

# Reference Materials

July 29, 2011

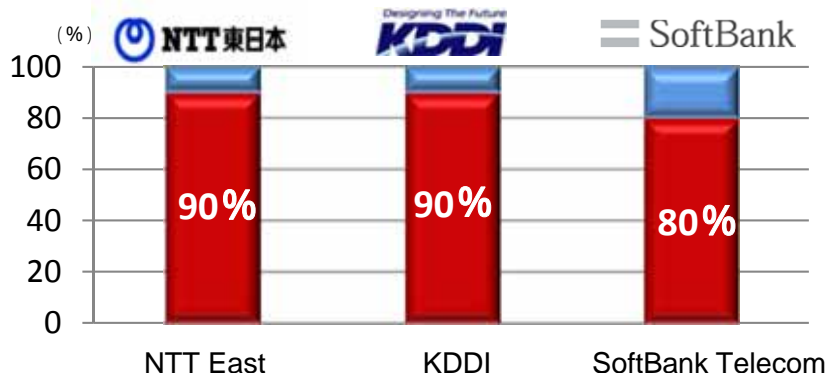
# State of Communication Damage and Congestion Caused by the Great East Japan Earthquake

## Fixed-line Communications

### State of Congestion

- Carriers restricted fixed-line phone traffic by as much as 80 to 90 percent.

#### Max. outgoing traffic restrictions



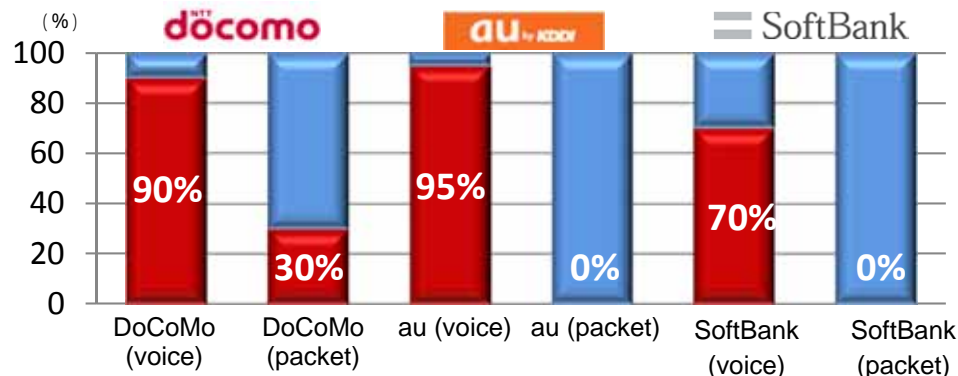
## Mobile Communications

### State of Congestion

- Carriers restricted voice traffic by as much as 70 to 95 percent.\*
- Packet traffic, however, was either not restricted or restricted at a lower rate than voice traffic.

#### Max. outgoing traffic restrictions

\*eMobile did not restrict voice or packet traffic.

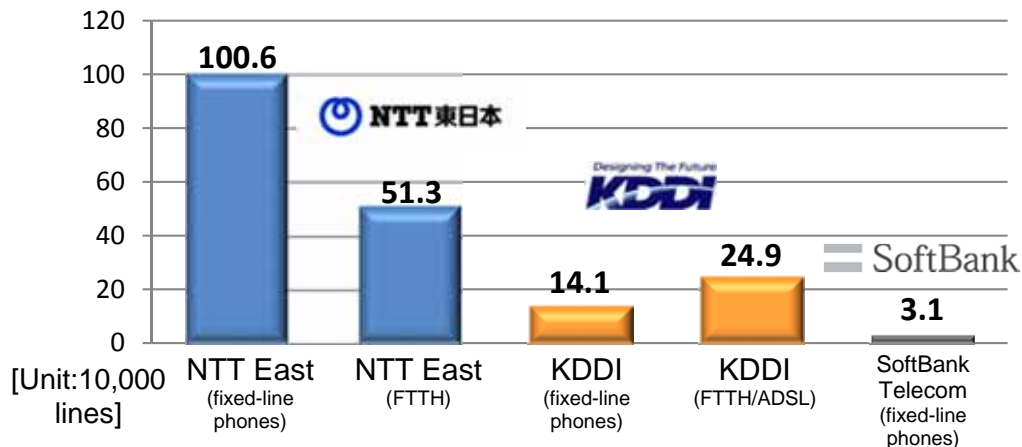


### State of Damage

- A total of approx. 1.9 million communication lines\* were damaged. More than 99 percent have been restored.
- NTT, KDDI, and SoftBank Telecom have completed restorations in all but a few areas.

\*Most of the damaged lines were in the Tohoku region. The total number of line subscriptions in the Tohoku and Kanto regions is ~24 million.

#### Max. no. of damaged lines

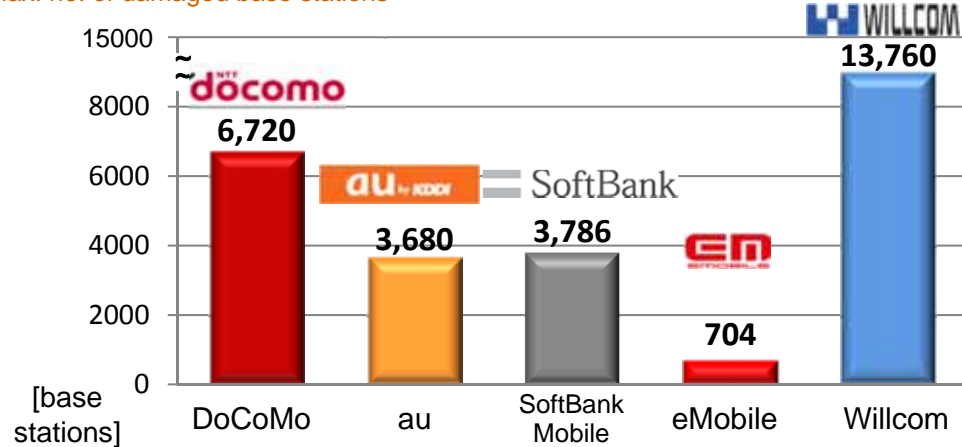


### State of Damage

- A total of about 29,000 base stations\* were damaged. More than 95 percent have been restored.
- eMobile has completed restorations, and NTT, KDDI, SoftBank Mobile, and Willcom have completed restorations in all but a few areas.

\*Most of the damaged base stations were in the Tohoku region. The total number of base stations in the Tohoku and Kanto region is ~132,000.

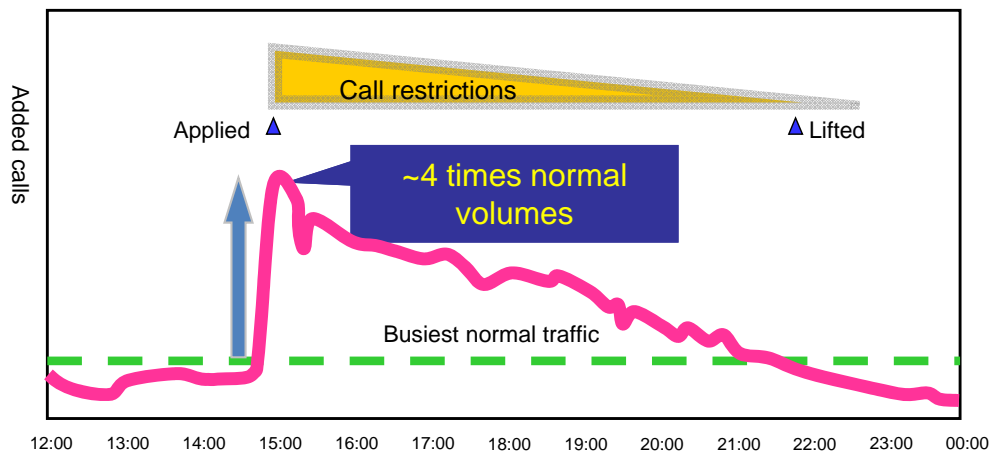
#### Max. no. of damaged base stations



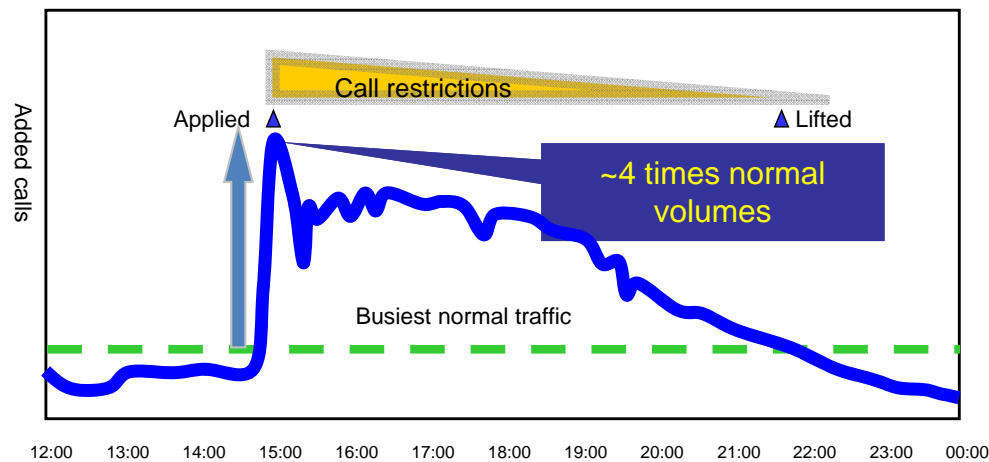
- Call restrictions were put in place immediately after the earthquake. Restrictions were applied on a per-prefecture basis, especially on calls to the Tohoku region, where the disaster occurred.
- Controls were applied to traffic to other areas based on the traffic volume; controls were lifted on a per-prefecture basis as traffic volumes declined.

## Metro Tokyo

Telephone traffic from all locations in Japan

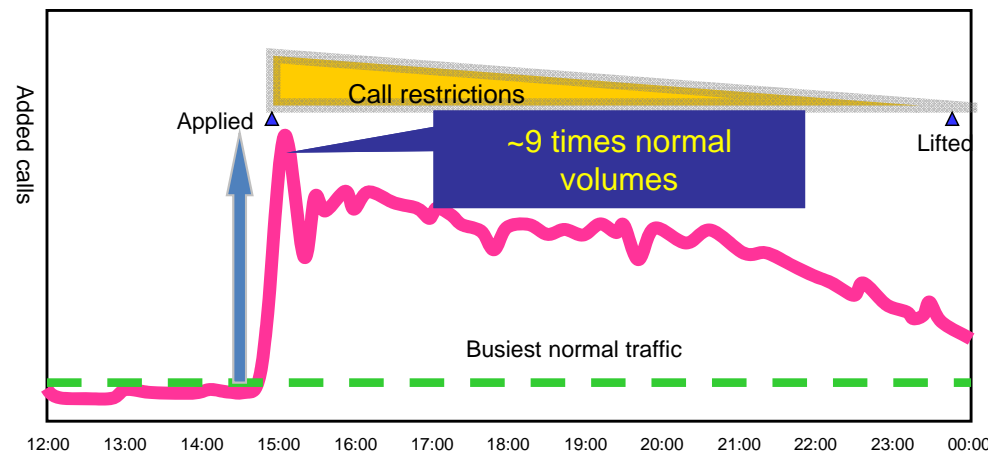


Telephone traffic within Metro Tokyo

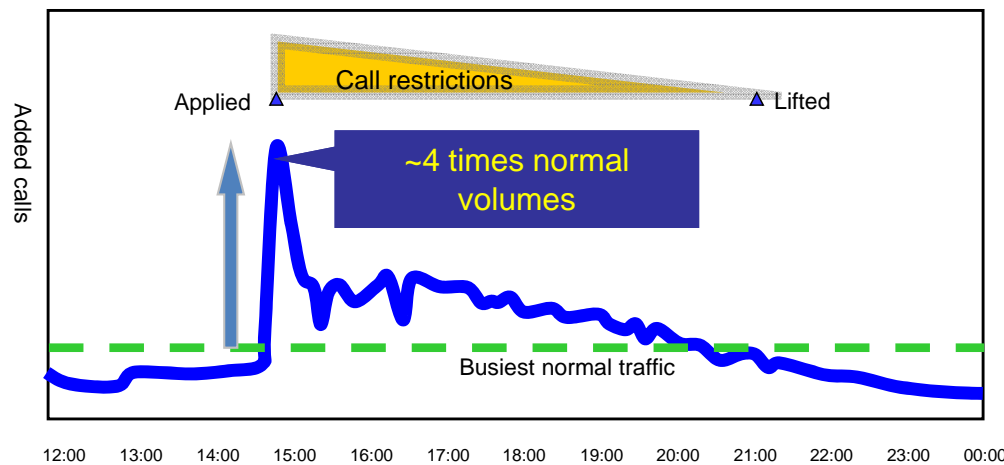


## Miyagi Prefecture

Telephone traffic from all locations in Japan

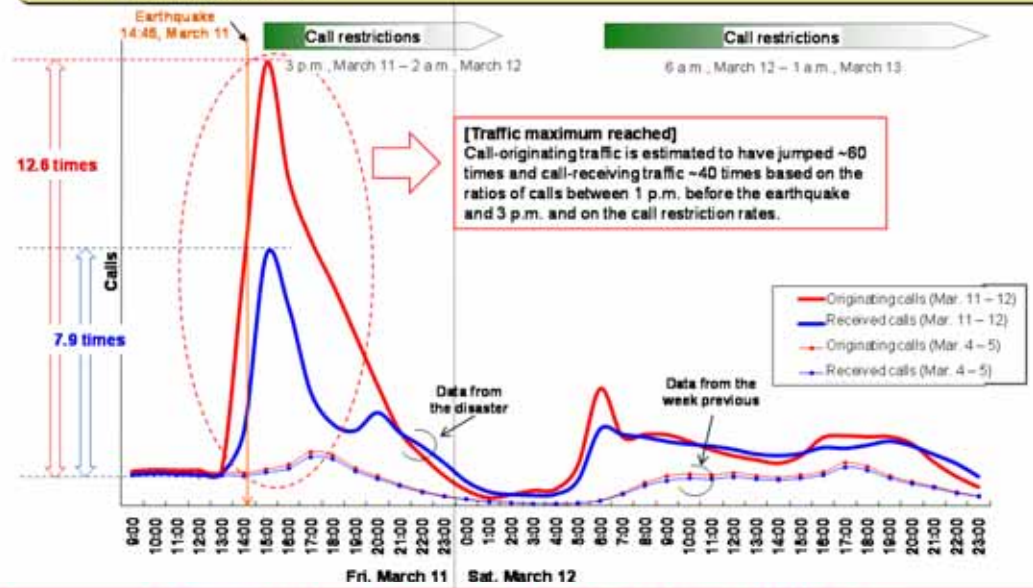


Telephone traffic within the prefecture



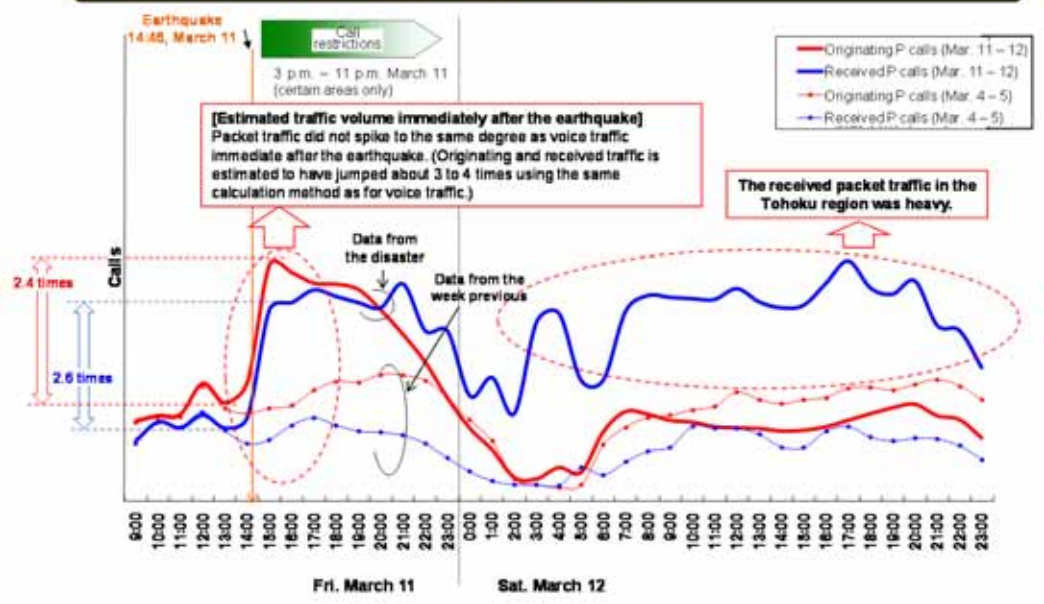
## (1)-1 State of Voice Traffic in the Tohoku Region

- Traffic maximum was reached (~60 times the (originating call) volume immediately prior to the earthquake). Call restrictions were applied.



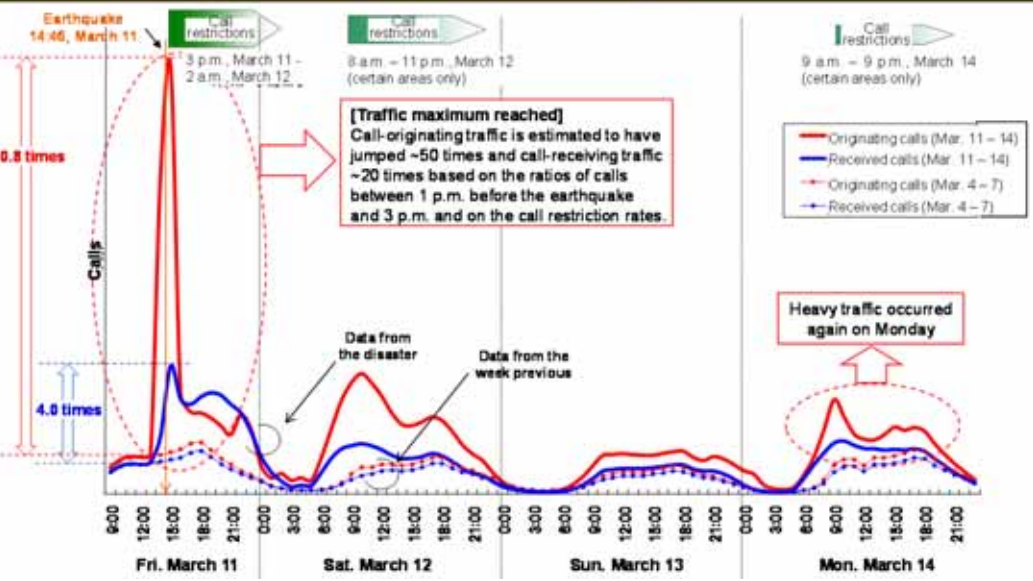
## (2)-1 State of Packet Traffic in the Tohoku Region

- Packet traffic did not reach the same volumes as voice traffic.



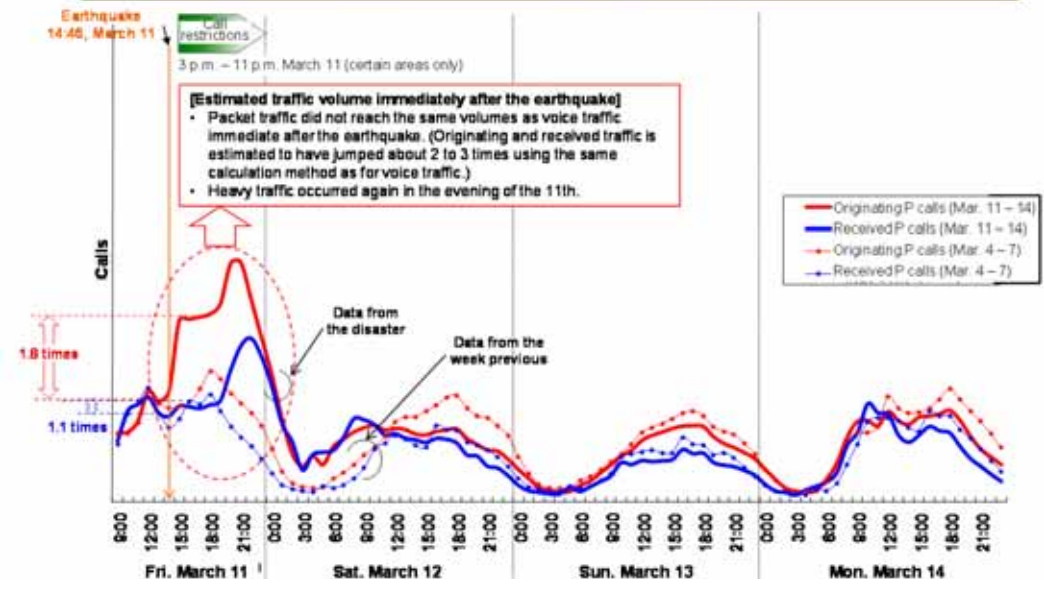
## (1)-2 State of Voice Traffic in Tokyo's 23 Wards

- Traffic maximum was reached (~50 times the (originating call) volume immediately prior to the earthquake). Call restrictions were applied.
- Heavy traffic was seen on Monday morning (March 14), and call restrictions were applied.

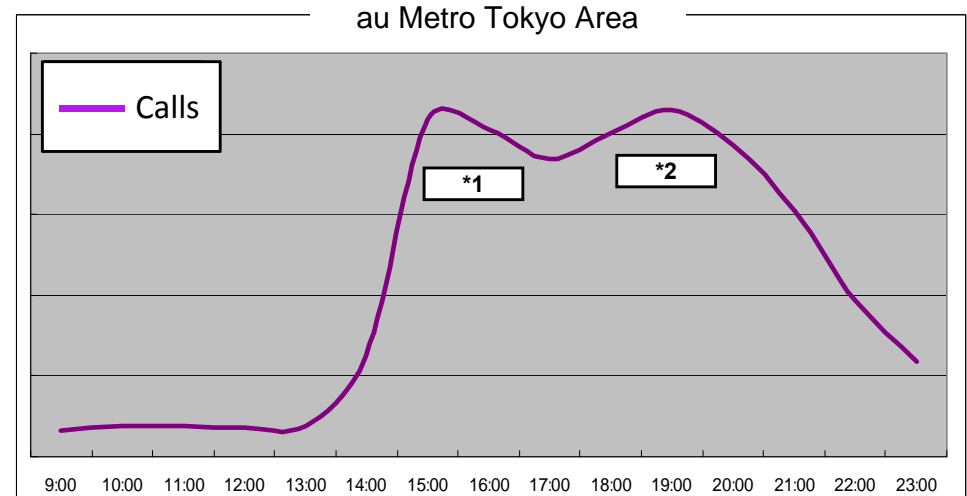
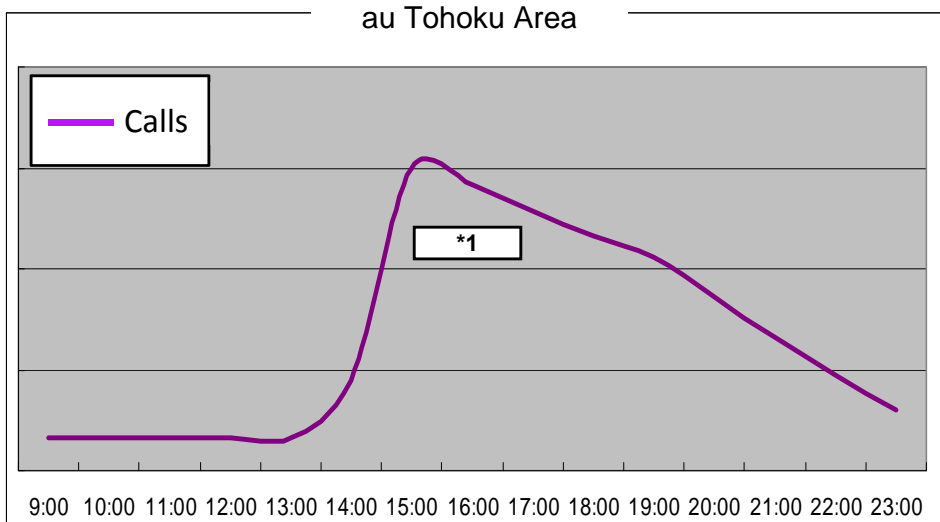


## (2)-2 State of Packet Traffic in Tokyo's 23 Wards

- Packet traffic did not reach the same volumes as voice traffic.
- Packet traffic had subsided to almost normal levels on Monday (March 14).

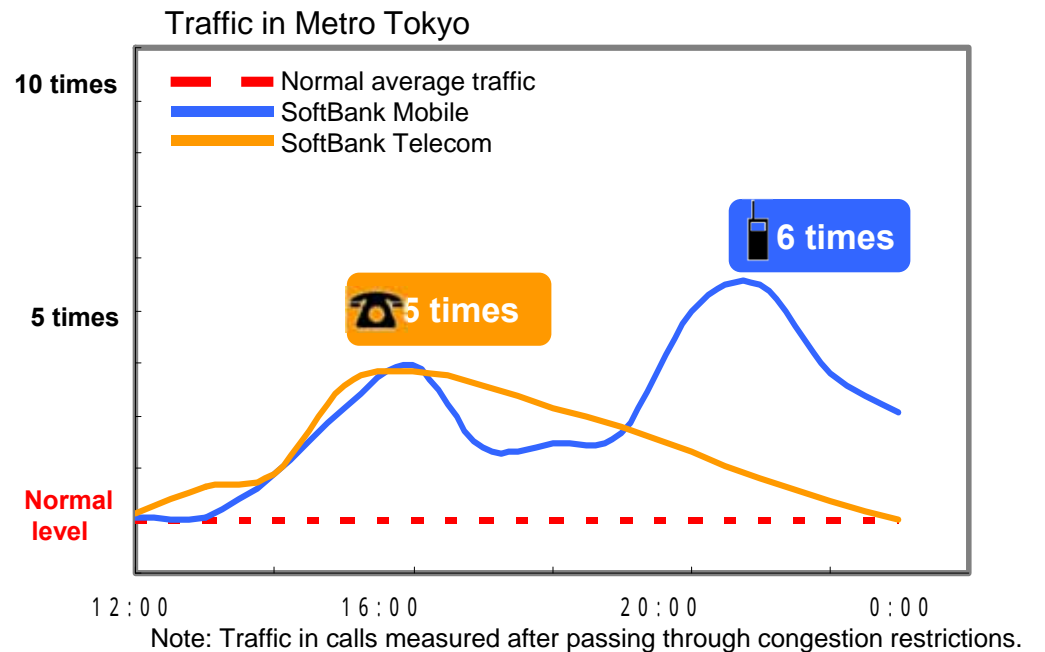
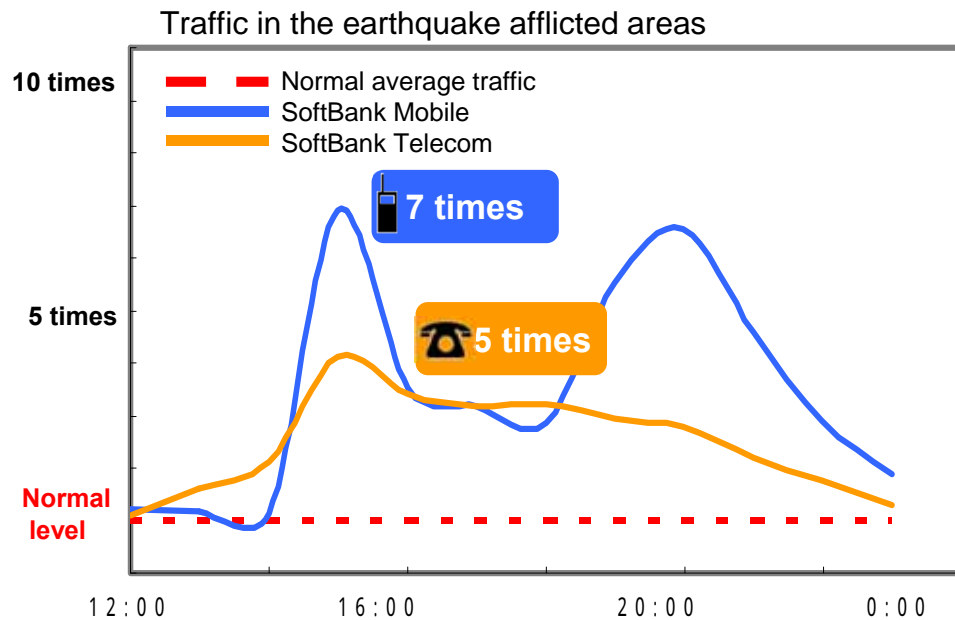


## KDDI



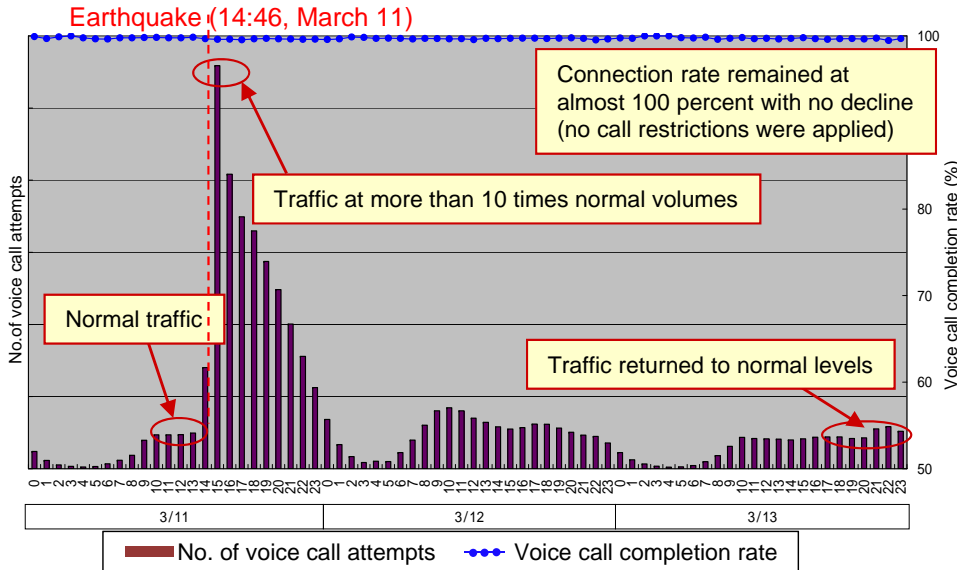
\*1. Safety confirmation calls rose suddenly immediately after the earthquake (~8 times in Tohoku and ~10 times in Tokyo)  
 \*2. Contact calls rose because of disruptions to public transportation systems.

## SoftBank

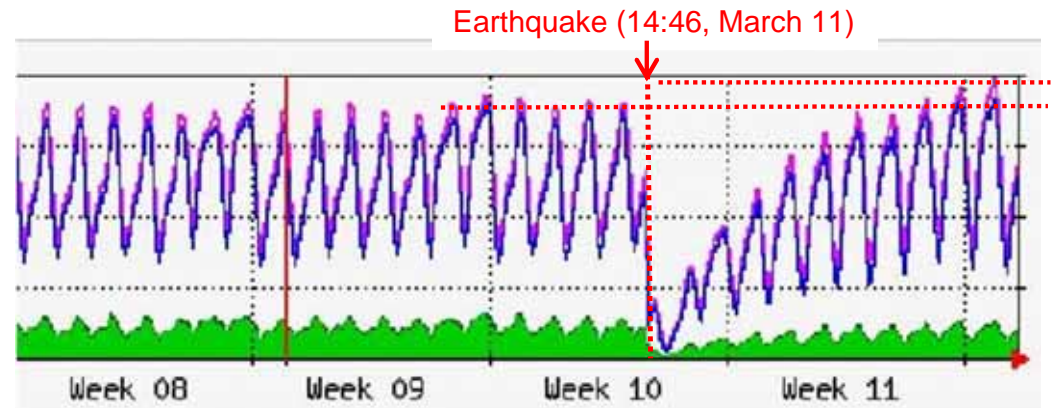


## eAccess

Voice traffic before and after the earthquake



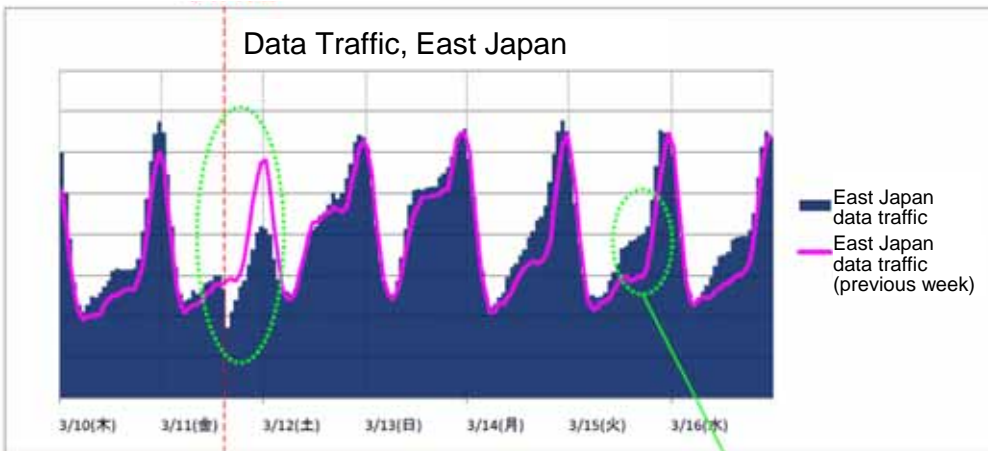
Data traffic in the Tohoku area before and after the earthquake



## UQ Communications

Earthquake (14:46, March 11)

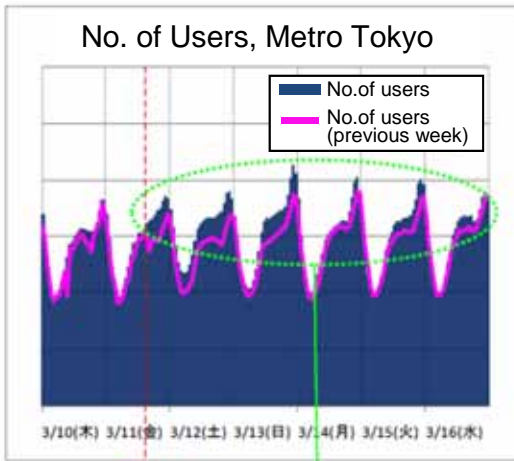
Data Traffic, East Japan



Data traffic declined after the earthquake

The following week, daytime data traffic volumes rose and Internet use increased.

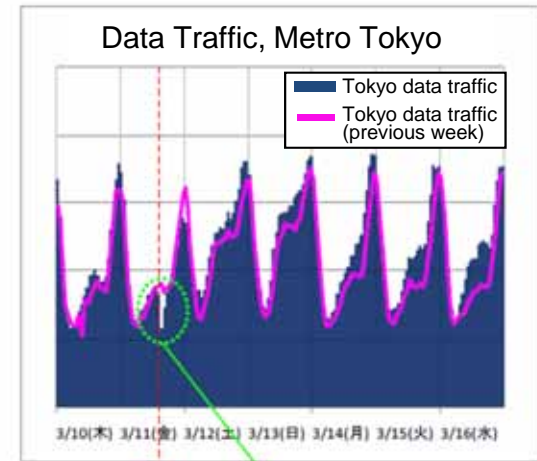
No. of Users, Metro Tokyo



**Earthquake (14:46, March 11)**

After the earthquake, the number of users increased 20% from previous week

Data Traffic, Metro Tokyo

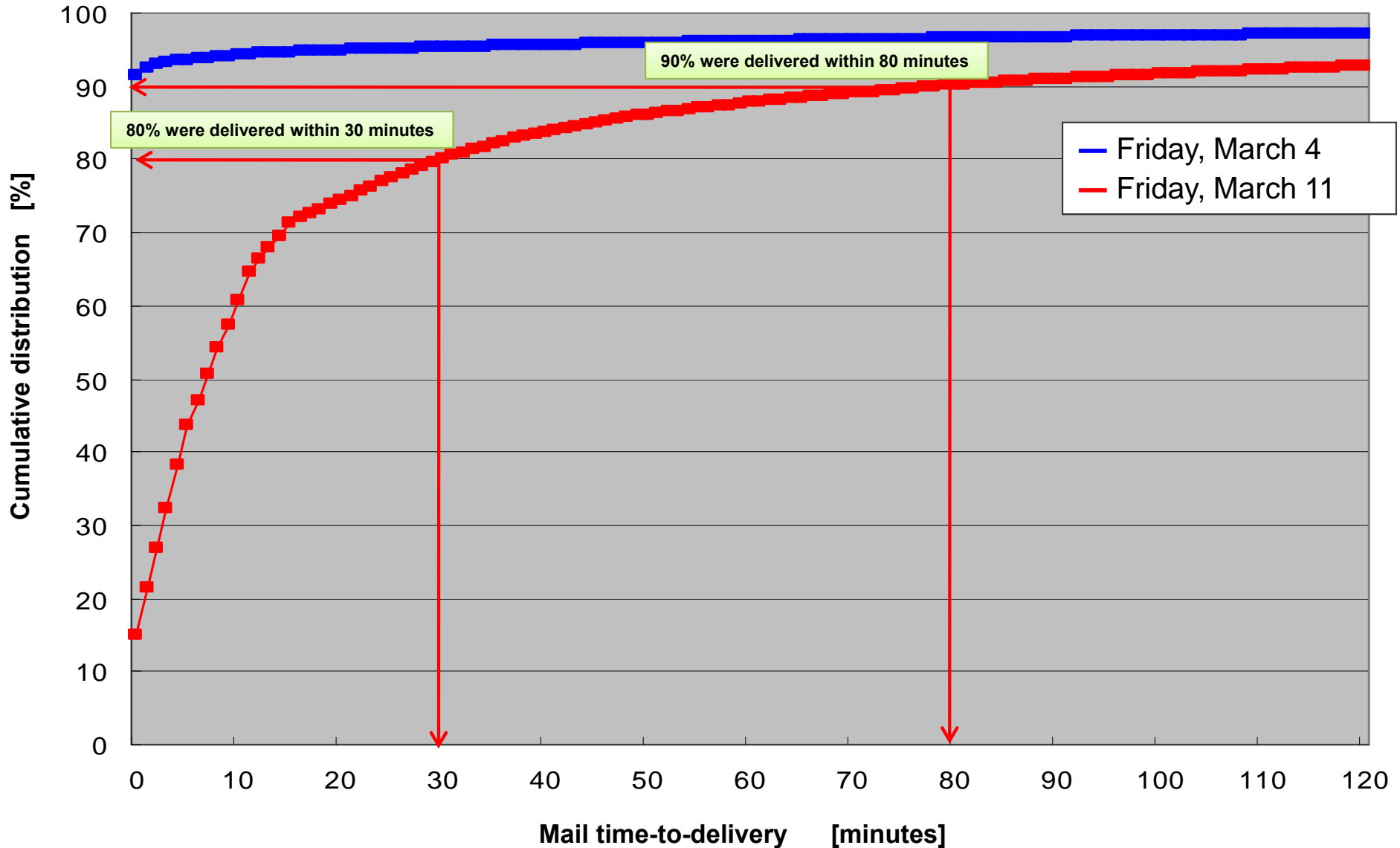


**Earthquake (14:46, March 11)**

After the earthquake, data traffic fell to about two-thirds from the previous week

# Example of Mail Latency (NTT DoCoMo)

- The chart below compares the mail latency for users in the Kanto and Koshinetsu regions between the day of the earthquake (Mar. 11) and the previous Friday (Mar. 4) (from immediately after the earthquake to late that night). Delays in mail deliveries occurred because of congestion at some iMode servers.



## Emergency Message Boards

	Posts	Confirmations
NTT DoCoMo	1,498,879	2,654,159
au	1,078,931	1,853,498
SoftBank	967,710	1,324,612
eMobile	457	750
Willcom	9,856	15,745

Notes:

Posts means the number of messages managed by the corresponding provider.

Each confirmation received in a cross-search is counted as one confirmation.

Each successful confirmation is counted as one confirmation.

(Figures as of May 14, 2011)

## Emergency Messaging Services (NTT East Japan)

	Accesses		
		Posts	Confirmations
Emergency messaging services	3.33 million	570,000	2.76 million
Emergency broadband message boards	280,000	110,000	180,000

(Figures as of May 30, 2011)



# Changes in the No. of Effected Fixed-Number Phone Lines

Note:

Created by MIC based on reports of effected phone lines from telecom operators.

NTT East Japan figures include fixed-line phones (subscription phones + ISDN),

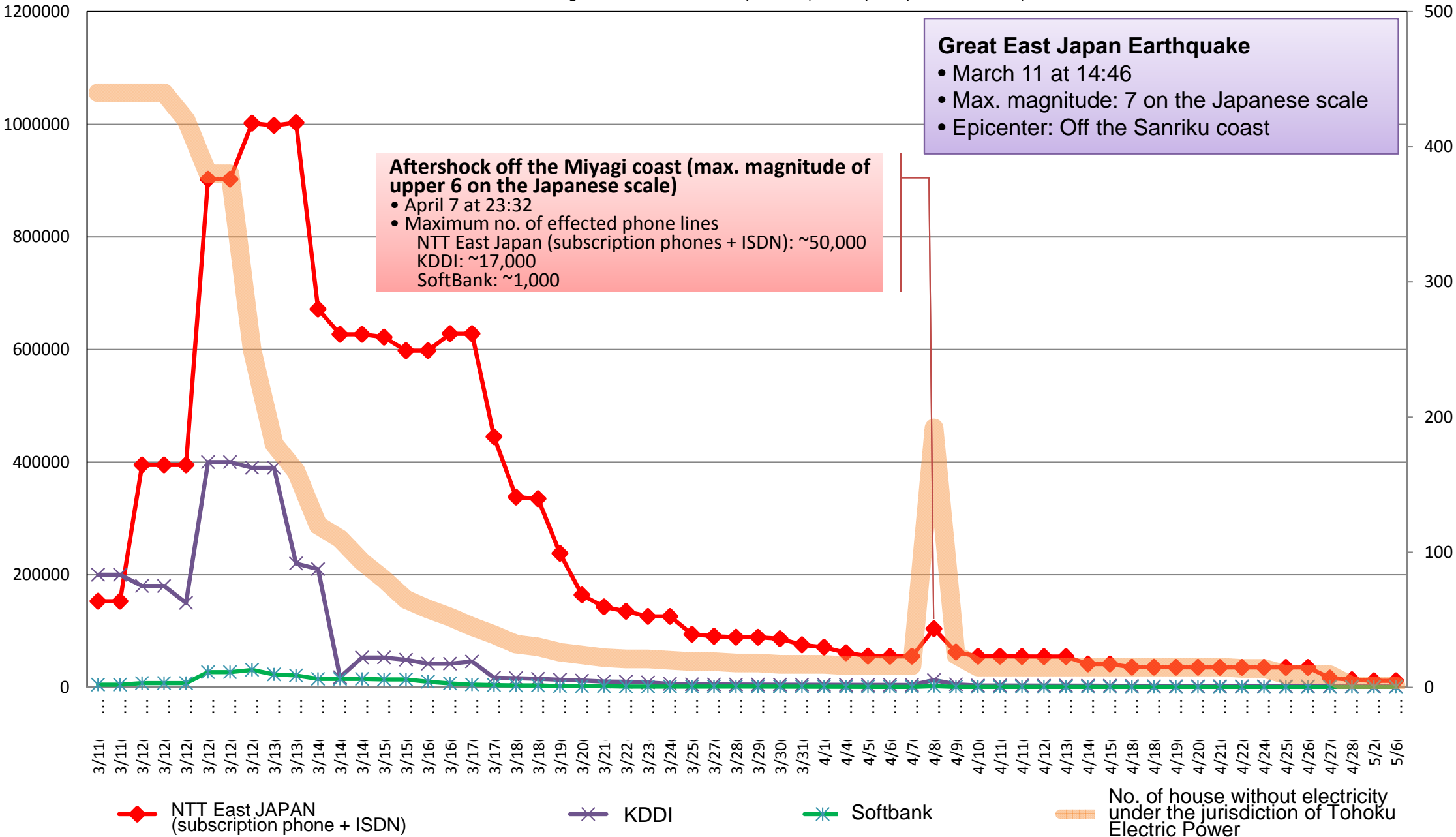
KDDI figures include fixed-line phones (subscription phones + ISDN), FTTH, and ADSL,

and SoftBank Telecom figures include fixed-line phones (subscription phones + ISDN).

No. of houses without electricity

[Unit: 10,000 houses]

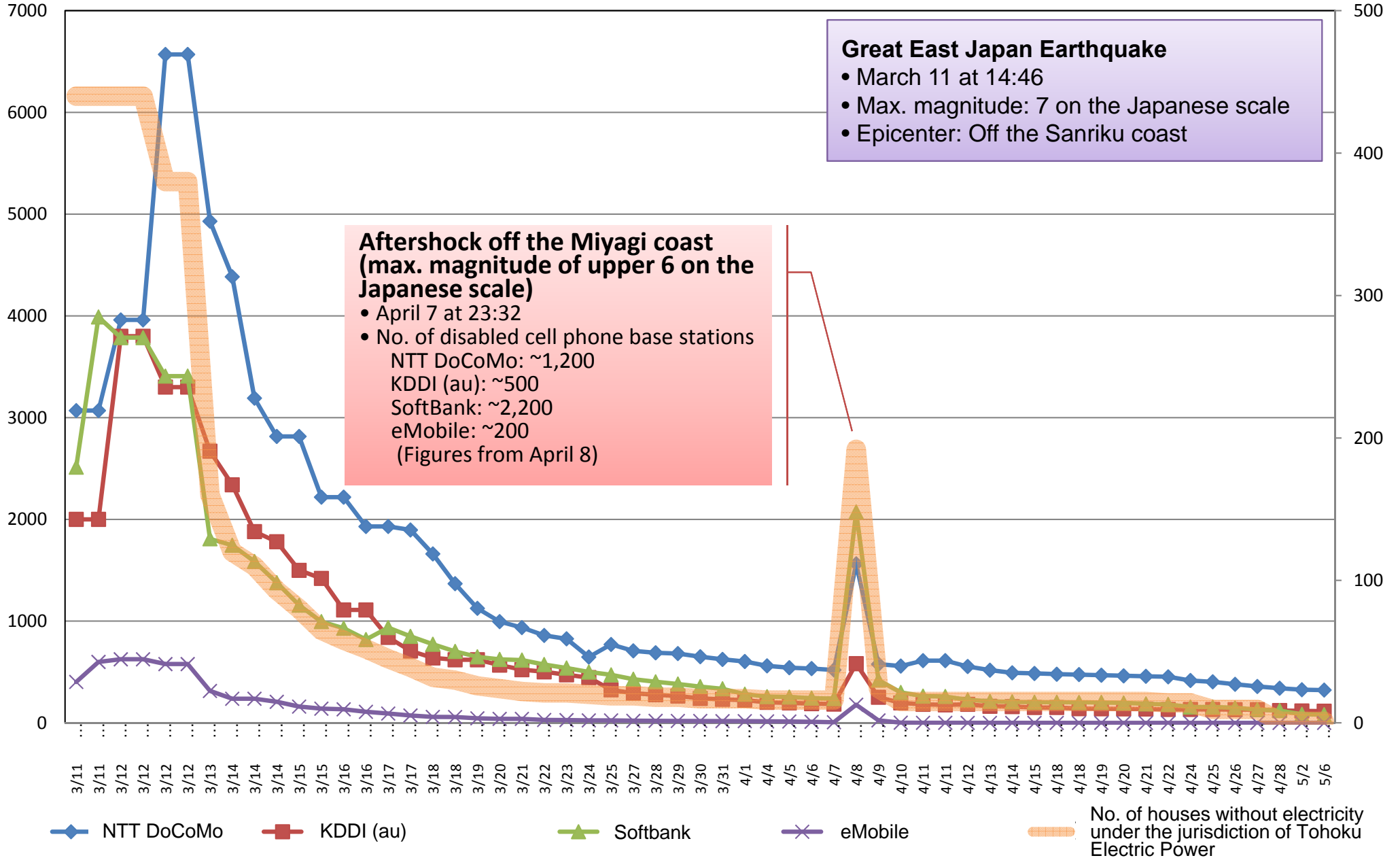
No. of effected phone lines



# Changes in No. of Disabled Cell Phone Base Stations

No. of disabled base stations

No. of houses without electricity  
[Unit: 10,000 houses]



# Geographical Changes in Damage from the Great East Japan Earthquake

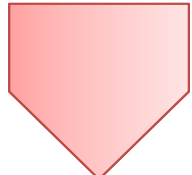
NTT East Japan and NTT DoCoMo

Iwate Prefecture

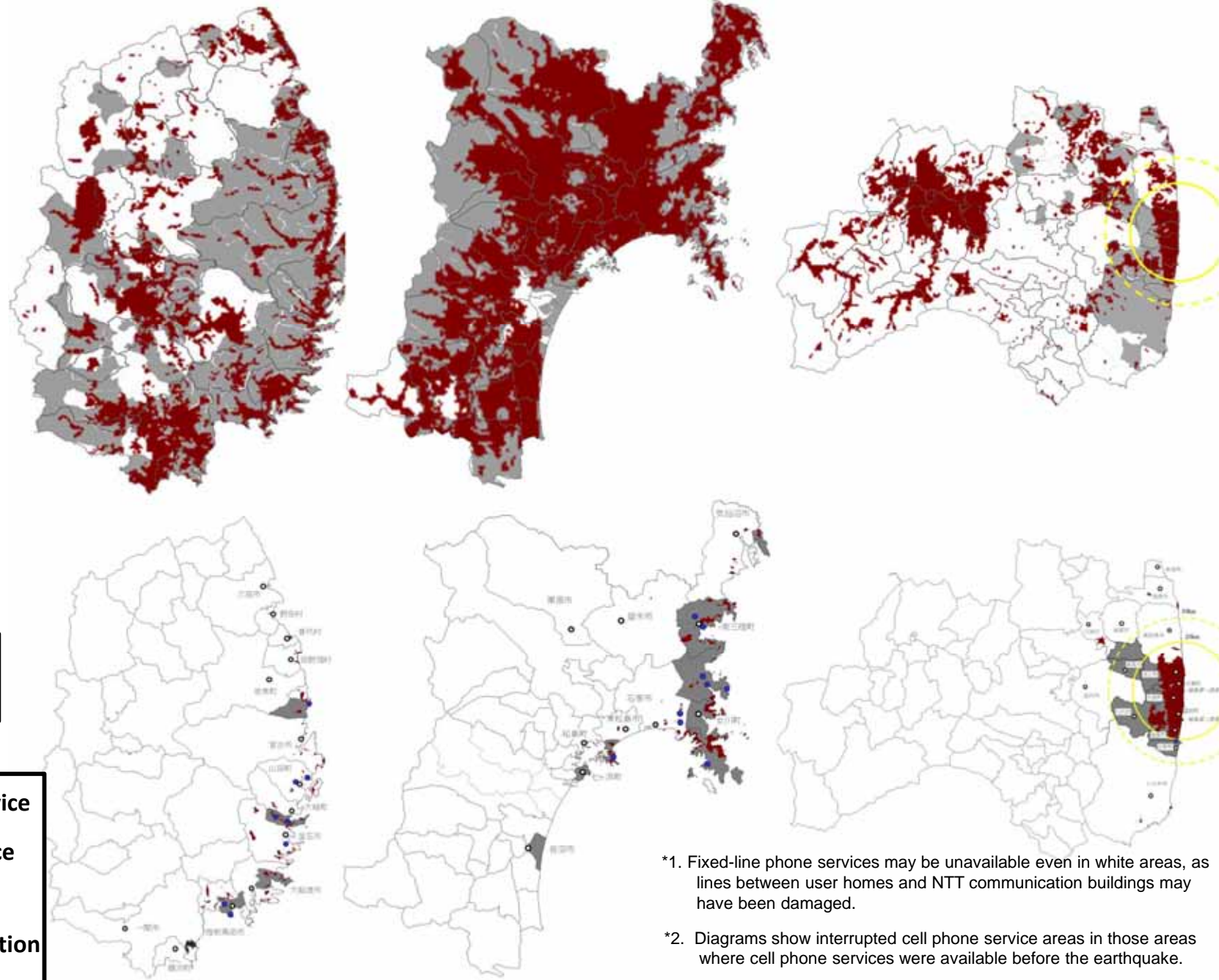
Miyagi Prefecture

Fukushima Prefecture

Two days after the earthquake (Mar. 13)



One month after the earthquake (Apr. 11)



- Interrupted fixed phone service areas (NTT East Japan)\*1
- Interrupted cell phone service areas (NTT DoCoMo)\*2
- Municipal offices
- DoCoMo mobile communication base stations

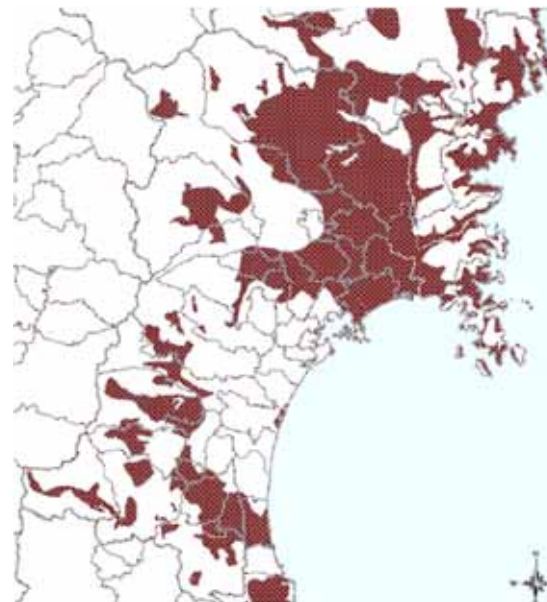
\*1. Fixed-line phone services may be unavailable even in white areas, as lines between user homes and NTT communication buildings may have been damaged.  
\*2. Diagrams show interrupted cell phone service areas in those areas where cell phone services were available before the earthquake.

KDDI

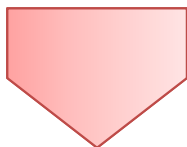
Iwate Prefecture

Miyagi Prefecture

Fukushima Prefecture



Three days after the earthquake (Mar. 14)



One month after the earthquake (Apr. 5)

■ Interrupted cell phone service areas (KDDI (au))\*  
● KDDI mobile communication base stations

\*Diagrams show interrupted cell phone service areas in those areas where cell phone services were available before the earthquake.

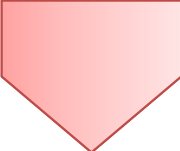
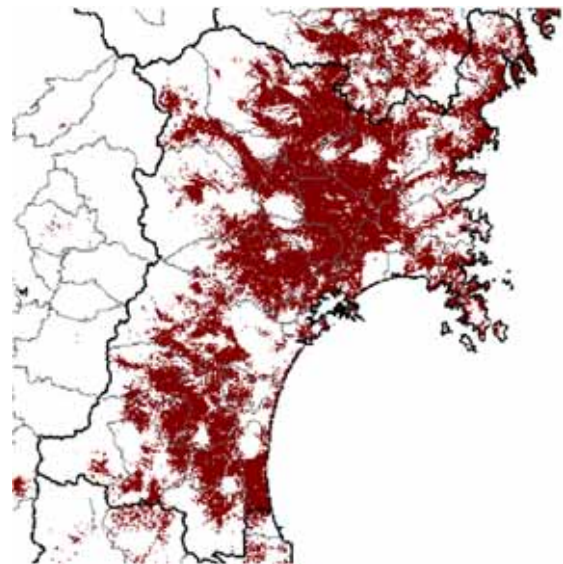
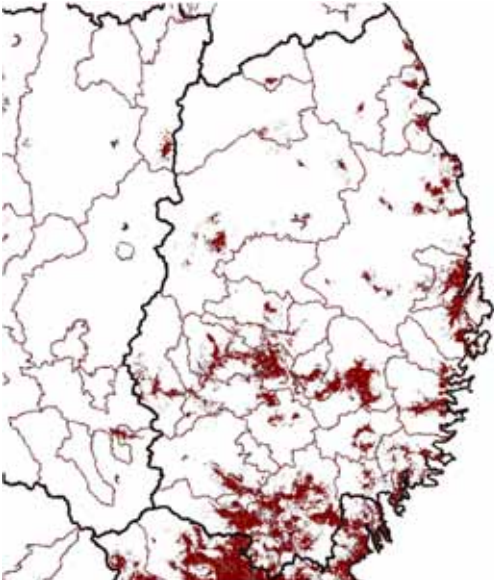
SoftBank

Iwate Prefecture

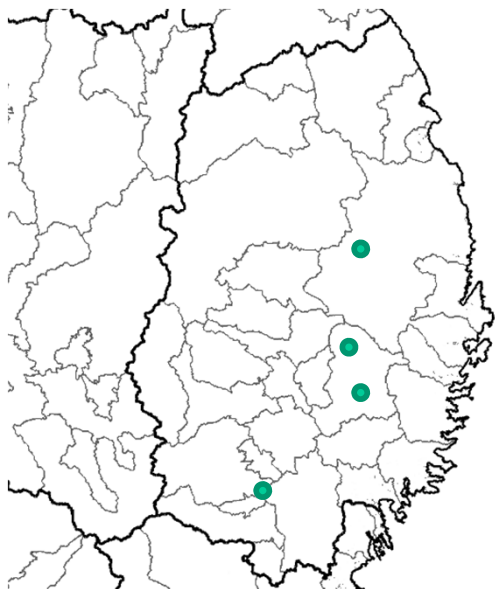
Miyagi Prefecture

Fukushima Prefecture

Two days after the earthquake (Mar. 13)

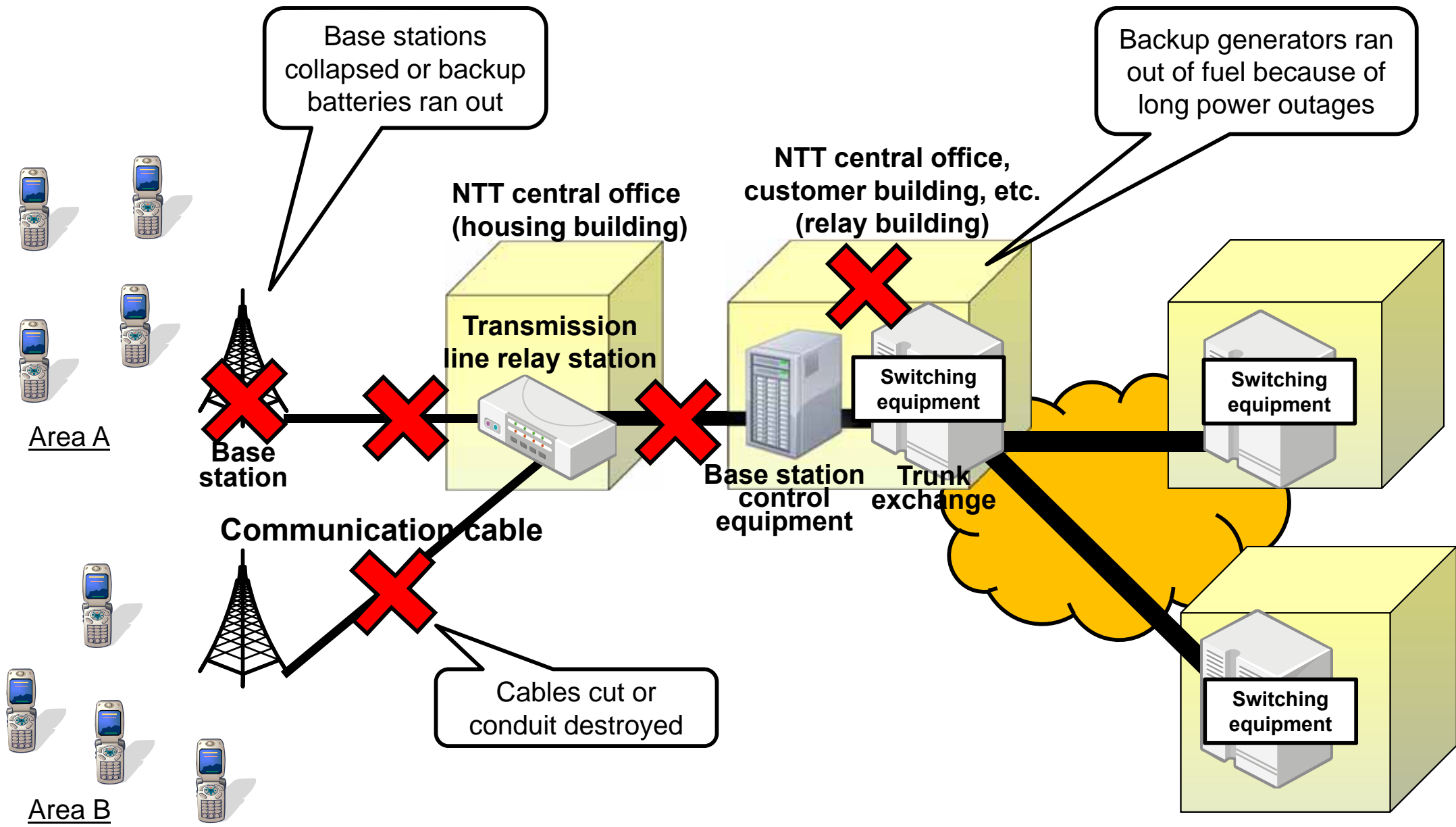


One month after the earthquake (Apr. 14)

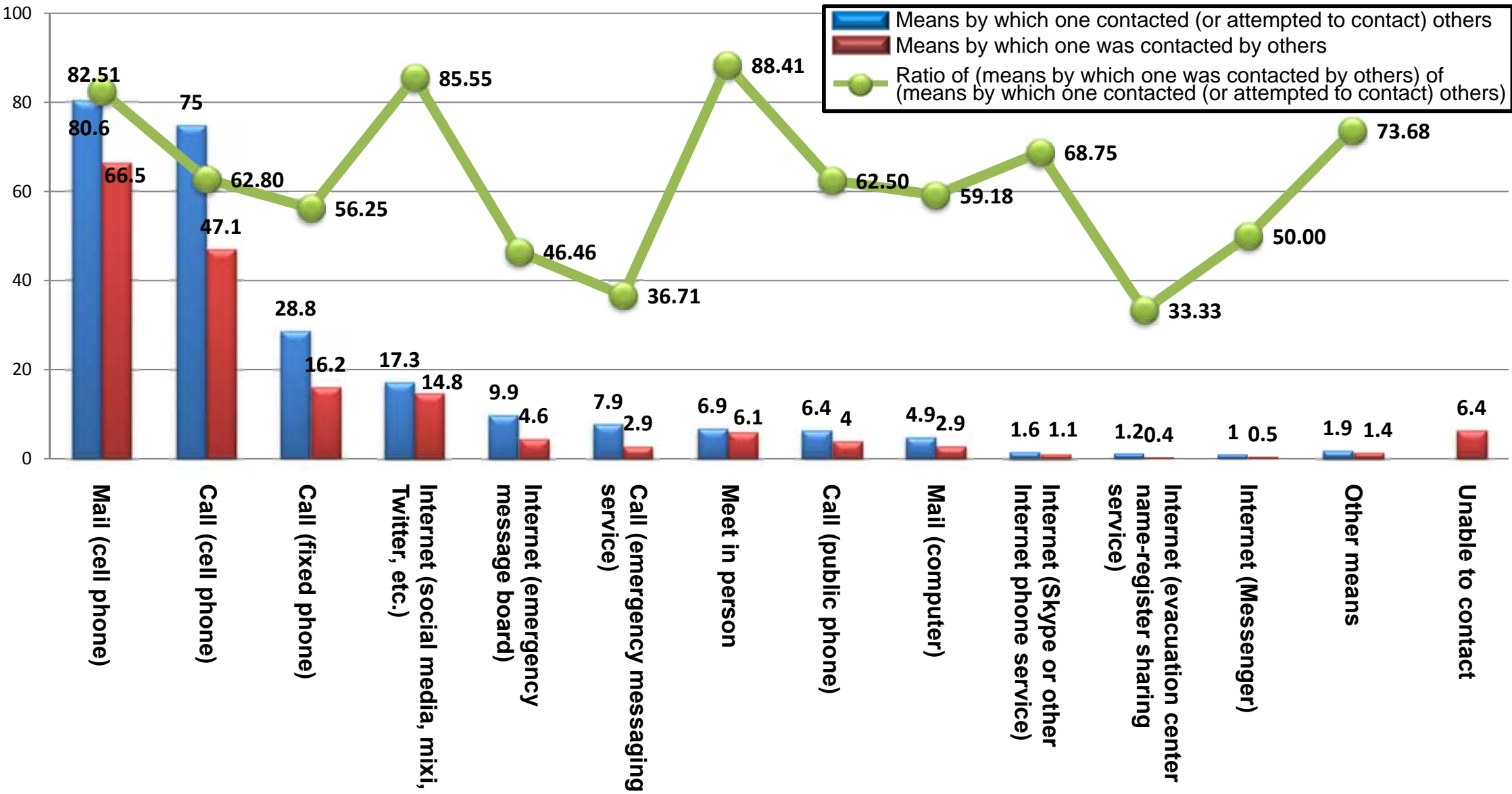


■ Interrupted cell phone service areas (Softbank 3G)\*  
● Softbank mobile communication base stations

\*Diagrams show interrupted cell phone service areas in those areas where cell phone services were available before the earthquake.

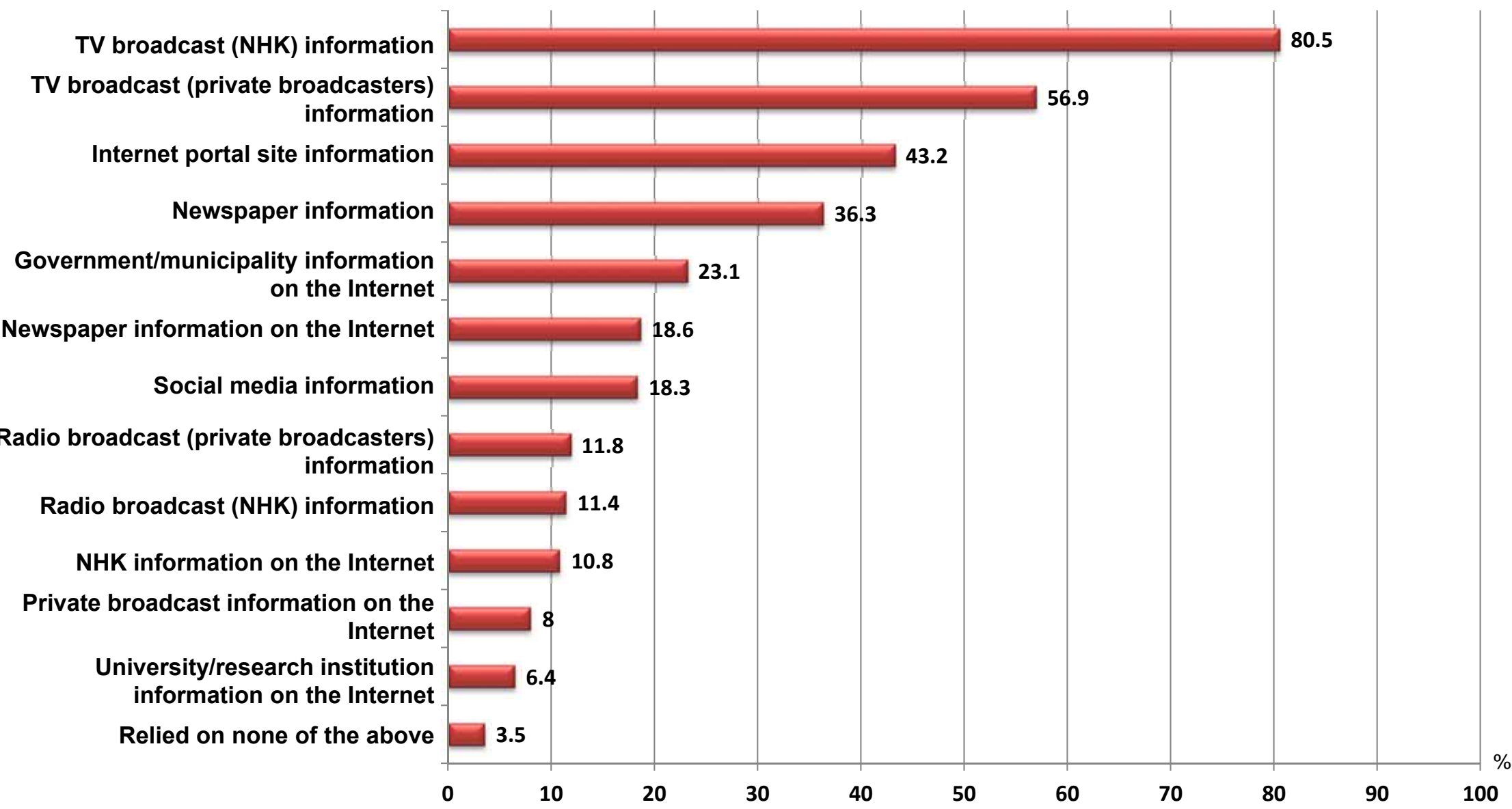


# Emergency Contact Means



- Survey target: 832 people, between 15 and 69 years old (equalized by gender and age bracket)
- Surveyed areas: nationwide, except Iwate, Miyagi, Fukushima, and Ibaraki prefectures
- Survey period: April 28 – 30, 2011

# Media Relied on for Information on the Great East Japan Earthquake



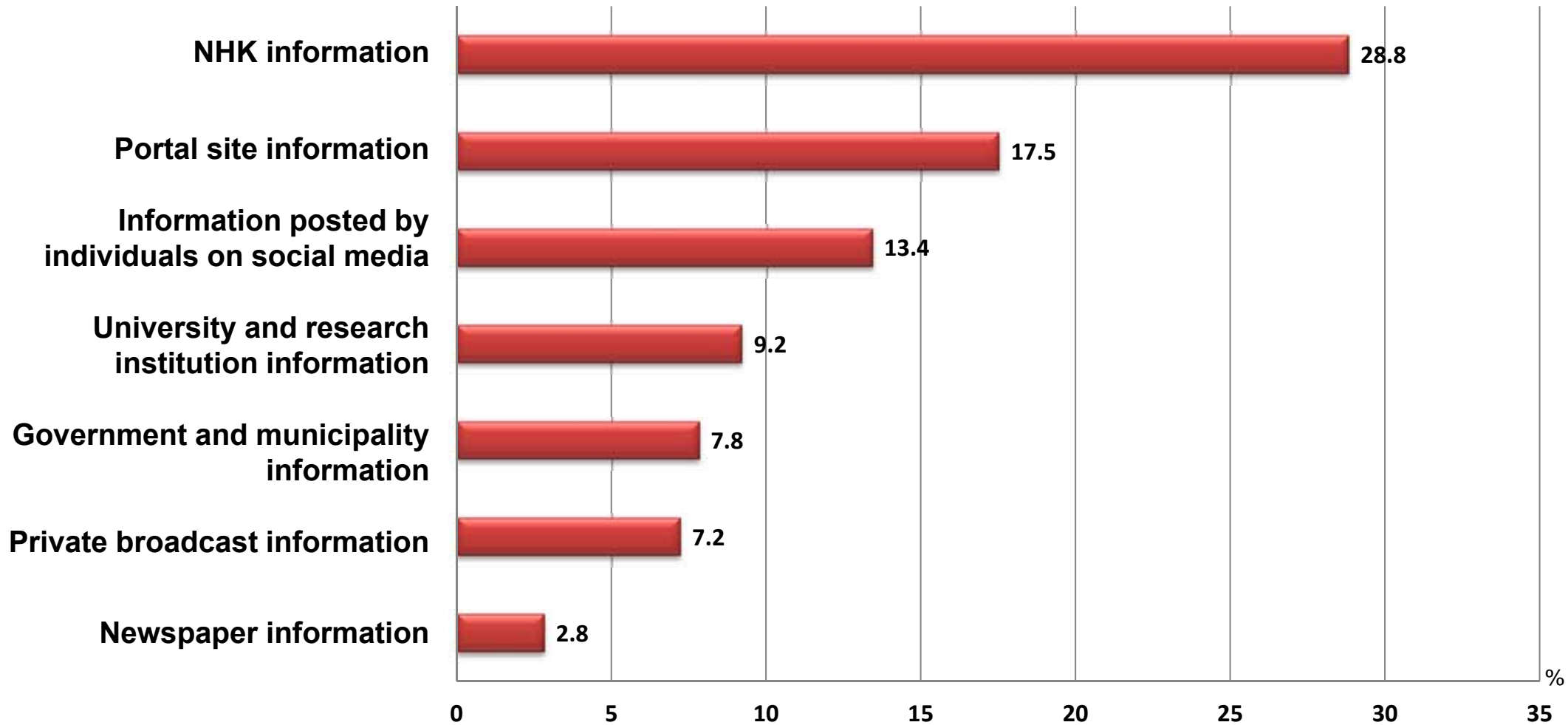
• Survey target: Nomura Research Institute’s Insight Signal single source panel (4,000 panel members)  
• Panel attributes: men and women, 20 to 59 (age-bracket weighted by population composition) from Kanto region (Ibaraki, Tochigi, Gunma, Chiba, Saitama, Tokyo, Kanagawa)

• Survey period: March 19 – 20, 2011  
Source: “Survey of Media Credibility in Association with Earthquake Damage,” Nomura Research Institute, April 2011



- Panel members answered from “credibility increased/credibility decreased/no change/don’t know”
- Figures for newspapers, NHK, and private broadcasters also include information provided over the Internet by these sources

## “Credibility increased” scores



- Survey target: Nomura Research Institute’s Insight Signal single source panel (4,000 panel members)
- Panel attributes: men and women, 20 to 59 (age-bracket weighted by population composition) from Kanto region (Ibaraki, Tochigi, Gunma, Chiba, Saitama, Tokyo, Kanagawa)

• Survey period: March 19 – 20, 2011

Source: “Survey of Media Credibility in Association with Earthquake Damage,” Nomura Research Institute, April 2011

## Services confirming people's safety using search functions

### Emergency shelter name-registry search (Yahoo)

The screenshot shows the Yahoo! Japan homepage with a focus on disaster relief. A prominent search bar is titled '公式避難場所名簿検索' (Official Evacuation Shelter Name Registry Search) and shows 236,862 results. Below this, there is a section for 'ボランティア情報検索' (Volunteer Information Search) with a search bar and a '検索' button. The page also includes various news and information links related to the Great East Japan Earthquake.

**Emergency shelter name-registry search**  
 Created to address the demand to search by name for the emergency shelters where relatives, friends, and acquaintances were staying, and to reduce the burden on municipalities to confirm the safety of people. Collected name registry data was posted to a Website and arranged, and the information was put in a searchable format through people power.

**Volunteer search**  
 Created to address the demand of customers wanting to volunteer and needing information. Obtained volunteering information from NPOs and put the information into a searchable format.

### Person Finder (Google)

The screenshot shows the Google Person Finder interface. It features two main buttons: '人を探している' (I am looking for people) and 'メッセージを提供する' (Provide a message). Below these buttons, it states that there are currently approximately 624,100 entries. A search URL is provided: <http://goo.gl/sagas>. The page also includes a note about data privacy and a link to the tool's terms of use.

- A tool that lets users easily post, search, and browse information on people's safety. The service started out with about 3,000 entries, but that grew to over 670,000 entries between April and mid-May 2011.
- Coordinated with municipal governments, the National Police Agency, media outlets, mobile phone companies, and others to centralize different databases.
- Person Finder not only acted as the backend for storing data; it also functioned as an information hub for PFIF (People Finder Information Format). By using PFIF, data can be easily converged and embedded as APIs.

Added value services that combined various information sets

## Road traffic confirmation maps (Yahoo)

**YAHOO! 地図** WEB 画像 動画 ブログ 辞書 知恵袋 地図 一覧

例: 東京都港区赤坂9-7-1

この地図のURL

情報 検索 道案内

宮城県 > 仙台市青葉区 > 本町3丁目 の周辺地図

### 道路通行確認マップ

青森 岩手 宮城 福島 茨城

前日の0時~24時までの通行実績情報と、前日の午前6時~10時までの混雑・渋滞情報を表示します。

表示する情報を選択してください。

- 通行できた
- 混雑・渋滞した

情報更新日: 2011年04月27日  
情報提供: 本田技研工業(株)

本田技研工業株式会社の「インターナビ・プレミアムクラブ」および「バイオニア株式会社」の「スマートループ」搭載車両から収集した走行軌跡データを元に本田技研工業が作成した情報の提供を受けて、地図上に公開しています。

なお、このマップは、被災地域の移動支援を目的として公開しております。それ以外の目的でのご利用はお控えください。

※通行実績がある道路でも、現在通行できることを保証するものではありません。

※緊急交通路に指定される等、通行が規制されている可能性があります。

※被災地およびその周辺では、救援活動、支援活動を妨げることのないようご配慮いただき、実際の走行にあたっては、必ず現地での規制、誘導に従ってください。

通行止 4/19 調査 (C) Yahoo Japan, (C) ZENRIN

## Provision of cloud services

### Disaster-area assistance solutions (Microsoft Japan)



Excerpted material from the 3<sup>rd</sup> meeting of the Internet Usage WG

### IBM Smart Business Cloud (IBM Japan)

【注意事項】被災地への直接の発送は「支援ギフト便」等の特別な配達でない限り厳禁です。

件名	食料品(南相馬市特産物受け入れセンター)
希望物資リスト	・食料品 米(精米済みのもの)、カップラーメン、レトルト食品、缶詰、漬物、副食(お菓子等)、などの日持ちする食料品。
送付先	南相馬市特産物受け入れセンター(相馬市総合地方卸売市場内) 住所: 〒979-2522 福島県相馬市日下石丸越道101 電話: 0244-25-1318
コメント	くわしくは 0244-24-5262(農林水産課) にお問い合わせください。 事前にFAX送信していただくと助かります。 なお、宅急便での受け入れセンターへの送付は、佐川急便及びヤマト運輸で取り扱っているようですので、上記受け入れ先へご送付ください。 <a href="http://www.city.nagamisoma.lg.jp/shinso2/shinbuzji.jp">http://www.city.nagamisoma.lg.jp/shinso2/shinbuzji.jp</a>
タグ	食料品

Excerpted material from the 1<sup>st</sup> meeting of the Internet Usage WG

- The disaster-area assistance solutions, which use cloud services, provide information management tools for sites sharing volunteer information, for example

- Provided a platform for damage-information and management-assistance applications designed for eligible areas under the Disaster Relief Act (lists of needed items, evacuation center help, hospital assistance, and goods-sharing information and instructions)

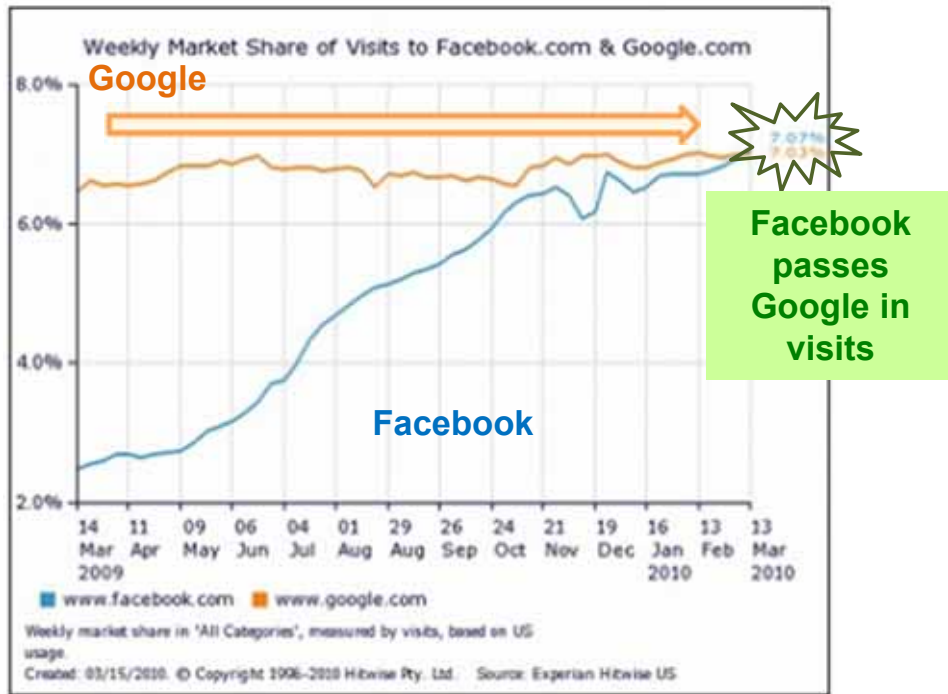
- Government bodies were recommended to provide information in HTML, CSV, and other formats and not just in PDF, Word, Excel, or similar proprietary formats, in consideration of enabling cell phone access, lowering network loads, and secondary use of data.

Title	Overview
<p>File Formats of Important Information Released to Citizens (March 18, 2011, bulletin from LASDEC to all municipal governments)</p>	<p>We ask that you take in consideration the data formats used for uploaded files so that as many people as possible can easily access those files for smooth delivery of information to citizens. The following are examples of how to provide specific files.</p> <ul style="list-style-type: none"> <li>Release information in HTML files, and not just PDF files.</li> <li>Provide scans of paper documents as JPEG files, not PDF files.</li> <li>Provide formatted data as CSV files, not Excel files.</li> </ul>
<p>Request for Cooperation Concerning the Provision of Information Related to Earthquake Damages (March 22, 2011, bulletin from the Cabinet Public Relations Secretary to government ministries)</p>	<ul style="list-style-type: none"> <li>We ask that you endeavor to deliver required information promptly by means of posting that information on government ministry Websites, etc. in formats that are easy for citizens to understand.</li> <li>We ask that you prepare Websites designed for cell phones as soon as possible because the importance of cell phones has increased dramatically as a means of collecting information in the disaster areas. For the same reason, we ask that you convert PDF and similar pages to HTML-formatt pages.</li> </ul>
<p>File Formats for Provision of Information Concerning the Great East Japan Earthquake (March 29, 2011, bulletin from MIC to government ministries)</p>	<ul style="list-style-type: none"> <li>We ask that you take into account file formats used when providing information over the Internet in the interest of smoothly providing information to citizens. This includes making use of relatively light file formats, such as HTML and CSV, wherever possible, instead of only network-intensive file formats such as PDF.</li> </ul>
<p>Data Formats for Provision of Information Concerning the Great East Japan Earthquake (March 29, 2011, bulletin from METI to the Japan Business Federation)</p>	<ul style="list-style-type: none"> <li>We ask that you consider when providing information over the Internet methods of providing data that is conducive to automated processing. This includes providing data in formats, such as HTML and CSV, that are easily processed alongside PDF and other formats that are difficult to automatically process, and establishing separate open information provision APIs.</li> </ul>

# Proliferation of Social Media

## Rise of Social Media

In March 2010, visits to Facebook reached No. 1 in the United States, passing visits to Google.

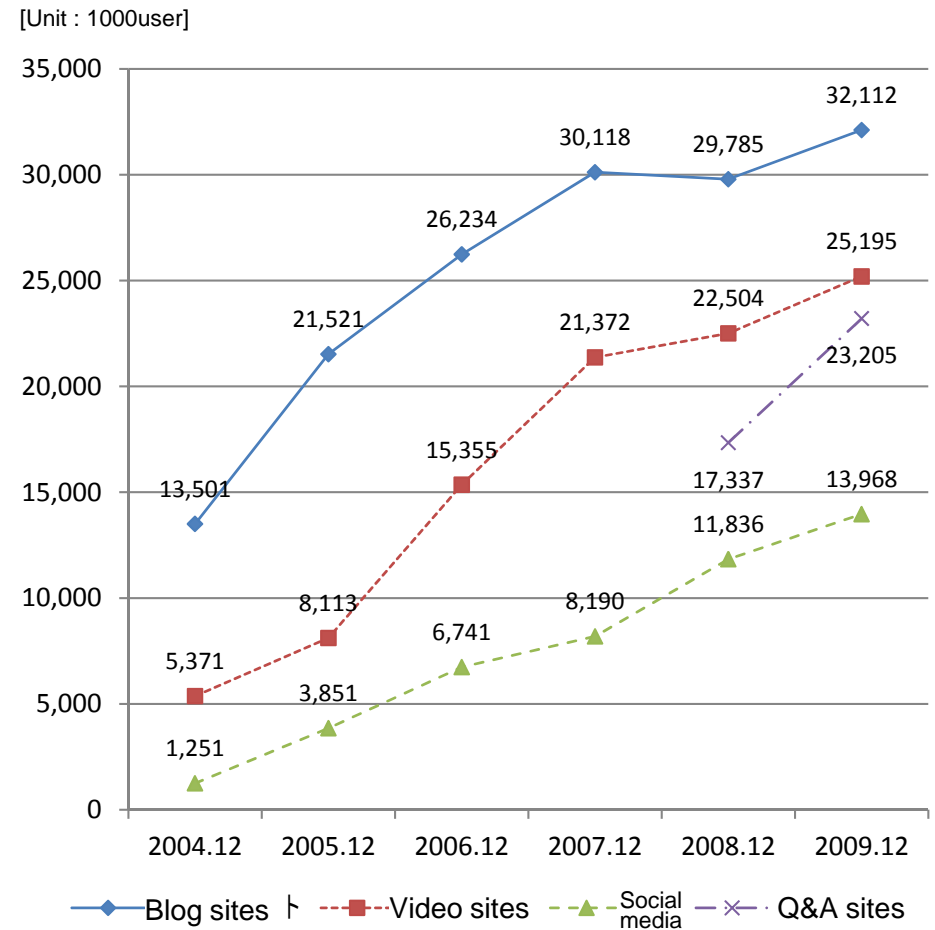


Changes in visits to Google and Facebook

Excerpted from ITmedia News (Facebook passes Google to become most visited site in the U.S.) <http://www.itmedia.co.jp/news/articles/1003/16/news027.html>

## Increase in Users

The number of social media users has skyrocketed in the past five years.

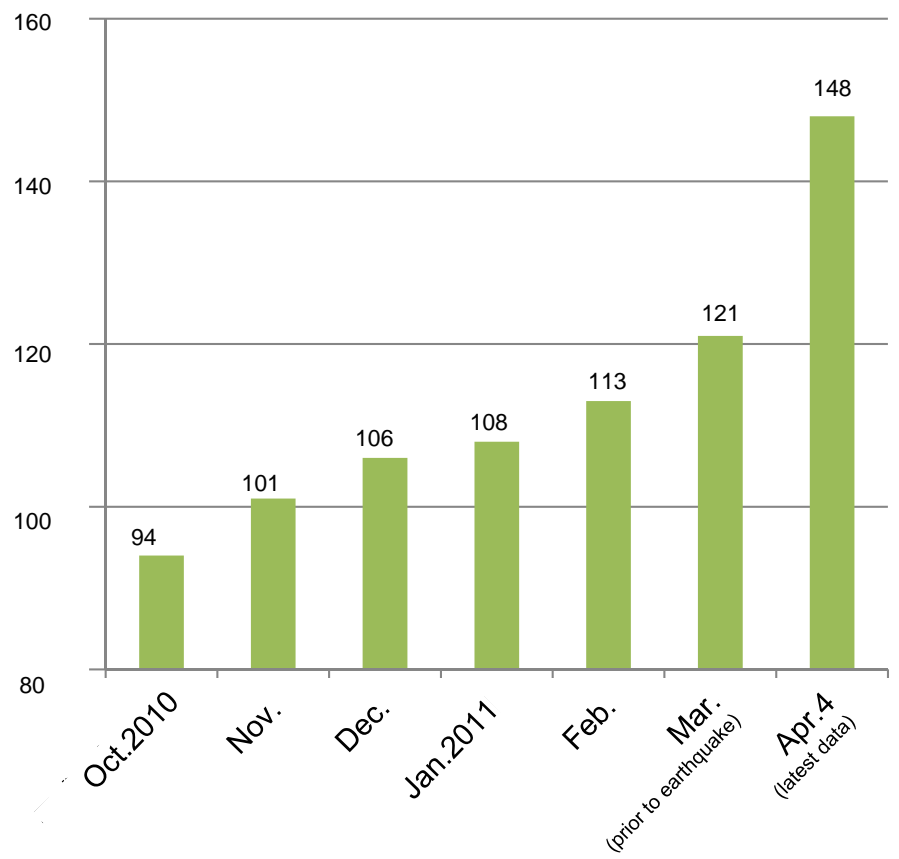


Created from "Present State of Online Media in Japan," Nielsen

# Use of Social Media and the Internet by Public Bodies

- Government ministries are using Twitter and social media to enhance their information delivery capacity and to deliver information as fast as possible to as many citizens as possible who need the information.
- Seeing that central and local government bodies were making more use of social media, MIC and others compiled pointers about delivering information using social media as a set of guidelines and published the guidelines.  
 “Guideline on Delivering Information Using Private-Sector Social Media for Central and Local Government Bodies,” Cabinet Secretariat (IT Office, IT Security Center), MIC, and METI

No. of government-related Twitter accounts (survey by METI)



Examples of tweeted information (during the Great East Japan Earthquake occurred)

**FDMA\_JAPAN** 国土交通省  
 【消防庁の対応】消防庁長官から北海道、福島県、茨城県、栃木県、群馬県、千葉県、神奈川県、富山県、山梨県の航空部隊に出動準備を指示しています。また、宮城県庁に職員2名の派遣を決定しています。現地消防本部に対して被害状況を確認中です。  
 Mar 11日

**FDMA\_JAPAN** 国土交通省  
 経産大臣指示で、福島第一原子力発電所の半径3キロメートル以内の住民に対する避難指示は、半径10キロメートル以内の住民に対する避難指示に拡大されました。落ち着いて避難してください。  
 Mar 12日

**FDMA\_JAPAN** 国土交通省  
 帰宅時間となりましたが、交通機関が動いていない状況での移動は二次的な被害に遭う可能性もあります。無理に帰宅するのではなく、職場等の安全な場所での待機するなど、冷静に行動してください。  
 Mar 11日

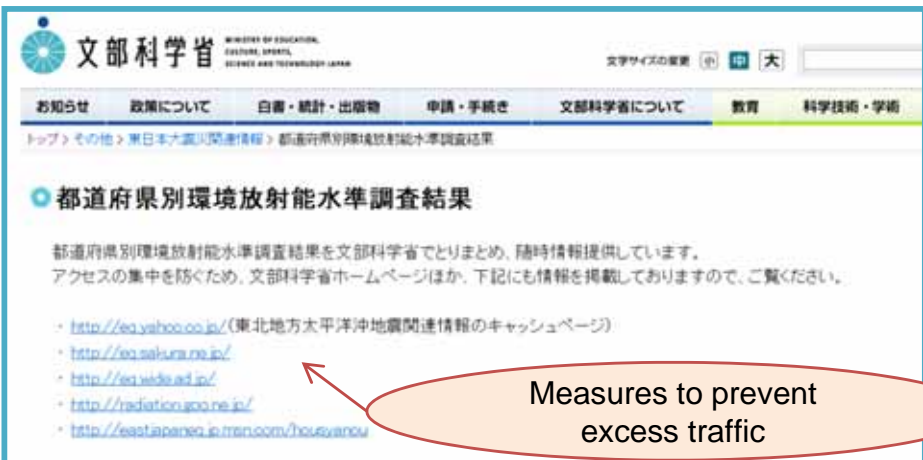
**MHLWitter** 厚生労働省  
 厚生労働省です。不特定多数の方に送信されている、コスモ石油千葉製造所における火災関連のメールについては、厚生労働省からの発表情報ではありませんのでご注意ください。 <http://bit.ly/1Zq3P6>  
 Mar 12日

**MHLWitter** 厚生労働省  
 厚生労働省です。厚生労働省講堂、ハローワーク新宿、大森、府中、池袋、墨田などの施設を帰宅困難者の一次収容施設として開放しています。 <http://bit.ly/g0v4mC>  
 Mar 12日

**meti\_NIPPON** 経済産業省  
 海江田経済産業大臣より 本日(3月17日)、厳しい寒さにより、東京電力管内で大規模停電のおそれあり。これまで以上の節電にご協力お願いします。大規模停電回避のための一層の節電のお願い。  
<http://bit.ly/173PVG>  
 Mar 17日

# Examples of Mirroring by Public Bodies

- The following are examples of mirroring by government ministries and power companies to avoid high traffic concentrations at public sites that may prevent people from obtaining information.



Example: MEXT Website  
[http://www.mext.go.jp/a\\_menu/saigaijohou/syousai/1303723.htm](http://www.mext.go.jp/a_menu/saigaijohou/syousai/1303723.htm)



Example: METI Website  
[http://www.meti.go.jp/earthquake/touhoku\\_epco/index.html](http://www.meti.go.jp/earthquake/touhoku_epco/index.html)



Example: TEPCO Website  
<http://www.tepcoco.jp/keikakuteiden/kensaku-j.html>



Telecoms and other businesses are proactively leading initiatives to assist victims in the disaster areas and to reconstruct damaged communication infrastructure.

## (1) Initiatives related to reconstructing communication infrastructure

- Deployment of mobile base station vehicles, installation of temporary base stations for satellite use, etc. [multiple mobile carriers]
- Deployment of portable-generator vehicles [NTT East Japan, NTT DoCoMo, KDDI, SoftBank Mobile, etc.]
- Provision of satellite communication links (loan of ultra-compact earth stations) [Sky Perfect JSAT]
- Installation of temporary relay stations in areas outside of MCA wireless areas [Mobile Radio Center]
- Posting restored area maps, provision of restoration information, etc. [multiple mobile and PHS carriers]

## (2) Initiatives related to ensuring communication means for victims

- Free calls from public phones and installation of special public phones [NTT East Japan]
- Free loan of cell phone handsets, chargers, etc. [multiple mobile and PHS carriers]
- Free loan of satellite phones [NTT DoCoMo, KDDI, etc.]
- Free loan of MCA wireless devices [Mobile Radio Center, etc.]
- Free provision of Internet access spots at evacuation centers, etc. [NTT East Japan, NTT DoCoMo, Sky Perfect JSAT, J:COM, Microsoft, UQ, etc.]
- Free access to public wireless LAN areas [NTT East Japan, NTT DoCoMo, SoftBank Mobile, etc.]

## (3) Reduced user fees

- Reduced basic service fees in disaster areas and extended usage fee payment deadlines [multiple carriers]
- Reduced repair charges for damaged mobile phones [multiple mobile carriers]

## (4) Assistance with collecting information (people's safety confirmation, damage information, etc.)

- Provision of emergency messaging services and emergency message boards [NTT East Japan, multiple mobile and PHS carriers, etc.]
- Site for posting and searching information on people's safety [Google]
- Special sites aggregating disaster-related information [NEC BIGLOBE, Google, Microsoft, Yahoo, etc.]
- Sites for free access via computers or smartphones of FM stations in the six Tohoku prefectures regardless of the broadcast area [KDDI]

## (5) Assistance with delivering information

- Provision of mirror sites of heavily accessed public body Websites [IBM, Google, Microsoft, Yahoo, etc.]
- Free provision of cloud services to governments in disaster areas, NPOs, etc. [IBM, NEC BIGLOBE, Google, Microsoft, etc.]

## Reference: MIC initiatives

- Free loan of satellite phones, MCA wireless devices, and citizen-radio devices
- Cooperated with the provision of temporary disaster-management satellite communication links using a technical test satellite (Kizuna) (NICT provided broadband line access)
- Granted special permits in response to applications for radio station usage from overseas relief groups