RECONSTRUCTING A MAJOR ROADWAY USING A COMMUNITY EMPLOYMENT PROGRAM WORKFORCE

KING WILLIAM ROAD, UNLEY, SOUTH AUSTRALIA

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ABSTRACT

This paper summarises the planning, design and construction of the King William Road reconstruction project in the City of Unley, Adelaide. The paper describes the reasons why the road needed reconstructing and the procedures undertaken to gain a Commonwealth Government Community Employment Program grant that allowed the work to proceed. Details of the grant, how the costs of the project were shared, and how the funds made available were spent are described in detail. The design of the road is described and the need to retain, as far as possible, the original thickness of the old road stressed. The construction of the road, the training and competency of the staff hired under the scheme, and liaison with the public authorities with respect to the relocation of services is described in detail. The public relation program mounted during the project is also described.

INTRODUCTION

In 1950, I moved to the southern suburbs of Adelaide to live only about 1 km south of the southern end of King William Road. Enrolled at a school in the eastern suburbs, I had to catch a bus to school, the route for which was along Park Terrace, now Greenhill Road, the main road at the northern extremity of King William Road. In order to catch that bus, I had to ride my bike along King William Road daily, and even then the road was in a bad way.

Some 30 years later, I was re-introduced to King William Road in a far worse condition when I joined the staff of the City of Unley. Among the first challenges given to me was the task of upgrading the street lighting and surface of the road.

FIRST STAGE PLANNING

For some years the traders at King William Road had been asking the Council to fix the road as its condition was so bad it was keeping trade away. Putting first things first, I negotiated with the Electricity Trust of South Australia to prepare a street lighting scheme based on the requests of the Traders Association, which set out the desires of its members and the needs of the Council to adequately and effectively light the roadway. After minor amendments, a scheme was prepared that proved acceptable to the residents and traders along the roadway, and served the street lighting requirements. The new lighting scheme was installed and was completed in 1982.

The upgrading of the road proved a little more difficult a task. Investigation showed that the existing

pavement was sub-standard for the volume and type of traffic using this arterial road. Initial estimation in 1982 indicated an expenditure of about $2m had to be faced by the Council just to fix the road pavement; on top of that was the need to reconstruct the footpaths along the entire length of the road and the construction of much needed underground stormwater drainage to dispose of stormwater from the catchments immediately above King William Road.

At a Council strategy session in March 1983, I outlined a plan to tackle the reconstruction. This plan involved the concentration of all Council's work resources over and above normal maintenance and running costs, and discretionary spending, for a period of almost three years. This plan, while it interested the Council, was not a politically acceptable solution.

In October 1983 the Commonwealth Government announced the Community Employment Program (CEP) scheme. An integral part of this scheme was the Jobs on Local Roads (JOLOR) scheme. This scheme immediately caught my interest as it seemed that it may be a way to get King William Road reconstructed with the use of less of Council's funds and over a shorter period. Planning now began.

KING WILLIAM ROAD

King William Road, in the City of Unley, is 2.2 km long and passes through five suburbs: Unley, Wayville, Goodwood, Hyde Park and Unley Park. The road width varied from 11.2 to 15.5 m owing to the width of the available road reserve. Generally the land use of the northern one-third of the roadway is residential and offices with some shops. The central section is shops and restaurants, and the southern section is residential.

Many of the buildings along the road were built prior to 1900, and Council wished to preserve the heritage nature of the roadway. The area is quickly becoming extablished as a trendy and upmarket shopping precinct. Council also wishes to develop the area in such a way that it might become a tourist attraction.

ARTERIAL V. LOCAL ROAD

Initial enquiries revealed that as King William Road was an arterial road under the Road Grants Act, 1981, it did not qualify for a JOLOR grant, even though the road was not classified as a principal road by the Highways Department, South Australia (HD, S.A.).

Work began in securing the declassification of the road from arterial road status to local road status. The support of HD, S.A., the State Department of Transport and the Department of Environment and Planning was enlisted. An application was made to the Commonwealth Department of Transport with the special support of Mr Ralph Jacobi, MP, Member for Hawker. The Hon. Peter Morris, Minister of Transport, approved the declassification in March 1984.

PLANNING

In order to assist with the planning process, Council applied for a JOLOR grant to employ an engineer for six months. The application was successful and planning started in earnest.

The engineer employed firstly undertook the preparation of specification for the employment of consultants, the evaluation of submissions from the professional groups seeking to undertake survey and design work for the road. He liaised with the successful surveyors and engineers during the design stage and then prepared estimates of the project and a plan of implementation. Finally, he prepared an application for a JOLOR grant.

The consultants engaged were:

Pavement design: B.C. Tonkin and Associates

Road Design: B.C. Tonkin and Associates

Surveying: Symonds, Ryan and Cornish Pty Ltd

In January 1984 an initial submission was made to the Commonwealth Employment Program (CEP) Secretariat in order to signal Council's intention to apply for a JOLOR grant through the CEP scheme.

Now that the planning process was well advanced, a formal application was made for the grant on 1 August 1984. After several months of negotiations and political manipulating, the Council was advised on 18 December 1984 that it had been successful in obtaining the JOLOR grant.

DESIGN

In investigating the critical part of the project, B.C. Tonkin and Associates examined several alternative design and construction techniques in order to make recommendations in relation to the final selection of a pavement design.

The soils investigation results along King William Road indicated poor natural subgrade material with low CBR values. The design CBR of this material was determined as 2 per cent, giving a conventional design thickness in the range 730 to 760 mm. The investigation of the existing pavement revealed that the old roadway varied in thickness between 130 and 500 mm, generally of conventional construction (a short section had been constructed using soil-cement stabilisation). The mean thickness of the pavement was approximately 300 mm, this being determined from the results at 21 test sites.

Although obviously sub-standard, the old pavement had performed satisfactorily over a relatively long period, mainly because of:

(a) the gradual increase in traffic loading conditions over a long period of time;

(b) the gradual consolidation of the poor pavement and underlying subgrade material over a long period of time; and

(c) the establishment of relatively stable moisture content conditions under the old road pavement.

It was clear that once these established conditions were disturbed in the reconstruction process, the accrued long-term benefits with respect to the load-carrying capacity of the old pavement would be lost. The new pavement construction would be required to immediately develop the load-carrying and other characteristics which had been developed over a long period of time by the old pavement.

Owing to the susceptibility of the natural subgrade material to changes in moisture content, it became obvious that the most acceptable pavement design would incorporate a concrete working platform. The use of such a platform enabled a minimum of disturbance of the subgrade material and thus a minimum of disturbance to the existing consolidation and moisture regime.

It was clear that the construction of the flexible pavement alternative would introduce particular problems owing to the severe loading conditions applied by bus traffic.

The service authorities expressed some dis-satisfaction about the use of a concrete working platform. However, as the design process continued, it became apparent that the pavement design that produced a minimum pavement thickness would result in the least disturbance to the service authority mains and services.

The construction standards and techniques and the long-term performance of conventional flexible pavements are well known and fully documented. Thus the lack of long-term detailed information on interlocking concrete block pavements for heavy duty roadway applications introduced an element of risk into using such a pavement. Thus, after considerable detailed discussions and technical work, the pavement designs shown in Fig. 1 were developed.

Council had initially asked for a cobblestone pavement through the heritage area (abouut 500 m). It was soon convinced that the traditional rough cobblestone surface was neither suitable nor acceptable in 1985. The most acceptable alternative was the interlocking concrete block pavement.

In considering my report and that of B.C. Tonkin and Associates, it was decided to pave the entire project using concrete blocks. This decision was based on the following.

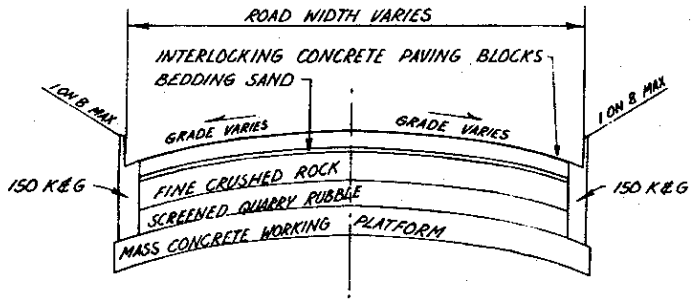
(a) The use of this pavement gave the desired (or as near as practicable) pavement through the heritage area.

(b) The design guaranteed a minimum of interference with the underground services.

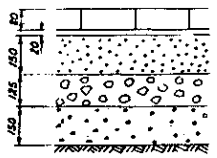
(c) The type of construction was particularly highly labour oriented and the most suitable for a CEP project.

(d) Research of papers written and studies undertaken revealed that the block pavement had qualities and properties which were satisfactory for the construction of heavy duty loads.

A short section (about 80 m) of asphaltic concrete was constructed at the northern end of King William Road in order to match the pavements of Greenhill Road and Peacock Road, the two roads which King William Road meet.

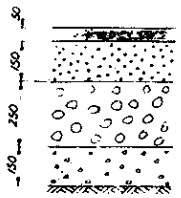


TYPICAL ROAD CROSS SECTION NOT TO SCALE



Interlocking concrete blocks
Bedding sand
20 mm fine crushed rock
20 mm screened quarry rubble
Mass concrete working platform
Sub-grade (CBR = 2)

PAVEMENT DETAIL



Asphaltic concrete
20 mm fine crushed rock
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Mass concrete working platform
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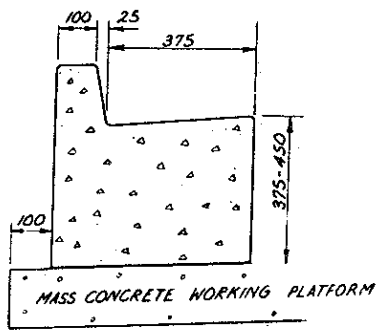

KERB & GUTTER DETAIL

Fig. 1 - Details of design of King William Road

CEP GRANT

Planning now moved into the final stages. Council had to commence the underground stormwater drainage works and all service authorities had to co-ordinate their works: E & WS (water) - a new main; Telecom - relocation and protection of its main cables; S.A. Gas Co. - upgrading of its existing mains; and the Lands Department to peg relocation markers for all permanent survey markers in the street. The drainage works commenced on 5 February 1985, and the road reconstruction on 18 March 1985.

DETAILS OF THE GRANT

CEP labour:	$779,266
non-labour:	$414,776
Sub-total:	$1,194,042
Council contribution:	$1,069,712
Total:	$2,263,754

The grant was made to employ:

Classification	Duration
1 engineer	12 months
3 grader operators	12 months
1 clerk	12 months
2 clerks	6 months each
6 concrete finishers	2 x 3 for 30 weeks
54 constr. workers	2 x 27 for 26 weeks
16 truck drivers	2 x 8 for 26 weeks
6 backhoe operators	2 x 3 for 26 weeks

Of the 89 employed, 88 had to be long-term unemployed (i.e. nine months or more out of work), 13 had to be classified by the CES as disabled, four had to be aboriginals, 35 had to be women, and two had to be migrants with english language difficulties.

TENDERS

Tenders were called for the supply of all major products to be used in the project. The successful tenders were:

supply and delivery of lean mix and construction concrete - Davalan Concrete Pty Ltd

supply and delivery of rubble, crushed rock and bedding sand - Readymix Farley Groups (S.A.) Ltd

supply of jointing sand - Gadac Plastics Pty Ltd

Supply and delivery of interlocking concrete blocks - Monier Besser. This contract included the training of pavers, the supply on loan of equipment to move the concrete units on and off pallets on the job, and the supply on loan of brick-cutting tools.

RECRUITING

The Unley CES commenced recruiting in late January 1985. Initially, all job applicants (except the engineer) were interviewed by Council's Works Supervisor and the Project Supervisor. Exercising the usual right of an employer to accept or reject those referred, the initial project team of 47 was selected and employed.

It was decided that the project would be supervised by one of Council's Assistant Works Supervisors. Council also decided to integrate four of its most experienced gangers on the project in order to ensure skilled supervision of the CEP employees. These four were chosen by the Director of Works and the Works Manager with not only their ability as gangers in mind, but also the skills they possessed as workers. This was done not only to ensure an adequate level of supervision, but also to have men in charge of gangs who were capable of training the unskilled recruits in the tasks to which they were to be put.

The CEP workers started on staggered dates for three reasons:

(a) all training was to be done on the job, this being a condition of the CEP grant;

(b) to enable maximum effort to be put into their training over a period of two to four weeks; and

(c) to enable the project to proceed with the new stages without interfering with the stages already commenced.

Basically the project was divided into the following stages:

excavation,

concrete working platform,

kerb and watertable,

roadbase construction - rubble and fine crushed rock, and

paving.

The project employees commenced work as follows.

11 March 1985	engineer
18 March 1985	1 clerk 8 truck drivers 3 backhoe operators 4 construction workers (excavation)
1 April 1985	3 concrete finishers 3 grader operators 5 construction workers (concrete and base)
15 April 1985	18 construction workers (pavers)
22 April 1985	1 clerk
Total	47

TRAINING

All new CEP employees spent their first day at work in induction training. This included familiarisation with the depot and site, an address outlining the principle facets of the project by the Works Manager, basic safety training - including issues of obligatory clothing equipment, and introduction to the gangers and the tasks they were to undertake and the tools and equipment they were to use.

The main areas where training was required were truck drivers, backhoe operators, grader operators, concrete finishers and pavers. As already explained, all training had to be undertaken on the job. As already set out, the first to start was the engineer. This man had extensive overseas experience in most facets of railway engineering, although his english left a little to be desired. He quickly settled down and commenced productive duties.

The next group to start were the truck drivers and backhoe operators. All truck drivers had Class 2 licences (i.e. licences to drive trucks) but many had not had the opportunity to drive a 5 t truck for a long time. Training in this area

generally consisted of familiarisation with the trucks to be used and getting as many hours driving practice (both unladen and laden) between the work site and the disposal site, some 8 km from the job. The backhoe operators proved more difficult to train. Fortunately, one of those employed had some skill, but the others had almost no experience. Training consisted of demonstration and explanation by our experienced and skilled operator and then several hours of practice. About two weeks and several dents in the sides of the trucks later, the three operators attained a barely-acceptable skill level. After a few weeks work, one of the operators became quite proficient and was immediately offered a job by one of the public authorities working on the project, which he accepted. We were disappointed to say the least, but upon reflection, it was realised that it was the first real success of the CEP project. One long-term unemployed person had secured permanent employment through participation in the scheme. Of course, training of a replacement commenced immediately.

The third group to be trained were the concrete finishers and the grader operators. Those employed as concrete finishers were practiced in laying and levelling-off the lean mix working platform and in the skills of setting up formwork for the kerb and gutter construction and the operation of a kerb machine, together with the skills in finishing off concrete surfaces.

One of the two most critical areas of training was the training of the grader operators. Owing to the critical nature of the thickness of the bedding sand under the pavers, the grader operator had to be trained to cut the final level very precisely. Ultimately, after many hours of practice, one operator was trained to an acceptable degree of proficiency. As this operator was somewhat slow, there were times when a second contract grader had to be engaged to ensure a satisfactory level of grader output was attained to keep this facet of the project on time. Fortunately, we were able to retain the services of this employee throughout the duration of the project.

The pavers were trained by Monier Besser who engaged one of their best contractors, a man who had been working on similar projects to that at King William Road for two years. He worked continuously for about four weeks with the pavers. Training consisted of demonstrations of the skills needed to undertake the paving, and practical sessions so that the workers could have hands-on experience. These skills included the following.

Job management, including the general approach to the job, the order in which tasks had to be undertaken, the layout of the job and the arrangement of the product, and tools and equipment to minimise movement and maximise effort.

Use of tools - specialist tools provided by Monier Besser were forklift trucks, block-carrying units and block cutters. Other tools requiring skills were screeds, trowels, spirit levels, string lines, rubber mallets, vibrating plates and several other minor tools used on the job.

Laying of sand - this critical phase of training included spreading the sand, screeding the sand both with and without screed rails, and interpretation of level pegs provided by the supervisor or ganger.

Laying the paving units - this phase of the training included the use of various laying patterns and methods of laying the units. It also included laying to the string lines to ensure 'straight' joints, methods of correcting mis-aligned units and methods of replacing unacceptable units.

Cutting - employees were trained to cut the paving units so that they would fit correctly along the gutters and around the many obstructions found in streets and on footpaths.

Jointing and locking up - employees were trained to spread the jointing sand and sweep it into the joints and then to use the high-frequency, low-amplitude vibrating plates to initially compact the paving and commence the lock-up process.

Rolling and final lock up - the plant operators were trained to pre-load the pavement with the correct use of a 12 t pneumatic-tyred, multi-wheeled roller.

SERVICES

Considerable time was spent in the planning stages to liaise with all groups with physical services and plant in the street. These groups were:

Telecom Australia - underground telephone communication cables

Engineering and Water Supply Department - mains water reticulation and sewage mains (both underground)

S.A. Gas Company - gas reticulation (underground)

Electricity Trust of S.A. - electricity reticulation (both underground and overhead)

Lands Department - survey marks (at ground level)

During the course of the project, the Council joined with the ESTA to underground all electricity power lines for 600 m through the shopping and heritage area. Following a submission by Council to the ESTA to share the cost of undergrounding the section of power lines, the matter was referred to the Trust's Committee, known as ERAC (Electricity Reticulation Advisory Committee). As that Committee deemed this part of the project had a community benefit, the Trust agreed to share the cost. The cost sharing was on the following basis:

Council - provision of land for transformer and switchgear; excavation of all trenching; reinstatement of all trenches; installation of underground consumer services; and supply and installation of covers for the service pits in the paved areas.

ETSA - supply and installation of all cables, transformers, switchgear and service pits; and removal of the old overhead electrical reticulation system and poles.

The E & WS Department laid a new water main in the southern half of the roadway (1250 m). This work was done immediately prior to the commencement of road excavation. It also altered existing mains and services as and when required by Council. The S.A. Gas Company relaid all its mains along the street, where it deemed it necessary. These mains were principally located under the foootpaths. It also made alterations to mains and services upon request. On several occasions a tardy response to Council's needs caused delays to the progress of the roadworks. Telecom made several alterations to its underground plant along the project, and responded to Council requests for alterations. Some delays were caused.

DELAYS

The project commenced physically on 18 March 1985 and was planned for completion on 18 March 1986. Because of various delays, the job was completed on 18 April 1986. After the thirtieth week of the project the program was very carefully examined. It was found that unless some aspects of the job were accelerated, the project may have dragged on to June.

The principal causes of the dalays were as follows.

Excessive wet weather. In the first 28 weeks of the job, wet weather affected 32 days. Of these, no work was undertaken on 16 days. Actually, the equivalent of 26 days work, or 19.3 per cent of the work time available, was lost due to weather.

Services. Both the S.A. Gas Company and Telecom caused delays in the work while they undertook alterations to their mains, services and plant.

The grader operator, while producing accurate work, could not perform to the time target.

Concrete work. Some kerb and gutter had to be replaced due to poor and unacceptable workmanship.

Excavation. This facet of the project proved to be the most critical in regard to meeting the anticipated completion date. The excavation rate being achieved by the semi-skilled backhoe operators was too slow to complete the project on time.

SUPPLEMENTARY GRANT

In order to complete the reconstruction by 18 April 1986, additional plant and employees were introduced. A second backhoe was engaged, plus three more trucks. They were deployed as follows: three backhoe operators, three truck drivers, four concrete finishers, three concrete workers and 11 construction workers.

An application for a supplementary CEP grant to cover the cost of this additional work was successful. The grant was increased by $212,641, being $138,217 for labour and $74,424 for non-labour expenses. The works program was reviewed and revamped to cater for the additional resources now available.

BUDGET REVIEW

In October 1985 the project budget was reviewed and increased by $413,600. The increased costs were due to

several factors. The most significant was perhaps the need to increase the quarry product budget due to an incorrect calculation of tonnage needed in the early planning stages. It had also been found that the semi-skilled backhoe operators tended to over-excavate, thus increasing the volume of lean mix concrete used in the working platform. Another significant increase was caused by the need to employ contract excavation teams to keep in touch with the program. Other minor adjustments were necessary. It is noted that there was a significant loss of tools and traffic control signs from the job.

A further budget increase of $67,100 was approved in February 1986. This arose from incorrect figures being brought forward on 1 July 1985 in the Council's balance sheet.

The total cost of the roadway project to Council was $1,688,900.

PUBLIC COST AND PUBLIC RELATIONS

The approximate expenditure by all bodies who undertook work in the King William Road project is shown in Table 1.

Council consulted extensively with the public, street traders and residents from the time the project was first mooted until it was completed. While this process did not always overcome problems associated with the transfer of information from Council to the public and the public to Council, I believe it significantly contributed to a smoother operation.

On 9 May 1984, Council held a public meeting in the Abbey Restaurant in King William Road to advise the public of its intention to undertake the road reconstruction. Although constant reference was made to the likely disruption to local businesses and inconvenience to users of the road, I believe the public initially under-assessed this factor. Of course, this led to unrest and dissatisfaction during the reconstruction work.

Numerous press releases followed. Some 95 press articles were published during the course of the project. Very few gave the Council's viewpoint and most were written in typical sensational style. I can only assume that the controversy caused by the constant bombardment in the press was selling newspapers, as it did nothing to change the state of affairs in King William Road. More than 100 public notices were published in the daily papers and the local weekly paper keeping the residents and the public informed on the progress of the job.

A second public meeting was held on 5 February 1985 to outline the project about to be commenced.

During the project, all was done to make adjacent traders and residents' lives a little easier while the actual construction was being done in front of their premises. Owing to the protests of a few traders early on in the job, which resulted in considerable adverse publicity on TV, the radio and in the press, the trading situation became very bad. Takings in some businesses reduced to almost nothing when potential shoppers thought they could not gain access to the shops. The Small Business Corporation of S.A. took a hand and helped to bring a little equilibrium into the trading. However, regular trading for all was not restored again until 28 February 1986, when the road past the trading area was completed.

Shortly after the road was completely re-opened to traffic on 17 April 1986, the road returned to normal; through traffic returned and trading returned to its old level. As

TABLE 1

DETAILS OF EXPENDITURE ON KING WILLIAM ROAD PROJECT

Council	Road	$1,688,900	
CEP		1,406,700	$3,095,600
Council	Stormwater drainage		800,000
E & WS	Water main		400,000
ETSA	Underground power		500,000
	Other work		100,000
S.A. Gas Co.	Gas mains		600,000
Lands Dept	Preservation of survey marks		40,000
Total			5,535,600

a result of frequent visits to the road since April, I perceive that trading is continuing to improve beyond the old level, or at least there appears to be more cars parked in the trading areas than was the case prior to the commencement of the project.

It is interesting to note that several businesses in King William Road have recently advertised for more staff, an indication of better trading levels.

QUALITY OF THE JOB

Technically the job has been done well. Testimony to this was given by Dr Brian Shackel of the University of New South Wales who reported:

> "... As you must be aware, this is one of the largest and most imaginative urban street renewal projects to have been undertaken outside Europe. Indeed, in my experience, the project is without peer in Australia, the U.S.A. or Canada ...
>
> I have no hesitation in saying that your project compares more than favourably in terms of both concept and execution with the urban paving projects that I have seen ..."

Dr Shackel has inspected block paving in at least 16 countries throughout the world.

CONCLUSION

The project was physically completed on 18 April 1986. On Sunday 20 April, an official function was held in conjunction with a street party conducted by the King William Road Traders Association. A portion of the road was closed again to conduct this event. On that day, the Mayor of Unley, B.L. Schuetz Esq., J.P. formally opened the new road.

Council has many people and companies to thank for the successful completion of the project. Acknowledgement must be made to the Commonwealth Government for the funds made available through the Community Employment Program, which was administered by the South Australian Government.

The Council's supervisors and gangers have played a significant role in the achievement and I am proud of their accomplishments. The suppliers of products are also to be thanked. Deliveries were generally been on time, and this helped the job along. B.C. Tonkin and Associates, the consulting engineers on the project, have always been available when needed. Finally, Monier Besser, whose ever-present assistance has been available. The interlocking concrete block paving of this road has been a learning process for both Monier Besser and the Council. Its assistance has been invaluable.

David McCarthy was educated in South Australia and graduated in engineering from the University of Adelaide. He also gained an Associate Diploma in Recreation. In 1980, Mr McCarthy studied waste management in Germany, England, Scotland, the U.S.A. and New Zealand as a Hockridge Fellow. He is an Associate of the Royal Australian Institute of Park and Recreation, a Member of the Australian Institute of Construction, and a Justice of the Peace. In 1980, Mr McCarthy was awarded the British Empire Medal for community service. Mr McCarthy joined the City of Unley in July 1981 after 23 years with the City of Henley and Grange.