

## Overview of COMCAR and DRiVE

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Mobile Multimedia Networks

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### Motivation and Scope

- **Demand for high-end mobile multimedia services is increasing**
  - especially in vehicular environments
- **Variety of Requirements:**
  - high bandwidth, asymmetry, interactivity, location dependency,...
- **Problem:**
  - Asymmetric traffic -- Focus on the Downlink
  - Cost efficient provision of services is faced by scarce radio resources
    - Harmonization of additional spectrum worldwide difficult
  - Distinct technologies for communication (GSM, UMTS) and broadcast services (DVB, DAB) with fixed long term spectrum allocation



## Two complementing projects

COMCAR

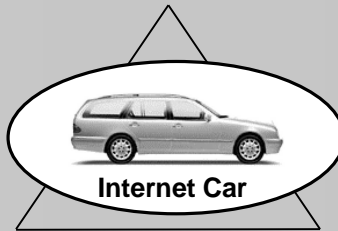
DRIVE

## Partners

DaimlerChrysler  
T-Nova  
Sony Europe

## Subcontractors

RWTH Aachen,  
TU Braunschweig,  
U Darmstadt, TU Dresden,  
U Karlsruhe, TU Munich,  
U Stuttgart, U Ulm

Dynamic Multi-Radio  
IP-Networks

## Partners

Nokia  
DaimlerChrysler  
Bertelsmann  
HHI  
VCON  
Tesci  
Bosch  
BBC, Vodafone, Teracom  
RWTH Aachen, U Bonn

Vehicular Communication  
Platform

Adaptive Multimedia  
Services

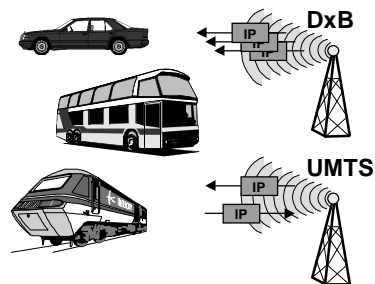
## Objective:

Enable spectrum-efficient high-quality wireless IP

- in a heterogeneous multi-radio environment
- to deliver in-vehicle multimedia services

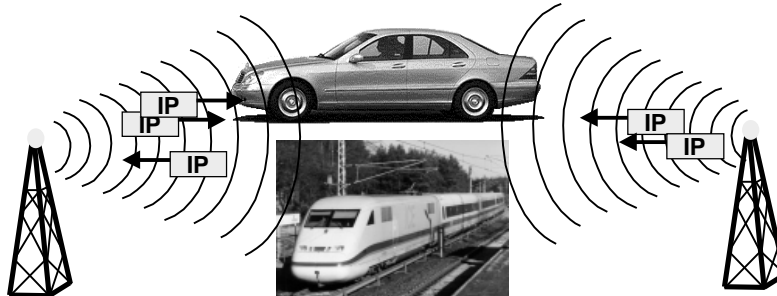
## Approach:

- Investigate system co-existence in a common frequency range with dynamic spectrum allocation
- Exploit co-operation of mobile and broadcast systems
- Enhance co-operation of network elements and adaptive applications



# COMCAR

## Spectrum for Mobile Multimedia Communication Service



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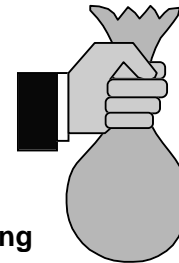
COMCAR-DRIVE, ITG 5.2.4.5

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## Spectrum for Mobile Multimedia Communication Services

- **Spectrum is expensive**
  - UMTS auctions in Germany and Great Britain:
    - aprox. 1 Mrd. DM / MHz / 10 Years / 100 Million Inhabitants
- **Demand for Mobile Data Services is increasing but existing allocation is dominated by voice services**
- **Harmonisation of additional spectrum in Europe and World-Wide is difficult**
- **Additional spectrum must be suited for asymmetric, high-quality IP services**
  - Enable also multicast service



COMCAR-DRIVE, ITG 5.2.4.6

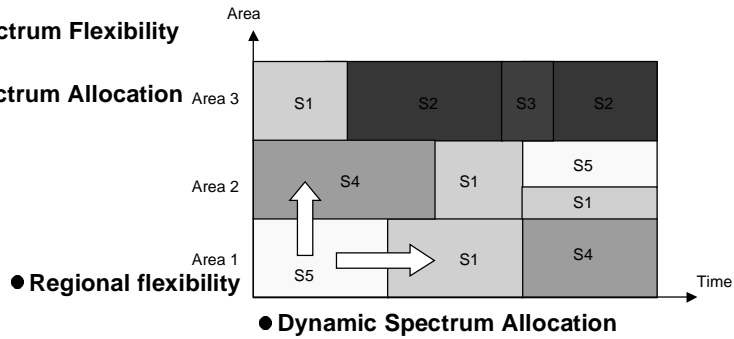
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## Convergence of Spectrum Utilization: Increase Capacity

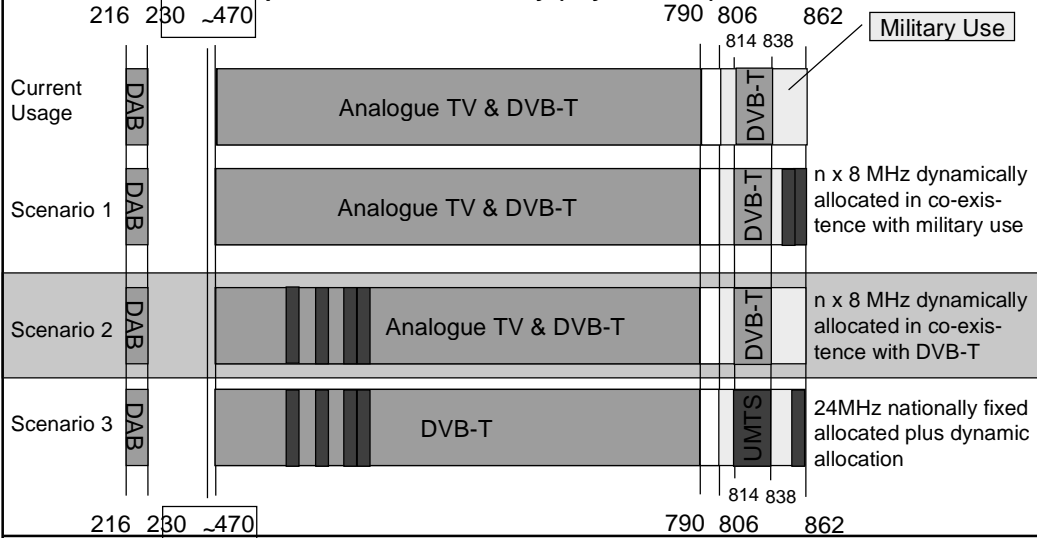
- Opening new spectrum for terrestrial wireless interactive multimedia concept by

- Coexistence of UMTS and Digital Broadcasting
- Regional Spectrum Flexibility
- Dynamic Spectrum Allocation

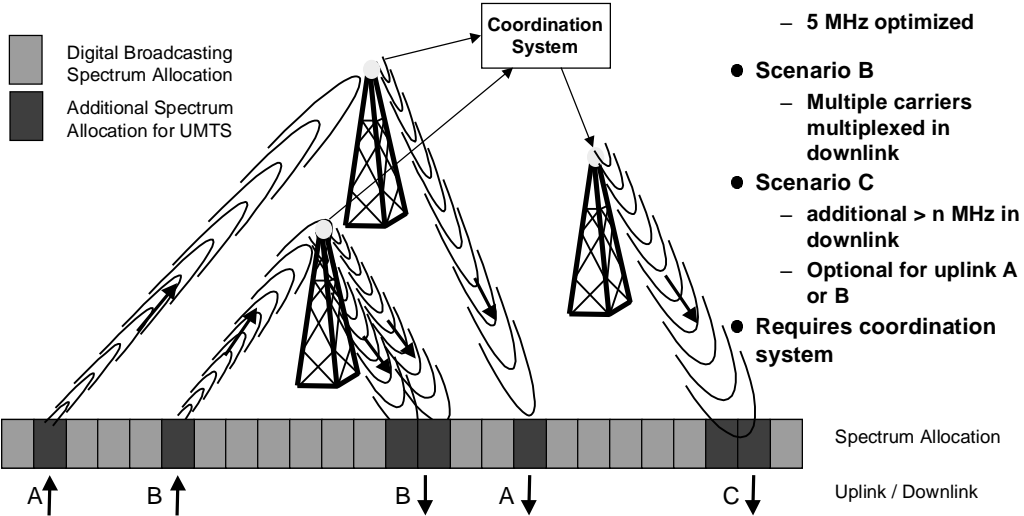


## Coexistence of UMTS and Digital Broadcasting Systems

- Scenarios for Spectrum Use in Germany (beyond 2010)-



## Coexistence of UMTS and Digital Broadcasting Systems in a Common Frequency Range



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DRIVE

WP2:  
IPv6 based multi-radio  
architecture in DRiVE

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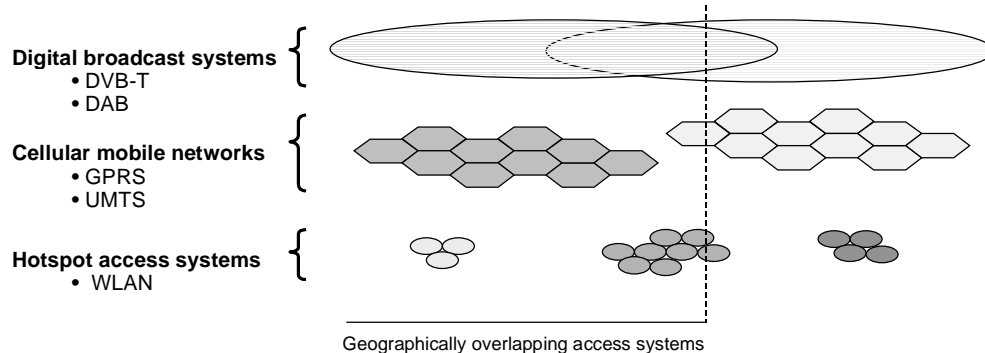
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## Multi-radio, multi-access and multi-operator environment in DRiVE

**Today:** Individual, fixed systems with specialized services



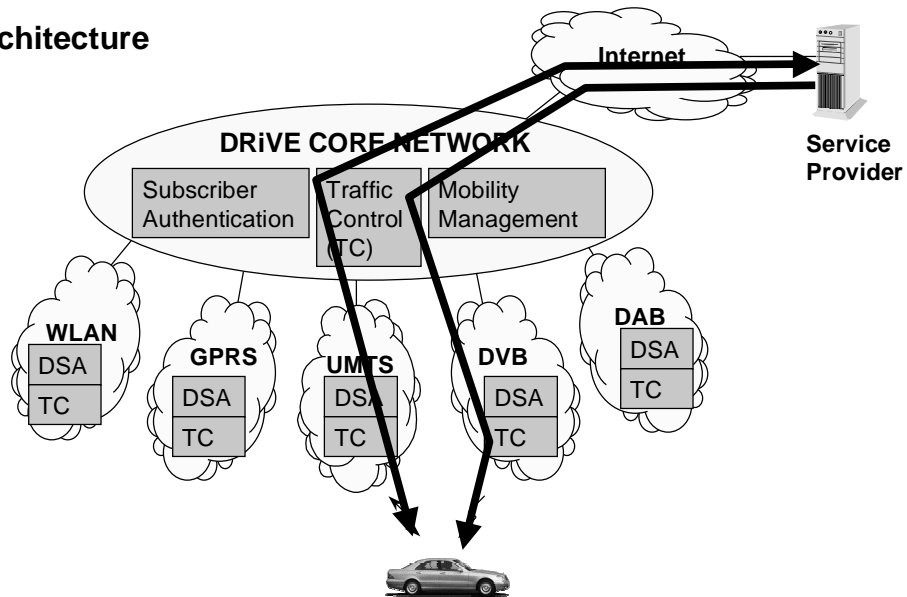
**Problem:** Low network efficiency

## Design goals for DRiVE network architecture

- Support multiple operators (no super-operator)
- No changes to existing access system technologies
- Reuse existing, standard protocols whenever possible
- Provide framework for co-operation between access systems (spectrum and traffic sharing)
- Must be extensible for future access systems
- Support gradual evolution path

These goals are seen as major enablers of wide deployment of the DRiVE concepts

## Architecture



## Thank you for your attention!

Additional Information:

<http://www.comcar.de>

<http://www.ist-drive.org>



IFA'01 in Berlin (25.8.-2.9.2001)