



Broadband for Digital Transformation

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AGENDA

- Digital Transformation
- Importance of Broadband for Digital Transformation
- Recommendations

WHY WE CARE FOR BROADBAND?

Goal

Widespread, affordable, high-quality broadband transforms countries, individuals lives, and promotes the beneficial use of technology

Policies

- Robust content and app ecosystems
- Facilities-based competition
- Targeted, efficient subsidies in high cost areas

Interests align well with consumers

DIGITAL TRANSFORMATION (DIGITAL ECONOMY)

- High-speed and high-quality Broadband
- Digitization (both government and private sector)
- Digital Skills (ICT in Education)

POLICY CHECKLIST FOR INVESTMENT IN THE DIGITAL ECONOMY



EU - DIGITAL SINGLE MARKET STRATEGY

Aims to open up digital opportunities for people and business and enhance Europe's position as a world leader in the digital economy.

- Improving connectivity and access
- Investing on network and technologies
- Boosting European digital industry
- Building a European data economy
- Advancing in digital science and infrastructures
- Supporting media and digital culture
- Creating a digital society
- Strengthening trust and security

CONNECTIVITY FOR A EUROPEAN GIGABIT SOCIETY

- **Common EU broadband targets for 2025**
- **A new rule book for providers of internet access and communication services - the European Electronic Communications Code**
- **A plan to foster European industrial leadership in 5th generation (5G) wireless technology**
- **A voucher scheme for public authorities who want to offer free Wi-Fi access to their citizens (WiFi4EU)**

DIGITAL INDIA PROGRAMME

A flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy.

PROGRAMME PILLARS

- Broadband Highways
- Universal Access to Mobile Connectivity
- Public Internet Access Programme
- E-governance – Reforming government through technology
- EKRANTI – Electronic Delivery of Services
- Information for All
- Electronic Manufacturing
- IT for Jobs
- Early Harvest Programmes

ESTONIA: DIGITAL AGENDA 2020

Goal: to increase the economic competitiveness, the well-being of people and the efficiency of public administration.

- Next generation broadband network Targets: Improving Internet Access
 - 30 Mbit/s internet for all residents of Estonia
 - 100 Mbit/s or faster internet subscriptions for 60%.
 - Development of Common service space for the public and the private sector (**e-Estonia**)
- Better ICT Skills
 - Basic ICT skills in schools, in particular in basic schools, will be enhanced.
 - There are also other action lines.
- Smarter Governance and Public Administration
- Greater awareness of e-Estonia in the world

E-ESTONIA: NAMED 'THE MOST ADVANCED DIGITAL SOCIETY IN THE WORLD' BY WIRED

Success Stories

- e-Governance: 1997
- e-Tax: 2000
- X-Road:2001
- Digital ID: 2001
- i-Voting:2005
- Public safety: 2007
- Blockchain: 2008
- e-Health:2008
- e-residency:2014

Ambitious Future

- Digital Transformation in Education
- New Digital Nation
- Cyber security
- Data Embassy
- Intelligent Transportation
- Reporting 3.0
- Cross-border data exchange
- Healthcare 4.0

BROADBAND IMPACT ON GDP GROWTH

World Bank Study

Broadband Impact on GDP growth (1980-2002 for 66 high income countries)

-10% increase in broadband penetration yielded an additional 1.21 percentage points of GDP growth

Low & Middle income economies (1980-2002 for the remaining 120 low and middle income countries)

-10 % increase in broadband penetration yielded an additional 1.38 in GDP growth

DIGITAL TRANSFORMATION IMPACT ON GROWTH

- The combined value – to society and industry – of digital transformation across industries could be greater than \$100 trillion over the next 10 years.
- “Combinatorial” effects of digital technologies – mobile, cloud, artificial intelligence, sensors and analytics among others – are accelerating progress exponentially.
- Full potential will not be achieved without collaboration between business, policy-makers and NGOs

NEXT GENERATION BROADBAND NETWORKS



Drones



Healthcare



Emergency Services



Autonomous Driving



Smart Cities



Smart Agriculture



Manufacturing



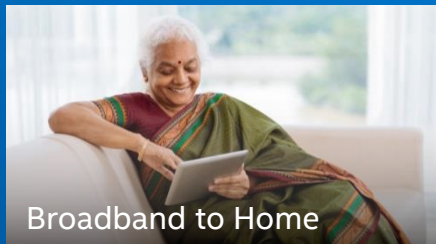
Supply Chain/
Logistics



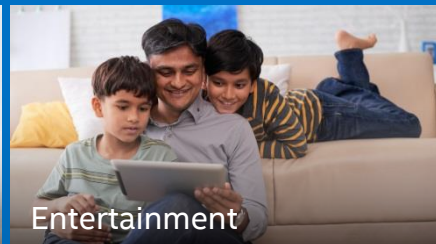
Virtual and
Merged Reality



Mobile Office

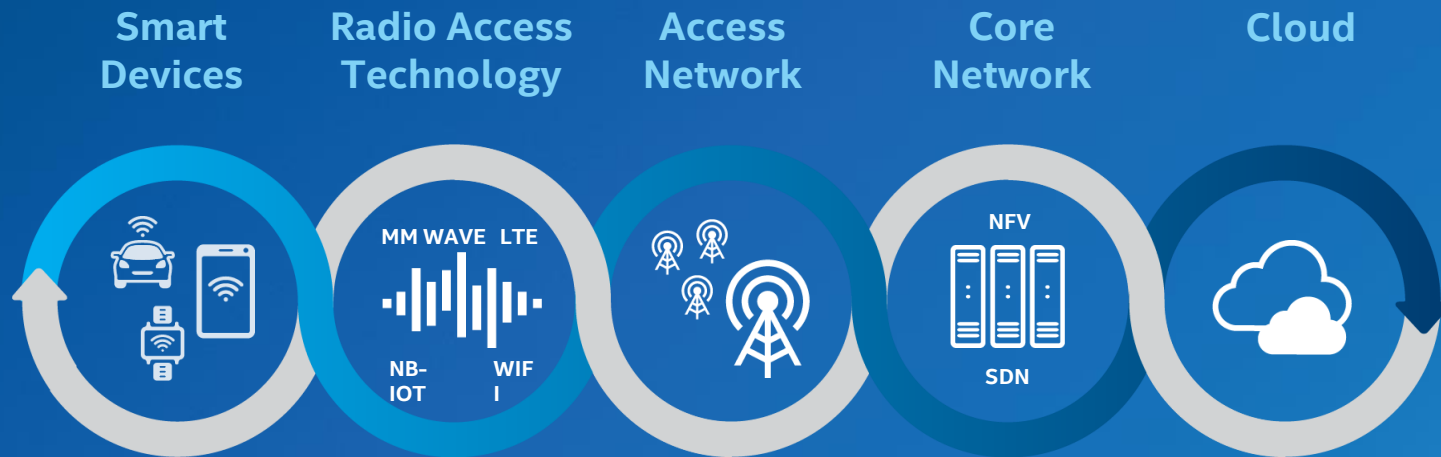


Broadband to Home



Entertainment

5G INCORPORATES COMPUTING AND CLOUD TECHNOLOGIES TO MAKE EVERYTHING SMART AND CONNECTED



Intel Powers 5G End-to-End

5G Plans

- **European Union: 5G Action Plan:** http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=17131
 - Timely deployment of 5G: a strategic opportunity for Europe
 - The need for a coordinated approach
 - A common EU timetable for the introduction of 5G:
 - i) Member States to develop, by end 2017, national 5G deployment roadmaps as part of the national broadband plans
 - ii) Every Member State will identify at least one major city to be "5Genabled" by the end of 2020 and that all urban areas and major terrestrial transport paths have uninterrupted 5G coverage by 2025.
- **Germany: 5G-Strategy**
(<https://www.bmvi.de/SharedDocs/DE/Publikationen/DG/098-dobrindt-5g-strategie.html?nn=12830>)
- **Turkey: 5GTR Forum**
- **UAE: National 5G Committee**
- **UK: 5G Strategy:**
(https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/597421/07.03.17_5G_strategy_-_for_publication.pdf)
- **South Korea:** Creative 5G Mobile Strategy and 5GForum (<https://www.5gforum.org>)
- **Japan:** 5G Development Roadmap toward 2020 (<http://5gmf.jp/en>)



How 5G will contribute to the economy?

- According to IHS report In 2035, 5G will enable \$12.3 trillion of global economic output. That is nearly equivalent to US consumer spending in 2016 and more than the combined spending by consumers in China, Japan, Germany, the United Kingdom and France in 2016 <https://www.ihs.com/Info/0117/5g-technology-global-economy.html>
- The global 5G value chain will generate \$3.5 trillion in output and support 22 million jobs in 2035. This figure is larger than the value of today's entire mobile value chain
- **CIS region should be able to get maximum benefit from this opportunity without any delay.**

Spectrum Needs of 5G

Success requires sufficient spectrum in a variety of bands with economies of scale

5G applications drive technical requirements, including type and amount of spectrum

< 1 GHz – for wide area applications, e.g. sensor networks, etc.

< 6 GHz – for coverage/capacity trade-off, e.g. massive MIMO, outdoor-to-indoor

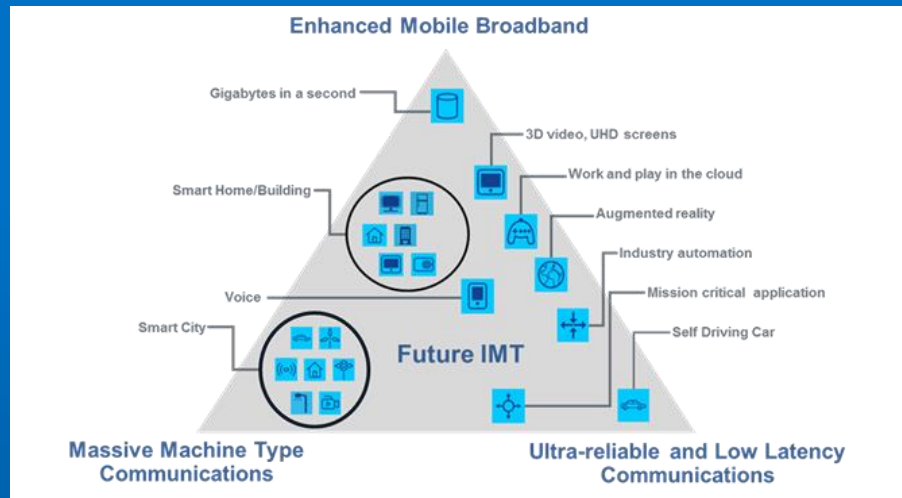
Higher MM Wave – for apps needing ultra-wide channels, e.g. 4k/8k video, VR, etc.

Continuous flow of sufficient, adequate, new spectrum is key to:

Expansion of wireless market to 5G and beyond

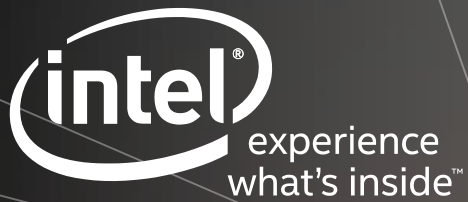
Building a strong and healthy eco-system

IMT for 2020 and Beyond



Recommendations

- Develop Regional and National Digital Economy Plans (including broadband infrastructure and services)
 - Transform existing networks to high speed, high quality broadband networks
 - Develop/Update National Broadband Plan with measurable targets
 - Develop Regional and National 5G Plans to accelerate the 5G and vertical applications.
 - Launch a 5G network at least in one major city by 2020.
 - Develop supply/demand/skill programs (especially ICT in Education)
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- Assign sufficient low-band, mid-band and high-band spectrum for mobile broadband.
 - Consider to assign low frequency bands (700 MHz, 800 MHz etc.) with universal service coverage obligation (Germany is a good example for 800 MHz; license winner first need to cover rural areas)



THANK YOU