



INTERNATIONAL TELECOMMUNICATION UNION

**TELECOMMUNICATION
DEVELOPMENT BUREAU**

**Document INF/018-E
03 December 2007
Original: English**

6TH WORLD TELECOMMUNICATION/ICT INDICATORS MEETING, GENEVA, 13-15 DECEMBER 2007

FOR INFORMATION

SOURCE: Korea (Rep.)

TITLE: Further suggestions on the Single ICT Index: Perspectives of Republic of Korea

Further suggestions on the Single ICT Index: Perspectives of Republic of Korea

Acknowledging ITU's commitment to develop a single index stated in the ITU Plenipotentiary Conference 2006 (PP06) Resolution 131, the Korean government would like to present its perspectives within the development process.

1. Prelude

Prior concern must be given to the questions of 'why are we working towards a single index?', 'for whom is it for?', and 'for what purpose?' The key objective is to '[a] realistic international performance evaluation and benchmarking, through comparable statistical indicator...taking into account different national circumstances', referring to paragraph 28 of the Plan of Action. Therefore, the index must contribute to facilitate the efforts to achieve goal of the World Summit on Information Society (WSIS), and further serve as a measure to evaluate its progress. WSIS made commitment to connect all places including communities, schools, and health service centers. Consequently, the core objective to develop a single ICT index must be to reach the WSIS goal rather than simply remain as a development of an index alone.

2. Based on the above perspective, the Korean government would like to propose the principles of a single ICT index as follows

a. Provide policy implications and development

The Index must identify the obstacles of ICT development and provide policy implications. Hence, the Index is not to simply report on the rankings and progress of each nation's different ICT development level, but to analyze the countries' status and problems, and be helpful to develop relevant policies. When selecting the sub-indicators, therefore, obstacle factors deterring ICT usage environment must be fully taken into account.

b. Comply to the rapid transition of IT development

ICT is evolving in an unprecedented speed. The big challenge is to comply and accommodate such ICT usage trend. Important recognition must be given towards the rapidly changing trend from PSTN to the application of IP-based data transition and VoIP. Thus, focus of examination must avoid surrounding the traditional indicators; instead shift its focus on indicators complying with the current trend of emerging technologies such as broadband and wireless technology.

c. Utilize diverse data source based on its availability and contextual reliability

Because the main objective of Index development is to analyze ICT environment for policy development, therefore sometimes restricting all countries to employ identical data collection methodology may be unnecessary. Such rigid approach may restrict availability of data resource. Instead, a more flexible approach must be taken to allow flexibility utilization of diverse data sources depending on the countries' particular context. Overall, a balance is needed here between wanting to have as many countries as possible included in the index, and wanting to have the best indicators represented in the model. Hence, a modular approach will be appropriate which enables additional components to complement and create for its specific purposes, for instance, for investigating digital inclusion and regulations.

d. Encourage to improve nation's data collection method

The greatest challenge to measure the Index is availability of data source. In order to address this problem, an active involvement of BDT to encourage countries to yield the necessary data would be required rather than passively relying on the existing sources. This would enhance the credibility of the Index. It is to note that BDT's initiative effort and leadership will be essential for this purpose.

e. Measure not only the 'digital divide' between countries but also within countries (including gender inequality)

In order to measure digital divide across people and groups within countries, comparison between individuals and social groups must be needed, which requires social survey to measure ICT status of each individual or groups. This can be promoted through BDT's support to assist statistical techniques and knowledge for its member countries to conduct social survey.

f. Index that is applicable to different context with transparent methodology

Keeping the index as simple as possible so that it can be easily replicable and with a transparent methodology which is published online. It will be important to also let individual countries additionally input their own data online and to have access to the source code on the model.

3. Korean government's actual proposal to design Single ICT Index is as follows.

a. Standardization of indicators through Z-score method

The WTI Background Paper ‘Toward a Single ICT Index’, hereafter referred to as Background Paper, did not see any solid ground for the use of weightings on different indicators, and has rejected its use. However, despite of its wish to avoid weighting, due to the difference in measurement units and distribution range, a particular indicator with a large unit and high distribution range will predominantly influence the overall index score and its ranking. The Background Paper uses this method to adjust the size of measurement unit by dividing actual value by average (Actual Value/Average Value)*100 (see p.47). However, the Background Paper did not adjust difference in distribution range. Therefore, *International voice/traffic volume* ranges from 30 to as much as 1600, and Literacy rate ranges from only 20 to 120. Thus, a country with a very high volume of International voice/data traffic will score high in the total Index only due to this single indicator. Skepticism arises at this point on whether a country’s ICT development can entirely rely on its International voice/data traffic. It is for this reason, a very well known standardizing methodology Z-score, which is simple and easily replicable, is recommended. In this way, equal contribution will be obtained across all indicators. (see Note 1)

b. Inappropriateness of International voice and Internet bandwidth indicator

International voice and Internet bandwidth indicator needs to be reconsidered. The nation’s main goal for ICT development is to facilitate information and communication between its people and enhance social development. Thus, emphasis must be on measuring interaction between people within the nation rather than international traffic. Therefore, eliminating International voice and Internet traffic will be more appropriate. Furthermore, in terms of the updated situation, telecommunication channels are transferring from voice calls via PSTN to VoIP over IP network, and various ways of data transition such as emails and messengers are being used. However, VoIP is not yet included in the voice call measurements. Therefore, we suggest to use only domestic Internet traffic as a indicator for measuring of ICT utilization.

Traffic is the best indicator to measure volume of information exchange. Yet, this remains a difficult task and thus, we suggest to use bandwidth as a proxy measure. While the Background Paper agrees with the importance of domestic Internet bandwidth, the Paper indicates the difficulty to measure domestic Internet bandwidth. Korea, however, has successfully collected domestic Internet bandwidth data through a simple survey on local ISPs. Such Korean methodology could be shared with other ITU member states in order to yield domestic bandwidth indicator in an efficient way. (see Note 2)

c. Separating fixed and mobile Internet subscribers

According to the Background Paper, the *Usage-Intensity sub-index* includes *Broadband Subscribers* (p.44; 46). Considering the recent explosive use of mobile broadband, the indicator needs to be sub-categorized into *fixed* and *mobile broadband subscribers*. Further, if the purpose is to measure the actual ‘intensity’ of ICT usage, measuring the ratio of broadband subscribers to total Internet subscribers will be more accurate.

d. Adoption of ‘goal post’ methodology

Adoption of ‘goal post’ will enhance credibility of measuring *mobile subscribers per capita*. In some countries, mobile subscription rate exceed 100%, however, mobile subscription rate exceeding 100 per cent does not necessarily represent high ICT opportunity since the universal access condition for mobile service is 100 per cent. More than 100 per cent in mobile subscription rate are happening in countries which use prepaid card based subscription and lots of foreign residents are living. For instance, as prepaid cards bought by temporary foreigners are counted as subscription resulting those countries exceeding the rate of 100 per cent since subscription rate is calculated based the number of citizen. A solution to this shortcoming can be setting a ‘goal post’ of 100 per cent whereby, all cases exceeding 100 per cent will be assigned as 100 per cent. Indeed, a survey method which is collecting data by asking each individuals whether they subscribed mobile service or not, will eliminate such mis-counting and employing a goal post will be not necessary. However, when using data provided by service operators, a ‘goal post’ method must be adopted.

e. Re-composing sub-indices

ICT infrastructure must be established first, accompanied by an appropriate environment in order to utilize the infrastructure, and followed by active utilization. Therefore, it is more appropriate for the composite of the Index to include sub-indices of *infrastructure, opportunity, and utilization* rather than *user-density, opportunity, and usage-intensity*. (see Note 3)

f. Household as a unit of fixed-line telephone and Internet service

Considering that fixed-line telephone and Internet services are provided at a household level, *subscription rate by household* is more appropriate than *individual units*. In this respect, survey is the best method to measure household subscription rates by asking whether your household is

subscribed fixed-line telephone and Internet services. However, given that many countries have not yet conducted such survey statistics, dividing the total number of subscribers of fixed-line telephone and Internet services by the number of household rather than individual would be the most relevant alternative.

g. Re-composing sub-indices: User-Density and Usage Intensity

According to the Background Paper, *Internet User per capita* is included as a sub-indicator of *User-Density* measuring *Network infrastructure* (see p.43). However, since rate of Internet users directly relates to ICT use, re-composing it to *Usage-Intensity(utilization)* is appropriate. Alternatively, *subscribers data* must be included under *User-Density(infrastructure)*. Furthermore, taking into account the increasing trend of wireless Internet use, *Internet subscription rate* needs to be separated into *fixed* and *mobile* service. Hereby, mobile subscription rate is measured by individuals where as fixed subscription rate is measured by households.

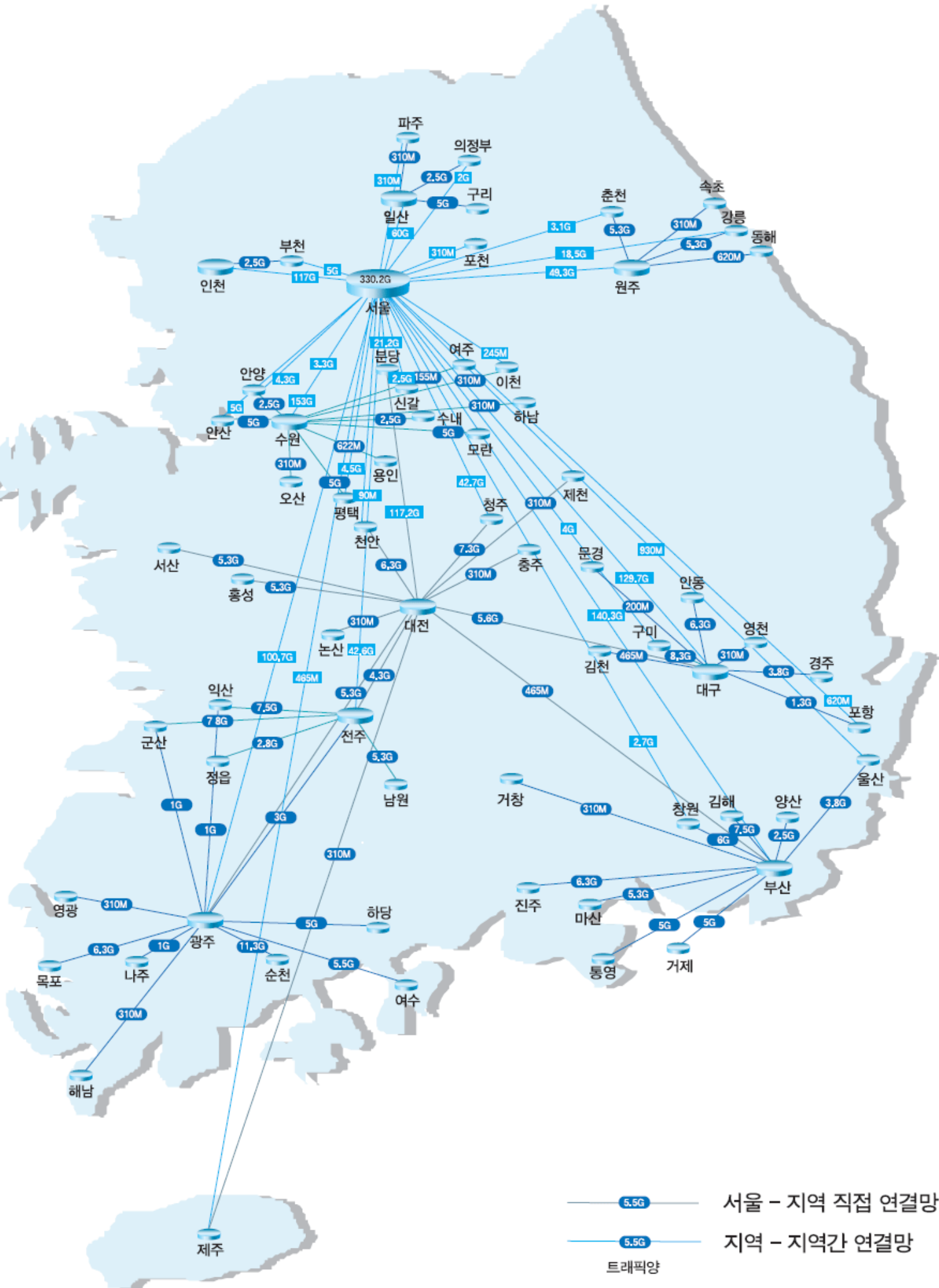
4. Comparison of Indicators proposed by the Background Paper and Republic of Korea

Categories	Background Paper	Republic of Korea	Comparison
User-Density/per capita (infrastructure)	<ul style="list-style-type: none"> - Mobile Subscribers - Fixed line households - Internet users 	<ul style="list-style-type: none"> - Mobile Subscriber - Fixed line households - Fixed Internet subscribers (/household) - Mobile Internet subscribers (/individual) 	<ul style="list-style-type: none"> - adoption of Goal post - no change - change - change
Usage-Intensity (utilization)	<ul style="list-style-type: none"> - International Voice + Data bandwidth - Broadband subscribers 	<ul style="list-style-type: none"> - Domestic Internet bandwidth (/capita) - Ratio of fixed broadband subscribers to total fixed Internet subscribers - Ratio of mobile broadband subscribers to total mobile Internet subscribers 	<ul style="list-style-type: none"> - change - change - change
Opportunity	<ul style="list-style-type: none"> - Mobile population coverage - Internet + Mobile affordability - Adult Literacy 	<ul style="list-style-type: none"> - Percentage of population covered by mobile telephony - Internet and mobile phone tariffs - Adult literacy rate 	<ul style="list-style-type: none"> - no change - no change - no change

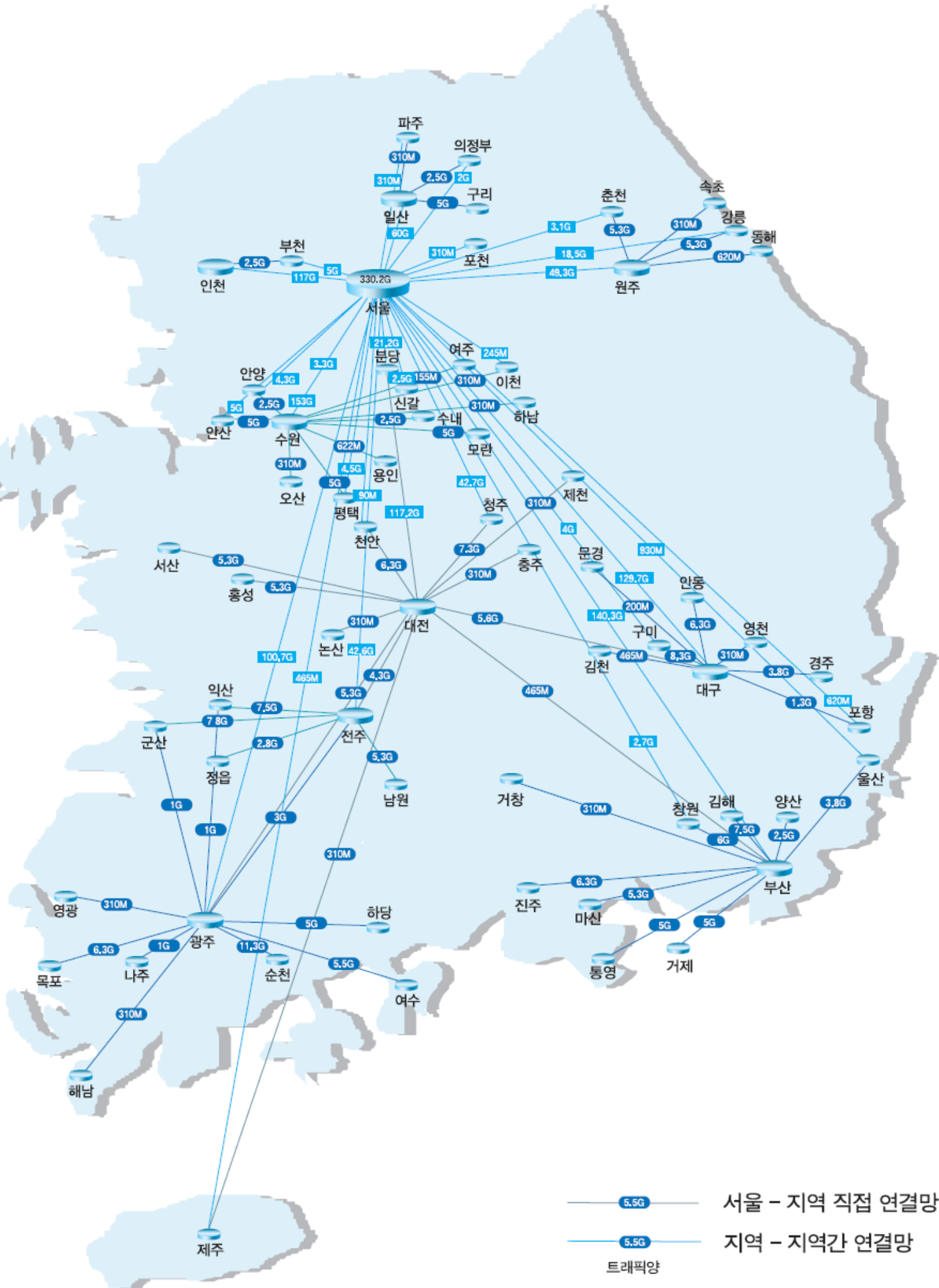
* Overall score and rank should be calculated by adoption of Z-score method in order to avoid artificially over-influencing of certain indicators.

Notes

1. $Z \text{ score} = (\text{actual value} - \text{average value}) / \text{standard deviation}$
2. Measurement of Domestic Internet bandwidth in Korea
Korean Agency(Korea Internet Development Agency) is collecting data on domestic Internet bandwidth volume against Korean ISP enterprises. Data is collected only on ISP which has its own telecommunication network. Measurement includes only bandwidth of backbone network connecting cities to cities excluding subscriber network. Because every ISP has its own record of bandwidth, this data collection process is very simple in Korea. In this sense, this method can be easily applied to all countries. The volume of Korea ISP's Internet bandwidth is presented in detail in the Appendix.
3. This involves some terminology issues. The Background Paper is using the term of User-Density for Infrastructure, Opportunity for Usage opportunity and Usage-intensity for Utilization. Thus, the basic composite between Background Paper and Korea proposal shares a similar framework. However, term infrastructure and utilization level appears to be more appropriate than user-density and usage-intensity.



파주 310M, 의정부 2.5G, 2G, 구리 5G, 춘천 3.1G, 속초 310M, 강릉 5.3G, 동해 620M, 서울 330.2G, 포천 310M, 원주 48.3G, 인천 2.5G, 부천 117G, 5G, 안양 4.3G, 3.3G, 21.2G, 2.5G, 155M, 310M, 여주 245M, 이천 310M, 안산 5G, 2.5G, 153G, 5G, 2.5G, 155M, 310M, 하남 310M, 수원 622M, 4.5G, 5G, 용인 90M, 모란 42.7G, 오산 310M, 평택 117.2G, 5G, 충청 310M, 제천 4G, 서산 5.3G, 천안 6.3G, 7.3G, 문경 930M, 홍성 5.3G, 논산 42.6G, 310M, 5.6G, 충주 129.7G, 200M, 영천 6.3G, 안동 310M, 대구 140.3G, 465M, 8.3G, 3.8G, 1.3G, 620M, 포항, 울산, 군산 7.8G, 익산 7.5G, 5.3G, 4.3G, 전주 5.3G, 310M, 465M, 2.7G, 정읍 1G, 1G, 3G, 남원 5.3G, 310M, 거창 310M, 창원 310M, 김해 7.5G, 양산 2.5G, 3.8G, 부산 6.3G, 영광 310M, 하당 5G, 5.5G, 진주 6.3G, 5.3G, 마산 5G, 5G, 통영, 거제, 목포 6.3G, 1G, 1G, 11.3G, 5.5G, 여수, 광주 310M, 순천, 해남, 제주



		ISP									
City	City	Dacom	Dreamline	SK Networks	SK telecom	Onse telecom	KT	Hanaro telecom	Samsung Networks	Enterprise	Sum
Suwon	Yongin						622M				622M
Suwon	Hanam						155M*2				310M
Suwon	Sunae						2.5G				2.5G
Suwon	Moran						2.5G*2				
Suwon	Anyang						2.5G				2.5G
Suwon	Ansan						2.5G*2				5G
Suwon	Pyeongtag						2.5G*2				5G
Suwon	Osan						155M*2				310M
Suwon	Yeosu						155M				155M
Suwon	Icheon						155M				310M
Incheon	Bucheon						2.5G				2.5G
Ilsan	Uijeongbu						2.5G				2.5G
Ilsan	Guri						2.5G*2				5G
Ilsan	Paju						155M*2				310M
Daejeon	Kwangju				310M					5G	5.3G
Daejeon	Daegu				310M*2					5G	5.6G
Daejeon	Pusan				155M*3					4G	4.3G
Daejeon	Jundgu				310M					4G	4.3G
Daejeon	Cheonan	310M	1G							5G	6.3G
Daejeon	Cheongju	310M	1G							6G	7.3G
Daejeon	Hongsung	310M					2.5G*2				5.3G
Daejeon	Chungju	310M									310M
Daejeon	Seosan	310M					2.5G*2				5.3G
Daejeon	Jaecheon	310M									310M
Daejeon	Nonsan						155M*2				310M
Daejeon	Jeju				310M						310M
Daegu	Koosung	310M	1G				2.5G*2			2G	8.3G
Daegu	Andong	310M	1G				2.5G*2				6.3G
Daegu	Pohang	310M	1G								1.3G
Daegu	Kimcheon	310M					155M				465M

		ISP									
City	City	Dacom	Dreamline	SK Networks	SK telecom	Onse telecom	KT	Hanaro telecom	Samsung Networks	Enterprise	Sum
Daegu	Munkyoung						200M				200M
Daegu	Kyeongju		1G				155M*2			2.5G	3.8G
Daegu	Yeongcheon						155M*2				310M
Kwangju	Kunsan		1G								1G
Kwangju	Iksan		1G								1G
Kwangju	Naju		1G								1G
Kwangju	Jundgu		1G							2G	3G
Kwangju	Yeongkwang	310M									310M
Kwangju	Mokpo	310M	1G							5G	6.3G
Kwangju	Haenam	310M									310M
Kwangju	Suncheon	310M	1G				2.5G*2			5G	11.3G
Kwangju	Yeosu	310M					155M			5G	5.5G
Kwangju	Hadang						2.5G*2				5G
Jundgu	Kunsan	310M					2.5G*2			2.5G	7.8G
Jundgu	Namwon	310M					2.5G*2				5.3G
Jundgu	Iksan						2.5G*2			2.5G	7.5G
Jundgu	Jeongup						155M*2			2.5G	2.8G
Wonju	Sokcho	310M									310M
Wonju	Kangrung	310M					2.5G*2				5.3G
Wonju	Donghae	310M					155M*2				620M
Pusan	Ulsan	310M	1G				2.5G				3.8G
Pusan	Jinju	310M	1G				2.5G*2				6.3G
Pusan	Masan	310M					2.5G			2.5G	5.3G
Pusan	Kimhae						2.5G*2			2.5G	7.5G
Pusan	Yangsan		1G				622M*2				2.5G
Pusan	Keochang						155M*2				310M
Pusan	Tongyeong						2.5G*2				5G
Pusan	Keoje						2.5G*2				5G
Pusan	Changwon		1G				2.5G*2				5G