



**EBU**

OPERATING EUROVISION AND EUORADIO



# **5G BROADCAST A SUSTAINABLE MULTILAYER APPROACH**

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VIENNA

# The distribution challenge

The goal: ***Delivery of the whole range of content and services***

- to all interested users
- at the right time
- at the right place
- on the right device
- with the desired quality
- for the right price

## ***Balancing act between***

- Optimising the user experience
- Resource management
- Business objectives
- Regulatory requirements and constraints

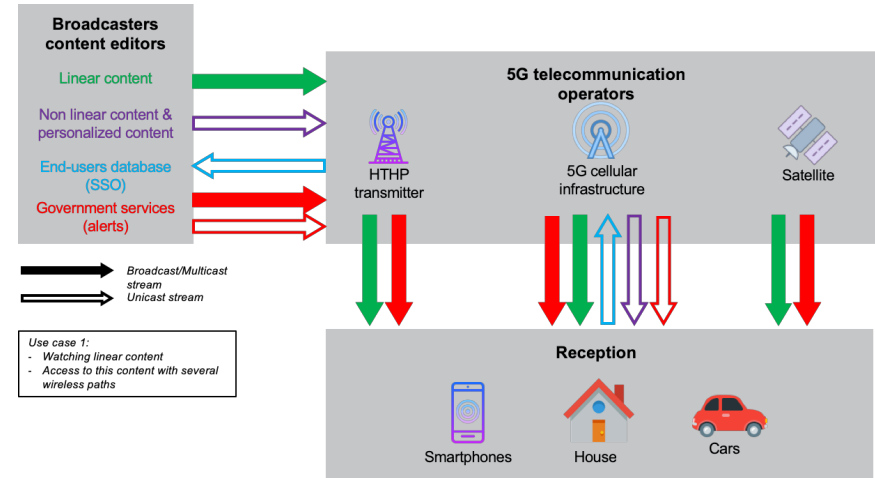


## **Public broadcasters are subject to additional regulatory requirements:**

- **Universal availability** (on all relevant platforms, everywhere, different user devices)
- **Free to view / listen** (no recurring charges for access to services)
- The ability to **reach the population in emergency situations**
- Regulated business models

# USING THE LAWS OF PHYSICS WHERE THEY WORK BEST

- Make use of the power of broadcasting to **serve an infinite number of users** combined with the speed and capacity of 5G Internet to provide interactive and personalised services to individual users.
- Make use of a satellite's coverage to serve places where it is **inefficient to provide terrestrial services**.
- **Intelligence in the user's receiver** will select the best option for service, quality and availability.
- Using **cooperative networks, 'orchestrated'** in this way, will also be energy-efficient in a coming world where this will be much needed.

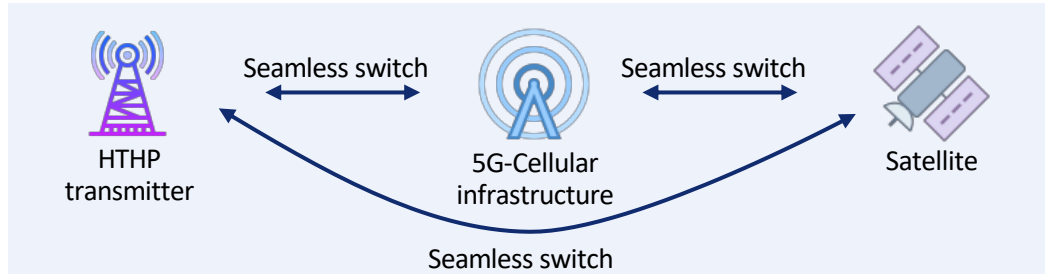


# COMBINING 5G CELLULAR & BROADCAST NETWORKS

Joining the forces of '5G' and combining them in a smart way

- the cellular mobile networks with
- terrestrial broadcast transmitters and
- satellite transmitters

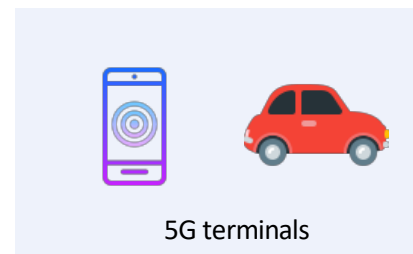
Matching the operational mode to the requirements of the provided services and the number of users who want the same content at the same time



Make use of the power of broadcasting to serve an infinite number of users combined with the speed and capacity of 5G Internet to provide interactive and personalized services to users.

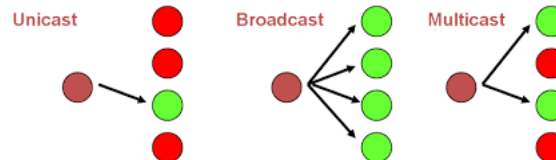
# 5G MULTILAYER MEDIA DELIVERY (1)

- **Collaborative 5G infrastructure:** providing services over a wide area using a cooperative network with three 5G 'layers' –cellular, high tower terrestrial and satellite.
- **Enhanced user experience:** creation of a delivery system able to effectively meet the evolving user requirements for access to media services :
  - from **highly personalised** and interactive to **highly popular live** events, leveraging upon local storage capabilities
  - in a technically and **cost-efficient** way, optimising the investments and the use of radio frequency spectrum.
- **Pushing popular Media contents** but also **Software and Map Upgrades:** delivering over of any territory at very low cost, guaranteed quality and high reliability



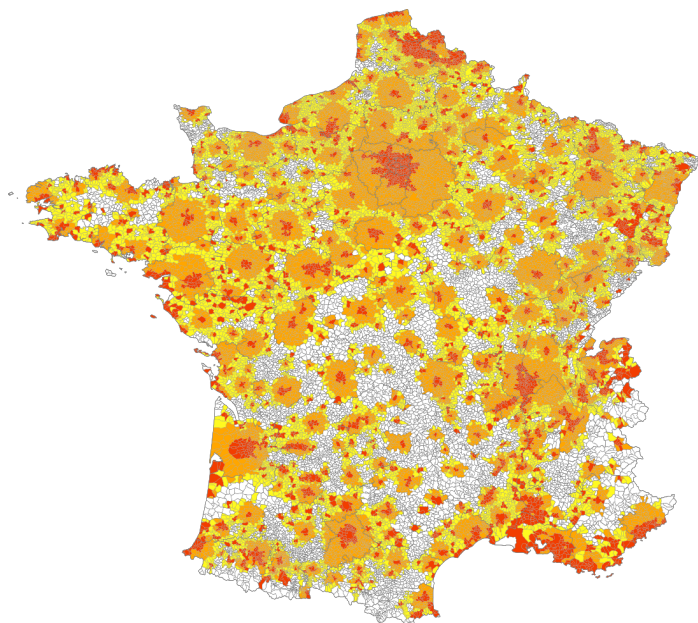
# COMBINING BROADCAST/MULTICAST AND UNICAST

- Combining broadcast/multicast using Towers + Satellite overlay + Unicast Cellular to
  - The **broadcast of events** interesting large number of users and entire territories
  - The **unicast delivery of one to one personalized contents**
  - The **multicast push delivery** of multimedia contents
    - entertainment contents but also other public service contents (e.g. live traffic/alerts, navigation corrections and emergency information)
    - and in general software and information distribution to large population of users with a zero marginal cost per additional user
    - The same contents delivered to mobiles/vehicles can be received and managed at the very edge of the network (end devices) and at the level of any edge server in general
  - Using a **local storage** to maximize efficiency and economical sustainability.
  - At the exception of some limited cases where the information flow can be purely unidirectional (emergency transmission or free to air broadcast content delivery) , it is always assumed the existence of a bidirectional link resource for the integration and orchestration of the 5G multilayer approach.
  - Broadcast-only would also work in areas where there is no unicast/uplink coverage



## 5G MULTILAYER MEDIA DELIVERY (2)

- **Orchestration with broadcasting** guarantees large capacity and full coverage in a **shorter time** frame while **absorbing peaks of traffic** for contents addressing large number of users (e. g. live sport and news events) => **lower Cellular network CAPEX**
- **Green technology:** The cost & power consumption is optimized combining cellular 'base stations' with HTHP broadcast transmitters, covered by a satellite overlay, guaranteeing almost 100% area coverage of territories.
- **First 5G Broadcast Trial Networks operational :**
  - In **Munich, Paris, and Turin** but also in **Beijing** and **Rio de Janeiro**
  - More to come at terrestrial and Satellite level in the coming months



5G Cellular + HTHP + Satellite

5G HTHP + Satellite

Satellite

# WHAT'S NEXT FOR THE VEHICULAR MARKET : BEYOND ENTERTAINMENT SERVICES

- Applications will extend beyond providing high quality media services for **'information, entertainment, and education'**
- The proposed solution will allow multiple services for manually driven and future self-driven (autonomous) vehicles.
- Cars will need continuous and highly reliable access to services not only to occupy the car passengers' new leisure time but also to provide other services such as **guaranteed and timely delivery of critical data to large number of vehicles** such as traffic-related information and navigation support (e.g. GNSS high precision corrections), including also alerts and alarms.
- The proposed solution address today's limitations on media and data delivery and interactivity that are affected by where and how you move and live, lifting the ceiling, so **citizens can freely choose how to move, and where to work and live their lives.**



automotive



5G terminals



# WHAT'S NEXT

- **Smart infrastructure - use 5G on all networks**
  - including terrestrial and satellite broadcast networks, in addition to mobile
  - for the reasons of physics: use any network / technology for what it does best
  - for economic reasons: maximise reach and impact for minimum investments
  - **the target coverage is 100% population and 100% territory**
- **Ensure that devices are brought to the market that can connect to the smart infrastructure**
  - within the global 5G ecosystem
  - Bringing the critical mass in terms of demand for 5G broadcasting
- **Ensure that the Media Industry can benefit from the smart infrastructure and have access to connected devices with guaranteed quality and zero marginal cost per additional customer**

**Aligning the whole media value chain, involving all broadcasters, reach out to other sectors with similar requirements (automotive) and involve regulators and governments.**



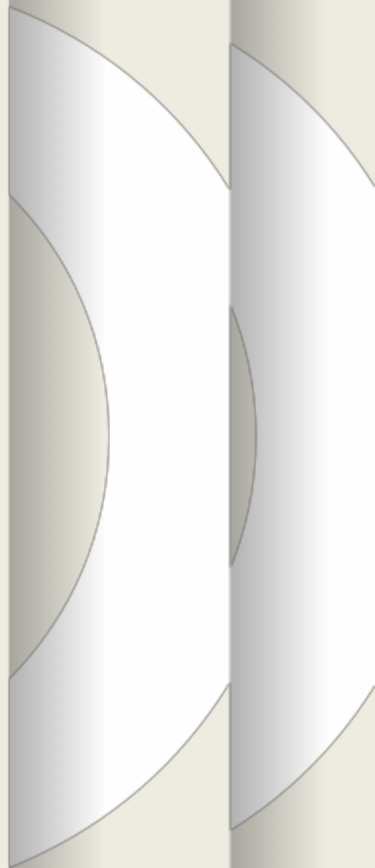
**5G MEDIA ACTION GROUP**

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MEDIA ACTION GROUP



# 5G MEDIA ACTION GROUP (5G-MAG)



***5G MAG is a cross-industry initiative with a commercial focus***

## ***The key objectives:***

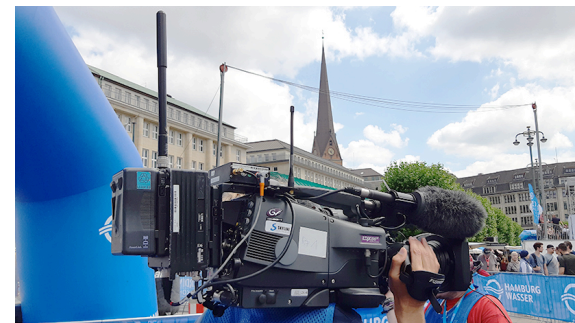
- Engage stakeholders in ***media, automotive and telecom sectors***, including broadcasters, equipment manufacturers, terrestrial and satellite network operators, ... as well as ***regulators and policy makers***.
- Identify and promote common interest of the media and automotive sectors in creating a convergent 5G infrastructure including terrestrial HPHT and satellite, in addition to cellular mobile networks, used in a collaborative way.
- Identify and address the commercial aspects aiming at
  - bringing 5G broadcast enabled equipment to the market, in particular in smartphones and cars
  - fast network rollout to achieve 100% coverage of the territory and the population
- Contribute to technical standardization and engage with the regulators

***5G MAG has its own legal identity, funding, and governance***

# WHAT DO WE EXPECT FROM 5G-MAG?

5G-MAG will take the 3GPP standards and turn them into viable solutions for media companies. This should at least include:

- Ensuring 5G technology meets **the requirements for production and distribution** use cases
- Working to facilitate and **promote trials**
- Helping design networks which are best suited to the distribution of media using a **hybrid 5G / broadcast networks**;
- **Representing media industry** in the various 5G stakeholder groups, e.g. 3GPP and DVB for standardization; CEPT, ITU, EU Commission for regulation ...
- 5G-MAG will leverage on competitive solutions developed and standardized at 3GPP, DVB, ETSI and EBU level
- identify and address the commercial, technical, and regulatory barriers to bringing converged **5G broadcast/multicast/unicast** enabled equipment to the market => **chipset and terminal availability**



## 5G-MAG ELECTED BOARD



Ludovic Noblet, b<>com	Vittoria Mignone, RAI
Stan Baaijens, Funke	Richard Waghorn, RTE
Lei Zhao, Huawei – Vice-Chair	Frank Heineberg, RTL
Hyungkyu Lee, LG Electronics	Wim Moortgat, VRT
Maria Perez, Sennheiser	Lars Backlund, BNE - Treasurer
Roland Beutler, ARD / SWR	Wojciech Pytel, Polkomtel – Vice-Chair
Paul Thornton-Jones, BBC	Guido Gentile, EI Towers
Greg Bensberg, Digital 3&4	Andrey Chernikov, RTRN
Jacques Donat-Bouillud, FranceTV Vice-Chair	Michael Wagenhofer, ORF/ORS
Gerjo Bruntink, NPO	Darius Quenum, CPTNT – Bénin
Antonio Arcidiacono, EBU - Chair	

Membership @ 1st GA  
October 16<sup>th</sup>, 2019  
33 members signed  
17 members pending

85% Europe  
12% Asia  
3% Africa



# 5G BROADCAST OPERATIONAL TRIALS

- **Europe**
  - Munich (2) – **ARD/BR**
  - Paris (2) – **France TV**
  - Turin/Aosta (2) – **RAI**
  - Scotland - **BBC**
- **Asia**
  - Beijing (3) - **CBN**
- **Americas**
  - Rio (2) - **GLOBO**



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# THANK YOU !

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