develop the data feed of \$459,142. The additional amount has been funded from project contingency.

### Wellington CBD RTI Display Signs

The standard 3 or 6-line RTI display sign is unsuitable for the unusually high frequency of buses in Wellington CBD, since at peak times on the busiest sections of the 'Golden Mile' only buses arriving within the next few minutes would be shown.

Display signs with more lines of information are therefore required. A standard display sign product range with 9 lines of information formed the basis of the original contract pricing, but it was expected that a solution with additional lines would be developed which would also permit the display of static Metlink bus information in a single structure.

Consequently, a 'totem' structure solution with 18 lines of information on TV-type screens was designed. A prototype was built and installed for evaluation in Manners Street, which showed that modifications to reduce reflection and improve visibility would be required. Before this could be done and the installation programme could be extended, further work was deferred in case the newly introduced Wellington City Council Pedestrian Safety Review made any safety recommendations affecting the design or location.

Despite the absence of definitive guidance from the safety review, a revised design was developed and approved. This utilised a custom development of the standard display sign, expanded to 18 lines and double-sided, designed to mount on either a standard sized square pole or onto existing structures where suitable.

Installation of the first seven CBD RTI display signs commenced in November 2013. They were commissioned in January 2014 and installation and commissioning of the remaining seven will be completed during the first quarter of 2014.

The development of the revised CBD RTI display sign solution and the associated installation programme represent a significant change in the original contract scope, adding to the RTI contract price a fixed element of \$335,465 and a variable estimated element for their installation of up to \$409,108. This amount has been funded partly from project contingency and partly from additional funds originally identified for replacement of the existing Metlink 'pylons' in Wellington CBD. The final cost for the installations that are complete is 20% below the variable cost estimate, but final costs for the second half are not yet available.

## **5. Outstanding items**

The following items remain to be fully implemented or are the subject of ongoing programmes to optimise their performance:

### **'SCATS' urban traffic control interface**

Development of the interface with Wellington City Council's 'SCATS' urban traffic control system was delayed but was completed late in 2012, and functional testing has been completed.

The interface will enable the RTI system to place requests for bus priority at traffic signal-controlled intersections, based on how much a bus is running behind schedule. Requests will be processed by 'SCATS' and a response actioned, according to a range of parameters concerned with optimisation of the operation of the wider road network as a whole.

Work towards deployment of the capability continues as a joint project with Wellington City Council. This includes the set-up of the off-line 'SCATS' test system to assess the effect on intersections and the wider network. There is a concern to ensure that any impacts on other road users (including other bus movements) resulting from the complex and optimised interaction of intersections in Wellington CBD, are managed. Once suitable parameters for treating priority requests are established, a controlled test at a single intersection is planned before the capability is deployed more widely.

Information sharing has been established with equivalent bodies in Perth (Western Australia), where the same interface was successfully deployed on the 'SCATS' system there in 2013.

A live deployment date for bus priority has not been confirmed, but will be agreed as the testing programme develops. The timeline for implementation relies primarily on Wellington City Council.

### Audio announcements

All RTI display signs have an audio capability, which can assist blind or partially sighted users by 'reading' the information on the display. The audio capability is known as 'REACT' and is a licensed product of the Royal National Institute of Blind People (RNIB) in the United Kingdom.

As a result of a programme of improvements to the design of the hand-held activating remote control fob, supplies were not available until early 2013. A quantity of activating fobs has been procured and a small number provided to the Foundation of the Blind locally for evaluation. Testing continues to be carried out in response to unreliable operation (most commonly, a failure to activate the audio message). At the same time, improvements to the pronunciation of stop or destination names are being identified and made.

Resolution of the problems involves the RTI supplier and RNIB, and is ongoing. Specific guidance on calibration of the installed equipment has been obtained from an RNIB support resource. Once resolved, arrangements for the administration of the activation fobs will be established.

Since the specification stage of the project, audio reading of websites and mobile-optimised websites has become increasingly accessible, and can provide an alternative for blind or partially sighted users.

The RTI project scope does not extend to providing audio announcements on board buses. RTI bus equipment is capable of supporting on-bus display signs with audio capability, which could be funded by bus operators or by a related project in future.

### Display sign at Wellington Airport

It has so far not been possible to reach agreement with Wellington International Airport Ltd on the installation of a display screen in the airport building announcing Airport Flyer bus arrivals and departures.

If agreement cannot be reached, a location for the allocated display screen will be identified elsewhere.

## **6. Additional Items**

### RTI Equipment Spares Holding

The spares holding for bus RTI equipment and display signs was based on the original project scope when only 150 display signs were planned. Additional spares were expected to have been funded from project contingency; however the project contingency has been fully allocated to the rail solution and completion of the CBD RTI signs.

The overall spares holding has proved insufficient, due to the increased project scope of 250 display signs and in particular to significant fluctuations in the size of bus fleets, which has required the use of spare bus RTI equipment to be used as a temporary measure. In addition, there is currently no spare CBD display sign to ensure continuity of service in case of damage.

In addition, although component spares for bus and display equipment were not available at the start of the contract, they are now available. Holding spare components would be a cost effective way of reducing the impact of equipment issues.

A suitable holding of RTI equipment spares and component spares has been identified and is valued at \$105,000.

### Wellington CBD Metlink information signs

The original CBD RTI display sign design incorporated provision for Metlink static information, such as timetables and the network map. The revised RTI display sign design has had to omit this information, as its approval required it to be pole-mounted. A design has been completed for separate information 'totem' signs at Wellington CBD bus stops using a design consistent with the Metlink Signage Strategy. The estimated cost of installing the Wellington CBD Metlink information signs is \$380,000.

## **7. System performance**

There are a range of measures of RTI system performance, but the most apparent to the user is system availability, expressed as the proportion of services that are being monitored by the system and are generating predicted arrival times. If not monitored by the system, services are still shown but as a 'scheduled' or timetable time. For the service to be monitored by the system, the journey data (e.g. route, direction, time, day of operation) needs to be accurately 'linked' to the vehicle's geographic position at all times.

The RTI system is a complex structure relying on accurate data inputs from a variety of sources. These include for example the basic schedule data applicable to the day and time of operation; the input of data indirectly from operational sources such as bus drivers (via electronic ticketing equipment and established sign-on practices) and operational staff; and the correct function of vehicle equipment, communications channels, central system applications and display signs.

It has proved extremely difficult to maintain consistently high levels of overall performance on New Zealand Bus (Go Wellington and Valley Flyer) services, despite concerted efforts to ensure known issues are addressed and maintained.

With the bus shortages experienced by New Zealand Bus in mid-2013, operational requirements resulted in extensive switching of buses between fleets, adversely impacting RTI performance. Changes have been made to allow this operational flexibility but in the third quarter of 2013, RTI

performance on New Zealand Bus services began to deteriorate, with significantly reduced performance over late December and January.

A co-ordinated programme has been established by the RTI supplier, operators and GWRC project staff to address this reduced performance. The underlying fault has now been confirmed as a hardware issue affecting the operation of the on-bus RTI equipment and a remedial fix has been developed and is being evaluated. However, the exact cause remains under investigation, and an update will be provided at the meeting. Any contractual implications of the failure have not yet been investigated, since the joint focus is on obtaining a conclusive solution.

Other operators, rail services and the RTI central system are unaffected by this fault and their performance remains entirely satisfactory. The proportion of services monitored by the system for Mana Newlands buses rarely drops below 90% and is normally maintained in the high 90s.

The rail RTI solution uses a central service linking function (where service data is linked with train positions centrally by a semi-automated process, rather than remotely by drivers). This results in the proportion of services monitored by RTI reliably being at or close to 100%.

A further measure of performance is the accuracy of arrival time predictions. For both bus and rail services this consistently meets or exceeds expected parameters, and presents no cause for concern. The system constantly optimises its prediction function using historical data.

## **8. Minor related works**

### **Application Programming Interface**

A number of independent developers have requested access to a suitable data feed from the RTI system, to enable them to develop applications providing different ways of presenting RTI including (for example) representation of moving vehicles on map backgrounds.

There are no plans to develop a Metlink application beyond the mobile website, and it has always been anticipated that a standard data feed will be made available by Metlink subject to a simple form of registration. This will permit us to maintain a record of consumers and to contact them in the event that data is incorrectly or misleadingly presented.

No specific timescale for this activity has been identified, and it is not expected to result in any cost to GWRC.

### **Kaiwharawhara Station Display signs**

The closure of Kaiwharawhara station releases two 6-line display signs for use elsewhere, or as spares. The signs will be recovered when suitable access arrangements can be made.

## **9. RTI integration into Public Transport Group business**

The RTI system generates a large amount of detailed data on the operation of public transport services, which was previously not available. This has clear applications in day-to-day operational management, as well as for service quality monitoring, scheduling and timetable reviews and for more strategic applications such as service planning, service design, and inputs to wider network modelling activity.

The participation of service providers in RTI is governed through specific agreements outside the existing service contracts. These cover a range of practical provisions, such as the ownership of the equipment, and the requirements and responsibilities of the operator. Service contracts currently prevent the use of RTI data for punitive purposes, but future operational contracts will ensure that it will be possible for data generated by the RTI system to be utilised in this way.

Clearly, for data to be reliable and complete the RTI system needs to perform consistently and at the highest levels to enable its use for compliance purposes or as the basis for punitive measures. The measures described above to optimise system performance, have this as their objective.

## **10. Maintenance and Support**

Maintenance and support of the RTI system is covered by a Maintenance and Support Agreement, forming part of the original contract. This came into effect on 1 July 2012 and is valid for five years (until 30 June 2017), but may be extended by agreement for a further two years.

Maintenance activities include regular preventive maintenance programmes for vehicle and display sign equipment, and for the central system hardware and applications.

Support activities include fault reporting and resolution, and access to development staff with detailed product knowledge. Faults are categorised by severity, and the nature and urgency of the resulting response is defined by the maintenance and support agreement.

Maintenance and support activity is co-ordinated and provided by Vix (Aust) Ltd from its main centres in Sydney and Perth, but all local work is carried out by Vix's contractor Kordia Solutions, and a range of subcontractors.

## **11. Budget**

The additional costs associated with the two significant contract changes described above - RTI for Rail Services and Wellington CBD RTI signs – have been funded from project contingency and budget allocated to the CBD information pylons.

Completing the Wellington CBD information pylons and increasing the RTI Equipment Spares Holding is estimated to cost \$485,000.



This would be \$328,000 (or 4%) over the approved capital budget. This equates to GWRC funding of \$65,600, assuming the project funding assistance rate of 80% from NZTA. This could be funded from underspend in other projects within this financial year.

Alternatively, the number of Wellington CBD information pylons could be reduced to fit within the existing budget, and equipment spares could be obtained as required and funded through operational budgets. This is not recommended.

The Maintenance and Support Agreement is covered by the approved budget, and is paid quarterly in advance.

## **12. Communication**

No communication is required.

## **13. The decision-making process and significance**

Officers recognise that the matters referenced in this report may have a high degree of importance to affected or interested parties.

The matter requiring decision in this report has been considered by officers against the requirements of Part 6 of the Local Government Act 2002 (the Act). Part 6 sets out the obligations of local authorities in relation to the making of decisions.

### **13.1 Significance of the decision**

Part 6 requires Greater Wellington Regional Council to consider the significance of the decision. The term 'significance' has a statutory definition set out in the Act.

Officers have considered the significance of the matter, taking the Council's significance policy and decision-making guidelines into account. Officers recommend that the matter be considered to have low significance.

The matter is considered to have low significance because of the relatively modest size of the residual funding implication for the Council.

Officers do not consider that a formal record outlining consideration of the decision-making process is required in this instance.

## **14. Recommendations**

*That the Committee:*

1. *Receives the report.*
2. *Notes the content of the report.*
3. *Approves an increase in approved project capital expenditure of up to \$327,861 to a total of \$8,798,819, funded from NZTA and underspend elsewhere in Public Transport group.*

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