

Introduction

This document proposes a Public WiFi Hotspot for the township of Woodside for the benefits of the local business sector and community.

In brief, the Adelaide Hills Business Centre has reviewed a number of options around Public Wifi for the Woodside Community and favours the **Community Partner (Hybrid)** model as outlined here-with-in.

This proposal aims at driving new and improved business opportunities along with greater community support and job opportunities through the popularity of Public WiFi Hotspot services.

It is important to note that a good portion of the population, particularly travellers and the youth, will stay in one location longer if public Wifi is available for them to stay in touch with family and friends to share their experiences. This also helps to put Woodside and the Adelaide Hills on the map for others to visit, and a signal to investors and outsiders that the town is forward-thinking.

Other benefits include a more connected and informed community, promotion of local businesses, sporting and community events and important notices around fire / flood seasons etc.

Small community development concerns

In more recent times, smaller regional communities are experiencing increased business closures, low business investment and the downturn in local employment. Local trade is being directed away from regional areas through larger advertisers that are city and cloud based businesses.

Public WiFi if established in Woodside and backed by council and the local business community, business trade and investment should increase through targeted marketing and greater awareness of local events and products / services.

In addition, the Public WiFi has the potential to support community connective, local events, community notice and the ability to generate a revenue surplus to fund Community Development Projects.

This document contains the following main section

1. Overview of Proposal
2. WiFi Hotspot Deployment Options
3. What and Why WiFi?
4. WiFi Users
5. WiFi Zone
6. Data and Gateways
7. Technology
8. Internet Of Things

9. WiFi Signage
10. Cost & Revenue
11. Proposed Key Stakeholders
12. Updates / Changes

Overview Of Proposal

Creating public Wi-Fi Hotspot zones in Woodside has a number of benefits that revolve around economic development, including the ability to promote local businesses, sporting and community events etc via web based landing pages.

This document provides a basic understanding overview of the technology, deployment strategies to consider, WiFi zones, users of such services, local promotion, recent developments and potential outcomes.

WiFi Hotspot Deployment Options

There are several options when it comes to establishing and operating a public WiFi:

1. **Wireless Internet Service Provider** - Permits an external operator to provide the online content, with advertising space sold to local and non-local businesses. Normally the infrastructure is funded by the community via SaaS, council and / or through long term end-to-end marketing contracts with the WISP. Content, data analysis and data mapping of personal information is owned by others to maximise returns through online content and sale. Eg. Plutus etc.
2. **Community Partner (Hybrid)** - Wireless zones set up with the assistance of a number of local main street businesses and sporting clubs. The system is funded and managed on behalf of the community by a service operator, and may be owned and funded in part by the community and the service operator.
3. **Community DIY** - Wireless zones set up by local volunteers, a full "Do It Yourself" (DIY) model where the community funds and operates the whole project. Can become fragmented and inconsistent with limited engagement.

Recent Developments with the SATC & Telstra (2017)

Current plans are in place whereby the South Australian Tourism Commission is joint funding with Telstra to provide Free WiFi to a number of Adelaide Hills townships.

It is a limited single access point located near existing Telstra infrastructure / phone box services. Eg Postoffice and Woodside North. Current understanding of the data collected will be used solely by Telstra to carry out target marketing or sold to multinational organisations.

In effect, this type of WiFi Hotspot is considered as a **Wireless Internet Service Provider** zone.

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Service Types	Advantages	Disadvantages
Wireless Internet Service Provider (WISP)	- May have lower upfront setup cost if infrastructure is provided by WISP. - If infrastructure is provided by the Community, the Community can expect to generate a revenue stream from hiring WiFi Zones. Normally based on a percentage of sold advertising by local businesses. - Does not involve the community except to maintain a revenue stream to the WISP. - Enables local business to promote to a wider group of people outside of Woodside through Targeting Advertising via Apps, online content or other WiFi locations - WISP apps to inform users of events based on user's profile.	- Promotion cost is higher with long term marketing end to end contracts back to the WISP. More so if infrastructure is supplied by WISP - High cost of providing infrastructure if not supplied by WISP. - Little to no control over local content or community news. - Target Advertising to visitors is not directly to Community advantage - Local businesses out bid by larger advertisers. - Data collection of visitors details and online activities is externally controlled and owned by WISP. - Use of collected data and sale thereof is externally controlled.
Community Partner (Hybrid) Preferred Option Covered by This Proposal	- Reduces Community involvement. - Higher level of success with community, driving engagement and awareness. - Low Operating Cost / Good Returns. - Surplus revenue can fund local community projects. - Access to collected data to remarket and promote local events. - Adjust the price of promotional cost based on advertiser and budget. (Eg Businesses v's Not For Profits) - Does not require knowledge in establishing or maintaining system - Does not require Community to collect advertising revenue. - Does not require Community to manage promotions and remarketing logic.	- Investment Required. - Involves Community to gain local support to back the Free WiFi Hotspot. - Initial involvement to high
Community DIY	- Low Operating Cost / Good Returns. - Surplus revenue to fund local community projects. - Full control over collected data to remarket and promote local events. - Adjust the price of promotional cost based on advertiser and budget. (Eg Business v's No For Profits)	- High startup investment cost. - Requires significant time at a Community level, most likely from volunteers. - Requires volunteers to have good knowledge in establishing WiFi systems and maintenance. - Requires Communication to gain skills, manage promotions and remarketing logic. - Greater reduction in overall success as community may drive from many directions and invested interest. - Requires the Community to maintain a revenue stream to offset cost through promotions and the like. - Hardware and other infrastructure to be maintained by Community. - The success will largely depend on some key players. - Return surplus funds are reduced.

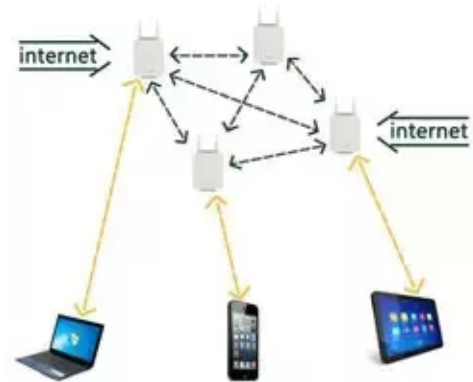
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Community Partner and **Community DIY** models, while more intensive, this approach requires a community commitment to use and promote in shops and on marketing material. It has a lower overall cost, though it is most successful when there is a dedicated coordinator who can manage the process, as in the **Community Partner** option.

About WiFi

Wi-Fi is a popular and proven technology that allows an electronic device to exchange data or connect to the internet wirelessly using radio waves.

It uses the same technology that is in a residential or home based WiFi unit whereby radio waves carry the data between the internet gateway router and any device that has a Wi-Fi receiver such as smartphones, computers, tablets, camera, etc.



It is an easy, low cost and effective method to connect to the internet using low powered short-range radio-waves.

Mobile devices using wireless data (3G - 5G) are power draining when connected back to the transmission towers. From a mobile user's perspective, most smartphone data plans have limits on the amount of data they can download and they need to be within range of a tower, which can be challenging in some parts of Woodside.

WiFi Users

For many overseas travellers, access to WiFi is a high priority when travelling. WiFi allows travellers to stay in contact with friends and family and share their travel adventures. When public WiFi is connected with a local news, events and service landing page, visitors (Overseas, Australians and locals) can plan their visit or return visits around local events.

Public WiFi also creates retention of visitors within an area particularly with families and youth and backpackers for the reasons stated above.

The Woodside sports ground is visited by hundreds of young people every month and while many will have internet devices, families will limit costly mobile plans to their children. These users rely on WiFi access. Access to WiFi enables these users to make phone calls using applications such as What's App, Viber, Messenger. Such WiFi service provides a range of benefits including safety, security, and family support.

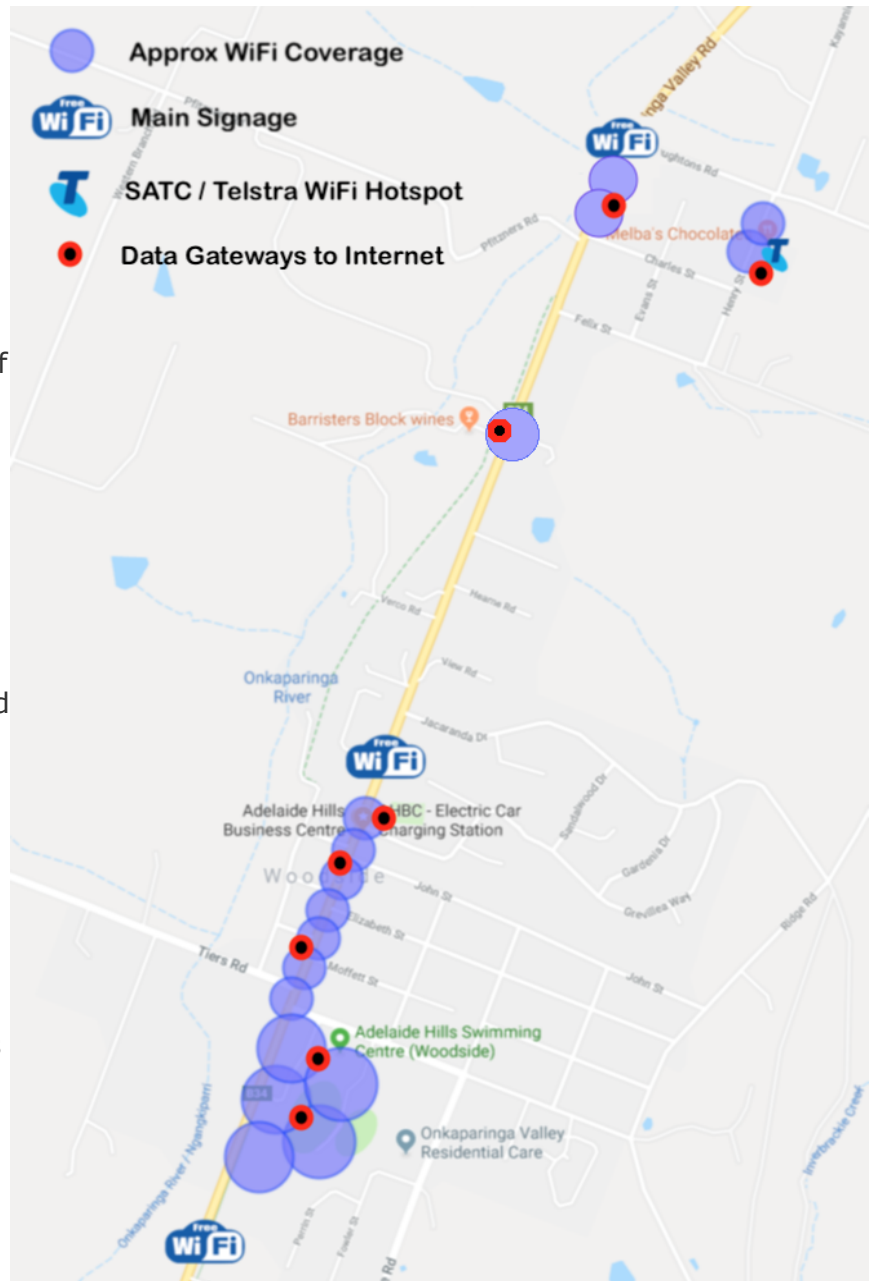
It is important that access must be nonrestrictive where possible, as people are becoming very aware and wary of potential tracking and privacy grabbing sites.

WiFi Zones

The following map provides an indication of the proposed WiFi zones and placement of main signage. It also shows the expected location of the SATC / Telstra WiFi Hotspot.

The circular areas indicate the approximate coverage of Meshing Devices as covered in the next section. The sports ground shows larger coverage per Meshing Device due to less signal obstructions.

Other isolated zones can be added for businesses located outside of the main zone locations. In such locations where the zone is dedicated to a business, the Control Software (See Technology section) can provide a unique splash screen identifying the business and separate landing page. This ensures a united Public WiFi Hotspot approach is maintained without isolating businesses from the overall promotional benefits. Eg Wineries like Barristers Block, Bird In Hand to name a few



Even so, these businesses still have the benefit of engaging with visitors through the Public WiFi hotspot with business and event promotions regardless of a delegated zone.

Meshing WiFi Hotspot Zones

Home Wi-Fi systems are delivered from the device connected to the internet also known as a router. In effect, your home Wi-Fi is a hotspot. In larger homes or homes with heavy stone walls, a second router (a.k.a extender, repeater) may be installed. As you move from one WiFi zone to another, the mobile device will disconnect and reconnect between the WiFi zones.

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Meshing devices are very similar to your home WiFi device.

Meshing devices are installed to communicate with each other and function as a gateway to the internet via a Router located at a local business premises, or simply to extend the range of the WiFi zone.

A WiFi hotspot is primarily a larger area of WiFi coverage with some technology that controls the level of system access by users,

To create a wireless mesh zone, several meshing devices need to be installed within 25 to 30m of each other. The zones do not need to be continuous. For example, a zone could be connected along the main street of Woodside with other zones created for the sports grounds and Woodside North near the chocolate and cheese tourism spots.

Data And Gateways

The Adelaide Hills Business Centre has investigated a number of High Speed, Internet options with Acceptable PIR, CIR and QoS.

While optic fibre has existed through Woodside for many years, the cost of establishing a gateway to the internet has been prohibitive.

Recent progress of the NBN Co services through Woodside with its new service called Fibre To The Curb (FTTC) provides a more cost-effective gateway solution. FTTC is expecting to deliver 100/40 Mbps and 50/20 Mbps to most of Woodside's main street.

The proposed three WiFi Hotspot zones are expected to require 6 to 9 internet Gateways. Provision of these Gateways shall be through existing shared Gateways located at businesses and sports grounds. Businesses providing gateway access within the zones shall be compensated. See section "Cost and Returns" for further details.

100/40 Mbps – which means that the theoretical peak download speed is 100 Megabits per second, and the theoretical peak upload speed is 40 Megabits per second. NBN options exist for Gigabit bandwidth in more populated areas if deployed beyond Woodside.

Committed Information Rate (CIR) - The guaranteed amount of bandwidth that NBN Co will provide to end-users.

Peak Information Rate (PIR) - PIR The theoretical speed that an end-user could receive if there were no other end-users using at the same time.

Quality of Service (QoS) - The traffic engineering term Quality of Service (QoS) refers to resource reservation control mechanisms rather than the achieved service quality. QoS is the ability to provide different priority to different applications, users, or data flows, or to guarantee a certain level of performance to a data flow.

Technology

Hardware and Access Points

There are many hardware solutions that can be used to create the wireless mesh network. While the technology, reliability and remote connectivity to service updates are important, the devices need to be encapsulated to protect them from our environment.

Most mesh units are no larger than a small loaf of bread. They are normally placed within a waterproof case and mounted to a building fascia or post. If the meshing device is used as an extender, a low voltage power connection is required. (*Uses as little as 5W of power*) If the Mesh device is connected to an internet gateway (Router) a data connection is also required.



Open Mesh products

<https://www.open-mesh.com.au/wp-content/uploads/2018/01/OM-Series-Datasheet.pdf>

Control Software and Use

Software is used for monitoring the zone and to ensure everything is working correctly and to control or limit the amount of data that each user can use. This software is normally cloud located for remote access anywhere on the Internet.

Many of these software products include the ability to create a splash page for users to sign-in with an email address or anonymously. The sign-in page is displayed to the user before an internet connection is established, providing an opportunity to welcome the user to Woodside and informing the user of key events, weather etc.

Once the person signs in, a landing web page can be displayed about Woodside including current events, community notices, accommodation, shops, wineries, tours, interactive maps and the like. The above is not available if a **Wireless Internet Service Provider** approach is adopted to deliver the Free WiFi Hotspot.

If a **Community Partner** or **Community DIY** approach is adopted, the community / partner has the additional ability to collect the user's contact details and measure usage. (Number of users, amount of data, types of data, operating system used and device type to name a few)

Remarketing is also provided by many of the systems, including the Redifi system. This means that emailing rules can be established to connect to a target market. For example, a "thank you for visiting Woodside" email can be sent to each user with a reminder of upcoming events such as the wine festivals, entertainment and the like. Further follow-up emails may be sent to the user when new events are scheduled.

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These systems detect when visitors reconnect to the Woodside WiFi Hotspot and, on doing so, can trigger some form of promotion or booking invite.

The management of this should be by an organisation that can oversee updates, events, promotions community news etc. Some time is required, however this can be largely reduced through automated systems, allowing Woodside businesses and community groups to post promotions as required.

Internet Of Things (IoT)

IoT is a technology enabler for communities and industries. In the past, to remote monitor and control services has meant large investment and specialised technology. The rapid growth of low cost WiFi and sensor electronics along with the development of a narrow radio band, lightweight, small payload protocol (LoRaWAN) has created an opportunity for to deploy low cost data and analysis services. LoRaWAN is an acronym for Long Range Wide Area Network that operates at 915 – 928 MHz in a public modulation bandwidth.

IoT devices are small, low powered and localised products that can measure a range of properties from its attached sensor, switch or other data collectors. Data is periodically transmitted through a lightweight LoRaWAN protocol. The data is received at a IoT gateway (Similar to a home Router) whereby subscribers (Owner of the data Eg Farmers etc) have access to collect and analyze the data for trends, alerts or to send data to remote devices. Eg. Crop levels and water trough level sensor drive supply pump and gates to move livestock automatically.

Some IoT uses:-

- Ability to measure and analyze the use of public tracks, sporting venues
- Monitoring of road use and movements from mine site and commercial properties.
- Waste emissions and flows
- In-field Livestock movements track and animal welfare
- Crops, land conditions and catchment data

The proposed WiFi also opens the possibility to extend the public WiFi with a LoRaWAN service with a 5 - 15km coverage radius around Woodside (Subject to topography and Gateway antenna Mounting locations)

The cost of this provision has not been included at this stage, but an estimate of \$12K would most likely cover the cost of two to three gateways located at Woodside town limits.

There are a number of IoT service providers including the free public service as used by the Adelaide Hills Business Centre called, "The Network Of Things", and specialised paid services such as "SigFox".

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The growth of this emerging technology can not be understated. It is a rapid technology that will become everyday technology, as is the internet and email of today.

To provide further knowledge, assist deployment and product development the Adelaide Hills Business Centre has established a service called Hacksaw.Tech (Cutting Through Technology)

Public WiFi Signage

It is proposed that a number of signs and sign types are created to promote Woodside as a Public WiFi Hotspot township.

- Three roadside signs placed at either end of the Woodside township and main trading area. (Road Grade - Council approval required)
- 20 x A2 Locality sizes placed at sports grounds, information bays, along main street and Woodside North
- 200 x Store front window stickers

Cost & Returns

The proposed Woodside WiFi Hotspot involves capital investment and an ongoing maintenance cost. It is proposed that cost recovery is modelled on advertising by local businesses, community groups, council and external advertisers around tourism.

The following figures are estimates based on adopting the **Community Partner (Hybrid)** model as outlined above.

Cost Items	Once Only (5 Year Life)	Annual Cost	Notes
Domain & Hosting		\$500	
Website landing Page with Directory at WirelessWoodside.org.au	\$6,000		
Control Software System	\$3,000	\$4,500	Subject to usage
Management landing page, events and adverts		\$8,000	
Data collection and analytics		\$1,000	
Hardware (20 Mesh Units)	\$4,000		
Installation of hardware	\$10,000		
Data via local businesses		\$3,000	Rebate for data use

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Main Data via Reseller 100/40 With Performance Guarantee		\$3,000	
WiFi Signage	\$7,000		
Total Cost	\$30,000	\$20,000	

Annual Recovery cost is $(\$30,000 / 5 \text{ years}) + \$20,000 = \$26,000$

Propose that 20 to 30% of the initial setup cost of \$30,000 is via local loans, 20 to 30% from Council and the remaining coming from local businesses and grant funding.

It is important to gain local buy-in to ensure the outcomes of building a stronger local business sector, increased job opportunities, community economic benefits / projects are all achieved.

The following table provides an overview of the potential returns if the program is supported by the local business community and council. Estimated income could be in the order of \$45 to 65k per year. The level of surplus (profit) could be in the order of 50% that could go towards paying the initial setup quick and community projects.

Revenue Areas	Price	Number	Total
Major sponsors - Slash Page and Landing page. (Limited to 3 sponsors)	\$3,000	3	\$9,000
Business Promotions 50/Month	\$50	600	\$30,000
Major event Promotions	\$200	30	\$6,000
Community Groups (Not For Profits)	\$20	100	\$2,000
Community Notice Eg Garage Sales	\$10	200	\$2,000
Council Notice / Support	\$200	10	\$2,000
External Promotions from Tourism Commission, Winter Reds etc	\$200	20	\$4,000
Total Revenue			\$55,000
Annual Recovery Cost			\$26,000
Surplus for Community Development Projects			\$29,000

Proposed Roles

The following are proposed, and not, a commitment.

Woodside Commerce Association / Love Woodside / Lions

- Oversee the management of Community Development Funds as derived from surplus revenues.
- Assistance to gain local business and community involvement.
- The WCA to manage revenue via automated systems using Square / Xero etc to minimise processing to a couple of hours a week
- Maintain landing page content

Adelaide Hills Council

- Community Funding
- Identify access to power and data particularly around sporting grounds

Adelaide Hills Business Centre (Optional)

- Oversee implementation and management of system

Redifi (Or Others)

- Provide Hardware, Installation and configuration.
- Maintain cloud technology to drive sign-in, usage and enable remarketing with emails.
- Process data collection and analytics for public, community and Councils use.
- Branding on engagement emails, splash screen and website shall include branding for key stakeholders.

Updates

UPDATE Dec 2017

Community meeting called to discuss this proposal.

UPDATE Mar 2018

Community meeting called to discuss this proposal.

UPDATE May 2018

Community meeting called to discuss this proposal.

UPDATE Sept 2019

Meeting with Hon Paul Fletcher MP indicated that a community backed public WiFi has merit for part funding via NBN Co.

UPDATE Oct 2019

Discussions with NBN Co. Indicated that gigabit like speed and bandwidth 750/50Mbps via hybrid-fibre coaxial (HFC) could be provided for this project. This would enable greater bandwidth for peak periods at lower overall cost by reducing the number of main street gateways.

UPDATE Dec 2019

As a result of recent bushfires, access to the internet access via Mobile Data was not available for the majority of the residents for some days. As such, contact with family and ability to obtain information regarding support and safe areas was delayed by days and in some cases a couple of weeks. A Public WiFi would have functioned for the majority of this time, enabling local and other hills residents to have access to WiFi and local information.

UPDATE Jan 2020

In addition, IoT deployment can help with early warning to CFS and other emergency service providers in the future, along with local businesses. Infield Fire and Smoke IoT detection units with LoRaWAN communications and local activation of pumps, sprinklers etc could save millions of dollars in assets and produce if implemented via Public IoT / Wifi and local industry / producers.