Telstra Response to the Department of Communications Review of the National Triple Zero (000) Operator Discussion Paper

12 September 2014

Executive Summary

Telstra welcomes the opportunity to respond to the Department of Communications' Review of the National Triple Zero (000) Operator, Discussion Paper[1] (the **Discussion Paper**). Telstra's history and experience as the national Triple Zero operator since 1961 means it is well placed to comment on the issues raised by the Department in the Discussion Paper.

The Triple Zero service[2] plays a critical role in meeting the expectations of the Australian public for effective access to emergency services and Telstra believes this will continue to be the case in the foreseeable future. In its role as the National Triple Zero (000) Operator, Telstra has made substantial investments since 1961 to improve both the network and call taking operations to ensure the Australian public are provided an effective and efficient Emergency Call Service. The Triple Zero (000) Operator, is required to answer 85% of calls to the emergency service numbers (000 or 112) within five seconds, and 95% of such calls within 10 seconds. In the 12 months to June 2014, the Triple Zero (000) Operator managed 8.48 million calls, of which 5.73 million were transferred to ESOs. In handling this volume of calls, Telstra has met or exceeded all grade of service targets[3] on a monthly basis for over a decade.

Telstra believes it is important that regulation remains relevant and appropriate to support the ongoing operation and development of the service in a rapidly changing social and technological environment. However, any proposed reforms must be thoroughly analysed and tested to ensure that they meet a demonstrated need and are the best approach to meeting this need.

In summary, Telstra's views on the key issues raised in the Discussion Paper and this submission are as follows:

- Any decision to implement the proposed reforms outlined in the Discussion Paper and this submission requires an appropriate balance between maintaining the highest levels of integrity, service continuity, availability, and the need to address the evolving community and public interest expectations of what a single national emergency call service should deliver.

- Any proposed changes, including the delivery of improved location information to Emergency Service Organisations (ESO), new methods of accessing the emergency call service (ECS) and technology enhancements to the national Triple Zero (000) operator, will need to be subject to detailed consultation and a thorough prior consideration of any impacts on the existing emergency call service. It is important that clearly articulated cost-benefit analyses are undertaken to ensure proposals represent the best options to address the underlying public policy objectives.

- Telstra believes that the Federal Government should partner with industry and relevant stakeholders in determining the most appropriate and effective ways of addressing the critical public interest issues canvassed in the Discussion Paper and this submission. Telstra thinks this collaborative approach would be best facilitated by establishing a new central governance body and framework for the ECS rather than continuing to rely on the existing complex web of stakeholders, agreements and regulations which has evolved in an ad-hoc fashion over time. A

[1] http://www.communications.gov.au/__data/assets/pdf_file/0004/237676/Review-of-the-National-Triple-Zero-000-Operator-Discussion-Paper.pdf#discussion

[2] For the purposes of this submission, the "Triple Zero service" is the service relating to receipt and response to calls to both the primary emergency call service number, 000, and secondary emergency call service number 112, but unless otherwise stated does not include the service relating to receipt and response to calls to secondary emergency call service number 106 (given the different service characteristics and parties involved in relation to calls to 106). References to the emergency call service or 'ECS' incorporate the services relating to receipt and response to relevant calls/communications to all three emergency service numbers.

[3] Subdivision 3.1.3, Telecommunications (Emergency Call Service) Determination 2009

centralised governance framework involving government and industry stakeholders would be better placed to determine the fundamental priorities that will support innovation, new capabilities and develop capacity and assist in the development of a technology roadmap for the national Triple Zero (000) operator.

- Telstra believes the Federal Government should develop a set of objectives and expectations for the ECS that will continue to deliver a single national emergency call network that is efficient, high quality and innovative. The aforementioned national governance framework can provide the appropriate levels of technical and operational expertise needed to develop options and test alternate approaches before final decisions are made, as well as assist in building a broader recognition of drivers for change and support for solutions.

In making these comments, Telstra as national Triple Zero (000) operator would like to acknowledge the high level of professionalism and cooperation amongst all stakeholders including the various levels of Federal, State and Territory Government departments and agencies, telecommunications service providers, advisory committees, ESOs, the Emergency Call Person (ECP) for 106 and industry associations which contribute to the smooth functioning and appearance of what is arguably Australia's most vital communications service in a life threatening or a time critical situation.

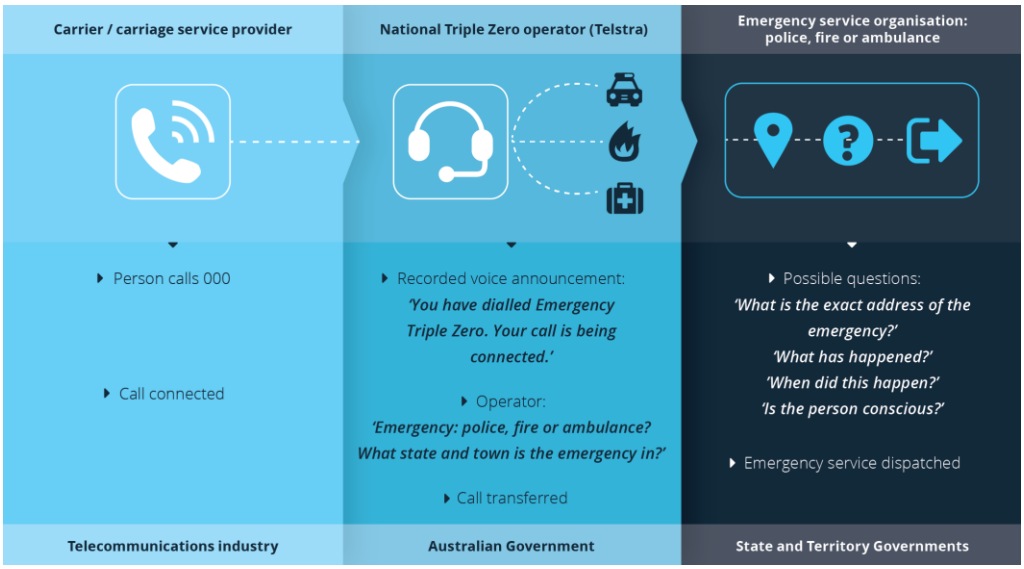
Introduction

This submission sets out Telstra's views on what it sees as the key issues that need to be responded to in the Discussion Paper.

Telstra has developed the knowledge and experience required to act as the national Triple Zero (000) operator and continues to meet the public interest purposes for which this role was created. Telstra has also continued to invest in the Emergency Call Service (ECS) to ensure the Triple Zero Operator delivers the services expected from it by the Australian public.

Triple Zero (000) is a brand, but unlike a commercial brand, the actual product - police, fire and ambulance attendance - is delivered slightly differently between different States and Territories. This reflects the differing approaches adopted by the States and Territories. The common identifier of "000" (the Brand) is the Emergency Call Service (ECS) (see Figure 1) which is provided cooperatively by Carriers/Carriage Service Providers (C/CSPs), and the Federal, State and Territory Governments, with the Federal Government responsible for the National Triple Zero Operator, and the State and Territory governments responsible for the emergency service organisations. The service is supported by telecommunications infrastructure provided by carriers and CSPs. Figure 1 illustrates the significant position that the National Triple Zero (000) Operator holds in the seamless national emergency call service currently operating in Australia.

Figure 1 – The Triple Zero Emergency Call Service



The Triple Zero (000) ECS is arguably the most vital communications service used by the Australian community in a life threatening or a time critical situation. The decision to summon help engages a number of participants, all of whom are in the service of the public: C/CSPs, the Triple Zero Operator, ESO dispatchers and responders, and secondary teams such as hospitals.

A reliable and consistent response to emergency calls by the C/CSPs, Triple Zero Operator and ESOs is expected by all Australians. Given that callers could be in a situation where a person's life is threatened or property is at risk, a key attribute of any emergency service response system is that genuine emergency calls are never abandoned and the callers can be located. Meeting these basic requirements presents a serious challenge from public policy, logistical, organisational and technical perspectives.

Australians expect that the ECS is one common, national network which can be used 24/7 to summon emergency assistance. The person calling for help has no interest or concern that one or more parts of the service are under federal jurisdiction and the other parts are provided under State or Territory jurisdiction. The caller cares only about help arriving in a timely fashion. From a very early age, Australians are taught that the number 'triple zero' (000) is to be used to make a genuine emergency call as it can be easily remembered, is quickly dialled, and they will receive a high level of response, assistance, protection and care when 000 is called.

Accordingly, Federal and State/Territorial Governments themselves need to consider the ECS from the community point of view, namely:-

- that it is one national network (and will continue to be so); and
- the single national system operates in a seamless manner.

Irrespective of where an emergency call may originate from within Australia, the management, connection and response received should appear consistent to the caller. The organisation of the ECS and the policy development in regard to the ECS should follow from this fundamental certainty.

The following pages provide Telstra's answers, views and suggestions in response to the specific questions raised by the Department in the Discussion Paper.

Answers to Questions in the Discussion Paper

The Triple Zero service of the future

Community expectations

Question 1: Community expectations

It is commonly accepted that community expects the Triple Zero service to be contactable anytime, anywhere, easily, quickly and free of charge.

Are these your expectations of the Triple Zero service now and into the future? Are your expectations currently being met? Why or why not?

Telstra agrees that community expectations of the Triple Zero service are that it is contactable "anytime, anywhere, easily, quickly and free of charge". These are well founded expectations which are important to emergency callers today. Telstra believes these expectations are currently being met, and this is supported by research. In 2012, the then Department of Broadband, Communications and the Digital Economy (DBCDE) commissioned Woolcott Research to explore the community views in Australia in relation to Triple Zero (the **DBCDE Study**). The Study illustrated that the community perceptions of the Triple Zero service were very positive:-

> *"It was also clear from our exploration that overall perceptions of the Triple Zero service were very positive. Personal experiences of use recounted (qualitatively) tended to involve high praise for the speed with which calls were answered, and also the way in which the operator dealt with the call."*[4]

From the DBCDE Study and associated research it is clear that the Australian community expects that:

Triple Zero can be contacted anytime

Telstra, as the national Triple Zero (000) operator partners with the Emergency Service Organisations (ESOs) nationally to provide voice access to the Triple Zero service 24 hours a day, every day of the year, in order that the Australian public has access to emergency assistance whenever it is required.

Triple Zero can be contacted anywhere

The Triple Zero service can be accessed nationally regardless of whether the call originates on a fixed or mobile network and regardless of the service provider. Mobile callers can access the Triple Zero service without a SIM card and, if calling 000 from an area of low signal, will have their call picked up by the mobile carrier with the highest signal strength regardless of whether the caller has a service with that mobile carrier or not. This means that a call to the Triple Zero service can utilise mobile coverage that combines the coverage ranges of all three Australian mobile carriers.

Triple Zero can be contacted easily

Triple Zero is easily contactable. Voice communication is the standard method of communicating with the National Triple Zero (000) Operator and ESOs via the ECS and this is the same in every part of the country where network access is available.

[4] DBCDE Triple Zero Research Study June 2012

Triple Zero can be contacted quickly

The DBCDE study[5] revealed that respondents expected very short wait times: 49% of respondents anticipated no wait and a further 36% expected a wait of less than one minute. Telstra, as the National Triple Zero Operator, is required to answer 85% of calls to the emergency service number 000 or 112 within five seconds, and 95% of such calls within 10 seconds. In the 12 months to June 2014, the National Triple Zero (000) Operator managed 8.48 million calls, of which 5.73 million were transferred to ESOs. In handling this volume of calls, Telstra has met or exceeded all grade of service targets[6] on a monthly basis for over a decade.

The personal experiences of the respondents confirm community expectations are currently being met by the Triple Zero Operator nationally.

> *"It all happened pretty quickly, I don't think it even rang once, they just seemed to answer straight away"*[7].

Triple Zero can be contacted free of charge

Telecommunication providers are required to provide users of a variety of communications services with free access to the emergency service numbers 000 and 112.

Based on the results of the DBCDE Study, Telstra believes that the current community expectations in relation to the Triple Zero service are being well met. However, it is clear that with technological advancements, as well as changes in consumer expectations and communication behaviour, community expectations of the ECS will continue to evolve.

Indeed, not surprisingly, respondents to the DBCDE Study indicated interest in a range of non-voice methods of contacting Triple Zero in the future. Specifically, it was found that 60% of respondents found SMS appealing, 57% of respondents found a smart phone application appealing and 56% of respondents found a Triple Zero website could be appealing. The other potential methods for communicating with Triple Zero referenced in the study included video calling, instant messaging (IM), email and social networking. These are discussed further in Telstra's responses to Questions 2 and 3.

[5] DBCDE Triple Zero Research Study June 2012
[6] Subdivision 3.1.3, Telecommunications (Emergency Call Service) Determination 2009
[7] DBCDE Triple Zero Research Study June 2012

Challenges

Question 2: Challenges facing the Triple Zero service

Ongoing changes in the communications landscape and certain expectations in the community regarding the nature of the service, present challenges for the Triple Zero service. These challenges include locating callers, the quality and prioritisation of VoIP calls, extreme call volumes during disasters and non-emergency calls.

What are your views on these challenges and what further steps could be taken to address them? What other challenges need to be considered?

The Australian public places significant expectation in having access to a reliable and responsive ECS. Having operated in the role as the national Triple Zero (000) operator since the service was established in 1961, Telstra has accumulated the knowledge and experience to address many challenges faced in the provision of this critical community service. This is evident through the number of management strategies that are currently in place to mitigate the impacts of the challenges listed in Question 2; although Telstra believes there are still some opportunities for improvement.

Locating Emergency Callers

As noted in the Discussion Paper, with 67% of calls to the national Triple Zero (000) operator now originating from mobile handsets, perhaps the most immediate challenge currently faced by the ECS is the ability to locate mobile emergency callers quickly with a high degree of accuracy.

There have been a number of enhancements which allow mobile carriers to send, and the ESOs to receive, location information in relation to calls from a mobile phone to the ECS, including:

- State of Call Origin (1999);
- Mobile Location Indication (MoLI) for Standardised Mobile Service Area (SMSA)(2002);
- Pull MoLI that allows ESOs and the Australian Maritime Safety Authority (AMSA) to request mobile location information (2011);
- Standardised Mobile Service Area (SMSA) for Satellite Emergency Calls (2013); and
- Push MoLI (extra location information pushed from the mobile carrier to the ECS on calling 000) adds cell tower or better location information to SMSA information (due late 2014).

The availability of new technologies plays an important part in facilitating improvements to the ECS. Telstra, in collaboration with the Federal Government, industry and ESOs, has introduced a number of improvements including those which will mean that an enhanced level of location information can be provided for all calls from a mobile phone to the ECS that display a unique calling number (e.g. telephone number). Following 'Push MoLI', the next initiative in improving location information would be the extraction and provision of GPS information for emergency callers to the ECS, an initiative that is currently being investigated by the mobile carriers.

Options to be considered include the delivery of GPS information to the ESOs via the Emergency+ smartphone application (app), other dedicated apps, or via independent location platforms. The ability for mobile carriers to access the mobile device's GPS information will have an impact on how GPS information can be made available to ESOs. Access to the mobile device's GPS information may depend

on whether or not the customer has turned on the mobile device's GPS capability, if GPS satellite coverage is available and if the customer's mobile C/CSP has access to the mobile device's GPS information. The combination of the GPS information with the existing Push MoLI, SMSA and IPND (geocoded address of the mobile device owner) location information will further improve the ability of ESOs to accurately locate callers.

When considering future options for enhancing location information for emergency callers, it must be understood that the degree of location accuracy will be largely dependent on the capabilities of fixed, mobile and satellite carriers to access network or other location capabilities. Each network has its own techniques and sources of location information which, in turn, are dependent on whether a caller's device is attached to a fixed, mobile or satellite network and the type of voice solution used over that network. There may also be technical limitations in obtaining location information of the emergency caller if the emergency caller is on the move.

This is summarised in Table 1 below:

Table 1. Location Information per origination network

Access Network Emergency Call Originated from	Location Information available	Location Information Format	Location Information Accuracy	Location Information supplied to Triple Zero by
Fixed Calling - PSTN	Service address	Street address	10-20m	IPND
Fixed Calling - NBN [Note 1]	Service address	Street address	10-20m	IPND
Fixed Broadband – 'over the top' (OTT) VoIP [Note 2]	State of call interconnect to dedicated Emergency Call Service Network	Numeric - one of 9 codes defined by Communications Alliance G557:2014	State or National (if no state is supplied)	Part of calling signalling information
Mobile	Standardised Mobile Service Area	Numeric - one of 256 areas defined by Communications Alliance G557:2014	Varies between ½ metropolitan area to part of state in area	IPND and Part of calling signalling information
	Mobile Network Location including Carrier Cell Tower Identification	Latitude / Longitude in format defined by Communications Alliance G557:2014	Dependent on type of location technology available to carriers' network and topology of the carriers' network. Typically 100m - 20km	Sent to Triple Zero in parallel to emergency call ("Push MoLI" project)
	GPS Location [Note 3]	Latitude / Longitude	Typically 50m-100m	Not currently available to mobile carriers. Only available to mobile phone vendors and their applications. Only available if a suitable application enabled on a mobile device, at present this is at the handset user's discretion. Also many mobile devices in operation today are not capable of using these types of applications.
Satellite	Standardised Mobile Service Area	Communications Alliance G557:2014	State or National (if no state is supplied)	IPND and Part of calling signalling information

Notes:

1. Telstra's NBN based voice services are both carrier grade VoIP and provide the service address to the IPND. Other providers of voice services over the NBN may not support this.
2. OTT (non-carrier) VoIP service providers do not necessarily support calling to Triple Zero and users should check the Terms and Conditions for these services. OTT VoIP is carried via access networks that supply broadband such as DSL, cable or NBN.
3. Mobile phone location capabilities such as GPS, and GPS augmented by other technologies such as WiFi, are currently only available to the handset applications using the APIs provided by the device operating system and/or device manufacturer (e.g. Google or Apple). Mobile carriers do not have access to this information as it is conveyed as data over the mobile network. Further information in relation to mobile location options is available in the ACMA document "Enhanced mobile location information for the Emergency Call Service"[8].

[8] http://www.acma.gov.au/~/media/National and Community Interests/Report/pdf/Enhanced mobile location information for the Emergency Call Service ACMA consultation on a proposal to amend the Telecommunications Emergency Call Service Determination 2009 Consultation Paper May 2010.PDF

It is important to also note that irrespective of the solution agreed and implemented, community expectations need to be carefully managed in relation to the availability and accuracy of mobile location information, as popular television shows depict highly accurate location of a mobile device/person in real time which is usually not realistic. Further education and awareness programs should be considered to manage the unrealistic expectations about the location information that is available to the mobile C/CSP, the national Triple Zero (000) operator and ESOs.

Voice over Internet Protocol (VoIP)

For carriers such as Telstra, the quality and prioritisation of (what are generally called) VoIP calls is not an issue. As seen in the table below, Telstra provides carrier grade IP based calling. However, OTT VoIP providers, whose voice services may lack the Quality of Service (QoS) guarantees of a carrier provided voice service, may not meet the standards required for maintaining a persistent and reliable connection to the national Triple Zero (000) operator. This lack of QoS is difficult to quantify as it is dependent on many factors including those noted below:

Table 2. Quality of Service Factors

Voice Service Provider	Originating Access Network Type	Quality and Prioritisation of VoIP call
Telstra	PSTN voice services	Not applicable
	NBN voice services	End to end Quality of Service (with guaranteed bandwidth)
	Mobile voice services (over LTE) – not yet available from Telstra	End to end Quality of Service (with guaranteed bandwidth)
OTT	VoIP service over broadband access network	Variable - dependent on OTT voice provider capabilities, broadband network bandwidth and network traffic load

OTT VoIP calls can also be either voice or video calling, and this may pose interconnection challenges for the national Triple Zero (000) operator and ESOs. This is discussed further in response to Question 3.

Locating users of OTT services for voice telephony who contact the national Triple Zero (000) operator is also an issue that requires further consideration. Whilst there are solutions for providing fixed network location for VoIP, they rely on compiling and matching unique identifiers from different layers within the telecommunications networks. As such, any reuse or obfuscation of unique identifiers such as IP addresses could provide an incorrect location outcome being sent to the national Triple Zero (000) operator. Any fixed network location solution would need to be considered as part of a standardised industry approach.

Extreme Call Volumes during Disasters

Extreme or unplanned high calling events (e.g. cyclones, floods, and bushfires) present a number of challenges for C/CSPs, the Triple Zero Operator and ESOs. At a C/CSP level there is a requirement to have the capability to deliver calls to the Triple Zero Operator. The national Triple Zero (000) operator is then required to answer calls quickly and efficiently and connect the emergency call to the requested ESO.

Congestion at any of these delivery points in the emergency call flow may result in a delayed response from ESOs. Additionally, extreme or unplanned high calling events generally impact one State or Territory which places an enormous resource requirement on the ESOs servicing that region. The worst case outcome is that callers requiring an emergency service are unable to be answered and connected to an ESO for a response.

There are a number of arrangements that have been put in place by the national Triple Zero Operator to manage unplanned calling events including:

- "E000 Extreme Call Management – Control Implementation": Pre-recorded voice announcements that can be utilised by the national Triple Zero Operator and placed on a State/Territory queue. These messages have been provided by the State/Territory ESOs and advise callers of alternate numbers that can be contacted if Triple Zero (000) is not required;
- Network management strategies implemented by the national Triple Zero Operator that allows call traffic to be channelled to specific call centres to handle the excess load thereby protecting the integrity of the Triple Zero (000) network; and
- A Triple Zero Operator recall plan that provides additional capacity for emergency call answering.

Unplanned high calling events should not only be considered in the context of a "natural" disaster situation but also in the event that a Denial of Service (**DoS**) attack is directed at the national Triple Zero (000) operator. The increasing use of IP based networks for the delivery of a voice communication service (or any other communication service) raises the need for the Triple Zero Operator arrangements to specifically address a DoS attack, including a Distributed Denial of Service, directed at the national Triple Zero (000) operator.

The potential impact on the handling of emergency calls due to a DoS attack on the ECS is extremely high. An extreme but possible outcome is that the national Triple Zero Operator is unable to receive emergency calls, including genuine calls. It is therefore prudent to have appropriate regulatory arrangements in place should such an attack take place whereby the national Triple Zero (000) operator and C/CSPs have the capability of dealing with these events effectively and without delay or risk of legal action.

In managing high traffic events, a national approach needs to be considered to ensure the most effective management of calls to the Triple Zero Operator. Strategies may include:

- Interoperability between ESOs and State / Territories; and
- National strategy for utilisation of media resources (social media, radio, television) to engage with the community and provide information.

Non-Emergency Calls

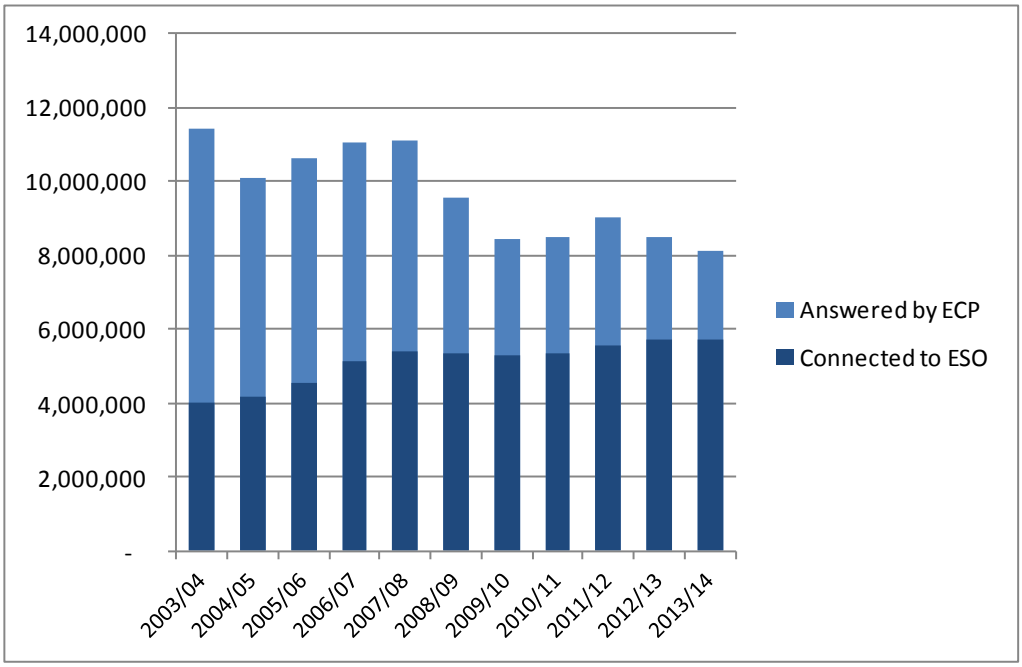
The impact of non-emergency calls on the ECS is significant as they drive unnecessary workload and cost onto the C/CSP's networks, the national Triple Zero operator and ESOs. Legislation defines an emergency call as a call made to an emergency service number, seeking a response from an ESO to deal with a time-critical event that is perceived to threaten life or to which the organisation is established to respond.

In recent years, a number of measures have been implemented to reduce the volume of non-emergency calls and their impact on the ECS. These reductions are evident in the following call data:

- In the 2002/03 financial year, 11.9 million calls were answered by the national Triple Zero operator with 34% (4 million calls) connected to an ESO as a genuine call.
- In the 2013/14 financial year, 8.1 million calls were answered by the national Triple Zero operator with 66% (5.3 million calls) connected to an ESO as a genuine call.

While the number of calls connected to an ESO has increased over the last decade, this is consistent with the increased penetration of mobile services resulting in multiple calls for a single event. Of note, the number of calls answered by the national Triple Zero operator has decreased significantly, as illustrated in Figure 2.

Figure 2 – Emergency Call Volumes



To reduce the number of non-emergency calls that present to the national Triple Zero (000) operator, the following measures have been implemented on a national level:

- A front end Recorded Voice Announcement (RVA) implemented to reduce the high level of inadvertent and other non-emergency calls received by ECS operators. Call switching analysis redirects calls to an RVA when excess digits are dialled after Triple Zero (000) has been dialled;

- For nuisance (abusive or suggestive) callers to the national Triple Zero (000) operator, calls are released to a nuisance RVA advising that Triple Zero (000) is for life threatening or time critical situations.

- "IMEI Blocking Customer Awareness & Notification Process" is a six stage process managed by Telstra as the national Triple Zero (000) operator, which targets persistent callers to the ECS who are not connected to an ESO and therefore deemed to be non-emergency callers; and

- The Triple Zero Awareness Working Group (TZAWG) has developed a number of educational programs to ensure the community is aware of the most appropriate number to call in an Emergency. These include the online game "Triple Zero Kids Challenge" and the recently launched Emergency+ Smartphone App.

Substantial reductions have been made over the last decade through the efforts such as those outlined above. In Telstra's view further effort is required to continue to reduce non-emergency calls to the ECS and provide further protection for genuine callers to the service. Consideration needs to be given to the following possibilities:

- Additional education and awareness for non-emergency callers;

- Increased flexibility and protection for C/CSPs to suspend or cancel nuisance callers;

- Financial penalties for those who make non-emergency calls or continue to make non-emergency calls;

- Further support and funding provided to develop and deliver national awareness and school education programs advising of the appropriate use of the Triple Zero service; and

- Review of current processes in place for the management of a DoS attack on the ECS.

Telstra also recognises that a high number of calls presented to ESOs by the Triple Zero Operator are also identified as non-emergency calls after further questioning by the ESOs. Further consideration could be given to identifying appropriate practices and mechanisms for use by the national Triple Zero Operator and ESOs to reduce the occurrence of these calls.

Community Awareness and Education

Over the last decade the communications environment has changed dramatically, as has the regulatory framework in which Telstra operates as the national Triple Zero operator. As technology advances there is also greater community expectation in relation to accessing the ECS. In Telstra's view, these expectations will see the current Triple Zero (000) voice-only service expand to include additional access technologies as discussed further in our response to Question 3. To manage community expectations, appropriate funding is required to ensure national education awareness programs are developed and delivered advising of the following:

- Technology that is capable of contacting the ECS;

- The process/call flow when contacting the ECS;

- Appropriate use of the ECS, including when to use the service and other non-emergency contact numbers; and

- Impacts to genuine emergency callers as a result of resources being consumed by non-emergency calls.

In Telstra's view, management of the challenges outlined above and those that will emerge in the future require a collaborative approach between the telecommunications industry, the national Triple Zero operator, ESOs and Federal, State and Territory Governments.

Further, there is no single central governing body coordinating activity across the ECS. Such a body would be useful for undertaking the technical feasibility and usability reviews required prior to future deployments. For example, the introduction of text messaging (SMS or IM) services would require the agreement of all impacted stakeholders including Federal, State and Territory Government departments and agencies, telecommunications service providers, advisory committees, ESOs, the national Triple Zero operator and industry associations and customers. Further comments on a new governing body are outlined in Telstra's responses to Questions 6 and 8.

Opportunities

Question 3: Other ways of requesting emergency assistance

The only way of contacting Triple Zero is with a voice call and this is likely to remain the primary way of requesting emergency assistance. However, people use a range of other ways to communicate, including SMS, email, instant messaging, video calls and social media.

In addition to voice calls, is it desirable to have other ways of requesting emergency assistance? If so, what ways and what challenges do you foresee?

In Telstra's view, voice communications should remain the primary method of requesting emergency assistance due to the immediacy and timeliness of a response expected by callers in an emergency. Messaging or video calling could be considered as new secondary methods for contacting the national Triple Zero (000) operator when voice calling is not possible or practical.

However, in practice, it should be noted that national Triple Zero (000) operator call takers are not currently in a position to collect or analyse video footage or photos of an emergency incident and Telstra believes this function should not be considered as part of the role of the national Triple Zero (000) operator.

It must be recognised that:

- the national Triple Zero (000) operator call takers are not currently trained or qualified emergency service personnel; and
- the main objective of the national Triple Zero (000) operator is to connect the caller to expertly trained ESO personnel as quickly as possible.

As outlined in Appendix A.3 of the Discussion Paper there are text-based communication methods that could potentially be used to contact the Triple Zero Operator. The use of text should ideally only be considered as an alternative contact method for the hearing and speech impaired or in situations in which voice contact is undesirable (such as domestic violence, home intruders etc) or there are network limitations where a voice call may not be successful.

If a messaging (SMS and/or IM) contact solution is adopted to meet the needs of these use cases, then the ESOs and the Triple Zero Operator would need to agree on approaches to resolve the following questions:

- What information (and in what format) is required from citizens using messaging to contact Triple Zero?
- How can timely delivery of messages be guaranteed?
- Given that there is a lack of personal immediacy of response with messaging in comparison with a voice call, what protocols need to be put in place to prevent hoax/non-genuine messaging?
- How should messages be transferred to the ESOs for emergency management?

- What happens if the citizen stops messaging without the nature and/location of the emergency being determined?
- What education campaigns are required to make sure that the public understands that messaging the national Triple Zero (000) operator should only be used in certain circumstances to avoid delays in receiving an emergency response?
- What messaging technologies or services could, or should, be used to contact the Triple Zero service?
- What are the privacy implications and appropriate privacy protection measures in relation to use of social media based messaging for contacting the Triple Zero service?

It also needs to be noted, that the introduction of any form of messaging to the national Triple Zero (000) operator represents a large scale change in the way the current ECS operates and would require careful consideration of the impacts (e.g. increased time in responding to an emergency message and increase in required staff numbers, the costs to upgrade ECLIPS and IT systems, development of agreed national Triple Zero (000) operator responses and ESO handover processes) on the operation of the existing voice service.

Similarly, if the national Triple Zero operator was required to accept and transfer video calls to the ESOs, there are a number of technical challenges that need to be considered including:

- Video calling services today are offered by a variety of providers, including OTT and carrier grade providers. These providers may use different video calling technologies or formats which could present interconnect challenges, as well as a challenge to the national Triple Zero operator and the ESOs to choose which video calling services to support;
- Video calling may require new hardware to enable display video at both the national Triple Zero operator and the ESOs; and
- The current ECS dedicated access networks only transport voice calls over the PSTN. The current infrastructure would require upgrading to support high quality video calling.

Finally, as identified in the DBCDE Study, Telstra would agree that email and web forms are not appropriate for use as an emergency contact method for several reasons, including privacy issues, concerns about ensuring that the emergency has been lodged with the appropriate ESO, and the lack of timeliness inherent to internet based technologies upon which these communications platforms may rely to transport data.

Geocoded address information

Question 4: Improving information

It is important that emergency service organisations, as well as callers, have the information they need in an emergency. Changes in technology offer opportunities to improve the information available, however, these changes also present some challenges.

What information is essential to emergency service organisations and callers in an emergency and what information is desirable?

Geocoded address or location information is vital for the successful management of emergency situations. In particular, this information (which includes the latitude and longitude of a mobile device or fixed service which has been used to make an emergency call) can be sent to the GPS or navigation system of the ESO vehicle that has been tasked to respond to the call for help, thereby reducing the time taken to attend to the location of the emergency caller. Geocoded address or location information could also be used to better manage non-emergency or hoax calls to the national Triple Zero operator and ESOs as the caller's location would be automatically sent to the Police for an appropriate response to manage these call types.

Currently, all fixed and mobile CSPs who provide a carriage service in Australia must send, amongst other information, the name, phone number and service/customer address of each of their fixed and mobile service customers to the Integrated Public Number Database (IPND). When responding to an emergency call, the national Triple Zero (000) operator is then able to 'attach' relevant location information from the IPND to an emergency call when transferring the call to the appropriate ESO.

In respect to providing geocoded address or location information to ESOs in response to an emergency call, mobile service providers, the national Triple Zero (000) operator and ESOs are currently in the process of deploying a Push MoLI system that will enable the provision mobile network derived geocoded location information to be sent along with each emergency call to the Triple Zero service, and then onto ESOs to assist them in locating the emergency caller. It is expected that all mobile services providers and the national Triple Zero (000) operator will be able to provide this mobile network derived geocoded location information by October 2014.

As part of a package of improvements to the IPND that Telstra has submitted under the IPND Review[9], Telstra has suggested that geocoded address information for fixed services could be provided to ESOs if the IPND is updated to geocode each fixed service address. The addition of this geocoding capability would enable the IPND to provide authoritative geocoded address data to the national Triple Zero Operator and then to ESOs, although the quality and utility of this fixed geocoded service address information would depend on customers continuing to provide accurate and up-to-date service address information to their CSPs.

Whilst Telstra supports the view that geospatial information could be made available to critical users such as ESOs, there is also the potential for high quality and well-maintained applications to access geospatial information which will add value to the emergency call service and ESO response. The issue of "ownership" of geospatial information collected and managed by private companies be need to be considered, as this information is a commercial asset to the owner; and the majority of geospatial

[9] http://www.communications.gov.au/telephone_services/telephone_numbering/integrated_public_number_database_ipnd

information held within Telstra is linked to customer information and therefore will be subject to the provisions of the Privacy Act.

Determining how we get there

The role of the national operator

Question 5: The role of the national Triple Zero operator

A tender for the national Triple Zero operator is required to be issued by June 2016. The aim of this review is to ensure that the arrangements for the national Triple Zero operator continue to support a world class Triple Zero service into the future.

What criteria should be used to determine the functions of the national operator?

Telstra has executed its role as the operator of the National Triple Zero service for more than 52 years, and has developed:-

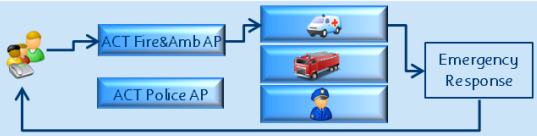
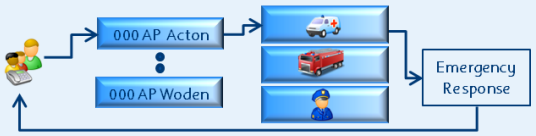
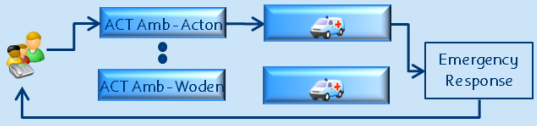
- a deep institutional commitment to the service;
- a deep operational understanding in the delivery of a time critical service;
- a dedicated network and framework that supports a national system in a competitive environment; and
- the engineering and information technology knowledge and capability that supports one emergency call service.

The current ECS model would appear to work very well in the existing voice telephony environment and this is supported by the findings of the DBCDE Study[10]. However, as part of the Department's Review of the National Triple Zero (000) Operator, a number of alternative models should also be considered. This will aid identification of the approach that will best help all stakeholders move towards building a future proofed national emergency call service that will take advantage of the capabilities and features offered by next generation IP based services and systems.

Internationally, there are many different models for the provision of emergency telecommunications. Some of these models are depicted in Figure 3:

[10] DBCDE Triple Zero Research Study June 2012

Figure 3 –Emergency Telecommunications Models

Model	Incident Call Flow	Used in	Caller Experience Pros	Caller Experience Cons
National Triple Zero Operator		Australia UK Denmark	Centralised first point of contact; Caller state & ESO required identified by Call Taker	Caller double handled as calls answered by both ECP and the ESO
State Triple Zero Operator (all ESOs within state)			Calls go directly to the State that will respond to the emergency	Not suitable for mobile or VoIP calls where location not verifiable
State Triple Zero Operator (required ESOs within state)			Calls go directly to the State ESO that will respond to the emergency	Not suitable for mobile or VoIP calls where location not verifiable; Caller needs to select ESO they need
Local Triple Zero Operator (all ESOs in local area)		USA	Calls go directly to the local ESOs that will respond to the emergency	Requires location based routing of calls; Not suitable for mobile or VoIP calls where location not verifiable
Local Triple Zero Operator (required ESO in local area)			Calls go directly to the local required ESO office that will respond to the emergency	Requires location based routing of calls; Not suitable for mobile or VoIP calls where location not verifiable; Caller needs to select ESO they need

In determining the functions of the national Triple Zero (000) operator, clearly community expectations and stakeholder experience need to be considered. In Telstra's view, moving from a centralised model, that is proven in the Australian environment, to a decentralised model such as that used in North America, would require considerable technical change as well as additional funding over and above the current arrangements from all stakeholders.

Under the current model, Telstra as the national Triple Zero (000) operator answers emergency calls and transfers them as effectively and efficiently as possible to the requested ESO. Under the current Telecommunications (Emergency Call Service) Determination 2009 ("**ECS Determination**") Telstra is required to answer 85% of all calls within 5 seconds and 95% of all calls within 10 seconds. In 2013/2014 Telstra exceeded these targets by answering 95% of all calls in 5 seconds and 99% of all calls within 10 seconds). In this role, Telstra's strong partnership with the ESOs provides a seamless and effective connection for emergency callers. In addition to the operational function of answering and connecting callers, the Telstra Triple Zero Operator also:

- filters identifiable non-emergency calls from the ECS prior to connections to ESOs ensuring valuable resources are not wasted;
- proactively implements strategies to reduce non-emergency calls to the ECS including a 'Customer Awareness and Notification Process' for repeat non-emergency callers;
- provides 24x7 technical support for faults relating to Triple Zero operations;
- provides assistance and advice to ESOs on request in relation to designing and managing emergency answer points and associated IT and communications networks;

- provides monthly and on request statistical performance data to assist ESOs (and the ACMA) in managing call volumes and overall performance in relation to call answering;

- contributes to a number of advisory committees including the Emergency Call Service Advisory Committee (ECSAC) and the Australia/New Zealand National Emergency Communications Working Group (NECWG);

- is an active member of the Triple Zero Awareness Working Group (TZAWG). TZAWG has developed a number of educational programs to ensure the community is aware of the most appropriate number to call in an emergency; and

- has a plan specifying the steps to ameliorate the impact of the very high Triple Zero (000) call rates being experienced during extreme or high unplanned calling events as outlined in our response to Question 2.

While clearly the service provided by the Telstra national Triple Zero (000) operator extends beyond simply answering, filtering and connecting emergency calls, the Discussion Paper raises the possibility that having a national operator necessarily involves double-handling of calls and the risk of congestion to the national emergency call service if ESOs reach call handling capacity. These points warrant further discussion; however, in Telstra's view the benefits to the community of having a national Triple Zero (000) operator are greater than the benefits that would arise if an extra layer of control and redundancy was added to the ECS process.

The role of telecommunications providers

Question 6: The role of telecommunications providers

Telecommunications providers have regulatory obligations in relation to Triple Zero, recognising their importance in the delivery of the service. However, it is important to consider whether the regulatory framework remains appropriate given changes in technology and the telecommunications industry, the likely direction of the Triple Zero service, and the Government's commitment to reduce the regulatory burden on industry.

Is the current regulatory and funding framework for the Triple Zero service appropriate now and for the future? If not, what changes should be made and why?

The Department welcomes information from the telecommunications industry, when responding to this question, on how much it costs industry to meet the existing regulatory requirements in relation to the Triple Zero service.

Telstra believes there is a need to give consideration to bringing all stakeholders and jurisdictions together under one national governance framework to allow the ECS to continue to work seamlessly as an outcome of this review. There is no existing policy forum that is capable of coordinating or anticipating the technical challenges and changes that are coming to the way the public will seek to communicate with the national Triple Zero (000) operator and ESOs.

This review offers the opportunity to consider a different arrangement or framework in managing the ECS going forward. The Federal Government's jurisdiction extends to regulating the telecommunications portion of the ECS as well as the national Triple Zero (000) operator whilst the emergency response portion falls within the State/Territorial jurisdiction. The State and Territories take a more hands-on approach to the strategic management and funding of the State and Territory based Emergency Service Organisations (Police, Fire and Ambulance) whilst the Federal Government's portion of the ECS is governed by regulation and goodwill, and is funded under the Telecommunications Universal Service Management Agency (TUSMA) Agreement.

Current Regulatory Stakeholder Framework

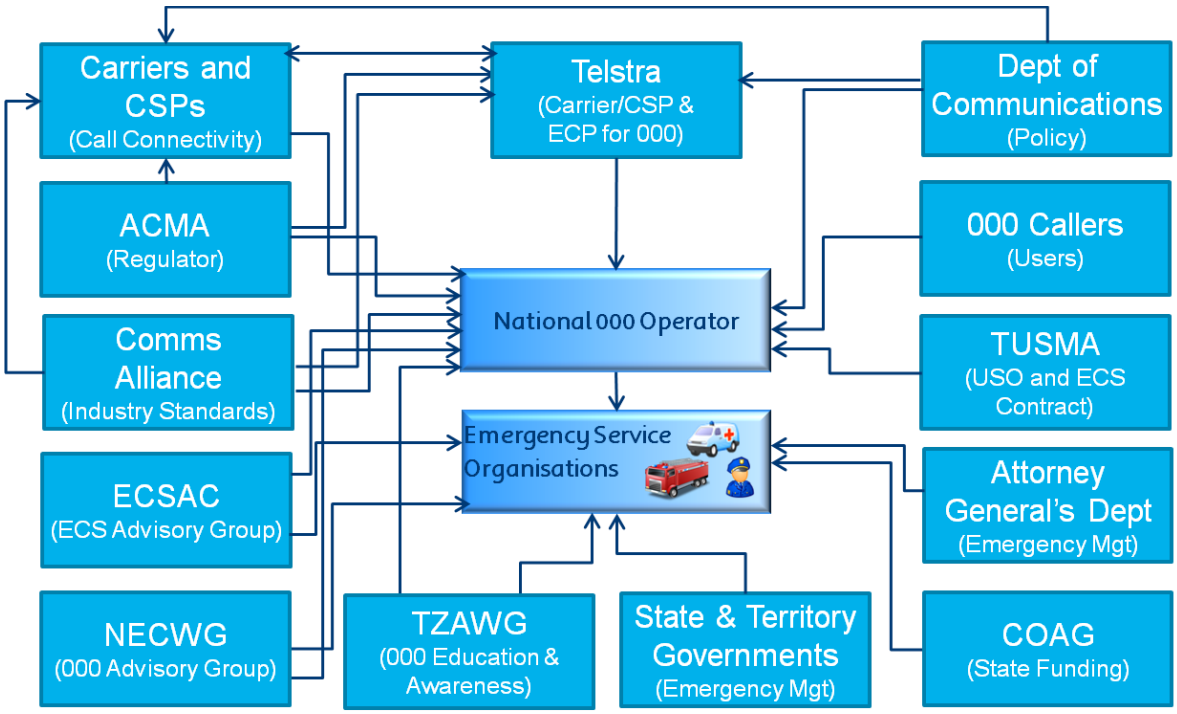
The current regulatory framework that the ECS works under is a loose collaboration of many stakeholders, including various levels of Federal, State and Territory government departments and agencies, telecommunications service providers, advisory committees, ESOs, the national Triple Zero (000) operator, the ECP for 106 and industry associations which all generally contribute to the smooth functioning and appearance of one national Triple Zero service (the Brand).

Telecommunications services providers and the national Triple Zero (000) operator are compelled to comply with a set of obligations[11] to efficiently deliver emergency calls to the national Triple Zero (000) operator, with the States and Territories managing the ESOs. The Department of Communications sets the national policies in relation to access to the ECS for callers, the national Triple Zero (000) operator, the IPND and some telecommunications technical requirements. The ACMA sets the legal obligations that compel C/CSPs and the national Triple Zero (000) operator to comply with the policies.

[11] Telecommunications (Emergency Call Service) Determination 2009

Figure 4 illustrates the collaboration described above.

Figure 4 - Emergency Call Service - Current Regulatory Stakeholder Interaction



This loose collaboration of many stakeholders has exhibited a high level of cooperation but it has also lead to significant levels of resourcing and funding by key stakeholders to make the ECS work as one network. There are six States and two Territories responsible for managing ESOs and three federal government departments responsible for addressing emergency issues including regulation of the national Triple Zero (000) operator. No one body combines all the technical and strategic expertise required to make the whole ECS work as one. There is also a high degree of duplication of effort in the current model.

Even with the significant contributions under the current framework the ECS will continue to experience indifferent or long lead times in the delivery of new initiatives and sometimes very complex legislation to make it all work. In the absence of a multi-stakeholder forum at which cross-agency multi-jurisdictional issues can be discussed, regulation has substituted for strategic policy development and modernisation in the federal jurisdiction.

Future regulatory framework

Telstra believes that improved governance and the setting of high level objectives is the key to obtaining better outcomes for a future ECS and to continue to deliver a single world class emergency call service.

In particular, Telstra believes there is a need for the formation of a new centralised governance forum to not only set the end-to-end objectives that each stake holder must deliver but also to take strategic responsibility for gathering all of the stakeholders (including the Triple Zero Operator, ESOs (Police, Fire, and Ambulance), consumer interests, service providers and relevant Federal, State, Territory authorities) to resolve such issues as the future technology roadmap and to determine future capacity and capability requirements.

Once the appropriate institutional relationships and management framework is established, it will be possible to start solving some of the strategic, technical and performance issues that will arise with the expected increase in demand for emergency assistance, the technical advances in mobile and IP based telecommunications services, and the information and data (customer and location) these services will generate. An appropriate governance framework would consider the advantages, opportunities and innovations these advanced technologies may deliver and the potential for the international standardisation of emergency call service networks[12] in the development of a much needed technology roadmap for the ECS that includes the C/CSPs, the national Triple Zero (000) operator and ESOs.

Telstra suggests that an Emergency Call Service Governance Council should be established by the Federal Government to assist in developing the strategic and forward thinking or thought leadership needed to implement the information, procedures and guidelines, and technical solutions that will be required in the future ECS. This Governance Council would avoid the various silos that currently exist and which may inhibit the ability of different stakeholders to deliver a single ECS in the future. It is not Telstra's desire to over-specify a solution at this stage, but to open up the possibilities of rational discussion on the basis of common perceived problems and goals and to consider all the options or ideas on how such a multi-stakeholder forum could work.

The Emergency Call Service Governance Council would be an open public forum where any interested party can participate in the various working groups. The proposed organisation is not intended to make changes to the current funding model or replace the existing Federal, State or Territorial authorities but to improve governance of the emergency call service.

Current Funding Framework

Telstra considers that the funding model that has operated since 1 July 2012 is appropriate at this point in time but also recognises that this may need to be revised to support any changes to the Triple Zero Operator model arising from this review. As noted in the Discussion paper, approximately two-thirds of the costs of the national Triple Zero service are met from the Telecommunications Industry Levy, and one-third from the Commonwealth. These arrangements provide an in-built mechanism that incorporates incentives for cost effective performance by Telstra as the current operator of the Triple Zero service, since Telstra is the largest individual contributor to the Telecommunications Industry Levy.

[12] For example Barnes, Richard and Rosen, Brian, 911 for the 21st Century, Spectrum IEEE.ORG, International, April 2014, page 51-56.

The role of innovators

Question 7: The role of innovators

Innovative ideas to improve emergency assistance may come from a range of parties such as app developers, device and car manufacturers, research organisations, community service providers and individuals.

What sorts of innovations would most improve the Triple Zero service? How can innovation and third party innovators be supported while ensuring the reliability and integrity of service?

Innovation in respect of the Triple Zero service needs to be considered in the context of the primary function of the national Triple Zero (000) operator; that is, to provide a fast, accurate and reliable transfer of emergency calls to ESOs. Any innovation that occurs must not jeopardise this primary function.

Innovative applications that provide additional information about an emergency call may be useful for the ESOs to aid in response or for incident management. However, the same additional information may not be necessary for the ECPs to reliably transfer emergency calls to the appropriate ESOs. Examples of additional information could include:

- Images and/or video of an incident (preferably geotagged) for situational awareness for ESOs;
- Aggregated social networking and/or crowd sourced data to gain insight into the extent of an event by ESOs; and
- Ambulance services would benefit from the timely availability of patient medical records; however, this information is private and should only be provided by the patient, the patient's medical practitioner, hospitals and/or government health authorities.

Innovation, by its nature, is highly unpredictable and risky, and does not always fit within existing structures, processes or frameworks. On the other hand the ECS must be highly dependable with an extremely low risk of failure. This risk can be managed by establishing a separate test environment, loosely coupled to the Triple Zero infrastructure, carriers and ESOs, for the testing innovation changes or solutions (including new applications) before they are introduced into the production environment. This type of test environment may allow the national Triple Zero (000) operator to facilitate the gathering of additional information from various sources to provide to ESOs.

Cooperation and decision-making

Question 8: Cooperation and decision-making

There are a range of parties with interests and responsibilities in relation to Triple Zero. It is important that there are effective cooperation and decision-making arrangements in place amongst these parties so that the service can continue to adapt and respond to issues as they arise in the future.

What things do the current cooperation and decision-making arrangements for Triple Zero do well? What things do they not do well? What changes are needed so the service can better adapt and respond to issues in the future?

Evidence would suggest that under the current arrangements, the ESOs, the national Triple Zero (000) operator, the ECP for 106, Government agencies and the telecommunications industry have delivered significant enhancements over time to the ECS. All parties involved in the delivery of the service are committed to ensuring an effective, efficient, reliable and robust service that is available to all Australians. This cooperation has demonstrated a productive partnership within the stakeholder group. The current arrangements for cooperation and decision-making have generally worked well in a mature and stable voice telephony environment but it has been more difficult to achieve innovation (such as Push MoLI) in this environment.

While the terms of reference for the Review specifically exclude state and territory responsibility for the dispatch of emergency assistance by the ESOs, the lack of a national approach clearly limits the overall effectiveness of the ECS. For example whilst the national Triple Zero (000) operator has a legislated responsibility to provide the Triple Zero service, the current model is not optimal for promoting strategic thinking, technical innovation or the development of a technology roadmap that encompasses all parties involved in the delivery of the ECS.

Technologically, much more can be achieved using existing capabilities within smart phones such as spatial data transmission via GPS. The difficulty resides with all ESOs and the national Triple Zero (000) operator committing to upgrading existing equipment, thereby ensuring collective compatibility, and the associated costs involved.

There is also an opportunity to simplify the ECS process through deregulation and implementation of the governance model. Deregulation can potentially deliver efficiencies to the current ECS process and stakeholder involvement. Further, less regulation should provide more flexibility so the ECS continues to meet future community expectations. Telstra invites the government to look into potential deregulation opportunities, including but not limited to, moving the national Triple Zero operator obligation into a commercial contract arrangement rather than retaining the current obligation under the Determination.

As explained in Telstra's response to Question 6, to truly support a world class national ECS into the future there is a need for the national Triple Zero (000) operator, ESOs, government, and industry stakeholders to participate in a joint governance model. Such a governance framework would lead strategic planning for the ECS including assistance in the development of a future technology roadmap.

Glossary

000	Triple Zero is the primary emergency service number as defined in the Numbering Plan.
106	The secondary emergency service number as defined in the Numbering Plan. The number to be called from a teletypewriter through the National Relay Service (NRS).
112	The secondary emergency service number as defined in the Numbering Plan (the international standard emergency number which can be called from a mobile phone).
ACMA	Australian Communications and Media Authority
API	Application Programming Interface
COAG	Council of Australia Governments
C/CSP	Carrier/Carriage Service Provider - has the meanings given by section 6 of the Telecommunications Act 1997
DBCDE	Department of Broadband, Communications and the Digital Economy which has been replaced by Department of Communications.
DoS	Denial of Service
ECP	Emergency Call Person - has the meaning given in the Telecommunications (Emergency Call Service) Determination 2009
ECS	Emergency Call Service - has the meaning given by section 7 of the Telecommunications Act 1997
ECSAC	Emergency Call Service Advisory Committee
ESO	Emergency Service Organisation – has the meaning given in the Telecommunications (Emergency Call Service) Determination 2009.
GPS	Global Positioning System
IPND	Integrated Public Number Database - has the meaning given in the Telecommunications (Emergency Call Service) Determination 2009.
IP	Internet Protocol
MoLI	Mobile Location Indicator
National Triple Zero (000) Operator	The body which answers the emergency call and transfers it to the appropriate ESO call centre (police, fire or ambulance). The service is currently provided by Telstra.
NECWG	National Emergency Communications Working Group
OTT	Over the Top (application provided by third party over a carrier service)
RVA	Recorded Voice Announcement
TUSMA	Telecommunication Universal Service Management Agency
TZAWG	Triple Zero Awareness Working Group
VoIP	Voice over Internet Protocol