日本国総務省総合通信基盤局国際部

ISSN 1346-5317

MPHPT COMMUNICATIONS NEWS

September 10, 2001, Vol. 12, No. 11

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Biweekly Newsletter of the Ministry of Public Management, Home Affairs, Posts and Telecommunications, Japan

Promotion Measures for Nationwide Construction of High/Ultrahigh-speed Internet

MPHPT has been holding the "Panel on Construction of Info-communications Network in the 21st Century" (Chair: Mr. Yutaka KOSAI, Chairman, Japan Center for Economic Research) since April 2000. The panel compiled i) on June 30, 2000, the first interim report on an image of info-communications networks in the 21st century, the way related for implementation thereof and necessary policy measures, and ii) on December 25, 2000, the second interim report on the five-year target schedule from CY2001 to CY2005 for constructing ultrahigh-speed networks, based upon objectives for forming ultrahigh-speed networks stipulated under the "IT Basic Strategy" and the "Basic Law on the Formation of an Advanced Information and Telecommunications Network Society (IT Basic Law)."

After the second interim report, the government has been promoting further measures toward realization of the IT revolution through adoption of the e-Japan Strategy, the e-Japan Priority Policy Program and the e-Japan 2002 Program, etc. In line with the government efforts, the panel, on August 3, 2001, compiled its findings as the final report after a series of deliberations on various topics. Based upon the final report, MPHPT will implement measures for countrywide penetration of high/ultrahigh-speed Internet access.

1. Measures for countrywide penetration of high/ultrahigh-speed Internet

Along with subscriber access networks become faster and large capacity, trunk networks are thought to become faster and of a larger capacity. Thus, investments into wavelength division multiplexers (WDMs), etc. and R&D on photonic networks shall be promoted. High/ultrahigh-speed network penetration in areas with worse conditions shall be promoted, in parallel, measures for facilitating effective use of ducts, dark fibers, etc. by carriers shall be studied.

Furthermore, there is a need to solve emerging problems concerning introduction of high/ultrahigh-speed Internet into collective housings, etc. in urban areas. The central and local governments shall make collaborative efforts to construct the e-government and develop public applications/content through effective use of high/ultrahigh-speed networks connecting public facilities.

As shown above, although there are various problems in promoting countrywide penetration of high/ultrahigh-speed networks, this final report focuses on preparation of infrastructures for high/ultrahigh-speed networks and issues concerning terms and conditions for providing services, and proposes desirable policy measures for closing the following two digital divides based upon analysis on the current status and problems thereof.

i) Promotion of ultrahigh-speed network penetration into collective housings, etc.
   - Closing the digital divide caused by a residential environment

ii) Promotion of ultrahigh-speed network infrastructure construction in areas with worse conditions
   - Closing the digital divide caused by a geographical factor

2. Promotion of ultrahigh-speed network penetration into collective housings, etc.

The "e-Japan Strategy" sets goals to make Japan the world's most advanced IT nation within five years. To achieve the goals, vital measures are to introduce the high/ultrahigh-speed Internet into households living in collective housings, which occupy a 37.7% share in all households. Because the ratio of households living in collective housings is

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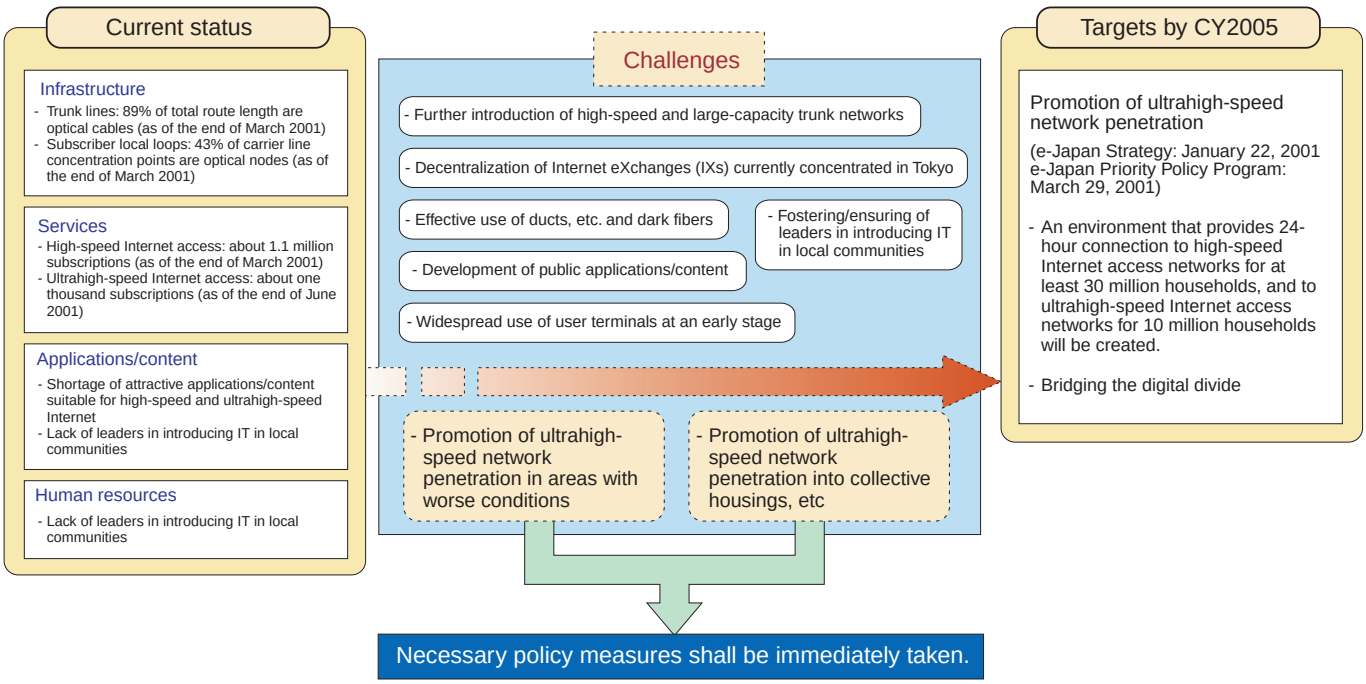
Fig. 1 Panel on Construction of Info-communications Network in the 21st Century



higher in urban areas, solutions of collective housing problems have greater significance in promoting urban renewal.

In order to introduce the high/ultrahigh-speed Internet into condominiums, installation spaces for DSLAMs, etc. are necessary. In cases of equipment installation work, new repair/improvement work or piping/wiring work at common areas and facilities, based on provisions of the Condominium Law, there is a need to receive three-fourth majority or more of unit owners or voting rights, in reality, extremely difficult.

Through revisions of regulatory frameworks and support measures for the private sector, the government shall promote widespread use of the high/ultrahigh-speed Internet in collective housings. To this end, promotion measures are needed, such as "facilitation of installation work/use of common areas and facilities through flexible application of systems concerning the Condominium Law," "creation of an approval system for condominiums, etc. compatible with the high/ultrahigh-speed Internet," etc.

3. Promotion of ultrahigh-speed network infrastructure construction in areas with worse conditions

The key infrastructure of ultrahigh-speed networks is fiber-optic networks. Accordingly, fiber-optic networks possessed and maintained by operating bodies other than telecommunications car-

Fig. 2 Problems in promoting ultrahigh-speed network construction into collective housings, etc.

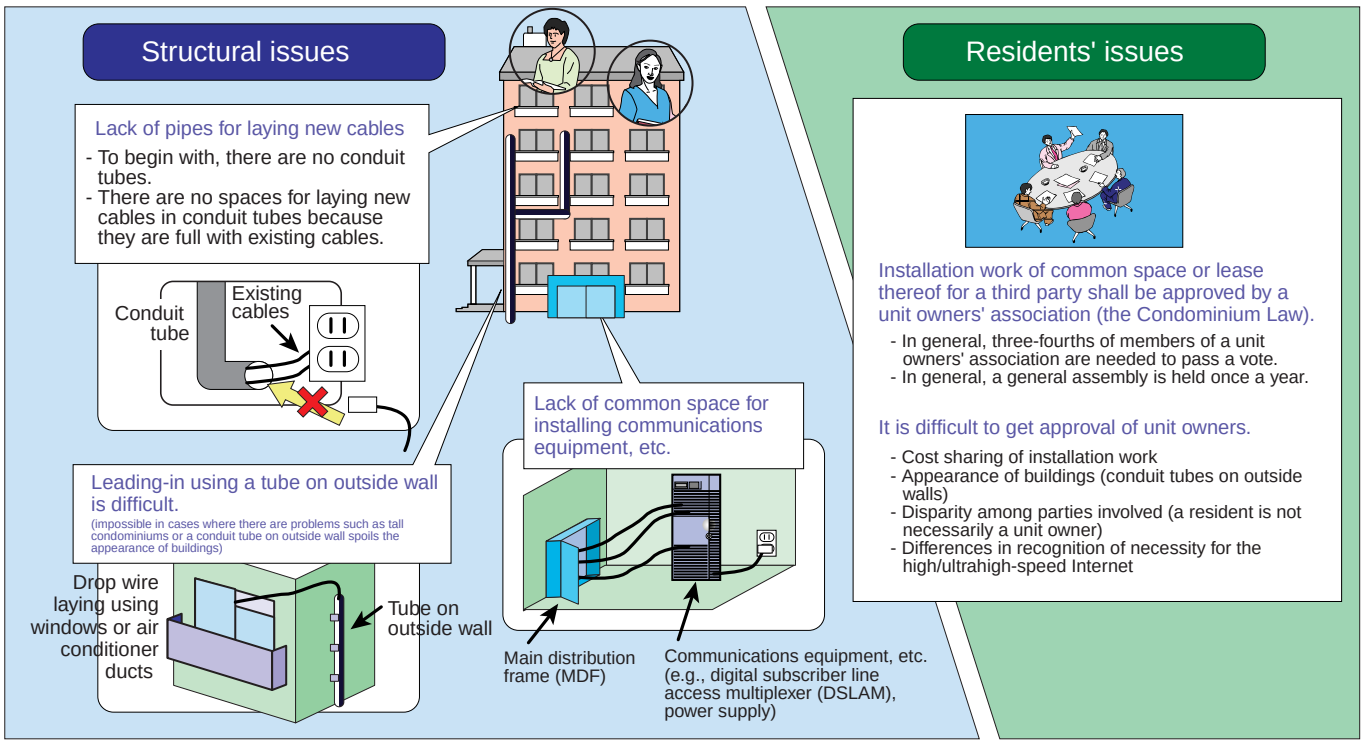
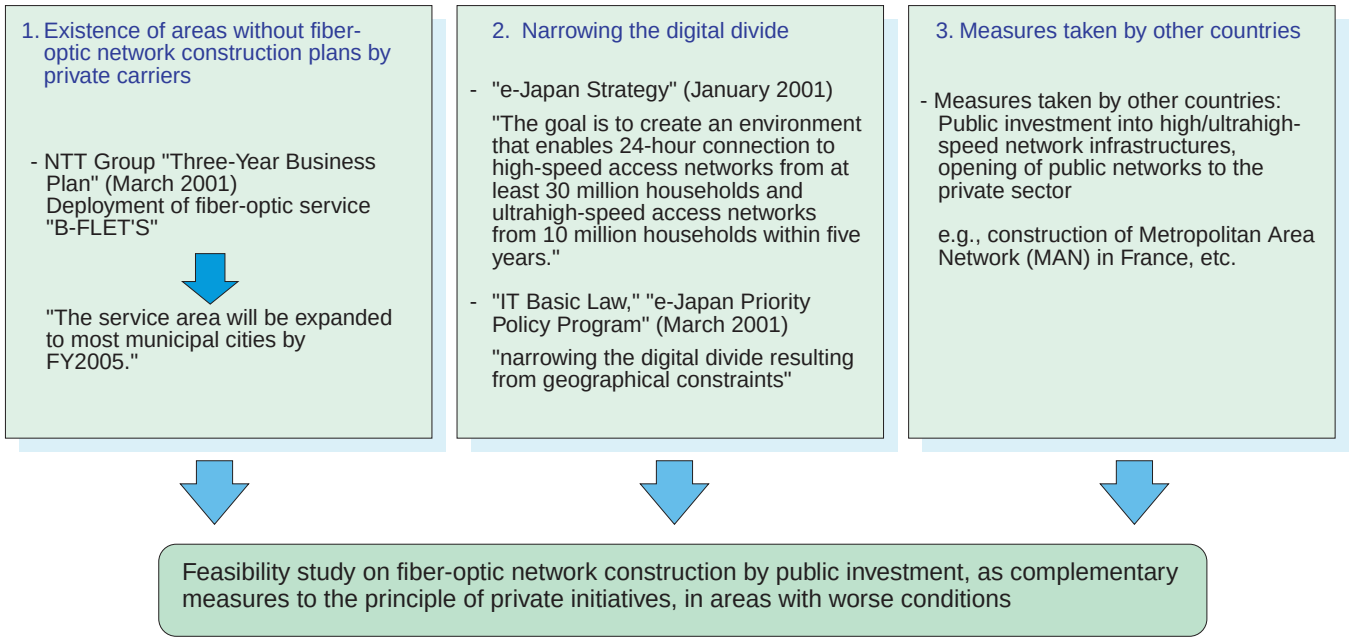


Fig. 3 Promotion of ultrahigh-speed network infrastructure construction in areas with worse conditions



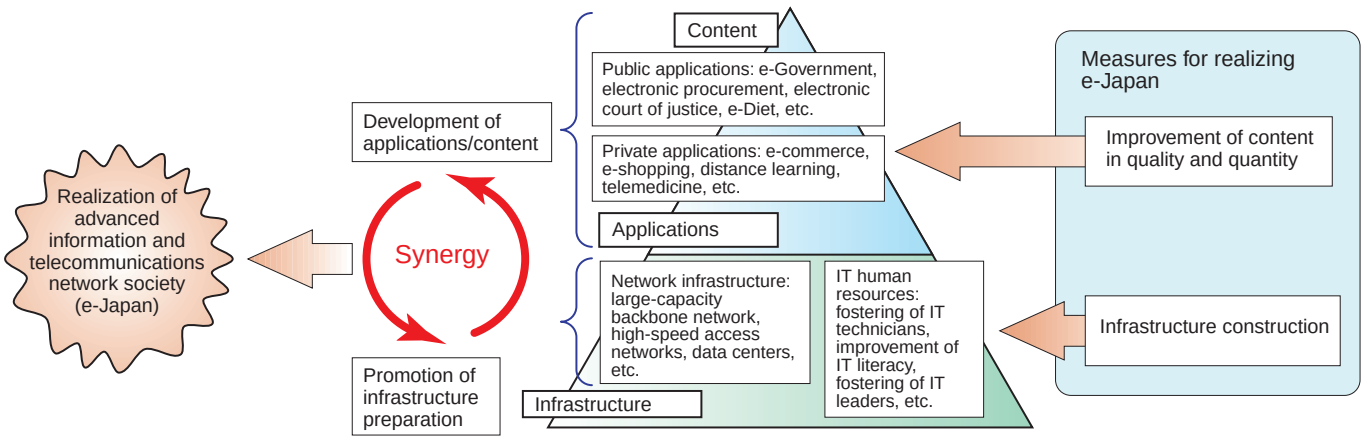
riers, namely, power utilities, railway companies, local governments, etc., shall be positively utilized as part of the ultrahigh-speed Internet, after due consideration to problems to be solved. To achieve the goals to make Japan the world's most advanced IT nation within five years, a countrywide environment shall be prepared, where users have access to the ultrahigh-speed Internet whenever they want. By overcoming geographical constraints, to enable all people to enjoy the benefits of IT is an indispensable factor to develop unique local communities. In light of the IT Basic Law, it is a must to positively narrow the digital divide caused by geographical constraints.

According to a research by Nomura Research Institute, Ltd., in CY2005 the ratio of line concentration points with economical rationality for constructing fiber-optic networks is up to 80.8% but, in particular, in rural areas the ratio decreases to less than 40%. Taking a look at service deployment plans of private businesses, at present, there will be no foreseeable areas with fiber-optic network construction plans in CY2005. As regards the goals of the "e-Japan Strategy" to make Japan the world's most advanced IT nation within five years, in order to bridge the digital divide, there is a need to construct fiber-optic networks in not only urban areas but also areas with worse conditions.

A result of questionnaires sent to local governments shows that i) although there is a problem concerning budgetary backgrounds, many local governments intend to invest public budgets into infrastructures, ii) regarding areas with worse conditions where private businesses hesitate to construct infrastructures, it is desirable that fiber-optic network infrastructures would be constructed by public investment. If fiber-optic network infrastructures are prepared, it is expected that advanced public services will lead to big reductions in administrative costs among others.

The fiber-optic network construction by public investment is to be regarded as supplementary measures to the principle of private initiatives. There would be two ways for constructing fiber-optic networks, namely, i) those projects shall be undertaken by local governments who are main beneficiaries and ii) taking into consideration the state goals to make Japan the most advanced IT nation within five years, upon implementation of those projects the central government shall play a leading role. After completion of the fiber-optic network construction by public investment, facing realities, operation and maintenance

Fig. 4 Promotion measures for countrywide construction of high/ultrahigh-speed Internet



of those networks, and provision of services for general users over those networks shall be undertaken by private telecommunications carriers and/or the third sectors.

As for target areas of the public investment, it is necessary to pay due consideration to the following factors: i) there are not enough fiber-optic networks, ii) private businesses will not positively construct fiber-optic networks until CY2005, etc. It shall be ensured that those fiber-optic networks constructed by public investment shall be opened to all telecommunications carriers on a non-discriminatory basis.

As regards operating bodies of those networks, many choices are possible, such as "state-run business," "businesses owned by local governments and subsidized by the central government," "private businesses directly subsidized by the central government," etc. Whatever they are, due consideration shall be paid to reduce financial burden of the central and local governments, and to encourage private initiatives to the fullest. For example, studies shall be carried out on utilization of local public networks and public finance initiatives (PFIs), and sale of those networks to private businesses after a given period, etc.

4. Promotion measures for country-wide construction of high/ultrahigh-speed Internet

It is necessary to promote policy measures by CY2005 as a target year, in a well-planned manner based on the "ultrahigh-speed network implementation annual target" proposed in the second interim report. Promotion of widespread construction of the high/ultrahigh-speed Internet will not be achieved without development of indispensable and attractive applications/content suitable for the high/ultrahigh-speed Internet. Accordingly, synergy between construction of infrastructure and growth in use shall be created.

Toward Diffusion of Websites with Excellent Accessibility

Verification experiments for the diffusion of websites with excellent accessibility for the elderly and people with disabilities

MPHPT has developed a "web accessibility system" for the purpose of promoting diffusion of websites with high accessibility for the elderly and people with disabilities. The ministry has commenced verification experiments in order to assess and evaluate availability, functions and user-friendliness of the system with the collaboration of local governments, etc.

For people with disabilities and the elderly with difficulty in moving places and communication, websites have become necessary means for obtaining diversified information. Thus, it is crucial that the websites be accessible by the elderly and people with disabilities.

However, many websites are not usable for the elderly and people with disabilities; some lack labeled graphics (with text information) as substitute for image information, some lack screen reader compatibility functions with which people suffering from vision impairment can grasp images, or others cannot be understood by people suffering from color blindness because their graphs and tables are made only with color information. Now, it is an important task to improve web accessibility for the elderly and people with disabilities.

As guidelines for web accessibility, the World Wide Web Consortium (W3), an international organization, created the "Web Content Accessibility Guidelines 1.0" in 1999. In Japan, based on the W3 Guidelines, the "guidelines concerning creation method of accessible web content over the Internet" was published in 1999.

The latter guidelines stipulate methods for website creators and authoring tool developers to provide the elderly and people with disabilities with websites accessible as well as technological issues that have to be cared so that the elderly and people with disabilities may understand web content.

MPHPT, based on the guidelines, has created a support system with functions such as evaluating websites whether or not they are accessible for the elderly and people with disabilities in FY2000.

The system is composed of:

1) Evaluation/correction systems with functions to check problems of given websites, and, if necessary, to automatically correct or to lead the creator to easily correct;
2) Access support systems which improve web accessibility for the elderly and people with disabilities, e.g., enlarging fonts or altering coloration to more eye-friendly; and
3) Accessibility sensing systems with functions which include screen reader compatibility and show examples of views of people who cannot distinguish colors.

The evaluation/correction systems, the core function of the entire system, checks websites with more than one hundred items classified in four priority levels, and evaluate checking results in four grades of B, A, AA and AAA.

MPHPT is planning to conduct verification experiments in FY2001 - FY2002 in order to make the support system more easy-to-use.

Since September 2001, the verification experiments of the support system have been commenced in three areas (Sendai City, Okayama Prefecture and Fukuoka City) with collaboration of local governments, private companies, website creators, etc. In the verification experiments, the Senior-net (which supports IT use of the elderly and people with disabilities) and PC volunteers participate.

After getting the test results, the improved system is planned to be released for the public use. MPHPT will encourage the use of the support system in government organizations as well as in other places, and promote the diffusion of websites accessible not only for the elderly and people with disabilities but also for every citizen.

Facilities and Equipment Investment by Communications Industry Totals 3.8 Trillion Yen in FY2000, Scheduled to Reach 4.1 Trillion Yen Total in FY2001

MPHPT compiled a survey result on facilities and equipment investment by the communications industry conducted in March 2001.

- **On Actual Facilities and Equipment Survey for Communications Industry**

The survey has been conducted twice a year since FY1989 for the purpose of comprehending actual facilities and equipment investment and its trend.

[Businesses surveyed]

Category	Questionnaires sent	Collected questionnaires	Collection rate (%)
Type I telecommunications carrier	256	216	84.4
Type II telecommunications carrier	1,084	400	36.9
Private broadcasting business	435	363	83.4
Cable TV operators	235	197	83.8
Total	2,010	1,176	58.5

Type I telecommunications carrier: All carriers were surveyed.
Type II telecommunications carrier: All Special Type II carriers were surveyed; as for General Type II carriers, carriers capitalized at or more than 30 million yen were surveyed.
Commercial broadcasters: All broadcasters are surveyed.
Cable TV operators: Operators other than stock companies with equal to or more than 100,000 drop terminals are excluded.

Outline of the survey

1. Amounts of facilities and equipment investment of the communications industry

1) Actual facilities and equipment investment in FY2000 by the communications industry is expected to be 3,756.1 billion yen, down 8.2% from the previous fiscal year.
(A main factor is the investment decrease of NTT and Type II telecommunications carriers.)

2) Facilities and equipment investment plans by the communications industry for FY2001 increased to 4,076.3 billion yen, an 8.5% increase from the previous fiscal year.
(A main factor is the investment increase by long-distance and mobile carriers)

Table 1 Facilities and equipment investment amount by communications business

(Unit: 1 billion yen)

Type of business	FY1999		FY2000		FY2001	
	Actual result	FY99/FY98	Forecast actual result	FY00/FY99	Planned	FY01/FY00
Communications Industry	4,090.8	-4.5%	3,756.1	-8.2%	4,076.3	8.5%
Telecommunications carriers	3,821.2	-5.2%	3,491.2	-8.6%	3,777.6	8.2%
Type I carriers	3,398.2	-8.4%	3,277.0	-3.6%	3,590.7	9.6%
Mobile carriers	1,521.0	1.9%	1,500.1	-1.4%	1,730.2	15.3%
Other than mobile carriers	1,877.2	-15.3%	1,777.0	-5.3%	1,860.5	4.7%
Type II carriers	423.0	32.2%	214.1	-49.4%	186.9	-12.7%
Broadcasters	269.6	6.7%	264.9	-1.8%	298.7	22.8%
Commercial broadcasters	119.1	0.5%	92.0	-22.8%	123.3	34.1%
Cable TV operators	80.8	3.7%	93.6	15.8%	97.7	4.4%
NHK	69.7	23.8%	79.3	13.7%	77.7	-2.0%
All industries	42,024.0	-1.6%	43,479.2	3.5%	41,094.0	-5.5%

Note: The data on the all industries are based on the "Business and Investment Survey of Incorporated Enterprises," Economic and Social Research Institute, the Cabinet Office.

Table 2 Facilities and equipment investment amount by Type I carriers

(Unit: 1 billion yen)

Type of carrier	FY1999		FY2000		FY2001	
	Actual result	FY99/FY98	Forecast actual result	FY00/FY99	Planned	FY01/FY00
NTT	1,416.8	-18.0%	1,249.0	-11.8%	1,190.0	-4.7%
NCCs	1,981.3	-1.0%	2,028.1	2.4%	2,400.7	18.4%
Long-distance/international carriers	250.7	-11.7%	357.2	42.5%	478.7	34.0%
Satellite carriers	57.8	24.6%	5.2	-91.0%	4.3	-17.4%
Regional carriers	152.0	-4.6%	165.6	9.0%	187.5	13.2%
Mobile carriers	1,521.0	1.9%	1,500.1	-1.4%	1,730.2	15.3%

Note: The figures for NTT are totals of those of NTT East, NTT West and NTT Communications.

Table 3 Facilities and equipment investment amount by the communications industry

(Unit: 1 billion yen; %)

Type of business	FY1999 Actual result			FY2000 forecast actual result			FY2001 planned		
	Amount	FY99/98 (%)	%	Amount	FY00/99 (%)	%	Amount	FY01/00 (%)	%
Lease industry	8,119.3	15.3	19.3	8,600.0	5.9	19.8	8,298.1	-3.5	20.2
Electric machinery industry	3,802.2	12.8	9.0	5,366.3	41.1	12.3	5,016.4	-6.5	12.2
Communications industry	4,090.8	-4.5	9.7	3,756.1	-8.2	8.6	4,076.3	8.5	9.9
Electric power/gas industry	4,869.3	-3.9	11.6	4,115.5	-15.5	9.5	3,769.1	-8.4	9.2
Service industry	3,349.2	24.9	8.0	4,231.9	26.4	9.7	3,527.8	-16.6	8.6
Finance/insurance industry	1,509.6	-16.5	3.6	1,630.8	8.0	3.8	1,987.1	21.8	4.8
Transport industry	2,511.4	-8.5	6.0	2,024.2	-19.4	4.7	1,922.7	-5.0	4.7
Chemical industry	1,560.8	-14.9	3.7	1,538.8	-1.4	3.5	1,613.1	4.8	3.9
Automobile industry	1,479.6	-20.8	3.5	1,456.8	-1.5	3.4	1,437.4	-1.3	3.5
Retail/catering industry	1,667.8	-6.6	4.0	1,769.8	6.1	4.1	1,310.8	-25.9	3.2
Real estate industry	1,693.4	11.1	4.0	1,711.3	1.1	3.9	1,290.3	-24.6	3.1
Food/beverage industry	1,071.7	-6.3	2.6	1,087.8	1.5	2.5	1,032.2	-5.1	2.5
All industries	42,024.0	-20.3	-	43,479.2	3.5	-	41,094.0	-5.5	-

Notes: 1. Figures for industries other than the communications industry are based on the "Business and Investment Survey of Incorporated Enterprises," Economic and Social Research Institute
2. The share in all industries is the ratios of each industry's facilities and equipment investment amount in all industries' investment.

2. Trends of facilities and equipment investment purposes

1) Type I telecommunications carrier

The ratios of "for expanding service areas" and "for commencing new services" have increased.

Investment purposes of Type I telecommunications carriers

(Unit: %)

Purpose of investment	FY94 Actual result	FY95 Actual result	FY96 Actual result	FY97 Actual result	FY98 Actual result	FY99 Actual result	FY2000 forecast actual result	FY2001 planned
Coping with demand increase	78.0	86.5	88.0	84.2	79.2	80.0	84.6	81.6
Expanding service areas	28.0	30.9	40.4	35.9	30.8	34.9	36.2	38.0
Commencing new services	8.8	10.3	17.4	23.2	19.3	14.8	12.2	17.3
Commencing new business	14.1	19.2	11.5	7.1	11.9	14.8	17.8	8.2
Maintenance and repair	2.4	0.9	0.9	2.2	4.2	5.0	2.6	3.9
Renewal (replacing old equipment)	4.0	2.6	2.6	3.0	2.1	2.1	2.8	2.7
Research and development	0.6	0.3	0.3	0.4	0.4	0.4	0.2	0.4
Improving security and reliability	2.6	2.3	0.5	2.6	5.1	1.3	1.6	1.7
Improving efficiency	2.4	2.9	1.1	3.5	3.2	3.3	4.1	5.6
Others	10.0	4.5	6.6	4.1	5.9	7.9	4.2	4.0
Total	100	100	100	100	100	100	100	100

2) Type II telecommunications carriers

The ratio of facilities and equipment investment for "commencing new services" has increased while that for "expanding service areas" has decreased.

Investment purposes of Special Type II telecommunications carriers

(Unit: %)

Purpose of investment	FY94 Actual result	FY95 Actual result	FY96 Actual result	FY97 Actual result	FY98 Actual result	FY99 Actual result	FY2000 forecast actual result	FY2001 planned
Coping with demand increase	64.1	58.5	71.5	63.5	66.3	55.9	61.1	70.8
Expanding service areas	17.2	19.6	13.6	23.3	21.6	10.1	16.8	13.1
Commencing new services	18.1	9.6	22.5	15.7	20.5	9.0	8.6	21.0
Commencing new business	0.7	9.7	12.2	13.0	9.2	15.1	13.5	15.9
Maintenance and repair	6.7	6.8	4.0	5.6	8.9	11.1	9.1	8.6
Renewal (replacing old equipment)	5.1	11.1	7.6	10.5	8.4	15.8	5.9	4.1
Research and development	3.3	2.0	1.2	1.5	1.3	0.3	3.0	0.1
Improving security and reliability	6.9	4.8	8.0	7.0	6.5	3.2	7.0	6.8
Improving efficiency	12.3	10.5	5.3	5.3	3.3	6.7	6.4	3.2
Others	1.6	6.3	2.4	6.6	5.3	7.0	7.5	6.4
Total	100	100	100	100	100	100	100	100

Investment purposes of General Type II telecommunications carriers

(Unit: %)

Purpose of investment	FY94 Actual result	FY95 Actual result	FY96 Actual result	FY97 Actual result	FY98 Actual result	FY99 Actual result	FY2000 forecast actual result	FY2001 planned
Coping with demand increase	50.0	60.7	59.6	50.0	49.4	47.1	40.6	38.3
Expanding service areas	11.9	10.6	12.6	14.2	16.9	13.3	13.0	10.9
Commencing new services	13.8	16.3	13.7	13.4	11.8	13.2	13.0	14.6
Commencing new business	13.4	23.4	26.9	13.7	8.7	12.2	7.3	4.8
Maintenance and repair	16.3	8.7	9.0	12.3	14.4	13.9	16.5	13.9
Renewal (replacing old equipment)	8.1	10.1	8.0	13.0	13.4	15.2	17.7	20.6
Research and development	8.0	6.3	4.5	4.9	5.3	5.4	5.9	7.8
Improving security and reliability	7.4	7.1	10.0	7.7	6.1	6.2	6.7	7.4
Improving efficiency	2.6	2.7	3.5	5.8	6.2	5.5	7.7	8.3
Others	7.6	4.4	5.4	6.3	5.1	6.8	5.0	3.8
Total	100	100	100	100	100	100	100	100

3) Commercial broadcasters

50% of businesses made facilities and equipment investment for "renewal (replacing old equipment)" and "improving production capability."

Investment purposes of commercial broadcasters

(Unit: %)

Purpose of investment	FY94 Actual result	FY95 Actual result	FY96 Actual result	FY97 Actual result	FY98 Actual result	FY99 Actual result	FY2000 forecast actual result	FY2001 planned
Coping with demand increase	17.7	21.3	26.3	23.2	22.6	19.2	16.3	15.8
Expanding service areas	8.9	9.2	6.4	6.4	5.5	9.4	8.0	5.8
Commencing new services	1.6	4.4	3.0	4.5	5.4	4.9	5.0	6.1
Commencing new business	5.9	7.1	15.2	10.8	9.9	3.3	2.9	3.5
Maintenance and repair	25.6	19.9	21.3	20.2	21.3	18.2	21.4	21.9
Renewal (replacing old equipment)	10.0	11.2	9.3	11.7	13.5	14.7	13.5	12.3
Research and development	32.4	29.8	26.1	30.1	28.8	28.6	29.3	33.5
Improving security and reliability	0.8	0.2	0.6	0.3	0.5	0.5	0.6	1.7
Improving efficiency	4.7	5.7	4.3	5.7	5.2	8.0	8.7	8.0
Others	8.8	11.9	12.1	8.7	8.1	10.7	10.1	7.0
Total	100	100	100	100	100	100	100	100

4) Cable TV operators

The ratio of facilities and equipment investment for "commencing new services" has increased.

Investment purposes of cable TV operators

(Unit: %)

Purpose of investment	FY94 Actual result	FY95 Actual result	FY96 Actual result	FY97 Actual result	FY98 Actual result	FY99 Actual result	FY2000 forecast actual result	FY2001 planned
Coping with demand increase	75.5	74.8	78.6	78.7	73.0	71.0	75.4	75.7
Expanding service areas	51.3	54.9	56.0	59.4	56.6	50.6	45.8	43.6
Commencing new services	8.3	4.7	3.4	4.2	5.9	7.1	15.6	19.6
Commencing new business	5.3	6.3	9.3	6.3	2.8	4.2	5.5	3.6
Maintenance and repair	5.2	3.4	3.0	2.5	3.3	2.9	3.2	2.3
Renewal (replacing old equipment)	8.8	8.1	8.4	7.4	12.4	13.5	7.0	7.2
Research and development	5.0	9.1	5.3	4.9	5.2	6.6	7.1	9.8
Improving security and reliability	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.1
Improving efficiency	1.0	1.2	1.4	0.4	1.8	0.7	1.6	0.6
Others	4.4	3.3	3.2	6.0	3.9	5.1	5.7	4.3
Total	100	100	100	100	100	100	100	100