Flinders Council

Phone and Data Communications Review

July 2017

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1 Executive Summary

Flinders Council engaged Noel Squires & Associates to assess Council's existing phone and data communications and identify possible opportunities for improvement.

Following meetings with Council Staff, the current IT service provider (Another Computer Store) and site visits, a range of initiatives aimed at increasing functionality, improving reliability and reducing recurrent Telstra service and equipment rental charges were identified.

Those initiatives are listed below and are explained in more detail throughout the document.

- Install additional CAT6 data cabling in the office
- Establish a private microwave data network linking council sites
- Reduce monthly Telstra charges by terminating the existing TIPT service and the BDSL service
- Setup a new Telstra 1MB "unbundled" BDSL service for phone services
- Migrate from rented Telstra TIPT hardware to independent council owned VoIP phone hardware and select a private telco to provide phone services
- Reduce dependence on Telstra by using NBN Satellite services for internet and as a backup for phone services.
- Migrate the locally hosted Exchange Server (email) to the cloud

While future options for Internet connectivity such as a direct connection to Basslink, improved Telstra internet options or other telco's may eventuate, the recommendations in this report are based on currently available Telstra and NBN services.

A transition to future improved services would require only minor changes to accommodate the new service.

2 Current Phone and Data Communications

2.1 Telstra TIPT

Council were early adopters of TIPT (Telstra Internet Protocol Telephony), which has been in use for approximately 8 years. TIPT is a VoIP (Voice over Internet Protocol) phone system with advanced capabilities that can be scaled from small organisations to large enterprises. Telstra themselves use TIPT internally.

2.1.1 VoIP Internet Connectivity

VoIP phone systems have largely replaced traditional PABX's because of their flexibility, good voice quality and generally lower cost for businesses that have access to fast, reliable and cheap internet access.

Internet access for Flinders Council is neither fast, reliable or cheap. The existing Telstra 2MB BDSL service used for voice and data has a monthly cost of $2,453. That cost combined with service and equipment rental charges for desk phones, routers and switches makes TIPT far less attractive for Council than it would be to a business with good internet access.

Satellite NBN is reasonably fast, fairly reliable and well priced, however the inherent latency of satellite internet is an issue for VoIP. While satellite services can and are being used for VoIP, land based services are preferred.

2.1.2 TIPT Features

While TIPT is rich in features, it lacks some of the features that are most valued in a small office. Other VoIP systems are targeted at small offices and offer more relevant functionality.

2.1.3 Service Level

TIPT is remotely maintained by Telstra and it typically comes with a 4 hour service level agreement. That service level is built into the cost. The reality is that Telstra are a national organisation who can generally meet their service level agreements, however for many isolated customers the logistics are simply impractical.

2.2 Council Network

While the office and the depot networks are joined by a short microwave data link, other sites such as the Airport and the Transfer Station have no direct link to the Council network.

Section 3.2 discusses extending the Council network to the Airport and the Transfer Station.

3 Recommendations

3.1 Office Cabling

At present, there is limited data cabling in the office and this is supplemented by wireless access points. Retro fitting new data cabling in the office would provide several benefits:

- Cabling enables Power over Ethernet (PoE). This allows devices such as phones to be powered from a central switch via their data connection, removing the need for separate power supplies.
- Wired connections are generally faster, more secure and more reliable than wireless connections.

When retro fitting data cables, the majority of the cost is labour and the cable itself is relatively inexpensive. It is therefore advisable to:

- Use good quality cable such as ADC KRONE Category 6 cable.
- Run 2 or 3 cables to each network point as this increases flexibility and is not significantly more expensive than running a single cable.

3.2 Linking Council Sites

There are significant advantages in connecting Council sites via a single fast data network.

These include:

- Improved remote support. When an IT service provider establishes a remote connection to the Council network, computers and peripherals at all connected sites will be visible and able to be supported.
- Centralised data storage and backup.
- Internal VoIP phone calls across networked sites are free. Phones across the organisation would appear as extensions in a single office.
- Centralised network management and monitoring.

Creating a private internal microwave data communications network, that is Council owned and independent of telecommunications companies can be done at relativity low capital cost and very low recurrent cost. It can provide high speed connectivity for collaboration and centralised remote management.

A critical requirement for a microwave link is a physical Line of Sight (LoS) from point to point. After an initial visual check, the topography around Whitemark provides an excellent opportunity to establish fast links between Council sites.

The list of Council sites provided was;

- Council Office
- FAEC (already connected)
- Hospital Office (already connected)
- Airport
- Depot (already connected)
- Transfer Station

Hays Hill and Walkers Lookout were both considered as a potential relay point between the Office and the Airport / Transfer Station. Hays Hill provided a shorter link path, but would probably require a mast at the Airport to clear a line of trees to the South.

Walkers Lookout provides a longer link path, but a much better LoS to the Airport. The link path passes almost directly over the Transfer Station which would allow a Point to Multipoint link from a single radio on Walkers Lookout to both the Airport and the Transfer Station.

Link	Distance	Bearing from Walkers Lookout
Walkers Lookout to Office	9.2 km	216.8° T
Walkers Lookout to Airport	7.8 km	239.3° T
Walkers Lookout to Transfer Station	3.8 km	238.6° T

3.2.1 Link Paths from Walkers Lookout

3.2.2 Line of Sight from Walkers Lookout

3.3 Phones and Network Hardware

The monthly cost of Telstra services and equipment rental for telephone handsets and associated hardware is significant.

In recent years the VoIP phone market has grown considerably, and as a result hardware costs have fallen substantially.

There is a strong business case for purchasing equipment outright and establishing a Council owned VoIP phone system.

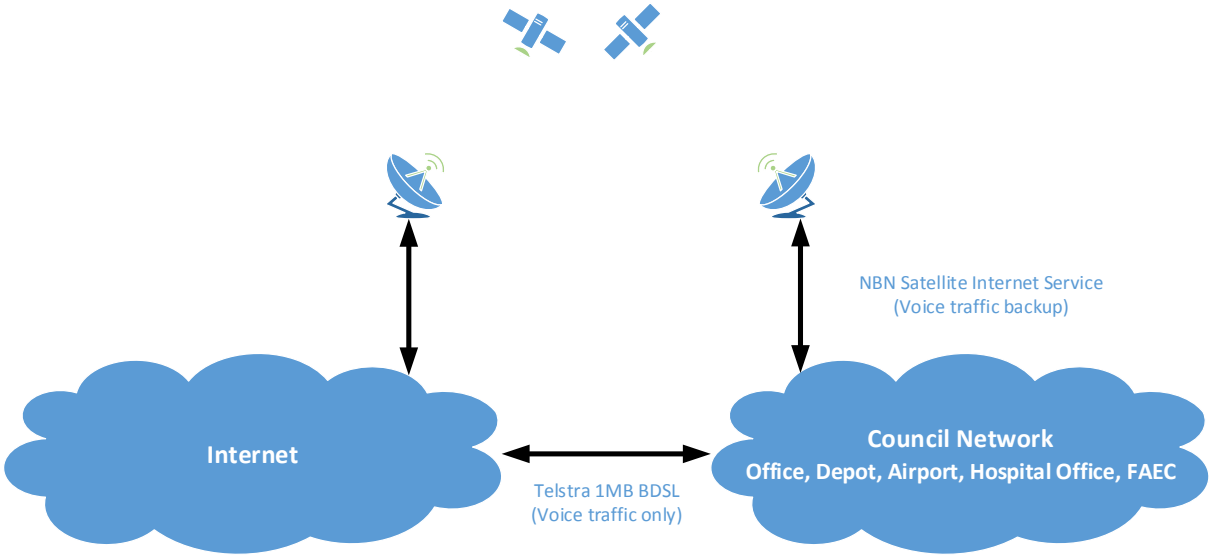
The cost of renting telephone handsets from Telstra will exceed the capital cost of purchasing handsets outright in around 2.5 years.

3.4 Internet Access and Satellite NBN and Voice

At present, all internet and voice data is via a Telstra 2M BDSL service at a cost of $2,453 per month, which accounts for more than 40% of Telstra charges including mobiles.

Satellite NBN offers higher download speeds at much lower cost, however is does have some limitations. The round trip time delay (known a latency) is noticeable on voice calls via satellite.

One option to get the best of both worlds would be to use NBN Satellite for internet and a slower BDSL service for VoIP only. The NBN Satellite service could also service as a backup for VoIP data if the BDSL service was down.



3.5 Exchange Migration to the Cloud

Council currently host their own Microsoft Exchange email server. This server could be made redundant by moving email to a hosted cloud based service.

There is a small monthly charge per mailbox, however this is offset by not having to maintain a local server. Operating system upgrades, Exchange upgrades, monitoring, maintenance and backups are no longer required as this is all done by the provider.

As with any cloud based service, an internet connection is essential, however in the case of Microsoft Outlook, a replica of a user's mailbox is kept locally. Users can continue to use Outlook when they are off-line. When the internet connection is restored, incoming and outgoing mail synchronise automatically.

4 List of Acronyms

Acronym	Definition
ADSL	Asymmetric Digital Subscriber Line
API	Application Program Interface
BDSL	Business-Digital Subscriber Line
BYOD	Bring Your Own Device
CAD	Computer Aided Design
CRM	Customer Relationship Management
DMR	Digital Mobile Radio
DR	Disaster Recovery
EDMS	Electronic Document Management System
EIS	Executive Information System
GIS	Geographical Information System
IP	Internet Protocol
IT	Information Technology
LoS	Line of Sight
Mbps	Megabits per second
MS	Microsoft
NBN	National Broadband Network
PABX	Private Access Branch Exchange
PoE	Power over Ethernet
SOE	Standard Operating Environment
TCO	Total Cost of Ownership
TIPIT	Telstra Internet Protocol Telephony
VoIP	Voice over Internet Protocol
VPN	Virtual Private Network
Wi-Fi	Wireless Fidelity