Australian Government

acma

Australian Communications and Media Authority

Antenna survey report

Summary of the 2022 household TV antenna survey – South Australia

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Executive summary

Background

Household television antenna surveys were conducted in South Australia between March and April 2022 by an external provider under contract to the ACMA. The surveys were conducted in the areas around local repeaters in the Adelaide TV1 licence area. The key objective of this exercise was to identify areas where households point their antennas to the local repeaters instead of the main transmitter. This would give an indication of the number and location of households using the local repeaters for the reception of terrestrial television services, which would potentially be affected by any changes to channel arrangements at those sites.

The survey areas included:

1. Adelaide metro area
2. the Yorke Peninsula
3. the Fleurieu Peninsula including Strathalbyn
4. the Barossa Valley, Gumeracha and Eudunda
5. Murray River communities including Swan Reach, Punyelroo, Nildottie and Mannum.

We determined the general size and location of the survey areas using computer modelling and the 'best server' approach, that is, identifying areas where local repeaters provide better coverage (in terms of the signal strength), compared to the main Adelaide site. Detailed survey planning and implementation considerations were determined by the contractor undertaking the surveys.

The survey results collected a large amount of data and descriptive information about household antenna pointing behaviour, which is presented in detail in this report.

Findings

The survey's findings were broadly consistent with the expected pointing behaviour of household antennas based on our computer-generated predictions.

However, a key observation was that in many of the surveyed areas, households are still relying on coverage from the main high-power Adelaide (Mt Lofty) site, even in some areas where predictions show that the local repeater may provide a stronger signal.

In some cases, antenna pointing direction choices are possibly due to historical reasons, that is, some antennas were installed before the new repeater sites were established.

In areas with known reception issues from the main sites, for example, obstructions by terrain or tall buildings, it was observed that household antennas were pointed towards the local repeater. The household antennas were pointing to local repeaters in suburbs at Victor Harbor, Normanville, Yankalilla, Carrickalinga, Angaston and Punyelroo. In all these areas coverage from the main Adelaide site is obstructed by

terrain to some extent. Overall, in areas closer to local repeaters, an increase in antennas pointing towards local repeaters was observed.

The majority of the antennas observed in this survey pointing to the local repeater were installed at roof height (nominally at 5 m). The antennas pointing to the main Adelaide (Mt Lofty) site were installed at roof height (nominally at 5 m) if there was clear line of site to the site and not too far away from the main transmission site otherwise antennas were installed up to 10 m in height from the ground level.

Detailed description and survey results for the South Australian survey areas are presented in separate sections in this report.

1. Introduction

The ACMA has conducted a survey of households' television (TV) antenna type (VHF and/or UHF), orientation and height in identified areas. The aim of this work is to support the evidence base for the considerations of the potential impact to consumers under different TV channel planning scenarios that may arise from a future restack channel planning exercise to support terrestrial television technology transition.

This work is one component of technical research conducted under the Television Research and Policy Development Program[1]. This work was also foreshadowed in the *Five-year spectrum outlook 2022–27* and 2022-23 work program.

The work program consists of preparatory activities to ready the ACMA to undertake channel replanning activities if required to support possible future government policy decisions that may require replanning of TV channels.

An approach to market for antenna surveys in South Australia was issued to 5 companies on 4 March 2022 with responses closing on 15 March 2022. The contractor engaged was T&M Instruments Pty Ltd.

The surveys in Adelaide and surrounding areas of South Australia commenced in March 2022 and were completed in April 2022. This report provides a summary of the results of the surveys conducted in South Australia.

Purpose and scope

The purpose of this work was to survey households' TV antenna type, orientation and height in identified survey areas.

The aim was to inform a reliable estimation of:

- the number and location of the households in a particular survey area that rely on (point their antenna to) the local TV (repeater) sites versus the main TV site for TV reception
- in the case of areas covered by a single frequency network (SFN), the number and location of households that rely on (point their antenna to) a particular TV transmission site (within a SFN) for TV reception.

The Adelaide TV1 licence area is predominantly served by the high-power main Adelaide VHF transmitter, which is located on the top of Mount Lofty[2]. However, there are lower-power metro repeaters located around Adelaide TV1 licence area, which are used to address local coverage issues.

The survey included areas around local repeaters within the Adelaide TV1 licence area. The sites which were included in the studies are shown in Figure 1. The list of the sites and the corresponding survey areas is shown in Table 1. There are only 2 repeaters in the greater Adelaide metro area and most of the repeaters are scattered around the Adelaide TV1 licence area providing coverage to smaller towns where the coverage from the main Adelaide (Mt Lofty) site may be deficient.

[1] Budget Paper No. 2, 2022-23 (p. 145) included in the Appropriation Bill (No. 3) 2021-22 (p. 61)
[2] Details of broadcasting licence areas are available on the ACMA website.

Figure 1: TV broadcast transmission sites included in the household antenna survey in South Australia (Shaded area is the Adelaide TV1 licence area)

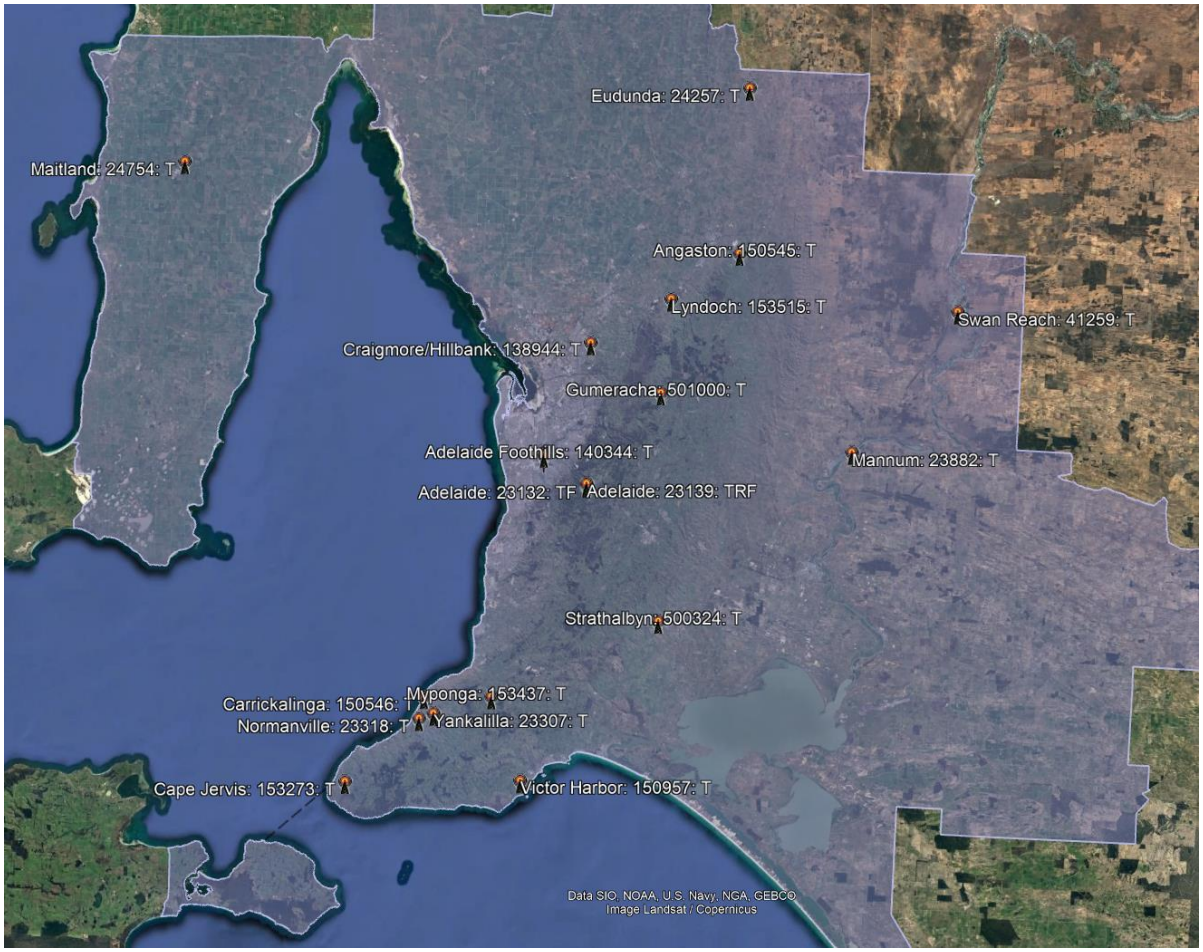


Table 1: List of survey areas in South Australia

Local transmission (repeater) site	TV Block	Surveyed areas
Adelaide Foothills	Block C	Craigmore/Hillbank, Gumeracha, Kersbrook, Wattle Park, Glen Osmond, Panorama/Pasadena, Athelstone
Craigmore/Hillbank	Block C	
Gumeracha	Block E	
Maitland	Block E	Maitland, Arthurton, Balgowan, Point Pearce, Point Victoria
Strathalbyn	Block D	Cape Jervis, Victor Harbor, Encounter Bay, McCracken, Point Elliot, Middleton, Goolwa, Goolwa Beach, Carrickalinga, Normanville, Yankalilla, Myponga, Strathalbyn, Willyaroo
Victor Harbor	Block C	
Myponga	Block D	
Carrickalinga	Block E	
Yankalilla	Block D	
Normanville	Block C	
Cape Jervis	Block D	
Lyndoch	Block C	Lyndoch, Altona, Angaston, Penrice, Eudunda
Angaston	Block C	
Eudunda	Block C	
Swan Reach	Block C	Swan Reach, Punyelroo, Nildottie, Mannum
Mannum	Block D	

Methodology

Surveys were performed by the contractor physically visiting the identified survey areas and visually observing and collecting household antenna information. The data was obtained by observing types (that is, UHF or VHF), height and orientations of antennas across identified survey areas and assessing percentage (proportion) estimates for each antenna type within each survey area. The surveys have been conducted by experienced antenna installers with detailed knowledge about the survey areas.

In addition to the proportion estimates, descriptive information was provided for all survey areas, including general descriptions of the survey areas and any relevant observations, such as:

- the size of the area surveyed
- how representative the area is
- impressions about the direction the antennas were generally pointing
- impressions of whether the households ‘try hard’ to get the reception based on the general antenna heights.

The surveys provided other observations such as:

- the geography of the area (flat, hilly, valley, etc)
- clutter (trees, type of buildings in the area, any other specifics)
- any parts of the surveyed area with arrangements different from the rest of the area
- a general impression about the survey.

All the survey results for each survey area as per Table 1 are presented in the corresponding sections of this report and are compared with the best server computer-based predictions. Best server predictions are plots which show which transmitter provides the strongest signal in an area (that is, they are the best server in that particular area, compared to all other transmitters that could potentially provide the coverage in that area). In addition, the descriptive summary about the general and specific observations are provided for each area under survey results in each section of this report.

The survey findings were based on the external observations only and therefore, no information was obtained about whether the antennas were functional and in use.

2. Adelaide metro area (Craigmore/Hillbank, Gumeracha and Adelaide Foothills repeaters)

Overview

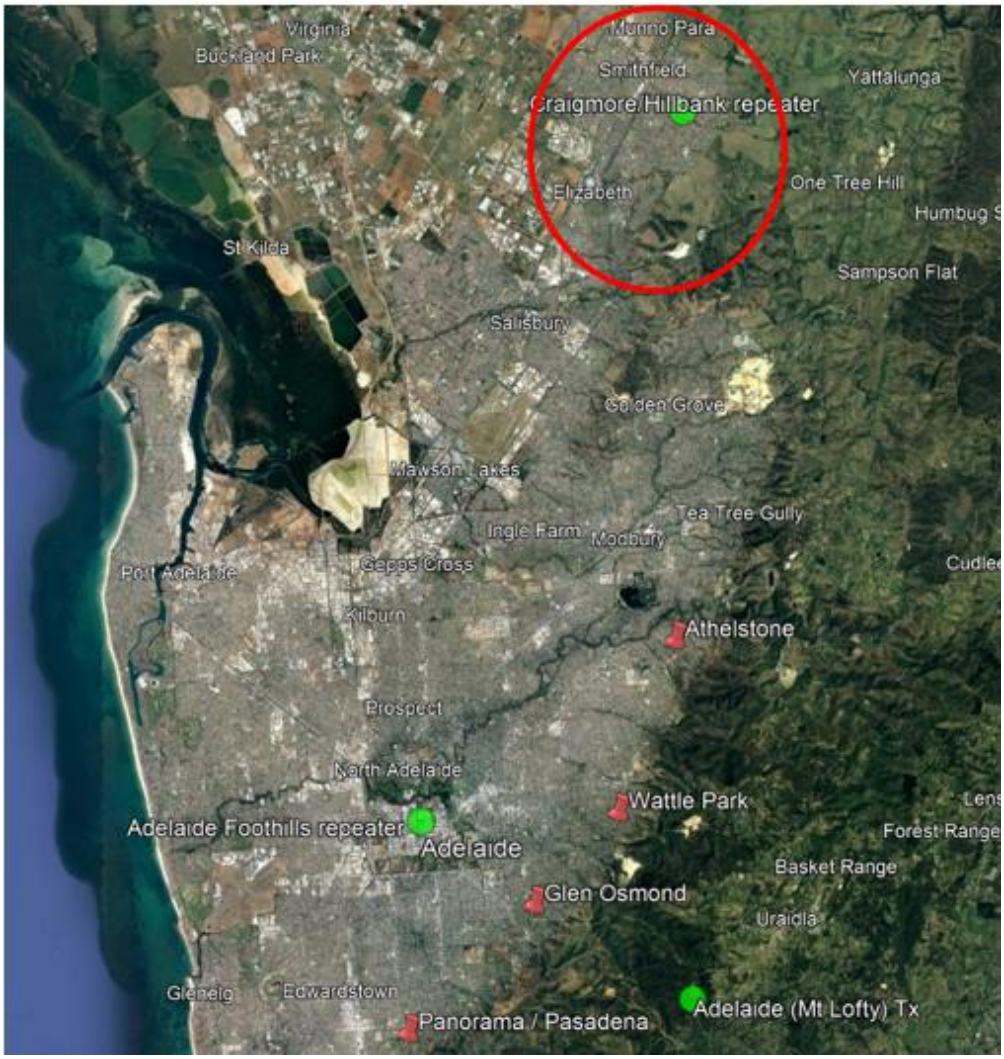
The main Adelaide (Mt Lofty) site (operating in VHF on Block A) is located 11 km to the south-east of the Adelaide CBD and is predicted to provide good coverage in the central Adelaide area. There are 2 repeaters operating in the metro Adelaide area, namely, Adelaide Foothills and Craigmore/Hillbank, both operating on Block C but not in an SFN.

The Adelaide Foothills repeater is located on Grenfell Street in the Adelaide CBD and, as the name indicates, its main purpose is to provide coverage to households in the foothills of Mt Lofty, which are shadowed from the main Adelaide (Mt Lofty) transmitter. As such, the transmission from this repeater is planned on the basis that it will be protected within suburban level coverage against interference from other broadcasting services and only at locations where this repeater provides best coverage (strongest signal). As can be observed from the best coverage plot (Figure 3), there are only a few areas along the Adelaide Foothills where this is the case.

The Craigmore/Hillbank repeater is located on Uley Road in Elizabeth Downs around 31 km to the north of the main Adelaide (Mt Lofty) site and 27 km to the north-east of the Adelaide Foothills repeater. The main purpose of this repeater is to provide coverage in the areas where the coverage from the main Adelaide (Mt Lofty) site may be deficient due to terrain obstructions.

The survey areas around greater Adelaide are shown in Figure 2. The areas were identified using the best server approach, that is, identifying areas where the local repeater provides the strongest signal compared to the main Adelaide (Mt Lofty) site. Both repeaters in this survey area were planned on the basis that they would be protected within suburban level coverage against interference from other broadcasting services.

Figure 2: VHF broadcast site (green dot): Adelaide (Mt Lofty) site; repeaters (green dots): Adelaide Foothills repeater and Craigmore/Hillbank repeater; survey areas (red pins & circle): Athelstone, Wattle Park, Glen Osmond, Panorama/Pasadena and the red circle around Craigmore/Hillbank repeater



Survey results

Survey results for the greater Adelaide area are shown in Figure 3 and are overlayed on the best server plot. The actual percentage breakdowns corresponding to the results in Figure 3 are presented in Figure 4.

Adelaide Foothills area

The suburbs of Pasadena, Panorama, Glen Osmond, Wattle Park and Athelstone are in the foothills of Mt Lofty. The coverage from the main Adelaide (Mt Lofty) site is predicted to be variable and the coverage from the Adelaide Foothills repeater is predicted to be good. It was observed that in Glen Osmond and Wattle Park the majority of the antennas were pointed to the Adelaide Foothills repeater. In Pasadena, Panorama and Athelstone the antennas observed were almost equally split between pointing to the main Adelaide (Mt Lofty) site and the Adelaide Foothills repeater depending on the location of the house.

In the Adelaide Foothills survey area, the majority of the antennas observed were installed at roof height (nominally at 5 m).

Craigmore/Hillbank repeater area

The main Adelaide (Mt Lofty) site coverage is predicted to be deficient in some parts of the Craigmore/Hillbank area due to terrain obstructions and hence the local repeater was established to provide local coverage to the area. A total of 17 suburbs were surveyed in this area. The Main North Road which runs in the centre of this survey area was considered as the centre point and the suburbs were grouped together as the eastern and western sector.

Hillbank, Elizabeth East, Elizabeth Park, Elizabeth Downs, Blakeview and Craigmore were grouped as the Craigmore/Hillbank – Eastern sector. A similar proportion of antennas were observed pointing to the main Adelaide (Mt Lofty) site and the Craigmore/Hillbank repeater. In the northern parts on this survey area more antennas were pointing to the Craigmore/Hillbank repeater than the main Adelaide (Mt Lofty) site.

Antennas observed in this survey area varied in height from roof height (nominally at 5 m) to up to 10 m above the ground level.

Munno Para, Munno Para West, Andrews Farm, Smithfield, Davoren Park, Elizabeth North, Rosewood, Elizabeth, Elizabeth South, Elizabeth Grove and Elizabeth Vale were grouped as the Craigmore/Hillbank – Western sector. A majority (75%) of the antennas observed in this sector was pointing to the main Adelaide (Mt Lofty) site and the remaining (25%) were pointing to the Craigmore/Hillbank repeater.

Many older antennas were observed in this area and a majority of antennas were installed at roof height (nominally at 5 m).

Figure 3: **Survey results overlayed on the coverage predications plot – Adelaide Foothills, Craigmore/Hillbank and Gumeracha repeaters; Coverage prediction background colour code: Yellow – Adelaide (Mt Lofty), Red – Adelaide Foothills and Purple – Craigmore/Hillbank**

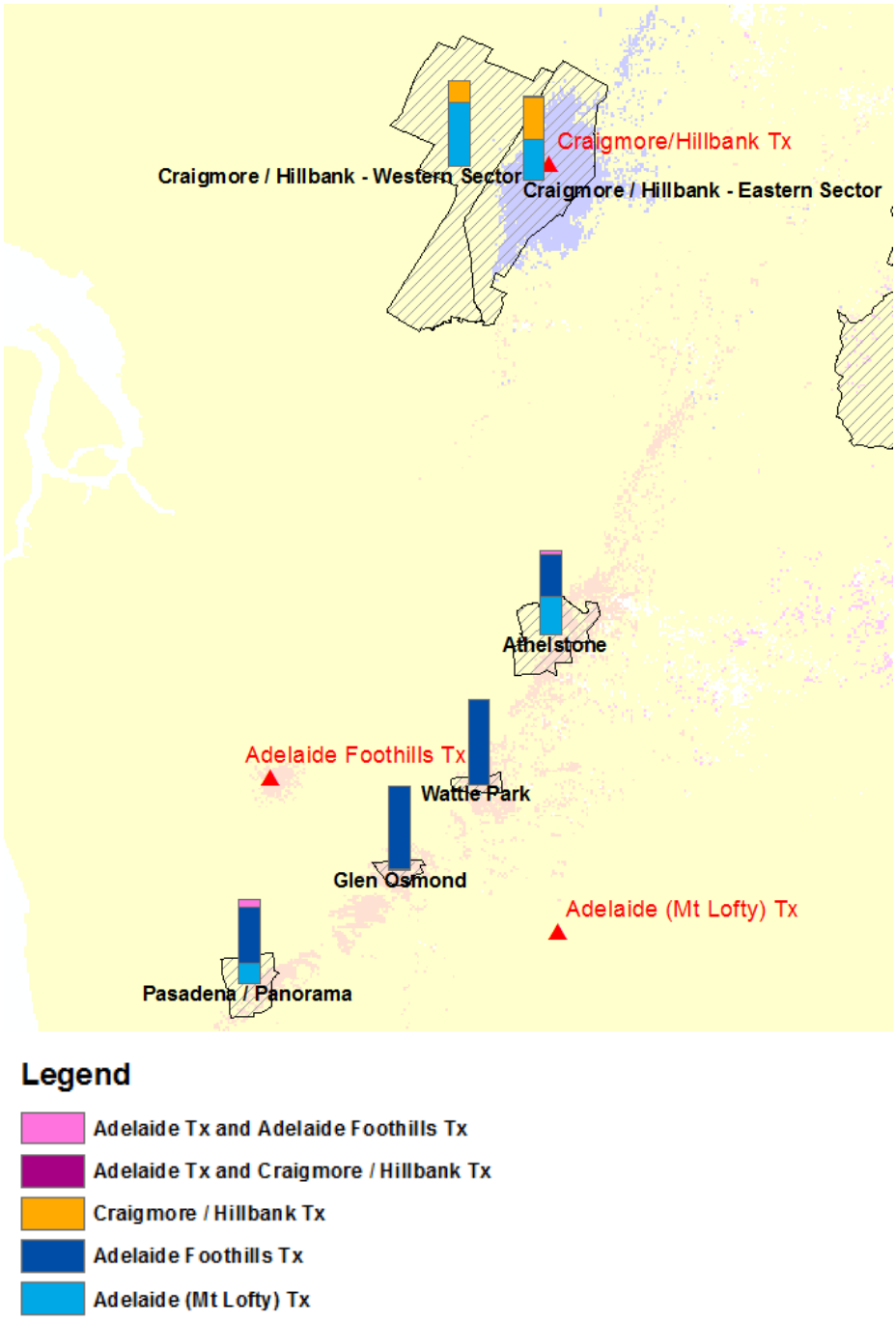
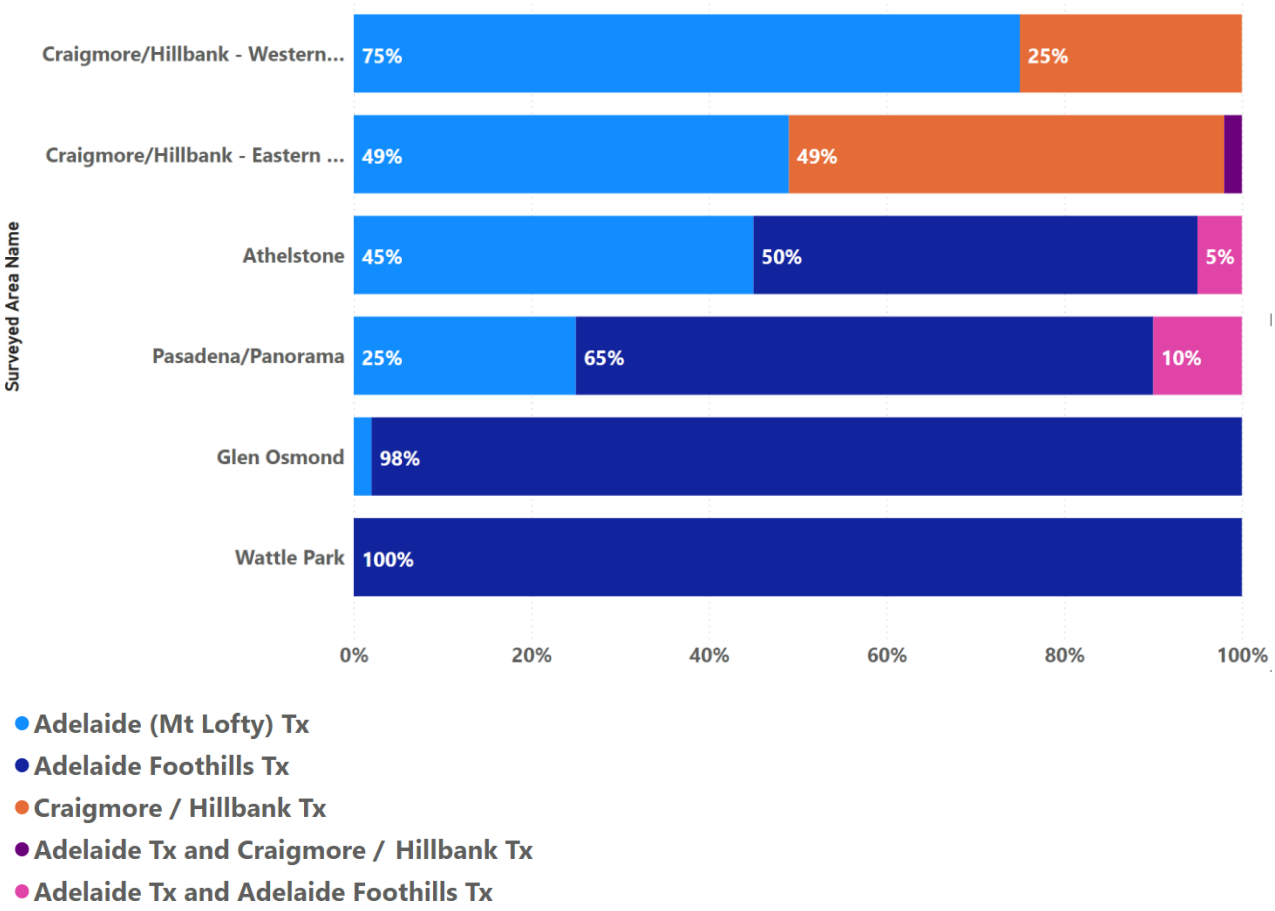


Figure 4: Percentage breakdown for each suburb in the survey area – Adelaide Foothills and Craigmore/Hillbank repeaters



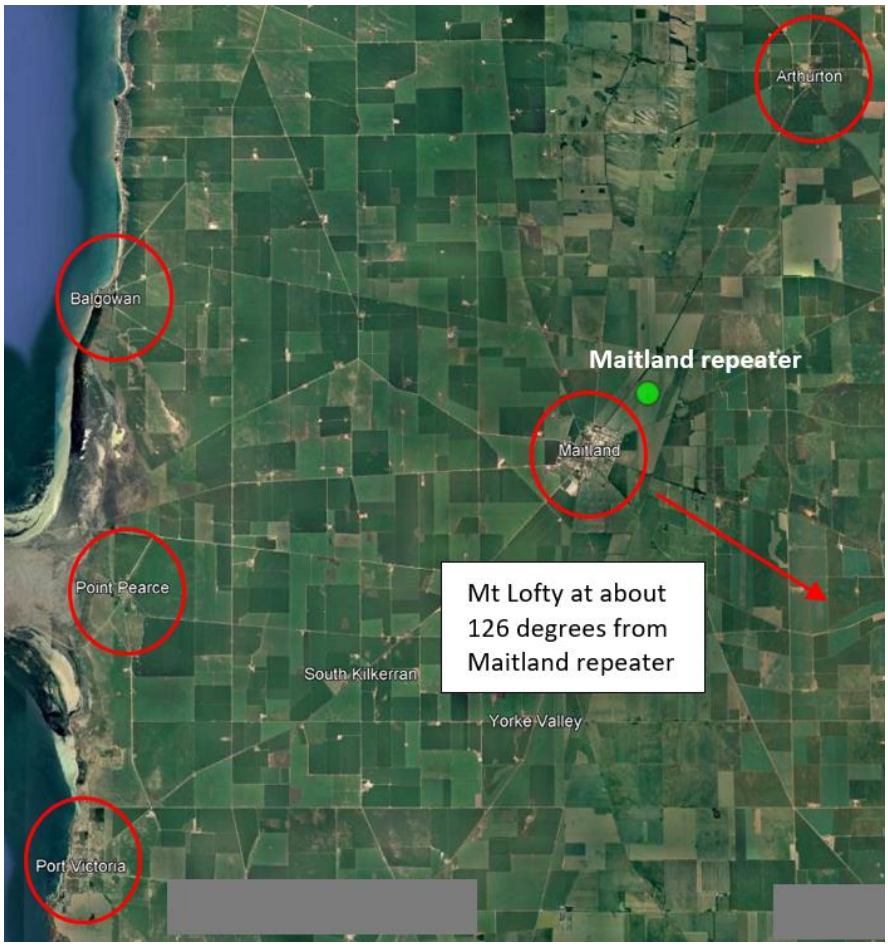
3. Yorke Peninsula area (Maitland repeater)

Overview

The Maitland repeater is located 115 km to the north-west of the main Adelaide (Mt Lofty) site. This repeater was established to provide coverage particularly to communities on the west coast of the Yorke Peninsula where coverage from the main Adelaide (Mt Lofty) site may be deficient due to obstructions caused by terrain.

The survey areas around the Maitland repeater are shown in Figure 5. The areas were identified using the best server approach, that is, identifying areas where the local repeater provides the strongest signal compared to the main Adelaide (Mt Lofty) site. The Maitland repeater was planned on the basis that it would be protected within suburban level coverage against interference from other broadcasting services. A total of 5 suburbs/local areas were surveyed, which include the main town of Maitland, small town of Arthurton and small coastal towns of Balgowan, Point Pearce and Point Victoria, which are located on the west cost of the peninsula.

Figure 5: Repeater (green dot): Maitland repeater; survey areas (red circles): Maitland, Arthurton, Balgowan, Point Pearce and Point Victoria



Survey results

Survey results for the areas around the Maitland repeater are shown in Figure 6 and are overlayed on the best server plot. The actual percentage breakdowns corresponding to the results in Figure 6 are presented in Figure 7.

In Maitland, Arthurton and Port Victoria almost half of the observed antennas were pointing to the main Adelaide (Mt Lofty) site and installed at heights at up to 10 m above the ground level. Many older antenna towers were observed. The remaining antennas were either UHF antennas pointing to the Maitland repeater usually at roof height (nominally at 5 m) or a combined UHF/VHF antenna pointing to both the main Adelaide (Mt Lofty) site and the Maitland repeater.

In Point Pearce, a majority of the observed antennas were pointing to the Maitland repeater and installed at roof height (nominally at 5 m). In Balgowan almost half of the observed antennas were pointing to the regional Cowell transmitter[3] with antennas installed up to 10 m above ground level. The remaining antennas in Balgowan were either pointing to the main Adelaide (Mt Lofty) site or the Maitland repeater.

The survey results are generally consistent with the predictions which showed that coverage from the main Adelaide (Mt Lofty) site is good in some (eastern) parts of Maitland and that rural level coverage is predicted in Arthurton. Along the west cost of the peninsula, the predicted coverage from the main Adelaide (Mt Lofty) site is predicted to be poor. Thus, survey observations in these areas are generally consistent with predictions.

[3] The Cowell transmitter is located on Mt Olinthus around 16 km north-west of the town of Cowell in the Spencer Gulf TV1 licence area. . It is approximately 106 km to the north-west of the Balgowan survey area across the Spencer Gulf.

Figure 6: Survey results overlayed on the coverage predications plot – Maitland repeater. Coverage prediction background colour code: Yellow – Adelaide (Mt Lofty), Grey – Maitland

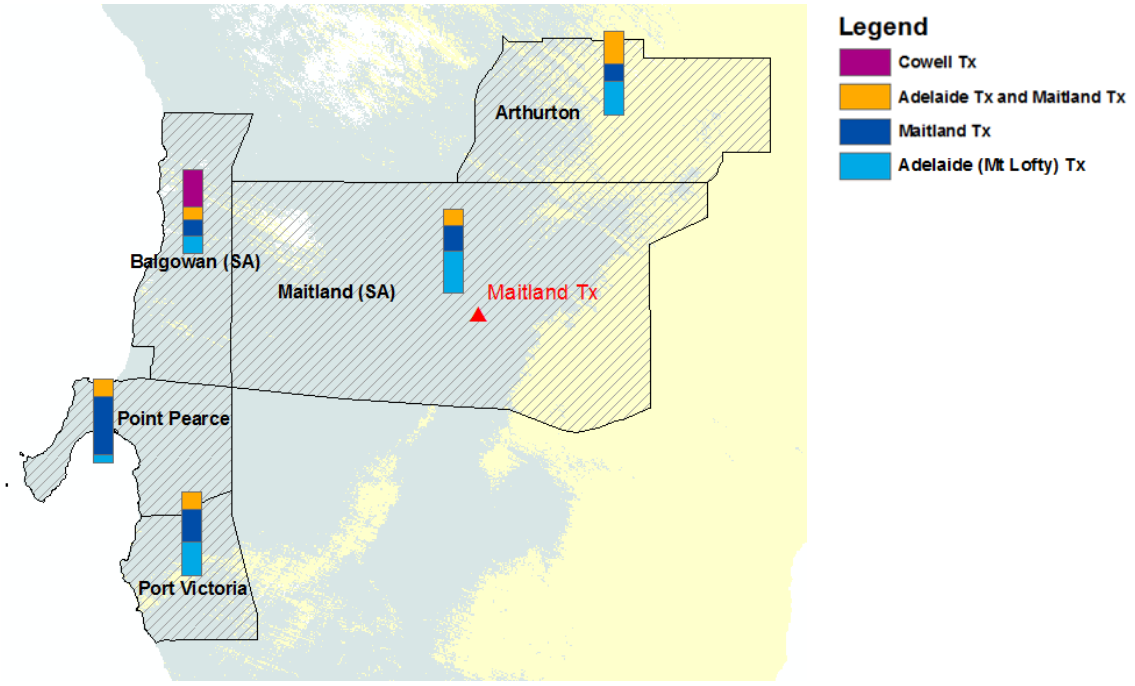
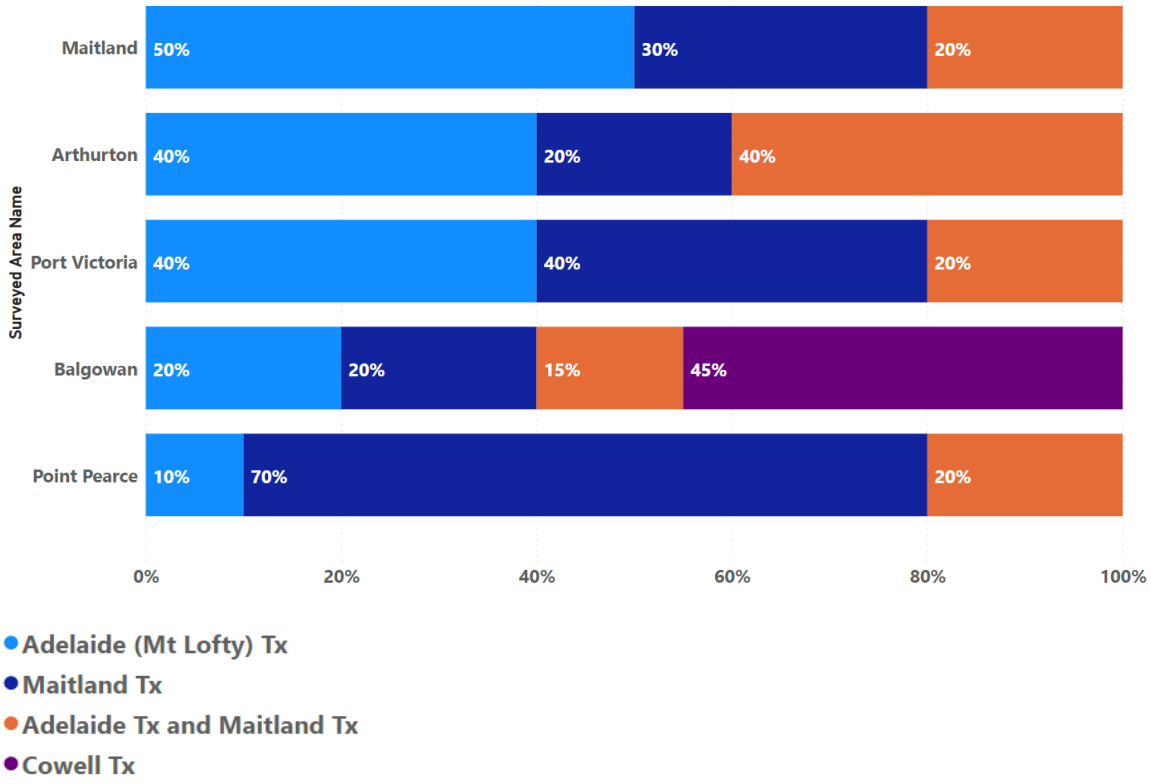


Figure 7: Percentage breakdown for each suburb in the survey area – Maitland



4. Fleurieu Peninsula area (Cape Jervis, Victor Harbor, Yankalilla, Carrickalinga, Normanville, Myponga and Strathalbyn repeaters)

Overview

The Fleurieu Peninsula area is located to the south of the Adelaide CBD. There are 7 repeaters operating around this area.

Strathalbyn is a town located at the north-east of the Fleurieu Peninsula. The survey was conducted in the suburbs of Strathalbyn and Willyaroo. The Strathalbyn repeater is located on Marchants Rd Strathalbyn around 35 km to the south-east of the main Adelaide (Mt Lofty) site and operates on Block D.

Victor Harbor is located along the south coast of the Fleurieu Peninsula and a total of 7 suburbs were surveyed in this area. The Victor Harbor repeater is located on Newland Hill around 5.5 km south-west of Victor Harbor town centre and around 68 km to the south of the main Adelaide (Mt Lofty) site. The Victor Harbor repeater operates on Block C.

Myponga is a small fairly flat town on the lower Fleurieu Peninsula. The Myponga repeater is located on Myponga Hill to the south-east of Myponga township around 4 km from the town centre and around 52 km to the south-south-east of the main Adelaide (Mt Lofty) site. The Myponga repeater operates on Block D.

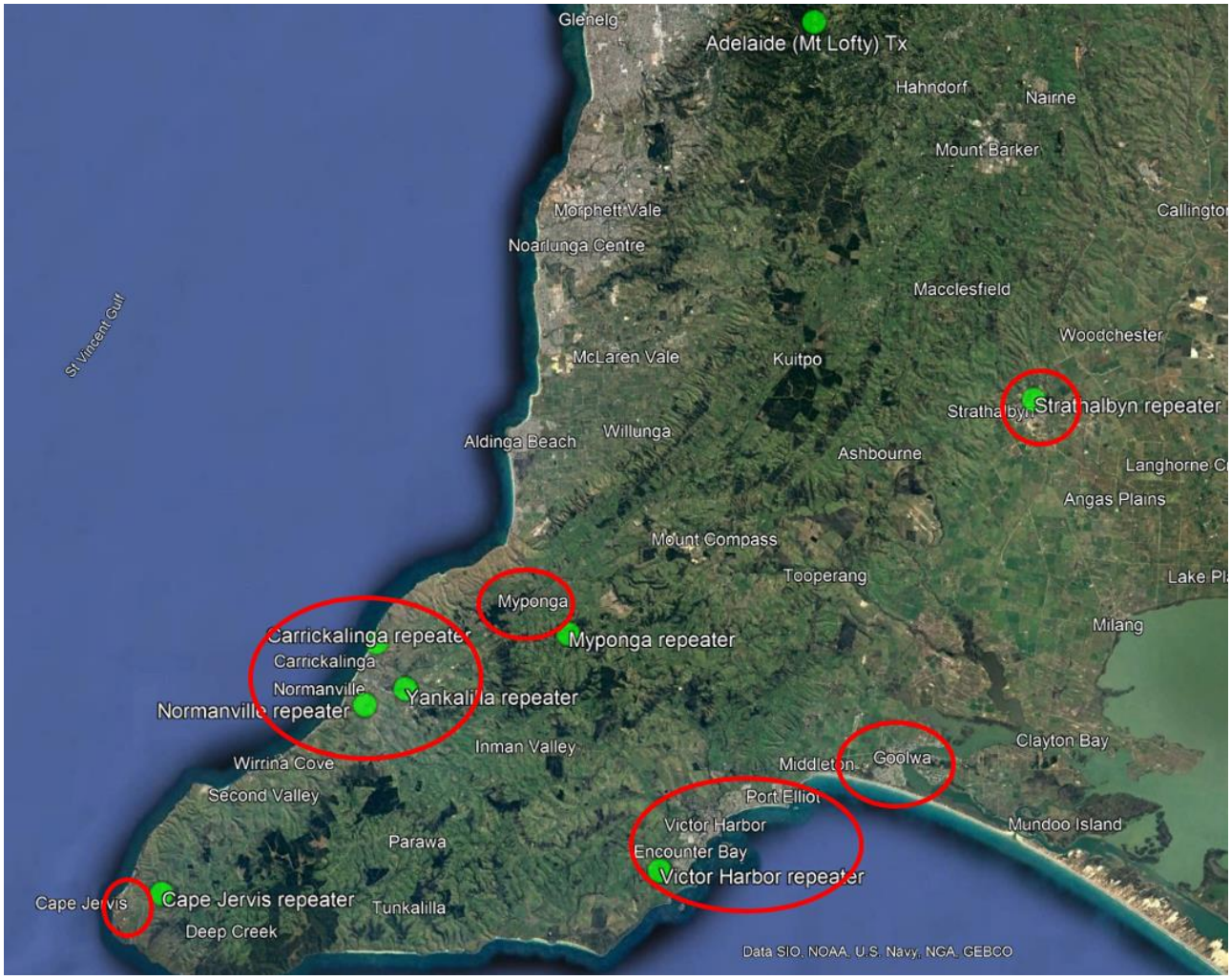
Carrickalinga, Normanville and Yankalilla are 3 towns which are located within very close proximity to each other, and each town is served by one local repeater. The Carrickalinga repeater is located 0.5 km inland from Haycock Point, around 60 km to the south-east of the main Adelaide (Mt Lofty) site and operates on Block E. The Yankalilla repeater is located to the north of Yankalilla township, around 62 km to the south-east of the main Adelaide (Mt Lofty) site and 4.5 km to the south-east of the Carrickalinga repeater. The Yankalilla repeater operates on Block D. The Normanville repeater is located around 65 km to the south-east of the main Adelaide (Mt Lofty) site, 5 km to the south-east of the Carrickalinga repeater and 3.5 km to the east-south-east of the Yankalilla repeater. The Normanville repeater operates on Block C.

Cape Jervis is a small town which is located near the western tip of the Fleurieu Peninsula. The Cape Jervis repeater is located around 3 km from the Cape Jervis town centre and around 86 km to the south-east of the main Adelaide (Mt Lofty) site. The Cape Jervis repeater operates on Block D.

These repeaters were established to provide coverage where the reception from the main Adelaide (Mt Lofty) site may be deficient, primarily due to obstruction by hilly terrain around the Adelaide TV1 licence area. All the repeaters in this survey area were planned on the basis that they would be protected within suburban level coverage against interference from other broadcasting services.

The survey areas around the Fleurieu Peninsula area are shown in Figure 8. The areas were identified using the best server approach, that is, identifying areas where the local repeater provides a stronger signal compared to the main Adelaide (Mt Lofty) transmitter. A total of 14 towns/local areas were surveyed.

Figure 8: VHF broadcast site (green dot): Adelaide (Mt Lofty) site; repeaters (green dots): Strathalbyn repeater, Carrickalinga repeater, Yankalilla repeater, Normanville repeater, Cape Jervis repeater, Victor Harbor repeater and Myponga repeater; survey area (red ovals/circles): Strathalbyn, Carrickalinga, Yankalilla, Normanville, Cape Jervis, Victor Harbor, Encounter Bay, McCracken, Point Elliot, Middleton, Goolwa, Goolwa Beach and Myponga



Survey results

Survey results are shown in Figure 9 and are overlayed on the best server plot. The actual percentage breakdowns corresponding to the results in Figure 9 are presented in Figure 10.

In Strathalbyn and Willyaroo, the majority of the observed antennas were installed at roof height (nominally at 5 m) and pointing towards the main Adelaide (Mt Lofty) site. The coverage predictions for this area showed a varying level of coverage within the area with some parts of the town predicted to have good coverage. The antenna survey observations are consistent with such observations, showing that the majority of the antennas are pointing towards the main Adelaide (Mt Lofty) site.

In Myponga the antennas were mostly installed at roof height (nominally at 5 m) and a similar proportion of antennas were pointing to the main Adelaide (Mt Lofty) site and the local repeater at Myponga. The coverage predictions for the Myponga area showed a varying level of coverage within the area with some, more elevated parts of the town predicted to have good coverage.

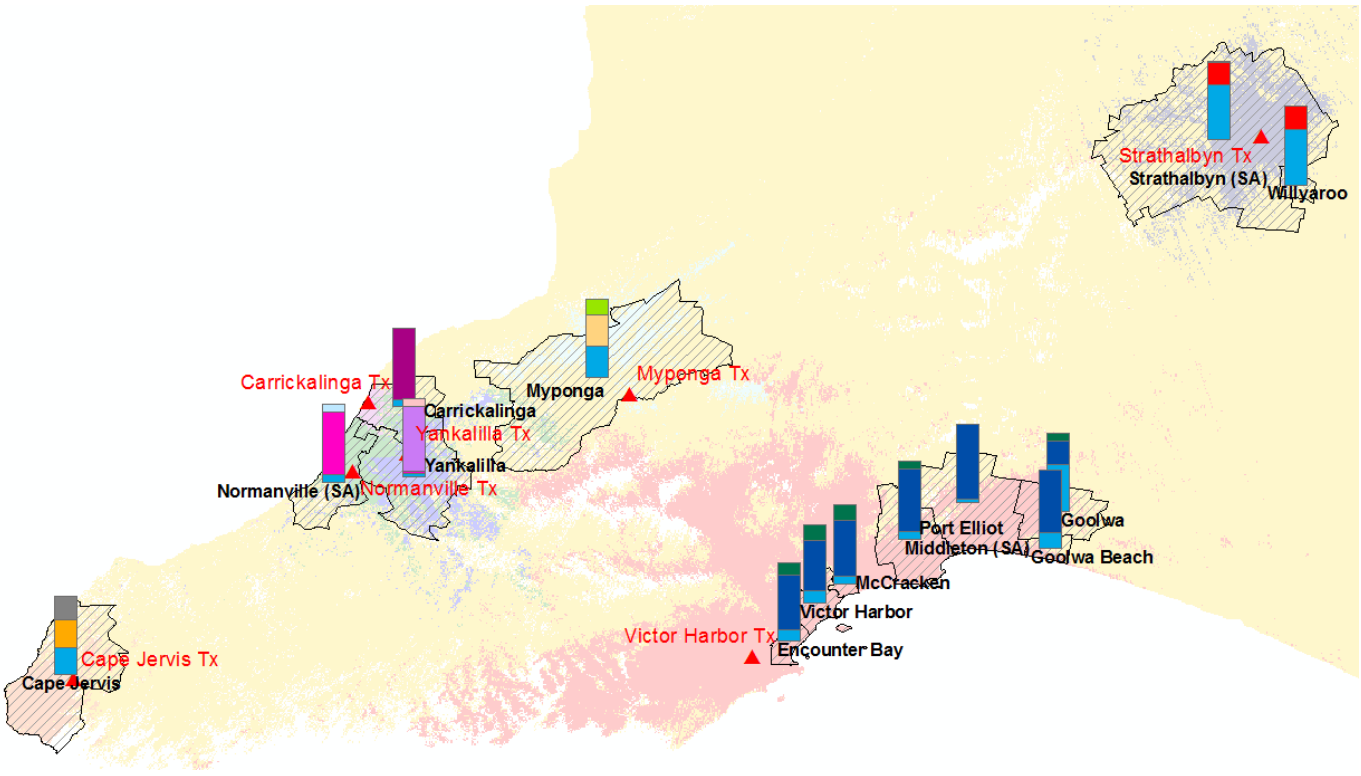
In the townships of Carrickalinga, Normanville, Yankalilla, the majority of the antennas were installed at roof height (nominally at 5 m) and were pointing towards the respective local repeaters in the townships.

In Cape Jervis, a similar proportion of antennas were pointing to the main Adelaide (Mt Lofty) site and the local repeater at Cape Jervis. The majority of the observed antennas were installed at 10 m height above ground level.

A total of 7 suburbs/local areas were surveyed in and around Victor Harbor. In all the 7 survey areas a majority of the antennas observed were pointing to the local Victor Harbor repeater. Most of the antennas pointing to the Victor Harbor repeater were installed at roof height (nominally at 5 m) while some antennas in low lying areas were installed at heights of up to 10 m from ground level. Some older VHF antennas pointing towards the main Adelaide (Mt Lofty) site were installed at heights of up to 10 m from the ground level. Many parts of the surveyed areas around Victor Harbor were predicted to have patchy coverage form the main Adelaide (Mt Lofty) site, and the local repeater predicted to provide significantly better coverage. The survey results are consistent with these predictions.

The observations in the Fleurieu Peninsula regarding household TV antenna orientation and height are generally consistent with what was expected from the coverage predictions from the main Adelaide (Mt lofty) site. In the areas where the coverage from the main Adelaide (Mt Lofty) site is less problematic (for example, Strathalbyn and, to some extent, Myponga), a significant proportion of the antennas were pointing towards the main site (including separate antennas pointing to both main and repeater sites). In other areas where the coverage from the main Adelaide (Mt Lofty) site is patchy (for example, Victor Harbor, Normanville, Carrickalinga, Yankalilla) the observed antennas were mostly pointing towards one of the local repeaters.

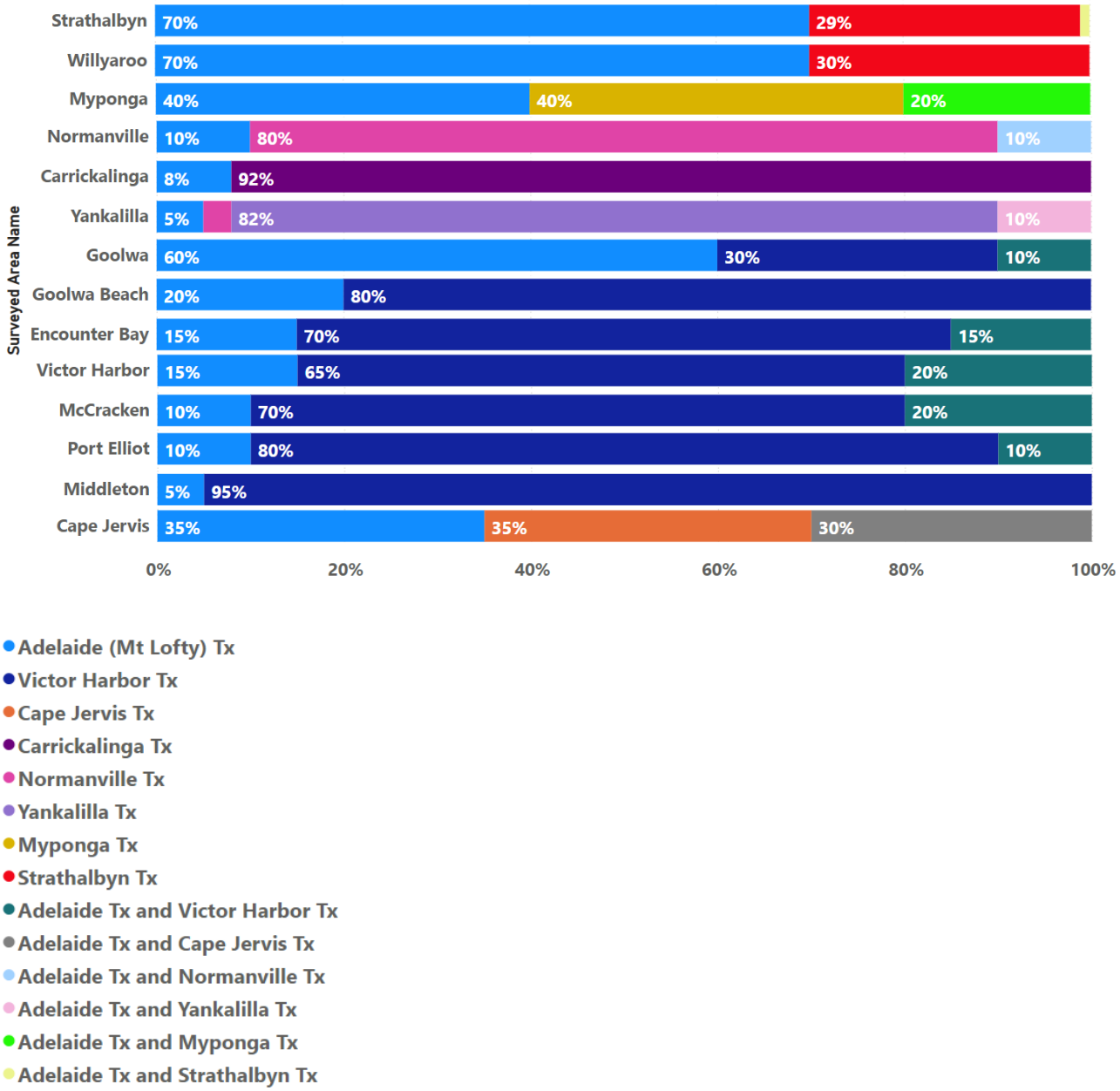
Figure 9: **Survey results overlayed on the coverage predications plot. Coverage prediction background colour code: Yellow – Adelaide (Mt Lofty), Dark blue – Strathalbyn, Red – Victor Harbor, Light blue – Myponga, Purple – Yankalilla, Green – Normanville, Pink – Carrickalinga and Orange – Cape Jervis**



Legend

- Adelaide Tx and Strathalbyn Tx
- Adelaide Tx and Myponga Tx
- Adelaide Tx and Yankalilla Tx
- Adelaide Tx and Normanville Tx
- Adelaide Tx and Cape Jervis Tx
- Adelaide Tx and Victor Harbor Tx
- Strathalbyn Tx
- Myponga Tx
- Yankalilla Tx
- Normanville Tx
- Carrickalinga Tx
- Cape Jervis Tx
- Victor Harbor Tx
- Adelaide (Mt Lofty) Tx

Figure 10: Percentage breakdown for each suburb in the survey area



5. Barossa Valley area (Lyndoch, Angaston, Gumeracha and Eudunda repeaters)

Overview

This survey area is located to the north-east of the Adelaide CBD. There are 4 repeaters operating around this area, as discussed below.

Lyndoch is a town in Barossa Valley located around 45 km north-east of the Adelaide CBD. The Lyndoch repeater is located to the east of Lyndoch township (around 1.5 km from the town centre), around 46 km to the north-east of the main Adelaide (Mt Lofty) site and operates on Block C.

Angaston is a town located on the eastern side of Barossa Valley around 60 km north-east of the Adelaide CBD. The Angaston repeater is located on a hill around 0.8 km east of the Angaston township, around 62 km to the north-east of the main Adelaide (Mt Lofty) site and operates on Block C.

Gumeracha is a small town in Adelaide Hills located around 28 km east of the Adelaide CBD. The Gumeracha repeater is located on Mt Gould around 3.5 km from Gumeracha township, around 26 km to the north-east of the main Adelaide (Mt Lofty) site and operates on Block E.

Eudunda is a small rural town located around 95 km north-north-east of the Adelaide CBD. The Eudunda repeater is located around 1.6 km to the west of the Eudunda township, around 97 km to the north-east of the main Adelaide (Mt Lofty) site and operates on Block C.

These repeaters were established to provide coverage where the reception from the main Adelaide (Mt Lofty) site may be deficient, primarily due to obstructions from local terrain. All the repeaters in this survey area were planned on the basis that they would be protected within suburban level coverage against interference from other broadcasting services.

The survey areas around the Barossa Valley area and the Eudunda repeater are shown in Figure 11. The areas were identified using the best server approach, that is, identifying areas where the local repeater provides the strongest signal compared to the main Adelaide (Mt Lofty) site. A total of 7 suburbs/local areas were surveyed.

Figure 11: Repeaters (green dots): Eudunda repeater, Angaston repeater, Lyndoch repeater, and Gumeracha repeater; survey areas (red circles): Eudunda, Angaston, Lyndoch, Altona, and Gumeracha

Survey results

Survey results for this area are shown in Figure 12 and are overlayed on the best server plot. The actual percentage breakdowns corresponding to the results in Figure 12 are presented in Figure 13.

In Lyndoch a similar proportion of antennas were pointing to the main Adelaide (Mt Lofty) site and the local repeater at Lyndoch and the majority of antennas were installed at roof height (nominally at 5 m). In Altona the majority of antennas were pointing to the main Adelaide (Mt Lofty) site and were installed at roof height (nominally at 5 m). These observations are consistent with the predictions which indicated that parts of Lyndoch and the entire Altona area have good coverage from

the main Adelaide site. However, the town of Lyndoch lies on undulating terrain and lower lying areas could have limited coverage from the main site.

In Angaston all the observed antennas were installed at roof height (nominally at 5 m) and were pointing to the Angaston repeater. In Penrice a similar proportion of antennas were pointing to the main Adelaide (Mt Lofty) site and the local Angaston repeater. The majority were installed at roof height (nominally at 5 m). The houses further away from the Angaston repeater were pointing to the main Adelaide (Mt Lofty) site. The results are consistent with coverage predictions for Angaston which indicated patchy coverage from the main Adelaide (Mt Lofty) site.

In Eudunda a similar proportion of antennas were pointing to the main Adelaide (Mt Lofty) site and the local repeater at Eudunda. The majority of the observed antennas were installed at 10 m height above the ground level. The coverage predictions indicated that coverage from the main Adelaide (Mt Lofty) site is patchy in Eudunda because the town is located just behind a small hill from Mt Lofty causing terrain shielding. The survey observations are generally consistent with the predictions, revealing the majority of households have antennas that point towards the local repeater site, either as a single UHF antenna or together with a VHF antenna pointing towards the main Adelaide (Mt Lofty) site. The observation that the majority of the antennas were at a height of 10 m above ground level could be due to coverage from the main Adelaide (Mt Lofty) site historically being patchy. Therefore, households have elevated their antennas in other to improve their reception.

Coverage from the main Adelaide (Mt Lofty) site is predicted to be deficient in Gumeracha due to the terrain. Hence the Gumeracha repeater was established to provide local coverage to the area. However, during the survey about 50% of households observed had antennas were pointing to the main Adelaide (Mt Lofty) site, 20% were pointing to the local Gumeracha repeater and the final 30% had 2 antennas pointing to both the transmitters. The majority of the observed antennas were installed on masts on roofs up to 10 m in height above ground level. In the neighbouring Kersbrook area, the majority of the antennas were pointing to the main Adelaide (Mt Lofty) site, which is consistent with predictions showing a very good coverage from the main Adelaide site.

Figure 12: Survey results overlayed on the coverage predications plot. Coverage prediction background colour code: Yellow – Adelaide (Mt Lofty), Green – Eudunda, Blue – Angaston, Pink – Lyndoch and Purple – Gumeracha

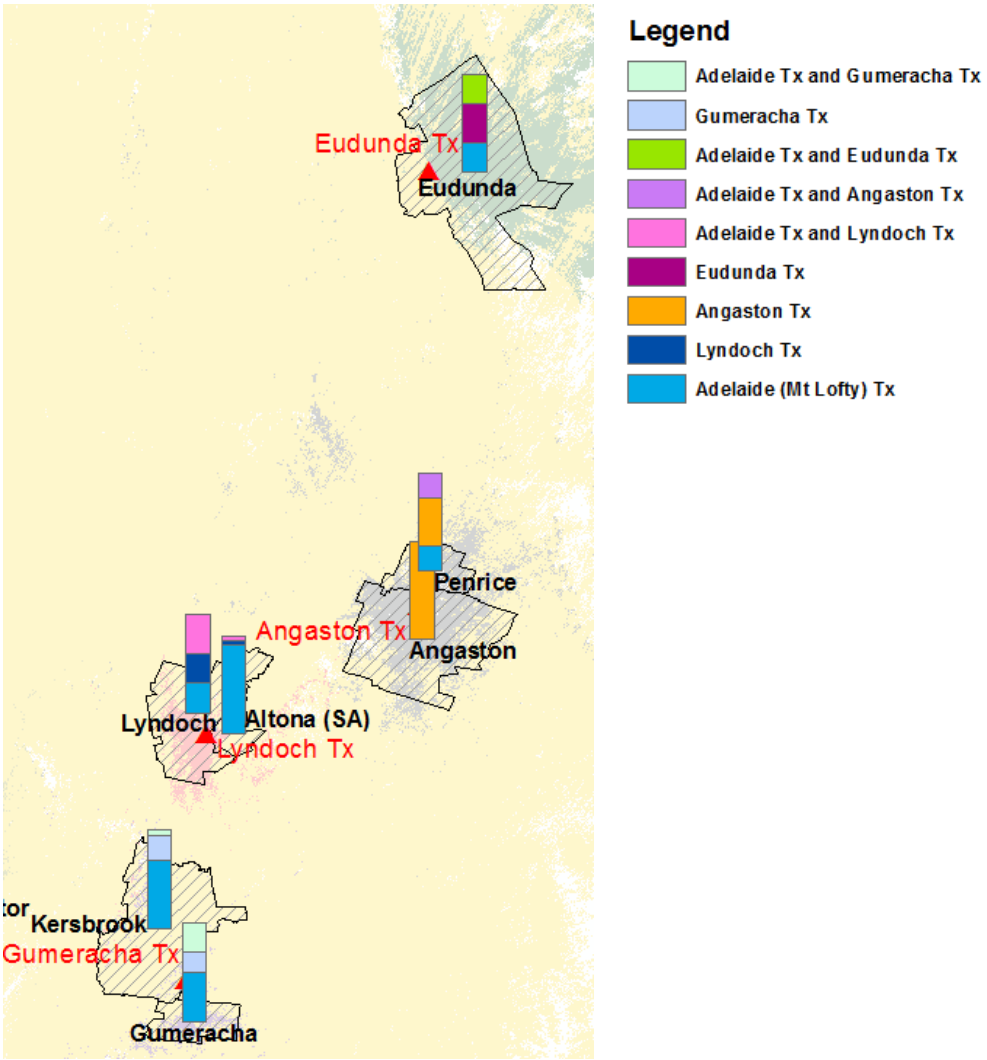
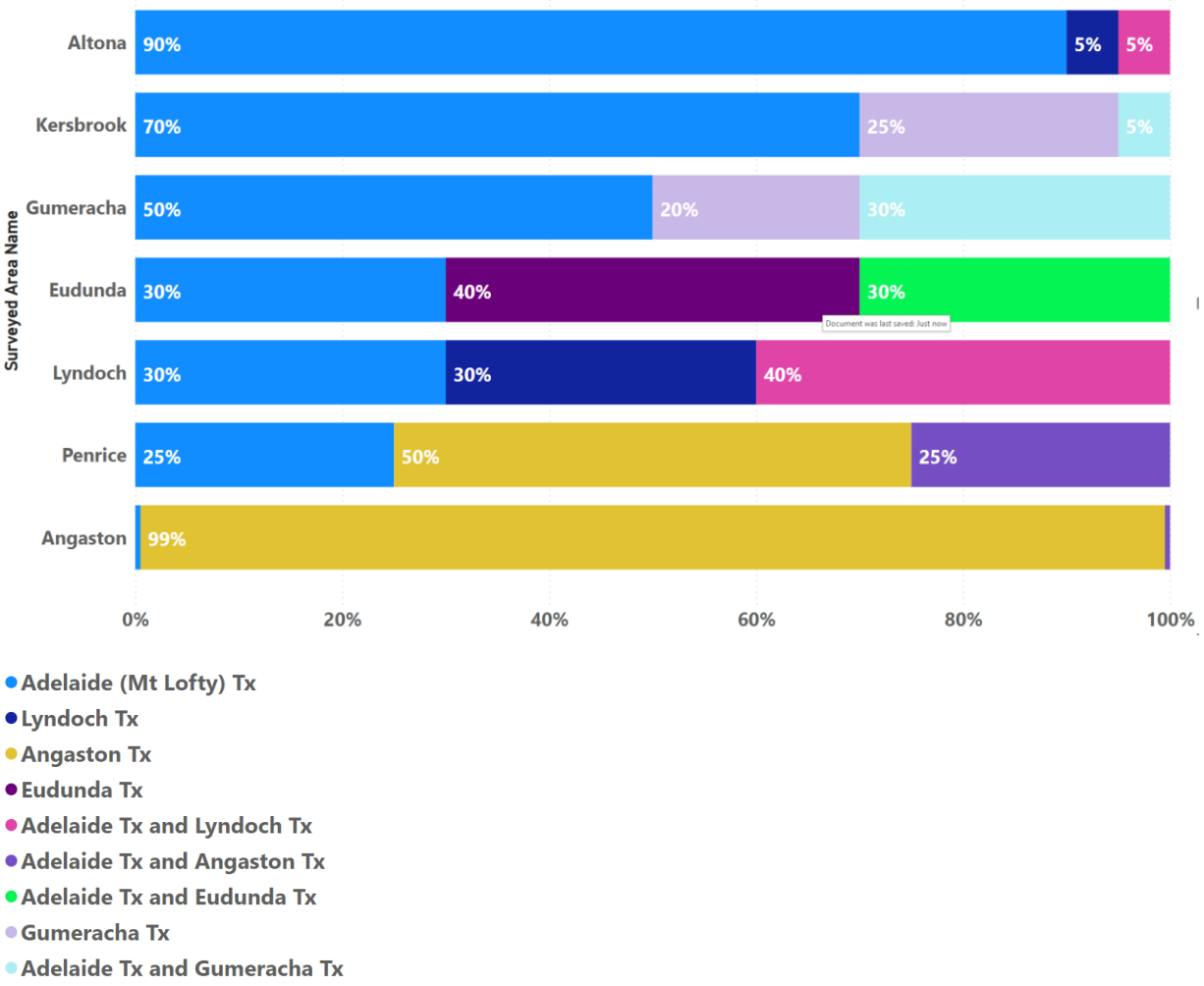


Figure 13: Percentage breakdown for each suburb in the survey area



6. Murray River area (Swan Reach and Mannum repeaters)

Overview

The Murray River area is located to the north-east of the Adelaide CBD. There are 2 repeaters operating around this area, Swan Reach and Mannum.

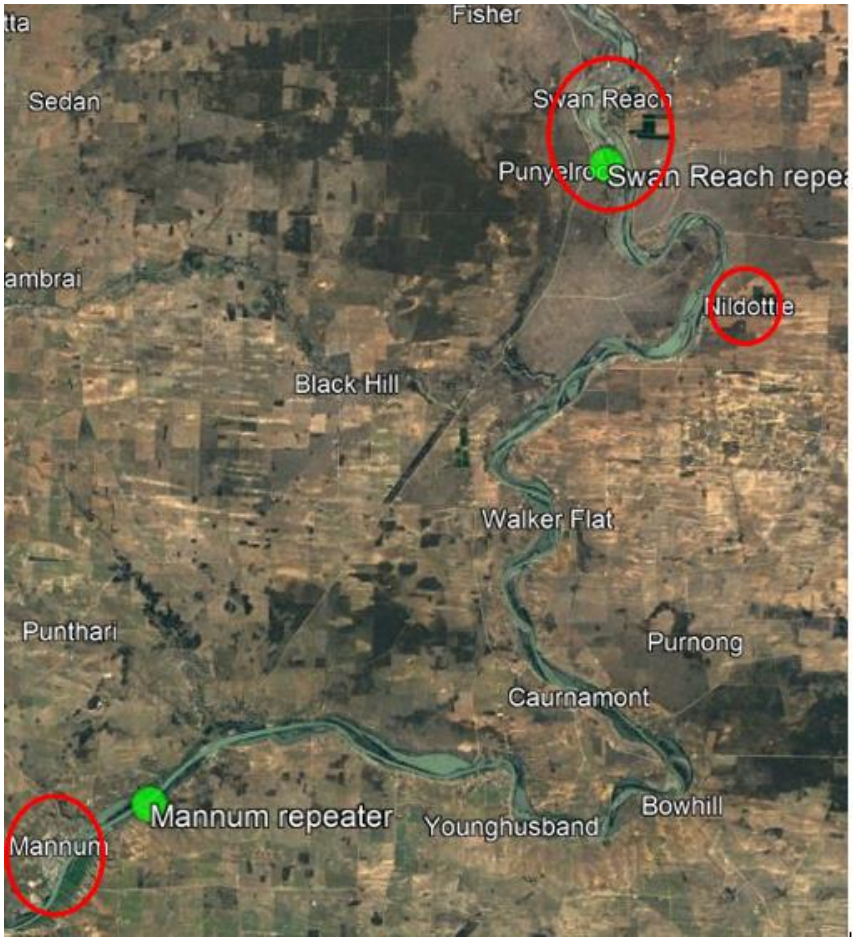
The Swan Reach repeater is located 4 km southeast of Swan Reach in Punyelroo around 91 km to the north-east of the main Adelaide (Mt Lofty) site and operates on Block C. The survey in this area was conducted in the towns of Swan Reach, Punyelroo and Nildottie, which are located on or near the Murray River. These are low lying areas and the predictions showed that the coverage from the main Adelaide (Mt Lofty) site in this area is poor.

Mannum is a town located around 65 km east of Adelaide CBD on the west bank of Murray River. The Mannum repeater is located around 5 km north-east of the Mannum town centre, around 60 km to the north-east of the main Adelaide (Mt Lofty) site and operates on Block D.

These repeaters were established to provide coverage where the reception from the main Adelaide (Mt Lofty) site may be deficient, primarily due to obstruction by local hilly terrain. Both repeaters in this survey area were planned on the basis that they would be protected within suburban level coverage against interference from other broadcasting services.

The survey areas around the Murry River area are shown in Figure 14. The areas were identified using the best server approach, that is, identifying areas where the local repeater provides the strongest signal compared to the main Adelaide (Mt Lofty) site. A total of 4 suburbs/local areas were surveyed.

Figure 14: Repeaters (green dot): Mannum repeater and Swan Reach repeater; survey area (red oval): Mannum, Swan Reach, Punyelroo and Nildottie



Survey results

Survey results for this area are shown in Figure 15 and are overlayed on the best server plot. The actual percentage breakdowns corresponding to the results in Figure 15 are presented in Figure 16.

In Swan Reach the antennas on houses at higher elevation were mostly pointing to the main Adelaide (Mt Lofty) site. The antennas in the remaining parts of the town were either pointing to the Swan Reach repeater or had multiple antennas pointing both to the main Adelaide (Mt Lofty) site and Swan Reach repeater. A similar proportion of antennas were observed installed at roof height (nominally at 5 m) and up to 10 m above ground level.

In Punyelroo the majority of the antennas observed were installed at roof height (nominally at 5 m) and pointing to the Swan Reach repeater. Only a small percentage (around 10%) of houses on the southern part of the town had antennas at up to 10 m in height above ground level and pointing to the main Adelaide (Mt Lofty) site.

In Nildottie the majority of the observed antennas were pointing to the main Adelaide (Mt Lofty) site and were installed at up to 10 m in height above ground level.

In Mannum almost half of the observed antennas were pointing to the main Adelaide (Mt Lofty) site and the remaining antennas were either pointing to the Mannum

repeater or had multiple antennas pointing both to the main Adelaide (Mt Lofty) site and the Mannum repeater. A similar proportion of antennas were observed installed at roof height (nominally at 5 m) and up to 10 m above ground level. These findings are consistent with the predictions, which showed that parts of Mannum could potentially have good coverage from the main Adelaide (Mt Lofty) site.

Figure 15: Survey results overlayed on the coverage predications plot. Coverage prediction background colour code: Yellow – Adelaide (Mt Lofty), Light Blue – Swan Reach and Pink – Mannum

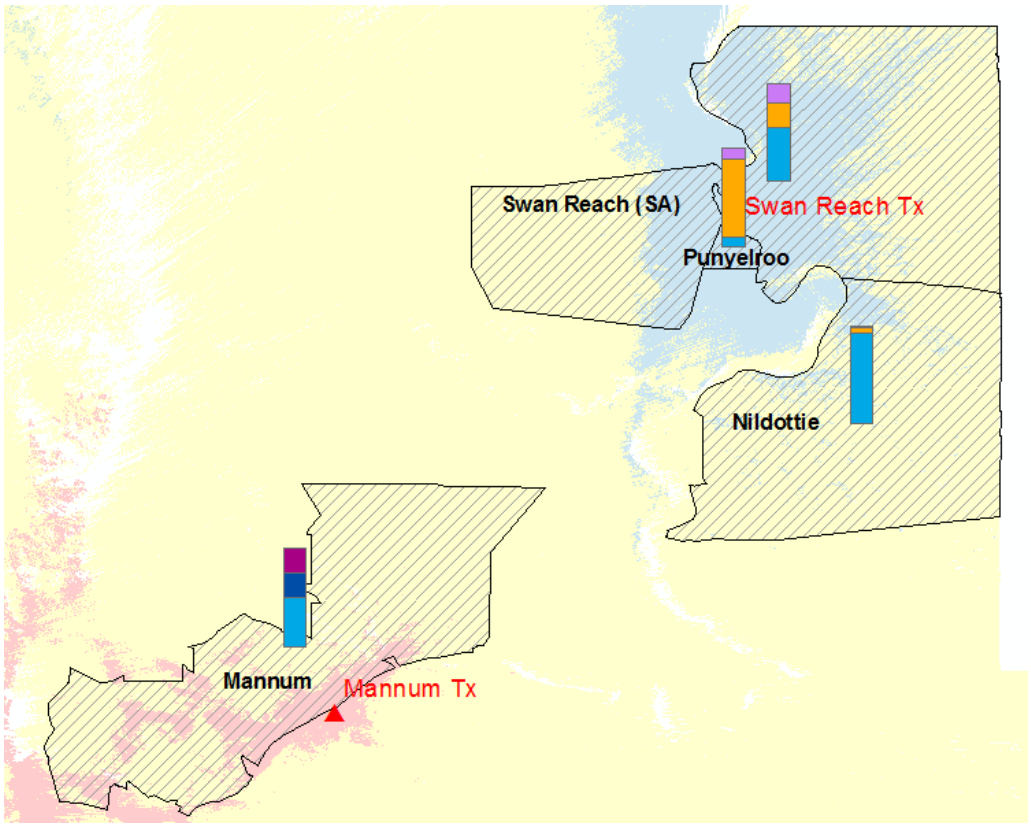


Figure 16: Percentage breakdown for each suburb in the survey area