

Auracast User Experience Testing – Report



Get Skilled Access acknowledges the Traditional Custodians on whose ancestral lands we live, and work and we pay our respects to their Elders past and present. We acknowledge and respect the deep spiritual relationship that Aboriginal and Torres Strait Islander people have to Country. We also pay our respects to the cultural authority of Aboriginal and Torres Strait Islander people and their nations across Australia.



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Executive summary

In 2026, Get Skilled Access, in collaboration with La Trobe and NEC Australia, undertook a research project supported by the iMOVE Cooperative Research Centre (CRC). The goal of the project was to explore the application of Auracast™ broadcast audio technology on and around public transport, as well as other complex public environments.

Get Skilled Access (GSA) was commissioned to perform an In Vivo functional inclusion assessment of the accessibility features of Auracast technology. The primary objective of this assessment was to collect qualitative and observational data from participants with diverse disability regarding the accessibility of the technology whilst in public transport environments.

The findings and resulting insights gathered from the assessment will enable a better understanding of the current accessibility of Auracast technology, identify areas for improvement, and allow for comparison with existing hearing technology. This phase of research builds on an earlier series of focus groups, which explored how people with disability access important information in public spaces and identified key barriers with existing hearing technologies. The insights and recommendations from that initial phase directly informed this stage, user testing of Auracast in public transport environments, to evaluate how effectively it addresses these challenges in real-world settings.

Approach

The approach consisted of 19 two-hour user testing sessions across three locations. Testing participants consisted of a diverse group of people with disability including those who are deaf, hard of hearing, neurodivergent, blind, or have low vision, and/or those who experience situational or cognitive barriers in public transport environments.

Participant breakdown:

5 x People who use hearing aids

3 x People who use both hearing aids and cochlear implants

1 x Person who uses a cochlear implant and required an Auslan interpreter

2 x People who are blind

1 x Person with low vision

1 x Person who uses a cochlear implant and has low vision

1 x Neurodivergent person

Further details regarding testing participants can be found in the table below:

Participant – Disability	Age	Gender	Access requirements:
Participant 1 Anita - Hard of hearing		Female	Cochlear Implant and Hearing Aid user: Nucleus 8 LEH and Phonak Audio Sphere RE
Participant 2 Bryce - Neurodivergent		Male	Adaptive headphone user. Uses noise cancelling headphones to support sensory needs. Uses Public transport frequently and travels often
Participant 3 Trevor - Hard of hearing		Male	Hearing aid user: Roger Phonak
Participant 4 Oliad - Hard of hearing		Male	Cochlear implant user: Nucleus 8 Uses Auslan to communicate
Participant 5 Elli - Hard of hearing		Female	Cochlear Implant and Hearing Aid user: Nucleus 8 Nexa (Auracast enabled) and Resound Nexia 7 mini RITE

Participant 6 Diana - Hard of hearing		Female	Hearing Aid user: Beltone serene 9 SER962S-DRWC
Participant 7 Adam – Hard of hearing		Male	Hearing Aid user: Non custom device (No Bluetooth capability) Travels frequently
Participant 8 Charlotte – Low vision		Female	Adaptive headphone user. Uses a white cane. Uses trains often, tends to avoid catching buses and trams
Participant 9 James – Hard of hearing / Low vision		Male	Cochlear Implant User: Nucleus 8 (Auracast ready but not enabled) Uses screen reader technology Catches Public Transport often
Participant 10 Amanda – Blind		Female	Adaptive headphone user Uses a Guide dog. Does not catch public transport often
Participant 11 Louise - Hard of hearing		Female	Cochlear Implant and Hearing Aid user: Cochlear CP1110 (Nucleus 8) and Resound EQ998-DWT (Enzo Q)
Participant 12 Rory – Deaf/Hard of hearing		Male	Hearing Aid user: Phonax Naida L90-UP in both ears. Uses speech to text technology
Participant 13 Rhiannon - Hard of hearing		Female	Hearing Aid user: GN Hearing XD760-DRWC Uses captions and speech to text technology Uses Public Transport often
Participant 14 Graham – Blind		Male	Adaptive headphone user Uses a ‘mini guide’ cane

Testing took place at the 3 below locations on the following dates:

Location	Dates	Number of sessions
Melbourne Airport	Wednesday 13 th May	4
	Thursday 14 th May	3
High Point shopping centre, Maribyrnong, CDC bus route	Tuesday 19 th May	3
	Thursday 21 st May	4
Dickson Interchange, Canberra, Transport Canberra bus and light rail	Monday 25 th May	5

Methodology

GSA took a mixed method approach which included interviews and simulations. To gather rich, qualitative data, interviews and observations of real-life simulations were conducted of participants day-to-day experiences navigating on and around public transport settings. Participants completed two scenarios per user; an independent run through, and a guided run through. During the testing, participants were interviewed using a consistent set of questions across both scenarios to assess and compare their experience and sentiment.

The In Vivo Functional Inclusion Tool

To support this assessment, GSA have developed an In Vivo Functional Inclusion tool, designed to gather qualitative and observational data about inclusion for people with a diverse range of disability. This tool is unique because it was used on site by GSA consultants with disability, and it includes considerations for how accessibility features perform or behave depending on the environment.

After completing each scenario on site, participants were also asked to rate how easy they found each usability feature on the In Vivo Functional Inclusion Tool using a five-point Likert scale.

The ranking scale was:

1. Can access and use independently with ease
2. Can access and use independently with moderate effort
3. Can access and use independently with maximum effort
4. Requires assistance to access or use
5. Access or use is not possible

The testing evaluated:

- Ease of connecting to Auracast broadcasts
- Audio clarity and reliability
- Usefulness for passengers, including people with disability
- Overall passenger experience during journeys

The specific features and elements that were validated included:

- Setup and Log in
- Connection

- Volume
- Audio quality
- Channel content
- App Customisation

Functional Assessment

Feature		Participant	Vivo Functional Assessment Rating				
			1	2	3	4	5
Melbourne Airport							
1	Self-guided	# 1					
		# 2					
		# 3					
		# 4					
		#5					
		#6					
		#7					
2	Login	# 1					
		# 2					
		# 3					
		# 4					
		#5					
		#6					
		#7					
2	Navigate	# 1					
		# 2					
		# 3					
		# 4					
		#5					
		#6					
		#7					
3	Connection	# 1					
		# 2					
		# 3					
		# 4					
		#5					
		#6					
		#7					

4	Audio quality	# 1					
		# 2					
		# 3					
		# 4					
		#5					
		#6					
		#7					
5	Channel 1 content	# 1					
		# 2					
		# 3					
		# 4					
		#5					
		#6					
		#7					
6	Moving through airport	# 1					
		# 2					
		# 3					
		# 4					
		#5					
		#6					
		# 7					
7	Arriving at Gate	# 1					
		# 2					
		# 3					
		# 4					
		#5					
		#6					
		# 7					
8	Beacon Range	# 1					
		# 2					
		# 3					
		# 4					
		#5					
		#6					
		#7					
9	Channel 2	# 1					
		# 2					
		# 3					
		# 4					
		#5					
		#6					
		#7					
10	Customisation	# 1					
		# 2					
		# 3					

		# 4					
		#5					
		#6					
		#7					
Highpoint Maribyrnong – CDC bus route							
1	Self-guided	# 1					
		# 2					
		# 3					
		# 5					
		# 6					
		# 8					
		# 9					
2	Login in	# 1					
		# 2					
		# 3					
		# 5					
		# 6					
		# 8					
		# 9					
3	Navigate	# 1					
		# 2					
		# 3					
		# 5					
		# 6					
		# 8					
		# 9					
4	Audio quality	# 1					
		# 2					
		# 3					
		# 5					
		# 6					
		# 8					
		# 9					
5	Channel 1 content	# 1					
		# 2					
		# 3					
		# 5					
		# 6					
		# 8					
		# 9					
6	Connecting to the bus entering	# 1					
		# 2					
		# 3					
		# 5					

		# 6					
		# 8					
		# 9					
7	Arriving at bus	# 1					
		# 2					
		# 3					
		# 5					
		# 6					
		# 8					
		# 9					
8	Channel 2	# 1					
		# 2					
		# 3					
		# 5					
		# 6					
		# 8					
		# 9					
10	Customisation	# 1					
		# 2					
		# 3					
		# 5					
		# 6					
		# 8					
		# 9					
11	Bus connecting outside	# 1					
		# 2					
		# 3					
		# 5					
		# 6					
		# 8					
		# 9					
12	Noise – External/ bus	# 1					
		# 2					
		# 3					
		# 5					
		# 6					
		# 8					
		# 9					
Dickson bus and light rail Interchange, Canberra							
1	Self-guided	# 10					
		# 11					
		# 12					
		# 13					
		# 14					

2	Login in	# 10					
		# 11					
		# 12					
		# 13					
		# 14					
3	Navigate	# 10					
		# 11					
		# 12					
		# 13					
		# 14					
4	Audio quality	# 10					
		# 11					
		# 12					
		# 13					
		# 14					
5	Channel 1 content	# 10					
		# 11					
		# 12					
		# 13					
		# 14					
6	Connecting to light rail	# 10					
		# 11					
		# 12					
		# 13					
		# 14					
7	Arriving at bus	# 10					
		# 11					
		# 12					
		# 13					
		# 14					
8	Connecting to the bus	# 10					
		# 11					
		# 12					
		# 13					
		# 14					
10	Channel 2	# 10					
		# 11					
		# 12					
		# 13					
		# 14					
11	Customisation	# 10					
		# 11					
		# 12					
		# 13					
		# 14					

12	Bus connecting outside	# 10					
		# 11					
		# 12					
		# 13					
		# 14					
13	Noise – External/ bus	# 10					
		# 11					
		# 12					
		# 13					
		# 14					

Summary of Findings

Auracast Broadcast Audio Technology was assessed and identified as an effective new option for all participants involved in the user testing sessions. While some participants encountered minor challenges with the technology’s elements and features, most participants expressed a preference for Auracast technology once readily available. Detailed participant feedback is included in the table below.

With improved accessibility features, Auracast addresses a number of barriers associated with existing assistive hearing systems. Previous feedback from hearing technology users suggests that current systems can be restrictive and often limit where audio can be accessed effectively. Whereas Auracast technology delivers clear audio channels directly to the user’s device via new Bluetooth technology.

Describing Auracast as positive, helpful, and easy to use, participants agreed it has the potential to improve access to critical information in public transport environments and improve overall user experience for a wide range of people, including those with disability, helping to ensure they can access essential information throughout their public transport journey.

Participants showed strong enthusiasm for the technology, and a key finding revealed that many devices already have Auracast technology built in, however this function simply has not yet been switched on by companies for user access

Findings		
Element	Observation	Participant feedback
Self-guided run through	Participants overall first impressions during their initial self-guided Auracast testing were positive, with most participants impressed by the clarity of the audio and its capacity to improve their ability to hear important announcements.	“Usually overhead public announcements are distorted, but this is good, in general I’m quite happy with it”. - Participant 7, Hearing Aid user “It was good, consistent, clear, I wasn’t confused at any point”. - Participant 8, Adaptive Headphone user “Pretty satisfied, still room for improvements, such as making it compatible with my hearing device, and pronouncing the street name more clearly”. - Participant 9, Cochlear Implant user with low vision “It is has great potential”. - Participant 14, Adaptive Headphone User
Login	While a larger portion of participants were able to successfully login to the Auracast app, a small number of participants required support to	“Logging in was ok, I wasn’t sure how to pair the device, that was tricky”. - Participant 1, Hearing aid and Cochlear implant user

	complete this task. Many participants were also observed to take some time to work out settings and adjust features.	“Navigating the app was super easy, nothing too complex”. - Participant 4, Cochlear Implant and Auslan User “Connecting to the app was pretty easy, there weren’t many ways to get it wrong, it was quick. The only thing I needed to adjust was the volume button. The name of the channel was clear and obvious”. - Participant 8, adaptive Headphone user “It’s a simple interface where you have the option of which channel to listen to”. - Participant 2, Adaptive headphone user
Connection: Reconnection - Hearing apps versus Auracast app	A difference was identified between the experience of those using the Auracast app and those using their own hearing device. When required, the Auracast app automatically reconnected, and the broadcasts recommenced. The hearing device app, however, did not automatically reconnect and the user needed to search for channels when entering the next range zone.	“It’s very easy, I don’t even need to scan the QR code, I can just search channels in the nearby area on the app, and it will find channels for me”. - Participant 2, Adaptive Headphone user “It doesn’t seem to reconnect automatically all the time. The connection itself is automatic with background static noise, but the messages don’t play, you need to select the channel”. - Participant 5, Cochlear implant, and hearing aid user
Connection: Disconnect/ reconnect Information	When disconnected from the selected channel, one participant found the 'searching for channels' notification reassuring. A number of participants,	“Reconnecting was good, but it would be good to be notified when it reconnects like a welcome message, so you know you’re back on. I liked that it connected instantly. I felt I could still have a

	however, were uncertain whether reconnection had occurred, while others who experienced an unsuccessful automatic reconnection were unsure how to manually reconnect and resume listening. Participants initial preference was having the automatic reconnection, however some also identified various opportunities to streamline this issue such as the addition of an audio signal, either using a sound or verbal message, and text to inform of the reconnection. It was also recommended by another participant that simple step by step instructions regarding how to reconnect are required in the instance of an unsuccessful automatic connection.	conversation with someone while listening to the announcements”. - Participant 8, Adaptive Headphone user “(Regarding notification of reconnection) Notifications are everything for me being hearing impaired. So, visual messages are important to me over audio which I’d then need to decipher to work out what it means”. Participant 4, Cochlear Implant and Auslan User “My biggest issue is if the reception drops out, I need clear instruction on how to reconnect, what steps do I need to take. I want a simple process where I don’t need to connect to multiple apps or take multiple steps to get the information that I need”. - Participant 3, Hearing aid user
Audio quality: Clarity	Feedback from participants consistently highlighted the clarity and quality of the audio as a positive aspect of the technology.	“Everything was perfectly clear with pronunciation; it didn’t sound like an AI voice. Different accents and consonants make a big difference to whether I can understand the message. Even when the echo started to occur, I could still hear the message”. - Participant 3, Hearing aid user

		“Being in a crowded environment I could still hear the messages coming through and still have a conversation. I feel a sense of relief that I can hear important information about my flight without having to always ask staff. It’s more about convenience to have the information in my ear rather than having to look for someone to help”. – Participant 6, Hearing Aid user “The audio quality was crisp. I could hear the difference between the number 2 and 3 which I can’t do with a T-switch and it’s not so flat the sound, the audio quality is quite good. However, hearing the audio in a busy environment like a food court is harder with background noise”. – Participant 1, Hearing aid and Cochlear implant user
Audio quality: Audio speed	A small number of participants noted challenges with understanding announcements due to the speed of the <u>a</u> udio.	“I would find it really helpful to have this information in a busy environment, but it would help if the voice was speaking slower. It takes me a moment to understand the announcements as I’d need to hear it a few times”. – Participant 11, Cochlear Implant and Hearing Aid user
Audio quality: Pronunciation	Many people who are hard of hearing expressed difficulty in hearing both nouns and consonants. While most participants were successful in identifying when a specific stop was approaching and pushed the button to	“The pronunciation needs to be more accurate; the names of places are being announced incorrectly. But the audio quality is still good. The amount of information was perfect, enough but not constant” – Participant 5, Cochlear implant and hearing aid user

	get off, a number suggested that placing greater emphasis on key words and their pronunciation could improve understanding, particularly for nouns and consonant sounds that were harder to distinguish. It was also identified that the audio output from Auracast via the driver's console on buses are originally designed for the drivers only, rather than for public use. In contrast the audio output from Auracast via the airport announcements were originally in text format, so converting to audio may improve pronunciation accuracy.	"The pronunciation needs to be clear and accurate, especially around consonants. Names and nouns are difficult to understand as they are out of context". - Participant 1, Hearing aid and Cochlear implant user "The sound is clear, but they over emphasise the type of street, when they should be placing emphasis on the street name. It sounds rushed. In unfamiliar environments I need a slower, clearer pronunciation of the street name so it can register in my mind. Prioritising key words and their pronunciation as opposed to articulating the entire sentence would help.". - Participant 3, Hearing aid user
Audio quality: Interference	When comparing Auracast technology to the T-switch hearing loop, the absence of static interference when using Auracast felt more comfortable for many users. Though a small number of participants still experienced soft static, some were able to adjust their device app settings	"I haven't used the T-switch due to the bad audio quality, even though I have been a tester on the new light rail hearing loop system. Comparing it to the T-switch the difference is huge; there's no buzz or interference on Auracast. It's very clear and doesn't have a limited range or boundary. The information coming through is very clear and easy to understand. The T-switch was like listening to an out of tune radio, until I got used to it". - Participant 11, Cochlear Implant and Hearing Aid user

	to improve comfort. This included a noise filter and a speech clarity function. “There’s no comparison with the Auracast vs the T-switch, there’s no way I could be connected to the hearing loop continuously, the static would be too bad. With the Auracast, I can wander around and not have to be in one spot. It means I don’t have to go and stand near a T-switch sign to hear any info. The fact I can roam around and not worry about being in one place at one time reduces my anxiety”. - Participant 5, Cochlear implant, and hearing aid user “I have used a T-coil before at a train station which gave me similar information to Auracast. Compared to the T-switch, Auracast is much clearer, as the T-switch you can also hear other background noises which is distracting”. James – Participant 9, Cochlear implant user who has low vision
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Volume: Dynamic Range	Participants' experience of the range in volume differed, with a majority finding the volume too quiet, even at the loudest volume setting and others <u>reporting</u> that they required the volume setting to be turned down. It was also discovered that for participants who had Auracast connected to their device, the excessively high volume may have been a characteristic of in-ear delivery, with the user being more sensitive to volume levels.	"I would like it on a louder volume. Even on max it wasn't loud enough. I hit the highest and would have liked an extra little bit of volume to choose from". - Participant 1, Hearing aid and Cochlear implant user "I can't seem to lower the volume anymore and it still seems loud. Is this a function of the broadcast being so close in the ear? I can't seem to lower the volume enough so I can still hear background noise as I like ambient over noise cancelling". - Participant 5, Cochlear Implant and Hearing Aid user "I think this technology is more suited to people with gradual hearing loss due to ageing, rather than deaf people". - Participant 13, Hearing Aid user
Volume: External noise	External noises and loud surrounding environments appeared to affect some participants ability to hear audio at maximum range.	"I had to make the volume louder to hear the announcements due to bus noise. Otherwise, the volume is too loud I needed to turn it right down to lowest. I was finally able to balance between hearing the announcements at a comfortable level and still hearing external noise, so I didn't want it noise cancelling, just ambient". - Participant 5, Cochlear implant, and hearing aid user

Volume: Function settings	A limitation highlighted by one participant was that volume adjustment was required for each individual channel, making the process less streamlined and hindering the ability to quickly tune in and hear important information. Participants also observed their volume reset to a lower level post broadcast channel reconnection, and noticed that when their phone screen locked, the volume in the app decreased, creating some confusion as to whether Auracast was still working.	I couldn't hear but then I worked out that I had to increase the volume, but then I had to do that on each channel. Good thing is I only needed to do that once on each channel". – Participant 11, Cochlear Implant and Hearing Aid user "A volume indicator level when initially connected would help me to see that the volume is the issue, or an indicator to show the connection is on low volume so I know to increase it". - Participant 4, Cochlear Implant and Auslan user "I would like to have more volume control. The volume connects and reconnects at a lower level, and I need to increase it". – Participant 1, Cochlear Implant and Hearing Aid user
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Volume: Noise cancelling versus ambient	Preferences for ambient versus noise-cancelling were highly individual, with some participants favouring ambient noise for safety and awareness, while others preferred noise cancelling to manage sensory overload. This affirms the importance of both noise cancellation and ambient features.	“Can I choose ambient or noise cancelling features in the app for my hearing aid or headphone? With that, there are many environments that may be overwhelming, so having noise cancelling as an added feature it would be amazing”. - Participant 4, Cochlear Implant and Auslan User “In the real world I wouldn’t be able to wear noise cancelling headphones as I need to be able to hear my surroundings”. - Participant 10, Adaptive Headphone user
Channel content: Pre travel preparation	Some participants felt that having direct access to important information whilst traveling on public transport allowed more flexibility in the way that they prepare and planned before the journey.	“In some ways it was easier, going on unfamiliar routes and not having to rely on google Maps, to have the info available and I'm able to know what the next stop is, kind of means that I didn't really need as much prep as what I would normally need” - Participant 2, Adaptive Headphone user
Channel content: Repetition	Several participants noted the repetition of the channel content, indicating a preference for pausing or switching off notifications before turning back in at points and/ or when closer to their destination. For some participants with profound deafness	“It was helpful. It was enough except when it started repeating itself. If I were in an emergency situation, I'd leave it on, but if we were just stuck in traffic id pause it or switch it off”. - Participant 2, Adaptive Headphone user “I'm getting the full spectrum of sound. I would keep listening to it if I was in an unfamiliar environment or if I needed to hear updates.

	the repetition of the announcements was helpful as having the message loop around meant they had several chances to hear and understand it.	But if I was in a quiet area and not much to do, I wouldn't listen to it all the time". - Participant 7, Hearing Aid user "The same announcement repeated 4 times before we arrived at the next stop. I'm not sure which one I'd prefer, to hear it once or repeated. The Auracast is lovely but I'm not sure I really want to hear the next stop every 30 seconds, but I do like hearing the 'next stop is' and 'arriving at' messages". - Participant 10, Adaptive Headphone user "Maybe if I hear it a few times, I could make out what she's saying, but I'd need to hear it repeatedly". - Participant 13, Hearing Aid user
Channel content: CDC specific – Incorporating stop numbers	Due to difficulty interpreting mispronounced wording, a small number of participants suggested incorporating stop numbers to support the identification of locations and stop destinations.	"Having stop numbers in addition to stop names would be helpful to ensure I'm getting off at the right stop. Is there a way we could incorporate this on the app?" - Participant 1, Hearing aid and Cochlear implant user
Channel content: CDC Specific – Announcement timings	Participants appreciated that upcoming stops were announced in a timely manner, allowing them to prepare for disembarking and locate and press the stop button.	"The announcements say what the coming stop is and what the next stop is. It gives me enough time to press the stop button before we arrive at next stop. Hearing the announcements makes me feel more confident on the bus". - Participant 5, Cochlear implant, and hearing aid user

		"It was good. I liked that it gave you plenty of notice, so I had enough time to prepare to get off. My anxiety was there a little bit as it was an unfamiliar route, but I felt better knowing the announcements were there. Using Google maps is clunkier and not as timely. But this gave me plenty of notice. I would probably use it over maps, but I do like to listen to my music on my phone so that's a small barrier. If I had the maps I would tab across whilst using other apps on my phone". - Participant 8, Adaptive Headphone user "If I was browsing the channels id go straight to the bus stops channel (channel 1). I can understand the stop I'm approaching and the following stop after that". - Participant 2, Adaptive headphone user
Channel content: PT and route identification	It was mentioned by multiple participants that bus and route identification is important for navigation and location awareness. Therefore, the addition of announcements for bus arrival, bus route confirmation, the addition of the next four stops ahead, and end of route are recommended.	"Maybe add a message that it's the end of the line where the route ends. Also, the name of the bus route announcement at the beginning would be helpful or add a msg to announce the route number after every stop and add a msg to announce the route number you can change to at a relevant stop". - Participant 5, - Cochlear implant and hearing aid user "I don't need any extra information but maybe to tell me when I get to the end of the line would be good too. The information on the light rail was enough for me to know the bus routes. I did feel a bit nervous when the arriving at announcement was very close after the next stop announcement. The sooner you get the next stop

		information the better. In the hierarchy of importance, the next stop is more important than the arriving at. But I never felt like I missed a stop, I knew where I was at all times”_ - Participant 10, Adaptive Headphone user
Channel content: Disruptions and delays	The addition of disruption, delay, and alternative route announcements on channel two was suggested by two participants. It was also suggested by some participants that current content on channel two was more relevant to information typically found at transport interchange terminals. Finally, some participants proposed having broadcast audio available at interchange terminals, providing information such as live tracking, and connecting public transport routes.	“The second channel with the access information would be better if it had information showing delays and traffic issues”. - Participant 1, cochlear implant, and Hearing aid user “Any service disruption announcements would be good”. Adaptive headphone user “I think there isn’t much else I’d want to hear on another channel, maybe about delays, detours, connecting routes or major public events that may affect bus times. Maybe calling it ‘transport Canberra updates’ or something like that”_ – Participant 11, Cochlear Implant and Hearing Aid user “It’s probably not needed on the bus itself, but at an interchange terminal it could be helpful”- Participant 5 – Cochlear implant and hearing aid user
Channel Content: Visual display information	For many participants, visual displays were an important way to access information such as transport updates, arrival times, and transport boarding locations, with some suggesting that accompanying audio would support	“It would help if Auracast would offer both inbound and outbound messages of rail journeys”. - Participant 10, Adaptive Headphone user

	broader user access to this information.	"It would be great if the interchange visual display of buses and times had an audio option". - Participant 1, Hearing aid and Cochlear implant user
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Channel Content: Airport information	Receiving accessibility information on channel two was important for a small number of participants, while receiving more specific flight and departure information was important for the majority of the participants. Some participants advised that it would be more useful for them if the channel was as specific as possible to their flight. The more specific the channel can be to their flight the more useful it would be.	“The content I’d like to hear is departures, emergencies, gate changes, gate open, passenger calls, and disruptions. On the second channel, the general info being repetitive on a loop was good so I can hear it once and then don’t need it again. I really think the technology has amazing potential, I hope it gets rolled out everywhere”. – Participant 6, Hearing Aid user “If it could be more specific where you could select your flight on a list of channels, so I can only hear (the flight) that I need”. – Participant 5, Elli – Cochlear implant and hearing aid user “I just really need information about my flight. Location of the sensory or quiet room would be helpful on a second channel, and maybe information about where the accessible toilets are depending on which gate, I’m at”. – Participant 2, Adaptive headphone user
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Channel content: Real time location awareness	Participants across all sites noted that Public Announcements can be unclear and difficult to understand so many appreciated the availability of important information directly to their devices in real time. This helped reduce anxiety and cognitive load and increase confidence to independently navigate public transport environments while lessening the need for constant visual checking e.g., google maps or PTV app	"It reduces my anxiety to know what's happening. I find this technology a good option at airports, hospitals etc. as sometimes in public places, I'm not sure if all the announcements are applicable to me or not". – Participant 11, Cochlear Implant and Hearing Aid user "I wasn't worried about loading or buffering or missing my stop. I loved that it was live and there was no delay impact" – Participant 8, Adaptive Headphone user "I tend to avoid taking buses because I'm not sure where to go to catch them. If I'm on a bus or tram, I'll let the driver know where I need to get off. Trains are usually the easiest to navigate due to announcements and clear platform locations etc. Having Auracast available would improve the use of buses. I always travel with headphones and AirPods anyway so this would be easy to adopt". – Participant 8, adaptive Headphone user "I would usually say travelling on unfamiliar routes is quite anxious for me, so this is nice to know exactly where I am at all times". – Participant 10, Adaptive Headphone user "It took a little bit of pressure off because I knew I just had to listen for what I needed to instead of constantly being aware and having to look at PTV map. Less anxious and a little bit more relaxed". – Participant 6, Hearing Aid user
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Customisation Multitasking	Participants using adaptive headphones indicated that their preference would be for the Auracast app and announcements to function simultaneously alongside other apps, particularly when listening to music and map tracking.	"I'm not sure if I can listen to my own music in the meantime, and switch to announcements when I need to". - Participant 2, Adaptive Hearing user "I like that Auracast was continuous so I could use my phone whilst listening to the announcements. It would be great if I could time the announcements to chime in 3 stops before I needed to get off whilst I listen to music on my headphones". - Participant 8, Adaptive Headphone user
Customisation: Prompts	While many participants were observed to take time familiarising the apps settings and features, one participant proposed prompts when initially connecting, to help guide settings and feature changes from the beginning of the user experience.	
Customisation: Captions	Some participants advised that they often use speech-to-text apps on their phone, as well as captions and visual displays of announcements where available.	"I use captions when I can't hear announcements in public environments". - Participant 13, Hearing Aid user
Customisation: Accent and Gender choice	One participant explained that he would expect to hear a human voice rather than the current robotic AI voice,	"Being able to choose a voice, gender and accent would be awesome. Base and treble are good features to have too". - Participant 5, Elli – Cochlear implant and hearing aid user

	expressing that a human voice felt more trustworthy. A greater number of participants also indicated that customisations to the audio voice such as gender and accents can enhance listeners ability to understand content.	“I think different voice options for clarity of consonants would be even better”. – Participant 6, Hearing Aid user “Having it customisable would be great, adjusting volume, clarity, accents, having different languages would be good for CALD people, or for me in countries like China”. – Participant 7, Hearing Aid user
Customisation: Language options	To ensure greater access and broader engagement with the technology, including for people from CALD backgrounds, two participants suggested offering the option of different languages.	“Different languages would be helpful too for when we travel. When I’m on public transport, I’m likely to have my air pods in anyway so I’d be looking to see if they’re compatible with Auracast”.
Customisation: Attention signal	It was noted that the announcements are sudden and no prewarning is provided, therefore reducing predictability of the app, and potentially causing shock reactions if participants are not prepared for the audio announcement.	“One downside is the that the announcements come it at a sudden time without warning”. – Participant 2, Adaptive headphone user “I think normally you get a chime or something before an announcement comes on, so I know the difference between listening to an audio book for example and then hearing the announcements. But it would be easy enough to pause the messages if it gets annoying. If I’m on a 20 minute bus ride I’d switch between apps and check in closer to my destination”. – Participant 11, Cochlear implant, and hearing aid user

Customisation: App Centralisation	One participant underscored the need for a single, centralised app to access broadcasts, rather than having to use different apps for different devices in order to connect.	"It would be great if we could use only one app to access the broadcasts because I use a hearing aid in one ear, my left, and a cochlear in the other ear, my right". Participant 1, cochlear implant, and Hearing aid user
Customisation: Screen reader compatibility	A small number of participants using screen reading technology found that the two technologies did not work in unison. One participant's screen reader did not function with the Auracast app, while another participant's screen reader was unable to operate alongside other phone features, such as receiving text messages or other app notifications.	"Setting up was pretty good, only I couldn't use my screen reader properly as I was getting a text message which was conflicting with the audio". – Participant 9, Cochlear implant user who has low vision,
Customisation: Audio speed	A small number of participants brought up the speed of the audio, flagging that it was too fast for them to fully comprehend what was being spoken. One of the participants recommended that the app include a function to enable customisation to the speed of the voice to better support individual processing and understanding.	"The app needs to be customisable so some people can speed it up and some can speed the voice down according to needs. There needs to be a pause or gap in between the light rail platform announcements as they loop around too quickly". - Participant 12, Hearing Aid user "Speaking quite fast, and the information isn't getting registered". - Participant 13, Hearing Aid user

Customisation: Auracast compatibility and enabling on devices	While only a small number of participants were successful in connecting their personal device during the user testing, it became apparent that many of the user's devices were Auracast compatible despite the technology not being enabled. One participant who uses adaptive hearing devices proposed that they would only purchase a pair of headphones if they were Auracast enabled and also allowed music to be played.	"The only negative is using the headset with the app, but in the future, I know it will improve and I'm excited." - Participant 4, Cochlear Implant and Auslan User "There are many people who have cochlear implants and so if Auracast was enabled for that it would be great" "I'd love to use my own headphones. I probably would buy Auracast headphones only if they could also be used to listen to music etc. or only if they were very cheap otherwise" – Participant 8, Adaptive Headphone user
Range: Channel Saving	Despite the majority of participants saving the channels without prompting, a select few were not aware that selecting the 'save' tab on the selected channel was pivotal to ensuring automatic reconnection, and in turn, the broadcast working effectively once participants moved back into range.	"There was a "save" function, but I didn't know what that was, the intention of it". - Participant 1, Hearing aid and Cochlear implant user

Range: Drop out - Airport	Participant's satisfaction varied in terms of audio range and distance from the beacon or point in which audio cut out with a small number expressing that they would expect there to be no gap or disconnection at all. One participant noted that in the event of this occurring in a real life situation they would turn it off, while others suggested drop out was not too much of an issue for them as they would return back to the last place, they had connection to encourage reconnection and listen back into the audio.	"It's not helpful how much it cuts out; I would probably stop using it based on how much it cuts out. Being sensory sensitive, there's not many areas I can hang out in, so that's more important than staying in one spot just to use the app so it doesn't cut out. If they had the tech available in the sensory room and quiet room, I'd feel more comfortable, so I don't need to keep exiting the room to get into a range area for the announcements". - Participant 2, Adaptive headphone user "To have the broadcast information available at all areas of the airport isn't necessary for me. If I need to know something, then I'll happily walk to the location to where I need to hear the information". - Participant 3, Hearing aid user
Range: Drop out – Public Transport	One participant explained that it would cause anxiety if a drop out occurred close to their stop.	"It did drop out a couple of times so then I got a little anxious. I can imagine if I was getting close to a stop and I was going to miss the announcement that would cause anxiety, otherwise it was fine!" - Participant 6, Hearing Aid user
Range: Coverage	It was identified that ear hearing devices dropped out sooner than the NEC headsets. The broadcasting	"I like being able to walk around while still hearing the broadcast vs the hearing loop restrictions. Being able to move makes me feel like everyone else, and I'm not limited to staying close to a hearing

	range between the two beacons also appeared to differ significantly for each participant, with individuals experiencing drop-out ranges varying between 35m and 70m within the airport. Reconnection also appeared to be inconsistent. Some participants experienced reconnection when walking closer to the first beacon, but when moving in between range zones devices didn't always reconnect easily and the app needed to search for channels again. Participants completing user testing on buses also experienced dropouts and disconnections whilst on their journey.	augmentation sign. If there were hearing hubs or zones that I could walk towards, it would be the next best thing to expecting it over time to stay connected continuously. I also think it would be helpful if I had a voice over or a notification to tell me I'm in an Auracast zone". – Participant 6, Hearing Aid user
Range: <u>Connection preferences</u>	Participants appeared to have differing expectation regarding when and how connection to Auracast should occur. One participant indicated that it would be beneficial if the broadcast range was as wide as possible and include	"Arriving at the airport is when I want to be "switched on" so, it's important to know information from the moment I arrive". - Participant 3, Hearing aid user "I like being able to walk around while still hearing the broadcast vs the hearing loop restrictions. Being able to move makes me feel

	areas prior to arrival into the terminal. A minority of participant also mentioned that hearing hubs or zones could be useful if it is not possible for a continuous connection throughout the area that they are navigating.	like everyone else, and I'm not limited to staying close to a hearing augmentation sign. If there were hearing hubs or zones that I could walk towards, it would be the next best thing to expecting it over time to stay connected continuously. I also think it would be helpful if I had a voice over or a notification to tell me I'm in an Auracast zone". – Participant 6, Hearing Aid user
Range: Boundary information	Participants appreciated the freedom to move around without being restricted to a small listening zone, while also highlighting the importance of seamless audio between bacons, ensuring there are no 'gaps. The need for clear information regarding range boundaries also emerged as a consistent theme throughout the feedback, with one participant suggesting the development of a visual map outlining broadcasting areas.	"There would be no gap, and it would be connected everywhere, or I would have information on where to go to be in the range of the broadcast". Participant 1, cochlear implant, and Hearing aid user "Or even a visual map to show the radar of where I can and can't go to receive the broadcast. I'd expect it cover most areas, and then I wouldn't mind having the odd dead areas, but it needs to cover more, maybe 100m radius. Walking into hotspots or zones would be OK, if I knew it would reconnect". – Participant 4, Cochlear Implant and Auslan User
Range: Timing of Bus/ light rail announcements	The delay in audio announcements until after the bus had commenced its journey appeared to create uncertainty for some participants who were unsure	I did feel like the announcement of 'next stop' was a bit too close to the 'arriving at' announcement which made me a bit anxious to find the stop button in time". – Participant 10, Adaptive Headphone user

	whether the connection had been successful established. Additionally, some participants found the announcements of “next stop” too close to the “arriving at” announcements, causing slight anxiety about locating and pressing the stop button for their correct location departure.	
App feature: <u>Auracast</u> Awareness	Participants consistently emphasised the need for multiple touch points to build awareness and encourage discovery, including signage at bus stops and on vehicles, QR codes near accessible seating and next to the back door window, app-based prompts, push notifications, and public announcements at interchanges. Creating awareness through multiple digital, physical, and audio modes will ensure access to information that meets everyone’s needs.	“It would be good to see a sign or poster at the bus stop so I can load and prepare my app, and one on the bus. The QR code near the accessible seating area and around the doors would be a good idea”. - Participant 2, Adaptive Headphone user “When getting on the bus I’d expect to either discover it (Auracast) on my app or see a poster showing some details about it near the accessibility seats”. - Participant 1, Hearing aid and Cochlear implant user “A push notification to prompt me when I get on the bus would help greatly once it has been established initially. A general public announcement at an interchange to say that Auracast is available would help”. - Participant 10, Adaptive Headphone user