Submission in response to MBIE's Public Consultation Document
New Zealand Telecommunications Relay Services Beyond June 2019

from

T-Meeting Global

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1. Purpose and structure of response

This document sets out T-Meeting's response to the public consultation document. It draws on the author's knowledge of the overall development of the current relay services in New Zealand over a period of 14 years while contracted to MBIE and its predecessor MED, recent liaison with DPOs, service providers and end-users together with knowledge of relay and direct services technology and service providers internationally.

In addition to providing feedback to MBIE on its document, this response sets out major issues that must be addressed with respect to technology, promotion of services, support to end-users and funding that have been omitted from the discussion document. T-Meeting submits that without consideration of these additional matters policy outcomes of the consultation appear to be pre-determined.

This response is structured into four sections:

a. Comment on the MBIE discussion document paragraph by paragraph with the numbering in this section corresponding to those of the MBIE document.
b. Additional issues which must be addressed to overcome shortcomings with the current contractual arrangements.
c. A completed response template to the extent that it makes sense.
d. Appendix A being T-Meeting's response to MBIE's Request for Information that closed 8 December 2017. This is included on the understanding that all consultation responses will be published on the MBIE website as is normal open government practice. T-Meeting grants MBIE permission to publish its RFI response that forms a part of this submission. The appendix is included to provide information to the user community on the capabilities of modern internet based systems that was omitted, apart from a passing reference to total communications (now superseded by complete communications), in MBIE's consultation document. By having access to the information the community will be in a more informed position to consider MBIE's questions and possibly make further submissions after the nominated closing date.

T-Meetings grants MBIE permission to publish this response document in its entirety.

2. Comment on the MBIE discussion document

The numbering of paragraphs in this section corresponds to that in MBIE's consultation document. If a paragraph number is omitted it means that T-Meeting has no comment on that paragraph.

Where the term 'direct services' is used it means a service whereby an assistive telecommunications service is provided but there is no Relay Assistant required to process the call thus significantly lowering the cost per minute by eliminating the labour component of a call cost.

Introduction and Context

1. The definition of blindness varies from country to country. In Australia and New Zealand an individual is considered legally blind when they cannot see at 6 metres what someone with normal vison can see at 60 metres. A person is legally blind if their field of vision is less than 20 degrees in diameter. A person with normal vison can see 180 degrees. Government departments use the term 'legally blind' to define a person whose degree of sight loss entitles them to special benefits.

   The definition of deafness varies. **The medical definition of legal deafness is 66 to 85 decibels of hearing loss.** On the scale of hearing loss degrees, this is considered severe. Anything over 85 decibels of hearing loss is considered profound. According to the U.S. Centers for Disease Control and Prevention, only those whose hearing impairment impedes their ability to comprehend speech and language are considered to have some level of deafness.

2. The current contracts expire on 30 June 2019. In addition to views on what services and equipment are required to meet the needs of users, and how the services and equipment offered may need to change in light of technological developments we consider it important to comment on the public awareness and promotion of future relay and direct services to the different user communities and how those user communities need to be supported with in-home visits to set up end-user devices to match the needs of individual users. Realistic declared budgets from MBIE are required for these outputs.

3. As at 20 March, T-Meeting's interactions with disability sector service providers showed that some had only found out about the consultation in that week, the newsletter cycle to elderly members who prefer a hard copy was missed and the next cycle would not occur in time for recipients to make a response. The final two meetings in Auckland and Wellington 11 and 12 April announced on 9 April were close to the closing date to have any benefit. Overall it appears that the community engagement at the consultation meetings was 20-25% of that achieved in 2010 when only three meetings were held. The low turnout is attributable to unsuitable locations and times as well as accepted social norms for the sector not being followed.

   T-Meeting is unaware of any notice of this consultation other than on-line. Hence elderly and disabled persons on the wrong side of the digital divide and whose inputs are important will be largely missed by this consultation. Furthermore, the public meetings in Auckland, Christchurch, Dunedin and Palmerston North are being held at times of day that are not conducive to people attending and the venues are unfamiliar to people in lower socio-economic circumstances thus foreshadowing low attendance. Hence, the outcomes should not be interpreted as users or

potential users being uninterested, it is simply that MBIE has not followed the advice it had been given on how to encourage a strong turn-out.

In terms of accessibility the current consultation is inferior to that MED carried out in 2010 and from which lessons learned were recorded. We note that .pdf publications are not accessible to Deafblind persons that require screen readers such as Jaws and that documents in MS Word format were not available until late in the process.

Any new service should be **effective, efficient and economic**.

4, 5. These statistics do not define the subset numbers of people whose lives can be enhanced by modern relay and direct services. T-Meeting accepts that the subsets are difficult to quantify, especially the number of hard of hearing who would benefit from captioned telephone service. Our own estimates of the subsets likely to benefit from relay or direct services in New Zealand, based on our experience, are:

- Deaf 4,000
- Deafblind <200
- Hard of hearing 180,000[1]
- Speech impaired 20,000

6. The service also commenced with trials of:

- Internet Relay, for which a trial report was received from Sprint 23 March 2005 and the service made permanent; and
- Speech to Speech service as a Phase 2 service. This was a result of advocacy on behalf of the speech impaired community by Victoria Terrell who at that time worked for CCS Disability Action. The Phase 2 trial became a permanent service after 9 months.

It is notable that with the exception of the drive to establish a Video Remote Interpreting service by Dr Jan Scown, a former Director of the Office for Disability Issues, no improvements in NZ Relay services originated with officials. In fact the NZSL interpreter scholarship programme, the introduction of CapTel and the Video Relay Service were all opposed by MED officials.

7. Ministerial intervention resulted in the introduction of CapTel when MED officials refused to include it in the RFP specification.

The hearing person's voice is robotically revoiced into a voice recognition machine that converts the speech to text. The delay between the hearing impaired person hearing the counterpart's speech and seeing text on their screen is typically >2 seconds. However, feedback from users is that the delay can extend to 5 seconds or more at which point the service is considered unusable. This is one explanation for decreasing CapTel usage with an essentially static number of CapTel phones distributed in NZ. See response to para 24 for further detail.

[1] Source: Estimate based on NZ and USA populations pro-rated with Rolka Loube data of IP CTS minutes of use in its capacity as Federal Relay Fund Administrator, USA.

The lack of growth in CapTel users is further attributed to:

- ineffective promotion by the service provider, partly due to the lack of a specific budget set by MBIE; and
- a lack of in-home support to set up the equipment for elderly users and to give them initial training including the saving of commonly dialled numbers into their telephone for ease of use.

8. The NZRAG Charter published on the MBIE website here: http://www.mbie.govt.nz/info-services/sectors-industries/technology-communications/communications/documents-image-library/nz-relay-advisory-group-charter.pdf has no requirement for NZRAG members to attend outreach events as may be required and no mechanism to compensate them for costs incurred although individual members do receive nominal recompense from the NZ Relay TRS TSO Provider.

   The NZRAG members contribute expertise and should be appropriately remunerated.

9. Apple's Facetime, Microsoft's Skype, Skype for Business, Viber, WhatsApp and the like are all siloed proprietary systems with the limitations and restrictions that apply to apps developed for hearing-oral persons. They cannot be compared to SIP total communications systems delivering audio, video and real time text or to complete communications systems that supplement ITU-T F.703 total communications with text to speech and speech to text. Non-siloed systems are a part of the global telephone numbering plan. It is agreed that siloed systems allow NZSL users to communicate with each other. Such thinking led to the now abandoned system in France where each Deaf user was given a videophone but no relay service interpretation. MBIE's consultation is concerned with communication between persons who are Deaf or have a communications disability, hearing persons or persons with a different communications disability. It is a common misconception that relay services are only for communications between Deaf or communications disabled persons and hearing-oral persons.

   The 20,000 NZSL users figure comes from an unfortunate 2005 census question. If there were 20,000 fluent NZSL users there would likely be more than 130 qualified NZSL/English interpreters.

10. The example of gloves that can translate American Sign Language into text is irrelevant to a discussion of relay advancements in New Zealand for several reasons:

    - The complex three dimensional camera set-ups required to capture the glove motions are cumbersome;
    - If there is further development in this field we agree that it will be in ASL as the largest developed visual language market whereas the NZSL market is very small;
    - NZSL is a more complex visual language than ASL because it uses two hands, arm movement and facial expression. MBIE has in its possession an academic research document "Lexical Comparison of Signs from American, Australian, British and New Zealand Sign Languages, David McKee and Graeme Kennedy, Deaf Studies Unit, Victoria University of Wellington. It concluded that ASL is least similar to NZSL;

- Exhibitors of visual language to text conversion systems at e.g. M-Enabling in Washington D.C. and WFD Budapest 2017 seem to be exhibiting mainly in the hope of attracting development money. Any commercial product is judged to be at least a decade away if indeed it ever eventuates; and
- It is considered doubtful that Deaf would accept a robot interpreting their sign language.

The statement "and improvements in voice recognition technology that may one day eliminate the need for a dedicated relay service" appears deliberately misleading because MBIE was informed in December 2017 that TERA, T-Meeting's AI speech to text service would launch in Sweden in Swedish in early 2018 (and has now launched) is developed in Norwegian and awaiting launch approval by the Labour & Welfare Administration in Norway, and in U.S. English ready for launch as soon as the US FCC has developed new regulations to allow such new cost effective direct services to be compensated from the Federal relay fund. Furthermore, MBIE was informed in December 2017 that NZ English and Spanish are currently in development for TERA by T-Meeting.

It is suggested that MBIE read the article "Deaf Kiwis at risk over 'lack of aid', Dominion Post 5 December 2017.

13. The NZRAG has served a very useful means of securing user community input to relay services in New Zealand. However, T-Meeting has learned in discussion with DPOs and service providers that they see merit in representation and indeed overall governance by DPO and service providers being directly represented rather than the user communities being represented by individuals in future. In this way ideas can be canvassed with a broader user base and the findings brought to the governance group. If new relay and direct services are governed by users for users it would be an exemplar in terms of government acceptance of the disability sector mantra "Nothing for Us without Us".

Affordable. Minister Curran is well aware of the digital divide that exists in New Zealand and that low socio-economic groups, senior citizens and persons with disabilities are on the wrong side of the digital divide[2]. This can be corrected with targeted assistance. She is quoted in the article **"Success isn't about building an infrastructure and hoping for the best".** The presentation by Grant Cleland, CEO of Workbridge, "Achieving Employment for Disabled People, Like Everyone Else" delivered at the NZDSN National Employment Symposium with the theme "Why Work Matters" in August 2017[3] sets out the costs and benefits of getting those disabled persons who want to work into work and showing a $1b boost to the economy[4] is a more sophisticated measurement than "value for money" widely recognised as bureaucratese for "cheapest".

14. It is noted that most questions concern current legacy services provided in New Zealand. There is no educational information on modern internet based services in the discussion document so that readers can understand what modern systems can do for them, including better access to

[2] The Dominion Post 20 February 2018 "Lofty goals dominate digital talks"
[3] See: https://www.nzdsn.org.nz/national-employment-symposium-2017-presentations/
[4] Quoted by Hon. Iain Lees-Galloway, Minister for Workplace Relations, on TV1 News 17 February 2018

emergency services and that therefore the consultation outcome is pre-determined to continue with the status quo.

Current Services and Usage

17. The contracted entities are:

- Sprint International New Zealand; and
- Communication Service for the Deaf.

18. VCO telephones have not been procurable since the last order was placed by MBIE in 2010. Furthermore, parts for New Zealand country adaptations are no longer available so as these devices fail users must either change to the Uniphone 1150 (designed for Deaf, not hard of hearing) or migrate to CapTel. There are probably less than 200 VCO phones still in use.

HCO calls are very infrequent.

Users cannot interrupt legacy TTY calls, Mobile Text Relay Calls or Internet Relay calls without the text becoming garbled. Modern systems that incorporate Real Time Text in accordance with ITU-T.140 or IETF RFC 4103 allow interruptions without text garbling.

With CapTel and WebCapTel the hearing person's speech is not transcribed by a specially trained operator, it is robotically revoiced into a voice recognition machine that converts speech to text. Using AI and a modern system, captioned telephone service does not need a human intermediary in the conversation. The conversion from speech to text is instantaneous The cost saving will allow 24/7 service to be provided.

STS and V-A STS have modern successors in the form of total communications and with TERA text to speech allowing the user to call any number, including an emergency number such as 111 without needing a relay assistant. Location data, with a timestamp of when the location was last captured, can be forwarded on demand as audio from GPS enabled devices such as fit for purpose tablets and smartphones.

19. It was recognised that the need to market adapt legacy PSTN equipment including TTYs, telebraillers, VCO phones and CapTel phones to meet NZ specifications added considerably to the cost of equipment available at much lower cost in e.g. the USA and U.K.

The current services use a variety of platform and end-user equipment without a common interface. This contrasts with a well-designed total or complete communications system that provides a common user interface and that can be configured to meet the particular needs of all user communications groups. Having a common interface and a single application for all user groups greatly simplifies service promotion, user set-up, in-home training, distribution of tips and tricks through regular newsletters etc .

20. The number of TTYs issued to users has always been lower than expected due to:

- the launch of internet Relay at service commencement in 2004;

- the existence of up to 500 TTYs from an abandoned privately provided relay service out of Christchurch of which the Crown was unaware.

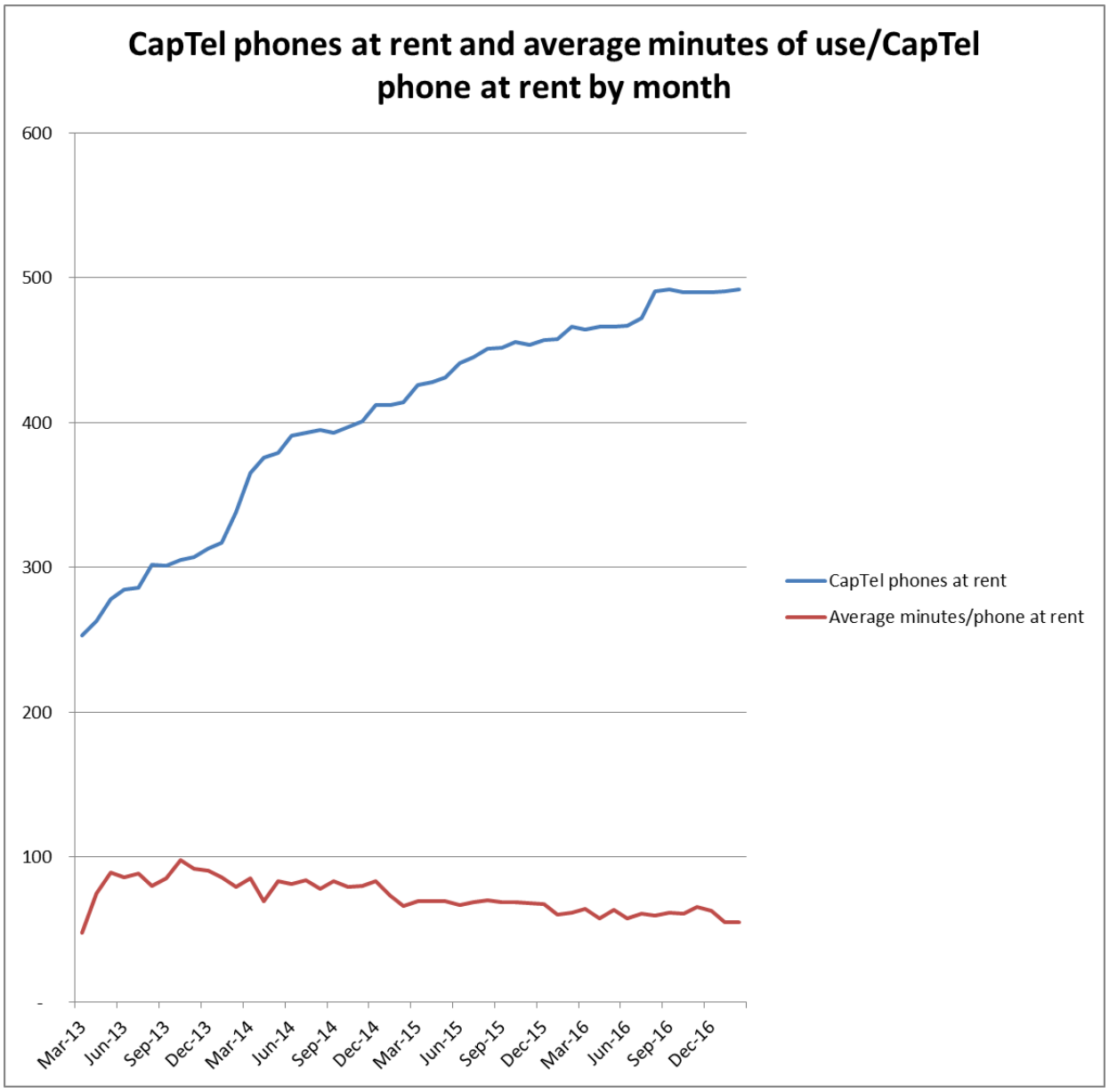
The number of TTYs issued since 2013 has been negligible and the bulk of the Crown's stock was disposed of through a recycler in approx. 2016. Community feedback indicates that few are still in use.

21. A significant issue with Internet Relay was that it used a Java applet. Every time that applet was updated users had to download and install the new version or their access to NZ Internet Relay ceased. While a PC can be configured to automatically download updates many Deaf users choose not to enable it. MBIE asked Sprint to replace the need for Java with an HTML version. When Sprint made a technical change to avoid the need for Java, users considered Internet Relay to be more stable and hence it is natural that usage has increased again.

22. The statement "VCO users, who tend to be those with hearing impairments, may have also transferred over to alternative services that enable text based responses" is pure supposition.

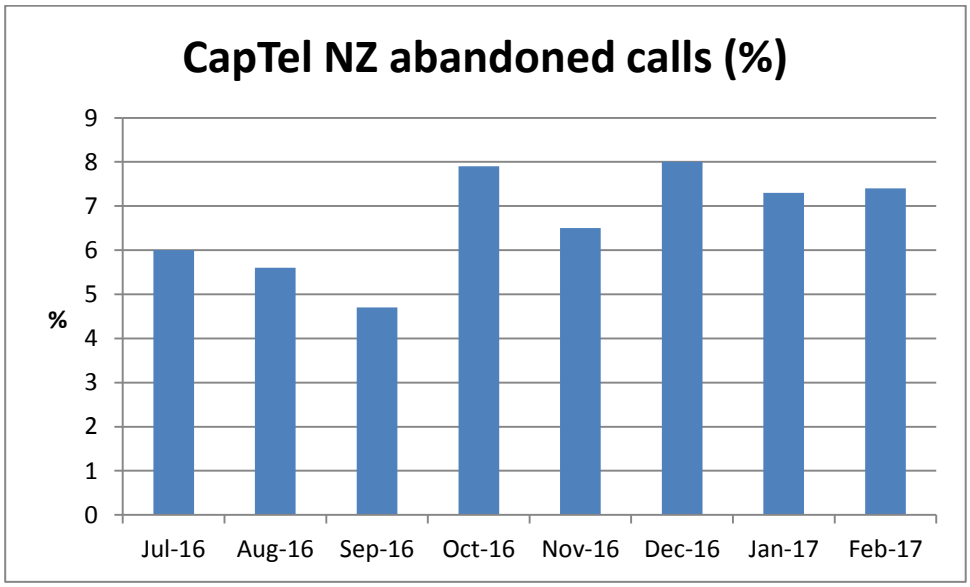
23. That there is no national organisation for speech disabled people is one factor. Another is funding for awareness, promotion and in-home support. It has been found that if a person fearful of using the telephone based on their past experiences is gently encouraged to make two calls via the relay service that they gain confidence to make further calls knowing that they will not be verbally abused. It is recommended that there be a specified amount in any new contract specifically for this purpose. Note that in the USA the Federal compensation rate for Speech to Speech is higher for this reason.

24. It is important to recognise that there is a delay of at least two seconds between the hearing impaired user hearing any sound and the appearance of captions. It has been brought to T-Meeting's attention by disappointed CapTel users in New Zealand and the USA that this delay is not mentioned clearly in promotional material. With revoicing technology as used by Ultratec's CapTel, Sorenson's CaptionCall and computer assisted real time captioning there is a trade-off between speed and accuracy. With the CapTel service errors classed as 'minor' by the service provider go uncorrected. With T-Meeting's TERA AI based speech to text conversion the speed is instantaneous. Users contend that speed is more important than accuracy because if a transcription mistake is made one can ask for the other party to repeat a word or sentence to get clarity. T-Meeting believes that the anecdotal evidence is supported by analysis of the average minutes of use per CapTel phone at rent shown in the chart below. MBIE can extend the data series from the monthly reports in its possession since February 2016 and make the result available to interested parties.



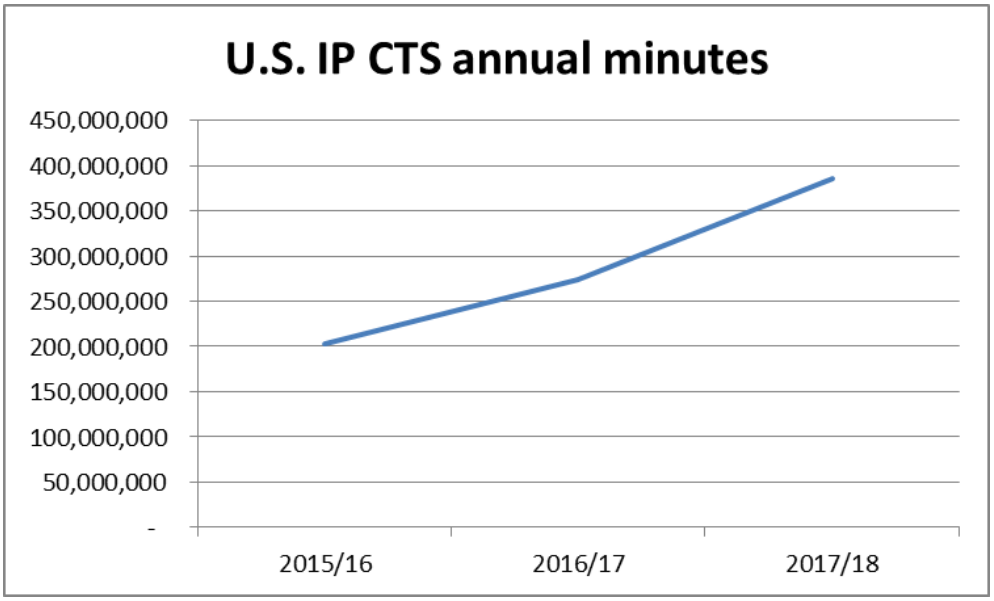
With reference to the preceding chart note:

- CapTel phones issued for rent stalled from August 2016;
- There has been a decline in average usage per phone at rent from a peak of 98 minutes in October 2013 to 55 minutes in February 2016. These figures are far below what the telcos have advised T-Meeting to expect in Sweden where an average use of TERA by a hard of hearing person in excess of 420 minutes/month is expected; and
- A further contributing factor is the percentage of calls abandoned due to the lack of captioning. This was raised as a serious issue with the TRS Provider during 2016 when the abandoned call rate was 8% or more. This was during the period when Sprint as an organisation was financially distressed and it was extremely difficult to get financial approval for more resources. Sprint began reporting on TRS and CapTel abandoned call rates in July 2016. The data is shown in the following chart:

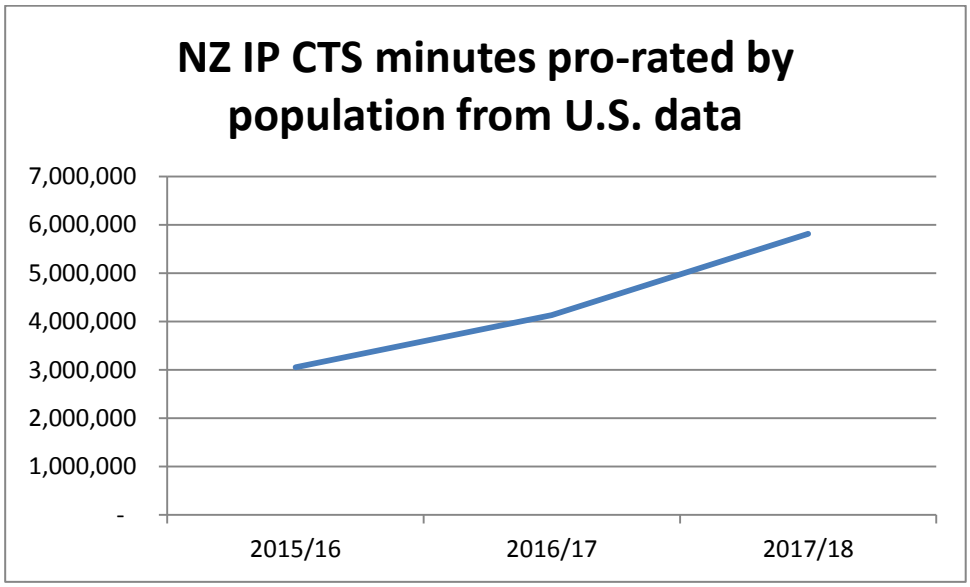


Calls are abandoned typically because captioning is not provided within a reasonable period after call answer. For the range of percentages shown, between 1 in 21 calls and 1 in 13 calls were abandoned. User frustration and service disuseis the result. Such an abandonment problem, if it ever occurred with T-Meeting's TERA, would be quickly fixed by adding more server capacity. There is no long training period for revoicers because the artificial intelligence of TERA replaces human revoicers.

It is notable that the usage of CapTel in NZ is very low compared to the usage in the USA on a pro-rated population basis. The following data is sourced from Rolka Loube Associates website. Rolka Loube is the U.S FCC's TRS Fund Administrator.



Pro-rating U.S. usage on a population basis gives the following result:



The author of this submission prepared a report for MBIE and the NZRAG on 23 October 2013 "Telecommunications Relay Service Funding, Revision G" that forecast IP CTS minutes of use to reach 2,040,000 at a cost of $4.3m in 2017/18. The forecast growth was restricted by funding available with which to purchase CapTel phones to be supplied to end-users with a 50% Crown subsidy and with which to finance depreciation. Production of the forecast was prompted by the legislated decrease in the Telecommunications Development Levy to $10m p.a. that was to occur in 2016/17. TRS + CapTel costs were forecast to rise to $5.64m in 2017/18.

Both Sprint and MBIE have been reluctant to promote CapTel and WebCapTel nationally. The maximum monthly minutes in NZ was 34,297 in Dec 2014 and annual usage is flat at approx. 360,000 minutes per year. The hard of hearing community is not well served by current arrangements.

To correct the very low uptake of service relative to the USA where relay funding is uncapped by legislation and required to be fully funded it is recommended that:

- in any new RFP MBIE declare a realistic specified sum that is to be used for promotion of services and in-home support to each user community;
- more cost effective technology be introduced with instantaneous transcription; and
- financial barriers to users for equipment and broadband service be removed by increased budget or by vote transfers.

25. There has been little promotion of WebCapTel.

26. The reason that the current VIS uses Skype is that it was a means to get the service introduced at low cost within the existing budget at the time to prove to policy makers that Deaf prefer visual communications. The number of blocked calls due to all interpreters being busy on calls is unknown. Monthly reporting shows the experienced traffic analyst that there is congestion in the busy hour but the extent of that congestion measured as abandoned calls is unknown. This problem can be managed with the introduction of a queueing and call distribution system with a traffic statistics module operating in real time under a new contract. In a modern system, even if

all interpreters are busy, any emergency call initiated from a SIP URI will be notified to all interpreters and any one of them can place their current call on hold to handle the emergency call.

28. The critical question is how many of these will require call captioning?

29. The preference for Deaf to use visual language is clearly demonstrated by the usage of the VIS.

30. The primary reason that the mobile phone with text capacity is now considered the most important communication tool for Deaf people including those who have difficulty with written English is because access to the preferred VIS 24/7 is not provided.

The future of New Zealand Relay Services

31. Only half the country signatories to the UNCRDP have a relay service. New Zealand's services are now considered to be legacy technology compared to countries that deliver their services via the internet using ITU-T F.703 total communications and such services supplemented with speech to text and text to speech to form a complete communications solution for all communications disabled groups.

32.

33. While the future of relay and direct services relies on access to the internet, legacy users with TTYs can still be served in a T-Meeting solution by setting the relay assistant workstation to text telephone. Incoming calls are distributed to correctly skilled and equipped relay assistants via an interactive voice and video response front end from where the responses are given in sign language, audio and real time text. The real time text can be output to a Bluetooth Braille reader thus providing access for Deafblind.

    We recommend that legacy TTY users be provided with modern end-user equipment as that is more cost effective than retaining some relay assistant workstations to process TTY calls.

    Affordability of internet access is an issue for users. This can be alleviated by targeted assistance.

34. This is the reason that NZ is so well placed to make a transition to modern internet based relay services. At the same time, it must be recognised, and is by the Minister for Communications, that there is a digital divide. Hon. Clare Curran has been quoted in the media that targeted funding is required to close that gap.

35.

36.

37. Poor promotion of relay services has been an ongoing issue in New Zealand for at least 6 years. With the contracting of CSD for the VIS there was a marked improvement in the quality of the website, outreach collateral, social media engagement and staffing to promote the VIS. It is submitted that:

- Promotion of relay and direct services nationally is too big a job for one person;
- One person cannot be relatable to all user groups. Deaf should promote services for Deaf, hard of hearing to hard of hearing etc.
- Expert creative support attuned to the New Zealand audience must be provided to those fronting the programme in terms of copywriting, graphics, presentations etc.
- Separate budgets for this work should be established by MBIE and declared in any future RFP so that bidders know MBIE's expectation and can devise a programme to best utilise the funds available.
- There should be annual reviews of promotion activities and a willingness to change direction if necessary based on results achieved.

38.

39. The messaging to the communities will be vastly simplified if there is one F.703 or better complete communications application that can be tailored to the sensory needs of individual users. The allocation of a telephone number to relay users and the introduction of Call Direct for Deaf will make calls from hearing-oral people to relay users as easy as making a telephone call to anyone else.

40. It is recommended that the Policy and Programmes team enlist expert help from the MBIE Communications team as a first step in remedial action on service promotion. The setting of realistic promotion and support budgets by MBIE and the declaration of them will help overcome overall bid price disparities of more than 2:1 that have occurred previously. The VIS RFP and resulting contract demonstrates the efficacy of the recommended approach. MBIE got more service and better promotion for its money as a result because proponents were not left guessing what the budget was.

41.

42. Devices are one part of the accessibility equation. The other is software that meets the needs of users with a range of hearing, speech and vison loss as well as Deaf.

    It is important to note that although 95% of all phones now sold are smartphones, only a proportion of these have the processing power and memory capacity to run communications software for use by persons with disabilities.

    Anecdotally, many Deaf and other relay users do not have mobile data plans and only use smartphone features when in a free Wi-Fi area. It is not known if SIP services (the foundation of total/complete communications) are generally accessible in free Wi-Fi areas. Home Wi-Fi routers must have SIP ALG turned off to allow unencrypted SIP traffic through. By using encryption as the first choice in a call set-up [5] T-Meeting users can communicate through routers with SIP ALG on. If the called party does not support encryption then the call reverts to being unencrypted.

[5] Transport Layer Security (RFC 6176) using port 443 and Secure Real Time Transport Protocol (STRP) RFC 3711 to encrypt media content

43. At present all the internet based relay services available in NZ are disparate legacy systems, not an integrated system. Each presents its own different user interface which demands more promotion and training resources. The ad-hoc nature of American systems is now recognised by the U.S. FCC as being unfavourable compared to ITU-T F.703 systems or better.

44. Costs of connectivity, equipment and using voice services have been identified as barriers to using the relay service for many years but officials have not yet made no moves to address the issue with targeted assistance.

45. The feedback described was provided in the 2010 consultation. Officials have declined to do anything about it, partly because the Telecommunications Relay Service is a Telecommunications Service Obligation and any change requires ministerial approval. There has been reluctance to write the required briefings to the Minister. There is no reason that any new relay and direct services contract should be declared a TSO instrument as to do so adds another layer of cost through the Commerce Commission for no output benefit.

46. It is misleading to use data drawn from the total population rather than the subset that is Deaf or has a communications disability.

47. Given that the cost per minute of calling to national landlines and mobiles has fallen considerably over the years and that NZ Relay uses approximately 750,000 minutes per year it is suggested that the incremental cost to the Crown of including free calls to mobiles for relay users would be small.

48. Given that Hon. Clare Curran recognises that there is a digital divide she may well be receptive to advice from officials on targeted assistance to relay and direct service users for home broadband connections.

49. The figures given in the MBIE document are misleading as they are for low-end devices that will not support the required software. There are good reasons that Scandinavian and U.S. programmes distribute predominantly Apple iPad and iPhone devices for their stability, processing power, memory, accessibility features and user preference. The USA also uses Motorola RAZ Mobility product, the global distribution of which does not include New Zealand. MBIE has had information on this since September 2016[6].

    Current consumer prices for iPhones that will run iOS 11 taken from the Apple NZ website https://www.apple.com/nz/ in March 2018 are:

[6] NZ Relay Strategic Plan, Draft Version 0.9, 2 September 2016, pg 34, pg 46

Model	Screen size	Memory (GB)	Price
SE	4"	32	$ 599
SE	4"	128	$ 799
6S	4.7"	32	$ 799
6S	4.7"	128	$ 999
6S Plus	5.5"	32	$ 999
6S Plus	5.5"	128	$ 1,199
7	4.7"	32	$ 999
7	4.7"	128	$ 1,199
7 Plus	5.5"	32	$ 1,219
7 Plus	5.5"	128	$ 1,419
8	4.7"	64	$ 1,249
8	4.7"	256	$ 1,549
8 Plus	5.5"	64	$ 1,449
8 Plus	5.5"	256	$ 1,749
X	5.8"	64	$ 1,799
X	5.8"	256	$ 2,099

Note that:

- The SE model has a small screen that makes reading sign language difficult.
- The 6S, 7 and 8 models all offer 4.7” screens while the Plus models offer 5.5” screens. The Plus models also offer a greater battery life and hence are preferred.
- Over time the minimum and maximum amounts of memory have increased. So while a 32GB model is adequate, as older models are discontinued a 64GB minimum will become the norm.
- NZSL users and hard of hearing with poor vision will prefer larger screen sizes.

Similarly, prices for various models of iPad with varying amounts of memory and Wi-Fi or Wi-Fi+ cellular connectivity are here: https://www.apple.com/nz/ipad/compare/

12.9-inch iPad Pro	10.5-inch iPad Pro	iPad
		
Silver	Silver	Silver

Capacity[1]

Wi-Fi		Wi-Fi		Wi-Fi	
64GB	NZ$1,299	64GB	NZ$1,099	32GB	NZ$539
256GB	NZ$1,499	256GB	NZ$1,299	128GB	NZ$699
512GB	NZ$1,799	512GB	NZ$1,599		
Wi-Fi + Cellular		**Wi-Fi + Cellular**		**Wi-Fi + Cellular**	
64GB	NZ$1,519	64GB	NZ$1,319	32GB	NZ$759
256GB	NZ$1,719	256GB	NZ$1,519	128GB	NZ$919
512GB	NZ$2,019	512GB	NZ$1,819		

The NZ Government has All of Government (AoG) contracts for items like PCs, tablets and smartphones. It has been previously pointed out to MBIE[7] that the lowest cost method of getting devices with adequate power, memory and screen size into the hands of relay and direct services users would be to utilise such AoG contracts in cooperation with an equipment distribution

[7], Ibid pg 11, pg 34

provider. However, there is no mention of such cost lowering innovation in MBIE's consultation document.

MBIE can do its own research on Android smartphones and tablets that run Android 5 rather than quoting low priced devices as misleading examples that are not fit for purpose.

An alternative distribution method is to use coupons that can be redeemed at any retail outlet for hardware according to the user's needs, e.g. iPad + stand or external Bluetooth keyboard etc.

In Sweden almost all municipalities prescribe all in one, software and hardware (Laptop PC or tablets/mostly iPads), except for the Skåne municipality, where they issue software but the user also gets a coupon with a monetary value that they purchase the hardware with. All other municipalities and the Norwegian Labour and Welfare Administration provides the user with hardware as well, including if they need extra accessibility, like an iPad holder with external keyboard etc. The goal is to meet all of the user's needs because that makes it easier to use the technology, not only the software as such, but the hardware as well. If it is made as easy as possible to use then it will be used is our experience. Several U.S. states also use a coupon method of equipment distribution. Inclusiveness in society is important and the probability to get a well-paying job is improved. Users are moved from welfare takers to welfare contributors. This is the essence of why Sweden at first glance appears to be overly generous but is actually saving a lot of money by investing in disabled people. In the end, it is win-win, for both disabled users and the government if all cost benefits are included. Grant Cleland's presentation mentioned elsewhere in this submission makes this abundantly clear in the New Zealand context. Approximately 95% of Swedish users use the software on iPad because of the stability of the devices.

T-Meeting will deliver TERA PC for Windows and TM- Mac for Apple Mac devices running iOS11 by mid 2018. Versions for Android tablets and smartphones are planned to be available end 2018.

50. The trends are irrelevant to relay users. Either they can afford the required telecommunications services or they cannot. If they cannot, targeted assistance is required.

51. Again, generic data is used that is not relay user specific.

52. It is recommended that MBIE consider the data volumes that a Deaf NZSL user would require to enable reasonable use of CIF video at 512kbps on a smartphone or HD video at 1.5Mbps on a tablet. 2GB of data lasts less than 3 hours for HD video.

53. MBIE has feedback from the NZRAG over a period of many years that the cost of connectivity **is** a barrier for some relay users. Why it suggests in its document that it **may** be a barrier is unknown.

Fit for Purpose

54.

55. This is generic information and supposition concerning relay user behaviour.

56. What of companies such as Vodafone and the plethora of Internet Service Providers?

57. Total Communications was ratified by the ITU in 2000. The standard was updated by SG16-TD85/WP2 on 16 February 2018. The revised standard lags behind leading edge solutions that complement total communications with speech to text and text to speech to form a complete communications solution for all groups.

    The lack of information given by MBIE on modern solutions to inform interested submitters gives the impression that MBIE wants to keep users in the dark so that they cannot compare the legacy services they have available to them today with what can be delivered in the immediate future and hence the intention of the 'consultation' is to simply maintain the status quo.

58. These statements show a lack of engagement with and understanding of the relay user community and its needs.

59.

60. MBIE was informed in late 2017 that an artificial intelligence system, TERA, for speech to text that dispenses with a revoicer would enter service in 2018. That has now happened in Sweden, it is ready for release following approval from NAV in Norway and in the USA when new regulations covering direct services compensation from the Federal relay fund are written and approved. There will be a need for NZSL/English interpreters and relay assistants for several years although direct services such as text to speech will decrease the need for relay services that have a relay assistant.

61. T-Meeting contends that TERA meets the needs of all communications disabled groups including deafblind. Yes, there will be a need for Bluetooth Braille devices but the total number is small. New Zealand has had a maximum of 3 telebraillers issued at any time and it is understood that Telstra in Australia has had up to 12 issued. There is no technical or supply reason why the legacy services cannot be discontinued from 30 June 2018 and be replaced 1 July 2018 with internet based services. Equipment and software distribution, user training etc could commence in March 2018.

Other Issues

62. T-Meeting's TERA text to speech service allows a speech impaired user to contact 111 directly and to give their location with a timestamp by audio so that the emergency service can see if the location is current. Similarly, TERA's speech to text function allows hard of hearing caller's to hear the emergency service's questions which they can respond to using their own voice. Of course their location can be given as in the case for text to speech. For emergency calls placed via the relay centre, such calls are prioritised through the T-Meeting infrastructure and presented to all active relay assistant workstations. Any free workstation can process the call. Any busy workstation can put their current call on hold and process the emergency call. When an emergency call is answered by a relay assistant the location of the caller is automatically received in a real time text box. Emergency calls can be saved, local regulations permitting, in two files for later replay:

- Audio and video
- Real Time Text

63. It is T-Meeting's understanding that texts cannot be prioritised through the telco networks. At the time the TXT 111 service was set up NZ Police received an assurance that texts could be prioritised but Supt. Andy McGregor was let down when informed by Telecom that it could in fact not prioritise them. Texting is a store and forward service and there is no guarantee that a text sent will be delivered. These failings are overcome with Real Time Text.

64. Today the NZ Relay centre handles emergency calls on a best endeavours basis. However, modern technology coupled with the expertise of the relay assistants allows much better handing of emergency calls by relay and direct calling users.

65. Given that MBIE received information on emergency call handing in a modern system in December 2018, MBIE's statement that it is proposing no change is an egregious example of the pre-determined outcome that the consultation document foreshadows in its language.

3. New Zealand Telecommunications Relay Services Beyond 2019: Submission template

The closing date for submissions is **5.00pm, Friday 13 April 2018.**

You can make a submission by emailing RelayConsultation@mbie.govt.nz or by posting your feedback to:

NZ Relay Project Team
ICT Policy & Programmes
Ministry of Business, Innovation & Employment
PO Box 1473
Wellington 6140
New Zealand

If you post your submission, please also send it electronically if possible (as a PDF or Microsoft Word document).

New Zealand Sign Language (NZSL) users are also able to make video submissions in NZSL. For Further information please visit http://www.mbie.govt.nz/info-services/sectors-industries/technology-communications/communications/telecommunications-relay-service/.

Please complete the following contact details:

Your name:	Paul Buckrell
Your email address:	paul.buckrell@tmeeting.se

Is your submission on behalf of an organisation?

√

√	Yes
	No

If yes, please write the name of the organisation and your position here:

Europea i Malmö, trading as T-Meeting Global International Business Coordinator

If you or your organisation do not wish your name to be included in any summary of submissions that the Ministry may publish, please advise here:

☐ No, I do not want my name / organisations name published in any summary of submissions

If you or your organisation object to the release of any information contained in this submission, please advise here:

If completing as an individual, which region do you live in?

√

	Northland		Wellington
	Auckland		Tasman
	Waikato		Nelson
	Bay of Plenty		Marlborough
	Gisborne		West Coast
	Hawke's Bay		Canterbury
	Taranaki		Otago
	Manawatu-Wanganui		Southland
	Outside New Zealand. Please specify location:		

If completing as an individual, which age bracket do you (or the person you are completing the form on behalf of) fall into?

√

	Under 18		45 – 54
	18 – 24		55 – 64
	25 – 34		Over 65
	35 – 44		Prefer not to disclose

If you are comfortable doing so, please tick any communications disabilities that apply to you, the person you are completing this submission on behalf of, and/or the body of people you or your organisation represents:

√

√	Deaf
√	Hearing Impaired
√	Speech Impaired
√	Deafblind
√	Other (please specify) The general public that are not Deaf or communications disabled that wish to be able to communicate easily with persons with communications disabilities
	Prefer not to disclose

Are you a hearing recipient of relay calls, or user of the VIS?

√

√	Yes

Are you a user of New Zealand Sign Language?

√

√	No

Are you a user of any of the relay services? If so, please tick which services, and the frequency with which you use them, below:

√

	Every day	Several times a week	Once a week	1-3 times a month	Less than once a month
Teletypewriter to Voice					√
Voice Carry Over					√
Hearing Carry Over					√
Mobile Text Relay					√

Internet Relay					√
CapTel				√	
Web CapTel					
Video Interpreting Service				√	
Speech to Speech					√
Video-Assisted Speech to Speech					√

If you are a user of the relay service, please describe the purposes for which you use it. For example, for social/personal calls, to conduct business, to use interpretation services for appointments:

I use it mainly to receive calls from relay users who wish to discuss aspects of the service with me as well as aspects of MBIE's current consultation.

If you are not a user of the relay service, please describe your interest in this public consultation:

I am a user of the relay service in that I mainly receive calls from persons who are Deaf or have a communications disability. While I am informed if a caller is using the VIS, if the call comes via NZ Relay I do not necessarily know the calling method that the caller is using to access the relay service.

Which of the current services were you aware of prior to completing this submission? Please tick the services below:

√

√	Teletypewriter to Voice	√	CapTel
√	Voice Carry Over	√	Web CapTel
√	Hearing Carry Over	√	Video Interpreting Service
√	Mobile Text Relay	√	Speech to Speech
√	Internet Relay	√	Video-Assisted Speech to Speech

Availability of Services – *Please let us know if your comments relate to a specific service*

1. What is your view of the current availability of the relay service (i.e. are you able to access the relay service when you need it?

2.

It is clear from the usage data that VIS and captioned telephone service are the most popular services yet they are not available 24/7/365. New AI technology will lower the cost of CTS so that it can be available 24/7/365 as can an equivalent of STS and V-A STS. Similarly, new technology will allow e.g. 1 or 2 VIS interpreters to work from home during the 10pm – 8am period to process emergency calls.

3. If you have encountered problems, what are these and what impact have they had?

Low upload bandwidth from Skype callers to the VIS creates difficulty for the interpreter to relay the conversation and requiring repeated signing from the caller.

4. What changes could be made to relay services to improve their availability, and why?
5.

Make the services available 24/7 from mobile devices so that persons using direct or relay services have the same anywhere anytime access as hearing-oral persons have to the global telephone system.

Accessibility – ***Please let us know if your comments relate to a specific service***

6. What additional measures or initiatives could be introduced to increase awareness of the relay service and its benefits to users of the service and the wider community?

Awareness can be increased by having people from each user community focus on raising awareness within their community. Overall the job is too big for just 1 or 2 people. More specified use funding must be allocated and identified by sector in any future RFP. The largest user group is hard of hearing and raising awareness will require mass media campaigns. Conversely raising awareness in the small Deafblind community may be done through Deafblind Awareness and in-home visits using Braille material.

7. If you had the choice between accessing a relay service from a fixed device at home or from your mobile, laptop or tablet, which would you prefer and why?

From home as a VIS user I would prefer to use a fixed device with a large screen (I regularly use 24” for HD video calls) and HD camera. Away from home I would use a smartphone such as iPhone 7 Plus for screen size, battery life and connection to the Internet via mobile data or Wi-Fi.

8. What specific relay services would you like to see available on your mobile, laptop or tablet and why?

Complete communications so that the communications mode can be chosen by me to best

suit a particular part of a conversation and its content. A common user interface would mean that I don't have to learn multiple systems as is the case with NZ Relay today.

9. For those relay services that are available on your mobile, laptop or tablet already, are there any improvements that could be made that would make them easier to use and why?

They would be easier to use if they were combined into a common application with a common user interface.

10. Are there any other issues related to ease of access and use with the current relay service that we should consider?

Yes, better access to emergency services at any time of the day.

Affordability – ***Please let us know if your comments relate to a specific service***

11. Are the costs of connectivity a barrier to you accessing and using the relay service?

They are not a barrier to me personally but are known to be a barrier to may users and potential users as reflected in the minutes of NZRAG meetings.

12. If so, what are the specific problems you have encountered and what impact has this had?

13. What changes could be made to the relay service to improve its affordability and why?

Targeted assistance could be provided as is done in Norway, Sweden and the USA. There is evidence of the significant overall economic benefit to the country of disabled people who wish to gain employment being given the support they need to achieve that goal. This appears to align with numerous media statements made by Ministers of the current NZ Government.

Fit for Purpose – ***Please let us know if your comments relate to a specific service***

14. Are there any particular features or changes that you think should be made to the relay service to ensure it continues to offer a good experience to users and why?

Why should relay users in New Zealand be constrained with old technology as this question implies? MBIE should inform the community About the future options available.

15. Are there any relay services or equipment that you consider are no longer relevant and could be phased out or discontinued? If so, what measures or support would need to be provided to transition users to other services or mainstream devices?

New Zealand is in an ideal position to cease all of current legacy relay services and move to a modern system form 1 July 2019. A transition period of equipment and software distribution and user training commencing March 2019 would allow an overnight transition from the old systems to the new integrated system.

16. Have you ever discontinued use of any of the relay services? If so which service or services, and why?

It is known that some users of CapTel have stopped using the service because of the delay between hearing sound and receiving captions. T-Meeting has been informed by some state relay administrators and officials in the USA that the same occurs there. Another problem in New Zealand is the abandoned call rate because users do not start receiving captions within a reasonable time after call answer.

Any Other Comments – ***Please let us know if your comments relate to a specific service***

17. What other comments do you have about New Zealand Telecommunications Relay Services?

Thank you for taking the time to complete this submission. Your feedback is appreciated.

Publication of submissions

Written submissions may be published at www.mbie.govt.nz. We will consider you to have consented to publication by making a submission, unless you clearly specify otherwise in your submissions.

In any case, all information provided to the Ministry in response to this discussion document is subject to the Official Information Act 1982 (OIA)**. Please advise if you have any objection to the release of any information contained in a submission**, and in particular, which part(s) you consider should be withheld, together the with reason(s) for withholding the information.

T-Meeting has no objection to this submission being published in its entirety. We believe this is consistent with the current Government's approach to open government and transparency.

In particular, please clearly indicate in your submission if you do not wish your name and any other identifying details to be included in any summary of submissions that the Ministry may publish, or in any responses to OIA requests.

The Ministry will consider all such objections when responding to requests for copies and information on submissions to this document under the OIA. Please note that in certain circumstances information you have provided us may be required to be released to a requester under the OIA, even if you would prefer it to be withheld.

The Privacy Act 1993 establishes certain principles with respect to the collection, use, and disclosure of information about individuals by various agencies including the Ministry. It governs access by individuals to information about themselves held by agencies. Please contact us if you would like a copy of, or to correct, any of your personal information. Any personal information you supply in the course of making a submission will be used by the Ministry only in conjunction with the matters covered by the documents.

4. Additional issues which must be addressed to overcome shortcomings with the current contractual arrangements

4.1 User representation

The NZRAG has been a very useful source of feedback and input to MBIE in particular since 2004. However, T-Meeting understands from DPOs and service providers that serve the Deaf, hard of hearing, deafblind and speech impaired communities of users that it would be more representative if the DPOS and service providers made up the Advisory Group rather than individuals. Such a change would make it possible for a much wider group of users to be informed of issues under consideration my MBIE or the relay/direct services provider and equipment distributor. DPO or service providers could canvass their memberships on issues and provide advice to MBIE on a much stronger basis than is currently possible.

4.2 Governance

The current TRS and VIS services are a minor part of the responsibilities of the Policy and Programmes group in MBIE and historically are given low priority. Although MBIE could attend e.g. NASRA and TEDPA conferences to establish relationships with peers and the FCC it has chosen not to do so since 2016. Other invitations that would enable policy analysts to gain in-depth knowledge of current developments have been declined. Close connections have not been forged with the relevant DPOs and service providers by the policy analysts now working part-time on relay matters. It is felt that the services, whether they involve a relay assistant or whether they be direct using modern technology should be governed by a Board comprising the CEOs or senior office holders from e.g. Deaf Aotearoa, National Foundation for the Deaf, Hearing Association of New Zealand, CCS Disability Action, Deafblind Awareness and possibly Royal New Zealand Foundation for the Blind. Such a Board would bring expert knowledge of the sectors to be served to the running of the service. The Board could bring all of its membership resources to bear on raising awareness of services and delivering support to their members given appropriate funding from MBIE to deliver such servcies.

4.3 Promotion of services

The promotion of relay services in New Zealand by the Service Provider has not been successful. One reason is that the job is simply too big for one person.

The proposed Board will have knowledge accumulated over many years of the most effective ways to get information to their memberships and to elicit feedback on issues.

Each DPO has existing networks, copy writers, graphic artists etc skilled in presenting information to their audiences.

Promotion of services needs to be segmented into:

- Deaf

- Deafblind
- Hard of hearing
- Speech impaired
- The general hearing-oral public

Then, people relatable to each community can make presentations and deliver in-home support. As an example, it is not possible for a hearing sighted person that does not know Braille to deliver effective and efficient training to a Deafblind user. However, a Deafblind person already familiar with the blind accessibility features of an iPad for example would quickly become proficient in the use of T-Meeting TERA and be able to teach other deafblind.

This is an area that can be expanded upon in any future RFP response.

4.4 In-home support

Some in-home support has been provided under the current TRS Deed. However, the budget for it is unknown as it is at the whim of the Provider.

In-home support is critical, especially for elderly and low income persons who may not have had access to the internet previously and are unfamiliar with things like Wi-Fi password setting or even what terms such as modem, router, Wi-Fi or mobile data means.

It is important that in-home support be funded by a specified amount. MBIE could consult ODI and Workbridge to find what a suitable budget amount should be.

4.5 Inclusion of direct services

The consultation paper is focussed on relay services and overlooks direct services that are delivered by T-Meeting's TERA at significantly lower cost than relay services that require a relay assistant.

The launch of TERA in Sweden has shown that excitement in all user groups is building rapidly as they realise that TERA allows them to make calls directly with no relay assistant involved or they can still place calls via the relay centre if that is what they are most comfortable with. Direct access to emergency services using the text to speech and speech to text functionality couple with location information is seen as a huge improvement in comparison to using legacy TTY and fax services. Finally, communications impaired persons are able to access emergency services like 111 in the same way that hearing-oral persons do.

4.6 Contract flexibility

The writer of this submission advocated for a 5 + 3 year TRS TSO contract term to minimise procurement effort and cost. Experience has shown that the structure of the resulting Deed and Addenda has precluded the introduction of new technology in a simple manner. It is recommended that any new contract have provision for a continuous improvement programme to be included so that the overall service delivery does not stagnate and that there be flexibility to negotiate the price of agreed improvements as they become available.

Appendix A T-Meeting's Response to Request for Information, New Zealand Relay Telecommunications Relay Services Reference Number 680

Response to Request for Information

New Zealand Telecommunications Relay Services

Reference Number 680

8 December 2017

Prepared by:

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Contents

1. Basis of Response

This response is prepared to provide MBIE with information on ITU-T F.703 based **total communications** solutions for telecommunications purposes. It also provides information on the next generation in relay and direct service technology that embodies F.703 total communications and additionally uses Artificial Intelligence (AI) to deliver a **complete communications** solution. Having one platform is seen by users as very beneficial because it simplifies access compared to the situation in New Zealand today where services must be accessed from different devices and in different ways.

Information is also given from T-Meeting's perspective that takes into account recent international conferences on the subject of relay and direct calling services, the author's accumulated knowledge built up while the NZ TRS Contracts Administrator and inputs from the user communities, Deaf Aotearoa with its status as one of six NZ Disabled Persons Organisations, NGOs, MSD, NZ Police and the Maori Language Commission.

This response has been prepared with reference to the NZ Disability Strategy.

The information presented describes current capabilities. However, T-Meeting has a relentless research and development programme that will see new world-leading innovations delivered over the term of any new contract in New Zealand. Contractual flexibility will therefore be required to be able to include such innovations over time.

It is notable that the budgets associated with relay services have not changed significantly since they commenced in 2004 after being set probably in Q3/2003. The textphone pool budget was reduced following the Global Financial Crisis. In the intervening period the CPI has increased 34%[8]. As a comparison, the MSD budget for emergency pendant alarms (the population of NZ >65 years is 607,000) has been increased to in excess of $26m to satisfy demand. It is suggested that TDL and MBIE non-departmental funding now needs reprioritisation to properly fund modern relay and direct AI services as described in this submission given that 4-6% of the population (192,000 – 288,000) has hearing loss[9], there are 2,500 – 4,500 ,Deaf[10] using NZSL as their primary means of communication and an estimated 20,000 speech impaired[11] persons.

We are also cognisant of the report Digital New Zealanders: The Pulse of our Nation released by Hon. Clare Curran, Minister for Communications, which identifies disabled people as being one of the groups at most risk of digital exclusion and, as a result, should be prioritised in terms of targeted support.

[8] Reserve Bank inflation calculator
[9] International Federation of Hard of Hearing
[10] Deaf Aotearoa
[11] Pro-rated from Swedish population

2. What technological solutions can best meet the needs of the user communities?

2.1 Background

ITU-T F.703 for total communications was ratified in 2000. Real world examples of solutions began appearing in approximately 2006. T-Meeting has had such systems in operation since 2007. F.703 is currently being updated. Whether the update will incorporate Artificial Intelligence (AI) improvements is unknown.

Total communications is especially useful for persons that are Deaf and use visual language as their primary method of communication. It is also tailored to the needs of Deafblind who sign and receive responses through real time text to a Braille reader.

Total communications platforms have been deployed in Europe for over a decade and recently in Canada but have not appeared in the USA. Only this year is RFC4103 Real Time Text to be deployed on mobile devices in the USA after several years of lobbying the US Federal Communications Commission primarily by AT&T. F.703 systems are now on the radar of the U.S. FCC Disability Rights Office both as a mass market telco service and for relay applications.

F.703, while specifying a conversation that includes audio, video and RTT, leaves open to suppliers the supply of features that benefit users with hearing, visual and mobility disabilities. The way in which such features are delivered, the intuitiveness of the user interface, the way in which valuable screen space is used in conference sessions, voice, video and RTT mail options, overall stability, reliability, the ability to place call-backs, make emergency calls with location information automatically forwarded as RTT or speech etc. is what differentiates supplier offerings.

F.703 systems follow the 'traditional' relay model of having a Relay Assistant in the call chain. Given that automation of visual language to speech or text and vice versa will not occur for many years, if ever, and where the user community is as small as 2,500 – 4,500 NZSL users which is the case in New Zealand there will continue to be a need for NZSL/English interpreters to provide a VIS in New Zealand.

2.2 Call types and technology

The introduction of AI to complement and enhance F.703 systems revolutionises relay services by making most call types direct between the calling and called parties without the need for a Relay Assistant. T-Meeting's TERA replaces:

- Teletypewriter to Voice
- Voice Carry Over (hardware for this service has been discontinued for > 3years)
- Hearing Carry Over (this type of call is extremely infrequent now)
- Internet Relay (this does not support bi-directional call initiation, requires a GA and garbles if an interruption is attempted)

- Mobile text Relay (this does not support bi-directional call initiation, requires a GA and garbles if an interruption is attempted)
- CapTel (phone and web). These services have not grown as forecast in New Zealand because of the Provider's reluctance to promote the services using mass media including TV, inappropriate (American centric) promotional material and importantly the delay between the audio and the delivery of captions. When the delay is frequently approaching 5 seconds users stop using the service. T-Meeting has recently discovered that new users can and do feel mislead by omission in the promotional material for CapTel concerning the delay in receiving captions. With TERA there is no noticeable delay and even contextual spelling mistakes are automatically corrected in a fraction of a second.

In addition, TERA partially replaces Speech to Speech and Video-Assisted Speech to Speech service in that TERA generates speech from text in a male or female voice. T-Meeting estimates that there are approximately 20,000 people in NZ with speech impairment. Currently the number of STS users is very small as this isolated group is very hard to reach and often fearful of trying to make a telephone call. Their access may be improved by using NZSL interpreters capable of understanding distorted speech and total communications or by deploying TERA.

Given that legacy relay system costs are approximately 75% labour and 25% technology, the cost savings that AI brings to the provision of functionally equivalent communications for persons with communications disabilities is significant. Furthermore, it allows the expansion of service hours for these services to 24/7/365 because the technologies, not Relay Assistants, are doing the intermediary work. The savings from the new technology can be applied to expanding hours of service and days of service for NZSL users.

2.3 Broadband service types

T-Meeting's system is accessible via any of the broadband services types available in New Zealand. On copper we recommend VDSL for an upload speed of 1Mb/s to support High Definition (HD) video. HD video at 30 frames per second on a 15" or larger monitor requires less concentration on the part of sign interpreters whose job is concurrently one of the most demanding physically and mentally.

2.4 Service platforms that allow for voice, text and video communications

Please see www.tmeeting.com/our-products

2.5 User specific equipment preferences for widely available and supported general purpose mobile devices, tablets and computers

The bulk of our end-users (Est >95%) use our software on Apple tablets and smartphones. The reason is their inclusion in equipment distribution programmes (EDPs) in Scandinavia and the USA. Apple provides a rigorously vetted system for accepting apps into the App Store, its devices include good accessibility features, especially for blind users, and there is less risk from malware.

EDPs generally allow for a 3 year replacement cycle on hardware because software vendors such as T-Meeting only support a few prior versions of OS as their own software takes advantage of new OS capabilities.

T-Meeting currently supports:

- Windows 7 and later on PCs;
- For iPad the requirement is iOS 11 and first generation iPad Air or newer, or second generation of iPad Mini or newer.
- Android 5.0 or later on Android devices.

Mac OS is not currently supported due to the low user base and users' desire for portability. While we have it in our development queue it does not have high priority.

2.6 Use of end-user apps running on popular operating systems such as Google Android, Apple OS and iOS, and MS Windows OS

a. MS Windows
We offer our total communications relay assistant workstation TM-PC Pro. See http://tmeeting.com/our-products/tm-pc-pro.cfm . This is probably the most powerful total communications workstation available today capable of conferencing 6 parties with HD video or a mixture of audio only (PSTN), video and RTT participants. Multi-party RTT is supported and is particularly useful in educational settings.

For end users we offer TM-PC, see https://tmeeting.airsquare.com/our-products/tm-pc.cfm . This has the same functionality as TM-PC Pro except that there is no conferencing or recording capability.

b. Tablets, iOS and Android
See TM-Touch https://tmeeting.airsquare.com/our-products/tm-touch.cfm

c. Smartphones
See TM-Mobile http://tmeeting.com/our-products/tm-mobile.cfm

d. Public station
See TM-Public https://tmeeting.airsquare.com/our-products/tm-public-station.cfm

e. TERA Complete Communications
See https://tmeeting.airsquare.com/our-products/tera.cfm TERA contains all of the total communications functionality of TM-Touch and TM Mobile plus AI for speech to text and text to speech and runs on the same minimum hardware and OS versions.

2.7 Standards Supported

T-Meeting's F.703 based platform uses the SIP RFC 3261 protocol at its heart. We have never used the older H.323 protocol.

Video codecs: H.263 (to support older videophones), H263+ (1998) H.264, Google VP8 (and VP9 in our WebRTC direct video calling platform)

Video quality:

- 720p 30 frames per second, the minimum to be considered high definition. The software is already prepared for 2k and 4k video at 30 fps and we await the emergence of affordable cameras that deliver 30 fps.
- Common Interchange format (CIF)
- QCIF = Quarter CIF (176*144)
- VGA (640*480)
- QVGA (Quarter VGA)

Audio codecs (device dependent):

- G.711 (A-law)
- G.711 (μ law)
- GSM (not recommended as it is inherently average quality)
- G.722
- Silk 8000 (Narrow bandwidth)
- Silk 12000 (Medium bandwidth)
- Silk 16000 (Wide bandwidth)
- Silk 24000 (Ultra wide bandwidth)
- OPUS (RFC 6716) wideband. This is our default HD audio codec that gives the best performance coupled with loud-speaking mode on the device for hard of hearing persons.)

Video bit rate:

Selectable from typically 512kbps to 1536kbps.

Transmission protocols:

- Universal Data Protocol (UDP)
- Transmission Control Protocol (TCP)

Encryption:

- Secure Real Time Transport Protocol (STRP) RFC 3711 to encrypt media content
- Transport Layer Security (TLS) using port 443.

Note that our end clients and infrastructure will revert to unencrypted if one party does not support encryption. This applies where there are multiple suppliers of end clients in a market.

End clients that are set up for unencrypted or encrypted calling use different Session Border Controllers in our cloud infrastructure.

Real Time Text: ITU-T.140/RFC4103 (based on UDP which was the only standardised real time protocol when RFC 4103 was developed) and SIP chat are supported. We recommend the use of RFC 4103 as it performs much better in a low quality broadband environment. We also offer 'advanced RTT' based on TCP that can be used as a real time protocol and HTML syntax that has the following advantages:

- It allows a cursor to be placed anywhere in a text string to add or delete characters rather than having to backspace and delete characters to the point that the correction shall be made. This is valuable for persons with e.g. cerebral palsy and motor problems like NZRAG rep Mike Hamill;
- Text formatting;
- Facilitates the sending and receiving of emoji's present in most modern chat systems;
- HTML with TCP has an inbuilt redundancy mechanism that ensures characters reach the counterpart, or if not, the characters are sent again. This is important for emergency calls. In UDP there is no such mechanism, RFC 4103 only retries 3 times;
- Advanced RTT allows throttling of text delivery to Braille readers that is not possible with RFC 4103; and
- T-Meeting's advanced RTT is backwards compatible with RFC4103.

Transcoding:

Transcoding between different audio and video codecs used in a call is done automatically in our cloud infrastructure.

Cloud infrastructure:

No call content information is ever stored in our cloud. For an F.703 based system cloud components include:

- Session Border Controllers
- Registration and authentication servers
- Interactive Voice and Video Response (IVVR) and media servers
- Proxies
- WebRTC Converter (if required)
- SIP/PSTN gateways
- Admin and statistics server with a customisable relational database for real-time, daily, weekly and annual reporting
- Web client server (if required)

The additional cloud components and structure required to deliver the new AI functions are held in strict confidence within the company.

Servers handling non time-sensitive tasks such as registration, authentication, admin and stats may be located anywhere in the world. Servers that handle call content are located to keep latency within acceptable limits for the client country.

Infrastructure can be duplicated within datacentres or for ultimate resiliency can be spread across datacentres located at least 160km apart in areas that have different exposures to natural hazards. The final configuration is determined by a customer's availability (uptime) specification and available budget.

3. How can current challenges be overcome?

3.1 Hours of Service

The introduction of AI and the removal of a Relay Assistant from most call types significantly lower the cost of call processing.

MBIE was advised in March 2017 of the likely cost of mass market hardware sourced through existing AoG contracts and total communications software to enable it to make a budget bid to properly fund the future textphone pool. Assuming that this has been taken care of, then the lowered cost of processing all call types except:

- VIS that is certain to grow with expanded hours of service and more peak hour capacity;
- STS that is a low volume service, the usage of which should increase with AI text to speech service; and
- V-A STS (T-Meeting understands that there has been only one user, partly due to a lack of service promotion but also the cumbersome nature of the current technology)

should enable the expansion of service hours for captioned telephone service to 24/7/365. Similarly, the use of TERA for text to speech enables a 24/7/365 service to be provided. It is anticipated that core VIS hours of service will be able to be expanded to 8am to 10pm daily (as in Norway) and an emergency service with an interpreter possibly working from home 10pm – 8am daily will provide Deaf with the visual language emergency calling service that they have asked for.

A move to 24/7/365 service for all call types would put New Zealand in good stead in its 4 yearly reporting on compliance with the UNCRDP and we feel sure would be supported by the parallel report presented to the U.N by NZ DPOs.

3.2 Two-way services, numbering and Call-Direct

3.2.1 Two-way services

A SIP based service that has a user's national telephone number as the SIP prefix allows hearing and non-communications disabled persons to call those that are Deaf who have a communications disability. In our case this is accomplished by including Call Direct as a service for Deaf so that an interpreter is automatically connected into a call and by using TERA's text to speech and speech to text functionality. These will overcome the user communities' long standing gripe that hearing - oral persons do not readily call Deaf and communications impaired persons through NZ Relay.

3.2.2 Numbering

T-Meeting has ascertained that it can obtain NZ telephone numbers for allocation to its end-user licence holders. There is still work to be done on national per minute PSTN rates for calls to landlines and to mobiles.

3.2.3 Call Direct

Currently this service is only available in Norway. It was promised by the supplier of the central VIS platform in Sweden but has not been delivered.

Norway restricts the availability of Call Direct to people in employment. Hence, Call Direct users are registered. In the past 12 months the number of Call Direct calls has increased by 87% to 2,471 calls.

Call Direct requires the user to have an allocated Over The Top (OTT) telephone number as the prefix of their SIP address which they can put on their business card as their primary contact number.

The main benefit of Call Direct is that PSTN users can easily call a Deaf person and an interpreter is automatically connected into the call. It also allows call-backs from IVR systems such as are used by IRD and utilities rather than the caller and interpreter having to hold for sometimes lengthy periods of 30 minutes or more. By utilising the call back option the interpreter is freed for other calls.

An important fact to consider when introducing Call Direct is that a call back must be answered within a reasonable time, preferably 20 seconds after which the abandoned call rate rapidly increases. This means that the VIS must be staffed to a higher level than when Call Direct is not offered and consequently the interpreter utilisation will be lower.

As with the current VIS contract, costs can be contained by specifying an average number of interpreters on duty. There should be a contractual mechanism to increase the average number of interpreters when the abandoned call rate exceeds an agreed threshold in the busy hour measured over a three month period, e.g. 4%.

3.3 Affordability

a. Broadband plans

T-Meeting believes that broadband plans should be subsidised for year for people seeking employment so that they can demonstrate their ability to function on an equal footing to hearing persons. Having proven that, the employer may subsidise a person's plan or the individual may be making enough income to be able to pay for their plan themselves.

b. Equipment

The Crown has in place All of Government contracts for PCs, tablets and smartphones. T-Meeting contends that those AoG contracts should be used to supply the textphone pool with modern devices and that there is a 3 year replacement policy.

Smartphones could be considered to be ubiquitous devices now. It is for this reason that Norway does not have them in the NAV distribution programme. On the other hand those U.S states that do have them in their EDPs predominantly offer Apple devices free

of charge because of their accessibility features. The other range offered in the USA is Motorola's RAZ Mobility that is not available in NZ. Factors that determine whether or not any given smartphone is suitable to be used with T-Meeting software are:

- Battery capacity. Until November 2017 our apps needed to be launched to receive a call. The app frequently pinged the central infrastructure to ensure it was connected. This activity consumed battery capacity and led users to prefer e.g. iPhone 6+ or iPhone 7+ for larger battery capacity over the iPhone 6 or iPhone 7. However, with the recent introduction of push technology a user does not have to have their T-Meeting app launched in order to receive a call. The app is started by the push technology when there is an incoming call.

- Screen size. Although T-Meeting apps are carefully design to maximise use of screen space, many users prefer to have the largest screen size, especially for visual language use and when their vision is reduced and they are reading text.

Where a user is issued a T-Meeting licence for a PC or tablet, T-Meeting also provides a free licence for the user's smartphone. Both licences have the same OTT telephone number allocated to them as a part of the SIP address. Deaf users typically set their smartphone to vibrate on ring to alert them to an incoming call.

c. Software

End-user licence software registration details need to be issued from the textphone pool provider. The software itself is downloadable from T-Meeting (TM-PC Pro) the App Store (iPad and iPhone) and Google (Android tablets and smartphones). For low technology literate users it will be preferable to ship a device with the software preloaded and registered. For low vision, Deafblind and complex case multiple disability users in-home assistance should be budgeted for.

d. Calls to landlines and mobiles

As MBIE has pointed out elsewhere, mobile penetration is well over 100% and the number of landlines has slumped from > 1.2 million to less than 186,000 today. The inability to call mobiles through relay (staffed or AI based) without the complexities of sourcing and maintaining a calling card is seen as miserly and discriminatory by users. New Zealand is encouraged to remove this obstacle as Australia, Norway and Sweden did years ago.

3.4 User registration

End users who are Deaf or have a communications disability who have downloaded our software will have to register with us to receive the activation details for their licence copy.

Non-disabled users who wish to call a disabled user from a landline or mobile do not have to register as users.

3.5 Emergency services calling

T-Meeting's TM-Touch, TM-Mobile and TERA products, both for Apple and Android, all have the ability to automatically forward the user's latitude and longitude to a relay centre equipped with TM-PC Pro workstations as real time text that pops open a chat field. The relay assistant can then out-dial to 111 to request the desired emergency service or better still have a number for each of Police, Fire and Ambulance that they can call directly. TM-PC Pro can record conversations. Two files are created, one for audio and video, the other for RTT.

T-Meeting's cloud infrastructure together with TM-PC Pro slows emergency calls to be identified even when all interpreters are busy on calls when the feature "Allow incoming call during Ongoing call" is enabled. The current call can be put on hold while the emergency call is processed. This eliminates the need for a separate, low utilisation, high cost emergency queue option.

TERA speech impaired users can set up their app so that when an emergency number is called directly (111 or preferably a direct number for the desired service) their latitude and longitude is spoken out when the call is answered and can be resent at any time on request.

T-Meeting sees no need to perpetuate the use of the Police 0800 numbers for TTY and facsimile. A short discussion with the Police Operations Manager Call Centres, Mal Schwartfeger, during the preparation of this document confirmed that T-Meeting's view aligns with that of NZ Police.

3.6 Transition from legacy to new services

Given the government's investment in the UFB and RBI programmes New Zealand is almost uniquely poised to make a clean break from legacy relay technology in the same way that on a date signalled a good way in advance analogue television was closed down in favour of digital. We cannot foresee that New Zealand could justify or afford to continue to operate a legacy system in parallel to an internet based system. We submit that the new Provider should begin equipment and software distribution and training from March 2019 so that users are ready and equipped for the transition to a new system on 1 July 2019.

By 1 July 2019 all of the current textphone equipment, including remaining CapTel phones in stock but not yet issued, should be fully depreciated. It can be seen as a blessing in disguise that CapTel uptake in New Zealand has been low, that all users are known and that they have an email address.

For those users that already have fixed line broadband and a router it will be necessary to ensure that the setting SIP-ALG is set to OFF. By default the Huawei routers delivered by Vodafone for example have SIP-ALG ON by default to block SIP traffic. It may be possible to mitigate this by using TLS443 so that the information is encrypted and the router cannot see that it is SIP traffic traversing it.

3.7 Role of incoming service provider(s)

This topic is somewhat difficult to contribute to when the structure of the RFP(s) are unknown.

Separation of the VIS from TRS and captioned telephone service has served the Ministry and the users well by introducing competitive tension between Sprint International NZ and CSD and delivered better value for money in VIS expenditure. It has shown that while one overseas organisation has never adapted to New Zealand culture and reflected that in its promotional activities, another overseas organisation, largely as a result of the efforts of a NZ champion within it has listened intently and adapted. The outcome has been a revamped VIS website and recently two new videos that reflect the feedback from the Deaf members of the NZRAG that Deaf enjoy humour in promotional material. Despite the videos being considered inappropriate and being quite intensely disliked by the CEO of CSD, Juli Robinson who has spent many weeks in in NZ stood her ground and the videos have been very well received in NZ. The VIS contract makes specific provision for promotion at an agreed amount per annum. CSD has recently appointed a Promotions Manager for VIS who is well regarded in the Deaf community.

Promotion of all the current legacy TRS services and CapTel has been considered unsatisfactory despite the promises made in its last tender by Sprint to appoint an appropriately qualified person but then made no change and continued to use a person not widely respected in the Deaf community. MBIE itself made a significant improvement through its internal marketing team in the creation of a NZ appropriate brochure for CapTel but it is believed all of the people involved in that have now left MBIE.

A big benefit of moving to total communications and complete communications is that there is a high degree of commonality across end-user devices and no benefit is seen from continuing to separate the supply of a VIS from other services. Basically, a user can be issued an F.703 total communications licence or a TERA licence and end-users can be educated on customisation of those to best suit themselves. T-Meeting recommends that specific budget be set for promotion of the new services including special provision during the transition period March – 1 July 2019. We contend that there must be direct involvement by the relevant Disabled Person's Organisations and NGOs in this effort for reasons of relatability and empathy. Further, we believe that such buy-in can be obtained providing those organisations are not expected to deliver services without being funded to do the work.

Promotion of the new service is too much to expect one person to succeed at. A team with knowledge of each user community is needed and the team members must be relatable to and respected by their communities. T-Meeting requests that MBIE set specific and realistic amounts for promotion to each major user group, i.e. Deaf, deafblind, hard of hearing and speech impaired in accordance with the NZ Disability Strategy. Mass media advertising including TV is seen as essential to reach hard of hearing and speech impaired persons. Expenditure on promotion should not continue at the whim of the Provider.

A new contract gives the opportunity to review the composition of the NZRAG. It has been suggested to T-Meeting that a DPO such as Deaf Aotearoa as well as major NGO groups like NFD Deafblind NZ (Inc.) and CCS Disability Action would be better user community representatives overall than individuals. Such a group, invested with decision making and governance power would fulfil the fundamental request of all disabled groups – **Nothing For Us Without Us**.

4. Possible limited support for te reo Māori

The current TRS TSO Deed includes a provision for a feasibility study on delivering captioned telephone service in te reo Māori. A brief report was delivered that concluded it was not feasible.

T-Meeting's TERA has the capability to work with languages that use diacritics to provide correct meaning. Given that te reo Māori is an official language of New Zealand, we have sought advice from the Maori Language Commission on the inclusion of Maori place names, given names and words commonly appearing in the NZ English lexicon in a NZ English dictionary.

The Commission's response reads in part:

In terms of "Māori place names" we are currently working with the NZ Geographic Board (who are the legislated organisation for the naming and orthography of all New Zealand geographical features) and Google who approached us several months ago to provide quality around the correct use of macrons on te reo Māori place names. This project we are currently involved in seems similar to achieving the same ultimate te reo Māori outcome of your project "accurate pronunciation from text to speech". I see that T-Meeting can also do "speech to text".

What is not widely known about te reo Māori place names is that the story behind the name is essential to knowing the pronunciation of the name. We have received requests for our te reo Māori experts to go through lists of te reo Māori place names and correct the orthography to suit the development of an algorithm- this is not a simple task of saying the name and then writing it. The expert in te reo Māori and geographical naming conventions is already heavily overloaded with contract work.

Whilst we are already committed with our small budget and expertise, we are still extremely supportive of any work programme that seeks to make te reo Māori more widely accessible to all users of any language within New Zealand, especially Māori people who choose to use te reo Māori.

However, we can:

- offer a statement of support, and check with NZ Geographical Board how they might feel about the sharing of any information that has been derived to support our current project with Google (correct use of macrons on the names of te reo Māori places and cities etc)
- direct you to the NZ History website which has a list of 100 te reo Māori words that every New Zealander should know - it also has sound files https://nzhistory.govt.nz/culture/maori-language-week/100-maori-words which will assist you in those "te reo Māori words common in the NZ lexicon".
- we can also provide you the name of a contractor who is expert in te reo Māori translation using artificial intelligence (which could be a useful contact for your project as it revolves around the use of artificial intelligence)

While T-Meeting is not suggesting that it may provide full support for te reo Maori, we feel that there are good avenues to explore for the correct pronunciation of place names, given names and 100 words every New Zealander should know.

Because this dictionary would be unique to New Zealand, the teo reo development costs would have to be borne by New Zealand and the timing for it would have to be mutually agreed.

5. Suggested Conditions of Tender and Contract

As a result of involvement in RFPs for F.703 total communications solutions over the last decade T-Meeting is aware that some countries have had a terrible experience in terms of other suppliers' platform reliability, end user app reliability and features being promised but not delivered. These issues can be attributed to evaluations being restricted to a paper evaluation, lack of involvement of the end-users in the hands-on evaluation and a lack of rigorous reference checking.

One platform provider in particular is notorious for stating "Comply" to all specified requirements in order to achieve a high evaluation score yet fails to deliver once a contract is awarded.

T-Meeting recommends that language along the following lines be included in any RFP to counteract such behaviour:

a. *In its statement of compliance to the specification proponents shall use the terms:*
    I. *Comply*
    II. *Partially comply*
    III. *Will comply by (insert date)*
    IV. *Do not comply*
    V. *Cannot comply*
b. *Where a proponent states "Comply" in its submission, that statement cannot be withdrawn in contract negotiations.*
c. *In the event that a service or feature is not supplied in accordance with the proponent's submission and subsequent contract there shall be a significant financial penalty imposed for each instance of non-compliance or the Ministry may elect to terminate the contract and change to another Provider.*

We are also aware that there are very restrictive arrangements in place concerning technology and platform operators. For example T-Meeting would like to work with CSD as an operator but is prevented from doing so due to two restrictive agreements that CSD has been obliged to enter into with Sprint and Ultratec. It is therefore suggested that MBIE include a question to proponents:

"Does your organisation have any technology or operations restrictions from your technology providers or imposed by you on your operations partner(s) that reduce or limit competition for the overall supply of relay services for Deaf, deafblind, hearing impaired and speech impaired persons in New Zealand?"