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# Response
# to
# The consultation paper released by TRAI on Tariff issues related to SMS and Cell Broadcast alerts disseminated through Common Alerting Protocol (CAP) platform during disasters/non-disasters
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# 1. Document Information

**Confidentiality**

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# 2. Introduction

## 2.1. About Everbridge

Everbridge (NASDAQ: EVBG) is a global leader in Cell Broadcast Systems, CAP Gateways, Location Based SMS systems, National Public Warning Brokers, and Critical Event Management (CEM) platforms. One2many, the global provider of Cell Broadcast System is an Everbridge Company.

For over 20 years, Everbridge has been relied on by competent authorities around the world to help keep people safe. We have delivered successful public warning deployments in many of the largest cities across the USA and countries including Cambodia, Singapore, India (Odisha), Sweden, Norway, the Netherlands and Greece, and we were awarded contracts for countrywide public warning systems in Australia, Peru & others. As such our experts have gathered a high level of insight and experience of what is required to provide an effective public warning system and we are pleased to have this opportunity to provide input to TRAI on how to assess the effectiveness of public warning systems transmitted by different means.

The solutions we have deployed in the past use a combination of Cell Broadcast, Location Based SMS, sirens, radio, tv, email, voice, social media and Apps. Everbridge therefore has an in depth understanding of public warning systems which use both Cell broadcast and LB- SMS, or a combination of both to deliver PWS. Our open platform supports a multi- channel approach which we recommend as a best practice approach to Public Warning. Our Public Warning & Critical Event Management solutions are used by over 6,000 global organizations & Governments to keep people safe and avoid and/or lessen disruption to operations when such events as severe weather, workplace violence, active shooters, terrorism, IT and power outages, environmental spills, brand attacks on social media, product recalls, and medical emergencies occur.

**Our Public Warning system Protects People Before, During and After Critical Events**

Setting the standard for **next generation** population alerting systems with the only **all-channel, intelligent critical communication platform** to help public authorities protect people when it matters.

The only all-channel, intelligent population alerting platform - Everbridge offers a truly comprehensive, flexible and modular public warning solution to meet the needs of countries at all stages of maturity for population alerting

We protect more countries and people than any other provider - Everbridge is the world's most trusted national public warning solution, helping to protect more than 800 million people across all five continents in more than 20 countries, big and small.

Our solution ensures PII data protection compliance with privacy regulations including EECC Article 110 and GDPR.

The Most Innovative solution provider - Pioneer in public alerting technologies, Everbridge developed the first cell broadcast and location-based SMS solutions and is active in driving standardization of public warning worldwide through 3GPP, ATIS, ETSI, and EMTEL. Recent examples are our significant contribution to 3GPP standardization for the Cell Broadcast Centre Function (CBCF) in 5G networks and CBC Device Based Geo-Fencing (WEA 3.0) functionality for which we have written largely the updates to 3GPP TS 23.041 and 3GPP TS 29.518.

TRAI on the behest of DOT is trying to get a public opinion in assessing the effectiveness of alternative Public Warning Systems using means of electronic communications services that are intended to provide a neutral, balanced, and accurate set of facts to serve as guidelines.

To assist TRAI in this task our response includes comments on best practices followed by a detailed response to specific questions to correct inaccuracies and provide a more balanced factual view of alternatives.

We request that TRAI adopts our recommendations. Should there be any questions regarding our submission, please do not hesitate to contact Sumit Aggarwal.

## 2.2. Requirements of effective Population Alerting / Public Warning System

For a Public Warning System (PWS) to be effective it needs to be able to:

- **Geo-target** the affected population so as not to cause widespread panic.
- Convey messages in real-time, **rapidly and reliably.**
- Provide **statistics** on messages sent and received in order to confirmperformance.
- **Reach** a very high percentage of the people within the targeted area,including visitors in their native languages as well as residents.
- **Not require users** to have to **opt-in** or to **configure** their mobile phones toreceive messages.
- Allow for **easy 2-way communication** in order to determine if people needassistance in response to an emergency and to receive information for use cases asking the public for information (e.g., searching for missing children).

## 2.3. Best Practices for Public Warning Systems

### 2.3.1. Multi-Channel Incident Lifecycle

Cell Broadcast (CB) is an appropriate tool for public warning when time is critical and there is an urgent need to get the attention of the affected population within seconds.

However, CB is not suited to every incident and could have negative outcomes for public safety. For example, during a terror attack, when people are hiding from assailants, the use of CB would trigger loud signals from their mobile devices, revealing their location and exposing them to possible attack.

Also, CB does not allow for two-way communication, thus failing to meet one of the key requirements of the effective PWS.

A best practice approach to public warning would allow for communication with the public before, during, and after a major incident.

Location-Based SMS (LB-SMS) can be used effectively in all phases of an incident lifecycle, whereas CB does not have the capabilities that LB-SMS offers beyond the initial ALERT phase. However, using a **combination** of Cell Broadcast, SMS and other channels throughout anincident can vastly improve the outcomes both for the public and the authorities tasked with responding to the incident, and would meet all of the requirements.

*It is worth quoting here …….. "For public warning there is no single solution that fits all requirements to reach all citizens in case of an emergency" (Source EENA PUBLIC WARNING SYSTEMS Update Version 3 2019* https://eena.org/document/public-warning-systems-2019-update/).

## 2.4. Five ( 5 ) Best Practices for Effective Public Warning Solutions

For the past 20 years Everbridge has developed solutions based on the changing needs of our customers and in response to real world events. This has shaped a set of 5 best practices which form the foundation of all our technical innovations. In other words, these best practices come from collective feedback from cities and governments across the world.

### 2.4.1. Best Practice #1

*Communicate across all phases of the incident*

Any incident has a lifecycle that moves through 4 key stages and it's vital that the authorities are able to communicate across all of these phases:

1. **PLAN** ahead for the most likely incidents; encourage residents to prepare and publicize practice drills.
2. **ALERT** the broadest number of people as fast as possible.
3. **RESPOND** to groups (residents, tourists, responders, etc.) in their local language with two-way communications.
4. **RECOVER** by precisely targeting people with special skills; those who can assist anddirect follow-up activities.`

### 2.4.2. Best Practice #2

*Communicate with all stakeholders*

During an incident, the Public Warning system should be able to automatically reach all stakeholders:

1. **Who can help**? First responders, registered volunteers, specialist skills units.
2. **Who is impacted?** Residents, visitors, tourists, special needs (elderly or disabled).
3. **Who needs to know?** Anyone who is both *directly* or *indirectly* impacted by the incident. The regulations require that all impacted people be alerted and we believe the intention of this includes people "indirectly" impacted: for example, parents of children attending a school in the impact area; people who were exposed to a biohazard because they were in the location where that hazard was present prior to when an alert is issued. We believe that this is the standard the public will hold Public Warning Systems to when assessing their effectiveness.

### 2.4.3. Best Practice #3

*Leverage location intelligence*

Before you can alert all stakeholders, it is vital to have locational intelligence. We think of this in terms of 3 locations:

1. **STATIC** Location is where people live or work and therefore spend most of the time.
2. **LAST KNOWN** Location is where people are right now or an historical snapshot ofwhere people were 6

hours ago.

3. **EXPECTED** location is where people regularly spend time outside their home such asvisiting family, going to a child's school or community activities that form a 'footprint' or pattern of behaviour.

### 2.4.4. Best Practice #4

*Communicate with the right people at the right time*

This combines best practice #1 and #2.

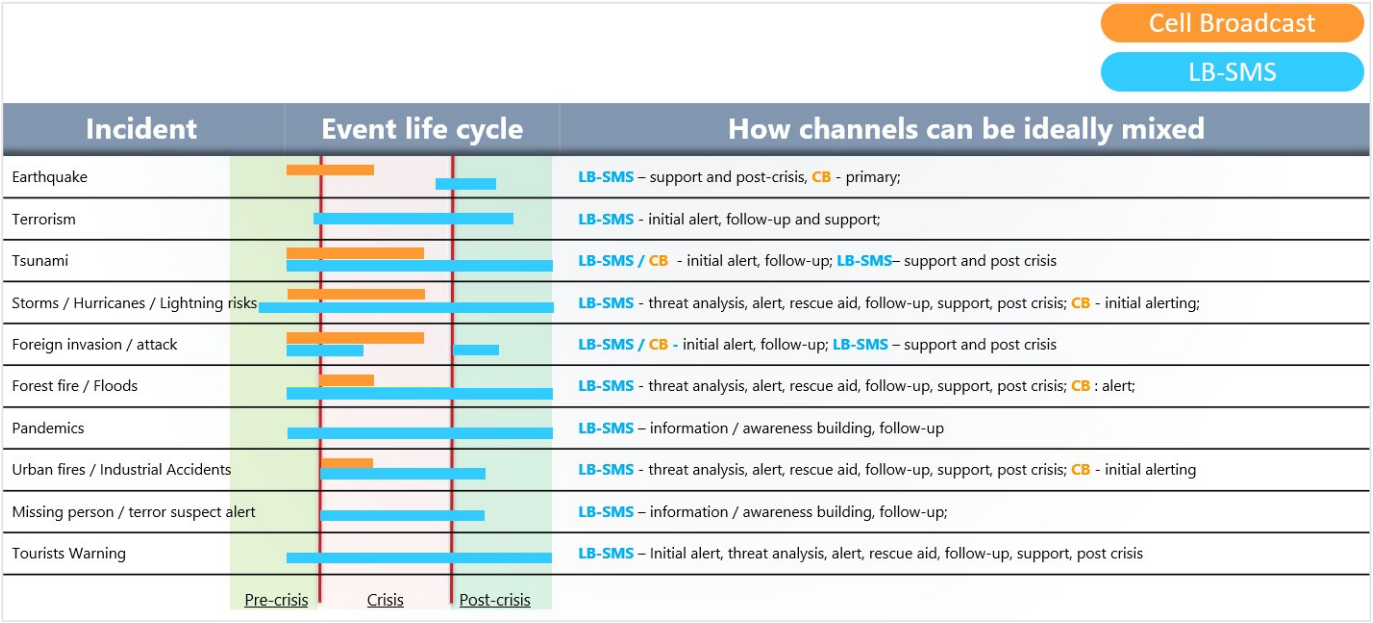
During the lifecycle of an incident the competent authorities should communicate with all stakeholders. This is best illustrated in the table below.


### 2.4.5. Best Practice #5

*Maximizing the Effectiveness of Public Warnings: A Hybrid Approach*

Cell Broadcast and Location Based SMS are both good technologies for public warning and each has its advantages and drawbacks. However, neither solution is capable of being 100% effective at reaching 100% of the population across the entire lifecycle of every incident.

The table below illustrates the event lifecycle of different incidents and shows how CB and LB-SMS should be used as a combined solution, before, during and after the incident.




## 2.5. Key Features of an Effective Public Warning System

Putting all of this together, Everbridge believes that an effective public warning system platform should be capable of delivering on the following key features:

1. **REACH EVERYONE**: Send alerts to 100% of mobile phones in the area.
2. **TWO-WAY**: Ability to see real time data on delivery status and receive incomingreplies from the population.
3. **SITUATIONAL AWARENESS**: Real-time statistics on the number of devices, their location and the nationality of the mobile in the affected area.
4. **KEEP ALIVE**: Geo-fence an area and alert new recipients as they enter.
5. **TOURISTS AND VISITORS**: alert anyone visiting from overseas using the mobilenetwork.
6. **FOLLOW UP**: Send messages to the same population to advise "All Clear" or provideother instructions.
7. **NATIVE LANGUAGE**: Messages can be set to any language based on SIM-card country code.
8. **TRAVELLER ALERT**: Enable outbound alerts to nationals travelling abroad to one or more countries.

The next section will provide our detailed responses to the points & questions in the consultation paper.

# 3. Response to the Points / Questions asked in the document

| Chapter 1: Introduction: Feasibility of SMS and Cell Broadcast dissemination through CAP Platform: | | |
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| | Clause as per Consultation Paper | Response / comments from Everbridge |
| Clause 1.1 | Cell Broadcast Service (CBS) has existed since 1988 and is standardized in 3GPP. Some important standards for Cell Broadcast are:<br>• 3GPP TS 23.041 - Technical Realisation of CBS<br>• 3GPP TS 44.012 - Short Message Service Cell Broadcast (SMSCB) | Everbridge Cell Broadcast Solution (CBC) is the most mature in the market, built as the world's first Cell Broadcast Centre in 1996 and follow / support 3GPP standards and more specifically following standards<br>• 3GPP defined standard for this interface ([3GPP TS 48.049],<br>• [3GPP TS 25.419],<br>• [3GPP TS 29.168], and<br>• [3GPP TS 29.518] for GSM, UMTS, LTE, and 5G respectively).<br>• 3GPP standardization for the Cell Broadcast Centre Function (CBCF) in 5G networks, for which Everbridge has written largely the updates to 3GPP TS 23.041 and 3GPP TS 29.518.<br>The CBC also supports interfaces to non 3GPP-compliant (GSM) cell controllers. |
| Clause 1.2 | ITU has issued specific guidelines for "Requirements for Land Mobile Alerting Broadcast Capabilities for Civic Purposes" which outlines best practices and design considerations for the deployment of Public Warning Systems (PWS). The focus is to promote the use of the Common Alerting Protocol (CAP) standard for public alerts and hazard notification in disasters and emergency situations | Everbridge's Public Warning System (PWS) comprises of scalable components to handle different functionality and all components can be enabled and integrated as & when required by different customers across the world based on their need/s.<br><br>Everbridge Public Warning System supports / allows alert originators of the customer to submit messages according to the CAP standard. The most recent version supported by EB PWS is the OASIS Common Alerting Protocol Version 1.2, also called CAP v1.2.<br><br>Everbridge Comment to this clause:<br>An effective Public Warning System must support both the alerting technologies (Cell Broadcast & LB-SMS) through CAP standard, which enables the system to send an alert based on the near-real-time location of the mobile or landline subscribers. |
| Clause 1.3 | Cell Broadcast platform is being utilized for sending messages to multiple users in a defined geographical area at the | Everbridge LB-SMS system can be used by Government authorities to alert multiple people in a specific geographic area at the same time in a quick and efficient manner. It can be as small a area |

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| | same time. It is also known as Short Message Service – Cell Broadcast. The broadcast range can be varied from a single cell to the entire network. Mobile service providers can send broadcast messages related to location, emergency alert, local news, advertisement etc. Cell Broadcast Centre (CBC) has evolved to support 2G, 3G and LTE. | like a district or large area like a nation (e.g. India as a whole). Technically, it can cover as small as single cell to entire national network of any mobile operator in India.<br><br>All mobile phones located within a defined area can be notified using location information from the mobile network without having to do anything to receive the messages. LB-SMS makes real-time dynamic alerting a reality as it supports all mobile technologies like 2G, 3G, 4G and forthcoming 5G.<br><br>Everbridge CB solution consists of a Public Warning Control Centre connected to Cell Broadcast Centers (CBCs) at mobile networks, solution is fully compliant with the "Commercial Mobile Alert System" (CMAS), "Wireless Emergency Alerts "(WEA) and EU-Alert as defined by ATIS, 3GPP and ETSI. |
| Clause 1.4 | Cell Broadcast has been included in current 3GPP 2G, 3G and LTE standards. In its simplest implementation CBS consists of one CBC, which is typically located in the network of a mobile operator, and at least one Cell Broadcast Entity (CBE), which for early warning systems are often based with government or a trusted authority. | |
| Clause 1.5 | The CBE is the messaging interface to the CBC. The message is sent to the CBC, which maps the target area to the mobile network cells and then sends the cell broadcast message to the required radio access network (GSM, 3G, LTE), which will manage the message broadcast to the end user.<br>CBS and Short Message Service (SMS) are technologies used for delivering mobile-driven Public Warning Systems (PWS). | We take this opportunity to go in detail on CBS & LB-SMS technology for delivering mobile-driven PWS. The same is highlighted below ……<br><br>Everbridge offers a rich front-end GUI that can function as a CAP gateway connected on one side to the Government Authority, and on the other side to the LB-SMS and CBC environments installed at Mobile Operators. This front-end can allow the alert originators of the Government to draw areas on the map, define the message and submit Public Warning messages according to the CAP standard.<br><br>For Cell Broadcast: |

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| | | Everbridge application supports configuration of values as per CMAS or EU standards as well as their corresponding CB channel number<br><br>The Everbridge's CBC is the central point from where CB messages are distributed to the PLMN(s). CBE's (e.g. EPW) submit broadcast requests to the CBC. Multiple CBE's may interface with the CBC simultaneously. A CBE can be connected to the CBC over (secure) IP connections.<br>The CBC will addres the necessary cell controllers (BSCs, RNCs, MMEs, AMFs) to execute actual broadcast of messages. Cells that are effectively transmitting the broadcasts are not directly connected to the CBC, but are interfaced via cell controllers.<br><br>For Location-based SMS:<br><br>Among the personalized parameters of CAP specification, there can be specific field <PARAMETERS> that indicates to the TSP's which technology needs be used to alert people in the targeted area. In case the technology indicated by CAP protocol is LB-SMS the Alert Message is routed to Everbridge LB-SMS environment using the Everbridge LB-SMS API. |
| Clause 1.6 | SMS is ideal as a personal one-to-one messaging solution. However, bulk messaging applications such as PWS, require the establishment and maintenance of a database of target numbers. It necessitates that messages are sent individually to each number in the database. In an emergency, networks are often severely congested, and this can further increase congestion and lead to delays in message delivery.<br>Moreover, SMS is sent directly to the handset number and messages received on the handset are independent of its location. Therefore, when a warning message is sent, there is no guarantee | The entire document does not consider that the technology has developed so much that Location based SMS is now available for location based Public Warning dissemination on mass level and is currently used in several countries like (Australia, Peru, Norway, Sweden, Odisha, etc.). Using LB-SMS technology, it is possible to use SMS for large-scale public warning scenarios without any need to establish or maintain the database of target numbers. .<br>One of the unique features of Everbridge LB-SMS is the ability to control the congestion towards the SMS-C as well as the radio network while delivering mass alert messaging.Everbridge LB-SMS uses an advanced location based throttling component, which can throttle the message throughput at Cell-ID level and per technology (2G / 3G / 4G / 5G) towards the SMS-C.<br><br>The SMS throttling components ensure that individual cells within the alert area are not overloaded due to SMS signalling during message sending. Increase or decrease of load is performed based on analysis of delivery report (DR) as well as configured information about SMS capacity at the TSP level. |

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| | the recipient is present in an area that the warning applies to. | The algorithm also takes into account variation in overall capacity to handle peak SMS volumes for each technology and it's specific configuration.<br><br>The handling of MSISDN queuing, as well as delivery report analysis is handled entirely within LB-SMS system, so no requirements apply to SMS-C except for providing delivery reports.<br><br>LB-SMS provides subscriber-level count of the SMS delivery. Delivery to individual subscribers is not by itself a performance bottleneck – in fact, this allows the alerting authority to see the delivery success rates per nationality and thereby know how many subscribers, including foreign visitors, have been reached, also categorized per nationality.<br><br>When an alert is triggered, only the target area and message content is sent to the mobile operator and only status and statistics is returned to the client. No PII or location is exposed in compliance with international standards such as GDPR.<br><br>Everbridge has worked with customers and TSP installed-base to optimize SMS delivery success. LB-SMS remains an effective mechanism for public warning especially for targeted information for critical or more local situations, and when there is a need to target individuals and/or ensure 2-way communication.<br><br>SMS is standard on every mobile phone and TSP network worldwide today. Thus, the LB-SMS technology is compatible automatically with every mobile telephone handset manufactured worldwide without configuration by the end-user. This means that, today, LB-SMS is accessible to and reaches everyone with a mobile phone when they are within network coverage.<br>This applies equally to citizens and international visitors roaming on the national networks.<br><br>Everbridge LB-SMS system sends SMS to all the subscribers who are ONLY within the Geographical area selected by Government and NOT to anyone outside the selected area. |

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| Clause 1.7 | Another advantage of CBS is that the recipients remain anonymous as CBS does not require registration of numbers or maintenance of a number database, and messages are sent to all users within a geographic area. The area can be as large as an entire network or as small as a single cell. Therefore, it does not violate citizen's privacy. CBS messages can only be sent by authorized personnel who have been given access to the system. | The LB-SMS technology also does not require any registration of numbers or maintenance of number database, hence the recipients always remain anonymous in this system. The LB-SMS system installed within TSP premises (which is not assessable to anyone outside TSP's authorised people / network) does all work of automatically identifying & sending LB-SMS to all subscribers falling within the geographical area selected by the Government authorised personnel. There is no human intervention or accessibility to any subscriber data involved for sending LB-SMS, hence it does not violate citizen's privacy.<br><br>SMS provides competent authorities with the capability to identify the aggregated and anonymised totals for every mobile device with a Last Known Location (LKL) within coverage of the warning area that they define geographically for the TSP's. The LKL is generated from the most recent transaction by the mobile device/user with the TSP. Otherwise, the device updates the TSP with its LKL automatically every few minutes. In addition, for auditing and performance assurance purposes, competent authorities can choose from a range of options. End-users are automatically opted in to receive the LB-SMS PW alerts sent by Government which is not the advantage in CBS. Moreover, the end-user cannot opt out of receiving the LB-SMS alert. |
| Clause 1.8 | In case of Cell Broadcast, the message can be displayed on the handset with no user interaction and a distinct warning tone sounded. Further, as it works on a broadcast mode, one message can be sent to millions of devices quickly within a designated target area without channel congestion. It can also send differentiated messages to designated areas.<br>Further, SMS uses signalling channels, which may be subjected to congestion in disaster and huge volumes may face delays during disaster situations. | In case of LB-SMS also the messages are displayed on the handset without any user interactions.<br><br>Further, our Operational experience from countries that have long-established PWS's that utilise LB-SMS demonstrate that the capacity of the SMSC to throttle up and down to manage its capacity to send alerts via SMS.<br><br>In India, the Mass Messaging System component for Odisha's Early Warning Dissemination System (EWDS) is part of the National Cyclone Risk Mitigation Project that will encompass all coastal states for improved disaster resilience. In 2019 may the state Government authorities in Odisha, along India's eastern flank, sent 2.6 million SMS messages within a span of few minutes to warn people about Cyclone Fani, this incient did not experience any network congestion when sent through BSNL.<br><br>In Saudi Arabia the local TSP, STS, regularly sends in excess of 1 million SMS's to advise on crowd |

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| | | safety during the annual Hajj in Mecca.<br><br>In Australia, “Emergency Alert” routinely sends SMS at the speed of 2,000 messsages per second per operator. Thus, the SMSCs have the capacity to support the operational demands of public alerting using LB-SMS.<br><br>Neither Saudi Arabia nor Australia have experienced any network congestion during an alert / campaign.<br><br>Moreover, there are very few realistic scenarios in India when a competent authority would choose to send the same alert message to millions of people simultaneously.<br><br>Experience shows that people expect to receive an alert that is relevant to them and targeted to actual threats in/around their geographic location.<br><br>Thus, states should focus on the local SMSC capacity. In addition, for their PWS to have the capacity to send multiple separate alerts simultaneously; each one tailored to the specific region under threat. Australia has the latent (and unused) capacity to send eight such alerts simultaneously.<br><br>Moreover, the Cell Broadcast is the optimal system to use when there is very small window (say only few minutes) between the time the disaster is approaching & time of alert to subscribers like in case of earthquakes.<br><br>Otherwise, with the technologies available these days, all disasters provide us ample time to alert subscribers in the possible affected area, wherein LB-SMS technology is better to send alerts with much higher success rate. |

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| | | If we consider the frequency of earthquakes in India, is it quite small in number and small in area, in comparison to Cyclones, Flooding, Fire, etc. where we have ample time to communicate people of such disasters.<br><br>"In mobile networks with 2G, 3G and 4G technologies, SMS throughput is typically limited between 1500 and 3000 SMS per second per operator, equivalent to alerting the entire population of Odisha (4 mobile networks, population 47 mill) in about 2 minute 11 seconds.<br><br>However, current limitations are primarily set to avoid congestion in older 2G and 3G networks. As mobile operators are introducing VoLTE with SMS delivery over SIP on 4G and 5G technologies, throughput on SMS is expected to multiply to the point where the congestion is no longer an issue to discuss for. |
| Clause 1.9 | Many countries and regions such as United States, Japan, South Korea, Canada etc have implemen"ed location-based alert systems based on cell broadcast and many others such as United Kingdom, Denmark etc are in the process of implementing such systems | Yes, that is true as each country has its own set of unique requirements. So they decide to use appropriate PWS for their country for benefit of its people.<br><br>Hence, countries like US, Japan, South Korea, etc. which are quite prone to earthquakes have therefore invested heavily in Mobile Network with CB at its core for instant messaging. Hence, have installed CB based PWS.<br><br>While countries like Estonia, Iceland, Norway, Sweden, India, etc. have developed their Mobile network based on SMS at its core due to various factors including disasters that are non-time bound in these countries. Hence, most of them have implemented LB-SMS for PW alerts (partially done by India) Which is cheaper & effective.<br><br>Our opinion on this clause is as follows:<br><br>**Given the individual limitations and benefits of each technology, the Government should consider developing a hybrid PWS that has LB-SMS as its core complemented by CB for when the principal** |

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| | | **purpose is alerting. The PWS design will also benefit from automated interfaces with other public warning and information channels to ensure the broadest coverage, accessibility and reach"**.<br><br>To clarify here that Everbridge is competent enough to advice what is stated in this document, we are hereby sharing some of our recent installations for CB and LB-SMS projects across the world:-<br><br>**Location based SMS implementations: -**<br><br>**1. Estonia (2021)**<br>a. State Information Communication Foundation - Public Warning System for LB-SMS, CAP, social media<br>b. Telia – LB-SMS for 2G, 3G, 4G, (5G) Site redundant, Geo-redundant<br>c. Elisa – LB-SMS for 2G, 3G, 4G, (5G) Site redundant, Geo-redundant<br>d. Tele2 – LB-SMS for 2G, 3G, 4G, (5G) Site redundant, Geo-redundant<br>**2. Sweden - SOS Alarm (2013/2020)**<br>a. SOS Alarm and Civil Contingency Agency, Public Warning System for LB-SMS, SMS, Voice, CAP, Pager, Tetra, social media,<br>b. Telia Company – LB-SMS for 2G, 3G, 4G, (5G) Site redundant, Geo-redundant.<br>c. Telenor Sweden – LB-SMS for 2G, 3G, 4G, (5G) Site redundant, Geo-redundant.<br>d. Hi3G / Tre.se - LB-SMS for 4G, (5G) Site redundant, Geo-redundant.<br>e. Tele2 Sweden - LB-SMS for 4G, (5G) Site redundant, Geo-redundant.<br>**3. Norway (2010/2020)**<br>a. Norway Ministry of Health, 50+ local government and municipalities. SaaS LB-SMS Public Warning Center hosted in Oslo SFR Data Center.<br>b. Telia Norway – LB-SMS for 2G, 3G, 4G, (5G) Site redundant<br>c. Telenor Norway – LB-SMS for 2G, 3G, 4G, (5G) Site redundant<br>d. Ice - LB-SMS for 4G, (5G) Site redundant<br>4. **Iceland (2018/2019)** |

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| | | a. Iceland 112, State of Iceland<br>b. Vodafone Iceland – LB-SMS for 2G, 3G, 4G, (5G) Site redundant<br>c. Nova – LB-SMS for 2G, 3G, 4G, (5G) Site redundant<br>d. Simmin - LB-SMS for 4G, (5G) Site redundant<br>**5. Australia (2019)**<br>a. Department of Justice and Community Safety (EMV) - Upgrade of the current national Emergency Warning System to the new generation Everbridge Public Warning product. Everbridge is providing the Government front-end and gateway systems, connected to<br>i. LB-SMS<br>ii. CAP Out<br>iii. Address-based Alerting<br>**6. India (2017)**<br>a. National Cyclone Risk Mitigation Project (NCRMP), Odisha<br>i. Everbridge partnered with Larsen & Toubro India for the delivery of the Mass Messaging System component for Odisha's Early Warning Dissemination System (EWDS)<br>ii. The project in Odisha is part of the National Cyclone Risk Mitigation Project in India that will encompass all coastal states for improved disaster resilience.<br>• LB-SMS<br>• CAP In & CAP Out<br>b. National Cyclone Risk Mitigation Project (NCRMP), Andhra Pradesh<br>i. The project in AP is part of the National Cyclone Risk Mitigation Project in India that encompasses all coastal states for improved disaster resilience<br>• LB-SMS<br>• CAP In & CAP Out |

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| | | **<u>Cell Broadcast implementations: -</u>**<br><br>**1. Spain (2021)**<br>a. PWS-RAN solution to the National Center for Monitoring and Coordination of Civil Protection Emergencies geo-redundant and highly available CBE Client Front-End System, CAP.<br>b. Movistar - HA and geo-redundant Cell Broadcast system (CBC and CAP GW)<br>c. Orange Spain - HA and geo-redundant Cell Broadcast system (CBC and CAP GW)<br>d. Vodafone Spain - HA and geo-redundant Cell Broadcast system (CBC and CAP GW)<br>e. MasMovil - HA and geo-redundant Cell Broadcast system (CBC and CAP GW)<br>**2. United Kingdom (2021)**<br>a. BT/EE – Mobile operator in United Kingdom, PWP, CBE, CAP Gateway, Cell Broadcast Centre (CBC), Site Redundant, Geographic redundant, virtual deployment – 2 sites, 5G, 4G & 2G. Live in Q1 2021<br>b. Telefonica UK/O2 – Mobile operator in United Kingdom, PWP, CBE, CAP Gateway, Cell Broadcast Centre (CBC), Site Redundant, Geographic redundant, virtual deployment – 2 sites, 5G, 4G & 2G. Live in Q1 2021<br>**c.** H3G UK/Three – Mobile operator in United Kingdom, PWP, CBE, CAP Gateway, Cell Broadcast Centre (CBC), Site Redundant, Geographic redundant, virtual deployment – 2 sites, 5G, 4G & 2G. Live in Q1 2021<br>**3. Mauritius (2019/2020)**<br>a. National Disaster Risk Reduction and Management Centre, National Early Warning system, Multi Hazard Multi Channel CAP 1.2 Aggregator, Multi input/output channels, Automatic sensor network integration for Flood warning and WMO integration for Typhoon warning, Geo Redundant – 2 sites, Hardware based. Project Status: Live January 2021<br>**4. Saudi-Arabia** |

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| | | a. STC – Largest Mobile operator in Saudi Arabia, PWP, CBE, CAP Gateway, Cell Broadcast Centre (CBC), Geographic redundant – 2 sites, 5G, 4G, 3G & 2G. Live Q1 2020<br>b. Kingdom of Saudi Arabia, Ministry of Interior, The Directorate of the Saudi Civil Defence, PWP, CBE, CAP Gateway, National Public Warning Solution, Geographic redundant – 2 sites. Live November 2020<br>**5. Greece (2018/2019)**<br>a. Centralized CBC for national public warning and public warning messages, redundant CBC, integrated in all Greek mobile networks, Cosmote, Wind Hellas and Vodafone Greece (2G, 3G, 4G, 5G ready). Live 2019<br>b. Government Public Warning Centre, CB, Voice, SMS, CAP, Twitter<br>**6. USA (2019)**<br>a. PGAlert, Software as a Service (Saas) Cell Broadcast, CMAS/WEA, AWS. Live 2019<br>b. T-Mobile USA, WEA infrastructure, CBC & CAP/CMSP Gateway, Geographic redundant – 2 sites, LTE, 3G & 2G. Live 2012<br>c. West (previously known as Intrado/911), CBC & CAP Gateway, Geographic redundant – 2 sites, LTE, 3G & 2G. Live 2012<br>d. PBS (Public Broadcasting Service), WEA infrastructure, CAP Gateway / CMSP Gateway, Geographic redundant – 2 sites, TV, Satellite. Live 2019<br>**7. New Zealand (2017/2019)**<br>a. Civil Defence (DPMC), CBE /Public Warning Portal. Geographic redundant – 2 sites, SaaS/AWS managed service. Project Status: Live 2017.<br>b. 2Degrees, CBS, Geographic redundant – 2 sites. Virtual Machine deployment – VMware. LTE & 3G. Live 2017<br>c. Spark, CBS, Geographic redundant – 2 sites. Virtual Machine deployment – VMware. LTE & 3G. Live 2017<br>d. Vodafone NZ, CBS, Geographic redundant – 2 sites. Virtual Machine deployment – VMware. LTE & 3G. Live 2017<br>**8. The Netherlands – NL-Alert (2012/2019)** |

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| | | a. Ministry of Justice & Security, Public Warning Portal, including among others Apps, Social Media, dynamic travel information signs. Redundant – 1 site, AWS managed service. Live 2018.<br>b. KPN, CBS, Geographic redundant – 2 sites. Virtual Deployment – VMware. LTE, 3G and 2G. Project status: Live 2012.<br>c. Vodafone NL, CBS, Geographic redundant – 2 sites. Virtual deployment – HP. LTE, 3G and 2G. Project status: Live 2012.<br>**9. Oman (2018/2019)**<br>a. Omantel, CBC, CBE & CMSP Gateway, Redundant – 1 site, Virtual Deployment – KVM. LTE, 3G and 2G. Live 2019<br>**10. Taiwan (2016)**<br>a. CHT, CBC & CAP/CMSP Gateway, Geographic redundant – 2 sites, LTE, (2G & 3G). Live 2016<br>b. FET, CBC & CAP/CMSP Gateway, Geographic redundant – 2 sites, LTE. Live 2016<br>**11. Philippines (2016)**<br>a. Smart, CBS, Geographic redundant – 2 sites, GSM, UMTS, LTE interfaces. Live 2016.<br>**12. UAE (United Arab Emirates**) - (2016)<br>a. Etisalat, CBC and CAP/CMSP Gateway, Geographic redundant – 2 sites, Virtual Machines, GSM, UMTS and LTE interfaces. Live 2016 |
| Clause 1.10 | Therefore, Cell Broadcast System is technically feasible and offers many advantages over SMS based system though there are certain limitations as well such as:-<br>(i) As CBS is a one way communication, therefore, the CBS platform cannot keep track of individual successful delivery count of the message, | We are hereby stating some key differentiators between CB & LB-SMS technology to help Government take an appropriate decision. These can be demonstrated on requests to TRAI or specific Government agencies.<br><br>Features / drawbacks of CB:-<br>1. CBS is a one-way communication; therefore, the CBS platform cannot keep track of individual successful delivery count of the alert message sent by Government. Therefore, the Government will not be able to ascertain the reach & effectiveness of the PW alerts sent by them. |

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| | (ii) Cell Broadcast may face handset compatibility issues. Subscriber may disable the cell broadcast channel on handset and may not get the message. | 2. Cell Broadcast has handset compatibility issues in India, as substantial section of subscribers (primarily the economically disadvantaged in affected areas) are still using feature phones which cannot or have constraint to receive CB messages. Therefore, not reaching to the people who actually require the alert.<br>3. Subscribers may disable / may not configure the Cell Broadcast channel on their handsets and hence may not get the message at all. Hence, it has an opt-out functionality available in this case.<br>4. The CB infrastructure at India's TSP's are commercial (advertising driven)CB and not Public Warning CB hence could not be used for PWS.<br>5. Historically, Indian TSP's have primarily developed their messaging infrastructure based on SMS technology and not CB technology hence they are currently not compatible for nation wide CB PW roll out.<br><br>Features & drawbacks of LB-SMS technologies:-<br><br>1. LB-SMS is a two way communication system, therefore it knows the count of subscribers present in the targeted area for various pre & post-disaster activities.<br>2. It works on usual SMS technology and hence does not require any configuration on handsets, it does have opt out facility for end-users, etc.<br>3. The TSP infrastructure already uses SMS-C for sending SMS's, hence they just need an Location based functionality in their network to ascertain the location of subscribers to send an alert. Therefore, saving on investment.<br>4. All handsets in India are compatible to receive SMS's as long as they within network coverage. Hence, all subscribers will receive the alerts sent by Government as they can not opt out of the same.<br>5. The situational awareness functionality of Everbridge LB-SMS helps to ascertain the subscribers in the targeted area even after happening of the event which helps the Government to communicate people present in the area in case of manmade disaster I.e. Bombing, shooting, etc. for proper law & order enforcement. |

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| | | 6. It helps in analysing the effectiveness of the PWS post alert sending. |
| Clause 1.11 | The first set of issues of consultation related to technical feasibility of SMS/Cell Broadcast system are: | |
| Question 1 | What are the technical options available with the Telecom Service Providers for mass message dissemination through Common Alerting Protocol (CAP) platform during disasters and non-disasters and what are the challenges being faced with respect to these technology options? | CAP is a technology-independent protocol to deliver alerts (warning messages) to dissemination platforms of Telecom Service Providers (TSP). The TSP delivers the alerts via either SMS or CB to mobile devices located in the impacted area. SMS is a point-to-point delivery technology and CB is a point-to-multi delivery technology, but both technologies deliver textual alerts to devices in the impacted area.<br><br>CAP is only a protocol. Since CAP is technology-neutral and the dissemination technology is CB or SMS, a mapping needs to happen from CAP parameters onto CB or SMS parameters. For a CB based deployment, CAP secure gateway can be used as part of the Mobile Operator domain working as a secure gateway connected on one side to the Indian Central/State Government environment and on the other side to the CBC environments of TSPs in specific state/all India.<br><br>Note that CAP can also be used for LB-SMS, but due to the richer features offered with LB-SMS, , additional CAP <parameters> has to be invoked for rich LB-SMS capabilities.<br>In the case of LB-SMS, Everbridge offer secure, proven LB-SMS based APIs that can be used between the Government environment and TSP LB-SMS system.<br><br>This solution can be used as a vendor-agnostic solution for some or all of the TSP LB-SMS systems.<br><br>The communication between the Government CAP Gateway and telecom-based CB / LB-SMS systems can be based upon the CAP protocol.<br><br>Here are some options on how a hybrid CB and LB-SMS system can be used in Public Warning: |

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| | | Prioritization between CB and LB-SMS would be possible by using TAC code filters to identify non-CB compliant devices and send LB-SMS only to these devices. Some countries and TSPs are considering a split deployment where CB would be deployed only to 4G and 5G networks, and then LB-SMS would be used for 2G/3G networks. In this scenario, the LB-SMS system can be set up to send SMS only to subscribers with activity on 2G/3G and leave out all subscribers that are active on 4G/5G.<br><br>Another way to combine CB and LB-SMS would be to use LB-SMS for inbound roamers, since this method would provide information about the number of such roamers and their nationalities so that language also could be adapted.<br><br>Finally other hybrid scenarios exist, such as sending CB through all technologies 2G/3G/4G/5G and also take a snapshot of the subscriber base for the same area, which allows the system to follow-up with LB-SMS to the same target audience at a later point regardless of their later location. This is what is called a follow-up messaging in LB-SMS, and this can be combined with CB alerting to get a powerful hybrid alerting approach. |

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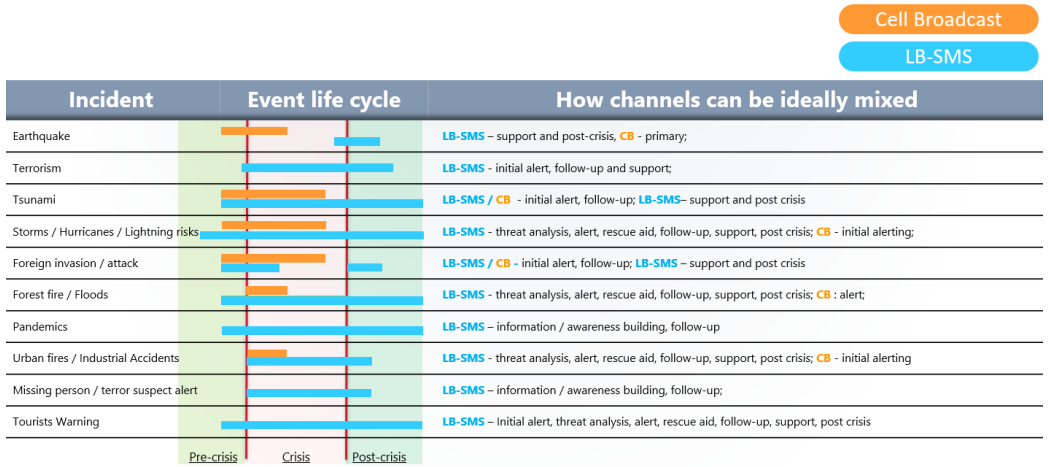
| Question 2 | Which method of mass message dissemination for alert, Short Service Message or Cell Broadcast Service, is preferred? Please provide supporting reasons. | As stated in our response above against Clause 1.9, Everbridge has capability to provide both CB and LB-SMS based system for India's national PW capabilities, no matter what the Government wants.<br><br>In reference to EU, BEREC in 2019-2020 did a detailed study including responses from Governments, Technology providers, etc. and has considered that CB and LB-SMS both to be equivalent technologies for Public Warning under Article 110(2) of EECC for Public Warning and left the selction of Technology on member states.<br><br>The BEREC conclusion was that that there is no single solution that fits all requirements to reach all citizens in case of an emergency" (Source EENA PUBLIC WARNING SYSTEMS Update Version 3 2019 https://eena.org/document/public-warning-systems-2019-update/).<br><br>Given the individual limitations and benefits of both CB and LB-SMS, **TRAI should consider Hybrid Mass Message dissemination engines** / PWS that also benefit from automated interfaces with other public warning and information channels to ensure the broadest coverage, accessibility, and reach.<br><br>The table below illustrates the event lifecycle of different incidents and shows how CB and LB-SMS should be used as a combined solution, before, during and after the incident. |




Cell Broadcast:

Cell Broadcast is a broadcast delivery technology which allows alerting millions of people within seconds or minutes. Mobile devices have a distinct ringtone, vibration, and immediate display when an alert is received.

A CBC requires an investment at the TSP end for PW CBC. For LB-SMS, an SMSC is already available with all TSP's, but Location-Based SMS requires location awareness of mobile devices in the impacted area by Telecom Network, which may require some investment.

If an alert needs to be delivered quickly (in few seconds / minutes) to many people, the preferred choice is CB. Furthermore, CB has a distinctive ringtone to alert the user. CB also supports DBGF which allows a far more precise geo-targeting (this block of houses, but not the next, etc.) and eliminates overshoot.

LB-SMS:

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| | | Using LB-SMS technology, it is possible to use SMS for large-scale public warning scenarios without any need to establish or maintain the database of target numbers. as detailed below. Hence, LB-SMS and CB both have been recognized as effective public warning technologies - ECS-PWS falling under Article 110(1).<br><br>One of the unique features of Everbridge LB-SMS is the ability to control the congestion towards the SMS-C as well as the radio network while delivering mass alert messaging.<br><br>Everbridge LB-SMS uses an advanced location based throttling component, which can throttle the message throughput at Cell-ID level and per technology (2G / 3G / 4G / 5G) towards the SMS-C.<br><br>The SMS throttling components ensure that individual cells within the alert area are not overloaded due to SMS signalling during message sending. Increase or decrease of load is performed based on analysis of delivery report (DR) as well as configured information about SMS capacity at the TSP level. The algorithm also takes into account variation in overall capacity to handle peak SMS volumes for each technology and it's specific configuration.<br><br>The handling of MSISDN queuing, as well as delivery report analysis is handled entirely within LB-SMS system, so no requirements apply to SMS-C except for providing delivery reports.<br><br>LB-SMS provides subscriber-level count of the SMS delivery. Delivery to individual subscribers is not by itself a performance bottleneck – in fact, this allows the alerting authority to see the delivery success rates per nationality and thereby know how many subscribers, including foreign visitors, have been reached, also categorized per nationality.<br><br>When an alert is triggered, only the target area and message content is sent to the mobile operator and only status and statistics is returned to the client. No PII or location is exposed in compliance with international standards such as GDPR. |

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| Question 3 | What is the success rate in delivery of messages in each of the methods adopted by the operators for dissemination of messages to the masses? Please provide details. | Before commenting on the success rate of delivery of CB or LB-SMS, we should understand what is the ratio (in percentage) of the number of events that trigger a Public Warning message that can be assigned to each of the following size of targeted area?<br>• *targeted area with population up to 50 000*<br>• *targeted area with population up to 500 000*<br>• *targeted area with population up to 2 million*<br>• *targeted area with population up to 10 million*<br>• *targeted area with population above 10 million*<br><br>To answer this question, we have assumed that 50% of the events that trigger public warnings will be alerts to less than 50000 people, 35% to less than 500,000 people etc.<br>A population of more than 10 million for Indian context could indicate an entire state or highly populated cities or municipalities. The circumstances under which an alert would go to such a large population are limited since most alerts are for an incident in a specific geographical area and alerts sent to people who are not impacted can cause confusion and panic:<br>• *targeted area with population up to 50 000 = 50%*<br>• *targeted area with population up to 500 000 = 35%*<br>• *targeted area with population up to 2 million = 14%*<br>• *targeted area with population up to 10 million = 0.9%*<br>• *targeted area with population above 10 million = 0.1%*<br>The Cell Broadcast is the optimal system when the population is quite large and there is very small window (say only few seconds / minutes) between the time of the disaster approaching & time to alert subscribers (e.g. in case of earthquakes).<br><br>Only mobile devices that are compatible with the CB technology and the end-user has not opted |

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| | | out of the PWS can receive a CB disseminated alert. Please be aware that recent tests of the CB PWS's in The Netherlands identified that 95+% of mobile devices were compatible with CB after almost 9 years of its national implementation.<br><br>Otherwise, with the technologies available these days, most of the disasters provide ample time to alert subscribers in the possible affected area, wherein LB-SMS technology is better to send alerts with much higher success rate.<br><br>For example, if we consider the frequency of earthquakes in India, is it quite few in numbers and smaller in area, in comparison to Cyclones, Flooding, Fire, etc. where we have ample time to communicate people of such disasters.<br><br>"In mobile networks with 2G, 3G and 4G technologies, SMS throughput is typically limited between 1500 and 3000 SMS per second per operator, equivalent to alerting the entire population of Odisha (4 mobile networks, population 47 mill) in about 2 minute 11 seconds.<br><br>However, current limitations are primarily set to avoid congestion in older 2G and 3G networks. As mobile operators are introducing VoLTE with SMS delivery over SIP on 4G and 5G technologies, throughput on SMS is expected to multiply to the point where the congestion is no longer an issue to discuss for" |
| Question 4 | What are the challenges related to customer end devices that may arise due to Cell Broadcast Service? If so, what are they and what is the extent (total number as well as percentage) of such cases encountered so far? In case an operator has first-hand experience, then the same may be shared with facts. | Both Apple's iOS and Android support CB since 2012 (In case of iOS, Apple needs to activate the service in the country). Older phones (including feature phones) in the market does not support CB. But, device compatibility was an issue sometime back, However in the recent years it has proven that the CB technology is used in some markets across the globe hence most of the device manufacturers are supporting Cell broadcast in their handsets.<br><br>The user does not need to configure anything on the device as the cell broadcast client for government alerts is embedded available on all Android, iPhone and Windows phones in most of |

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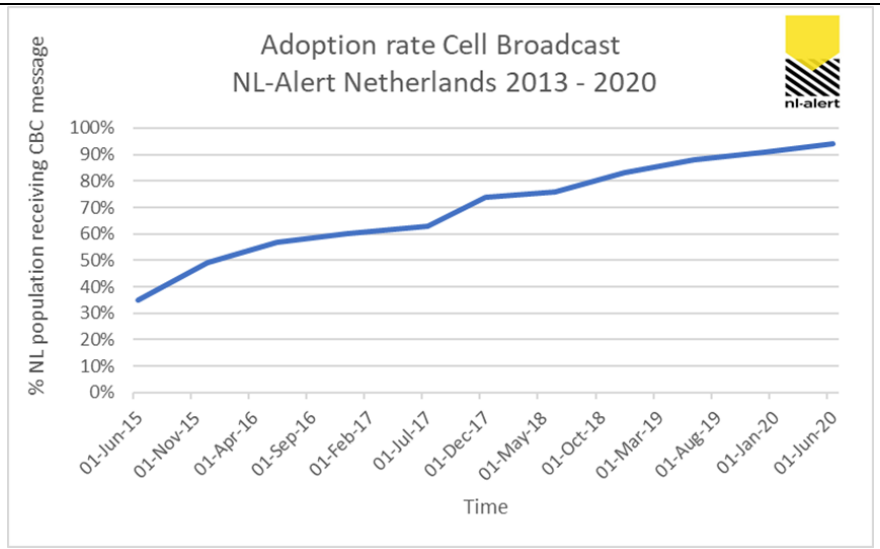
| | | the CB based countries / markets. However, depending on how each device is pre-configured for specific country / market, a user might need to turn on the alerting function / configure the same to receive the alerts.<br><br>The default setting at the point of sale of mobile devices should be "opted in" for alerts and "opted out" for test messages. It would be good to verify with TSPs that these settings are observed at their points-of-sale.<br><br>All phones connected to telecom networks support SMS.<br><br>The Netherlands and New Zealand have shown that at the start of the service the reachability was around 20-30% and in a few years this has risen to 80-90%.<br><br>We can put as an example the Netherlands, which is a mature CB country and has developed its CB adoption over several years already. 95% of all devices in the Netherlands are capable of receiving CB. NL-Alert has been used in the Netherlands for past 9 years, and every six months a test message is sent which is broadcast throughout the Netherlands. The reach of the Control Cell Broadcast message has increased over the years resulting that in the recent test more than 14.2 million (94%) citizens received directly the test warning Cell Broadcast message on their mobile phone. |




It is also worth considering the cost of getting to 99% coverage. The Netherlands have spent almost 9 years getting to 95+% coverage for CB penetration, compared to a LB-SMS system which would be at 100% from day one (provided all operators are included).

| Chapter 2: Identification of other Tariff issues for consultation | | |
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| Clause 2.1 | Section 11(2) of TRAI Act, 1997, inter alia, states the following:<br>"*Notwithstanding anything contained in the Indian Telegraph Act, 1885 (13 of 1885), the Authority may, from time to time, by order, notify in Official Gazette the rates at which the telecommunication services within India and outside India shall be provided under this Act including the rates at which messages shall be transmitted to any country outside India*:<br>*Provided that the Authority may notify different rates for different persons or class of persons for similar telecommunication services and where different rates are fixed as aforesaid the Authority shall record the reasons therefor"* | N.A. |
| Clause 2.2 | Department of Telecom vide their letter dated 25th March 2021 (Annexure-I) has requested TRAI to provide tariff for SMS and Cell Broadcast alerts/messages to be disseminated by TSPs through CAP platform during disasters/ non-disasters in which it is, inter-alia, stated that:<br>The National Digital Communication Policy (NDCP)-2018 of Government of India envisages, inter-alia, the following strategy under para 3.4 of its 'Secure India' mission:<br>i) Developing a comprehensive plan for network preparedness, disaster response relief, restoration and reconstruction<br>ii) Establishing institutional framework to promote monitoring of activities, rapid dissemination of early warning disaster notifications and better coordination and collaboration between relevant Ministries / Departments, | N.A. |

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| | including the National Disaster Management Authority of India."<br><br>Based on the request of National Disaster Management Authority (NDMA), the Centre for Development of Telematics (C-DOT) developed a CAP based pilot platform for dissemination of geo intelligent alert messages (through Telecom network) for State of Tamil Nadu at a cost of Rs 14.99 Crs. The Pilot project is at advanced stage of completion. The capabilities of this platform were demonstrated during pandemic/natural disasters of Covid-19 and Cyclones in recent times. | |
| Clause 2.3 | Upscaled CAP project for pan-India implementation is entrusted by NDMA to C-DOT at a cost of Rs 354 Cr (including 10 years AMC). The project envisages integration of India Meteorological Department (IMD), Central Water Commission (CWC), Indian National Centre for Ocean Information Services (INCOIS), GPS Aided Geo Augmented Navigation (GAGAN), Navigation with Indian Constellation (NAVIC), Snow and Avalanche Study Establishment (SASE), 36 State Disaster Management Authorities (SDMAs), Telecom Service Providers (TSPs) for SMS/Cell Broadcast based geo intelligent alert dissemination and Proof of Concept (PoC) / demonstration of alert dissemination through Cell Broadcast, TV, Radio, Indian Railways (public address systems & displays) and Coastal Sirens. | N.A. |
| Clause 2.4 | The system allows sending geo intelligent CAP messages as per latitude and longitude of the targeted area. Upon receipt of CAP alert message, TSPs identify Base Transceiver Station (BTS) and their latched subscribers within targeted area. Then SMS/Cell Broadcast is disseminated to identified subscribers within targeted area automatically. Therefore, dissemination of CAP alert SMS through TSPs network is different from propagation of conventional peer-to-peer SMS | No, it is very same as conventional peer to peer SMS dissemination system |

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| Clause 2.5 | The provisions mentioned in para 6.2(xii) of Standard Operating Procedure (SOP)-2020 of DoT for responding to disasters, is reproduced below for ready reference:<br>"TSPs shall broadcast messages at regular intervals, in consultation with State/ National Telecom Disaster Coordination Committee (STDCC/ NTDCC) to all the subscribers in the affected areas through SMSs / Cell broadcast free of cost during disaster period based upon instructions of Nodal authorities as per DM act 2005 i.e. National Executive Committee (NEC)/National Crisis Management Committee (NCMC)/ State Executive Committee (SEC).<br>This shall provide details about:<br>a) Details of TSPs helpline numbers.<br>b) Details about rescue and relief activities of state government such as tentative schedule of food / water distribution / nearest shelter/ shelter camp etc. as per need of State agencies." | N.A. |
| Clause 2.6 | As per the above SOP, DoT allows SMS/ Cell Broadcast free of cost only for a definite period and for events where specific request for free of cost messages comes from NEC/ NCMC/ SEC/ Nodal Authorities. However, there are occasions where the government would like to send alert messages to the public forewarning of a possible disaster or occasions where public has to be informed of special events such as holding of relief/ vaccine/ medical camps/ specific law and order related situations etc. Platform is not meant to disseminate political/commercial messages. As per DM Act 2005 and SOP following four possible categories of alerts/messages may be sent through CAP:-<br>(i) Alerts/messages sent during non-disaster situation which may be on chargeable basis; | We suggest that the disaster / non-disaster related charges be fixed & same for the states to pay in case of (I), (ii) & (iii) for use of either technology I.e., SMS / CB. |

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| | (ii) Alerts/messages sent by designated nodal agencies as per DM Act 2005 prior to notification of disaster which may be on chargeable basis;<br>(iii) Alerts/messages sent during disaster by/on instructions of designated nodal agencies as per DM Act 2005 and extant SOP which will be free, and<br>(iv) Alerts/messages that are unrelated to disaster but sent during disaster by agencies other than designated nodal agencies as per DM Act 2005 which may be on chargeable basis. | |
| Clause 2.7 | The Authority has issued a regulation The Telecom Commercial Communication Customer Preference Regulations (TCCCPR)[2], 2018.As per provisions of regulation 35 of TCCCPR, 2018, Terminating Access Provider (TAP) may charge Originating Access Provider (OAP) for Commercial communication messages as following:-<br>1. Up to Rs.0.05 (five paisa only) for each promotional SMS.<br>2. Up to Rs.0.05 (five paisa only) for each service SMS.<br>Provided that there shall be no service SMS charge on:<br>i. any message transmitted by or on the directions of the Central Government or State Government;<br>ii. any message transmitted by or on the directions of bodies established under the Constitution;<br>iii. any message transmitted by or on the directions of the Authority;<br>iv. any message transmitted by any agency authorized by the Authority from time to time; | N.A. |

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| Clause 2.8 | Detailed guidelines to grant exemption on SMS charges with respect to TCCCPR, 2018 are provided in Annexure - II. | N.A. |
| Clause 2.9 | The purpose of this consultation paper is to elicit stakeholders' views on the tariff for SMS/Cell Broadcast disseminated by TSPs through CAP platform during disasters/ non-disasters and to understand the technical aspects that might have an impact on the costing of the service. | N.A. |
| Clause 2.10 | Following are the next set of issues for consultation related to tariff: | |
| Question 5 | Is there a need for an elaborate tariff fixation exercise for CAP messages? In the alternative, would it be better from the perspective of ease of regulation to keep all categories of alerts/ messages given in paragraph 2.6 above including those at categories (i),(ii) and (iv) thereof, free of charge? Is keeping all CAP alerts/ messages free of charge an economically prudent and viable option? | We recommend that Government agencies implement a CAP based public warning system(s) with three pricing components:<br>**CAP agent/broker** – this serves as the user interface for Government agencies to define map areas, messages and other aspects of the public warning message, and converts user or automatic CAP inputs into CAP public warning messages.<br>**Sending CAP messages via CB:** The load on the core network and radio access network of a TSP for a cell broadcast message is quite small. Hence, setting a tariff on a CB message is purely a commercial agreement, unrelated to the load on network but definitely a factor of investment, maintenance & availability of system for PW usage.<br>**Sending CAP messages via LB-SMS:** The costs to deliver SMS messages by a TSP could be charged per delivered SMS as a conventional model, but the amount per year is unpredictable since it is not known how many emergency events will occur in a year and how many people need to receive an SMS.<br>Another consideration could be a commercial agreement related to the investments the TSP has to make for either CB / LB-SMS for PWS. |

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| | | Thus, setting up a tariff per message may be difficult and could easily end up to be far too low or far too high to cover the costs of deploying a Public warning system.<br><br>Also, keeping the cost of CAP messages free would be a direct transfer of burden on TSP's as they have to incur cost in infrastructure, maintenance & support delivery of CAP messages, hence not advisable. |
| Question 6 | If answer to the question number 5 is No, then whether the service SMS charges of up to Rs 0.05 (up to five paise) as mentioned at Regulation 35 of TCCCPR 2018 be adopted for SMS/Cell Broadcast alerts/ messages sent through CAP platform? | In order to compare the costs & effectiveness of the PW systems, it is advisable to have similar / same cost for CB / SMS technology used for PWS. |
| Question 7 | What tariffs should be charged by TSPs for SMS and Cell Broadcast alerts/ messages under category (i), (ii) & (iv) as given at paragraph 2.6 above, in case SMS charges of up to Rs 0.05 (up to five paise) as mentioned at Regulation 35 of TCCCPR 2018 is not to be adopted? | N.A. |
| Question 8 | What are the operational challenges for disseminating mass messages through Short Service Message and Cell Broadcast Service? What is the impact of these operational challenges on the costs involved in such dissemination? Please justify. | **Disseminating Mass Messages via CB:** Delivering an alert via CB is not mass delivery; it is a broadcast. The CBC sends a message of about 1kB – 100 kB (depending on the number of cells that need to broadcast the message) to the radio access network only once and the radio cells broadcast that message. Since CB is a broadcast technology it makes no difference if only 1 person or 10 million persons receive the message. The costs that are involved are the deployment of a CBS and licenses in the network including maintenance and keeping the system available for PW.<br><br>CB is directly connected to the RAN (Radio Access Network) hence it does not require extra capacity for Signalling, SIGTRAN Signalling or IMS core. With Cell broadcast, 1 CB message is sufficient to reach millions of handsets or even the |

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| | | complete population of India if required with various bottlenecks shared earlier in our response.<br><br>**Disseminating Mass Messages via LB-SMS:**Delivering an alert via SMS puts some load on the network if the number of recipients is high (which seldom happens in India after various studies on disasters happened in last decades). A TSP normally has an SMSC and other infrastructure installed in its network, but need to monitor mobile device traffic and the LB-SMS system can detect which mobile devices are attached to which cells in the impacted area.<br><br>SMS is a proven and stable Valued Added Services working in all technologies and all networks, consequently we see no operational challenges.<br><br>The SMS channel is shared with multiple commercial services and need not be dedicated for Public Warning nor a dedicated channel to be used for the Government but has no impact on SMS being used for PW.<br><br>SMS makes use of SIGTRAN signaling and IMS which are also used for other services like Voice, RCS, MMS.<br><br>LB-SMS provides subscriber-level count of the SMS delivery. Delivery to individual subscribers is not by itself a performance bottleneck – in fact, this allows the alerting authority to see the delivery success rates per nationality and thereby know how many subscribers, including foreign visitors, have been reached, also categorized per nationality. |

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| Question 9 | What methodology should be adopted to do the costing of the Cell Broadcast alerts/ messages? What are the cost items which should be factored in? Please provide supporting reasons. | The investments are for a CBC and possibly CB licenses in other parts of the network (e.g., RAN). A CB system often consists of a geo-redundant setup and may be done on bare-metal (server rack) or on virtual machines.<br><br>Further, for LB-SMS a small amount of investment is to be made to detect which mobile devices are attached to which cells in the impacted area.<br><br>Due to the unpredictability of the number of alerts and the number of citizens that is going to be reached, an option could be to charge per SMS sent / population in the targeted (for CB) area basis and bear the costs of deploying a warning system and keeping it operational. |
| Question 10 | If there are any other issues/suggestions relevant to the subject, stakeholders are invited to submit the same with proper justification. | From experience: the costs of a CB solution and the costs of an LB-SMS solution are not very different, provided that if an SMS is not charged per message.<br><br>The costs of the warning system in New Zealand is publicly available. Everbridge can provide that information if needed.<br><br>Please note that the costs listed by the New Zealand Government include the cost investments made internally by all 3 mobile operators and the New Zealand Government next to costs to Everbridge. |

## SUMMARY

Everbridge's opinion is that that there is no single solution that fits all requirements to reach all citizens in case of an emergency. CB and LB-SMS must both be considered equivalent technologies for Public Warning.

- Cell Broadcast is the optimal technology when the population size is quite large and there is very small window (say only few seconds / minutes) between the time of the disaster approaching & time to alert subscribers (e.g. in case of earthquakes). However, only mobile devices that are compatible with the CB technology and the end-user has not opted out of the PWS can receive a CB disseminated alert.

- LB-SMS is compatible with all phones (including feature phones) on all TSP networks. With the technologies available these days, most of the disasters (eg: cyclones or Tsunamis) provide ample time to alert subscribers in the possible affected area, wherein LB-SMS technology is better to send alerts with much higher success rate.

In summary, TRAI should consider a hybrid PWS that has LB-SMS as its core complemented by CB for when the principal purpose is alerting. The PWS design will also benefit from automated interfaces based on CAP and other open data standards, with other public warning and information channels to ensure the broadest coverage, accessibility and reach.