Public Safety Answering Points
Global Edition

–December 2018–

Understanding PSAPs around the world has never been easier

eena
EUROPEAN EMERGENCY NUMBER ASSOCIATION

Abstract

19 December 2018

Welcome message

Since 2011, EENA's annual publication "Public Safety Answering Points (PSAPs) in Europe" became one of the most anticipated documents in the emergency services field. In order to provide readers with an even more comprehensive guide, the document evolved to a global overview and, for the first time ever, in 2016 EENA published the "**PSAPs around the Globe**".

The time for the third global edition is finally here! Find details about PSAPs' functioning, understand the complexity of different national structures and get a clear view of the context in which PSAPs operate – **in 56 countries worldwide**!

Every year, the report adds new questions and topics to make sure the latest information on new technologies and developments is available to you. That is why the 2018 edition adds everything covered by previous editions, as well as information on AML deployments and tools used for ensuring a high quality of service.

Enjoy your reading!

The EENA team

Legal disclaimer

This document is authored by EENA staff members with contributions from individual members of EENA. This document does not represent the views of individual members of EENA, or any other parties.

This document is published for information purposes only and it does not declare to be a statement or interpretation of EU law or the national law of EU Member States. This document is entirely without prejudice to the views of relevant national statutory authorities and their legal functions and powers, whether under EU law or the national law of their Member State. Accordingly, under no circumstances may reliance be placed upon this document by any parties in compliance or otherwise with any applicable laws. Neither may reliance be placed upon this document in relation to the suitability or functionality of any technical specifications, or any other matters discussed in it. Legal advice, technical advice and other advice as relevant, may be sought as necessary.

This publication is for EENA Members only. It is forbidden to forward this publication to non-EENA members without the approval of EENA. If you are not member of EENA you must not use, disclose, reproduce, copy or distribute the contents of this communication. If you have received this in error, please contact the sender. The information published is based on the information provided by EENA members. It is also based on responses to a questionnaire designed by EENA and sent to EENA members in each country described in this document. Possible inaccuracies of information are not under EENA's responsibility. EENA is not liable for any use that may be made of the information contained therein.

For more information, please contact Jerome Paris at jp@eena.org.

Report information

Last updated on 19 December 2018.

Use of symbols

- "-" and "*No information provided*" are used when no answer was provided in a questionnaire response
- "*Not available*" is used when a questionnaire response indicates that the data is not available
- "*n/a*" is used when a question is not applicable

List of acronyms

A definition of all acronyms related to 112 can be found in the 112 Terminology EENA Operations Document. It is updated with the terminology used in the EENA Operations and Next Generation 112 documents.

Questions or comments? Please contact Jerome Paris at jp@eena.org.

Contents

112 Models

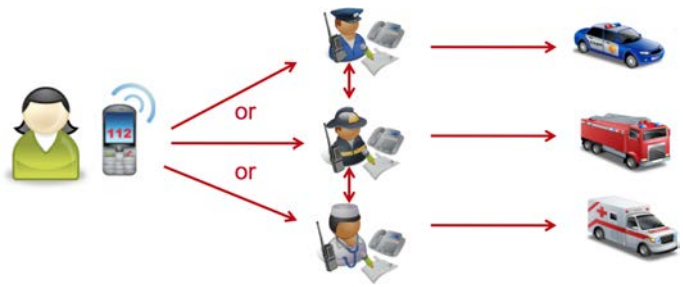
This section provides a short explanation of the 112 models as they are used in this publication.

Please note that the following models do not introduce all the PSAPs Organisation models in Europe but present the major concepts with simplified descriptions. The models do not cover the entire call handling model but rather try to highlight their major characteristics.

This has been prepared by EENA based on several sources and is continuously amended.

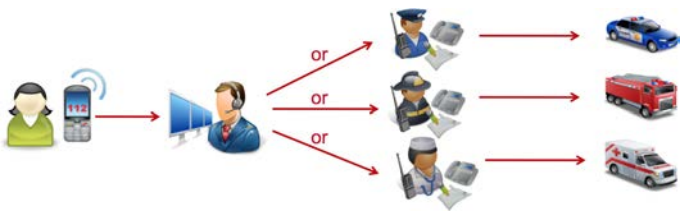
Model 1: EROs handling emergency calls

- Calls to national numbers and 112 redirected to Emergency Response Organisations (EROs).
- If the intervention of a different ERO is required, call and/or data about the emergency situation are forwarded to the most appropriate ERO.
- Dispatch from the intervention resources done by the ERO operators.
- In a variant, two EROS are colocated and contacted via the same number



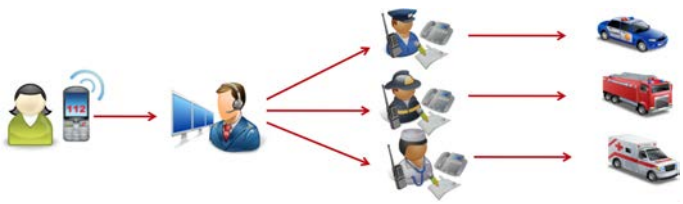
Model 2: Filtering Stage 1 PSAP and resource dispatching stage 2 PSAPs

- Independent Stage 1 PSAP receives all emergency calls and then forwards it to a local ERO.
- Call-takers only ask the caller with which emergency service he/she wants to be connected to.
- Stage 1 PSAP forwards the call to the appropriate local ERO. Detailed data gathering and dispatch of the intervention resources are done by the emergency response organisation.



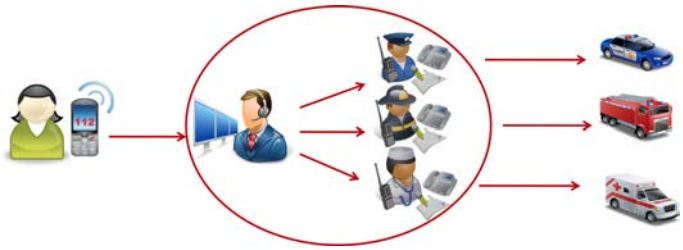
Model 3: Data gathering by Stage 1, resource dispatching by Stage 2

- Also in two levels. The difference is the role played by the independent organisations.
- Civilian call-takers classify the call and makes a parallel dispatch of the calls to EROs. In some cases police, EROs' specialists are available to support the call-takers.
- Dispatch of the intervention resources done by EROs.



Model 4: Data gathering by Stage 1 PSAP, resource dispatching by Stage 2 in an integrated control room

- Also in two levels but civilian call-takers and EROs are in the same location.
- Civilian call-takers are in charge of classifying the call and make a parallel dispatch of the calls to the most appropriate EROs if needed. In some cases, EROs' specialists are available to support call-takers.
- Dispatch of the intervention resources done by EROs.



Model 5: ERO independent PSAP

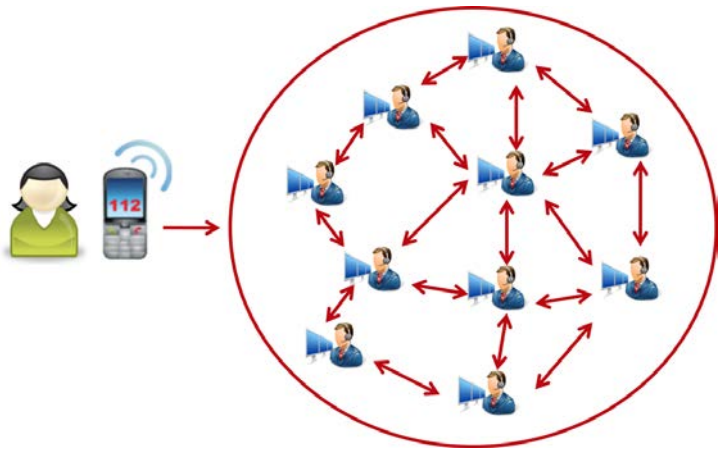
- Civilian call-takers handle both call-taking and intervention resources' dispatch. In some cases, EROS' specialists are available to support.
- The same PSAP is in charge of classification of calls, data collection and dispatching the intervention resources to the incident.

Model 6: Variant: "Interconnected PSAPs"

PSAPs of different regions can be interconnected. If no call-taker is available, the call can be redirected to another PSAP.

Source

Emergency calls handling systems simplified models (EENA).



EENA Publications

112 General Information

- 112 service chain description
- 112 Terminology
- Promotion of Emergency Numbers

Access to 112

- 112 Accessibility for People with Disabilities
- Access to 112 from Private Networks
- Digital Transformation of Cities: Smart Cities & Emergency Services
- Means to Access 112
- Mobile Handset Requirements: Communication to Emergency Services
- Public Safety Digital Transformation: The Internet of Things (IoT) and Emergency Services
- SMS Access to 112
- SMS communication with PSAPs and EROs

AED

- AED Mapping & Emergency Response

Apps

- 112 Apps Strategy: Pan European Mobile Emergency Apps
- 112 Smartphones Apps
- Pan-European Mobile Emergency App (PEMEA) Approval Procedure
- Pan-European Mobile Emergency Application (PEMEA) Protocol and Procedures Specification
- Pan-European Mobile Emergency Application (PEMEA) Requirements and Functional Architecture

Case Studies

- Advanced Mobile Location (AML) in the UK
- Brussels Attacks Crossover between research and reality
- eCall implementation in Lithuania
- GIS112 Estonia
- MANAGING CHANGE: The example of Finland From 15 centres to a network of 6 centres
- MANAGING CHANGE: THE EXAMPLE OF REGIONE LOMBARDIA, ITALY
- Public Warning in Chile: Resilient culture

Drones

- Drone Efficacy Study: Evaluating the Impact of Drones for Locating Lost Persons in Search and Rescue Events
- EENA / DJI Pilot Project Report: The use of Remotely Piloted Aircraft Systems (RPAS) by the emergency services
- Remote Piloted Airborne Systems (RPAS) and the Emergency Services
- Remote Piloted Airborne Systems Operations Manual

eCall

- eCall and open issues: 2018 revision
- eCall Factsheet
- eCall implementation in Lithuania: PSAP, eCall Flag & TPSP eCall
- eCall Key Performance Indicators
- eCall TPSP and Emergency Services Authorities Agreement template
- Next Generation eCall: NG eCall

Legislation

- 112 and the EU Legislative Framework
- Emergency calls in the upcoming EU-legislation

Location

- Advanced Mobile Location (AML) Additional requirements and guidance for Mobile Handset Manufacturers and Mobile Network Operators
- Advanced Mobile Location (AML) in the UK
- Advanced Mobile Location (AML) Specifications & Requirements
- Caller Location in Support of Emergency Services
- Handset Derived Location for Emergency Calls
- HTML5 Geolocation: Accurate caller location in support of emergency services
- Mobile Identity: Platform for the Emergency services
- The Role of Geographic Information Systems in Next Generation 112 Moving from current state 112 to future state NG112

NG112

- Next Generation 112 Long Term Definition
- Next Generation eCall
- NG112 and the new Emergency Services Networks landscape: Challenges and opportunities
- NG112 Emergency Services Plugtest 2016 - Report by ETSI
- NG112 Emergency Services Plugtest 2017 - Report by ETSI
- NG112 Transition Models
- NG112 Transition Models Implementation Activities
- Results for Next Generation 112: Emergency services operational requirements survey
- Security and Privacy Issues in NG112
- The Role of Geographic Information Systems in Next Generation 112 Moving from current state 112 to future state NG112
- What is needed for Interoperability Testing?

PSAP Operations

- Assessing meaningful response times
- Call taking procedures and data to be gathered
- Capturing Feedback from Stakeholders
- Contingency Plans
- Costs of Providing Emergency Call Answering Services
- Data sharing between Emergency Services
- Emergency Silent, Hang-Up and Abandoned 112 Calls
- False Emergency Calls
- Managing change
- MANAGING CHANGE: The example of Finland From 15 centres to a network of 6 centres
- MANAGING CHANGE: THE EXAMPLE OF REGIONE LOMBARDIA, ITALY
- Managing human resources in a PSAP
- Managing the Tendering process
- Multilingual Emergency Calls
- Overload of calls
- Psychological support of 112 call takers
- Training of 112 call takers
- Transnational Emergency Calls
- Workforce Management in PSAP operations

PSAP Technology

- 112 PSAPs Technology
- Cybersecurity Guidelines and Best Practices for Emergency Services
- GIS112 Estonia
- GSI: The Value of Spatial Information for Emergency Services
- Mobile Identity Platform for the Emergency services
- Oblique Imagery in Support of Emergency Services
- Public Safety Digital Transformation: The fundamentals of Voice over IP
- Recording for PSAPs Future Technology
- The who is who handbook in the public safety industry
- Using and optimising GIS in an emergency response
- WebRTC and Emergency Services

Public Warning

- Media in Authority-to-Citizen (A2C) Communications
- Public Warning
- Public Warning (updated)
- Public Warning in Chile: Resilient Culture

SMEM

- Brussels Attacks Crossover between research and reality
- VOST: Crowdsourcing and Digital Volunteering in Emergency Response
- What Internet Companies can do in Emergency and Crisis situations

New Zealand

4.7 million	267,710 km²	2,705 K	2017
Population	Area	Calls	Year of reference

Organisation handling 111 calls

New Zealand's primary emergency call number is Triple One (111). The Initial Call Answer Point (ICAP) is operated by Spark New Zealand Ltd. Stage 2 PSAPs are operated by Police, Fire and Ambulance Services.

National legislative / regulatory acts on 111 references

Spark New Zealand operates the New Zealand ICAP to fulfil requirements of the Telecommunications Service Obligation (TSO) for local telephone services. The ICAP requirements obligations are prescribed in a TSO Deed agreement between Spark New Zealand and the Crown. The TSO Deed is a regulatory instrument under the Telecommunications Act 2001.

Other available emergency numbers

Primary emergency number: Triple One (111)

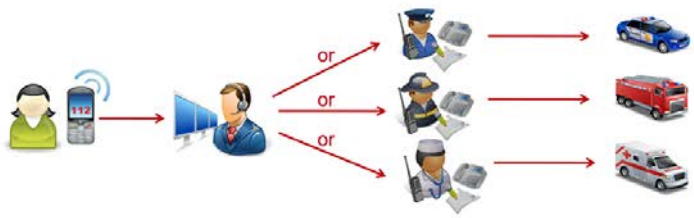
Secondary emergency numbers:

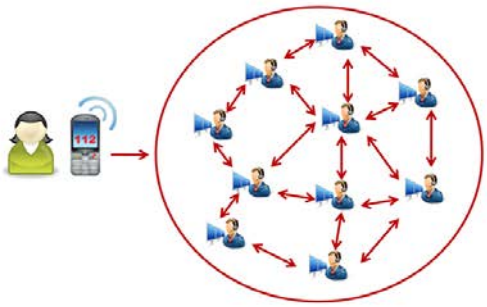
- International Standard Emergency Number (112)
- Triple One Text (for Police only)

Report applies to

- The national provider of the 111 Centre(s) who receives and distributes calls for Police, Fire and Ambulance
- All of New Zealand

111 Model





There are two 'Stage 1' Answering Points, which is called the Initial Call Answer Point (ICAP) – operated by telecommunications organisation Spark – which receives all national Triple One (111) calls. These calls are then presented to one of 9 x 'Stage 2' Public Safety Answering Points (PSAPs) of Fire and Rescue Services, the Police, and Ambulance Services.

The Stage 1 PSAPs have redundant facilities available for business continuity and disaster recovery.

Stage 2 PSAPs within each individual ESP are interconnected to provide 'virtual' call management and CAD service.

eCall implementation

eCall is under consideration. It may bypass the ICAP/PSAP and come direct into the Police CAD. It is anticipated to be available within the next 12-24 months.

- Plans to cooperate with third-party services (TPS)

PSAPs and dispatch centres

	PSAPs	Dispatch centres	Comments
111	2	-	2 x primary ICAP call centres, 2 x back up sites for business continuity purposes
FRS	-	3	
EMS	-	3	
POLICE	-	4	3 x primary, 1 x reserve centre for business continuity
OTHER AGENCIES	-	-	
SEVERAL FORCES	-	3	Included in ESP figures. Police and Fire Comms are co-located in both Auckland and Wellington. Ambulance standalone Police Fire, and Ambulance are all co-located on the same floor within the Justice and Emergency Services Precinct in Christchurch.
TOTAL	**2**	**10**	

Comments

No plans to increase or reduce the number of PSAPs.

Direct numbers per emergency service

	FRS	EMS	Police	Other	Several Forces
Do they directly receive 111 calls?	No	No	No	n/a	No
Direct emergency number different from 111	No	No	No	n/a	No

Emergency calls in 2017

	Calls	Comments
111	2,705,000	Total number of people who dialled 111
FRS	90,000	111 calls connected to Fire & Rescue
EMS	461,000	111 calls connected to Medical Services
POLICE	856,000	111 calls connected to Police
OTHER AGENCIES	n/a	
TOTAL	**2,705,000**	

Comments

- 514K (19%) disconnected at the first IVR message
- 2.191 million people reached the ICAP queue
- 91K (4%) abandoned from the ICAP queue
- 2.100 million interacted with an ICAP operator
- 692K (33%) not transferred to an ESP PSAP
- 1.408 million (67%) transferred to an ESP PSAP

Emergency calls per type

Mobile Telephone Networks

2,089,000 (77%)

Fixed telephone networks (landlines)

616,000 (23%)

Campus/private company networks

Included in counts for landline / mobile

IP networks

Included in counts for landline / mobile

Technology and equipment used in the 111 PSAPs

Do all 111 PSAPs use the same technology in your country?

No. The Stage 1 PSAPs operate the same technology but not the same as the Stage ESP PSAPs. For Stage 2 PSAPs:

- NZ Police and Fire Emergency NZ use the Hexagon CAD and shared telephony and radio network
- ST John and Wellington Free Ambulance use Tritech VisiCad and a different radio network

How are the 111 PSAPs interconnected?

Some are interconnected via data, others only voice interconnected. The ICAP and ESP call centres are connected by voice. All ESP call centres are linked via voice and data through a common virtual private network. There is an InterCAD link between Police, Fire and Ambulance.

In case of data interconnection, are these data exchanged thanks to a common network?

Yes. The Stage 1 ICAP PSAPs are connected through a private network but have no data connection with the Stage 2 ESP PSAPs. Stage 2 ESP call centres are connected through a common virtual private network within their own Agency.

Do the interconnected 111 PSAPs use common databases?

Yes - mostly. Police ESP call centres share common databases. Fire ESP call centres share common databases. Fire access Police databases for landline subscriber information. Databases are not shared across Police, Fire, and Ambulance.

Technologies available in the 111 PSAPs

Geographic Information System (GIS)	Available in all ESP PSAPs
Computer Telephony Integration (CTI)	Available in all ESP PSAPs
Computer-Aided Dispatch (CAD)	Available in all ESP PSAPs
Workforce Management System	Available in some PSAPs - Police use the ASPECT WFM system
Business Intelligence System	Available in all ESP PSAPs

Caller Location in support of emergency services

Mobile caller location

Method

- Pull - Mobile caller location is available in Police call centres using an App to pull GPS information from the phone on approval from the caller.
- A system accessed via a host website which acts as intermediary between Police and the caller called 'Mobile Locate' that connects with a mobile phone and seeks permission of the caller to access (pull) their device GPS and relay this information to the ESP – on approval from the caller.
- Push – New Zealand have implemented AML for Android and are working with Apple to introduce same capability
- Mobile caller location is unavailable in ICAP call centres

Time needed

For mobile callers, Cell-ID can, in general, be received by an ESP within 20 minutes of a request. Using 'Mobile Locate', NZ Police, can receive GPS location in near real time once the caller has approved for it to be provided. With PCL a maximum for 25 seconds for GPS. Network and Wi-Fi a few seconds.

Type of caller location

- Cell-ID
- Handset derived location via third party App
- Handset-derived location via AML

Landline caller location

Method

- Push - Landline caller location is available in ESP call centres
- Landline caller location is unavailable in ICAP call centres

Time needed

Immediate with connection of call

Accuracy & reliability criteria defined for all 112 PSAPs

By mobile network providers when they provide you with caller location information.

There are no specified performance criteria applicable to mobile network operators for Cell ID information, with the supply of Cell ID information by mobile network operators discretionary unless the information is requested under warrant.

The supply of caller location information on a continuous basis for emergency calls by telecommunications network operators is neither prescribed in legislative instruments such as statutes and regulations nor prescribed in consensual instruments such as contracts and deeds.

The telecommunications industry code for emergency calling services references a data interface standard that is applied for landline location data from telecommunications service providers entered into ESP database.

Advanced Mobile Location (AML)

Read about Advanced Mobile Location (AML)

AML deployment

- deployed for 111 (In New Zealand AML is called ECLI – Emergency Caller Location Information)

Works with

- Android
- Apple (to be introduced with ECLI Phase 2 capabilities later in 2018)

AML transmission

- via Data SMS

Additional features

- International roaming (in the planning stage)
- Location tracking during 111 call (planned for rollout late 2018/19)

Apps

ICAP and PSAPs are not able to receive data from emergency apps. New Zealand has no plans at this time to develop its own emergency app.

Accessibility for people with disabilities

Fax

- Available to people with disabilities
- Does not require registration
- Disability emergency services are also available to all citizens with eligibility based on the level of disability. Registration is not required for eligible persons to access emergency services by fax or textphone.

SMS

- Available to people with disabilities
- Requires registration
- SMS sent to 111

Textphone (TTY)

- Available to people with disabilities
- Does not require registration
- Disability emergency services are also available to all citizens with eligibility based on the level of disability. Registration is not required for eligible persons to access emergency services by fax or textphone.

SMS service

- SMS service is available
- SMS sent to: 111 (111 SMS is answered by Police on behalf of the 3 emergency services.)
- Available to people with disabilities
- Registration is required (Registration is required for eligible persons to access emergency services by SMS)

111 available from handsets without SIM cards?

No

Use of social media

Social media/networks mostly used

- Facebook
- Twitter

Social media/networks are used to

- NZ Police use social media for increasing public engagement, Public alerting, getting information quickly out to the public, myth busting, and to help with recruiting
- Occasionally Fire Service PSAPs use the national Fire Service Facebook for alerting public to high risk days during the drier months, and for non-specific monitoring during major events however currently this is not a requirement or expectation
- Use of Twitter is primarily used to alert media agencies to events of public interest with the intention of providing initial information, and delay multiple media phone calls when busy

Virtual Operations Support Team (VOST)

Setting up a VOST is considered.

Most followed social media accounts

- @nzpolice
- @NZcivildefence
- @EQCNZ (EarthquakeCommission)
- @NZCDEM (sector info and resources)
- @NZGetThru (public education and more)
- @NZFireService

  - The Stage ICAP does not use social media.
  - NZ Police uses Facebook.
  - Fire has a national Fire Service Facebook page but it is used primarily for providing information rather than receiving information specific to current events.
  - Fire Communications use Twitter to a very limited extent on a day to day basis to provide notification of incident responses but it is dependent on the duty shift manager's predisposition to the use of this social media.

Public warning

(Alert to citizens)

Public warning by

- Cell Broadcast Alerting - Emergency Mobile Alert Portal went live nationally in NZ in 2017. The Cell Broadcast Alerting (CBA) project is an NZ, All of Government (AoG) project, led by the Ministry of Civil Defence and Emergency Management (MCDEM). CBA enables time critical safety information to be broadcast to geo-fenced locations for communities at risk
- Sirens
- Radio
- TV
- App based mobile phone service (available in Auckland region)

Organisation Responsible for public warning

Ministry of Business Innovation & Employment (MBIE)

Use of RPAS

(Remotely Piloted Aircraft Systems) or UAVs (Unmanned Aerial Vehicles) in emergencies

Drones are used by Emergency Services Organisations (ESOs).

Emergency Services Organisations (ESOs) using RPAS

- FRS
- Police

Quality of service

Recorded calls storage period

The ICAP call centres record all 111 emergency calls and store them for 45 days. The Police call centres record all 111 emergency calls and store them for 4 years.

Call handling evaluation

- ✔ Call handling service is evaluated

ICAP

There is coaching (minimum two hours per month for each call taker) and random auditing of call recordings to ensure call-takers follow the correct processes while conversing with callers in a pleasant tone and manner.

ESP

Police have assessors undertake in-depth analysis on a sample of 30-40 calls per week and provide structured interview feedback to the call-takers for these calls.

Fire Service quality assurance is currently carried out by shift managers or senior communicators on watch. Rural calls over 120 seconds and urban calls over 90 seconds exceed SLAs and reports are provided on the critique of the call taking / dispatching process for these events. This process is starting to be standardised across all 3 Centres.

Use of quality improvement systems

- ✔ Yes

NZ Police Comms have an In house developed QA process.

Use of key performance indicators

- ✔ Yes

Use of protocols by call-takers/dispatchers

- ✔ Yes

Use of questions and decisions tree by call-takers/dispatchers

- ✔ Yes

NZ Ambulance uses ProQA. NZ Police and Fire do not use.

Quality certification(s)

- ✔ ACE accreditation (NZ Ambulance)

Projects, reforms, upgrades

- Public alerting, eCall,
- Ongoing development and enhancement of ECLI – Emergency Caller Location Information with Android and Apple. (MCL)
- Police to rollout a Single Non-Emergency Number (SNEN) by 2019. Short dial number.
- Police Communications are trialling Preferential Based Rostering (PBS) for Call takers where staff choose their own roster each quarter. To date 220 staff are on PBS. The only guideline for staff is the national call demand profile. The aim is for staff to get around 80% of their preferences.
- In 2013 NZ Police rolled out Mobility to 12000 staff. This is constantly being developed and enhanced to improve productivity and response to the public.
- Current Review of the Spark ICAP in consultation with ESPs and MBIE
- NZ Police online reporting
- Fire Service trialing mobility devices in Fire Appliances with roll out expected in approx. 18 months. This will provide incident and route information, critical information relating to premises etc.
- NZ Police: Using Social Media as public communication medium for both emergency and non-emergency
- Push To Talk (PTT) development has recently started.

Upgrade towards Next Generation 112

Work has been under way for some time on facets of NG111.

Technology providers

- NEC
- Hexagon
- Mitel Aastra
- Optima (Intermedix)
- Unisys (Fire Service - private fire alarms)
- Salcom (Fire Service station alerting system)
- TriTec
- Spark (Fire Service national paging system)

Annex 1: Number of PSAPs per service

		Stage 1		FRS		EMS		Police		Other		Several forces		TOTAL	
Country	**Data**	**PSAP**	**DC**	**PSAP**	**DC**	**PSAP**	**DC**	**PSAP**	**DC**	**PSAP**	**DC**	**PSAP**	**DC**	**PSAP**	**DC**
New Zealand	2017	2	-	-	3	-	3	-	4	-	-	-	3	2	10

Annex 2: Direct emergency numbers to PSAPs

	Do PSAPs receive 112 emergency calls?					Direct emergency number				
Country	**FRS**	**EMS**	**Police**	**Other**	**Several**	**FRS**	**EMS**	**Police**	**Other**	**Several**
New Zealand	×	×	×	n/a	×	No	No	No	n/a	No

Annex 3: Number of calls per service

Country	Data	Stage 1	FRS	EMS	Police	Other	TOTAL	Comments
New Zealand	2017	2,705,000	90,000	461,000	856,000	n/a	**2,705,000**	112: Total number of people who dialled 111 FRS: 111 calls connected to Fire & Rescue EMS: 111 calls connected to Medical Services Police: 111 calls connected to Police

Annex 4: Number of calls per network type

Country	Data	Mobile	Fixed	Private	IP
New Zealand	2017	2,089,000 (77%)	616,000 (23%)	Included in counts for landline / mobile	Included in counts for landline / mobile

Annex 5: Technologies available in the PSAPs

Country	GIS	CTI	CAD	WFMS	BIS
New Zealand	Available in all ESP PSAPs	Available in all ESP PSAPs	Available in all ESP PSAPs	Available in some PSAPs - Police use the ASPECT WFM system	Available in all ESP PSAPs

Annex 6: Caller Location

	Mobile caller location			Landline caller location	
Country	**Method**	**Time needed**	**Type**	**Method**	**Time needed**
New Zealand	Pull - Mobile caller location is available in Police call...	For mobile callers, Cell-ID can, in general, be received by an...	Cell-ID Handset derived location via third party App Handset-derived...	Push - Landline caller location is available in ESP call centres Landline...	Immediate with connection of call

Annex 7: Advanced Mobile Location

Country	Deployed	Works with	Transmission	Features
New Zealand	✓	→ Android → Apple	→ via Data SMS	→ International roaming (in the planning stage) → Location tracking during 111 call (planned for rollout late 2018/19)

Annex 8: Apps & SMS

Country	Apps	SMS
New Zealand		→ SMS service is available → Available to people with disabilities → Registration is required

Annex 9: Accessibility

Country	Fax	SMS	App	Video call	Real Time Text	Other
New Zealand	✓	✓	×	×	×	→ Textphone (TTY)

Annex 10: Public Warning

Country	Sirens	Radio	TV	Cell Broadcast	SMS	Other
New Zealand	✓	✓	✓	×	×	→ Cell Broadcast Alerting → App based mobile phone service