

## 6. UNDERGROUND CONVERSION OF OVERHEAD SERVICES

<b>Officer responsible</b> Environmental Policy and Planning Manager	<b>Author</b> Josie Schröder, Graduate Planner (Urban Design) Geoff English, Light Asset Engineer
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In 1995 the Council adopted the *Undergrounding of Overhead Services* policy, in which it required that a strong statement be in the City Plan and Strategic Plan that all services be undergrounded within 40 years. At the request of the Chairman this report reviews the lack of progress in achieving the 40-year target and discusses means that could meet the proposed rate of undergrounding.

### BACKGROUND

While undergrounding overhead services has long been an issue in the City, the introduction of Saturn as an additional network provider using overhead wiring has heightened the awareness of the implications of these services on urban amenity. The accumulative effect of such services has again brought the rate of undergrounding up for public discussion.

Overhead wires can have a major impact on the visual quality of our City. Having a largely flat topography, the streetscene is often the foremost view. Particularly in winter, when the trees have lost their leaves, the overhead wires and poles become very dominant within the streetscene. In the hill suburbs, the obstruction of the view by overhead wiring is cited as a factor in the reduction of amenity.



The most obvious benefit of undergrounding is the improvement to the general amenity of the streetscene. It not only includes the removal of unsightly poles and cables, but also allows for better provision of street trees and planting. Residents often comment that overhead services are undesirable features in their areas. These comments come as a result of Annual Plan submissions and consultation during neighbourhood improvement programmes or as general submissions.



It is more beneficial to underground overhead services in conjunction with other street improvement works, such as kerb and channel renewal and footpath resurfacing, than to undertake the works separately. The period of disturbance for residents, businesses and general traffic is minimised, and the completed street has a higher quality finish.

Traffic safety is an issue that can sometimes be overlooked in discussions about undergrounding. Between 1990 and 1994, 26 people died in 22 collisions involving utility poles. The placement of poles further back from the road closer to property boundaries, and a reduction in the number of utility poles can reduce the number of serious accidents and fatalities involving utility poles. Additionally, “undergrounding of power and telephone transmission lines can give additional savings in that fewer poles may be needed. Sufficient poles must be retained to light the road and footpath and to provide services to properties. It is likely that, as a minimum, the number of poles can be reduced from the present approximation of 51 poles per kilometre to 44 (and could be further reduced to 30 poles.) This has a potential resource cost saving of \$1.8million/annum in Christchurch.”<sup>1</sup>

The effect on property prices is another aspect of the argument for undergrounding. Quotable Value New Zealand has stated that while it is difficult to pinpoint the level of actual value added, the flow-on effect of the increase in amenity on property prices, particularly in more affluent areas and the hill suburbs, is very positive.

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<sup>1</sup> Huntington R. T, 1997 “Data survey of motor vehicle collisions involving posts or poles in the city of Christchurch” *Road and Transport Research* Vol 6 No 1 March 1997

This is partially attributable to the upgrade in the quality of the street, as well as the undergrounding of overhead services. The effects equate to the number of buyers interested, the period of time in which the property takes to sell, and subsequently the price.

Prior to 1989, both Heathcote and Riccarton Boroughs had undergrounding policies recognising the issues raised above, and the potential benefits that undergrounding would have on their local environments. While neither of the programmes was fully completed, there is a marked difference between these areas and those areas where undergrounding has not been undertaken. Riccarton is a particularly good example of this.

A number of other cities nationwide have been reviewing their positions on the undergrounding of overhead services. A recent study released in Auckland showed that all powerlines in Auckland City could be undergrounded in the next 10 years at a cost of \$400M. The questions of whether to do it and how to fund the programme for undergrounding are currently up for debate.

#### **CURRENT POLICY**

The Council has a number of existing interrelated policies that aim to underground overhead wiring. The policies are as follows:

##### **Overhead Cable Reticulation**

1. *That the Council adopt as policy general opposition to any extensions of non-essential aerial services.*
2. *Notwithstanding the above, that pending the undergrounding of currently overhead areas, Southpower (now Orion) be requested to negotiate if necessary a suitable commercial arrangement with other network operators regarding joint use of existing poles to avoid the erection of a duplicate set.*
3. *That conditions imposed on network operators wishing to establish services by aerial means include:*
  - (a) *a requirement that any gaps in existing pole lines be bridged by underground means and not by the introduction of new poles.*
  - (b) *a requirement to go underground at the same time as other service authorities do, or as otherwise required by the Council, including the clearance of short sections of line or individual poles as appropriate.*
4. *That Telecom South Limited be advised of the Council's policy on this matter and be invited to agree to similar arrangements in the event of its poles being needed in the interim by another network operator. (This has not been discussed in full to date).*

Council  
5 March 1990

## **Undergrounding Of Overhead Services**

1. *That a strong statement is included in the City Plan and Strategic Plan that all services are undergrounded within 40 years.*
2. *That the Council has discussion with the Board of Southpower (now known as Orion) on how this may be achieved.*
3. *That the Council set policy that all Cable TV cables within the city be undergrounded.*

Council

14 December 1993

## **Urban Renewal Policy (abridged)**

*The Council supports the progressive renewal of the older residential parts of the city to standards appropriate in today's environment.*

*The Council's role in this renewal be to:*

- *Ensure that the basic infrastructure of roading, **utility services** and open spaces can meet the changing needs and patterns of development.*
- *Ensure the public streets and parks **are designed and rebuilt to be attractive and safe.***

*The following techniques and approaches be applied where appropriate:*

- *The reconstruction of older style streets, including new footpaths, kerbs and channels, grass berms, street trees **and the undergrounding of overhead services.***
- *That at any one time, the Council's urban renewal programme be concentrated in one or two areas, in order to make recognisable impacts over short periods of time.*

Council

23 August 1995

## **CURRENT SITUATION**

Prior to 1996/97 Orion (Southpower) funded an annual underground conversion programme of \$3M to \$3.3M per year (excluding street lighting and Telecom costs). In 1996/97 the Christchurch City Council agreed to directly control the underground conversion programme, rather than Orion doing the work and passing on a reduced dividend to the Council.

The following table shows the City Streets Unit and Urban Renewal budget allocation, from the Annual Plan, for underground conversion over the last five years.

<b>Financial Year</b>	<b>City Streets Budget</b>	<b>Urban Renewal Budget</b>	<b>Total Budget</b>	<b>Kilometres Undergrounded</b>
<b>1996/97</b>	\$1,044,000	\$125,000	\$1,169,000	4.1
<b>1997/98</b>	\$700,000	\$425,000	\$1,125,000	3.5
<b>1998/99</b>	\$882,000	\$420,000	\$1,302,000	8.2
<b>1999/00</b>	\$1,950,000	\$350,000	\$2,300,000	7.3
<b>Average/Year</b>	<b>\$1,144,000</b>	<b>\$330,000</b>	<b>\$1,474,000</b>	<b>5.8</b>

Orion currently contributes 18% towards the Council funded conversion projects to reflect the betterment they receive. The Council pays the remaining 82% of Orion's conversion costs and the full cost of converting the street lighting and a contribution towards Telecom's conversion costs (based on the condition of the existing assets). In recent years Orion has also funded some undergrounding for network reinforcement reasons and the Council has funded the conversion of streetlighting and Telecom at the same time.

There are approximately 900km of urban roads remaining to be converted assuming that it would not be considered necessary to underground rural services beyond the urban fringe. Based on this years projects it is costing the Council (Orion and Telecom contributions are an additional cost) approximately \$330,000 per kilometre of road length to underground overhead services. This allows for the Council's contribution to Telecom and the street lighting costs associated with conversion. Where there are high voltage overhead lines the cost may increase or Orion may accept this cost. The Council has completed 23km of undergrounding since 1997, when it assumed control of the conversion programme.

The roads undergrounded are principally arterial and collector roads selected using the City Streets prioritisation criteria, which are:

- road reconstruction
- traffic volume
- safety benefit
- road hierarchy
- amenity value
- cost

Urban Renewal contributions towards undergrounding are confined to local streets in the older residential parts of the City covered by Neighbourhood Improvement Plans, where undergrounding will contribute to enhancing the residential qualities of the area.

Given the prioritisation criteria, and the budget for undergrounding overhead services, for the year ending June 2000 only 40% of the streets programmed for kerb and channel renewal will have the overhead services undergrounded at the same time. This major reconstruction of existing roads only happens every 80 years. The 2000/01 level of undergrounding is much the same. The City Streets Unit have 11km of kerb and channel renewal programmed for the year. Of the 11km, 1.5km of overhead services have already been undergrounded. The remaining 9.5km of kerb and channel still have overhead wiring. Of the 9.5km, 2.9km of services will be undergrounded by June 2001, leaving 6.6km of road with renewed kerb and channel that will not be undergrounded.

## ISSUES

It is clear that, based upon progress over the four years since Council began to directly fund undergrounding, the target of completing the undergrounding of all overhead services in 40 years will not be met. This is due to the level of funding. Additionally, there are a number of influences that either dictate or counter the ability to have overhead services converted in conjunction with kerb and channel renewal, or that require service providers to underground overhead services, if another target rate is agreed upon.

### (a) Synchronisation and Statutory Powers

The issue of synchronised undergrounding was raised last year by the Chairman of the City Services Committee with regard to Wilsons Road between Ferry Road and Lismore Street. The electricity network and street lighting cables were converted approximately four years ago, however overhead telephone wires remain. It is not possible, through the City Plan, to require existing wires to be undergrounded, although it is possible to require new wires to be placed underground.

The Resource Management Act 1991, under Section 10, establishes in what circumstances “existing use rights” apply. Effectively a land use consent for an existing land use, such as telephone poles on public land, cannot be revoked unless it is contrary to other provisions within the Act. In addition, if no consent was required for the activity at the time it was established, and the facility was otherwise lawfully established, then it is protected by existing use rights.

The Council does not therefore have the ability through the City Plan to require service authorities to underground **existing** services. The Proposed City Plan did at the time of notification in 1995 have a provision making the addition of overhead wires to existing infrastructure a discretionary activity. That provision was deleted as a consequence of the submissions process. However, it is being investigated again through a new variation.

The Council does have the authority, through provisions in the City Plan, to require that new cables be undergrounded where support structures do not already exist in new streets located in new subdivisions. This provision has existed since 1963 in the succession of planning documents, and continues today in the City Plan, and for this reason new residential subdivisions since then have had services undergrounded.

### (b) Funding

Undergrounding is costly at \$330,000/km of road. This figure is based upon the average cost of work undertaken to date. It must be noted that this does not include underground conversion in the hill suburbs of the City, which could increase the average future cost depending upon ground conditions. Current funding allows approximately 40% of roads to be undergrounded in conjunction with kerb and channel renewals, leaving the outstanding 60% of streets with some

visual improvement to the streetscene, but with overhead wires remaining. There is little likelihood of these areas being converted until the new kerb and channel has reached the end of its life, ie 80 years.

Over recent years a number of Community Boards have sought an increase in the rate of undergrounding, for example, in a submission to the 1999 Annual Plan, the Riccarton/Wigram Community Board sought a substantial (financial) increased allocation of at least \$10 million into undergrounding overhead services. The Council has received a number of submissions seeking the allocation of increased resources for underground conversions. As the Council does not own the cables this work is an operational rather than capital expense and therefore must be funded from rates.

Annual fluctuations in funding have meant that it is difficult to have a consistent approach to underground conversion. While there is quite a number of streets annually that are considered worthy of undergrounding, budget reductions have limited the number of streets where underground conversion can be undertaken. The cost of conversion can vary, affecting the amount completed each year.

The City Streets Unit/EPPU try to take a comprehensive approach to kerb and channel renewal in any given area, for example Neighbourhood Improvement Plan areas, so that a whole area is completed.

For practical and consistency reasons the overhead conversions may extend beyond the limits of the kerb and channel project and this needs consideration when budgets are developed. There are other significant roads (e.g. the ring road, one way streets, and state highways) that already have new flat kerb and channel that are worthy of conversion and these could be undergrounded in conjunction with the footpath resurfacing programme. This programme is worked on an 18-year cycle, increasing the opportunities for undergrounding.

**(c) Implementation projections**

Of 1,300km of urban streets in Christchurch, there are approximately 900km (including 65km of urban roads on hills) that need to be converted at \$330,000/km. Based on these figures it would cost approximately \$300M to convert the remaining roads.

Using the City Streets/Urban Renewal undergrounding budget for 1999/00 it will take 130 years to complete the conversion work, well short of the 40 year target. This assumes the continuation of the current level of contribution from Orion and Telecom. It is unknown at this stage whether Saturn will have an impact on the conversion programme as it currently stands. They have agreed to convert overhead services in tandem with Orion, but whether a financial contribution will be made similar to that of Orion's is unknown.

If conversion is undertaken at the same rate as the kerb and channel renewal, effectively doubling the 2000/01 undergrounding budget, it will take 80 years to complete at current rates of renewal. Further to this, if funding is provided to underground overhead services in conjunction with the footpath renewal programme, the number of years taken may be further reduced.

It is to be noted that if the Council chooses to increase conversion funding Orion and Telecom will also need to increase their contribution. The conversion that Orion does currently is mostly high voltage or where it is a needed utility improvement. However, it does seem that if capital is to be repatriated from Orion, at least some of this should be utilised to minimise the environmental impacts of the operations by undergrounding overhead wires which generated these funds in the first place.

#### **(d) Technology**

It should also be added that as we look to the future of the city, potential change in technologies should be considered. There have been in the last decade, major technological advances in communication systems, such as cellphones. This has in some instances eliminated the need for service cables. Such advances are also being seen in the energy industries, including electricity generation. Fuel cell technology is of particular relevance to the debate on the continuing use of cabling. It is foreseeable that fuel cells could replace utility networks such as Orion.

#### **CONCLUSION**

Undergrounding of overhead services can result in:

- an increase in the quality of the urban environment
- an increase in the potential for street tree planting and landscaping
- a reduction in the number of car accidents involving service poles
- overall enhancement of the older areas of the city to bring them up to standards similar to more recently developed areas

It is clear that the anticipated policy target of 40 years to complete underground conversion in urban Christchurch will not be achieved unless a significant increase in funding is made by the Council. To do so annual funding will need to be increased from around \$2M pa to \$8M pa.

A more realistic short term goal could be to increase the funding from \$2M pa to \$4.5M pa which would ensure that as older streets are reconstructed through the kerb and channel renewal, wires are placed underground at the same time. The figure given is based upon the 2000/01 programme and should be reviewed annually in conjunction with the kerb and channel renewal programme. Additionally, for practical and consistency reasons conversions may extend beyond the limits of the kerb and channel project and this needs consideration when budgets are developed. There are other significant roads (e.g. the ring road, one way streets, and state highways) that already



have flat kerb and channel that are worthy of conversion and these could be undergrounded in conjunction with the footpath resurfacing programme. This programme is worked on an 18-year cycle, increasing the opportunities for undergrounding.

As the Council cannot force service providers to underground existing overhead services, if the Council is to achieve a set target level, the only realistic option is to provide sufficient funding to attain that target level.

Regardless of the level of funding that the Council chooses, it is better that a consistent approach to funding undergrounding is taken. An established programme better allows the contractors undertaking the works to gear up to the given level, providing some certainty in the industry, increasing efficiency and reducing the cost to the Council of undergrounding.

- Recommendation:**
1. That as an immediate step, the annual level of funding for the conversion of overhead services be increased from \$2M to \$4.5M to match the rate of kerb and channel renewals.
  2. That within five years the level of annual funding be increased to \$8M to achieve the target of completing the conversion of overhead services City-wide within 40 years.
  3. That an approach be made to the City's service providers seeking a guarantee that if the Council was to increase the level of funding for underground conversion, their financial contribution would be increased accordingly.

- Chairman's Recommendation:**
1. That the Committee confirm its previous policy to underground all overhead services within 40 years from 1993.
  2. That the appropriate budget provision be made to achieve this goal from the 2000/01 budget year.