[Data A] Designing of safe and peaceful towns and information communication technology

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- Classification and related elementary technologies of ICT peace of mind securing system

- Mobility unimaginable with analog network

Japanese version of this document was created by Prof. Kiyoshi NAKANO, Osaka City University and was translated into English by JICA as an ODA program. If you would like to use it, e.g., in publications, please send an e-mail to the mail address in the following :

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What is a social safety system? [I]

- Creation of a social safety system
  - Creation of a system, a combination of ITC and human systems, to ensure safety and peace of mind of the society
  - Introducing the process of keeping safety and peace of mind into the existing physical and social system

- Background
  - Cruelty happened to children in and outside a school in the Kansai region
  - Cruelty happened to children and teachers at schools
  - Osaka Prefecture is ranked No. 1 in Japan in the number of reported purse snatchings in the past 29 consecutive years
    - → Recognized by society as an area where crimes are frequently committed

- Specific target of a social safety system
  - Crime prevention
    - Track children with wireless IC tags
    - Watch shopping streets and schools with crime prevention cameras
  - Disaster prevention and reduction: reduce loss caused by earthquakes and floods
  - Make sure of traffic safety
  - Make sure of food safety
  - Make sure of safety in medical and welfare fields

A   Demands on a social safety system using ICT

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What is a social safety system? [II]

- Specific structural elements
  - Specific examples of making good use of ICT
    - Camera
    - Wireless IC tag
    - Non-contact IC card
    - Biometrics (biological authentication)
    - GPS (Global Positioning System)
    - GIS (Geographic Information System)
    - Mail auto-distribution system
    - Information sharing by various databases
  - Specific image of human system
    - Reconstruction of a human network beyond the conventional walls of kinship; relations by regions and by companies

- Approach
  - Allopathic type
  - Advanced planning type: Ensure safety and peace of mind from the stages of planning and design, and systematically consider disaster reduction.
    - Those involved
      - Town designing and city planning
      - Existing physical social system
        » Building management
        » Railway operation control
        » Road control
        » Food distribution
        » Medical waste distribution
        » Industrial waste distribution

A   Demands on a social safety system using ICT

Why ICT (Information Communication Technology) is good for peace of mind and safety? [I]
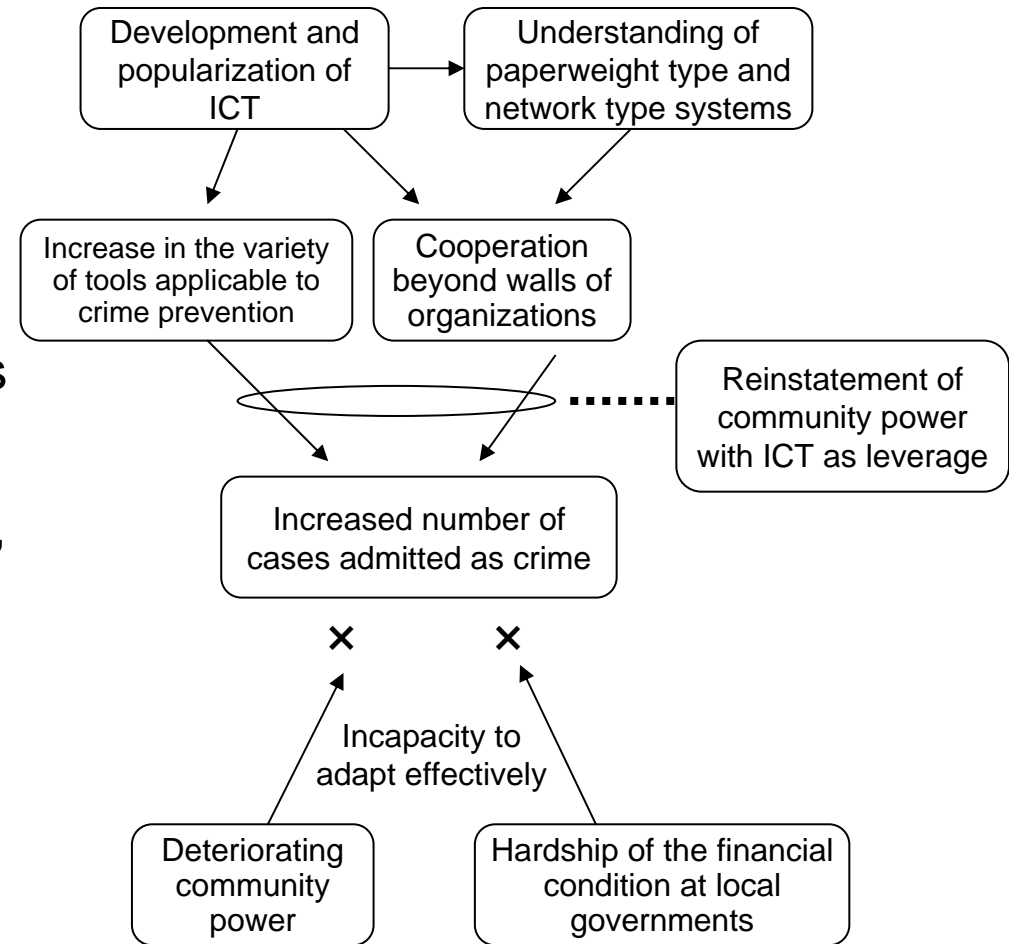
- Increasing fear of residents to crimes
  - Number of crimes has been increasing since latter half of 1990s
  - Number of crimes: 1.78 million cases in 1995 to 2.79 million cases in 2003 (160% increase)
  - Clearance rate: Drop from 42.2% in 1995 to 23.2% in 2003
  - Matters have been improving since 2002. (Reported by the Police Agency)
- Hardship of the financial condition at local governments
  - Profits by cost reduction by utilizing ICT and profits by selection
  - Cooperation among NPO, community and administration, and industry

- Declining community power
  - Spread of the nuclear family
  - Increase in the number of single person households (bachelor, aged person)
  - Increased double-income households (other than independent enterprise)
  - Housing shielded from noises from neighbors (increased air-tightness, improved soundproof effect, high-rise housing)
  - Communities cannot demonstrate their power in the development of insecure situations.

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Why ICT (Information Communication Technology) is good for peace of mind and safety? [II]

- Development and popularizing of ICT
    - Popularizing of personal computer
    - Popularizing of Internet
    - Evolution and popularizing of RFID (Wireless IC tag)
    - Increased capacity and reduced cost of communicating devices
    - Popularizing of mobile communication/devices
    - Cost reduction of camera, sensor and display devices
    - Level-up and reduced cost of location information measuring technologies such as GPS, etc.
    - Level-up and reduced cost of GIS (Geographic information system)

- Innovation of the structure of social organizations
    - Cooperative structure among organizations of different characters being mixed in local society = Diverse subjects may unite together in a purpose of designing a safe and peaceful town.
    - Potential to break down existing walls of vertically divided information systems
    - Movements to go beyond walls of organizations
    - Development NPOs, etc.

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Why ICT (Information Communication Technology) is good for peace of mind and safety? [III]

- For revitalization of community power with ICT as leverage
  - Utilization of crime prevention camera
  - Utilization of e-Mail, etc.
- Crime prevention system leveraged with ICT beyond walls between organizations
  - Instantaneous exchange of information among school, PTA, self-governing meeting, police, local enterprises, etc.
  - If rules are defined clearly, information can be exchanged between sites of activity bypassing heads of organizations.

Development and popularization of ICT → Understanding of paperweight type and network type systems

Increase in the variety of tools applicable to crime prevention

Cooperation beyond walls of organizations

Reinstatement of community power with ICT as leverage

Increased number of cases admitted as crime

× ×

Incapacity to adapt effectively

Deteriorating community power

Hardship of the financial condition at local governments

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Measures of the country and designing of safe and peaceful towns by Osaka Prefecture

- u-Japan and safety
  - "Realization of safe/secure living environment" that combines 3 factors of safety of foods, crime prevention and provisions for disaster = Task of highest priority
- Provisions of Osaka Prefecture
  - Conference and seminars
    - Start of [Osaka ICT promotion seminar for (Designing of safe towns)]: Mary 2005
    - Osaka IT utilization conference for designing of safe and peaceful towns: May 2004
  - They were then united as a conference. Its subcommittees promote researches.
    - Osaka ICT utilization conference for support of designing safe and peaceful towns (Daiankyo, in short)
      Constituted by 40 enterprises, 20 local governments and 5 researchers.
      http:// www.osaka-anzen.jp/

- Ordinance for designing safe towns of Osaka: April 2002
  - Initial ordinance of this kind over the country
    A total of about 60 "Safe town designing promotion conference" were organized in the Osaka Prefecture in cooperation with cities, towns, villages and police stations: As of June 2004, 9 cities established their own ordinances for designing of towns: These are projects in cooperation with the Prefecture.
- Unique projects by local communities
  - Tsurumi-ku, Osaka City, organized a ladies team with about 60 members. (The team contributed to reduce cases of snatching robbery by 45% a year.)
  - Association of self-governing meetings has been promoting Anshin (Peace of mind) Patrols with members beyond generations at Kasugaoka, Ibaraki City.
  - Unique activities such as watching of children in the areas, creation of local crime prevention map, etc. have been promoted also at other areas.

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Scale of the domestic market for ICT and related matters for safety and peace of mind

Table 1 Scale of the domestic market for ICT and related matters for safety and peace of mind

Kinds of Product (value in ¥1 million, quantity in 1,000 pcs.)	2001	2002	2003	2004	2005	2006	2007	2010
IC tag *1 *3 (value in top line, pieces in lower line)	3,675	3,710	3,752	3,792	4,340		9,550	43,840
	5,250	10,600	13,400	15,800	21,700		95,500	2,192,000
IC tag-related *2 *4 (value)	13,548	15,602	17,314	16,383	32,239	45,710		
IC card *1 *5 (value in top line, quantity in lower line)	10,412	17,425	23,031	33,680	39,550	48,670	52,785	66,600
	18,930	34,850	51,180	84,200	113,000	157,000	195,500	333,000
Biometrics *1 *3 (value in top line, pieces in lower line)			6,565	9,125	14,675			30,110
			47,950	587,700	953,000			2,467,550
Biometrics-related *2 *4 (value)		760	1,867	2,357	21,342	27,467		
Mobile phone for which non-contact IC card can be used *1 *4 (number of units shipped)					16,800	23,000	28,000	32,000

*1: Yano Research Institute Ltd.
*2: Japan Automatic Identification Systems Association (JAISA, an incorporated association). Calendar year
*3: Based on actual results for FY2004 and earlier. Estimation or forecast for later years.
*4: Based on actual results for FY2004. Estimation or forecast for later years.
*5: Based on actual results for FY200   and earlier. Estimation or forecast for later years.

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Examples and classification of ICT utilization for designing of safe towns

- "Local information network for peace of mind and safety" (See the conceptual diagram of structure referred to later.)
  - "Presentation of disaster/crime prevention information, etc." based on multi-source/multi-purpose technology (More than one for both input and output)
  - Cross-referencing of information among the fire fighting, police, school, administration and community
  - Utilization of digital network enables to provide accurate and speedy cooperation among organizations of different characters.
  - Network function/linkage is essential more than anything else for local systems.

- Classification of ICT utilization
  - (1) Risk information early warning type
  - (2) Risk information early sharing type
  - (3) Countermeasures supporting type
  - (4) Risk discovery support/watching appeal type
  - (5) Entrance/exit and movement control type
- Examples of ICT application
  - Remote browsing of Web (Including browsing via cellular phone)
  - e-Mail (Including e-Mail via cellular phone)
  - Street camera, robot eye camera
  - Geographic information system (GIS), etc.

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Classification and related elementary technologies of ICT safety and peace of mind securing system [I]

Table 2   Classification and related elementary technologies of ICT safety and peace of mind securing system, based on (1)

	Technology mainly used								
	Web (including browsing with mobile phone), remote browsing	e-Mail (including e-Mail via mobile phone), etc.	Mobile phone camera	Crime prevention camera and robot eye camera	Mobile phone with GPS function	Geographic information system	Wireless LAN	IC tag	Intrusion prevention by IC card or sensor
(1) Risk information of early warning type, based on multi-media technique									
(a) Osaka Prefectural Police Headquarters "Video image dial 110"									
(2) Risk information of early sharing type									
(b) Ikeda City "ANSIN Mail System"									
(c) Izumi General Crime Prevention Center "Crime prevention catcher"									
(d) Kadoma City PTA conference "Safety network system"									
(e) Toyonaka City "Local peace of mind and safety information sharing system"									
(f) Hirakata City "Local safety and peace of mind information sharing system", Ministry of Internal Affaires and Communications									
(3) Countermeasures of support type									
(g) Shimanouchi district, Higashi-Osaka City "Digital crime prevention map"									

Based on the writer's analysis on his own responsibility for the cases recorded in the "ITC utilization handbook for designing safety and peace of mind town" (Osaka, etc.) or others

KNakano [Data A]

Classification and related elementary technologies of ICT safety and peace of mind securing system [II]

Table 2 Classification and related elementary technologies of ICT safety and peace of mind securing system based on ICT (2)

	Technology mainly used									
	Web (including browsing with mobile phone), remote browsing	e-Mail (including e-Mail via mobile phone), etc.	Mobile phone camera	Crime prevention camera and robot eye camera	Mobile phone with GPS function	Geographic information system	Wireless LAN	IC tag	Intrusion prevention by IC card or sensor
(4) Early risk discovery support/watching appeal type										
(h) Osaka Prefectural Police Headquarters "snatching prevention pilot district project"										
(i) "Street crime prevention system" (street corner coin machine robot)										
(j) Use of crime prevention camera network										
(k) Tracking of children on their way to and from school (IC tag)										
(l) Project to create a system that safety and peace of mind of school children making good use of active IC tags										
(m) Designing a safety and peace of mind town using N-code										
(n) Substantiative experiment of electronic tags to safety and peace of mind of school children										
(o) Technological development of Ritsumeikan University, Nishi-Otsu										
(p) Communication and GPS integrated terminal										
(q) Crime prevention robot (Banryu or "protecting dragon")										
(5) Entrance/exit and movement control type										
(r) Refle Promontory and Sea View Slope "Town security"										
(s) e-CAB Express (Tax linked with GPS)										

Based on the writer's analysis on his own responsibility for the cases recorded in the "ITC utilization handbook for designing safety and peace of mind town" (Osaka, etc.) or others

Mobility which has been realized only with the feature of digital network [I]
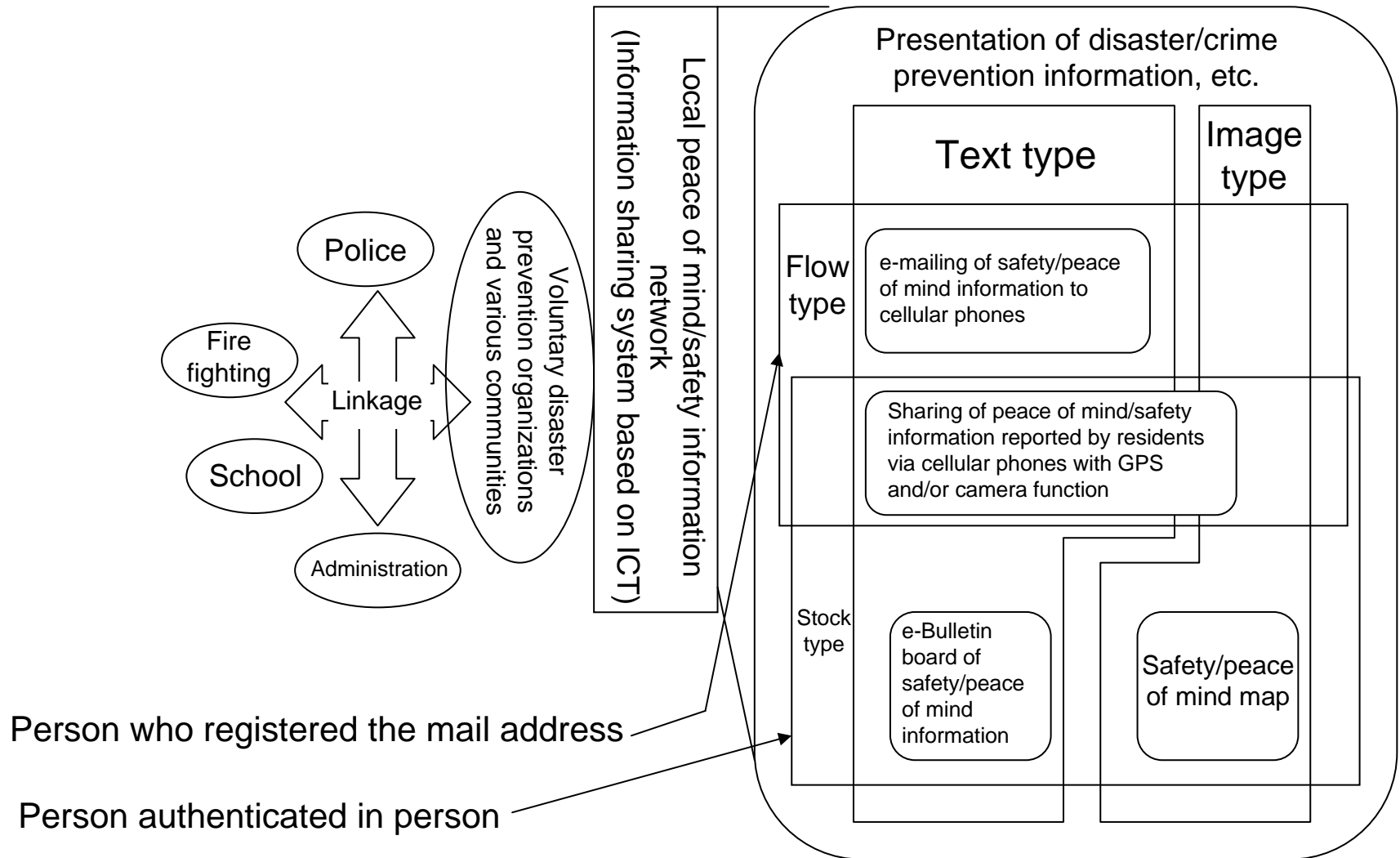

Chart 6 Example of the configuration of local peace of mind/safety information network (Modified from the data of Toyonaka City)

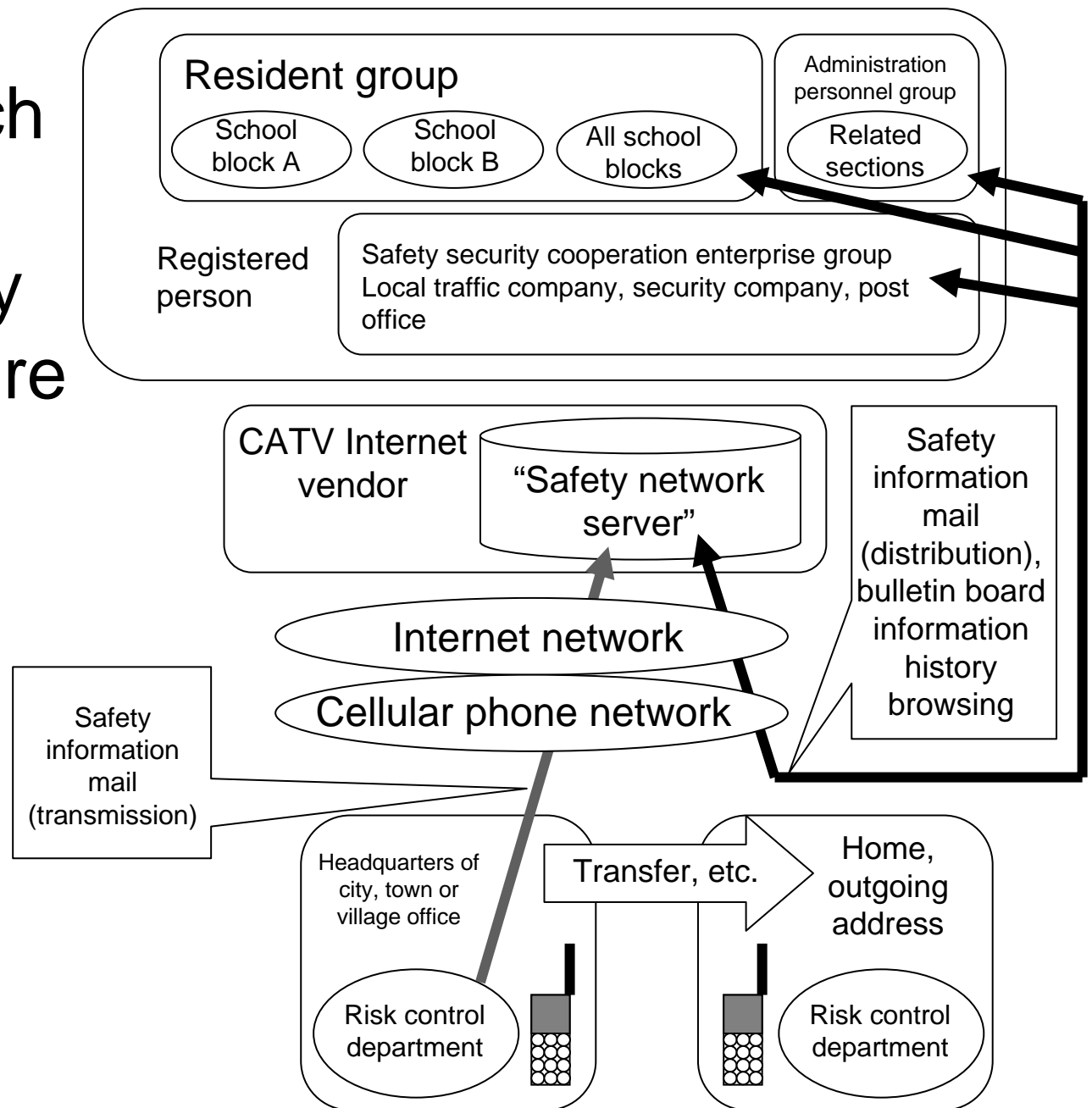Mobility which has been realized only with the feature of digital network [I]

Resident group

School block A

School block B

All school blocks

Administration personnel group

Related sections

Registered person

Safety security cooperation enterprise group
Local traffic company, security company, post office

CATV Internet vendor

"Safety network server"

Safety information mail (distribution), bulletin board information history browsing

Internet network

Cellular phone network

Safety information mail (transmission)

Headquarters of city, town or village office

Transfer, etc.

Home, outgoing address

Risk control department

Risk control department

Chart 7 Conceptual diagram of "ANSHIN (Peace of mind)" mail system (Ikeda city)

Specification of wireless communications for municipality's disaster prevention administration

- Wireless communications displays its great power in a disaster. There are wireless communications methods available to ordinary citizens in case of a large disaster such as data broadcasting including terrestrial digital broadcasting and satellite broadcasting, as well as disaster message dial (with fewer restrictions on distribution than telephone by sound). At the same time, special wireless communications methods are secured by local governments, police and fire stations that support and protect citizens for their unrestricted communications.

Rough Category	Category by Objective	Frequency Band	Objective
Wireless communication method for disaster prevention administration of municipalities	Fixed-type (simultaneous warning)	60MHz	Issue warning to local residents via outdoor speaker, etc. to share disaster information
	Mobile-type	150MHz 400MHz	Communications such as collection and transfer of disaster information between the municipality office and vehicles in disaster-hit areas
	Telemeter-type	(70 MHz and 400MHz for prefectures)	Connect with a weather observatory to get such data as rainfall and level of river.
Wireless communication method for local disaster prevention		800 MHz (MCA Method)	Communication regarding disaster prevention activities among municipalities and their branch offices, organizations related to local disaster prevention such as those involved in local information or flood prevention, the police, bodies relating to daily life such as those involved in medical service, electricity, gas, communications, transportation, or finance, agricultural cooperatives and voluntary disaster prevention groups.

KNakano [Data A]   (Based on the materials of Kinki Bureau of Telecommunications, etc.)