Mobile TV
A Perspective from IPWireless

IET Mobile TV Event
Cambridge
7 December 2006

Agenda

An Introduction to MBMS TDD

The Value Proposition for Operators

The Pan-European Operator Trial in Bristol

Commercialization Plan and Issues

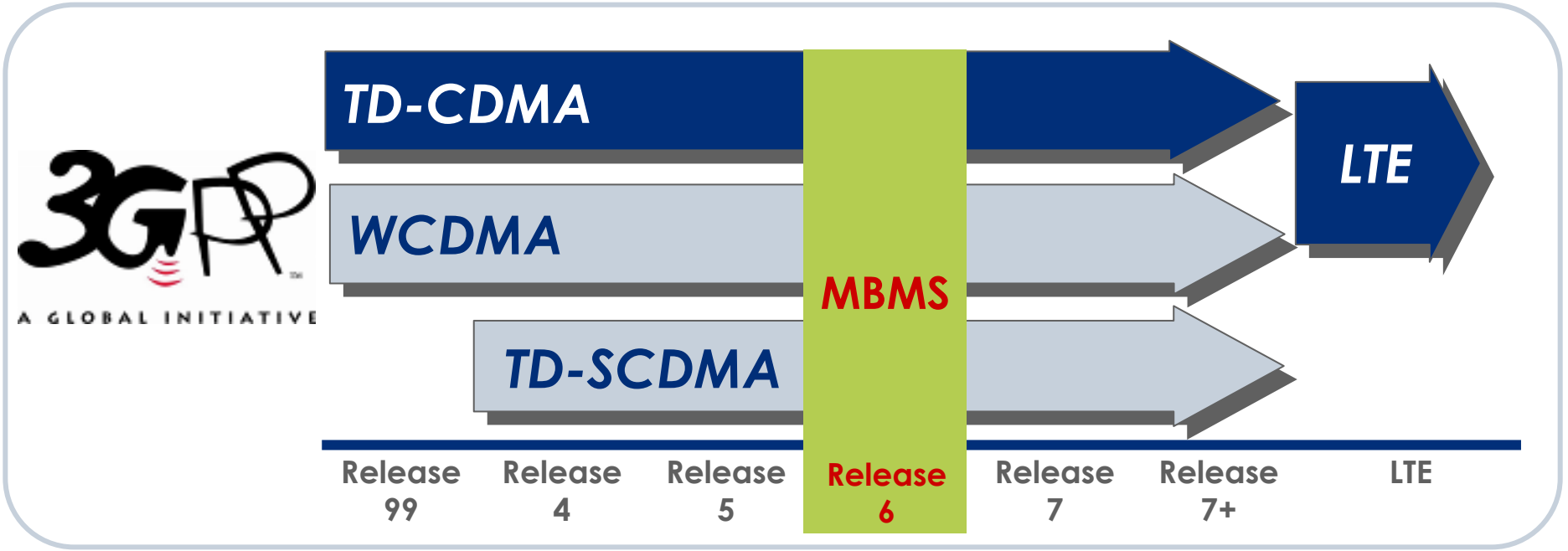
Q&A

What Are the Key Criteria for Mobile Operators Looking at Mobile TV Options

1. **Can they deliver the experience end users require?**
   - > High quality channels (30 fps / QVGA)
   - > Large number of channels – (10+)
   - > Deliver more than just TV? (radio / clip casting / broadcast SMS)
   - > Responsiveness – quick channel change times
2. **Can they create a business at the price consumers want to pay?**
   - > How do they have to share revenues?
   - > What is the total cost of ownership?
     - > Scale capacity as subscribers are added to the networks?
     - > Is the CAPEX success based?
     - > Can they source devices at a group level?
     - > How does the solution integrate with current platform?
3. **Does the solution leverage their current spectrum and network assets?**

TDtv Based on 3GPP TD-CDMA MBMS An Ideal Technology for Mobile Broadcast Services

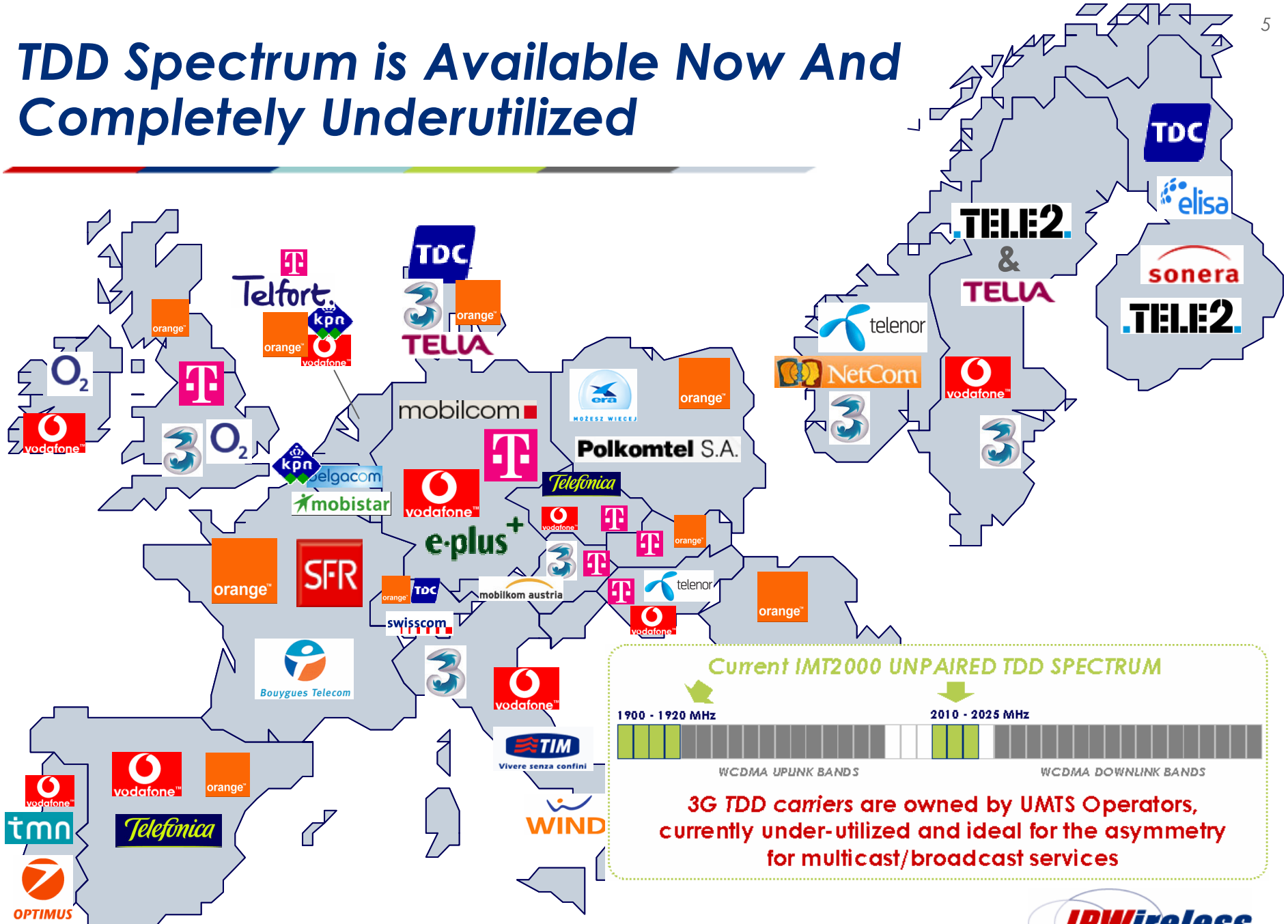
Multimedia Broadcast and Multicast Services (MBMS) defined in Release 6 of the UMTS standards for all 3GPP technologies



This allows TDtv to be deployed in UMTS TDD Spectrum - The standard band owned by 120 UMTS Operators for 3GPP technology

IPWireless Generations Ahead

TDD Spectrum is Available Now And Completely Underutilized



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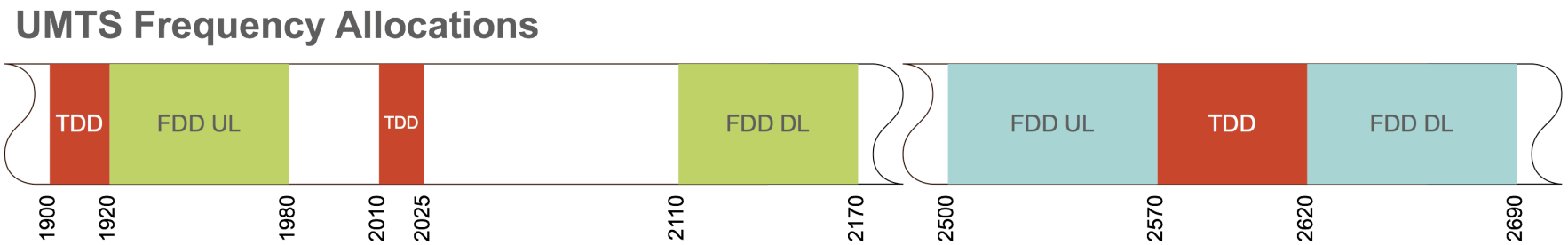
TDD spectrum

TDD spectrum available now

Source: ERO report – December 2005

More Spectrum is coming along…

> The UMTS extension band at 2.5 GHz has further potential to increase the MBMS broadcast capacity

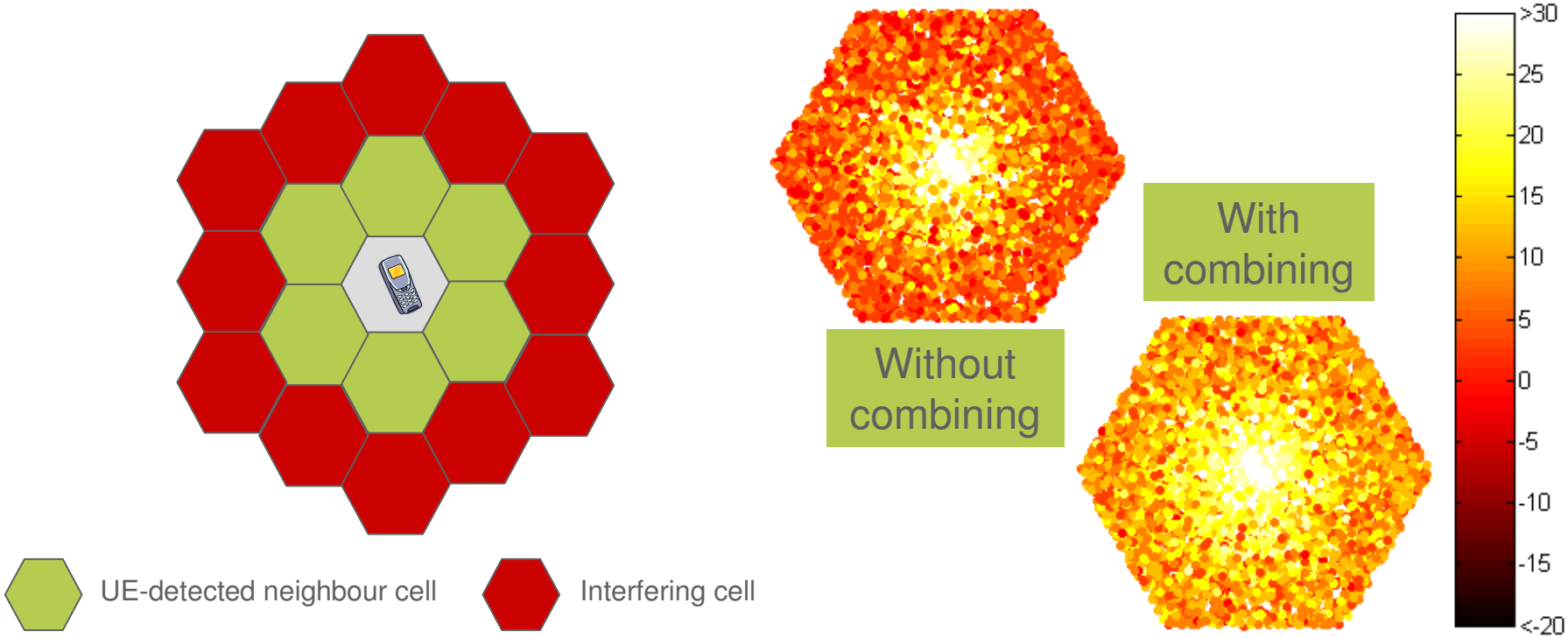


Support for SFN operation

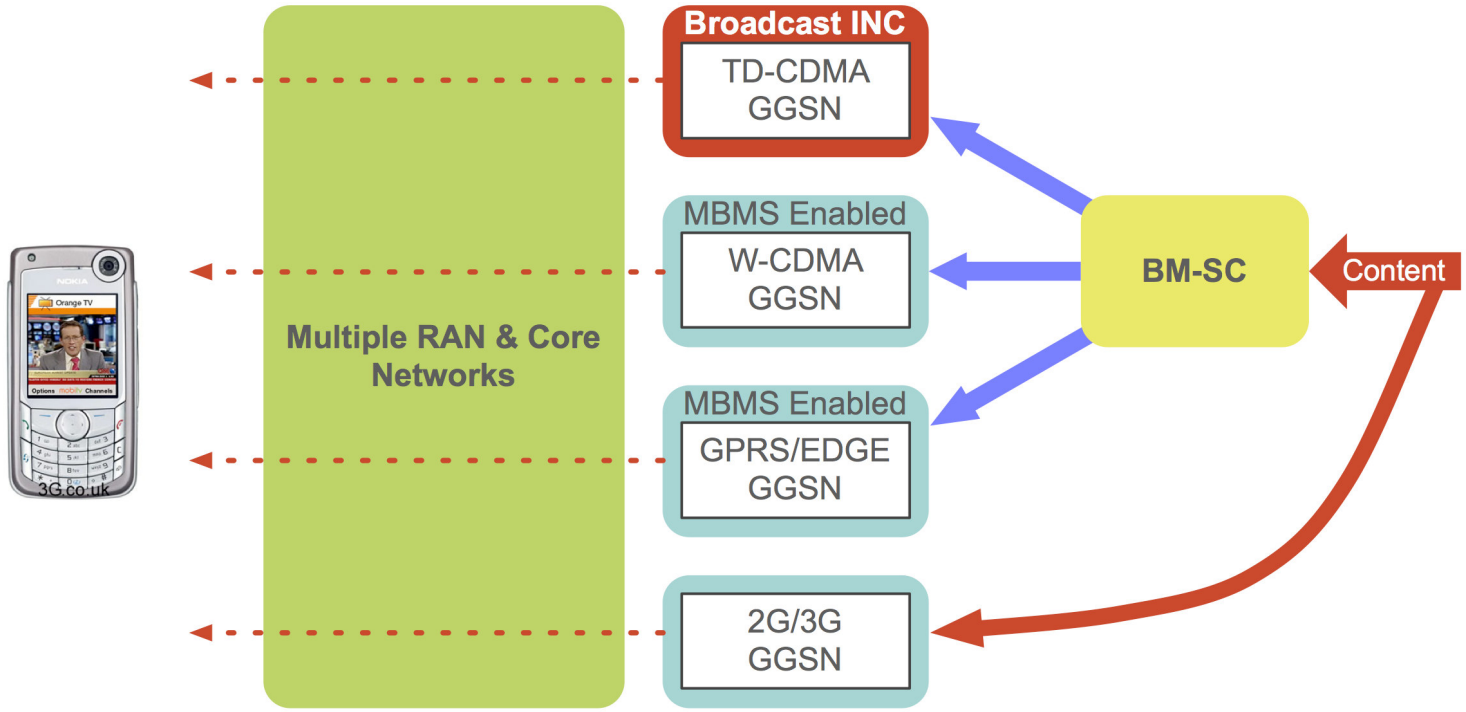
- TD-CDMA base stations are inherently synchronised, as required for a TDD air interface
  - IPWireless Node Bs include GPS receivers for this purpose
- For MBMS Broadcast over TD-CDMA (TDtv) content is synchronised on all base stations in a service area
  - This is a synchronised, single frequency network, therefore mobile devices can combine signals from all visible cells and thus:
    - The signal is re-enforced
    - Neighbouring cells do not interfere
- Significant C/I gains have been measured during the trial (see later…)

TD-CDMA Supports Techniques to Significantly Improve Performance of System

Effective interference is reduced by downlink signal combining - increasing C/I at UE



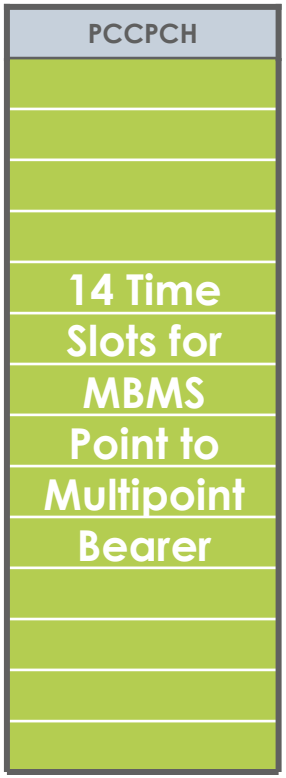
TDtv Becomes Part of a Fully Integrated Mobile TV Network for a UMTS/GSM Operator



See 3GPP TR 23.905 for further details

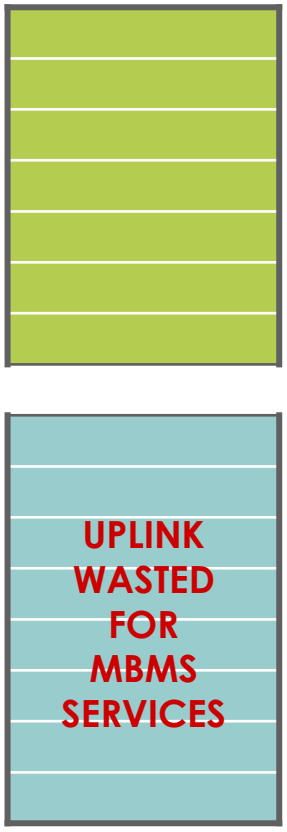
TDtv Delivers Broadcast Level Performance in Current Spectrum Assets

UMTS TD-CDMA for MBMS



- Maximizes bandwidth for broadcast and multicast services
- Gain from Macro Diversity (up to 10dB) reduces CAPEX – increases Capacity
- Supports up 10-15 high quality channels in 5MHz carrier
- Paired with WCDMA network for interactivity and Unicast integration
- Support for high speed mobility
- Support for broadcast services other than TV (audio, clip casting, file distribution,...) via the MBMS protocol suite

W-CDMA MBMS



- WCDMA operators may launch MBMS on FDD first.
  - FDD pair likely to support 4-5 channels (1.3 Mbps/300kbps)
- Adding MBMS services to unpaired spectrum allows operators to:
  1. Increase the number of channels to DVB-H levels
  2. Use their paired spectrum more efficiently

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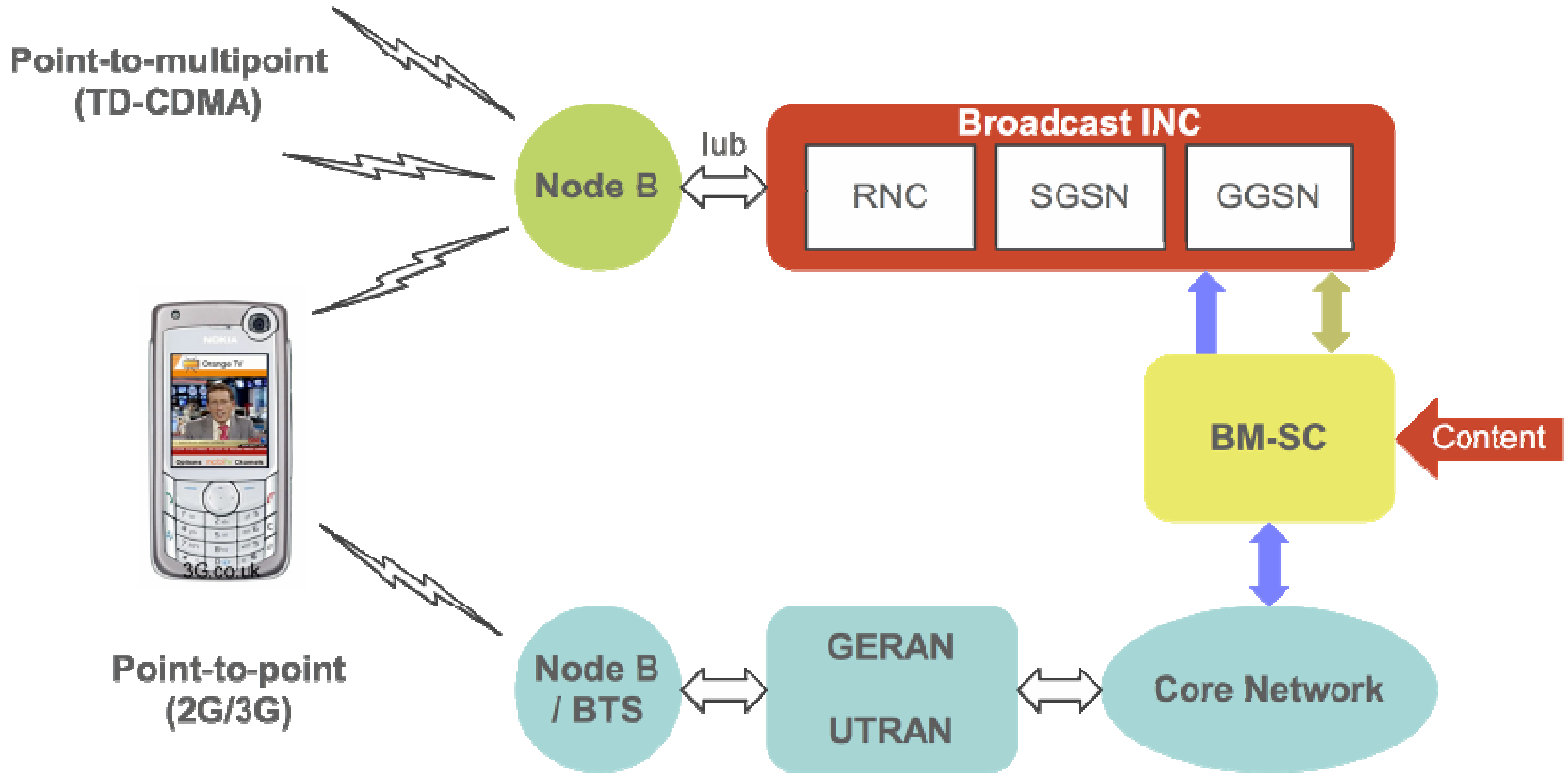
TD-CDMA MBMS architecture



This is one of the architecture options in 3GPP TR 23.905

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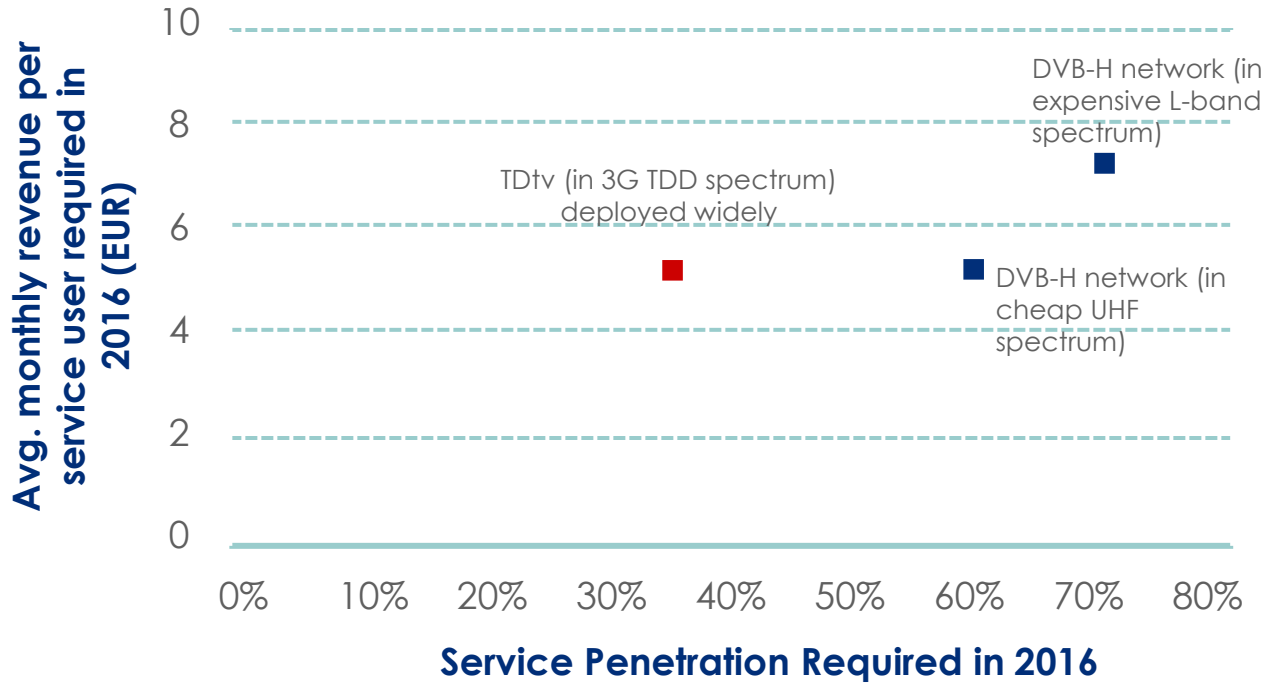
The Benefits of TDtv for UMTS Operators

- Gives UMTS operators the ability to leverage the unpaired UMTS spectrum owned across Europe and Asia enabling a common mobile TV strategy across properties, sourcing of devices at a group level, and roaming for subscribers.
- Allows UMTS operators to deliver the same service experience as the alternative broadcast technologies, but allows them to control the user service experience and keep a larger share of the revenues.
- Has been designed to give UMTS operators a very low total cost of ownership with a very simple addition to their 3G sites.
  - Current simulations show TDtv would need to be put only on 25-50% of WCDMA sites in urban areas and main transport routes

Analysts Support The Economic Advantages of TDtv For Large Mobile Operators

Service penetration and avg. monthly revenue per service user required by a large mobile operator to achieve a 15% IRR using a TDtv or DVB-H network



Source: Analysys Research/Sound Partners: Evaluating the Options for Mobile TV and Radio Broadcasting in Western Europe, 2006

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TDD Network Sharing Dramatically Improves This Business Case

- **Cost Saving & Compelling Business Case:**
  - Halves, thirds or quarters the network deployment cost depending how many players sign up per country
- **Fills Spectrum Gaps for Operators:**
  - Fills holes in spectrum gaps for operators across Europe e.g. In UK, gives Vodafone access where currently it does not have spectrum. In Germany/Italy gives Orange access. In Spain gives Three access.
- **Value Chain Benefits:**
  1. Content/Channel differentiation to attract new subscribers
  2. No revenue share and/or higher margins
  3. Operational control over own broadcast network
  4. Integration with FDD network

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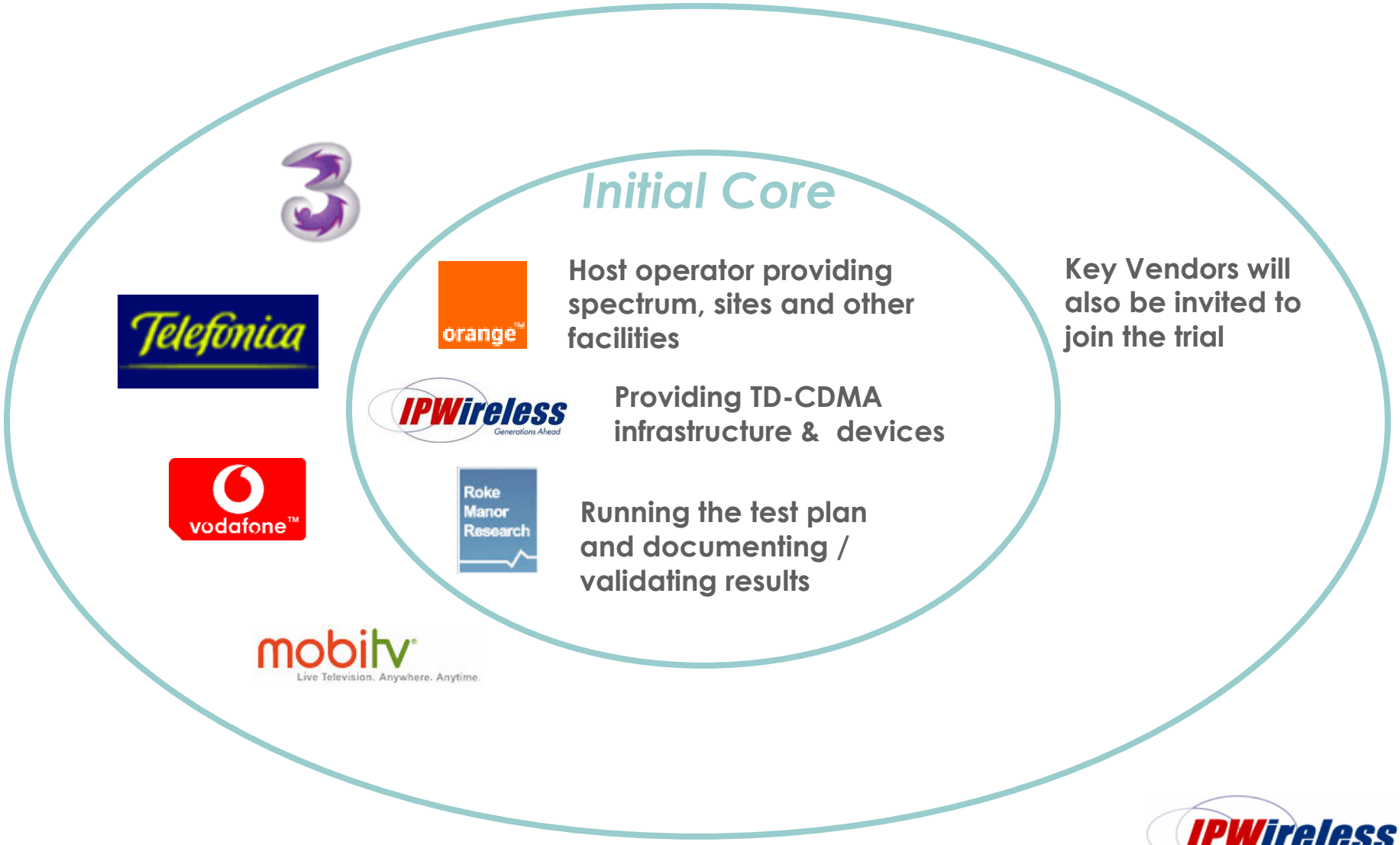
European TDtv Trial Players & Setup



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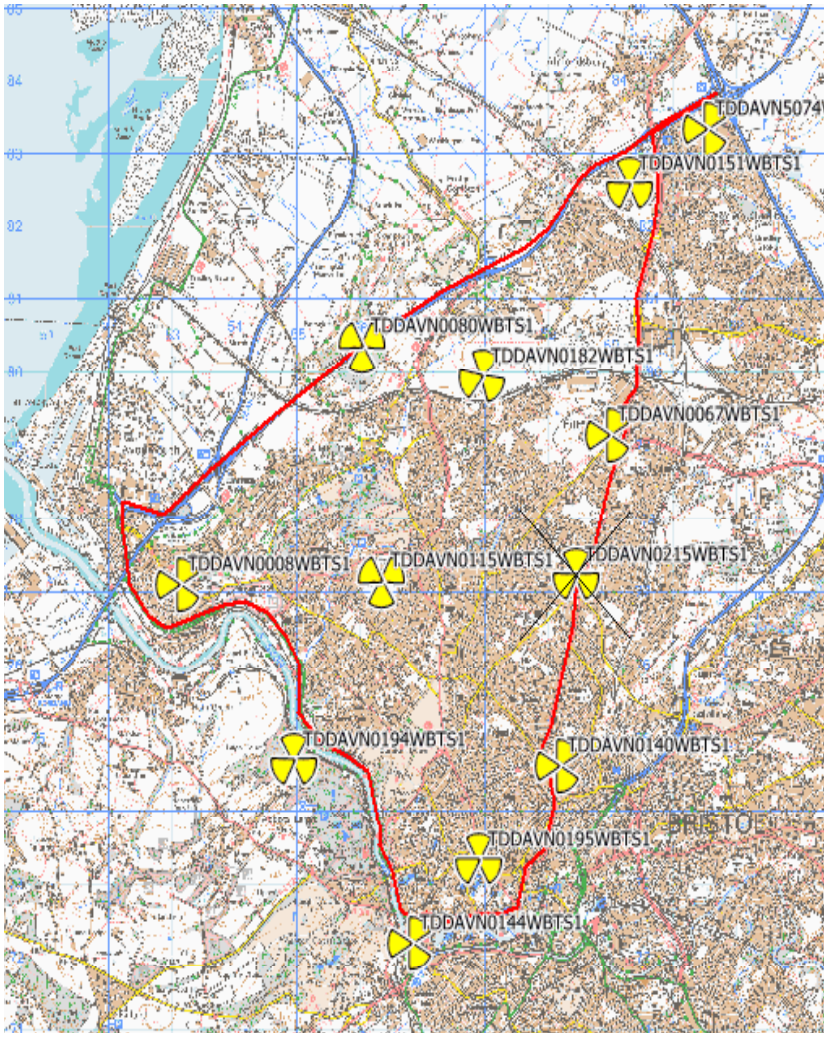
Bristol TDtv Trial



Network

- Area covered is North, West and central Bristol
  - This area currently has 48 3G/FDD Cell Sites (micro and macro)
- 12 TDD Cell sites have been installed
- TDD is on approx 33% of the Orange 3G macro cell sites
- Testing in multiple environments: dense urban, urban, suburban, rural and motorway

Trial

- Phase 1: current chipset devices, technical trial (completed)
- Phase 2: test mobile simulating 2007 chipset, technical trial
- Phase 3: friendly users

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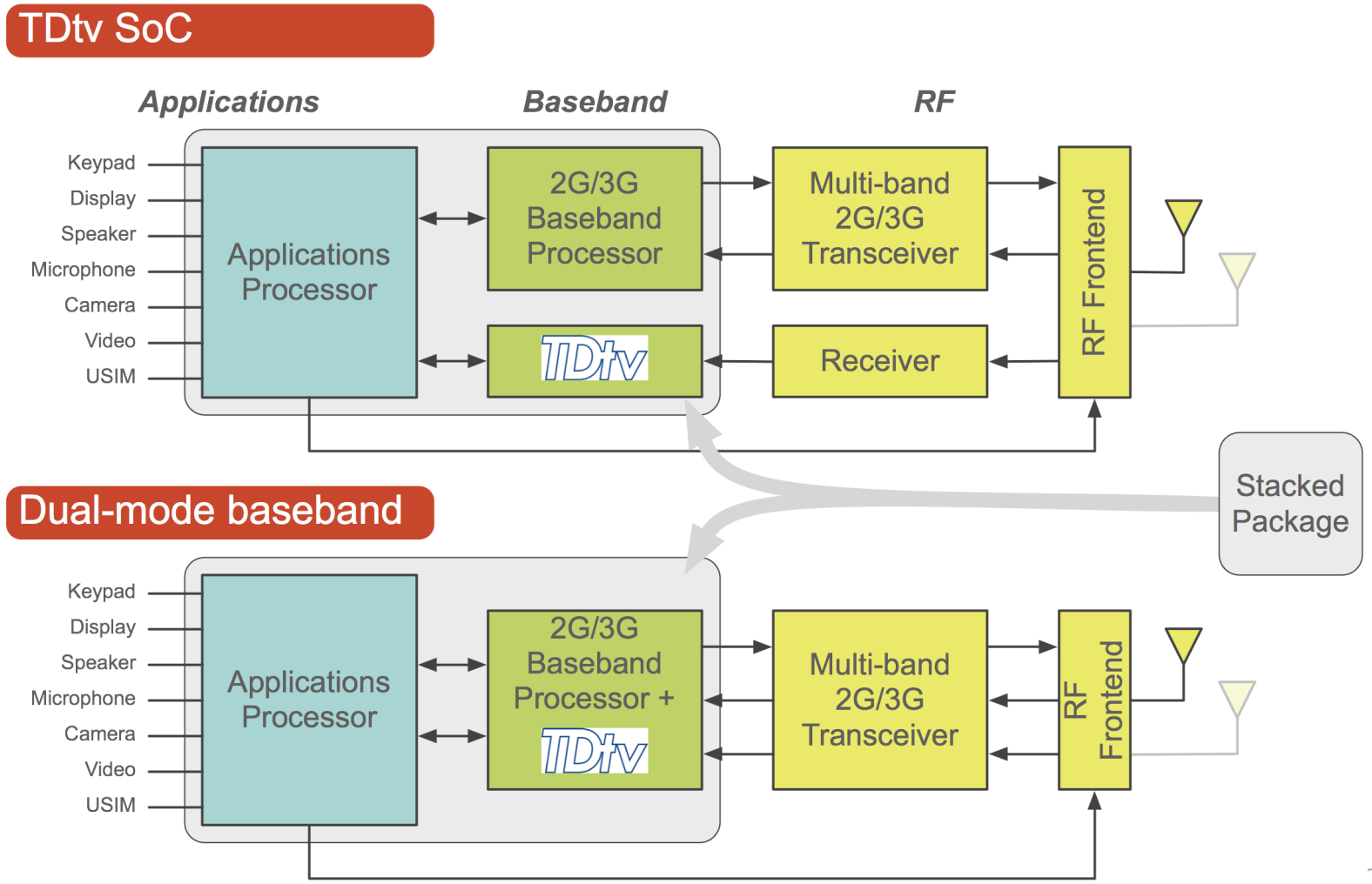
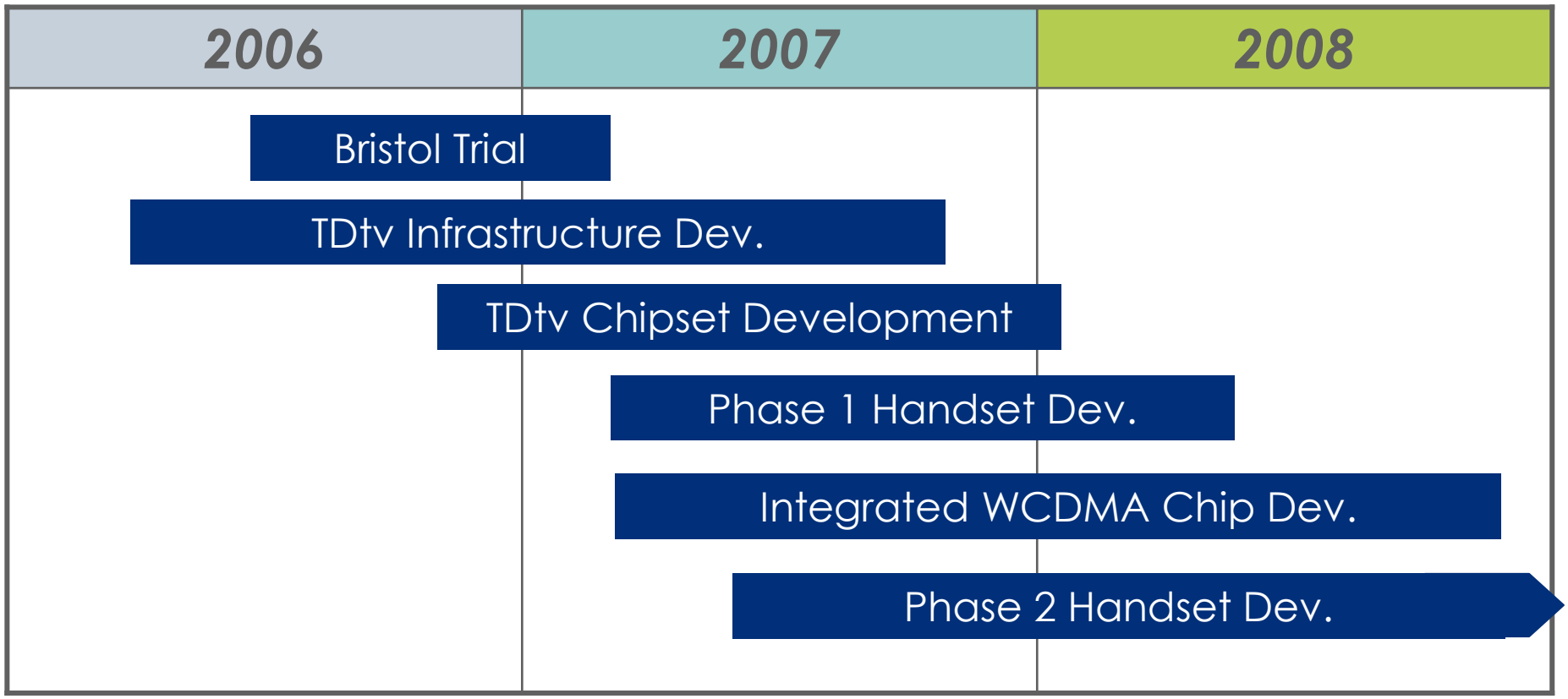
TDtv Handset Architecture



Commercial TDtv Solutions Timeline



Commercial availability of handsets is the gating factor to commercial availability

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Thank You!

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