

Subregional Workshop on ICT Co-deployment along Passive Infrastructure in South Asia

27 June 2019, New Delhi, India

Summary Report

ICT and Development Section
ICT and Disaster Risk Reduction Division

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List of Abbreviations

4G	Fourth Generation of Broadband Cellular Network Technology
ALTID	Asian Land Transport Infrastructure Development
AP-IS	Asia Pacific Information Super-highway
AU	African Union
CAREC	Central Asia Regional Economic Cooperation Program
CSD	Common Service Ducts
FOC	Fibre-Optic Cable
GPS	Global Positioning System
HDI	Human Development Index
HDPE	High-Density Polyethylene
ICT	Information and Communications Technology
IDD	Information and Communications Technology and Disaster Risk Reduction Division
ITS	Intelligent Smart Transport
MOT	Ministry of Transport
NH	National Highways
NHAI	National Highways Authority of India
PPP	Public-Private Partnerships
ROW	Right of Way
SDGs	Sustainable Development Goals
TMIS	Transport Management Information System
UN ESCAP	United Nations Economic and Social Commission for Asia and the Pacific

Background

1. Expanding ICT connectivity has played a strategically significant role in achieving the 2030 Agenda for Sustainable Development in the Asia-Pacific region. ICT enables growth across sectors through accelerated innovation that increases productivity and efficiency. It provides a foundation for digital economy and society that bring socio-economic transformations in many significant ways including advancing health, education, financial services, smart agriculture, and energy systems; accelerating online communities, commerce, finance, and a wide range of services; economizing resource allocation and usage; and promoting public awareness and engagement.
2. However, investment in ICT infrastructure development is costly and time consuming and is further complicated by negotiations required when it comes to cross-border connectivity. One of the means to expand broadband connectivity is to leverage cross-sectoral infrastructure synergies; that is, through co-deployment of fibre optic cables (FOCs) along passive infrastructure such as roads, railways, power grids and oil and gas pipelines.
3. Co-deployment could save costs of infrastructure deployment by minimizing duplicated civil works and environmental impacts via a one-time investment and construction. Through significant cost saving opportunities, it would allow countries to scale up and access more quickly and efficiently infrastructure networks, both within and across national boundaries. It also serves a wide range of complementary purposes which benefits other infrastructure sectors that need high-speed broadband and ICT services. For instance, transport entities can leverage FOC network to develop intelligent transport systems and other applications for modern transport. As such, codeployment results in a win-win outcome for all involved sectors.
4. However, various challenges and constraints are encountered by some member countries. The challenges do not only emerge from financial issues, but political and institutional issues have also been an obstacle. Therefore, raising awareness and knowledge of policy makers on the practical implications of cross-border co-deployment would facilitate informed decisions and ensure that countries take a mutually beneficial approach to materialize the practice of co-deployment in crossborder projects. At the same time, the capacity development will contribute to an informed consideration of the implementation of the Asia-Pacific Information Superhighway (AP-IS) Master Plan and Regional Cooperation Framework Document 2019-2022.

Objectives

5. Against this background and considering the potential opportunities of co-deployment to promote regional infrastructure connectivity for sustainable development in Asia and Pacific, ESCAP's ICT and Disaster Risk Reduction Division, together with ESCAP's Transport Division and Subregional Office, will organize a "Subregional Workshop on

ICT Co-deployment along Passive Infrastructure in South Asia”, in New Delhi, India, with the objective to raise awareness and facilitate constructive dialogue between government officials responsible for ICT and Transport respectively on opportunities and challenges for implementing policies on cross-border infrastructure co-deployment. In addition, to discuss the policy implications of cross-border ICT co-deployment on national and regional legislative and regulatory frameworks.

Agenda and Participants List

6. Agenda and participants list are attached as Annex 1 & 2 to this summary report.

Session 1: Opening Session

7. Mr. B.N. Puri, Director (R), Asian Institute of Transport Development welcomed participants to the subregional meeting. He noted that the issue of ICT co-deployment along passive infrastructures such as roads and railways has been a topic that AITD given considerable attention. Mr. Puri further noted the close collaboration between AITD and ESCAP on this issue when AITD was lead-consultant to conduct an ESCAP study titled, ‘Co-deployment of Fibre Optic Cables along Transport Infrastructure for SDGs, Including Cross Border’¹, in December 2018. He noted that the report consolidated national experiences on co-deployment of ICT along passive infrastructures (roads and railways) in selected countries.
8. Mr. Nagesh Kumar, Head of Office, Subregional Office for South and South-West Asia ESCAP delivered his welcoming remarks by thanking AITD for the opportunity to collaborate and co-host the subregional event. Mr. Kumar reminded participants of the important role of ICT for economic development and noted the need for countries in South Asia to harness the synergies between ICT and Transport infrastructures for sustainable development. Mr. Kumar stated that co-deployment at the national level in India is handled by Railtel Corporation which provides a neutral fibre optic network infrastructure on exclusive right of way (ROW) along railway tracks nationwide. However, he noted that much attention is needed for cross-border ICT co-deployment along passive infrastructures, while noting that it has been estimated to cost around US\$5 billion needed for infrastructure development in South Asia. He assured participants that the discussions in the coming day would facilitate sharing of national experiences on the issue as well as building consensus on a way forward for the subregion and acknowledged AITD as a pioneer of this work.
9. Mr. R. K. Pandey, Member (Projects), National Highways Authority of India Mr. R. K. Pandey, Member (Projects), National Highways Authority of India began his inaugural address by thanking AITD for the invitation to share his views on ICT co-deployment

¹ <https://www.unescap.org/sites/default/files/1-%20Transport%20Division-%20draft%20Final%20Report-%20Dec2018.pdf>

along passive infrastructure. He stated that ICT and transport infrastructure co-deployment is part of people's lives but acknowledged the complexity of arrangement, differing legal frameworks between countries, and different cultures of countries are key challenges.

10. Ms. Tiziana Bonapace, Director, Information and Communications Technology and Disaster Risk Reduction Division, UN ESCAP began her remarks by extending her sincere appreciation to AITD for the productive partnership and support to ESCAP's work on ICT and transport synergies, without which the subregional workshop would not have been possible. Ms. Bonapace noted that since more than 80% of the fiber optic cable deployment costs goes to civil engineering works, telecommunications service providers are increasingly attracted to the option of deploying fibre and ducts during excavation works related to roads, railways, power grids, oil and gas pipelines. She informed the meeting that large cost-savings are possible and stated that an ESCAP study² of ICT co-deployment (compared to separate deployment) in Myanmar has been estimated to save at least USD7,379 per kilometer. She further stated that for a network that is thousands of kilometers long, for example, the Asian Highway involves 143,000 km, cost savings could be in the order of more than USD1 billion.
11. Ms. Bonapace noted that the digital divide continued to be a major challenge in the subregion as well as the whole of Asia-Pacific. Notably, in Afghanistan and Pakistan only 2% of the population has access to fixed-broadband while in all countries of South and Southwest Asia, less than 1/3 of their respective populations having access to mobile-broadband subscriptions. She further noted that fibre-optic cables transmit the majority of the world's Internet traffic between countries and within countries. She further stated that a Cisco report³ in 2017 found that 59 per cent of all traffic from mobile-connected devices was offloaded to the fixed network by means of Wi-Fi devices and femtocells each month. As a result, she informed the meeting that putting in place appropriate policies to facilitate the cost-effective and timely deployment of fibre-optic cables within a country, and between countries is critical for inclusive broadband access and sustainable development.
12. Ms Bonapace informed the meeting that there is an opportunity to establish mutually beneficial digital gains between countries and sectors, such as ICT and transport. By lowering the costs of fibre optic cable construction through co-deployment, it can reach more villages and areas which are currently under-serviced. Such fibre optic networks would then benefit the transport sector through data collection and analysis for Intelligent Transport System (ITS), increased revenue and economic and social opportunities along the highways and railways.

² <https://www.unescap.org/resources/study-cost-benefit-analysis-fibre-optic-co-deployment-asian-highway-connectivity>

³ <https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white-paper-c11-738429.pdf>

Session 2: Transboundary Infrastructure Co-deployment in ICT and Transport Sectors: Opportunities, Challenges, and Legal, Regulatory and Policy Harmonization

13. Mr. Siope Vakataki 'Ofa, Economic Affairs Officer, ICT and Disaster Risk Reduction Division, ESCAP began his presentation by highlighting how the member countries have the opportunity to build and enhance synergies in the region through broadband infrastructure co-deployment. He discussed the status of ICT connectivity in the region and highlighted the state broadband access, affordability, and capacity in the South and Southwest Asia. He stated that the Asia-Pacific Information Superhighway (AP-IS) initiative aims to increase the availability and affordability of broadband Internet across Asia and the Pacific by promoting terrestrial and submarine fibre-optic connectivity between ESCAP countries. He updated the participants on strategic initiatives in the AP-IS Master Plan. In particular, he informed participants of the scope and type of ICT co-deployment opportunities along passive infrastructures that could reduce the cost of investment; decrease the frequency of construction on major highways; and improve overall broadband coverage.
14. Mr. 'Ofa stated that overcoming the challenges of co-deployment will require comprehensive domestic policies backed by law and a framework for international cooperation. He noted that major cross-sectoral coordination exercise among various government authorities, regulators, and the private sector is needed to benefit from co-deployment opportunities. In particular, the need for regulatory frameworks to support co-deployment and acknowledged that establishing cross-border fiber-optic cable connectivity links is a complicated process because of varying revenue sharing/business models, different provision by laws and regulations, and costly mechanisms to resolve cross-border connectivity issues. He concluded his presentation by emphasizing that strengthening ICT infrastructure connectivity is critical for the development of intelligent smart transport (ITS), smart cities, and digital economies in the sub-region.

15. Mr. Sandeep Jain, Economic Affairs Officer, Transport Division, ESCAP provided an overview of the United Nations global and regional mandates pertaining to transport infrastructure connectivity. He informed participants of the key regional transport infrastructure connectivity initiatives that ESCAP is supporting which includes the Asian Land Transport Infrastructure Development Project (ALTID); The Intergovernmental Agreement on the Asian Highway Network 2005; Intergovernmental Agreement on Trans-Asian Railway network 2009; and Intergovernmental Agreement on Dry Ports 2016. Mr. Jain moved on to explain the benefits of intergovernmental agreements, regional cooperation mandates, and stated that these intergovernmental initiatives provide a basis for the coordinated development of transport networks at regional, sub-regional, and national levels. He mentioned that these initiatives have helped promote common design and technical standards for development for transport infrastructure; enhanced domestic and regional transport connectivity; increased potential to secure financing; and led to the development of sub-regional networks.
16. However, he noted that despite these achievements, challenges exist: more than 7 per cent of the Asian Highway Network roads are still in sub-standard condition; about 10 per cent of the Trans-Asian Railway Network is still missing, and Intermodal-linkage between different modes of transport is inadequate. He emphasised the critical need for increased financial investment and stressed that approximately USD 3.5 billion would be necessary for improving the sub-standard sections of the Asian Highway Network and USD 76 billion to eliminate the missing links of the Trans-Asian Railway Network. He reminded participants that an integrated approach to developing quality, reliable, sustainable, and resilient infrastructure including regional and cross-border infrastructure is not only an SDG target, it is also critical to help achieve various other Sustainable Development Goals (SDGs) in the region.
17. He highlighted that building such an infrastructure requires integrated and cross-sectoral approaches. In particular, ICT connectivity along transport network is key to ensuring its quality and resilience and would support increasing the application of Intelligent Transport Systems. He stated that co-deployment of fibre-optic cables along road and rail

infrastructure could be a cost-efficient way of developing transport and ICT infrastructure and co-deployment along the Asian Highway Network and Trans-Asian Railway Network could support regional connectivity initiatives.

18. Mr. Jain informed participants that in 2014, a joint session of the Committees of Transport and ICT was organised to discuss harnessing cross-sectoral infrastructure synergies between Transport and ICT including co-deployment. Following the discussions at the Asian Highway Working group at the seventh session in 2017, the ESCAP secretariat undertook a further study on ICT co-deployment along passive infrastructures and organized a dedicated workshop during the fifth session of the Committee on Transport held in November 2018. He updated participants that the studies and policy discussions during the Committee' session demonstrated that ICT co-deployment along passive infrastructures is already practiced in many countries in the region and that policy coherence and coordinated approaches among relevant sectors are critical for identifying opportunities for successful co-deployment. He further stated that the ESCAP secretariat is currently implementing a UN Development Account Project on addressing the transboundary dimensions of the 2030 Agenda. The project will assess connectivity deficits along selected major connectivity corridors, to enhance inclusive and sustainable access to transport, electricity and ICT.
19. Prof. K. M. Baharul Islam, Dean of Indian Institute of Management Kashipur, began his presentation by highlighting the emerging opportunities and challenges of transboundary ICT infrastructure co-deployment between India and Bangladesh. He gave an overview of the India and Bangladesh's ambitious plans to expand fibre-optic connectivity in their respective countries, and promote increased use of broadband particularly for the last-mile connectivity. Prof. K. M. Baharul Islam informed participants that public-private partnerships (PPP) and infrastructure-sharing is a key component to successful broadband expansion. He noted that PPP interventions such as governments building ducts to share with service providers could also generate revenue for the local government and overcome the common Right of Way (ROW) challenges. He further noted another ICT codeployment opportunity in the subregion to partner with cable TV operators for rural

connectivity which allows the private sector to deploy fibre-optic cables along the highways. He concluded by that Infrastructure sharing at backend would not damage the sector's competitive landscape and in fact, such partnerships are necessary to make robust infrastructure projects successful.

20. Mr. Abdelmoula Ghzala, Transport Expert, began his presentation by emphasizing the relevance of digital connectivity to sustainable and inclusive development and noted that although fixed-broadband and mobile technologies are not explicit targets within the SDGs, the development of these broadband connectivities contribute to achieving socially inclusive and environmentally sustainable economic development. Mr. Ghzala stated that the high price of Internet services in many countries continues to undermine broadband adoption, particularly for low income and rural areas. He suggested that marginalized communities will require new business models, creative thinking, and active cooperation between all relevant stakeholders. Business models, that are tailor the solutions to the country's circumstances and needs, and serve reference tool for policymakers. Mr. Ghzala informed participants of that Africa is experiencing a growing digital divide with limited and expensive broadband connectivity slowing economic transformation but noted that the African Union, African Development Bank and the World Bank have adopted respective regional strategies and initiative for addressing connectivity gaps. He explained the case of Madagascar of which is one of the world's poorest economies but with good digital connectivity with 2 submarine fiber optic cables (East Africa Submarine System and Lion Cable) and one other submarine cable planned (METISS cable) to be connected by 2020. As a result, network coverage is around 90 per cent of the population, and broadband speed is one of the fastest in Africa. The development of the sector has been largely due to clear government planning with a national fiber cabling plan that focuses on rural areas, as well as support from the World Bank in funding projects.

21. Mr. Abhay Shanker Verma, Deputy Director General (Mobile Technologies), Ministry of Communications, India, started his presentation by providing a brief background of India's telecom sector. He pointed out the role of various regulatory agencies, telecom policies reforms and licensing processes for the ICT sector. He further expanded on the Indian

Telegraph Right of Way (RoW) Rules 2016. In particular, how these rules laid down critical principles for granting RoW permissions to the telecom sector, address and reduce various problems faced in getting RoW permissions, and set up a time-bound and straightforward procedure for RoW clearances.

22. Mr. Verma explained how India's 2018 National Digital Communication Policy encourages co-deployment by promoting collaboration models involving state, local bodies and private sector as necessary for the provision of shared duct infrastructure in municipalities, rural areas and national highways. Mr. Verma mentioned that these policies are facilitating the establishment of Common Service Ducts (CSD) and utility corridors in all new cities and highway road projects. Mr. Verma informed participants that these policies are effective on promoting and incentivizing the deployment of common sharable, passive as well as active, infrastructure.
23. Mr. Verma provided some empirical examples of ICT co-deployment interventions in India including telecom infrastructure provisioning on all lands and buildings of India's central government. He further noted that the national Universal Service Obligation Fund (USOF) was used to fund creation of shared Telecom tower infrastructure in unviable areas throughout India but acknowledged that the project took off for some time but more than 50 per cent of towers could not be used by Telecom Service Providers (TSPs) as envisaged and thus he could view the project as successful in a limited extent.
24. Following the presentations, Mr. Jain asked participants of their perspective on the need for developing a common standard on emerging technologies for transport connectivity. Mr. Verma responded that there is a need to ensure ICT connectivity before venturing into standards for emerging technologies. A representative of Bangladesh asked if only one service provider is allowed to provide services in a specific area in India. A representative of India responded that in the case of India, several telecom operators are allowed to operate in one area. Ms. Bonapace asked if there is one department in India tasked as coordinator of all the national initiatives on ICT and transport. A representative of India responded that a new reform policy was announced in 2018 and there are committees currently being formed to coordinate. A representative of AITD echoed Mr. Jain's

question on the need for developing a common standard and requested ESCAP to collaborate with AITD to look into this issue.

Session 3: Country Experiences on Trans-Boundary Infrastructure Co-deployment

25. Mr. Suresh Kumar, Executive Director, RailTel, started his presentation by informing participants how RailTel has facilitated the Indian railways' operations in modernizing train operation and safety systems by providing state of the art communication network infrastructure. He stated that RailTel infrastructure has not only benefited the railway sector but also helped develop, operate and maintain a nationwide broadband telecom and multimedia network to supplement national telecom infrastructure in all parts of country, especially rural and remote areas. He highlighted the innovative developments that were made possible through the existence of co-deployed broadband infrastructure along railways. This included high-definition video conferencing service and Wi-Fi stations. The Wi-Fi service was a collaboration between RailTel and Google that is providing Wi-Fi enabled internet service to over half a million monthly users in India through four hundred Wi-Fi enabled stations. He highlighted the future opportunities to use the co-deployed broadband infrastructure to promote digital literacy through ongoing plans to establish digital centers at 4000 railway stations that would enable a vast population to access digital services including e-governance and e-agriculture services.
26. Mr. Ali Farzam, CAREC & UN ESCAP Disk Expert, from the Ministry of Transport (MOT), Islamic Republic of Afghanistan mentioned that the country is reforming the transport by adopting new technological tools and systems which includes establishing a data collection and analytical unit within the structure of MOT (Ministry of Transport), and developing a Transport Management Information System (TMIS). He stated that using ICTs (e.g., equipping and monitoring public transport with GPS system and using transport data management systems to make reliable transport data accessible), would help MOT track its operation, improve the efficiency of the country's transport sector, and plan for its future. He further highlighted that the main challenges facing the transport sector

are lack of transport sector expertise and conducive policies towards developing a robust transport infrastructure network in Afghanistan. He noted that these challenges have unfortunately hindered the progress on development of the transportation sector.

27. Mr. Karma Sangay, Executive Engineer, Department of Information Technology and Telecom, Ministry of Information and Communications, Bhutan presented the state of connectivity in Bhutan. He informed the meeting that Bhutan's transition towards improved broadband connectivity started in 1999 with the introduction of the Internet. He stated that building resilient broadband networks is essential for landlocked Bhutan due to its mountainous terrain. He further stated that the national fiber optic cable network is provided free of charge for all telecom operators and rural connectivity relies on radio as backup but fiber connectivity as the main connector. He informed the meeting that broadband deployment and expansion is dependent on power infrastructure via transmission and distribution lines (98%). He further mentioned that the lack of digital literacy and the absence of local internet-based application are challenges for Bhutan's transition towards a more connected world.
28. The representative from the Ministry of Road Transport & Highways, India, started his presentation with the work of his Ministry including projects that have been implemented. He explained the BharatNet India which promotes fiber optic connectivity in the rural areas. The construction of utility ducts are provided in the urban areas, road safety is also important. Present the national highways in the projects. Laying of fiber optic cables has been classified as public utility, license of which 1/3 of the private utility. The challenge is the cost of the land is prohibitively high and also availability of rights of way. There are also higher costs of including ducts in the building of the ducts, the viability of these needs to be looked into.
29. He highlighted the challenges of laying utilities in the congested urban areas. He mentioned that due to the lack of space and Right of Way (RoW) constraints, laying of utilities is a great challenge in densely inhabited urban areas, especially when we are not able to even provide earmark space for the bicycle tracks and the pedestrians. He mentioned that the new policy guidelines for accommodating public and industrial utility

services along and across national highways (NHs) enable provision for utility duct/corridors for appropriate categories/combination of utilities in the construction/development of new projects of NHs. He mentioned that facilities that are laid underground in an open utility corridor has been found to form an efficient deployment system, without any mutual conflict as the earth acts as a natural neutralizing agent. To Cross the NHs, especially built structure or conduits will be used to increase the resilience of the co-deployed infrastructure. He stated that the government is systematically paving the path for co-deployment of services and since the introduction of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013, land acquisition for deployment of utilities has gone up by 3 to 4 times, which reflects the faster pace of co-deployment activities.

30. Mr. Mushthag Firag from the Communication Authority of Maldives spoke about the state of broadband connectivity in the Maldives. He mentioned that in 2006, Maldives made links of Submarine cable to Sri Lanka and India. He highlighted the Maldives's focus on fibre-optic cable connectivity and stated that 2016, Maldives further expanded its submarine cable network to improve nationwide connectivity. He noted that this nationwide connectivity has significantly enhanced the quality of broadband services and facilitated the implementation of e-services such as e-health, telemedicine, e-government, and various other online services in the country. He concluded his presentation by mentioning that during the year 2017, submarine cable links made with Sri Lanka Telecom and Indian Reliance Infocom, increased Maldives's International bandwidth capacity by 63,000 Mbps. This improved core network connectivity paved the path for the 4G services rollout in 2017, which now covers all Islands of the Maldives.
31. The representative of Sri Lanka thanked ESCAP and AITD for inviting his ministry to attend the meeting. He informed the meeting of the current challenges his ministry is encountering, including limited human capacity and expertise on ICT as well as limited number of investment in the sector. The representative of Sri Lanka requested ESCAP and partners to assist with the capacity training on developing strategies for promoting private investment in the ICT sector.

32. The representative of Bangladesh, Mr. S. M. Shohid, Systems Analyst, Road Transport and Highways Division, Ministry of Road Transport and Bridges, Bangladesh began his country update by informing the meeting of the developments of the ICT sector with Digital Bangladesh 2021 prioritising development of the ICT sector. He informed the meeting that other developments including the nation's own satellite program, national fibre-optic deployment of more than 11,000kms deployment, upgrade to the government network connectivity with video conferencing capabilities in all government ministries and 66 Police stations connected to the network. He further informed the meeting that 20,000 websites for government services was consolidated into one single window online platform, as well as several government services are now automated and online automated such salaries and pensions disbursement and access to information.

Session 4: Ways Forward

33. In light of the discussions and country updates by participants, Ms. Tiziana Bonapace, Director, Information and Communications Technology and Disaster Risk Reduction Division began the session by informing participants that a joint session by ESCAP's ICT-Transport Committees in 2014, recommended that member States should consider amending the Intergovernmental Agreement on the Trans-Asian Railway Network and the Intergovernmental Agreement on the Asian Highway Network to encourage co-deployment of fibre-optic cables along passive infrastructure. Ms. Bonapace stated that in November 2017, Bangladesh proposed an amendment for the Intergovernmental Agreement on the Asian Highway Network to highlight the opportunity to leverage synergies between the concurrent deployment of optical fibre cables during the construction and maintenance of the Asian Highway network.

34. She further stated that the Asian Highway Working Group – November 2017 requested the secretariat to organize a joint meeting of the Working Group and undertake further studies on co-deployment. Ms. Bonapace cited the co-deployment related activities conducted by ESCAP since November 2017 including feasibility studies on co-deployment, Workshops, steering committee meetings, and a regional economic,

integration & cooperation project. Ms. Bonapace mentioned that the ESCAP's Commission Resolution 75/6 in May 2019, on 'Advancing the implementation of the Asia-Pacific Information Superhighway initiative through regional cooperation', invited ESCAP member States to consider infrastructure sharing and co-deployment of fiber optic cables along with passive infrastructure in the implementation of the AP-IS in each ESCAP subregion. Ms. Bonapace concluded her presentation by updating participants with information on the upcoming 8th Meeting of the Working Group on the Asian Highway Network, scheduled to be held for 18-20 September 2019 in Bangkok.

35. Ms. Bonapace noted that one issue emerging is that within South Asia, it may be easier to reach a consensus through an intergovernmental framework for crossborder co-deployment. Mr. Verma (India) responded that India is already implementing cross-border codeployment telecom connectivity between India and Nepal, Bhutan and Bangladesh respectively. A representative from India asked if there are best practices on cross-border codeployment for countries to review. In response, Mr. Arun Saxena, Senior Fellow, Asian Institute of Transport Development (AITD) informed the meeting that AITD prepared a report for ESCAP which discuss several country case studies that may benefit countries. Ms. Bonapace also noted that there are countries in the European Union, the United States, and the Russian Federation fiber optic cables codeployed along highways.
36. Mr. Verma informed the meeting that the exchange of information (through the use of fiber optic cables) between foreign countries using India as a transit hub is not allowed under the current national regulatory framework. Mr. Verma suggested that similar multilateral agreement used to facilitate cross-border ICT codeployment in the European Union be considered for South Asia.
37. Mr. Arun Saxena, Senior Fellow, Asian Institute of Transport Development, began his presentation by outlining the challenges and the opportunities of co-deployment of fibre-optic cables, right of way of roads and railways, and cross border co-deployment. Mr. Saxena highlighted the findings and recommendations of a study on "Co-deployment of fibre-optic cables along with transport infrastructure for SDGs." He noted that the study re-confirms that a cost-effective approach towards implementing regional integration

could include the co-deployment of fibre-optic cables along with road and rail infrastructure and can create a “win-win” situation for multiple sectors, including highway/railway and ICT sectors.

38. Mr. Saxena stated that there are already examples of cross-border co-deployment along road and rail infrastructure networks in the region, including along routes of the Asian Highway and Trans-Asian Railway. He mentioned that the research study noted that in most of the countries, both at a national and cross-border level, the policy, planning, legal and regulatory frameworks related to co-deployment of fibre-optic infrastructure are generally developed and established by different entities. He stressed that policy coherence and a coordinated approach among relevant sectors is critical for successful co-deployment and enhanced infrastructure connectivity that promotes regional economic cooperation and integration in the Asia-Pacific region. He cited that the study findings supported the benefits of co-deployment as a cost-efficient way of developing transport and ICT infrastructure, and experts that conducted the study recommended the “Dig Once,” “Integrate the Planning of Utilities” and “Collaborate to Share the Infrastructure” as guiding principles for transport infrastructure and ICT entities for cost-saving and efficient use of infrastructure facilities.
39. He further elaborated that countries need to address certain challenges and constraints while co-deploying fibre-optic infrastructure along road/highway and railway routes. These challenges include i) lack of coordination among agencies and entities, ii) lack of related laws in the country, iii) difficulty in planning for co-deployment, iv) lack of awareness about the benefits of co-deployment, v) damage to fibre-optic cables during maintenance work. Mr. Saxena pointed out that, through co-deployment, transport sector can benefit in various ways including the availability of fibre-optic infrastructure for intelligent transport systems and related services, and avoiding repeated excavation of road and railways. He further mentioned that in many cases, railways have their Own FOC network infrastructure laid on Many Routes along RoW, without significant sharing and there is an opportunity for cooperation.

40. He moved on to inform participants that the study recommended further strengthening of RoW policies to ensure more transparency, faster deployment, and ease of doing business. He noted that by adapting implementation strategies such as the open transparent lease of space in utility ducts to the service provider; use of pre-defined charges per km based on location; standardized rates for sharing; and use of uniform procedures may be put into practice for improving RoW policies. He further noted that the study recommended installation of FOC network with minimum 2 x 48 fibres in concrete ducts or bundle of HDPE (High-Density Polyethylene) ducts along identified roads/highways within countries & across borders under bilateral agreements. He mentioned that the study findings suggest that procedure for permission for FOC/conduit laying, leasing of space in conduits, costs for wayleave, installation, repair & maintenance, typical location, and layout designs should be stipulated by a notified central authority comprising of members from all relevant units and stakeholders.
41. He noted that the experts recognize that ESCAP secretariat act as a well-established platform for intergovernmental agreements, regional norm-setting and capacity building and a knowledge hub for lessons and regional experience promoting good policy as well as facilitating harmonization and standardization. In this respect, the meeting recognized ESCAP as a platform to be further utilized to enhance multi-sectoral cooperation concerning developing ICT connectivity across the borders in the region.

Session 5: Closing Remarks

42. Mr. K.L. Thapar, Chairman, Asian Institute of Transport Development thanked participants for the engaging discussions and recalled that the topic of ICT co-deployment was discussed 10 years back. He noted that the United Nations is the appropriate platform for ICT co-deployment to be discussed and addressed. He noted that the sharing country experiences has highlighted the need for better coordination of ICT co-deployment along other infrastructures at the national level.
43. Ms. Tiziana Bonapace, Director, Information and Communications Technology and Disaster Risk Reduction Division expressed support by ESCAP on the merits of ICT co-

deployment along passive infrastructures. She informed participants that ESCAP will look into the insights and suggestions from the meeting as a way forward for the subregion.

44. The meeting closed.

Annex 1: Agenda

Time	27 June 2019
08:30-09:00	Registration
09:00-10:00	<p><u>Session 1: Opening session (Auditorium)</u></p> <ul style="list-style-type: none"> • Welcoming remarks: <ul style="list-style-type: none"> ◦ Mr. B.N. Puri, Director (R), Asian Institute of Transport Development ◦ Mr. Nagesh Kumar, Head of Office, Subregional Office for South and South-West Asia ESCAP • Opening address: <ul style="list-style-type: none"> ◦ Mr. K. L. Thapar, Founder and Chairman, Asian Institute of Transport Development • Inaugural address: <ul style="list-style-type: none"> ◦ Mr. R. K. Pandey, Member (Projects), National Highways Authority of India • Introduction and background to the Workshop: <ul style="list-style-type: none"> ◦ Ms. Tiziana Bonapace, Director, Information and Communications Technology and Disaster Risk Reduction Division • Self-introduction by all participants • Group picture
10:00-10:20	Coffee/Tea Break
10:20-12:00	<p><u>Session 2: Transboundary Infrastructure Co-deployment in ICT and Transport Sectors: Opportunities, Challenges, and Legal, Regulatory and Policy Harmonization</u></p> <p>Moderator: Mr. Arun Saxena, Advisor (Signal), RailTel Enterprises Limited, India</p> <ul style="list-style-type: none"> • Presentations by ESCAP (ICT/Transport) <ul style="list-style-type: none"> ◦ ICT – Mr. Siopo Vakataki 'Ofa, Economic Affairs Officer, ICT and Disaster Risk Reduction Division, ESCAP ◦ Transport – Mr. Sandeep Jain, Economic Affairs Officer, Transport Division, ESCAP • Presentations by Experts and Resource Persons <ul style="list-style-type: none"> ◦ Prof. K M Baharul Islam, Dean, Indian Institute of Management Kashipur, “Bangladesh-India co-deployment”

	<ul style="list-style-type: none"> ○ Mr. Abdelmoula Ghzala, “Rural digital connection on improvement of rural livelihood and the role and supporting initiatives of IFIs, international organizations and public and private sectors” ○ Mr. Abhay Shanker Verma, Deputy Director General (Mobile Technologies), Ministry of Communications, India, “ICT Infrastructure Co-deployment – Indian Perspective” <ul style="list-style-type: none"> • Discussions
12:00-13:00	<i>Lunch Break</i>
13:00-14:30	<p><u>Session 3: Country Experiences on Trans-boundary Infrastructure Co-deployment</u></p> <p>Moderator: Mr. Abhay Shanker Verma, Deputy Director General (Mobile Technologies), Ministry of Communications, India</p> <ul style="list-style-type: none"> • Sharing of information and experiences by participants on national legal and regulatory framework, strategic and policy initiatives, and/or governance structure that incentivize or disincentivize infrastructure co-deployment across sectors and national boundaries <ul style="list-style-type: none"> • Presentation by: <ul style="list-style-type: none"> ○ Mr. Suresh Kumar, Executive Director, RailTel Corporation of India Ltd. • Presentations by country representatives of: <ul style="list-style-type: none"> ○ Afghanistan ○ Bangladesh ○ Bhutan ○ India ○ Maldives ○ Sri Lanka • Discussions
14:30-14:45	<i>Coffee/Tea Break</i>
14:45-16:45	<p><u>Session 4: Ways Forward</u></p> <p>Moderator: Mr. B. N. Puri, Director (R), AITD, India</p> <ul style="list-style-type: none"> • Identifying the legal, regulatory and policy gaps for co-deployment • Discussion on action plan for way forward to promote or enable trans-boundary infrastructure co-deployment <p>Speakers:</p> <ul style="list-style-type: none"> ○ Ms. Tiziana Bonapace, Director, Information and Communications Technology and Disaster Risk Reduction Division, ESCAP ○ Mr. Arun Saxena, Advisor (Signal), RailTel Enterprises Limited, India

	<ul style="list-style-type: none"> ○ Country representatives
16:45-17:00	<p><u>Session 5: Closing by ESCAP</u></p> <ul style="list-style-type: none"> ○ Mr. K.L. Thapar, Chairman, Asian Institute of Transport Development ○ Ms. Tiziana Bonapace, Director, Information and Communications Technology and Disaster Risk Reduction Division, ESCAP

Annex 2: List of Participants

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