Session 2

Early Warning system

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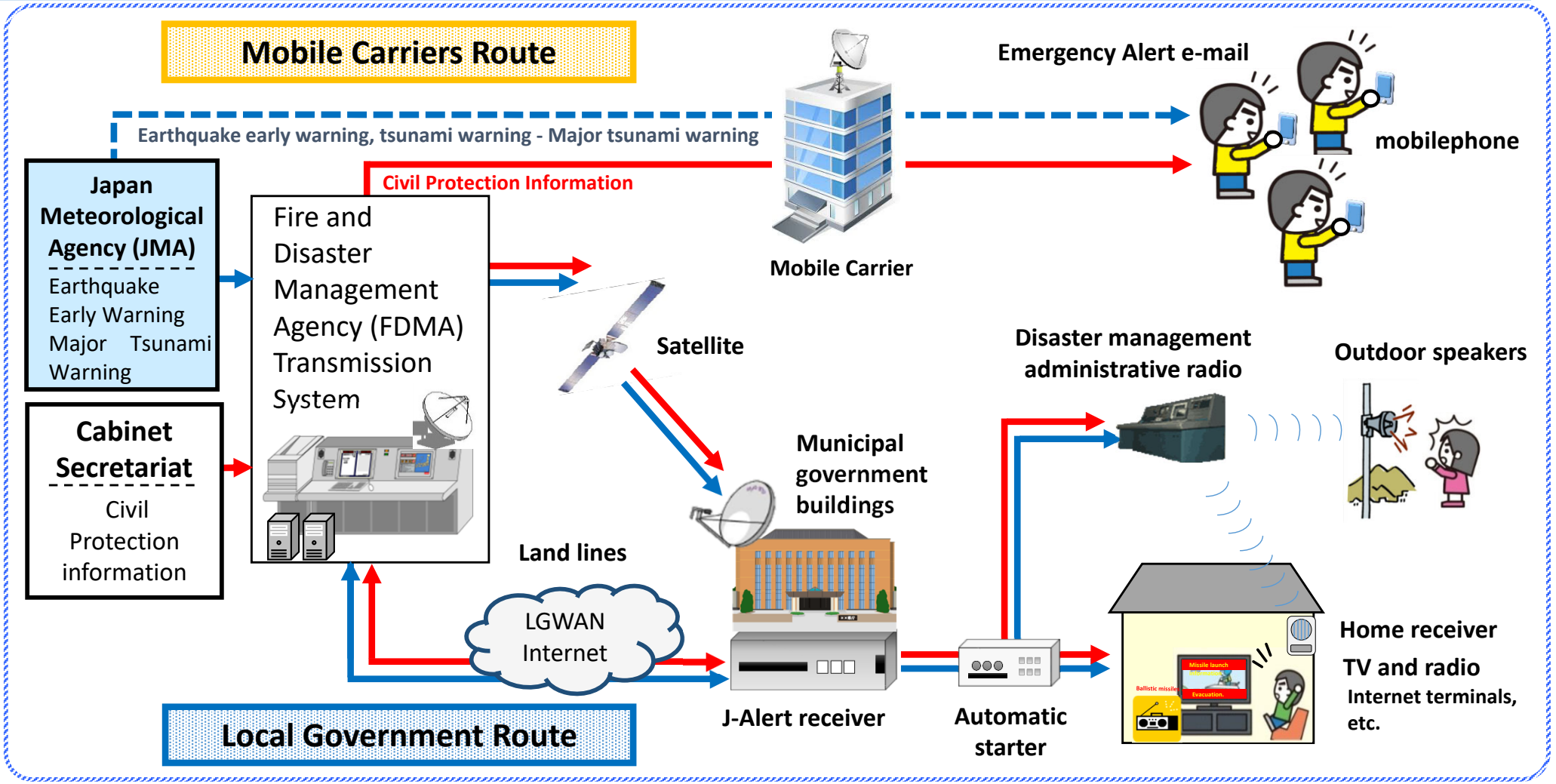
Flow of disaster information

National Early Warning System (J-Alert)

J-Alert is a system that instantly transmits information, which require immediate action, from the national government to residents via emergency alert emails sent to mobile phones, and disaster management administrative radio, etc.

Information transmitted through J-Alert is, for example, ballistic missile information, earthquake early warning, major tsunami warning.



Regulations regarding the transmission of disaster information by municipalities

○ **The Basic Act on Disaster Management** stipulates **that mayors of cities, towns, and villages must communicate disaster forecasts and warnings to residents.** And **the Act on Measures for the Protection of the People in Armed Attack Situations** also stipulates that mayors of cities, towns, and villages **must endeavor to communicate with residents** by using sirens, disaster management administrative radio, and other means.

→ In order to transmit information to residents, municipalities are installing disaster management administrative radio, etc.

○ The Basic Disaster Prevention Plan stipulates that municipalities should endeavor to establish disaster management administrative radio systems and other systems.

Basic Act on Disaster Management (Excerpt)

(Communication of Warnings and Alerts by Mayors of Municipalities)
Article 56: When a mayor of a city, town, or village receives a disaster forecast or alert pursuant to the provisions of laws and regulations, becomes aware of a disaster forecast or alert, issues a disaster alert pursuant to the provisions of laws and regulations, or receives a notification pursuant to the preceding article, he/she must communicate the details of the forecast, alert, or notification to relevant agencies, residents, and other relevant public and private organizations, pursuant to the provisions of the local disaster prevention plan. In such cases, if he/she deems it necessary, he/she may issue necessary notifications or warnings to residents and other relevant public and private organizations regarding the anticipated disaster situation and the preparations for evacuation and other measures to be taken in response.

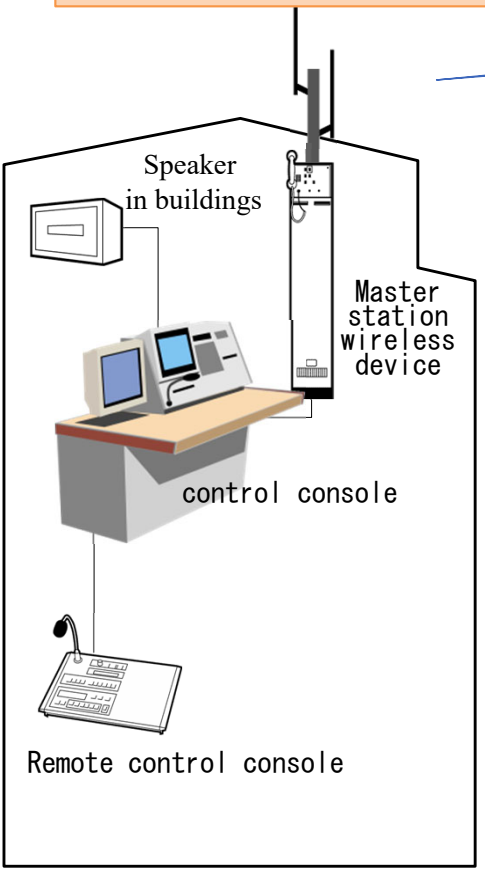
the Act on Measures for the Protection of the People in Armed Attack Situations (Excerpt)

(Communication of Warnings by Municipal Mayors, etc.)
Article 47: When a mayor of a city, town, or village receives a notification pursuant to the provisions of the preceding Article, he/she must immediately communicate the contents of the notification to residents and relevant public and private organizations, as well as to other executive agencies and other relevant organizations of the city, town, or village, pursuant to the provisions of the mayor's civil protection plan.

2. In the case of the preceding paragraph, the mayor of the city, town, or village must endeavor to communicate the contents of the notification pursuant to the preceding paragraph to residents and relevant public and private organizations as promptly as possible, using sirens, disaster prevention administrative radio, and other means.

Disaster management administrative radio(overview)

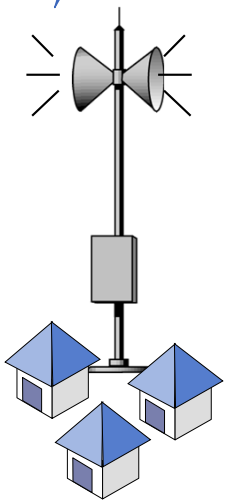
- Disaster management administrative radio is a system that transmits information, such as evacuation advisories, directly to residents via outdoor speakers and home receivers.
- Connected wirelessly to a console in a city or town, village hall, etc.,



Cituy hall
(Master station)

Relay station

with Messgae board



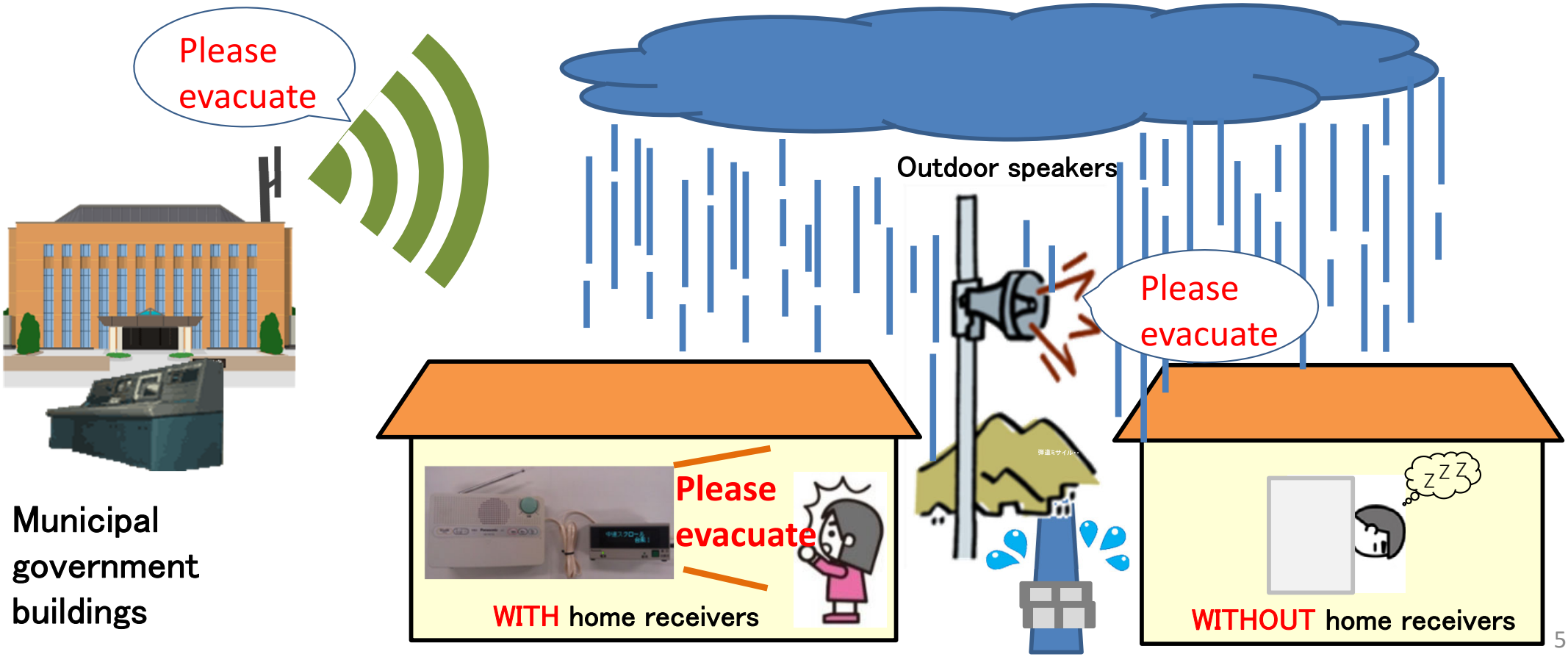
Outdoor speakers

home receivers

with Messgae board

Home receiver

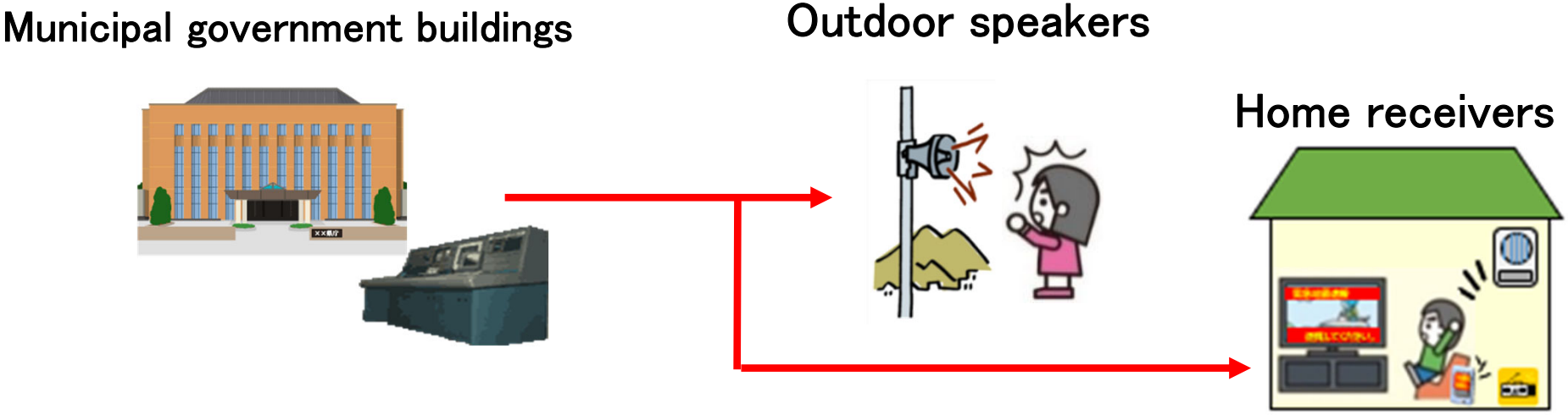
- As a means of communicating information to residents, municipalities are required to establish means of information transmission,
  such as disaster management administrative radio (Basic Disaster Prevention Plan).
- In a situations where outdoor speakers are difficult to hear, such as during heavy rain or typhoons, home receivers are an effective way to communicate information to residents. (This is particularly effective for households without smartphones or cell phones.)



MAIN MEANS of disaster information transmission

The Fire and Disaster Management Agency(FDMA) is promoting development of systems, such as disaster management administrative radio, which meet the following requirements for quickly and reliably transmitting on disaster information:

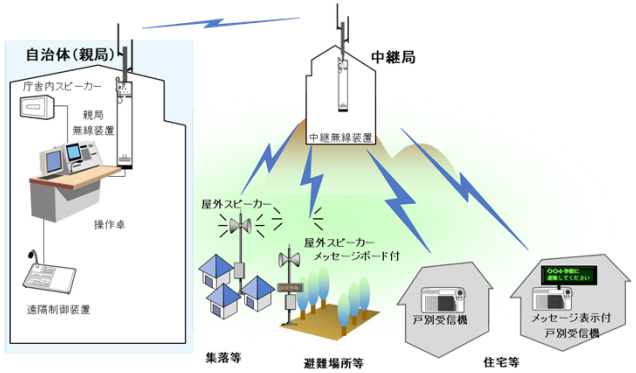
1. **Push-based** information delivery.
2. Capability for **broadcasting** to residents simultaneously.
3. Residents do **NOT need** to have information **devices**(ex : smart phone).
4. Transmit disaster information, which municipalities need to communicate, without restrictions (they must be able to **communicate all the information** which is necessary to residents).
5. **Disaster-resistance** so that they can be used continuously before and after a disaster occurs.



Main means of disaster information transmission (1)

Municipal disaster management administrative radio (broadcast system)

- Disaster prevention information is broadcast to local residents via a privately operated wireless network connecting municipal offices and local residents.
- Comprises a transmitting station, relay stations, outdoor speakers, home receivers, etc.



Broadcasting systems using municipal digital mobile communication systems.

- There is a digital mobile communication system that uses base stations installed by municipalities and mobile stations installed in vehicles, etc. to communicate with each other. This method utilizes this system to simultaneously transmit disaster prevention information to local residents.
- Consists of a transmitting station, outdoor speakers, indoor receivers, etc.

Broadcasting systems using MCA land mobile communication systems.

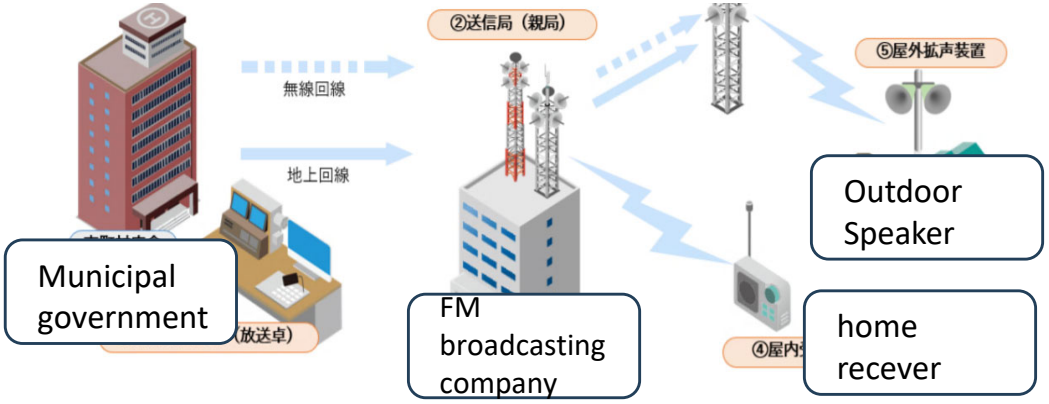
- Utilizing the wireless network used by private companies such as taxi companies and transportation companies, this system simultaneously transmits disaster prevention information to local residents.
- Comprises a transmitter station, outdoor speakers, and indoor receivers.

*Since the digital MCA system's communication service will end on May 31, 2029 (Reiwa 11), it will be necessary to establish other systems.

Main means of disaster information transmission (2)

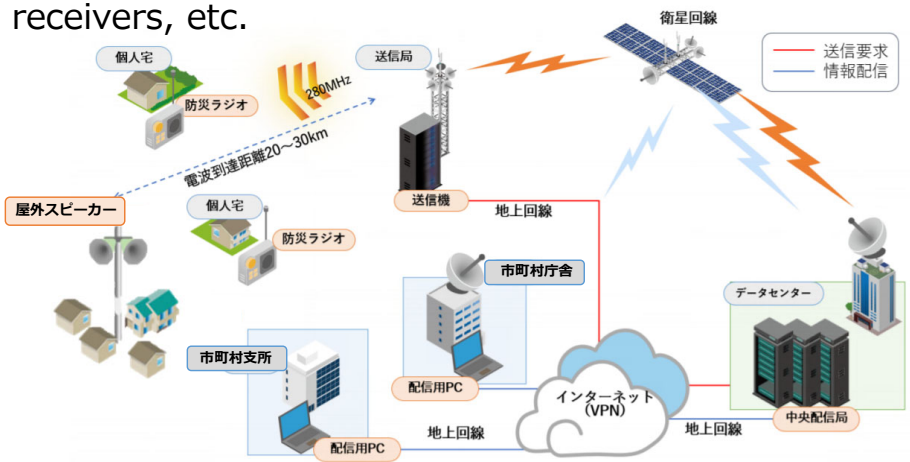
Broadcasting system using FM radio broadcasting

- Utilizing an existing FM radio station to simultaneously broadcast disaster prevention information to local residents(Since it uses radio station equipment, it can be installed relatively inexpensively.)
- Consists of a broadcasting console, outdoor speakers, and an indoor receiver (auto-start radio).



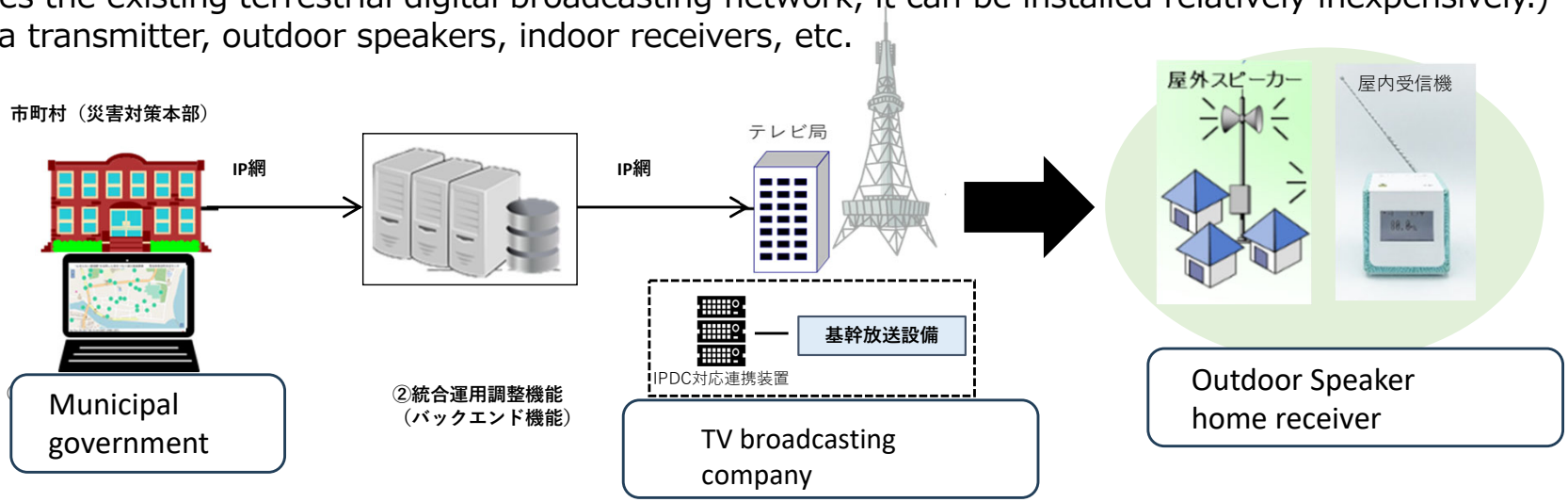
Broadcasting system using 280 MHz band telecommunications business pagers.

- Uses pager technology to simultaneously transmit disaster information to local residents (relatively inexpensive to set up, as it uses telecommunications carrier equipment)
- Consists of a transmitter, outdoor speakers, indoor receivers, etc.



Information transmission system using terrestrial digital broadcasting waves

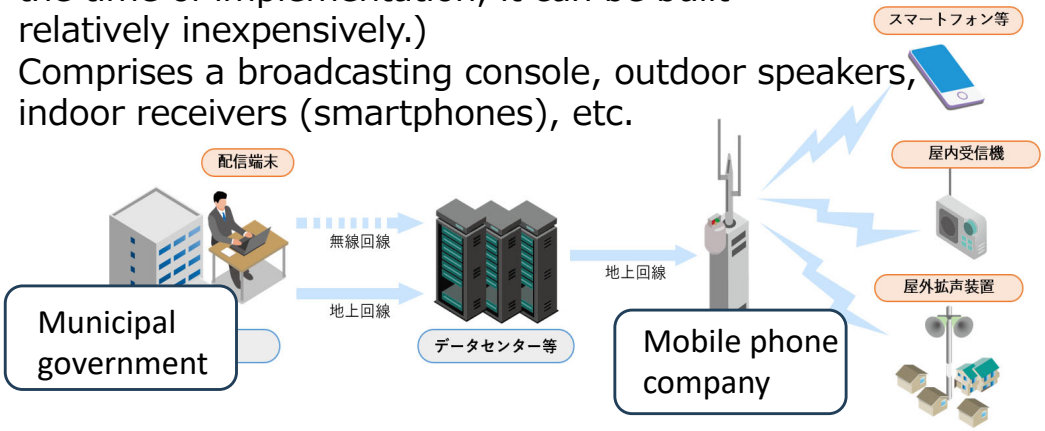
- By entering into a contract with a broadcasting company, disaster prevention information is transmitted simultaneously to local residents using terrestrial digital broadcasting signals.
  (Since it uses the existing terrestrial digital broadcasting network, it can be installed relatively inexpensively.)
- Comprises a transmitter, outdoor speakers, indoor receivers, etc.



Main means of disaster information transmission (3)

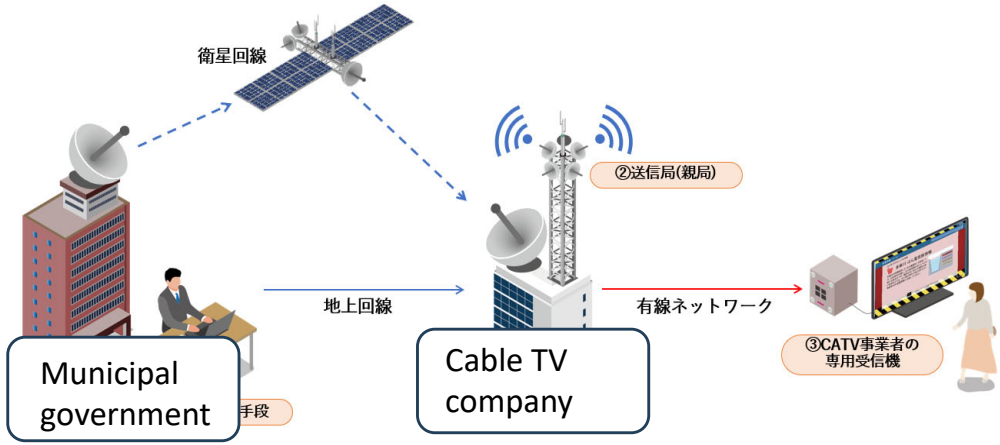
Information transmission systems using mobile phone networks.

- - Utilizes existing mobile phone networks to simultaneously transmit disaster prevention information to local residents.
  (Since little new equipment needs to be constructed at the time of implementation, it can be built relatively inexpensively.)
- Comprises a broadcasting console, outdoor speakers, indoor receivers (smartphones), etc.



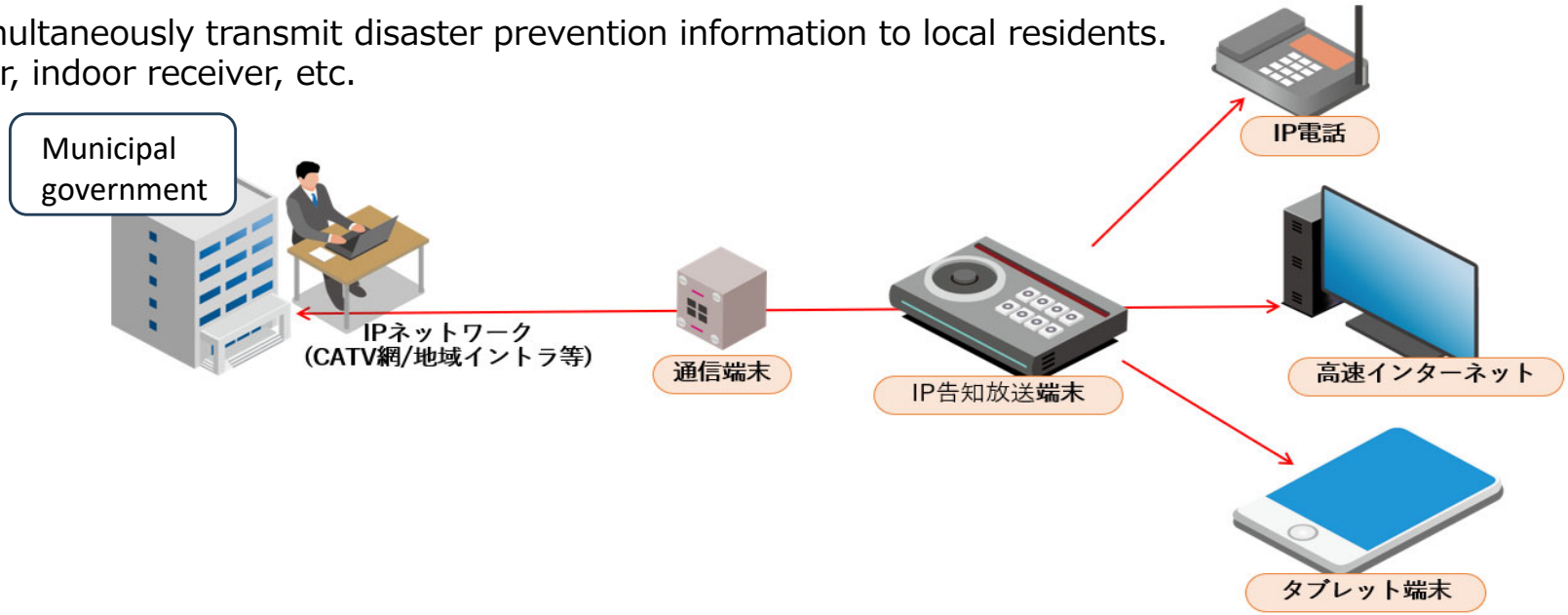
Information transmission systems using cable television networks.

- Utilizing existing cable television networks, this system simultaneously transmits disaster prevention information to local residents.
- Consists of a transmitter, indoor receiver, etc.



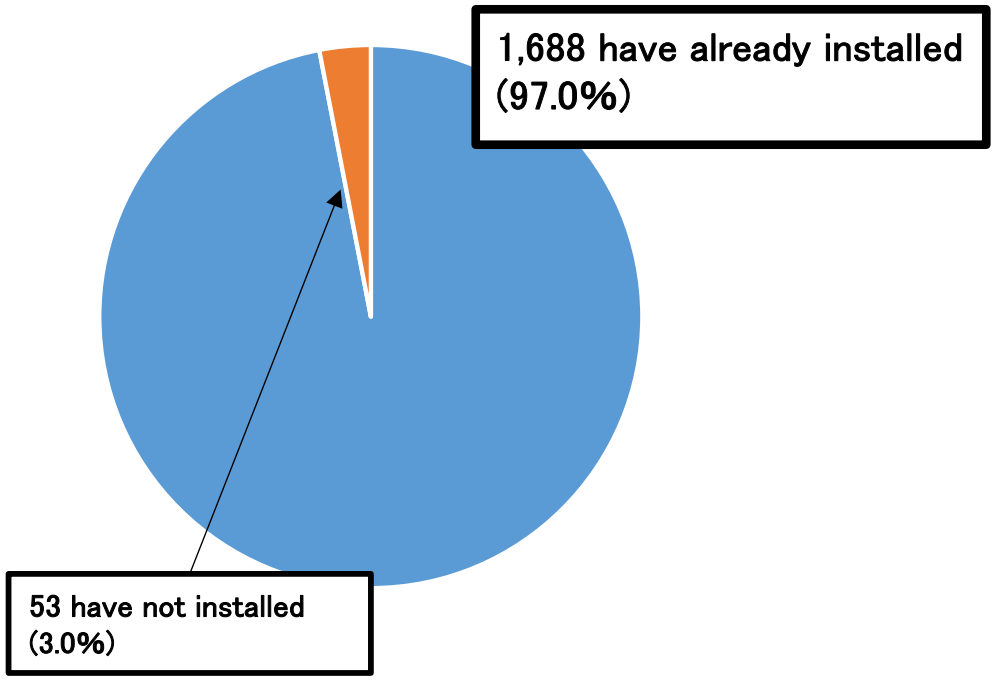
IP announcement system

- ・Uses IP networks to simultaneously transmit disaster prevention information to local residents.
- ・Consists of a transmitter, indoor receiver, etc.



Percentage of city, town, village which have Main means

- 97.0% of municipalities have MAIN MEANS for disaster information transmission.
- Of 1,741 municipalities, 1,688 have already installed them (as of March 31, 2025).



Status of disaster prevention administrative radio systems over the past five years (trend)

Fiscal Year		2020	2021	2022	2023	2024
	installed	1,523	1,668	1,674	1,673	1,688
	Not installed	218	73	67	68	53
Rate of installed (%)		87.5	95.8	96.2	96.1	97.0

The Fire and Disaster Management Agency will endeavor to improve the rate by providing advice through the dispatch of advisors.

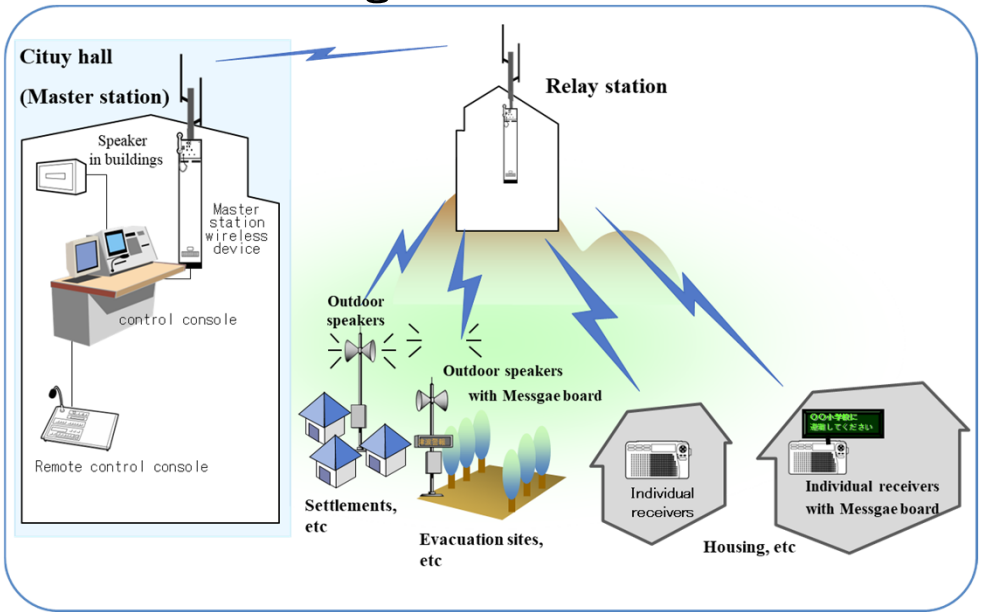
Multiple disaster information transmission methods

To ensure reliable information transmission to residents during disasters, following points are important

- Multiple disaster information transmission methods (rather than relying on a single method)
- Strengthen each disaster information transmission method

It is important to promote multiple disaster information transmission methods, so that detailed information can be distributed to residents not only by main means such as disaster prevention administrative radio but also by other disaster information transmission methods such as emergency alert mails to mobile phones , mailing lists,etc in accordance with local area's conditions.

Disaster manegemant administrative radio, etc



Emergency Broadcast Mail System

HomePage

Mailing list

Social Media

Announcements with car

,etc

Emergency Alert Email (Cell Broadcast)

- Emergency Alert Email is a free service that allows cellular carriers to simultaneously distribute emergency safety/disaster information for specific areas.
- Unlike regular email, Emergency Alert Email allows for broadcast distribution. This means that messages can be instantly delivered to a large number of cell phones without being affected by network congestion.

Japan Meteorological Agency (JMA)

Earthquake Early Warning
Major Tsunami Warning ,etc

Cabinet Secretariat.

Civil Protect INFO

Fire and Disaster Management Agency (FDMA)

J –ALERT (Early Warning System)

Local Governments

Emergency Safety Measures
Landslide Alert Information ,etc

Cellular carriers

Regidents

Evacuate information ,etc

Area where distribution IS specified

Area where distribution is NOT specified

Projects to Dispatch Advisors

Advisors will go to each city, town, and village and discuss about disaster information transmission methods.

Advisors and FDMA(Fire and Disaster Management Agency) staff is dispatched to municipalities (or online meeting) to provide proposals and advice, which is tailored to each municipality's circumstances and challenges, including technical and operational, financial aspects and schedules.

- Advisors from Municipal : Officials from municipal that have already installed disaster prevention administrative radio systems (mainly to share their experience)
- Advisors from Corporate : Companies and others with the latest technological knowledge (mainly to provide technical advice)

Before meeting	Analyses	Meeting
Questionnaires	Geographical Conditions	What are the operational challenges?
Hazard Map	Expected Disasters	What are the technical challenges?
Regional Disaster Management Plan	Population Distribution	What is the best methods to transmit information ?
	Current Information Transmission Methods	

Information which is Actually Delivered by J-Alerts

Type of information		Principal uses.	
Information on **National Protection**	**Ballistic missile information** **Air strike information** **Guerrilla and special forces attack information** **Large-scale terrorism information** **Other national protection information**	29 August 2017.	North Korean missile launch incident (Hokkaido and 12 other prefectures)
		29 September 2017	
		October 2022	North Korean missile launch incident (Hokkaido, Aomori).
		November 2022	North Korean missile launch incident (Miyagi, Yamagata and Niigata Prefectures)
		April 2023	North Korean missile launch incident (Hokkaido)
Information on **Earthquakes**	**Earthquake Early Warning** Seismic intensity bulletins, etc.	March 2011	Great East Japan Earthquake
		April 2016	Kumamoto earthquake
		September 2008	Hokkaido earthquake
Information on **Tsunamis**	**Major Tsunami warning** **Tsunami warning** Tsunami advisory	March 2011	Great East Japan Earthquake
		November 2016	Fukushima-oki earthquake
Information on **Volcanoes**	**Eruption warning (residential areas)** **Eruption bulletins** Eruption warnings (around crater), etc.	November 2021	Mount Aso volcanic eruption
		July 2022	Sakurajima eruption
Information on **Weather**	**Special warnings**, alerts and advisories Landslide warning information, etc.	July 2020	Torrential rain in July 2020
		September 2022	Typhoon No. 14 in 2022

Features of the National Early Warning System (J-Alert)

The purpose is to inform the public of the occurrence of an emergency situation that requires immediate action and encourage prompt evacuation.

Instantaneous

- By automatically activating municipal disaster prevention radio systems, information is transmitted directly from the national government to residents without the involvement of local government officials.
- Information is transmitted to residents regardless of the local government's staffing, even on holidays or at night.

Disaster Resistance

- Information reception and distribution via two systems: satellite and terrestrial
- disaster-resistant system with a backup base for the transmission system

Information Types specified in J-Alert Operational Rules

Of the 25 information types to be distributed by J-Alert, **11 types are,** in principle, set to automatically activate the municipal disaster management administrative radio (broadcast system), etc.

*Reference rule: 'National Early Warning System Operational Rules'.

	Information Types	Activation Category		Information Types	Activation Category
1	Ballistic missile information*1	◎	13	Tokai earthquake warning*2	○
2	Air strike information*1	◎	14	Seismic intensity bulletin	○
3	Guerrilla and special forces attack information*1	◎	15	Tsunami advisory	○
4	Large-scale terrorism information*1	◎	16	Eruption warning (crater area)	○
5	Other national protection information (e.g. instant text-to-speech information)	◎	17	Weather warnings	○
			18	Landslide Warning Information	○
6	Earthquake Early Warning	◎	19	Tornado warning	○
7	Major tsunami warning	◎	20	Recordable Short-Time Heavy Rainfall Information	△
8	Tsunami warning	◎	21	designated river flood forecast	△
9	Eruption warning (residential area)	◎	22	Research information on the Tokai earthquake*2	△
10	Eruption bulletins	◎	23	Information on epicentre and intensity	△
11	Weather special warnings	◎	24	Eruption forecast	△
12	Tokai Earthquake Prediction Information*2	○	25	Weather and other warnings	△

*1 Information types for which distribution from the Cabinet Secretariat is currently operationally suspended. (This information is now delivered as immediate speech synthesis information).

*2 Information types for which distribution from the JMA is currently operationally suspended.

<Legend for activation category>.

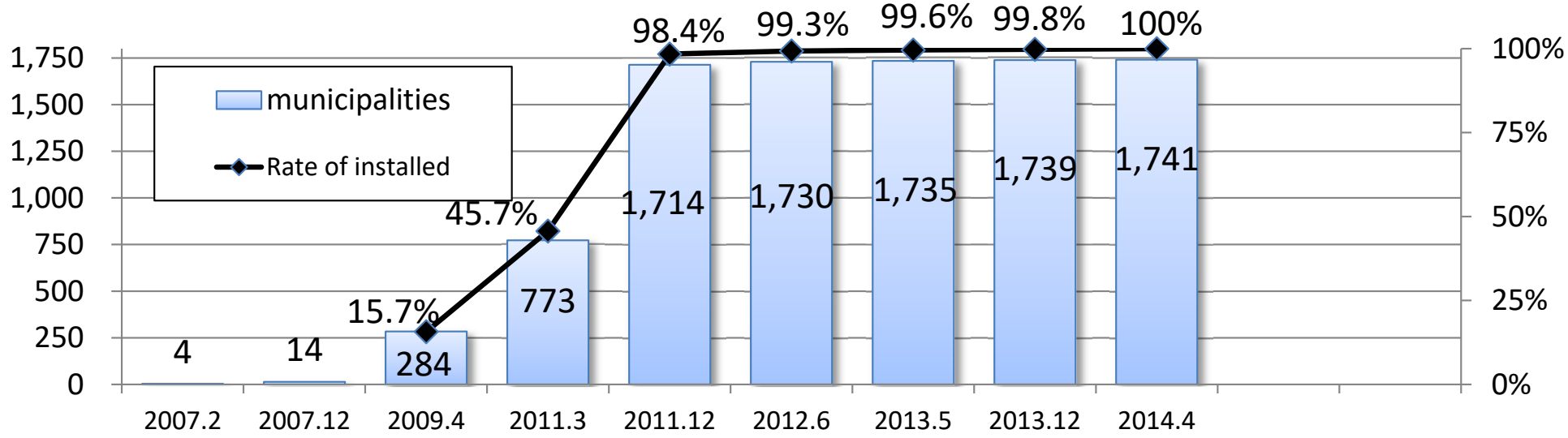
◎: Automatic activation of municipal disaster mgmt administrative radio (broadcast system)

○: Automatic activation of municipal disaster mgmt administrative radio (broadcast system). according to the settings of the municipality.

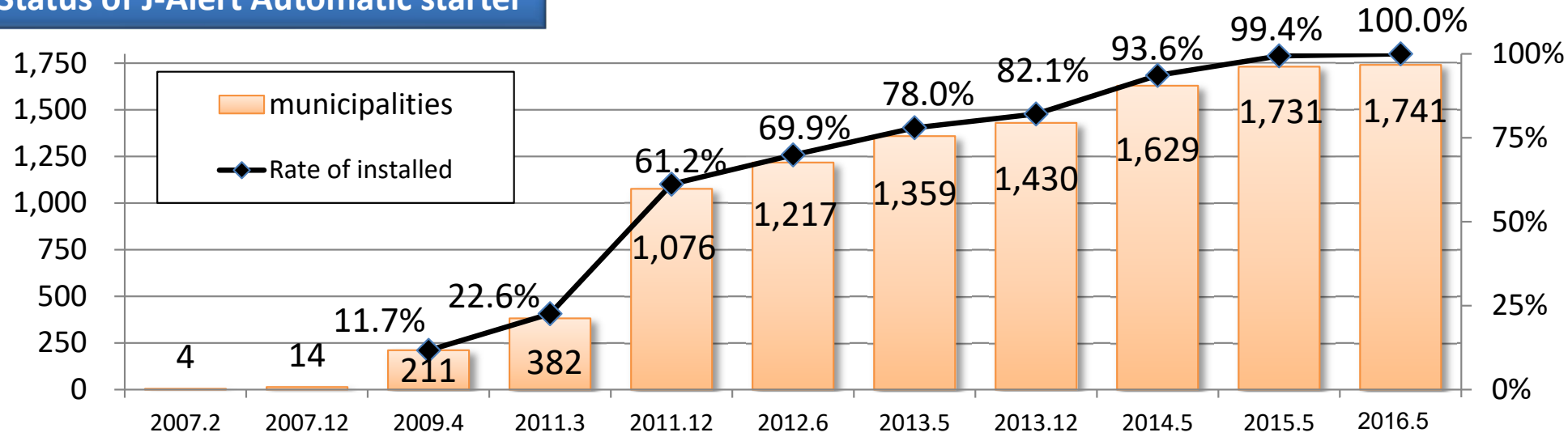
△: Not automatic activation of municipal disaster mgmt administrative radio (broadcast system)

Status of J-Alert

Status of J-Alert receiver



Status of J-Alert Automatic starter



Cases of the use of J-Alert in Natural disasters

Case 1： Great East Japan Earthquake（2011. 3. 11）

1. In the chaotic situation immediately after the Earthquake, the automatic activation of disaster information transmission via J-Alert, enabling the broadcast of the first report of the TSUNAMI warning, was very effective for residents to evacuate.（Hirono town（Iwate Pref.）, Higashimatsushima City（Miyagi Pref.））
2. Major TSUNAMI warning was transmitted via J-Alert through disaster management administrative radio systems and public announcement at the city hall, allowing staff at the disaster response headquarters to smoothly transition to evacuation guidance, saving residents' lives.（Namie Town（Fukushima Pref.））
3. According to residents, the first report of the Major TSUNAMI warning by J-Alert, and because it had a distinctive sound (a male synthetic voice), they quickly realized it was an abnormal situation.（Shinchi Town（Fukushima Pref.））
4. The sound calling for evacuation was automatically broadcast from outdoor speakers by J-Alert simultaneously with the TSUNAMI warning and Major TSUNAMI warning. The linkage between outdoor speakers and the J-Alert was very effective for the evacuation of residents.（Hitachinaka City（Ibaragi Pref.））
5. Due to the impact of the Earthquake, J-Alert receiver at the city hall was out of use, but J-Alert receiver installed at the fire station was operational, and the contents of Major TSUNAMI warning were manually broadcasted from the fire station.（Miyako City(Iwate Pref.)）

Case2：Kumamoto Earthquakes（2016. 4. 16）

1. The town hall could not be accessed immediately after the Earthquake, but J-Alert placed in the tawn hall automatically activated in the unmanned building, and the subsequent Earthquake early warning was transmitted by Wireless simultaneous broadcast.（Mashiki Town(Kumamoto Pref.)）
2. Due to the power outage, broadcasts could not be made through outdoor speakers, but emergency information was distributed to residents thanks to the Mail list, which automatically activated for a brief period before the power outage.（Yunomae Town(Kumamoto Pref.) ）

Typhoon Hagibis, known in Japan as Reiwa 1 East Japan Typhoon（2019. 10. 12）

1. Due to the effect of the Typhoon, the internet, landlines, and some mobile phone carriers were out of service. As a result, the disaster information transmission through disaster management administrative radio played a very significant role.（Asakawa Town（Fukushima Pref.）
2. By introducing a multi-media distribution system(via disaster management administrative radio systems, FM radio, Emergency Alert e-mail, Mailing list, Social Madia（Twitter）), It has become possible to disseminate disaster information simultaneously with fewer people than before, which has also been effective for the staff's disaster response system. Additionally, since Community FM radio was distributed for a fee, it became possible to convey disaster information to those without mobile devices, even in windy and rainy conditions.（Hiratsuka City（Kanagawa Pref.）

Ballistic missile information by North Korea（2024,May, 27）

2024,May,27
Ballistic missile information by North Korea

●22:43　Missile launch

＜Information transmission via J—Alert＞

●22:46　**Ballistic missile information /Distribution of the evacuation order**

（ Covered area： Okinawa Pref. ）

“Missile launch. Missile launch. A missile has been possibly launched from North Korea. Please take shelter inside a building or underground.”

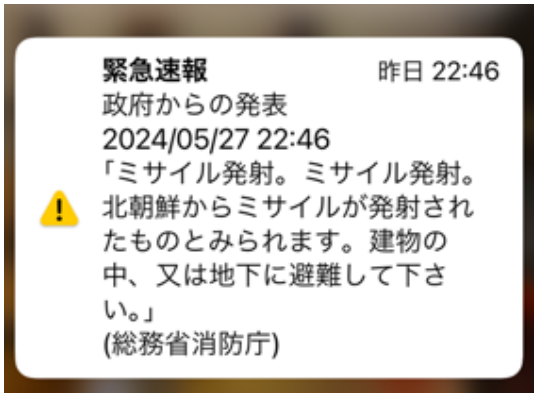
●23：03　**lifting of the evacuation order**（Covered area：Okinawa Pref.）

“It is believed that the missile will not fly into our nation’s territory. The evacuation order has been lifted.”

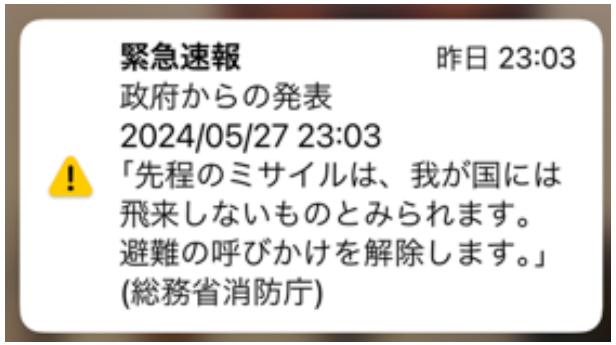
※ In covered area(Okinawa Pref.)、disaster management administrative radio systems was started automatically via J-Alert. In addition, Emergency Alert e-mail are distributed to mobile phone in covered area directly through mobile phone operators from the Fire and Disaster Management Agency(FDMA).

Emergency Alert e-mail distributed to mobile phone

（ Ballistic missile information /Distribution of the evacuation order ）



（lifting of the evacuation order ）



Multiple disaster information transmission methods via J-Alert

Basic approach

- We will prioritize the consideration of the introduction and collaboration of Municipal disaster management administrative radio (broadcast system) and other means of communicating information that have equivalent functions.
- When introducing of means of disaster information transmission, we will consider the implementation and coordination of means of disaster information transmission for outdoor (Outdoor speakers) and indoor (home receivers) in order to enable simultaneous information transmission to more residents.
- In Addition to disaster information transmission methods with Sounds, other disaster information transmission methods with text.
- In order to provide detailed information to residents solely through disaster prevention administrative wireless communication systems, we will also consider collaboration with other disaster information transmission methods according to the local circumstances.