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**National Media and Infocommunications
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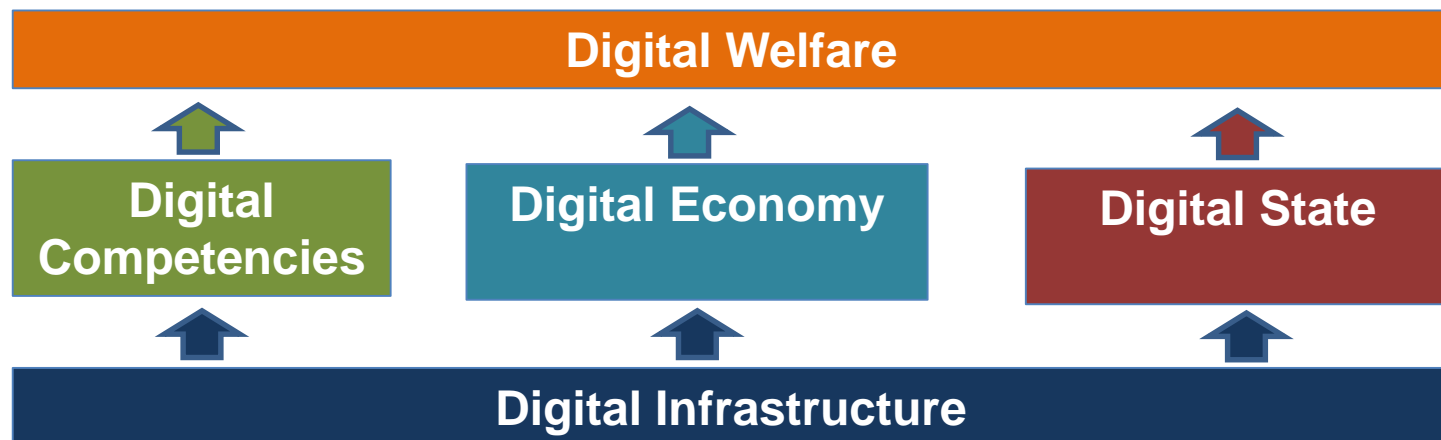
National strategies for 5G implementation

Preparation for the 5G introduction in
Hungary

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Deputy Director General

- Hungary has a clear ambition for the development of digital infrastructure including early introduction of 5G mobile technologies
- Digital Welfare Program (DJP) based on the National Infocommunications Strategy and Digital Nation Development Program of Hungary defines the first objectives concerning the introduction of 5G



Main 5G related objectives of DJP2.0 for Hungary

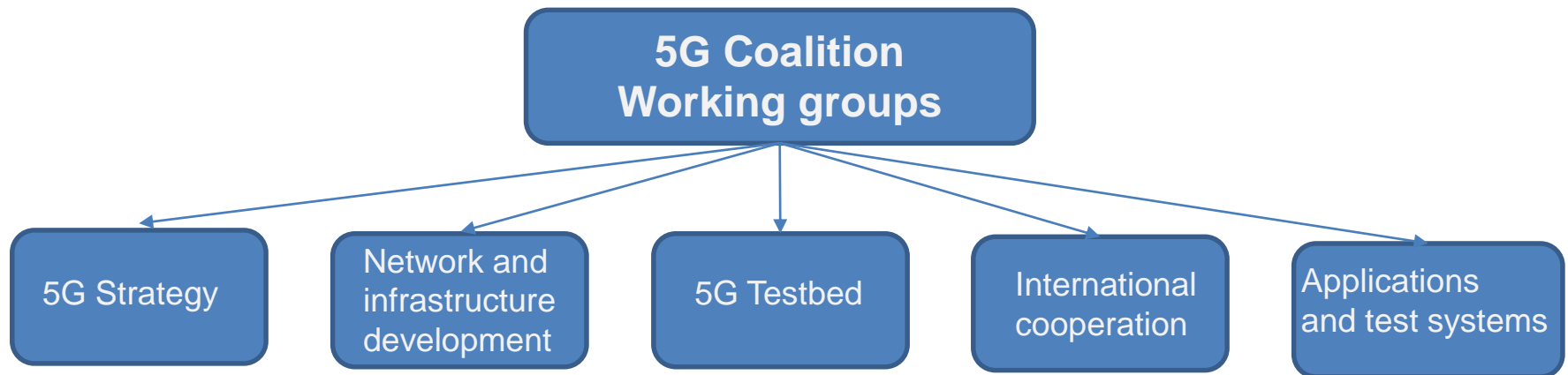
- Become one of the 5G development centres by 2018
- Play important role in the region in the testing process of 5G applications
- Introduce 5G in the first round after 2020

Actions taken up to now to achieve the objectives

- 1) Hungarian 5G Coalition establishment
- 2) Building of 5G test environment
- 3) Ensure appropriate frequency spectrum as a fundamental resource for 5G applications



- Founded on 19th June 2017
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- 46 members including:
 - market players
 - industry representatives
 - governmental, regulatory and academia institutions
 - professional organisations
- Objective: to prepare and support Hungary to become one of the European centres of 5G development
- Working groups:



5G Testbed



- Established in Zalaegerszeg - construction is ongoing
- Purpose: test field for autonomous driving, 5G developments and smart city functions
- Domestic service providers and manufacturer companies invited to participate in the 5G developments
- Cooperation between Hungary and interested neighbouring countries
 - Ongoing negotiation with Slovenia concerning PPDR tests

Zalaegerszeg testbed

DSRC*
installation for
current devices

LTE network for
current
broadband ITS
applications

LTE or WiFi
network for the
testbed stuff

Infrastructure
developments
to meet 5G
demands after
availability of
standards

*Dedicated short range communication

Spectrum for 5G applications

„National Roadmap for the utilisation of the VHF III. (174-230 MHz) and the UHF (470-790 MHz) frequency bands”

- National Roadmap published in June 2017.
- Public hearing (23 November 2017) on future plans regarding the frequency bands available for the provision of wireless broadband services (700 MHz, 1500 MHz, 2300-2400 MHz, 2100 MHz, 2600 MHz, 3400-3800 MHz, 26 GHz)
- Preparation of detailed regulatory bases concerning the spectrum award for 5G „pioneer bands” is ongoing
 - **700 MHz**
 - **3400-3800 MHz**
 - **24.25-27.5 GHz**
- Commencing of spectrum awarding procedure expected by **Q3 2019**

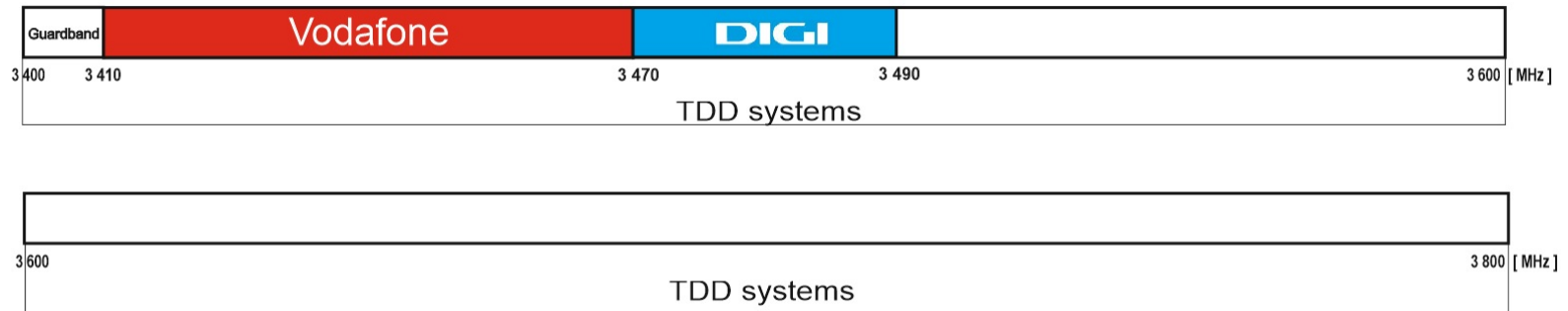
National Roadmap – 700 MHz band

- pioneer 5G band below 1 GHz; important for nationwide and indoor 5G coverage, high interest from the market players
- the mandatory technical harmonisation criteria set out in the Decision (EU) 2017/899 implemented
 - according to present national regulation:
 - 2x30 MHz planned for MFCN
 - 2x3 MHz +2x5 MHz planned for PPDR
- conceptual issues of the spectrum awarding procedure and the remaining part of the Decision (coverage, quality, secondary trading etc) are planned to be implemented by the end of 2018.
- cross-border frequency coordination: technical arrangements with most of the neighbouring countries concluded in February 2018
- the band is currently used for digital television broadcasting, the licenses expire in September 2020



NHH National Roadmap - 3400-3800 MHz band

- The band is available for MFCN, large amount of contiguous spectrum block is currently available
- Frequency award in 2016, licenses for 60+20 MHz TDD usage at present in the lower part of the band



- New technical criteria for the introduction of 5G can be implemented (under elaboration)
- 5G introduction is feasible before 2020



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National Roadmap - 24.25-27.7 GHz band

- Intensive fixed service use currently in 24.5-26.5 GHz sub-band
- Expiry date of most of the licenses is 2027
- Negotiation with present frequency users is ongoing
- 26.5-27.5 GHz sub-band suitable for early introduction of 5G
- Strategy for implementing new technical criteria for the introduction of 5G is under elaboration and the rules for the transition period are to be developed



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Thank you for your attention.