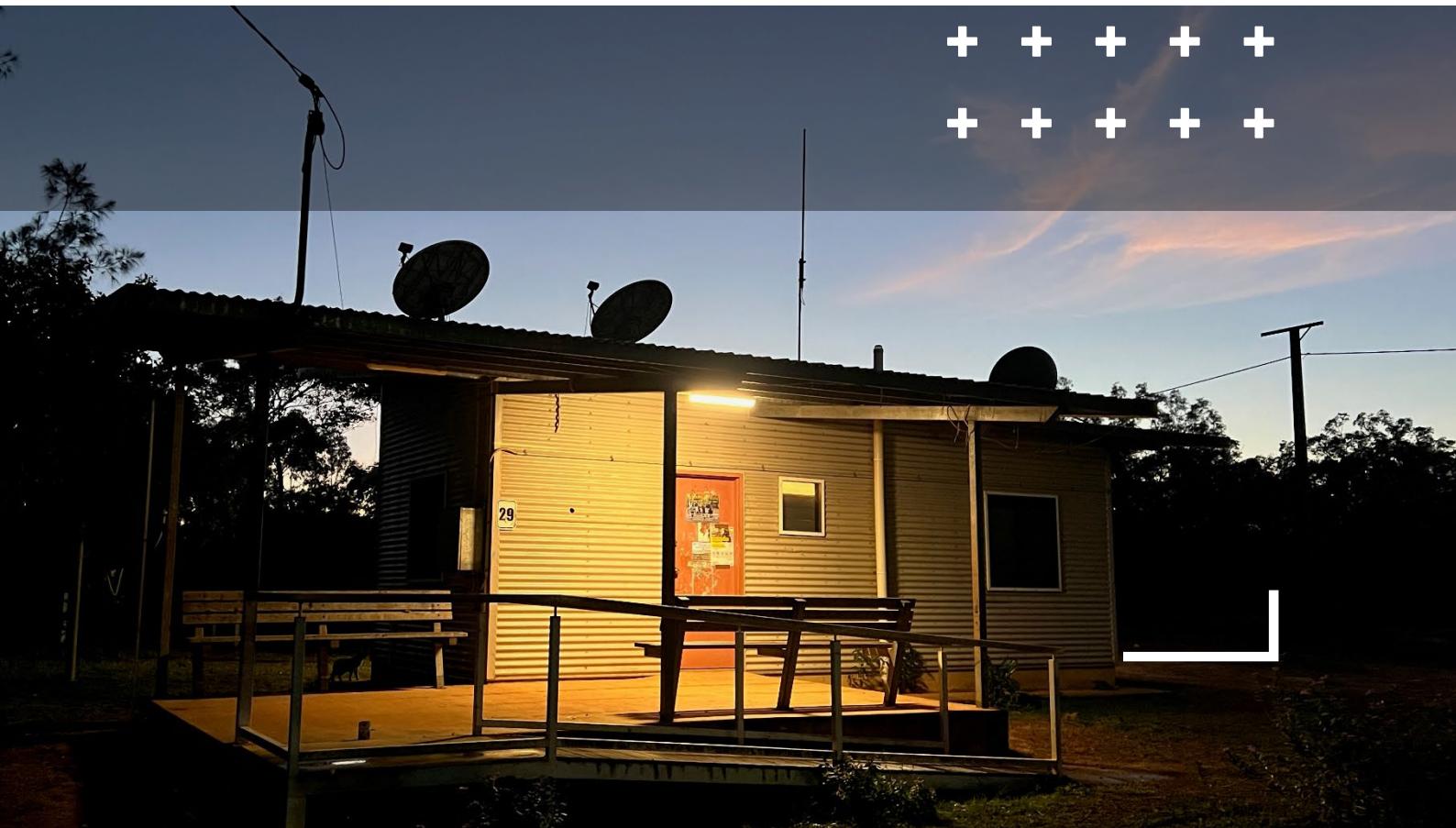
June 2024

MAPPING THE DIGITAL GAP

Measuring Digital Inclusion and Media Use in Remote Aboriginal and Torres Strait Islander Communities 2021-24

Gängan, NT

2023 Community Update Report



Acknowledgement of Country

We respectfully acknowledge the Yolŋu (Dhuwala) people, and pay our respect to their Ancestors and Elders, past and present. We also acknowledge the Traditional Custodians and their Ancestors of the lands and waters across Australia where we work, live and undertake our research.

About the Mapping the Digital Gap Research Project

Mapping the Digital Gap is a 4-year research project working in partnership with local organisations in 12 remote First Nations communities, to generate a detailed account of digital inclusion and uses of digital services including news and media, track changes over time, and inform appropriate local strategies and services enabling informed decision making by remote Aboriginal and Torres Strait Islander people. It is a supplementary project to the Australian Digital inclusion Index, coordinated within the RMIT University node of the Centre of Excellence for Automated Decision Making and Society in partnership with Telstra.

Contact

Dr Daniel Featherstone
Project Lead

E: mtdg@rmit.edu.au
M: 0437 798 076
W: mappingthedigitalgap.com.au

The 'Mapping the Digital Gap' project received funding support from Telstra and the Australian Research Council Centre of Excellence for Automated Decision-Making and Society (CE200100005).

Suggested citation: Featherstone, D, Ormond-Parker, L, Hawkins, L, Thomas, J, Parkinson, S, Kennedy, J, Ganambarr, D (2024) *Mapping the Digital Gap: Gängan NT Community Update Report 2023*. ARC Centre of Excellence for Automated Decision Making and Society: RMIT University, Melbourne. DOI: 10.60836/twfk-9q41

Acknowledgements

We would like to thank the following key contributors to this research:

Community Research Partner
Laynhapuy Homelands Aboriginal Corporation
laynhapuy.com.au

Community Co-Researchers
Djamika Ganambarr, Trina Nunggumajbarr

Research Participants and Stakeholders
Thank you to all the community residents and local agency staff who generously participated in the surveys and interviews, providing the personal experience to make this research meaningful. We conducted 20 surveys with First Nations community residents in 2023 (31 in 2022). During 2022 and 2023 research visits, we undertook 13 interviews with community leaders, residents and the following stakeholder agencies:

- Laynhapuy Homelands Aboriginal Corporation
- Laynhapuy Homelands School
- Laynhapuy Health / Stores
- Yirralka Rangers

Gängan research trips dates
3–9 June 2023; 23–27 May 2022

RMIT University researchers
Dr Daniel Featherstone
Dr Lyndon Ormond-Parker

Design/Research support: Leah Hawkins
Photography: Daniel Featherstone
Copy editing: Lucy Valenta
Cover photo: Gängan clinic, run by Laynhapuy Health

CONTENTS

01. EXECUTIVE SUMMARY

This report outlines updated findings from our second research visit to Gäŋgaŋ Homeland; a remote inland riverside community located in the East Arnhem region of the Northern Territory (NT). Gäŋgaŋ is about 190 km south of the regional centre of Nhulunbuy, 206 km by road to Yirrkala and 900 km to Darwin via the central Arnhem Highway. The traditional owners are the Dhalwaŋu people.

Gäŋgaŋ is one of the largest of the 30 Laynhapuy homelands in East Arnhemland, and one of the first established by the traditional owners during the homelands movement from 1972 to provide a sustainable and independent future for their children on their ancestral country. Like other homelands in the East Arnhem region, Gäŋgaŋ has strong local governance.

Gäŋgaŋ has 13 residential dwellings and a permanent population of about 100 people (82 according to ABS 2021), with all identifying as Yolŋu (Aboriginal people) and speaking Yolŋu Matha dialects, primarily Dhay'yi, with Dhuwal or Dhuwaya dialects also spoken.

Our second research visit to Gäŋgaŋ was undertaken 3–9 June 2023. The RMIT University team worked with community research partner Laynhapuy Homelands Aboriginal Corporation and co-researchers Djamika Ganambarr and Trina Nunggumajbarr. The team had a productive week, undertaking 20 surveys with residents and conducting 6 interviews with agencies and community leaders. We thank all residents and agency staff who participated in the research and made us feel very welcome.

Building on the 2022 Gäŋgaŋ Community Outcomes Report, this Update Report is intended to assist local and regional agencies, leaders and residents to better understand the barriers to digital inclusion, develop local strategies to address these barriers, and support planning and partnerships with government and industry stakeholders.

This report presents research findings to date, compares survey results from 2022 and 2023, outlines changes in communications and media services and usage, and renews the analysis section with 2023 findings and quotes. The proposed Digital Inclusion Plan has been updated based on community input and progress to date, as well as planned activities.

The report also presents 2023 Australian Digital Inclusion Index scores for Gäŋgaŋ relative to national averages and key findings from our first round of visits to 10 remote towns, communities, and homelands in 2022.

This report is part of our commitment to Indigenous data sovereignty, providing data and research findings to the participating communities to use for their own analysis, planning and advocacy. We will publish another update report following the final research visit in 2024.

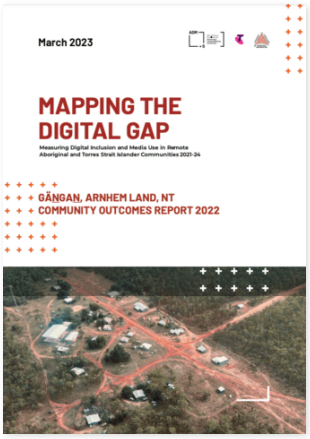
206km
Nearest major regional centre (Yirrkala)

100
Population (Laynhapuy Homelands Aboriginal Corporation, survey data)

100%
Aboriginal and/or Torres Strait Islanders (LHAC survey data)

20
surveys conducted in 2023 (31 in 2022)

6
interviews conducted 2023 (8 in 2022)



Gäŋgaŋ at a Glance

Distance	**926 km**	east of Darwin
Dwellings	**13**	occupied dwellings
	7.8	people per ATSI household
Language	**100%**	ATSI people who speak an Aboriginal language
Income	**$282 / week**	median ATSI personal income (Laynhapuy–Gumatj homelands)

Figure 1: Aerial photo of Gäŋgaŋ community

Key Survey Findings

The figure below provides a summary of 2023 survey results. Please note that there was a lower sample of 20 in 2023 compared to 31 in 2022, with many residents away for funerals at the time of our visit.

ACCESS

85% own or share a mobile phone (87% in 2022)

100% of mobile phone users have pre-paid services (100% in 2022)

100% use the public phone for calls (90% in 2022)

0% use a fixed line phone at home (23% in 2022)

0% Have a nbn Sky Muster service (0% in 2022)

AFFORDABILITY

$115 avg fortnightly prepaid household mobile expenditure ($184 / month in 2022)

$0 avg monthly household expenditure for homes with fixed internet ($0 in 2022)

90% compromise on internet speed or quality due to affordability (71% in 2022)

50% sometimes, often, or always cut back on essential household costs to afford internet (58% in 2022)

DIGITAL ABILITY

95% used the Internet in the past 6 months (regular users) (90% in 2022)

5% never use the internet (10% in 2022)

79% of regular users use online banking (79% in 2022)

53% of regular users use social media to connect with family/ friends (61% in 2022)

37% of regular users can send and receive emails (very or mostly true)

MEDIA USE

40% Listen to Yolŋu Radio daily or weekly; 29% occasionally

0% None of the 13 households have TV services working

45% watch YouTube daily; 20% streaming services

90% get daily news direct and in-person; Facebook 25%

100% get emergency information direct and in-person, Yolŋu Radio 40%

Full 2023 survey results are available in Appendix 1, with comparison to 2022 results. An updated audit of demographics and communications and media services available in Gäŋgaŋ is provided in Appendix 2.

What is Digital Inclusion? How is it measured?

Digital inclusion refers to equitable and reliable access to and use of information and communication technologies for participation in social and economic life.

The Australian Digital Inclusion Index (ADII) is an annual national survey that measures three dimensions of digital inclusion – Access, Affordability and Digital Ability. ADII scores range from 0 to 100. The higher the score, the greater level of digital inclusion. ADII scores are relative, enabling comparisons across demographic groups and geographic areas over time.

The Mapping the Digital Gap project uses an amended version of the ADII survey to collect digital inclusion data. This enables us to compare results for the participating remote communities, towns and homelands with the national results collected by the ADII, and track changes in digital inclusion between and within these sites.

In 2021, Closing the Gap Outcome 17 was introduced for *access to information and services enabling participation in informed decision making regarding their own lives.* Target 17 includes a target of equal levels of digital inclusion for Aboriginal and Torres Strait Islander people by 2026.

Combined with ADII data collection, the Mapping the Digital Gap project is helping to track progress against Target 17 for remote, regional and urban First Nations people for the first time.

DIGITAL INCLUSION

ACCESS

- Reliable access to phone and internet
- Access to IT devices and/or facilities
- Access to trusted media, news and information

AFFORDABILITY

- Affordable phone and internet services
- Affordable devices

DIGITAL ABILITY

- Ability to use digital devices, software and online services
- Awareness of cybersafety, scams, and viruses

ADII First Nations Data Dashboard

The First Nations dashboard on the ADII website provides interactive charts and community-specific results for the ten research sites in 2022. The Mapping the Digital Gap 2023 Outcomes Report provides summary findings across all sites.

View dashboard using the QR code below:

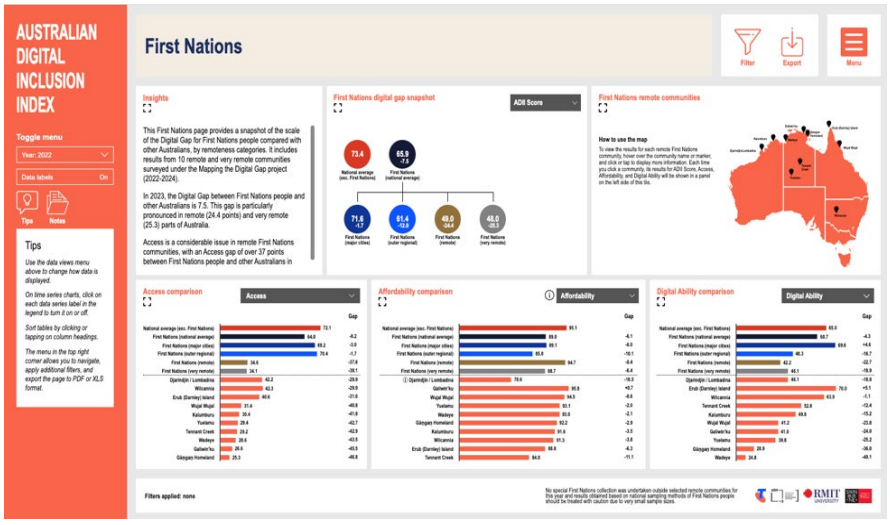


Figure 2: First Nations dashboard on ADII website: digitalinclusionindex.org.au/dashboard/firstnations.aspx

ADII 2023 Report Findings

The 2023 ADII found a digital gap of 7.5 points for First Nations people compared with other Australians. This gap widened substantially for people living in remote (24.4) and very remote Australia (25.3), where contributing factors include limited access to digital infrastructure and services, high internet costs relative to income, climate, geography and cultural context.

Based on our 2022 survey results, the average Australian Digital Inclusion Index (ADII) score for Gängan was 39.0, a gap of 34.2 points below the national average for non-First Nations Australians, and lowest of the 10 research sites.

The key element of this gap was in the Access dimension score of 25.3, which was a huge 46.7 points below the non-First Nations average. There was also a very large gap for Digital Ability (-35.9). The apparent lack of a gap in Affordability (-2.8) is due to large household sizes enlarging household income relative to expenditure. This does not reflect lived reality in Gängan where affordability is a major concern. These gaps vary widely for different demographic groups as detailed below.

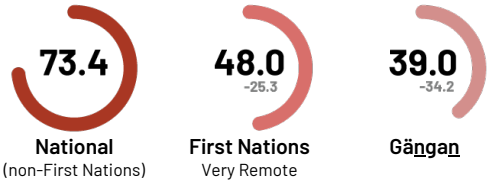


Figure 3: Gängan ADII scores compared to National Average (non-First Nations) and Very Remote First Nations scores, based on 2022 surveys

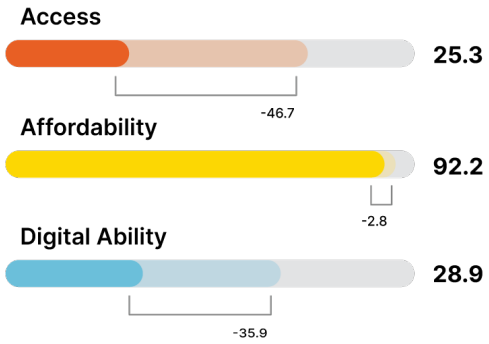


Figure 4: 2023 ADII scores for Gängan, with gap against national non-First Nations averages

Demographic gaps in Gängan

The 2022 survey results found significant variations in digital inclusion between various demographic groups. These results demonstrate that targeted digital support activities would benefit these demographic groups in Gängan. *

Education gap

15.3

Those who did not complete secondary school had an average digital inclusion score of 27.4 compared to 42.7 for those who completed Year 12. The gap was primarily in the area of Digital Ability (2.1 compared to 40.9), with Access also a factor (21.2 compared to 26.2).

Age gap

30.4

Those aged 65–74 had an average digital inclusion score of 18.6, compared with a score of 49.0 for those aged 18–34 years. The gap was primarily due to a zero score Digital Ability for elders (compared with 55.9) and low levels of with Access (2.5 compared with 27.6).

Employment gap

10.8

The average digital inclusion score for people engaged in Community Development Program (CDP) activities was 31.2 compared to 42.0 for those employed (full-time or part-time). The gap was greatest in the areas of Digital Ability (10.0 compared with 30.8) and Access (22.3 compared with 27.4).

Gender gap

3.5

Women had a higher average digital inclusion score than men (40.7 compared with 37.2). This gap was due to significantly higher levels of Digital Ability among women (37.5 compared with 20.1), with Access scores being slightly lower for women (24.5 compared with 26.1),

Disability gap

5.1

People with disability had average digital inclusion scores of 35.0 compared to 40.1 for those without disability. The gap was primarily in the areas of Access (18.0 compared with 27.3) and Digital Ability (27.2 compared with 35.3).

* Note that low sample sizes may play a significant factor in some of these results.

02. INTRODUCTION

The Mapping the Digital Gap project tracks changes in digital inclusion and media and communications use in each research site over three years. This report provides an update from our second visit to Gäŋgaŋ in June 2023, comparing the survey and interview results to our findings from the first visit in May 2022. The report also tracks any progress on the suggested strategies for a local Digital Inclusion Plan and update the plan with any newly identified strategies or activities.

2022 Findings

As outlined on page 7, the ADII score for Gäŋgaŋ was the lowest of the 10 sites we visited in 2022, primarily due to very limited communications access. Gäŋgaŋ community is largely offline, with no mobile service and no internet access in any of the 13 dwellings. Residents rely primarily on the Telstra public phone near the school or, during opening hours, the phone at the shop. A free public Wi-Fi hotspot at the shop, provided by Laynhapuy Health, enables internet access from 2–8 pm during the week, with longer hours on weekends.

Despite the lack of mobile coverage, our survey found high levels of mobile phone ownership and expenditure on pre-paid services. Residents of all ages use mobile phones for internet access and Wi-Fi calling via the free Wi-Fi hotspot or when visiting regional centre Nhulunbuy or large communities such as Gapuwiyak or Yirrkala.

During our 2022 visit, there was no household take-up of Sky Muster satellite services, the only household internet option at the time. The only satellite internet services in Gäŋgaŋ were at the school, clinic and shop, with Sky Muster installed at the ranger base after our visit. The NT Schools' STARS satellite system, installed about ten years earlier, was described as highly congested and slow, but had enabled remote meetings, lessons, and a regional assembly during the 6-week COVID-19 lockdown period in early 2022. The Sky Muster service at the clinic had insufficient speed or reliability to operate the high-end telehealth equipment installed in the clinic, but enabled basic telehealth via Facetime on mobile phones. Similarly, visiting health staff used an offline version of the Communicare patient records database rather than the cloud-based version.

In an effort to develop a fit-for purpose satellite broadband solution for homelands without mobile services, the NT Government (NTG) developed the Telecommunications in Remote Aboriginal Communities (TRAC) project for four small remote communities (Gäŋgaŋ and Wandawuy in the Laynhapuy homelands and Arawerr and Mungkarta in the Barkly region). Regional Connectivity Program (RCP) co-investment was approved in 2021. Field Solutions Group was to deliver the project, involving installing a Wi-Fi mesh network direct to each household with a pay-as-you-go system for data use.[1] The community were eagerly awaiting the service during our visit and outlined their preferences as to how it would operate (outlined as a Case Study in our 2022 report, updated in Section 5 of this report). This included a request for content filtering, a nightly curfew on internet access and local switch-off capability.

> "It's crucial that Yolŋu that live out here have access to all the things that other people in town have access to. They really need access to internet banking, news, reporting to Centrelink and all those things. But it has to be done in a really careful way, because there's potential for ... having a negative impact upon the way of life out here, which ... is really special, and that's why they live here, and it's crucial that we maintain that."
>
> - Rachel Godley, LHAC Youth Program Manager, 2022

[1] https://www.infrastructure.gov.au/department/media/publications/round-1-regional-connectivity-program-funded-projects.

Other projects were being planned to address ongoing issues with broadband availability and reliability across the East Arnhem region, including an upgrade of the the Arnhem Fibre Network from Jabiru to Nhulunbuy (planned for completion in 2023). NTG also commissioned a Remote Small Cells Program[2] with Telstra to provide 4G micro-cell mobile services in 20 small communities using low earth orbit (LEO) satellite backhaul by OneWeb. Three potential sites were in the Laynhapuy homelands (Birany Birany, Donydji, Garrthalala), with site selection consultation underway. This project is yet to be completed.

Figure 5: Research team in 2022: Co-researcher Djamika Ganambarr, Lyndon Ormond-Parker, Co-researcher Guruwuy Ganambarr, senior ranger Yinimala Gumana, and Daniel Featherstone

Our survey found that Gängan residents have low levels of digital ability, with an average ADII score of 28.9, 36.0 points below the national average. This is primarily due to having very limited internet access, and being mobile-only users. Digital literacy tends to be lowest among people over 50 years of age, people with disability, and those with limited English literacy.

However, our survey found that most respondents had used the internet in the last three months (90%), with primary usage being for internet banking, social media, online entertainment and games. With little digital support currently available in Gängan, there is demand for community access computers and mentor support to help use online services, select mobile devices and plans, activate SIM cards, develop digital skills and build awareness of scams and cyber-safety issues. There was also demand for workplace digital skills training.

> **"I would like to learn more about computer. But at the moment we don't have an office to sit down and work. Without having a computer in this community [we can't prepare for the broadband coming] here at Gängan."**
>
> - **Billy Gumana, LHAC Board Director / traditional owner, 2022**

With the average personal income in Gängan being only $287 per week (ABS 2021) and with high costs for food, fuel and other household needs, affordability is a major issue. Our survey found households spent an average $184 / month for pre-paid mobile, despite only having mobile access at external sites. A critical element of a broadband solution is that data costs be affordable in order to avoid 'digital poverty'.

> **"Having access to communication now is pretty much tied to your standard of living ... I think people just expect it now."**
>
> - **Kerry Legge, LHAC CEO, 2022**

We also found that Gängan residents had very limited access to news or information, with the only freely available media being the popular Yolŋu Radio service, delivered primarily in Yolŋu Matha language. None of the 13 households had VAST direct-to-home satellite television services working. Residents currently have very limited access to news, information and entertainment, with young people using Wi-Fi to access streaming

[2] Source: https://dcdd.nt.gov.au/news/2022/remote-nt-communities-to-have-new-mobile-phone-service#:~:text=RESC%20programs%20target%20remote%20communities,by%20the%20end%20of%202023.

services and games online. There were calls for VAST TV services to be replaced. This lack of offline news and entertainment services is likely to place high data demand on a future broadband solution, as it will quickly become the primary source of these services.

2023 Findings

When we returned in 2023, we found that there had been no progress on the broadband solution planned for Gängan and the other three sites, with disappointment among residents about the lack of communications about the project. We consequently heard that the project was not going ahead after efforts by Field Solutions Group to vary the scope of the RCP funding.

More recently, in 2024, nbn received Australian Government funding to install Wi-Fi mesh networks in 20 remote First Nations communities, and have begun discussions with Laynhapuy Homelands AC and Gängan community residents about potential inclusion as one of the sites.

Otherwise, we found there had been very little change in the level of access to communications services, with the public phone and public Wi-Fi still the primary means of access. There was still no household uptake of satellite broadband, no residential phone or computer access, and no TV services working. The only change in broadband access among the service providers was that Laynhapuy Health had installed a Starlink dish on the Gängan shop to improve reliability for EFTPOS and online ordering. However, this was not being used for public Wi-Fi access due to limitations in configuring a separate shared-use network.

Figure 6: Traditional owner Marrpalawuy Marika using phone

Our survey found only minor changes since 2022, although the number of respondents who had used the internet in the last six months had increased slightly from 90% to 95%. Usage of online government services such as myGov and Centrelink had increased from 54% to 63%, however other usage, including online shopping, online learning and social media use, had reduced since 2022. Affordability challenges had also increased, with our survey finding average expenditure on prepaid mobile data had increased from $184/month to $115/fortnight ($230/month).

All service providers working in the region, including Laynhapuy Homelands AC and its health service Laynhapuy Health, and Laynhapuy School, reported challenges in delivering services and communicating with clients because of limited connectivity options in Gängan and other homelands. The lack of access to online services and IT support impacts on Centrelink reporting, banking services, NAPLAN tests, justice matters and more. While there is caution about potential disruption to the peace and cultural governance within homelands by introducing mobile services which cannot be switched off, there is demand by agencies and residents for appropriate and reliable broadband access, including within households for emergency communications.

Nevertheless, there were clear calls for a change management plan to align with introduction of services to ensure awareness and preparation by homelands and to limit negative impacts. We heard significant discussion about risks witnessed in other locations, including cyber-safety issues, scams and children staying up at night and not attending school. There were calls for more on-site training and support to improve digital inclusion, however more work is needed to source funding and determine appropriate delivery models.

Updates to Proposed Digital Inclusion Plan

Telecommunications in remote communities relies on finding telco providers who will deliver services that meet community needs. Due to the remote locations and small populations, these projects typically require external funding from federal, state and/or local governments, with decisions and timeframes often determined by funding programs and industry players. This can leave residents and agencies feeling disempowered, with limited input to ensure the technology and services are fit for purpose.

The proposed digital inclusion plan in Section 6 is intended as a tool to assist communities to determine and communicate local needs and priorities. This updated plan builds upon the proposed digital inclusion plan in the 2022 Community Outcomes Report, including new strategies proposed by residents and stakeholders during our 2023 visit, as well as a summary of progress to date and planned activities for each item listed.

We recognise the challenges in implementing a local digital inclusion plan, with multiple agencies involved in delivering media, communications and digital programs. However the Laynhapuy Homelands have collectively advocated for improved services over several years. This draft plan is intended to support planning and advocacy for improved media and communication services and digital inclusion activities in Gäṉgaṉ. As part of our ongoing research work with Gäṉgaṉ in 2024, the Mapping the Digital Gap team can assist with further development of this plan.

> "We want to be [connected] because Gängan is part of the Northern Territory and also part of Australia. [We want] to be able to communicate with other friends, to be able to see that our children can do the things that they want to do. And that's why it's important for this research to come and sit with us and we can learn from each other."
>
> - Marrpalawuy Marika, Gängan traditional owner, 2023

Figure 7: Research team in Gäṉgaṉ: left to right – Lyndon Ormond-Parker, Laynhapuy Homelands AC CEO Kerry Legge, traditional owner Marrpalawuy Marika, co-researcher Djamika Ganambarr, and Daniel Featherstone

03. MEDIA & COMMUNICATIONS IN GÄNGAN

Existing Telecommunications Services

Backhaul to community
Gängan currently only has telephony backhaul via the Higher Capacity Radio Concentrator (HCRC) microwave network. All internet services are delivered via satellite.

Landlines
There is a basic copper network providing phone services only (not ADSL) to the public phone, school, clinic, visiting officers quarters, and community shop, with limited residential access.

Mobile coverage
There is no mobile coverage in Gängan. The nearest service is available in Gapuwiyak, 75 km north.

Mobile phones and recharge sales
The Gängan shop does not stock mobile phones or Telstra recharge vouchers. Residents can only purchase these online or in Nhulunbuy or large communities such as Gapuwiyak.

Public phones
There are two free-to-use public phones in Gängan. The Telstra public phone is located near the school, and Gängan shop has a public-use phone during opening hours.

Wi-Fi services
There is a free public Wi-Fi hotspot available at Gängan shop from 2–8 pm during the week, with longer hours on weekends.

nbn services
Under nbn zoning, all East Arnhem communities and homelands, outside of Nhulunbuy, are zoned as satellite delivery only (Note: Yirrkala had nbn fixed line services installed in 2023). In Gängan, the clinic, shop and ranger base have Sky Muster satellite services, but no households.

Starlink services
Laynhapuy Health had recently installed a Starlink service at the Gängan shop in 2023, with plans to upgrade all shops and clinics across the region to Starlink in the future. There were no residential Starlink services.

Telemetry
There is no known use of telemetry on the generator, electricity grid or water supply facilities in Gängan.

HF / UHF Radio
Yirralka Rangers use UHF radios for communication between rangers and vehicles while undertaking land management work. VHF is used by aircraft and emergency services including Royal Flying Doctor Service. We did not identify any other use use of VHF or UHF radio by other service providers in the region.

Media Services

Radio services
Yolŋu Radio is the only radio service available in Gäŋgaŋ.

TV services
Free-to-air television services are only available via Viewer Access Satellite Television (VAST) direct-to-home equipment. However, none of the 13 Gäŋgaŋ households had VAST services working.

Newspaper
There are no newspapers available in Gäŋgaŋ.

Local and regional news
Being a small homeland, local news about upcoming events, meetings, and visiting agencies is primarily shared via word of mouth, the noticeboard at the Gäŋgaŋ shop and the shopkeeper's megaphone. Regional news is shared via Yolŋu radio, and LHAC and East Arnhem Regional Council Facebook pages.

Access and Support Facilities

Community access facilities
There are no community access computers in Gäŋgaŋ.

IT support
IT support is coordinated regionally by LHAC, Laynhapuy Health (undertaken in-house where possible) and the Laynhapuy School though the NTG. Contractors travel from Nhulunbuy or Darwin.

See the full Community Audit in Appendix 3 for more details

Figure 8: Co-researcher Djamika Ganambarr uses the public phone in Gängan

04. KEY FINDINGS FROM DATA ANALYSIS

This section provides key findings from the 14 interviews conducted in 2022 and 2023 with community leaders and stakeholders, as well as observational data and survey results. The analysis builds upon the findings in the 2022 Community Outcomes Report, with new topics labelled with 2023 after the heading.

See Appendix 1 for the full set of unprocessed survey results from 2022 and 2023. As outlined in the Executive Summary, the finalised results published in the 2023 Outcomes Report and on the First Nations dashboard of the Australian Digital Inclusion Index website can differ slightly from raw survey results following data cleaning and weighting against ABS data.

Communications Access

History of communications access and upgrades in Gängan

Traditional owner Yinimala Gumana outlined the traditional modes of communication, before colonisation.

- "[In early times] where people were … moving around this country, [to communicate with another clan] especially for ceremonies, they [would] send someone to go out and talk to those people, and also, to light the grass to make a big smoke, so other people they know [that] people is coming from other places. That's how they communicate … from the very beginning, before the colonisation started." (Yinimala Gumana, Yirralka Rangers Co-manager / traditional owner, 2022)

When homelands were being established in the 1970s, VHF radio became a primary communication tool.

- "Then [VHF] radios system were coming in [and] they used that one to communicate to other places [and would] carry their own radio wherever they go … They always communicate to other homelands and talk to leaders and family. [In] every village, they have been using the radio to communicate." (Yinimala Gumana, as above, 2022)

Telecom introduced public phones in the 1990s, with backhaul via a microwave repeater network.[3]

- "Laynha [then] helped the homeland people to get … Telecom to come and to build a telephone [system]. They have to build the tower first [to] connect it there to other wires … Then they put [a] public telephone [in]. I was kid, I used to help my community, and the people would make a trench from the tower [for] that telephone cable [to] run from tower to the payphone there." (Yinimala Gumana, as above, 2022)

The technology options have changed significantly today.

- "Now today, we on different technologies … we can use phone, the internet, to … send a email or check message, whatever. … [These days] we're all connected, [using mobile] phones connecting to the internet." (Yinimala Gumana, as above, 2022)
- "[Kids are learning about digital technologies] too quick. Back in early days, we didn't see any Wi-Fi [or] Facebook, TikTok … These days they got so many things to do. [The kids are] the one learning to become technology. That's why we can't stop them. They're addicted to their technology and all that stuff." (Djamika Ganambarr, Youth worker / Co-researcher, 2023)

[3] The original Digital Radio Concentrator microwave repeater system was upgraded to a Higher Capacity Radio Concentrator system in the early 2000s. HCRC enables phone calls and low bandwidth applications (e.g fax, EFTPOS).

Improved communications are needed for safety throughout the East Arnhem region

Beyond Nhulunbuy and the major communities in the region (Yirrkala, Gapuwiyak), there is very limited communications access in much of the East Arnhem region. Most of the 30 Laynhapuy homelands have basic telephony delivered via HCRC microwave or satellite backhaul. In most homelands, the public phone is the only means of communications, making contacting people extraordinarily difficult. The only homelands currently with 4G coverage are Gutjangan on Bremer Island and Baniyala homeland.

- "[Currently] communications is pretty much restricted. [Beyond Yirrkala], there's not much mobile coverage … So there's a big focus on knowing where people are all the time to make sure that they're safe, and also getting messages back in a timely way." (Kerry Legge, LHAC CEO, 2022)

Emergency communications and safety are critical factors for the needs for improved communications.

> **"One of the concerns that we have around lack of communication is personal safety, and we do have quite severe events. [Recently] a young boy was bitten by a crocodile at Bukudal … fortunately they had access to communication so that we could respond and get the boy into hospital [in Darwin]. It was quite a severe event. [Also a] young child who rolled in a fire and the parents had to drive him to Gapuwiyak. [It took] hours before that child had medical attention. … We're lucky that more things don't go wrong, [but] more equity in communication around here would be a great outcome."**
>
> - Kerry Legge, LHAC CEO, 2022

Like many of the Laynhapuy homelands, Gäŋgaŋ becomes isolated during the wet season, with road travel often not possible between December and April each year.

- "In the dry season, it's about 3 hours. But it can be up to 5 hours in wet season, [or impassable if] the road's all flooded over. And [even] then you've got to have a reliable 4WD and fuel." (Rachel Godley, LHAC Youth Program Manager, 2022)

Figure 9: Road access to Gangan is via the Central Arnhem Road from Nhulunbuy

Since our first visit, LHAC purchased Zoleo satellite communications devices for staff use when travelling remotely, which acts as an SOS beacon and can send text messages via satellite using a mobile app.

- "We've actually moved on to the Zoleo devices which are fantastic … you can send a message to anybody, even if they don't have that Zoleo app … Most of the time text messaging is all you need if [you're] travelling in between homelands and you blow a tire or you come across somebody who's had an accident, it's pretty easy to [send a message]." (Rhys Yerbury, Stores Coordinator, Laynhapuy Health, 2023)

For residents, the cost of travel to regional centres also makes communications services critical.

- "[A bush taxi] costs $750 one-way, so it's [not] easy to get into town for most people. … There's no regular passenger transport service out here. It's all charters and therefore expensive. [It's] also difficult to navigate the [booking] system, like a lot of other things in the dominant culture that Yolŋu are still learning to navigate." (Rachel Godley, LHAC Youth Program Manager, 2022)

With no mobile coverage in Gängan the public phone and Wi-Fi are primary means of making calls

Gängan has HCRC backhaul supplying limited phone services, including to the public phone, school, clinic and store, via a copper network from a small exchange by the tower near the school. There is no mobile coverage in Gängan, with the nearest accessible coverage being in Gapuwiyak about 75 km to the north by road. The phone options in Gängan are:

- Public phones: There is one Telstra public phone close to the school, which is free to use (as with all Telstra public phones now). The shop also has a phone for free public use when the store is open.
- Wi-Fi calling: When the public Wi-Fi is on, between 2pm and 8pm each day, there is active use of Wi-Fi calling and texting to make phone calls due to the lack of home phones.

Public phones are the primary means for calling for most Gängan residents, with 100% of respondents to our 2023 survey reporting use of the Telstra public phone or public phone at the shop for phone calls. No respondents used a fixed line telephone in their home. 15% also reported using workplace phones in the school, clinic, or shop. While all survey respondents said the public phone in Gängan was reliable, there were calls for another public phone to improve access.

- "Even when there's a cyclone coming or something, we were able to use that [phone]. The best access is to keep the public phone so we can contact [in case of emergency. But we need] another telephone because [the only phone] is right in the middle [and people] can't hear it properly [and] have to walk all the way to the public phone. And when emergency happens [like] a child being bitten by a snake or a crocodile, it's best that the phone call can be made from that end." (Marrpalawuy Marika, Gängan traditional owner, 2023)

Figure 10: The public phone provides only means of communications for residents for most of the day

With no household phone access, it is difficult for agency staff to contact people via the public phone.

- "[You sometimes] ring a pay phone ten times hoping that somebody would pick up. And if someone picks up, hoping that that person will go and find somebody in community for you and bring them back to the pay phone. It's definitely an interesting part of living and working remote is that style of communication." (Rhys Yerbury, Stores Coordinator, Laynhapuy Health, 2023)

Given the lack of mobile coverage, internet access is almost entirely via the Wi-Fi hotpot at the shop or via a workplace Wi-Fi (i.e. school, clinic, ranger base). None of the residential households have any form of fixed home internet.

Beyond Gängan, some homelands have the Activ8me public phones (Dhamiyaka, Dhupuwamirri, Djarrakpi, Garrthalala, Bunhungura) which were installed in the early 2010s under the Federal Government's Indigenous Communications Program in small communities with under 50 residents. These provide Wi-Fi connectivity near the phone, enabling Wi-Fi Calling using a mobile device.

- "[At Gurkawuy homeland] the public phones are satellite type phones, but it's Wi-Fi enabled … the community loves it … you can just do simple text messages and they can get through. I don't know if you'd be able to use FaceTime or anything like that." (Lonnie Dentith, Nurse, Laynhapuy Health, 2022)

There are high rates of mobile phone ownership

85% of respondents said they owned or shared a mobile phone (87% in 2022), with all of being smartphones and all using pre-paid services. Despite the lack of mobile coverage in Gängan, 85% of survey respondents said they regularly used a mobile phone for phone calls. This is either through Wi-Fi Calling from the Wi-Fi hotspot or while visiting a community with mobile coverage.

Residents report using their pre-paid mobile services when they travel to larger communities, such as Gapuwiyak, Ramingining or Yirrkala, or the regional centre Nhulunbuy. There are no pre-paid vouchers available in Gängan, so these are purchased online or in the larger communities.

Figure 11: Health worker Xephina Nunggumajbarr holds child as she watches cartoons on a smartphone

Of the 95% of respondents who had used the internet within the last three months (90% in 2022), 95% said they use their smartphone as their primary means of internet access (89% in 2022). Only 5% had used a desktop computer for internet access, and 5% a laptop. This usage was predominantly by school or clinic staff in a work context, with no computers or laptops in homes.

Gängan is still waiting for a communications solution after a planned project was ceased (2023)

Our first report outlined a planned project to introduce a satellite-delivered broadband service in Gängan and nearby Wandawuy homeland in 2023, as well as two small communities in the Barkly region (Arawerr and Mungkarta). The project, named Telecommunications in Remote Aboriginal Communities (TRAC) was initiated by NTG, with Regional Connectivity Program funding approved in 2021 to Field Solutions Group for project delivery. However, after protracted efforts to vary the funding agreement with reduced scope, the funding offer was withdrawn and the project did not proceed.

After several years of waiting, this decision has left the community without improved communications and disappointed that they have to re-start discussions about a broadband solution to meet their needs. Agency staff said that Laynhapuy homelands residents often feel overlooked or let down by promises of projects that never eventuate. As researchers who have helped the community outline their preferences for the project, we also played a role in building community expectations. However, this delay has provided an opportunity to ensure a community-led model for the communications solution.

When we first visited in 2022, Gängan residents and staff were keenly awaiting the service to be installed.

- "The community [wants the broadband service] here instead [of] using our pay phone [so] they can just use their own mobile to call their friends or families." (Billy Gumana, LHAC Board Director / traditional owner, 2022)
- "[We want better coverage here] because this is the very remote area. [Currently] people were using their mobiles phone [via the Wi-Fi. Sometimes] the public phone's not working. [So] that's why we need the [broadband]." (Yinimala Gumana, Yirralka Rangers Co-manager / traditional owner, 2022)

The calls for household broadband solution were repeated during our 2023 visit.

- "They want reception to Gängan so instead using one phone, payphone to do something like reporting every week and using work phone … they want [to] use mobile phone [from their house]. Maybe these people need internet in house and Wi-

Fi so they can call someone [in an] emergency." (Djamika Ganambarr, Youth worker / Co-researcher, 2023)

Previously there has been resistance to having any form of mobile coverage by Laynhapuy homelands residents due to potential social and cultural impact, however interviewees said this attitude is changing.

- "Homelands have been protected from that in a lot of ways but now that we're starting to get access through Wi-Fi, we're seeing that exposure growing. [A] few years ago community was speaking against mobile networks … whereas now, most people have mobiles [and want more coverage]." (Haidee Dentith, Laynhapuy School Principal 2022)

We heard that some young people are not wanting to return to Gängan due to lack of internet access.

- "Some kids from Gängan, they live in Yirrkala now and it's too hard to ask parents to bring the kids back to wherever they're from. [They want the] internet, too much. We got strong culture here. We turn [off the Wi-Fi] every night. [That's why] they walked off and live in the big area like Yirrkala." (Djamika Ganambarr, Youth worker / Co-researcher, 2023)

Some elders see connectivity as a way of reducing the barrier of remoteness for young people.

- "There were a time [when] two football teams came from Melbourne to Gängan, and I saw it on Facebook. And I was so happy to see the cross-cultural exchange [between] homelands [and] the wider community like Melbourne … We want [access to the wider community so] our young leaders, both female and male, can be able to do that. I believe in our young people of today, they can [be connected and] part of the wider Australia." (Marrpalawuy Marika, Gängan traditional owner, 2023)

A Wi-Fi delivery system was described as the most appropriate model for homelands due to options for community control.

- "[Currently] the Wi-Fi is the way that people communicate [in several homelands], and there's a really good understand of how that works and how you can control it. That's really strong for people to know that they can have some input into access to social media. [There is] still a lot of conversations around good social media and bad social media. I think Wi-Fi is the strongest way to do that." (Kerry Legge, CEO, Laynhapuy Homelands AC, 2023)

- "I think Wi-Fi is going to be the best communication set up for everybody in Homelands [to enable] connectivity and that ability to call people … it just seems that Wi-Fi calling and Wi-Fi communications is the next best thing [and most people now have] a mobile device capable of Wi-Fi calling. … It just makes our life a heap easier with reliable 24hr communication. Even for emergencies in Homelands … anybody in Homelands with a mobile device is able to call up video and show 000 what's going on. That's [really] important in homelands." (Rhys Yerbury, Stores Coordinator, Laynhapuy Health, 2023)

Kerry Legge urged the need for a change management plan to prepare for the new broadband access.

> **"You can't just introduce something and not bring people along with the change. [You need to] talk about what you had before and what's now and what you [need to] know."**
>
> - Kerry Legge, LHAC CEO, 2022

The Case Study in Section 5 outlines community concerns and preferences for the broadband service.

An alternate nbn-delivered broadband solution is now being planned for Gängan (2024)

In 2024, an alternate Wi-Fi mesh broadband solution by nbn Co is being proposed. Following a trial of community-wide Wi-Fi mesh in four remote communities since 2022, nbn received Australian Government funding in early 2024 to install free Wi-Fi mesh networks in a further 23 sites. Along with NT Government, our team recommended that Gängan, and the other three TRAC sites, be considered as part of this rollout. Consultation is now underway with Laynhapuy Homelands AC and the Gängan community on the design and community rules for the network. If there is agreement, the project will likely be implemented in the second half of 2024.

The community will be able to make decisions on where the Wi-Fi service can be accessed, with local management protocols relating to curfew times and content filtering. The protocols will be able to be changed if needed.

Our 2023 Warakurna Community Outcomes Report[4] includes a case study of an existing nbn Wi-Fi Mesh network, including the network design and local protocols.

There is no household uptake of nbn Sky Muster

Despite the lack of mobile coverage, none of the 13 residential houses in Gängan had nbn Sky Muster services. The only Sky Muster services are on the clinic and store, both managed by Laynhapuy Health, and the ranger base since December 2022. There was very little awareness of Sky Muster being an option for home internet. With post-paid billing as the primary option, this was not considered an affordable means of access by residents. Rather, the preferred model of internet access was community-wide broadband coverage for Gängan, expanding on the existing Wi-Fi service, rather than individual household services. The nbn Wi-Fi mesh network will enable this model of shared broadband.

There is initial uptake of Starlink satellite services in the Laynhapuy homelands (2023)

There was no use of Starlink in the region during our 2022 visit, with Starlink only expanding its coverage footprint to include northern Australia in November 2022.[5] During our 2023 visit we found that Laynhapuy Health had installed Starlink dishes on the shops located in four homelands (Gängan, Wandawuy, Baniyala and Garrthalala) to provide better reliability with use of EFTPOS, which the community relies upon as the stores do not accept cash.

- "Starlink came about mainly due to some connection [and] reliability issues that we were having with the nbn Sky Muster satellite … We were just finding that it would drop out, the speed and connectivity were an issue. [In both Gängan] and Garrthalala [the service would] drop out all through the morning [and] randomly come back online at 2 or 3 pm … We rely on that internet communication to [keep] the EFTPOS working … because we're a card only store, [no] cash. [It] was hard [to] diagnose any issues that we did have and difficult to organise timely servicing from any nbn technicians. [So we installed] Starlink [and] haven't had any issues with it in three months. [Also] you get all the diagnostics and everything on your phone through the Starlink app." (Rhys Yerbury, Stores Coordinator, Laynhapuy Health, 2023)

While Starlink services are more expensive than nbn Sky Muster,[6] the speeds are significantly faster, with lower latency and unlimited download (Sky Muster plans available at the time had varied data limits[7]).

[4] This can be found at: https://apo.org.au/node/326782 or on the Mapping the Digital Gap webpage: https://www.admscentre.org.au/mapping-the-digital-gap/
[5] For information about Starlink see: https://www.ozbroadbandreview.com/blog/what-is-starlink/
[6] Starlink costs $139/month plus up-front equipment costs, compared with nbn Sky Muster plans which start at $45/month and include free installation.
[7] Sky Muster Plus data limits only apply to video and VPN use, unmetered from midnight to 4 pm. New nbn Sky Muster Plus Premium plans were introduced in November 2023 which have unlimited download and up to 100/20Mbps speed.

Using the Ookla speed test app,[8] we found the Starlink service at the Gäṉgaṉ shop had a speed of 213/10 Mbps and latency of 59 ms, compared with the Sky Muster speed of 23/5 Mbps and latency of 681 ms at the same location. While not a comprehensive test, this is typical of the speeds both services offer on a clear day. However, speeds can vary significantly with weather conditions, Wi-Fi configuration and the number of users and applications being used.

Figure 12: Skymuster and Starlink dishes above Gäṉgaṉ Shop

Rhys Yerbury, who set up the Starlink service at Gäṉgaṉ, described the improvement in speed.

- "I was putting it in for my boss Jeff and I said, "Oh, the download speed's 200 Mbps. He said, "That doesn't really mean anything to me." And I said, "I just downloaded a two hour movie in about 34 seconds." And he [responded] "Okay now I understand." (Rhys Yerbury, Stores Coordinator, Laynhapuy Health, 2023)

Rhys was impressed with the ease of installing the Starlink satellite equipment.

- "Its ease of install is second to none. I chucked that [dish] up on the roof, plug and play. We just popped it all together and used the app on the phone [which is] probably the only limiting factor to being out in community. But it was easy enough … you plug it in, power it up and [the dish] unclicks itself and then just moves around, finds the satellite and then locks on and makes incremental movements to get the best download speed possible." (Rhys Yerbury, as above, 2023)

Rhys described that Starlink is less impacted by rain or heavy cloud than Sky Muster.

- "Historically, any storm that comes through, Sky Muster gets knocked out [and we] have to wait for EFTPOS payments until the storm passes and then it reconnects itself … It's a bit of a limitation of that service. [However with Starlink] the day that I installed it, a large stormfront came over and [I] was still [getting] 125 Mbps download … it was pretty impressive." (Rhys Yerbury, as above, 2023)

While not generally affordable for residential use, Starlink provides an opportunity for improved service delivery, such as for telehealth and education purposes. Laynhapuy Health are now looking at installing Starlink at the clinics across the region, with funding through National Aboriginal Community Controlled Health Organisation (NACCHO).

- "Laynhapuy [Health has] secured some funding for more Starlink [at] the clinics now as well. Purely because you'd effectively be able to do telehealth. A lot of the clinics [had] fairly sophisticated cameras … installed many years ago but they were unable to use because of the reliability and the upload limitations of [Sky Muster]." (Rhys Yerbury, as above, 2023)

[8] https://www.speedtest.net/

Last-Mile Access and Community Access Facilities

The Wi-Fi hotspot provides public internet access and enables local control

With no 4G coverage in the community, the Wi-Fi hotspot currently provides the only means of public internet access for Gäŋgaŋ residents. The Wi-Fi is set up at the Gäŋgaŋ Shop and operated by Laynhapuy Health as a free service using Sky Muster satellite backhaul.[9] The service has content filtering to restrict access to pornography or online gambling sites. At community request, it operates on weekdays from 2 pm (when school finishes) to 8 pm, with longer hours on weekends.

- "It is free and there's no password or anything … if lots of people are on it, it gets fairly congested, but otherwise it's all right, and I don't think we've run out of data yet." (Rachel Godley, LHAC Youth Program Manager, 2022)

Figure 13: Co-researcher Guruwuy Ganambarr using the Wi-Fi hotspot

There is a public Wi-Fi service in six other Laynhapuy homelands.

- "The Wi-Fi is set up using Sky Muster in sites … where all the health clinics are … Dhalinybuy, Garrthalala, Gurrumuru, Wandawuy, Baniyala, Gäŋgaŋ and Birany Birany. …The reason it's limited is not to use up all the bandwidth on it, because [the clinics still need it] to do their main core job." (Kerry Legge, LHAC CEO, 2022)

In 2022, we spoke to Jeff Cook, Operations Manager with Laynhapuy Health and Community Stores Coordinator, who manages the Wi-Fi set up at the shops. He said that the Sky Muster service is a domestic 25/5 Mbps plan which provides the internet needed for the EFTPOS machine as well as free public Wi-Fi. This was more affordable than a business-grade service,[10] however if there is a fault, SkyMesh can take months to fix the service. Jeff said he would ideally like an nbn business plan that enables shared data use across the four sites, but this option was not available.

While there is demand for increased internet access by some residents, especially young people, there are concerns by some elders about the Wi-Fi access.

- "Sometimes [the elders] want me to turn the whole Wi-Fi off and never want it again, [but] young people [say] "If something happens with the shop Wi-Fi, we want the clinic Wi-Fi password". [It] depends on who you're speaking to." (Rachel Godley, LHAC Youth Program Manager, 2022)

Some homelands have experienced issues of young people not attending school due to staying up late at night watching movies or playing online games.

- "When we've had students not coming to school, [it's often] because they've been up all night on the internet. [So communities directed] Laynha Health to restrict the Wi-Fi [here and at] Garrthalala … That seems to be addressing it." (Haidee Dentith, Laynhapuy School Principal 2022)

However, the Wi-Fi time limit was raised as a limitation where this is the only means of internet access.

- "We need to access emails for work so the Wi-Fi time limit makes it hard when it doesn't start until 2 pm. We need access the whole day for work but we don't want kids having access during school." (Yananymul Munuŋgurr, LHAC Chairperson / Garrthalala resident, 2022)

[9] The Wi-Fi was set up by eMerge in Sydney, using Unifi software, which enables content filtering.
[10] This costs about about $1,500 per annum, compared with a business plan cost of $21,000 per shop per annum.

The lack of alternate internet access leaves residents without access to essential services during the day.

- "I [agree that] if the community don't want the internet to be on after a certain time, then it ought be shut off [and] not be available. But the problem [is, it's currently] it's off in business hours when people ought be able to utilise it and access it." (Geoff Ellis, LHAC legal support, 2023)

Even when a broadband solution is installed in Gängan, the existing Wi-Fi service at the shop will likely be continued as a vital back-up service in case of broadband service outages.

- "People [need] Wi-Fi to do some banking, internet [and make calls. We] don't have [pre-paid] credit in our community. [It's] four hours drive from here to Nhulunbuy to go and buy [mobile] credit." (Billy Gumana, LHAC Board Director / traditional owner, 2022)

It is also important that residents can use the broadband service to access emergency services at all times, including as a backup if the Telstra public phone is not working.

- "We have to be able to talk to leaders [about the times for the Wi-Fi and when to] turn it off at night. And when we use for emergency, we can use that Wi-Fi. But during the night, [having internet is] no good for the kids … only emergency." (Djamika Ganambarr, Youth worker / Co-researcher, 2023)

While the new Starlink service at the shop would be an ideal alternative to the Sky Muster service for the public Wi-Fi, we heard that this was not currently possible due to limitations with the router in configuring a separate shared-use network to enable setting restricted access times for Wi-Fi.

There are currently no community-access computers in Gäṉgaṉ

The only computers in the community are in the clinic, the school and the ranger office, however these are not available for public access.

- "Some [Yolŋu health workers] can use the computer in the clinic [and] youth workers [can] use that as well." (Rachel Godley, LHAC Youth Program Manager, 2022)

Our survey found that no households had a computer at home. Traditional owner Billy Gumana said that computers or laptops are needed in workplaces to enable people to do their work and conduct meetings via videoconference. He wanted a community-access computer in Gäṉgaṉ to enable him to learn to use online services.

The community store is the communications hub in Gäṉgaṉ

The Gäṉgaṉ shop is the default communications hub for Gäṉgaṉ. It is open each day and is the location of the public Wi-Fi and phone, as well as the noticeboard for messages and upcoming activities. Shopkeeper Marakuku makes announcements of meetings, visitor arrivals, and weather warnings on his megaphone. When the mobile service arrives, this is where people will buy mobile phones and pre-paid vouchers. The centrality of the Gäṉgaṉ shop and its existing communications role makes it a suitable location for community-access computer, laptop or iPad equipment for residents to access online services and learn digital skills.

Figure 14: Gäṉgaṉ shop

Previously the community office supported communications access, however it is no longer operating.

- "The shops are a good [place] to make a hub … And that's away from the school … It doesn't have to be a computer. Like a couple of iPads that are just locked down and you can come and use for internet banking or MyGov, which are the key things." (Kerry Legge, LHAC CEO, 2022)

The shopkeeper could provide a level of supervision, and with appropriate training and support, may also become a digital mentor to support people with phone activation, use of online services and other digital skills needs. Alternately another person could be employed to provide the digital mentor role.

Service Delivery and Use of Online Services

Limited communications are a challenge for Laynhapuy School, especially during COVID-19

The Laynhapuy School manages nine homeland learning centres spread throughout the region, from Rorruwuy and Bremer Island down to Gängan. The School supports all ages from transition to Year 12, with senior students in Years 10 to 12 accessing a boarding program at Garrthalala homeland. Teachers are based in Yirrkala and visit the homelands during the week (from one to five days), with homeland-based Yolngu educators, who deliver lessons in language, running the school from Monday to Friday. When visiting staff were unable to travel to the homelands during the pandemic outbreaks in early 2022, the homeland-based educators ensured the schools remained operational.

The lack of communications access restricts Laynhapuy School in arranging charter flights for students to attend high school in Garrthalala each week. Household communications would make this task simpler.

- "[It] would be a gamechanger [to be able to] contact families every week to let them know when the planes are coming and find out [if] their child is [attending] this week. That sort [of] communication, that's vital. I'm excited about the opportunities that might come in that space." (Haidee Dentith, Laynhapuy School Principal 2022)

In Gängan, there are phones in each classroom as well as the Families as First Teachers (FAFT) pre-school and the visiting officers' quarters, all connected to the one line and phone number. Laynhapuy School Principal Haidee Dentith reported regular issues with the phone line, such as the Gängan line not having any dial tone for two days during our 2022 visit, and phone lines becoming very crackly. With Telstra reportedly taking a long time to respond to issues, the lack of reliability makes it difficult to stay connected with the homeland-based educators as well as ensure workplace health and safety.

As an NT Government school, internet is provided to the school site via the STARS satellite network in seven of the nine homelands, with Bremer Island having 4G phone connectivity but no internet. The STARS network was installed about 10 years ago and has reportedly not been upgraded since that time. This enables staff to access email, basic internet and some educational apps. The STARS network shares bandwidth across all NT schools and so can become highly congested.

Figure 15: The STARS satellite dish at the Gängan school

The lack of high-speed internet in Gängan limits teachers to primarily using paper-based resources rather than benefiting from the range of online resources available.

> "[We need] faster internet [to use online learning resources]. It would be great to be able to quickly Google something or pop up a resource on an iPad ... There's so many good English as An Additional Language programs that all need internet ... I would love to be able to put students [on an iPad for] 20 minutes of a day [to] learn how to type and learn how to blend words, rather than the teachers having to [try to teach all levels from] transition to Year 9 in one class. These ICT resources [can start] where the student's level is. [For now we] carry this big black box around with the whole week's resources."
>
> - Anna Lansdown, as above, 2023

Educational apps run from a remote server, so there is a long delay to re-boot if the connection is lost.

- "[It] takes about four or five minutes to reboot every time your computer goes black ... it's been frustrating at times, not being able to just have internet quickly. [Even] to load the roll takes five, ten minutes. [And] we're using this program called 'Class Dojo' [which] the kids love and you click on their name and they get a point for when they've done something kind or when they've come to school on time. But just to load that it takes five minutes each time to reboot. [In a] mainstream context where you have access to internet, those things are taken for granted." (Anna Lansdown, Laynhapuy School teacher, Gäŋgaŋ, 2023)

During the pandemic outbreak in early 2022, school staff were restricted from travelling to homelands for a six-week period. They supported local educators via phone, video calls and sending packages of resources by plane. Video conferencing platforms were trialled for delivering lessons, with the school settling on Microsoft Teams as the most reliable platform on laptops and iPads, supported by the NT Education department. We heard that while email was often unreliable due to limited bandwidth, Microsoft Teams still enabled teachers to send a chat message. The School trialled an all-sites school assembly via Teams and found that worked over the limited bandwidth. However, teachers are typically unable to show an online video over the STARS network.

During our 2022 visit, NAPLAN tests were being conducted at the school using an offline version of the test on iPads. While this removed poor connectivity issues, other factors such as limited English and digital literacy make for uneven comparison with mainstream school students using online NAPLAN tests.

Senior school students are using laptops, developing keyboard skills and using PC-based applications. Digital skills and comfort with online applications are increasingly necessary life skills that are critical for work readiness. Senior school students are introduced to workplace applications, such as the iTracker application used by rangers, as well as internet banking, search techniques, and more.

- "Once the students make it into Year 9, they [join] the Makarrata program. The kids all get collected on planes out to [the high school at Garrthalala] each week. I think there's 15 iPads for 30 students so they share iPads. They learn how to use Word, type, they have to submit presentations and Power Points, [and] they do some music stuff on their iPads as well." (Anna Lansdown, as above, 2023)

Younger students have access to iPads in some of the schools. Laynhapuy School has partnered with Apple Australia over the last four years around using iPads as a tool for learning and work within schools. Community educators use resources provided by Apple to learn a digital skill or an iPad app and then share it with the students. This includes creating movies and multi-media projects and doing learning assessments. However, we heard that there is limited opportunity for follow up by the school at Gäŋgaŋ due to limited IT resources.

- "Once a year there's the Apple workshop [where] a team of people fly out and [show students] how to use an iPad. [Beyond the iPads we bring out for the workshop] there's really no other access within school to any kind of ICT stuff … other than just my own personal laptop and the other teacher's laptop [which we use] to show our Power Point and [use online tools]." (Anna Lansdown, Laynhapuy School teacher, Gängan, 2023)

Once connectivity improves, the School is planning to introduce more desktop computers for use by both students and community members to learn to use internet banking and other practical applications.

We heard that the School's IT contractor was trialling Sky Muster at Birany Birany homeland in 2022, where there was no internet. This service was described as relatively reliable and fast compared with the STARS system.

Laynhapuy Health has limited phone and internet connectivity

There is a mix of communications services in the Laynhapuy Homelands clinics, in all but a few very small homelands. Clinics are staffed by local health workers and supported by roving nurses, who visit each homeland at least once a week. The larger homeland clinics are connected to Sky Muster services.

- "We have landlines which are on and off, but satellite internet is our main communication. We use that for all sorts of things within the clinic, FaceTime-ing doctors for medical consults or communication with the office and other people … Internet-based email [and internet access is] through the Sky Muster network … It's not particularly fast and it comes and goes … if there's bad weather [heavy clouds] around it doesn't work." (Lonnie Dentith, Nurse, Laynhapuy Health, 2022)

There have been numerous satellite services installed on the clinics over the last 20–30 years.

"On top of the roof [there's] literally five satellite dishes … [which are mostly] obsolete. There's one working out of all of those … We've gone through a lot of services in the time that I've been here."

- **Lonnie Dentith, as above**

Lonnie said that high-definition telehealth camera equipment was installed in the clinic at Gängan several years ago to enable remote access by General Practitioners. It worked for a couple of years, however the connection was discontinued due to difficulties accessing technical support. Nursing staff have found the most reliable means of telehealth is via FaceTime on a mobile phone using the Wi-Fi.

- "None of that [high-end equipment] works anymore. So we're just back to standard nbn type internet [with] the basic iPhone [which] seems to be the easiest thing to do … We're just using FaceTime [or WhatsApp] depending on what the other person [has. It works pretty well] but occasionally it will bomb out [if] there's not enough data or … cloud cover or whatever." (Lonnie Dentith, as above)

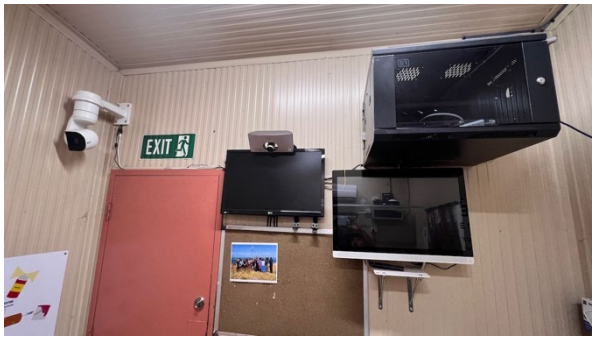


Figure 16: Telehealth equipment in Gängan clinic is currently unable to be used

Simbani Research has recently undertaken a telehealth research project,[11] working in NT homelands with Laynhapuy Health as a partner. The project found that Sky Muster Plus can be used effectively for remote telehealth using basic equipment that works with limited bandwidth, including FaceTime and videoconferencing software such as Teams or Zoom. While Sky Muster is being used by numerous community clinics, we hear mixed reviews, with health services in many regions transitioning to Starlink for telehealth due to limited speed of Sky Muster and unreliability during heavy cloud or wet weather.

Wi-Fi calling is used extensively by nurses in the homelands.

- "[Most] nurses … use [Wi-Fi calling] quite often. The quality is okay most of the time. Sometimes there's a bit of a delay [due to latency via the satellite]. Today there was quite a bit of delay when I was talking to the office." (Lonnie Dentith, as above)

The landline or mobile phone is used for emergency calls.

- "[For] emergency retrieval stuff we [mostly use the landline phone or] the Wi-Fi enabled phone through our mobiles … depending on how things are going with the Wi-Fi." (Lonnie Dentith, as above)

The clinic Wi-Fi is intended for health service use only to preserve monthly data limits, however it does get some public use if the Wi-Fi password gets shared with community residents.

- "We try not to give the password out. [But] you'll probably [see] people sitting around the clinic after hours playing with their phones … Some health workers turn our Wi-Fi off when we're not there because they don't like kids accessing it." (Lonnie Dentith, as above)

The Communicare cloud-based patient records database requires high speed and low latency for reliable access. It does not work well over the domestic Sky Muster services, with nurses using an offline version when visiting homelands due to limited speeds.

- "[In Gäŋgaŋ today] I couldn't even log in. [So we use an] offline version. [W]hen we get back to the office [we] synchronise that back up onto our server. That's how we operate because the internet is way too slow for that sort of stuff and too unreliable as well." (Lonnie Dentith, as above)

However, the Sky Muster connectivity was sufficient for remote IT support using TeamViewer.

Communications technologies are used for undertaking land management work on country

The Yirralka Rangers have bases in more than 14 homelands. They have 55 people on the team, 48 of whom are based in the homelands. They have recently been through a significant restructure and now have two coordinators, one Yolŋu (Yinimala Gumana) and one non-Indigenous (formerly Sarah Kemp, now Lachy Sutherland following Sarah's resignation in November 2022).

Figure 17: Yirralka Rangers Co-manager and community leader Yinimala Gumana

Former Co-Coordinator Sarah Kemp said it had been difficult to contact people for meetings or work due to public phones being the only means of contact in many sites. To address this, in December 2022 Yirralka Rangers set up nbn Sky Muster services in the Ranger stations in the five larger

[11] See https://simbani.com.au/ and presentation on telehealth trial and equipment at: https://www.crcna.com.au/file-download/download/public/582.

communities (Gurrumurru, Barraratjpi, Dhalinybuy, Baniyala and Gängan) to improve communications and enable online meetings. Rangers now use Wi-Fi calling to make calls at these sites.

- "Some of the places where the rangers have put the nbn satellite [are] really remote homelands, so what they're doing is improving access to communications [for those sites]. There's always caution about giving out passwords, but in a lot of the smaller homelands, it's only the rangers living there, so they are the community." (Kerry Legge, CEO, Laynhapuy Homelands AC, 2023)

The Yirralka Rangers use the iTracker database to collect land management records.

- "In regard to the work, we have [to] capture all the information, and put it into our [iTracker] database. [This is] what we've been using for our animals and for weed spraying, fire … If we find someone there doing wrong thing in our country, [we] record on our database and send it over to the main office." (Yinimala Gumana, Yirralka Rangers Co-manager / traditional owner, 2022)

Figure 18: The Yirralka Rangers base in Gängan now has a Sky Muster service

Without connectivity and support, residents can miss out on services and entitlements (2023)

Geoff Ellis is a lawyer employed by LHAC to provide legal and justice support for homelands residents. However, Geoff finds his role extended to supporting people in navigating a range of services, especially online services which require multiple forms of identification.

- "I'm officially a lawyer but [while] dealing with some criminal matters [I] do lots of other work [like] assisting with setting up banking [or] with Centrelink situations … people wanting to get identification for example, you have to come up with all of these materials like birth certificates, which they don't have, and they have to have copies of a bank account [or] driver's licence with a photo ID. [So] life becomes impossible. And because they don't have any ID, they can't get any Centrelink [and so] it just burrows down into further poverty." (Geoff Ellis, LHAC legal support, 2023)

Limited communications make use of helpline services very difficult, especially with long wait times.

> **"Dealing with those agencies, you can be in the phone to Centrelink for two hours … Yolngu [have to call] on a public phone, but everyone else is wanting to use the public phone. They try and come over here and use [Wi-Fi calling but] it's very much unreliable and cuts off, so they might be waiting on the phone to Centrelink for an hour, and all of a sudden, the internet goes down, and they're back to square one. It is really disadvantaging them in being able to have what ought be just everyday normal entitlements. And that goes through trying to get identification, trying to get Centrelink [or] pensions, trying to get kids registered."**
>
> - Geoff Ellis, as above, 2023

Geoff said that many people go without entitlements due to the poor communications access and lack of First Nations helplines for some services.

- "The number of people out here who wouldn't be on their proper benefits because they can't get through with the necessary requirements of Centrelink [or] Medicare … the hoops [they have to jump through to] get a replacement Medicare card, or to put a child on a Medicare card is ridiculous, and there is no Aboriginal line for Medicare, so it makes it even all the more difficult." (Geoff Ellis, as above, 2023)

Lack of communications can also impact on providing support with justice matters.

- "[I've been trying to support a client with justice issues, requiring a] number of phone calls, of which we have been cut off on numerous occasions. They say that they want us to email our request. Well, we can't email the request from here [because] the internet out here at Gäŋgaŋ is really, really unreliable." (Geoff Ellis, LHAC legal support, 2023)

Due to the remoteness from a regional centre, access to reliable and effective communications is critical.

- "To have coverage [or] Wi-Fi [and] a reliable telephone service is absolutely critical, and they have neither of those at the moment. [Especially] when you're four hours from Nhulunbuy, where the bank is, or where Centrelink is [and] some people … don't want to go into town. [Having reliable connectivity] is absolutely essential for people in their day-to-day living." (Geoff Ellis, as above, 2023)

The limited postal service also impacts on people accessing key services.

- "[Often] the post doesn't get through [or] ends up in the wrong homeland [or] going to the wrong person. [And when] I'm acting on behalf of the Yolŋu people [agencies often say] "You'll have to post this in for your superannuation," or if you're opening a [bank account] that'll be followed up by your code in the post. [Even] in this day and age [many agencies] need original copies to be sent in the post with ID that's certified. [Fortunately] I can do it as a lawyer [but] I think I'm the only one in Arnhem Land. [So] it becomes incredibly difficult [and] makes it so much more critical that you have [reliable] Wi-Fi." (Geoff Ellis, as above, 2023)

There is currently work underway by the Australian Government to develop a Digital ID, which aims to address the need to provide identification documents to set up each new service.[12] While this has the potential to reduce challenges for remote First Nations people, it is yet to be seen how this will work in remote communities with limited or poor connectivity and where people rarely use email and regularly change mobile phones and numbers.

Access to services and democratic processes is difficult without communications access

Some government agencies have to travel out to the homelands to deliver services in person due to the lack of access to phone or internet communications. For example, Centrelink staff fly out to homelands to do fortnightly reporting with clients. Other agencies partner with LHAC to deliver services.

The Electoral Commission drive or fly to each community to conduct pre-voting for Federal and Territory elections. Voting for the federal election was underway just prior to our 2022 visit. There were calls for a means of online or postal voting to reduce the resources needed and the impact of visits on communities.

The Australian Bureau of Statistics also struggle to undertake the Census in remote homelands. The 2021 Census, conducted during COVID-19 lockdowns, was reportedly impacted by limited access to homelands and administration issues in collecting the Census forms.

[12] See: https://www.digitalidentity.gov.au/

There is limited access to devices in the homelands (2023)

Mobile phones are not available for sale in the Gängan shop, with most phones purchased on trips to regional centre Nhulunbuy. As a result, sharing of phones is common, with 20% of survey respondents saying they share a phone. However, phones also get transferred to those most in need.

- "Phones are [often] shared [within] families. I've seen a mobile phone get passed to a whole other family that was going to Katherine, so it's almost like that phone is not really owned by that person, it's just who needs it, who needs to access someone the most. There are some people that just don't have the SIM, but they'll use the Wi-Fi." (Nadine Warbrick, LHAC Social and Emotional Wellbeing Worker, 2023)

In remote First Nations communities, there is often a high level of shared phones between couples. However, we heard that this can result in situations where a partner can restrict access to a device as a means of control.

- "I used to work at the women's shelter, and [often] it was the woman who said, 'He took my phone', or 'I'm not allowed one'. And even if they do have a phone, they have to give it to the partner to check all the time. That jealous thing, [and] control [of] phones for partners, incredibly high. And it just can't be reported [to] police. [But that] controlling or abusive behaviour [is] just really common." (Nadine Warbrick, as above, 2023)

Access to Media and News Services

No Gängan households have TV services working

Our 2023 survey found that none of the 13 residential houses in Gängan have VAST direct-to-home TV services working. 55% of survey respondents said this was due to not having VAST satellite equipment installed at the house. During our 2023 visit, we observed that only four of the 13 households had a VAST dish on the roof following a housing upgrade program in which roofing was replaced and VAST dishes were removed and not replaced.

Of the respondents in houses with VAST satellite equipment not working, 45% said it was because the set-top box was not working, 47% had a damaged dish or cabling, and 5% did not know why.

Figure 19: Only four of the 13 houses in Gängan still have a VAST satellite dish on the roof following housing upgrades

- "At the moment, it's nothing at all, [no TV services]. Set top box, they've got like damage. [We want to know] who [is] responsible to manage that one?" (Yinimala Gumana, Yirralka Rangers Co-manager / traditional owner, 2022)
- "[TV is] not on [in] Gängan … It's very hard, wishing for to see TV that's happening here." (Billy Gumana, LHAC Board Director / traditional owner, 2022)

The lack of working VAST television services is common in other Laynhapuy homelands.

- "I don't think there's TV anywhere that I can think of, maybe Gutjangan [on Bremer Island] which is near town [Nhulunbuy]. But as far as I'm aware there's no TV anywhere else. Some people seem to have Foxtel, they [have] pay TV set up in their house. … But I haven't actually seen any of them working lately." (Lonnie Dentith, Nurse, Laynhapuy Health, 2022)

The VAST direct-to-home satellite TV service was installed on all premises in remote communities by the Australian Government in about 2014., It replaced local television broadcasting, and ongoing maintenance was deemed a householder responsibility. However, under the Digital Switchover program, there was no funding allocation or planning undertaken for a coordinated maintenance program of VAST equipment for remote First Nations communities. The expense of getting technical contractors to travel from Nhulunbuy, over 200 km or 5 hours' drive away, is prohibitive for residents.

The most common problem is with the VAST set-top boxes, which are prone to damage by surges in the community electricity grid when generators are re-booted. Surge protectors were not provided as part of the roll-out. VAST set top boxes are not available at the Gäŋgaŋ store. They can be purchased in Nhulunbuy for about $400 or online for about $320. However, even when people buy a new set top box, it is very difficult to activate the smart card without phone or internet access at home.

Figure 20: VAST set-top box

There is community demand to get TV services working again.

- "Some community were asking, when [will we have] Channel 7 [and] ABC News [so we can] watch news on the TV [and] football games … When you guys left and then we keep talking, 'When are we going to have proper TV so we can watch the news?' " (Djamika Ganambarr, Youth worker / Co-researcher, 2023)
- "The main one I would love to see would be TV, to install TV in this community [and have access to] the ABC News. [We used to have] that satellite dish [and some had] Austar or Foxtel … But now everything just stopped now. Will it cost more [to get] the TV [again]?" (Marrpalawuy Marika, Gäŋgaŋ traditional owner, 2023
- "[Having TV working again] would be really good … Young people wouldn't have to sit around on their phones all the time. Maybe they could watch sports on a bigger screen … It would probably create better community atmosphere if people could watch TV together rather than on a small [mobile] screen." (Rachel Godley, LHAC Youth Program Manager, 2022)
- "It's good for the community to able to look at news, what happening around the country … It's good to see television and movies … That is something maybe Layna might look at." (Yinimala Gumana, as above, 2022)

Improved access to broadcast television would likely reduce demand on the mobile services and expense for users in accessing online entertainment. However, with no agency responsible for ensuring TV services are working in communities, this will require external financial and technical support.

The First Nations radio service is the primary source of local news and information

The only radio service available in Gäŋgaŋ is the First Nations radio service Yolŋu Radio, which broadcasts programming in Yolŋu Matha languages. 40% of survey respondents listen to Yolŋu Radio daily or weekly, with a further 50% occasionally. Yolŋu Radio provides locally relevant news and information, with 35% citing it as a source of news content daily or weekly.

- **"**[We] listen to the news and other messages, what government people say about the law and whatever … Yolŋu Radio [is all] we have here, and nothing else. [Some people might] use their Wi-Fi to listen [to] news and weather." (Billy Gumana, LHAC Board Director / traditional owner, 2022)

- "[There's Yolŋu Radio and] nothing else. People listen to the radio a fair bit, especially the older people will have it on." (Lonnie Dentith, Nurse, Laynhapuy Health, 2022)

Yolŋu Radio also provides emergency information, particularly with cyclones prevalent in wet season. Our 2023 survey found that 40% of people used Yolŋu Radio as a primary source of emergency information.

During both our visits to Gäng̲an̲, the Yolŋu radio service was not working and we helped to restore the service. While highly valued, there were calls to improve reliability of the Yolŋu Radio's broadcast.

- "[We want] the radio [working], the Yolngu Radio, which is already installed at the Gäng̲an̲ clinic." (Marrpalawuy Marika, Gäng̲an̲ traditional owner, 2023)

It was suggested that ARDS could teach a local person how to troubleshoot if the service is not working.

- "Yolŋu Radio's the most reliable radio service. [It's better than ABC] because it's in language, and even the music's different. [But] when [it doesn't work], people stop using it. [So we just need] reliability of one radio service. [ARDS could show local people how to] to reset it, because [it's often a simple fix to] just reset [the receiver]." (Kerry Legge, CEO, Laynhapuy Homelands AC, 2023)

Other than Yolŋu radio and social media, there is a lack of other news sources. When we arrived in Gäng̲an̲ for our 2022 visit and held a community meeting, nobody present had heard the outcome of the Federal election held two days beforehand.

- "[When they found out we] had a new Prime Minister, everyone cheered. No-one had heard anything about that. [It] does show you how people lack services out here [and] access to current events. They [want] to know what's happening in the world, [so] it highlights a need." (Rachel Godley, LHAC Youth Program Manager, 2022)

Without access to television services or radios, the limited access to news services was raised as an issue by interviewees, particularly during the Voice referendum.

> **"Whenever the law changes, or where the government announces something, that news doesn't reach here. [There's information] going around about the Voice at the moment [but] Yolngu people were asking me about it. [Information] gets here too late [and it often] gets dumbed down, and the people don't need it dumbed down; they just need it [translated]. Also international news, like the news about what happens around the world, it's not really reaching here."**
>
> **- Nadine Warbrick, LHAC Social and Emotional Wellbeing Worker, 2023**

Word of mouth is the primary source of news and information

There are limited sources of local news and information in Gäng̲an̲ to provide relevant, trusted information about meetings and events, service provider visits, news and weather or emergency situations. Local information sources include:

- Yolŋu Radio (see above)
- Noticeboard at the shop
- LHAC and East Arnhem Regional Council Facebook pages.

However, the primary source of news and information across the Laynhapuy Homelands is face to face delivery, known locally as the 'Yolŋu telegraph'.

- "It's pretty much the radio and the Yolŋu telegraph … the talk. … I don't know how people find out but people know stuff really rapidly … cultural things mainly. I don't think it would include politics and all those sorts of things … I don't know how it works but it's pretty quick that people get told things." (Lonnie Dentith, Nurse, Laynhapuy Health, 2022)

In Gäng̲a̲n̲, information is also shared via megaphone by local storekeeper Marakuku or over the public address system at the pre-school.

- "The PA system [is the local equivalent of a] Facebook announcement." (Nadine Warbrick, LHAC Social and Emotional Wellbeing Worker, 2023)

Figure 21: Marrpalawuy Marika using the PA system for a community announcement

Our 2023 survey confirmed this, finding that the most common source of news and information was direct and in person (90% daily, 10% weekly), followed by Facebook (25% daily, 10% weekly), other social media (20% daily, 5% weekly) and Yolŋu radio (15% daily, 20% weekly). The most common sources of emergency information were direct and in-person (100%), local PA announcements (50%), Yolŋu Radio (40%) and Facebook (42%).

Motor vehicles are also considered a means of communications in the Laynhapuy region.

- "To find out where someone is [you can't] just text someone … the public phone sometimes doesn't work [or] when it does [you sometimes] get a kid who will say, "They're not here," but actually they were. [It's] really hit and miss, [so often I] have to drive to the community. [It's] so much easier to drive [and talk] face-to-face. [Often] I just can't get hold of people [any other way]." (Nadine Warbrick, as above, 2023)

Affordability

Affordability of mobile data and devices may increase as an issue

Affordability of mobile and internet access is likely to become a significant issue as internet use increases. 42% of survey respondents who used the internet within the last six months gave the reason "The internet is too expensive for me" for not using the internet more often (up from 39% in 2022).

Our survey found that the average household cost for pre-paid mobile users is $115 / fortnight (up from $92 / fortnight in 2022), with 45% of households paying over $200/month (up from 19%). These rates are similar to sites with consistent mobile access, even though the primary usage in Gäng̲a̲n̲ would be restricted to when visiting Nhulunbuy or other communities.

This expenditure may seem somewhat surprising given the primary means of internet access is via free public Wi-Fi. However as most commonly used pre-paid vouchers have a 28-day refresh period, users need to recharge monthly whether they have used the data or not. A more suitable pre-paid product is needed that allows longer refresh periods to reduce expenditure for homelands residents.

50% of survey respondents reported sacrificing essential household costs, such as food and bills, to afford internet access within the past six months (55% in 2022), with 90% compromising on connection speed and/or quality to prioritise affordability (71% in 2022).

With no mobile service in Gängan, 100% of those surveyed with mobile phones use pre-paid services. Pre-paid services enable people to pay what they can afford and when they have money, rather than commit to a billed service that they may not be able to pay when it is due.

During our 2022 visit, there were concerns raised that household data costs could increase significantly under the proposed broadband solution which would use pre-paid vouchers for data use.

- "We don't know how much [the] bills will be going up … They love [using YouTube and Tik Tok] they watch it non-stop." (Yinimala Gumana, Yirralka Rangers Co-manager / traditional owner, 2022)
- "If people are having to purchase data, which they're currently not having to do, [that's] an expense that they don't currently have. [If] you're living in poverty, it's obviously going to affect you." (Rachel Godley, LHAC Youth Program Manager, 2022)

There were calls to retain the free Wi-Fi service at the shop once the broadband service is installed to ensure a means of affordable access to online services.

- "I would like to think that there would be a level of free data available [and for] Laynha Health, to keep that Wi-Fi going … I think that's only fair." (Rachel Godley, as above, 2022)

There is currently no consumer information available in the community on options for household broadband plans, devices or strategies for managing costs.

Digital Ability

Digital literacy levels are relatively low currently

Digital literacy is rapidly becoming a necessary life skill for accessing online services and information, communicating, learning, and using digital technologies in the workplace and at home. Our survey found that most people used the internet (90%) but for a limited range of applications and online services. This is largely due to the restricted internet and device access in Gängan, and usage being almost entirely mobile only.

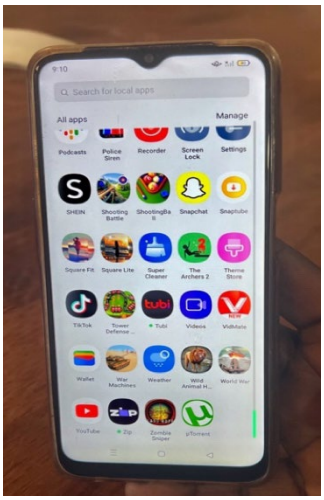


Figure 22: Social media, streaming apps and games on a resident's mobile phone

Digital literacy tends to be lowest among people over 50 years of age, people with disability, and those with limited English literacy. While all residents surveyed in 2023 speak a Yolŋu Matha dialect at home, 85% understand spoken English very or quite well and 75% understand written English.

Young people have higher levels of digital ability, however this does not necessarily extend to use of online services.

> With some of the young people that I work with, [I've noticed they are] very clever on the social media [but when it comes to using online] services on the phone, there [is] not a good understanding of that … there still needs to be a bit of work [to address that]." (Kerry Legge, CEO, Laynhapuy Homelands AC, 2023)

Of the 95% of respondents to our 2023 survey who used the internet within the last six months, 90% said they knew how to connect to a Wi-Fi network (indicated 'very true' or 'mostly true'), 58% said they could find and install apps, 53% could open a new internet browser tab, 37% were able to send and receive emails, and 32% could complete online forms. Among regular internet users, 79% had used online banking in the last six months, 63% had accessed online government services such as myGov or Centrelink, 32% had done online learning or study, and 32% had checked prices of products or services online.

Most usage of the Wi-Fi is for social media and content streaming.

- "[I use] Facebook [and] Messenger, chat there with my friends … Sometimes I use internet [to watch] Netflix [and Tubi or] download music … I don't use [MyGov] much, just banking." (Djamika Ganambarr, Youth worker / Co-researcher, 2023)

Only one survey respondent in 2023 had never used the internet and gave the following reasons for not using the internet: low confidence, no internet access, cost and lack of content in their own language.

Despite the limited connectivity, young people are increasingly using mobile phones and devices.

> **"Every kid's got a device [now], everyone's listening to music, TikTok's a thing, Facebook … Communities [are] talking about cyber bullying and cyber safety [which] wasn't on our radar [previously] because students didn't have their own devices."**
>
> - **Haidee Dentith, Laynhapuy School Principal, 2022**

Need for digital literacy training and support

With restricted access to computers and support outside the school, there are limited opportunities to develop more advanced capabilities and workplace readiness digital skills. With a broadband service planned for Gäng̲an̲, there is demand for support in use of digital devices and online services.

> **"With digital inclusion there still needs to [be support for people in] moving toward that equity … I remember when I didn't have a smart phone and all the education that I received around correct use of social media. [I] hope we don't just give people something and not also give them the means to make the change towards that."**
>
> - **Kerry Legge, LHAC CEO, 2022**

There is community demand for training and support in using online services and apps.

- "I think we need training [in] how to use the internet and how to use Wi-Fi and any stuff we've never seen … Some people know and some people need to learn. They need some people experienced [in] how to use laptop [and] how to use Westpac [and] MyGov." (Djamika Ganambarr, Youth worker / Co-researcher, 2023)

Yinimala Gumana urged that training be delivered in person, not online.

- "[We need] that to educate the people on the ground about this technology [because the internet] is something new for the communities and for the Yolŋu people really." (Yinimala Gumana, Yirralka Rangers Co-manager / traditional owner, 2022)

Elder Marrpalawuy Marika urged that training be co-delivered with Yolngu.

- "Side by side with Yolngu … It's best to have Yolngu arm and Balanda arm together [so] we can work on the same level, on the same table. [Also] teaching side by side with the younger generations and with the older. [That way elders] can be taught how to get into the communication and [digital] work more." (Marrpalawuy Marika, Gäng̲an̲ traditional owner, 2023)

For those without digital skills, there is a lack of internet access or support available.

- "I think whoever is bringing this technology needs to think of the other side as well. [And it's] progressive learning [so] It could also sit with the education and the schools [or] CDU [for adults]." (Kerry Legge, as above, 2022)

There is no agency currently delivering IT training or support in the region, with a question about who would be the appropriate agency to do this. Possible agencies referred to included ARDS, LHAC youth program or Yolŋu Business Enterprises.

- "Yes [we need that training]. Layna might help and do the training." (Billy Gumana, LHAC Board Director / traditional owner, 2022)

Laynhapuy School also said they may be able to play a role in providing basic online skills for community members if they have improved connectivity and get computers in schools.

With a regional focus on increased vocational training, digital skills could also become a role of the CDP provider Arnhem Land Progress Association (ALPA) in the future.

- "With the exit of Rio Tinto [from Gove Peninsula] by 2030 … this area could be a bit more of an education hub for the region … So it's going to be a very different type of focus up here [with more vocation specific digital training for rangers, cultural and media production, health and education]." (Kerry Legge, as above, 2022)

Prior to our 2023 visit, an nbn community ambassador Hayley Hardy had recently visited Gäŋgaŋ.

- "[Hayley got] a first-hand understanding of how fast the internet was, and what kind of problems people were having, [such as] access to bank, people not able to log on [or not] understanding the app. Some apps are really hard to follow. [She also wanted to find out if nbn's] community information is appropriate as well. [Most of their] videos were in English … but they were relatable." (Nadine Warbrick, LHAC Social and Emotional Wellbeing Worker, 2023)

Nadine pointed out that learning resources in language are the most effective, with resources that are visual and have few or no words also being effective.

Hayley's visit demonstrated the need for digital support in Gäŋgaŋ.

- "[She] ended up almost being a digital support worker. She had a line of 11 people at one stage here in Gäŋgaŋ, and people were saying, "I forgot my password. I need some help with calling Westpac" [It's good] having that person who's really good at bridging the gap between those worlds. [She] got straight to work [on] phone calls, on people's phones [and] trying to get around the systems of how to get things sorted. She got through quite a lot." (Nadine Warbrick, as above, 2023)

Hayley also delivered some online safety training during her visit.

- "[Hayley did a] presentation to the women here about shaming people online, like Facebook, and trolling, and being abusive on Facebook, so there was a good discussion [among the women]. And she did another one with children [where she showed] a video about YouTube safety." (Nadine Warbrick, as above, 2023)

Figure 23: Example of resources used for family and domestic violence awareness, including online safety

With online activity increasing, cyber safety training and support is needed

Cyber safety refers to the safe and responsible use of the internet, social media, online games, smart phones, and other connected devices. Cyber safety training aims to provide the knowledge and skills that people need to stay safe online. It aims to raise awareness about the range of potential online abuse or harms, including bullying or jealousing[13] on social media, trolling, exposure to pornography, violence or offensive content, scams or fraud, breaking cultural protocols and so on.

While there is general community support for improved internet access in Gäṉgaṉ, local residents and agency staff raised concerns about online safety risks, based on the experience of communities with mobile coverage in the region. This led to requests for more cyber-safety awareness in preparation.

- "[Sometimes people] argue each other through the phone [or are] bullying and other things … That makes trouble [and] is not [good] for the community and for our wellbeing. [People] need to learn and get the skills [to] understand [about online safety]." (Yinimala Gumana, Yirralka Rangers Co-manager / traditional owner, 2022)
- "Sometimes, it's very hard [for us] talking with the kids about using their mobile. [When broadband comes to] Gäṉgaṉ [kids] might [use] bad language on friends living in other communities. [We need] help from the school, from Laynha, elders, or even their own parents [to tell them about] languages that they shouldn't be doing." (Billy Gumana, LHAC Board Director / traditional owner, 2022)
- "Sometimes they tease one another through Messenger [or] Facebook … That's not good for kids growing in homeland … That's not healthy lifestyle." (Djamika Ganambarr, Youth worker / Co-researcher, 2023)

With satellite small cell mobile services being planned in several Laynhapuy homelands, the potential for an increase in cyber-bullying was raised as a particular concern.

- "We would like to see parental control system over kids' use of Facebook. Our main concern is cyber bullying, people having a go at each other through Facebook. We need this to be addressed before putting mobile into communities." (Yananymul Munuŋgurr, LHAC Chairperson / Garrthalala resident, 2022)
- "There's a lot of bullying online. [A serious incident in another community] started with kids on phones and Facebook, and then everyone would jump on. [It's] like public shaming [which is] incredibly damaging for people. And that does definitely escalate domestic violence, aggression in families." (Nadine Warbrick, LHAC Social and Emotional Wellbeing Worker, 2023)

We heard that young people in Yirrkala are posting fight videos. While this is a common trend in many remote communities, it increases the normalisation of violence and promotes copy-cat behaviour.

- "[In Yirrkala] I see kids fighting [and] pull out cell phones to record, [sometimes] just mucking around fights too. And that [is] exposing children to more violence." (Nadine Warbrick, LHAC Social and Emotional Wellbeing Worker, 2023)

While some elders want to limit internet access, it was argued that cyber-safety awareness training is a more effective long-term strategy.

- "There will always be some problems in bullying and [other online safety issues]. But [these issues are not] peculiar to the remote communities. [It] happens in white communities, [it] happens everywhere. [Rather than] try and prevent [access, we

[13] 'Jealousing' can refer to someone being jealous of their partner due to social media or phone use, potentially leading to domestic violence or control.

need] education [and local] leadership. [For] the children, [the school could provide] an aspect of their curriculum [on] how to deal with the bullying and the various other things that go on [social] media outlets." (Geoff Ellis, LHAC legal support, 2023)

The Laynhapuy School already provides some cyber-safety awareness, mostly in high school.

- "Certainly in our senior years program we've talked about it quite a bit … those conversations [need to be done] in a really sensitive way. [In] the senior years program [it's] easier to talk about [but] we're still working on [it for younger year levels]." (Haidee Dentith, Laynhapuy School Principal 2022)

The Laynhapuy youth program can assist in cyber-safety awareness, with cultural guidance from elders.

- "[Through] youth program, we can definitely incorporate that. [I work] closely with the school. We're having wellbeing camps in Term 3 [and] will be discussing online safety [within] a cultural framework [of] what's appropriate and what's not. [We] would need to go through the elders." (Rachel Godley, LHAC Youth Program Manager, 2022)

In a region that has strict cultural protocols around how news of someone passing away is communicated, there is also concern about the erosion of cultural protocols via social media.

> **"Recently a fella died [in] town and that was put on Facebook before people were told … There was a huge stir over that. [It's] happened a few times over the years [with] people becoming aware of people passing away before they're even told culturally appropriately. [Yolŋu now] have to consider [how to extend cultural protocols to the online world]."**
>
> **Lonnie Dentith, Nurse, Laynhapuy Health, 2022**

Increased scam messages and fraudulent services led to calls for more awareness and support (2023)

With scam calls, texts and online messages becoming more commonplace, it would be timely to have scam awareness training in advance of the introduction of new broadband or mobile services.

- "[Most] people understand scams, like random people ringing and leaving messages. It's the text messages with the 'click this link' [that] will catch people. We try to talk about [but need more awareness]. 'Don't click the link. Don't click that random email'." (Nadine Warbrick, LHAC Social and Emotional Wellbeing Worker, 2023)

There was also concern raised about television promotions resulting in people signing up for products or services they cannot afford. While legal, these were also referred to as 'phishing' scams.

- "I've seen any number of scams, whether it be people getting putting onto phone plans that are just totally and utterly inappropriate for where they are [to] people [signing up for deals they've] seen on television [like] fantastic fishing equipment that is beyond their financial capabilities … they sign up [and] then the money comes out of their account every month, and you [can't] turn that tap off. [Those] enticements [are literally] fishing, [designed to] lure them in [and] they get hooked up. [I try to help people get out of] contracts that they've entered into in [but I can only do that if] the Wi-Fi is working and the phone is working." (Geoff Ellis, LHAC legal support, 2023)

High-interest loans are a prime example of such services.

- "Afterpay is one that the people over-commit themselves. [Also] there's a lending mob in Darwin [who gave a client a] loan to get a car [but] the interest rate she was paying was 150%. [The loan] may be only $1,000 [but she] ended up paying $2,500 in just over 12 months. I put it down as corrupt activity." (Geoff Ellis, as above, 2023)

Local digital mentor roles could be a benefit, but adequate support needed for success

Funding for a digital mentors program was announced in the 2024 Federal budget. There was cautious interest in the concept of having digital mentor roles in Laynhapuy homelands, with the need for the roles to build on existing programs, have strong cultural guidance, and be well supported with regional coordination and resources.

> "In theory [digital mentor roles could work out here, but] that person needs to be set up for success [with the right knowledge]. Maybe they'd be shadowing someone [initially. Some young] people exhibit a lot of capability [and] confidence, but they need [support and] an assessment [so they can answer] bigger questions and [can] find information. [And they would need to be] part of a wider group doing that, so that they're hearing other stories [and learning and supporting each other. That way we ensure] that true transfer of knowledge [and] empowerment."
>
> - Kerry Legge, CEO, Laynhapuy Homelands AC, 2023

It was recommended that a digital mentors program would build on existing programs in the homelands.

- "Building on things that people are already familiar with, building on existing organisations and facilities that people use now, is always the key. It's the existing ecology of communication, [it's] what people are familiar with is what they will naturally build upon [and] feel comfortable with." (Kerry Legge, as above, 2023)

Figure 24: Aerial image of Gängan

05. CASE STUDY – COMMUNITY PREFERENCES FOR A BROADBAND SERVICE IN GÄNGAN

As previously outlined, the planned Regional Connectivity Program funded project for Field Solutions Group (FSG) to install a satellite backhaul broadband solution in Gängan and Wandawuy homelands, and two other NT communities, is no longer proceeding after unsuccessful efforts by FSG to revise the scope of the project. However, this case study from our 2022 report still remains relevant in informing a future broadband solution for Gängan. As such, we have made only minor updates to this section.

Community hopes and concerns about the planned broadband service

In 2022, Gängan residents and elders were looking forward to the new broadband service providing improved communications and internet access. However, they expressed concern about its potential impact on the strong social and cultural cohesion of their homeland.

> "The good things that I can see is ... it's good to be able to communicate others. [But] there's bad things happening as well ... our kids [are] going to use the mobile every day [and] the adults too [to] look at Facebook or [other social media]. That is very worrying for me ... If the kids or us as adults can sit around [and] play with the phone, all night or all day, then we'll miss the other parts, other important things like learning, schooling, work ... culture. Mainly the culture because in Yolŋu world we have a [strong] culture. ... We're still connecting to this country [and] we got kinship and law system ... We don't want to lose everything [because people are using] phones or technology for the first time [and become] addicted [to] games or whatever."
>
> - Yinimala Gumana, Yirralka Rangers Coordinator / traditional owner, 2022

The traditional owners of Gängan have governance over all aspects of the community's operations. The elders are keen to ensure that their cultural authority also extends to decisions about telecommunications services for the community.

Gängan community currently has free Wi-Fi, set up by Laynhapuy Health, which is available from 2–8 pm at the local shop each weekday, with longer hours on weekends. While limited in range and hours, this has been an effective self-managed model of internet access. There is concern, based on experience in other communities, that the sudden availability of 24/7 internet access would have a detrimental impact on this peaceful homeland. A phased-in approach which allows a level of community governance will help to reduce that impact.

> "The reason why we [restrict the Wi-Fi time is] we don't like kids waking up late ... We like our kids to have a better school instead of sitting down on Wi-Fi all the time. [When the broadband comes] we don't want to see kids wake up all night, we don't want to see that happening in our community. [Maybe we turn the internet off] a bit late, maybe 10:00 pm. We want our community to live in peace, and to have respect [and] for the kids to learn the culture."
>
> - Billy Gumana, LHAC Board Director / traditional owner, 2022

- "[When the broadband comes we want people] going to the bed at night [we want to be] able to stop the internet, maybe use it only for the [daytime] for our work [and] to communicate and send email and check [our] online services … We have to manage [that ourselves] otherwise we might fail … like don't go to work or to schooling [if kids] sit [up] all night." (Yinimala Gumana, Yirralka Rangers Co-manager / traditional owner, 2022)
- "With the Wi-Fi, we can control and what time we want to finish … We have a local school here and the children need to go to bed and then attend school the next day. [So] we don't want them staying up late on the internet." (Marrpalawuy Marika, Gäṉgaṉ traditional owner, 2023)
- "From my discussions with community members, [they want a] cut-off time at night [and] maybe [only text or] call at night … The community have to be empowered to make these decisions for themselves … not just one size fits all. [What Gäṉgaṉ want] might not be the same as Wandawuy." (Rachel Godley, LHAC Youth Program Manager, 2022)

The Laynhapuy School also raised concerns about children potentially staying up late and missing school.

- "The biggest risk is if it's not limited access, kids accessing internet all night. I think the only way we've managed that is where communities have [limited] the Wi-Fi [to] turn it off after 8:00 pm. Whereas if it's a 4G mobile tower and you can't turn off the 4G [then] we'll see a spike [in] absence with kids staying up all night on the internet." (Haidee Dentith, Laynhapuy Homelands School Principal, 2022)

The community want content filtering to reduce access to inappropriate content by young people.

- "The majority of community, particularly the elders [and] parents, do not want access to [inappropriate content or pornography] which youth are downloading and watching on their phones, on social media." (Rachel Godley, as above, 2022)

While most mobile base stations do not have content filtering, there is precedent. Optus have enabled content filtering on several satellite small cell services in remote WA communities. Also, at the request of community residents in Kiwirrkurra in WA, Telstra recently provided content filtering on the new mobile service there.

There are concerns about online safety and misuse of social media, based on experiences of large communities.

- "I don't want … people to use [the mobile service] for bad things [like] texting messages, bullying and other things in bad words …. We should respect one another and respect for the community … In this world, there's too many things that affected our life. [We] want to use for good purpose and for good reason, to able to send a message, text, get email and send email, or take photos or do video recording." (Yinimala Gumana, as above, 2022)
- "I think the Wi-Fi coverage would be good [but] we don't want [our children] getting … inappropriate content [or talking] wrong way on Facebook. It's been a huge problem." (Marrpalawuy Marika, Gäṉgaṉ traditional owner, 2023)

There was also concern about who is responsible for the ongoing maintenance of the infrastructure.

- "But my concern, if we get damage [to the equipment, who is responsible for] the cost. That is my question is, if we'll damage it, [is it] up to us to able to manage it. As I said, it is new thing for Yolŋu." (Yinimala Gumana, as above, 2022)

Community request for measures to limit impact of the broadband service

At the community's request, our team drafted a summary of requests about the broadband service design for LHAC, to distribute to NTG and other stakeholders. The document stated that Gängan residents are looking forward to the service, but outlined concerns raised by Gängan community members, including potential impacts of full-time internet access, cyber-safety issues, and the cost of pre-paid data to access essential online services.

As the Gängan homeland is community run, they would like to implement a cultural authority approach to the communications as well. In particular, they are requesting that the broadband service have some of the features of the current Wi-Fi service, including the ability to switch off internet access at night, allowing calls only.

The document outlined the following requests in the setup of the new broadband service:

- Data access to be restricted overnight, with a curfew time to be determined by the community, allowing only phone calls and texts overnight
- Content filtering on all DNS traffic through the service
- The ability to locally 'switch off' data access, if there is misuse, to allow time for the community to address the situation before reinstating the service
- A means for government services, banking and other key services to be unmetered (free of charge)
- The cost of pre-paid data or vouchers to be affordable.

While some considerations may be technically challenging or have cost impacts, the paper proposed a partnership approach with LHAC to ensure an effective model for the community.

If the community's requests are implemented, Gängan's experiences would offer a model of culturally appropriate broadband and phone service that other communities and homelands across Australia may want to consider.

Figure 25: Welcome sign at Gängan airstrip

06. CONSIDERATIONS FOR LOCAL DIGITAL INCLUSION PLAN

Developing a local Digital Inclusion Plan enables a coordinated place-based approach to addressing some of the challenges outlined in this report. It also provides a useful tool for advocacy to government, industry, and for fundraising efforts. The strategies below are based on input from community stakeholders and are possible options for local planning to improve communications services and digital inclusion in Gäṉgaṉ. These are not intended to be prescriptive, nor are they listed in order of priority.

Based on our 2023 interviews and discussions, the proposed Digital Inclusion Plan has been updated with new strategies and a column for Progress / Next Steps, to track progress on the actions over time.

Identified Issue	Possible Actions	Potential Stakeholders	Progress/ Next Steps
Regional planning and development			
Regional planning: Need for LHAC input to NTG East Arnhem Digital Connectivity Strategy to address connectivity needs and appropriate delivery models for Laynhapuy homelands	Establish a regional planning process for community consultation with NTG and telcos regarding the design and operation of planned services and solutions to address outstanding needs using appropriate delivery models	Laynhapuy Homelands A.C. (LHAC) Northern Territory Government (NTG) Telstra nbn	*There is increased consultation with LHAC by NTG and telcos about project delivery, but limited involvement in planning to date*
Regional needs assessment: Some Laynhapuy homelands having limited or no connectivity and/or existing infrastructure is not working reliably	Undertake review of existing communications infrastructure in Laynhapuy homelands Develop strategy to guide future infrastructure planning, upgrades, cost models, and policies on co-design and shared use Review maintenance processes including remote monitoring and support to reduce outage times; coordinate maintenance/IT support between agencies where possible	LHAC Laynhapuy Health NTG	*Some needs analysis has been undertaken by LHAC and Laynhapuy Health*
Change management: Need for change management plan to prepare for new technology access	LHAC to work with Board and homelands representatives to develop and circulate a communications change management plan to empower people to have input into communications delivery models, maximise benefits and reduce risks of introduction of mobile and broadband services	LHAC NTG	*Yet to do*

Identified Issue	Possible Actions	Potential Stakeholders	Progress/ Next Steps
Access			
Computer access: Demand for access computers for digital skills development, access to online services, meetings, and remote learning	Identify appropriate space/s for community access computers/laptops/tablets and peripherals (printer/scanner, monitor etc.) to meet different community needs, including privacy for meetings	LHAC Laynhapuy Health Laynhapuy Homelands School ALPA (CDP provider)	*Yet to do*
Ongoing public Wi-Fi access: Ongoing need for Wi-Fi access beyond installation of broadband solution	Continue provision of free Wi-Fi at Gäŋgaŋ Shop to ensure affordable internet access beyond installation of the broadband service	LHAC Laynhapuy Health	*Laynhapuy Health planning to continue providing Wi-Fi hotspot*
Telehealth: Need fast, low latency broadband for telehealth	Consider trial of Starlink satellite service for Gäŋgaŋ clinic	Laynhapuy Health NTG	*Starlink installed in four clinics, but not in Gäŋgaŋ as yet*
Lack of household internet for school students: Low home internet access limits extended learning opportunities for students	Promote the Federal Government's School Student Broadband Initiative within Laynhapuy homelands, which provides free nbn broadband to end of 2025 for households with school students but no broadband access	LHAC nbn Anglicare	*Yet to do*
Affordability			
Data costs: High expenditure on pre-paid mobile data despite irregular access to a mobile service, with 45% of households paying over $200/month (currently 28-day refresh period)	Advocate for a pre-paid option with longer refresh period and lower data costs for homelands residents Provide accessible information in store (posters, brochures) and on Yolŋu Radio outlining ways to minimise costs of data usage via mobile and satellite service	LHAC NTG nbn Co	*nbn have proposed including Gäŋgaŋ as one of the 23 Wi-Fi sites funded by Australian Government, with consultation underway as at June 2024*
Need for consumer information to limit financial impact of new broadband service	Provide independent consumer information about telecommunications plans, devices or strategies for managing data use and costs	LHAC nbn Local Anglicare ACCAN	*Yet to do*
Digital Ability			
IT training and support: Limited digital skills, use of online services and cyber-safety awareness, particularly among seniors	Delivery of informal digital skills workshops, possibly at Gäŋgaŋ School Discuss options for digital skills workshop delivery with nbn Community Engagement team or inDigiMOB	LHAC Laynhapuy Homelands School Telstra nbn inDigiMOB	*Yet to do*

Identified Issue	Possible Actions	Potential Stakeholders	Progress/ Next Steps
Digital mentor: High demand for support in setting up and using online services, banking, sourcing identification, SIM activation, etc	Employment of a digital mentor, possibly based at Gängan shop, to support people to use online government, banking and other services and apps, phone SIM activation/recharge, ID requirements etc	DHS / Centrelink CDRC nbn Local	*Funding for Digital mentor roles allocated in 2024 Federal budget; funding program yet to be developed*
Workplace digital skills: Demand for workforce readiness IT skills	Incorporate digital skills training into workforce readiness training and on-the-job training by local agencies as needed	Laynhapuy Health Laynhapuy Homelands School Yirralka Rangers ALPA CDP	*On-the-job training involved in most roles currently, however more digital skills training is needed*
Access to media services			
TV services failure: VAST direct-to-home satellite TV services not working in all Gängan households; only four houses with VAST dishes; high cost to repair satellite equipment or replace set-top boxes	Advocate for funding to upgrade or install VAST satellite services in all residences, replace VAST set-top boxes in homes where not working, and shelf unit and power surge protectors needed for set-top boxes. VAST boxes should be sold at cost price. *Note: DITRDCA currently have an Audit Group for remote and regional TV services to review future of VAST services in remote communities*	LHAC NTG Australian Government (DITRDCA)	*No funding program as yet for communities to switch to local broadcast model, nor for a VAST equipment repair program (pending outcomes of audit report)*
Yolngu Radio not reliable: Upgrade Yolngu radio broadcast equipment and UPS to improve reliability in Gängan	Advocate for funding to re-establish and maintain an ABC radio service in Yuelamu (and other central Australian communities) Provide training for local person to monitor and reset radio service if not working	LHAC ARDS NIAA	*ARDS to apply to Community Broadcasting Foundation for funding for equipment upgrade*

Figure 26: Co-researcher Guruwuy Ganambarr doing a survey with resident Alissia Wirrpanda, 2022

Appendix 1: Summary of Survey Results

Note: Surveys undertaken in 2022 included 1 of 31 non-First Nations respondents, whereas all 20 respondents in 2023 were First Nations. During our 2023 visit, nearly half of Gängan residents were away for funerals, hunting and other activities, which impacted on demographic range (e.g. more females). Please note these differences when comparing between the two sets of results. Not all respondents answered all questions, so percentages are based on the number of respondents to each question.

Demographics	2022 (31 respondents)	2023 (20 respondents)
Gender	58% female; 42% male	75% female; 25% male
% Aboriginal	97%	100%
Education	42% up to year 12 29% year 10 or below 10% with tertiary education (certificate, diploma)	45% up to year 12 15% year 10 or below 25% with tertiary education (certificates I-IV)
Employment	81% employed or on CDP (44% of these full-time) 10% given up on looking for work 3% unemployed 29% looked for work in past month	65% employed or on CDP (23% of these full-time) 15% unable to work due to disability 10% unemployed 30% looked for work in past month
Welfare	55% received Centrelink (primarily JobSeeker / Youth Allowance and Family Tax Benefit)	81% received Centrelink (primarily JobSeeker / Youth Allowance and Family Tax Benefit)
Housing	97% in multi-generational or shared households (6.3 people per house)	100% in multi-generational or shared households (6.5 people per house)
% with long-term disability or health condition	26%	20%
% who speak a language other than English at home	100%	100%
ATSI languages spoken (multi-choice question)	87% Yolngu Matha 10% Dhuwaya 3% Dhay'yi 1 other language	95% Yolngu Matha 25% Dhuwaya 10% Dhay'yi 3 other languages
Understanding of English (very and quite well)	Spoken English: 97% Written English: 84%	Spoken English: 85% Written English: 75%
Average weekly household income	$1,109.98	$1,061.34
Income breakdown	10% $1–$399 23% $400–$999 65% $1000–$1999 3% above $2000	0% $1–$399 42% $400–$999 58% $1000–$1999 0% above $2000

Phone use	2022 (31 respondents)	2023 (20 respondents)
Primary devices used for phone calls (multi-choice question)	90% public phone 84% mobile phone (own) 61% phone in community office or workplace 23% fixed line phone in home 10% shared mobile phone 6% someone else's fixed line home phone	100% public phone 85% mobile phone (own or shared) 15% phone in community office or workplace
Reliability of public phone	0% don't use a public phone 19% said it was reliable 81% said it was not or sometimes reliable	0% with no access to public phone 100% said it was reliable 0% said it was not reliable 0% don't know
Rate of mobile phone ownership	87% own or share (100% of these smartphones)	85% own or share (100% of these smartphones)
% prepaid services	100%	100%
Average pre-paid data allowances	0% no data 70% pay for up to 10 GB / month 30% 11–40 GB / month 0% 41–60 GB / month 0% over 60 GB / month 0% unlimited	0% no data 47% pay for up to 10 GB / month 53% 11–40 GB / month 0% 41–60 GB / month 0% over 60 GB / month 0% unlimited
Average number of prepaid services per household	N/A	3.5
Household pre-paid mobile expenditure	**31 responses** Average household cost of $184 / month 32% pay up to $100 / month 35% pay $101–$200 / month 19% pay $201–$300 / month 13% pay over $300 / month	**20 responses** Average household cost of $115 / fortnight 55% pay up to $100 / fortnight 35% pay $101–$200 / fortnight 10% pay $201–$300 / fortnight 0% pay over $300 / fortnight
Media use	**2022 (31 respondents)**	**2023 (20 respondents)**
Radio access (multi-choice question)	68% listen via car 32% listen to a radio at home 29% via phone/tablet 29% never listen to radio	82% listen via car 24% only listen to radio at places other than the home or car 18% listen to a radio at home 18% via phone/tablet 15% never listen to radio
Primary radio stations listened to	Yolŋu Radio (29% listening daily or weekly, 29% occasionally)	Yolŋu Radio (40% listening daily or weekly, 50% occasionally)
TV access (multi-choice question)	60% only via USB/DVDs on TV 17% via phone 10% never watch TV	85% only via USB/DVDs on TV 50% via phone 5% never watch TV
VAST TV access	3% have VAST service working 55% VAST not working (41% due to set-top box not working, 31% due to a damaged dish or cabling) 42% do not have VAST installed at house	0% have VAST service working 45% VAST not working (47% due to set-top box not working, 47% due to a damaged dish or cabling) 55% do not have VAST installed at house

Most popular sources of TV and online content (multi-choice question)	YouTube (39% daily, 13% weekly) Streaming services (23% daily, 3% weekly) Other (17% daily, 3% weekly)	YouTube (45% daily, 25% occasionally) Streaming services (20% daily, 15% occasionally) Other (16% daily, 5% occasionally) Commercial TV (7, 9, 10) (0% daily, 20% occasionally)
Primary sources of news and information (multi-choice question)	Direct / in-person communication (77% daily, 10% weekly, 6% occasionally) Facebook (29% daily, 16% weekly, 16% occasionally) Other social media (29% daily, 10% weekly, 0% occasionally) Online news service (13% daily, 10% weekly, 13% occasionally) Other (10% daily, 7% weekly, 10% occasionally) Yolŋu Radio (10% daily, 13% weekly, 32% occasionally)	Direct / in-person communication (90% daily, 10% weekly, 0% occasionally) Facebook (25% daily, 10% weekly, 15% occasionally) Other social media (20% daily, 5% weekly, 40% occasionally) Yolŋu Radio (15% daily, 20% weekly, 40% occasionally) Online news service (10% daily, 15% weekly, 25% occasionally) Online (other than social media / news) (10% daily, 5% weekly, 10% occasionally)
Primary sources of emergency information (multi-choice question)	Direct / in-person communication (87%) Yolŋu Radio (48%) Facebook (42%) Online emergency services (23%) Other social media (23%) Call through public phone (19%) Online news service (13%) PA announcement (10%)	Direct / in-person communication (100%) Yolŋu Radio (40%) Facebook (35%) Store megaphone (20%) Rangers' speaker system (15%) Online emergency services (15%) Commercial TV (10%)
Internet use	**2022 (31 respondents)**	**2023 (20 respondents)**
Latest internet use	58% used internet in past week 23% in past month 10% never use the internet	80% used internet in past week 0% in past month 5% never use the internet
Rate of internet use (of respondents who had used the internet within the last three months)	0% use the internet almost constantly 21% several times a day 43% about once a day or several times a week	5% use the internet almost constantly 42% several times a day 26% about once a day or several times a week
Regular internet users (Indented sections below refer to respondents who used internet in last six months)	**90%**	**95%**
Primary online devices (multi-choice question)	Smartphone (89%) Smart TV (14%) Tablet (14%) Portable laptop or notebook computer (7%) Smart speaker (7%)	Smartphone (95%) Smart TV (47%) Desktop computer (5%) Portable laptop or notebook computer (5%)
Use of internet provided by others (multi-choice question)	79% public space with free Wi-Fi 21% at place of work or education 21% community or Shire office 14% community access centre	58% public space with free Wi-Fi 47% shopping centre, retail, or service business 32% community or Shire office 11% at houses of friends or family

Reasons given for not using the internet more (multi-choice question)	'I do not have convenient access to the internet' (71%) 'I am not confident using the internet' (43%) 'The internet is too expensive for me' (39%) 'I do not need to use the internet more often' (36%) 'I do not have access to content in my own language' (36%)	'I do not have convenient access to the internet' (84%) 'The internet is too expensive for me' (42%) 'I am not confident using the internet' (32%) 'I am concerned about privacy or scams' (26%)
Concern about amount of time spent online	4% extremely concerned 14% moderately concerned 0% slightly concerned 79% not at all concerned	0% moderately to extremely concerned 16% slightly concerned 79% not at all concerned
Low internet users	**10%***	**5%***
Reasons given for not using the internet more (multi-choice question)	'I am not confident using the internet' (100%) 'I do not have access to the internet' (67%) 'The internet is too expensive for me' (67%) 'I do not have access to content in my own language' (67%) 'I am concerned about inappropriate content and causing conflict' (67%)	'I do not have access to the internet' (100%) 'The internet is too expensive for me' (100%) 'I am not confident using the internet' (100%) 'I do not have access to content in my own language' (100%)
Fixed broadband services (e.g. nbn Sky Muster, Starlink)	100% did not have any kind of fixed home internet	100% did not have any kind of fixed home internet
Respondents with fixed broadband	0%	0%
Data allowances	N/A	N/A
Average cost	N/A	N/A
Mobile broadband services (e.g. 4G modem or dongle)	94% without any mobile broadband device 6% used a laptop/tablet SIM	100% without any mobile broadband device
Respondents with mobile broadband	6% (100% of these pre-paid)	0%
Data allowances	100% had less than 10 GB / month	N/A
Frequency of exceeding data limits	100% exceeded their monthly data limit between 1–5 times in the last year	N/A
Affordability	**2022 (31 respondents)**	**2023 (20 respondents)**
How often respondents cut back on essential household costs to afford personal or household internet	3% often or always 55% sometimes 42% rarely or never	15% often or always 35% sometimes 50% rarely or never
Respondents who compromise on internet speed and/or quality to prioritise affordability	71%	90%

* Note that due to low samples, 5% -10% are only 1-3 respondents, so these responses may not be representative.

Digital Ability	2022 (31 respondents)	2023 (20 respondents)
Regular internet users (The following indented sections refer to respondents who had used the internet within the last six months)	90%	95%
Basic digital ability metrics (very true or mostly true of me)	Connect to a Wi-Fi network (86%) Use a mobile device as a Wi-Fi hotspot (75%) Find and install apps (64%) Open a new browser tab (57%) Send and receive emails (54%) Download and then open a file (46%) Complete online forms (36%)	Connect to a Wi-Fi network (88%) Use a mobile device as a Wi-Fi hotspot (77%) Find and install apps (67%) Open a new browser tab (55%) Send and receive emails (48%) Download and then open a file (44%) Complete online forms (39%)
Online security and cyber-safety awareness (very true or mostly true of me)	Set/manage secure passwords (61%) Add or remove friends or followers on social media (61%) Set/adjust privacy settings (54%) Identify which apps/software are safe to download (46%) Decide what personal information to share online (36%) Check if information is trustworthy (18%)	Add or remove friends or followers on social media (79%) Set/manage secure passwords (58%) Decide what personal information to share online (47%) Set/adjust privacy settings (42%) Identify which apps/software are safe to download (42%) Check if information is trustworthy (32%)
Online content creation (very true or mostly true of me)	Produce online content (46%) Post videos (57%) Create websites (21%) Awareness of online copyright law (14%)	Produce online content (26%) Post videos (21%) Create websites (5%) Awareness of online copyright law (5%)
Smart devices (e.g. smart TV) (very true or mostly true of me)	Connect smart devices (e.g. smart TV) to the internet (50%) Adjust smart device privacy and security settings (46%)	Connect smart devices (e.g. smart TV) to the internet (47%) Adjust smart device privacy and security settings (26%)
Primary online activities (activities undertaken in past six months)	Online banking (79%) Accessing government services (54%) Online learning / study (43%) Accessing health information (39%) Comparing prices of products etc (36%) Online buying / selling (32%)	Online banking (79%) Accessing government services (63%) Comparing prices of products etc (32%) Online learning / study (32%) Tracking packages (26%)
Social media use (usage in past six months)	Keeping in touch with family or friends (77%) Meeting new friends or reconnecting with old friends online (71%) Engaging with community (63%)	Keeping in touch with family or friends (53%) Meeting new friends or reconnecting with old friends online (37%) Engaging with community (42%)
Online entertainment (in past six months)	86% used online entertainment services 32% attended an online music, arts, or cultural event online	95% used online entertainment services 84% attended an online music, arts, or cultural event online 21% played online games
Online navigation and transport	32% had navigated a route via maps on a smartphone	63% had navigated a route via maps on a smartphone

Comments

Internet and phone access

We want Internet at the house so the kids can use it. We need a phone at our house not just public phone. The TV should be put back on our house. I would like more help to learn to use Internet banking and online services

- Free Wi-Fi in the house
- Telstra tower in Gängan please - Wi-Fi access in the house
- Telstra and more Wi-Fi
- We want TV working and more Wi-Fi
- We want to get Wi-Fi at our house
- Free Wi-Fi in Gängan - Telstra mobile
- Telstra in Gängan - Wi-Fi across community
- We want Wi-Fi around the community
- We want more Wi-Fi in Gängan but we don't want it to cost us a lot. It's better if it comes out of Centrelink payments
- It would be good to have mobile in Gängan so we can make phone calls and get Internet at home.
- We want Telstra mobile here
- Telstra in Gängan to access internet in the house
- More internet AND satellite dish so can ring when out bush. VAST TV repaired

TV and radio access

- We want the TV working at my house. We should have ARDS and ABC radio here.
- I've got a TV but no satellite working to watch TV channels
- We want TV to save money on Netflix and Wi-Fi
- We also need TV working at our house

Digital ability /other

- We like Gängan to stay peaceful

We need more help to learn about online services and cyber safety and scams but it needs to be translated in our language

Figure 27: Lyndon Ormond-Parker showing survey to co-researcher Djamika Ganambarr

Appendix 2: Community Communications Audit

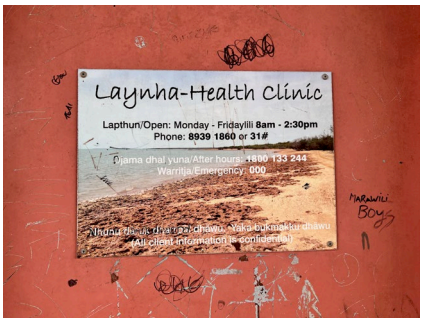
About the community	
Community name:	Gäŋgaŋ
Traditional owners/ Language group	Yolŋu Matha (Dhuwaya)
Location (Coords)	Longitude: 135.944 Latitude: -13.046
Region	East Arnhem
LGA/Shire/ Regional Council	East Arnhem Regional Council
Land Council	Northern Land Council
Regional service centre, distance	206 km from Yirrkala; 220 km from Nhulunbuy; 35 min flight from Gove airport
Remoteness (ABS / ARIA+)	Very remote
Demographic data – ABS 2021	
ABS link – Aboriginal and/or Torres Strait Islander (ATSI) people QuickStats	https://abs.gov.au/census/find-census-data/quickstats/2021/ILOC70600302
Total population	82 (LHAC estimate 100)
ATSI population	100%
Gender breakdown	50% male, 50% female
Median Age	21
Families	17
Language groups – numbers of speakers	Yolŋu Matha dialects – primarily Dhay'yi, Dhuwaya, Dhuwal
% ATSI people who speak an ATSI language	100%
% who speak only English at home	0%
Employment levels	No data
Education levels	No data
Number of buildings	13 residential houses
Housing suitability for ATSI households	6.3 (7.6 if using population of 100)
Median weekly ATSI household income	$1,812
Median personal income – over 15 years	No data
Average weekly rent	$90
Average motor vehicles per dwelling	No data
Community services and plans	
Community layout plan	See: https://bushtel.nt.gov.au/profile/498?tab=detail
Agencies in community	Laynhapuy Homelands Aboriginal Corporation – Yirralka Rangers, LHAC Youth program, municipal services Laynhapuy Health Services, stores, Ganybu Housing AC; Laynhapuy Homelands School; CDP - Arnhem Land Progress Association (ALPA)

Visiting agencies	Northern Land Council; Anglicare (money management); AFL; contractors
Community development plan	Not published. See Laynhapuy Homelands A.C. – https://www.laynhapuy.com.au
Power supply/type in community	Local diesel generator
Use of power cards	Power cards were used, not since COVID – covered by LHAC
Types of communications available	
Public phones – number/ location	One Telstra public phone and one free call phone in shop
Home / agency phones	Yinimala Gumana has only home phone, all others in agency buildings – School, clinic, VOQ, pre-school, ranger base.
Mobile coverage	None
Coverage description	HCRC phone system for phone; Sky Muster for broadband
Fibre to community	No
ADSL – number of connections	No
Fibre-to-the-premises connections	No, satellite
Satellite services – number, locations, provider	Sky Muster for school and clinic and VOQ/training centre; eMerge satellite for Wi-Fi on shop; no other staff houses in community
UHF or HF Radio	UHF radio used by rangers
Status of services – faults, issues, speeds during peak use time etc	HCRC phone system regular dropouts/ outages, especially during rainfall events; Regular generator outages
Communications funding history – Mobile Black Spots, Regional Connectivity Program, state government investment etc	Australian Government funding to NBN to install Wi-Fi mesh in 20 remote communities ; Regional Connectivity Program Round 1 for FSG broadband solution (project did not proceed)
Any planned upgrades?	Yes. NBN Wi-Fi mesh network to be installed in 2024-25 (pending consultation)
Emergency information system	Primarily word of mouth; Marakuku's megaphone at the Gäŋgaŋ shop
Telemetry network	None being used
Media services available	
Radio services broadcast – AM or FM	Yolŋu Radio (FM) is the only radio service
TV services	VAST satellite direct-to-home is only form of TV access, however this is not working in any of the 13 houses
Other media services – newspaper etc	None
Community access facilities	
Public access facilities	None
Public Wi-Fi availability, free or voucher system, agency, RSP, monthly download limit	Free public Wi-Fi at store, available 2-8 pm – provided by Laynhapuy Health

Appendix 3: Photos of Research Activities

Figures 28 & 29: Lyndon Ormond-Parker helping co-researcher Djamika Ganambarr; Gängan shop with free public Wi-Fi

Figures 30 & 31: Children using mobile phone to stream online TV content via Wi-Fi; Co-researcher Djamika Ganambarr



Figures 32 & 33: Laynhapuy Homelands AC office in Yirrkala; Laynhapuy Health Clinic sign.

Figures 34 & 35: Marrpalawuy Marika on mobile phone; Daniel, Djamika and Lyndon at the air strip