Speech communication in cars goes wideband – the new ITU-T Focus Group CarCom

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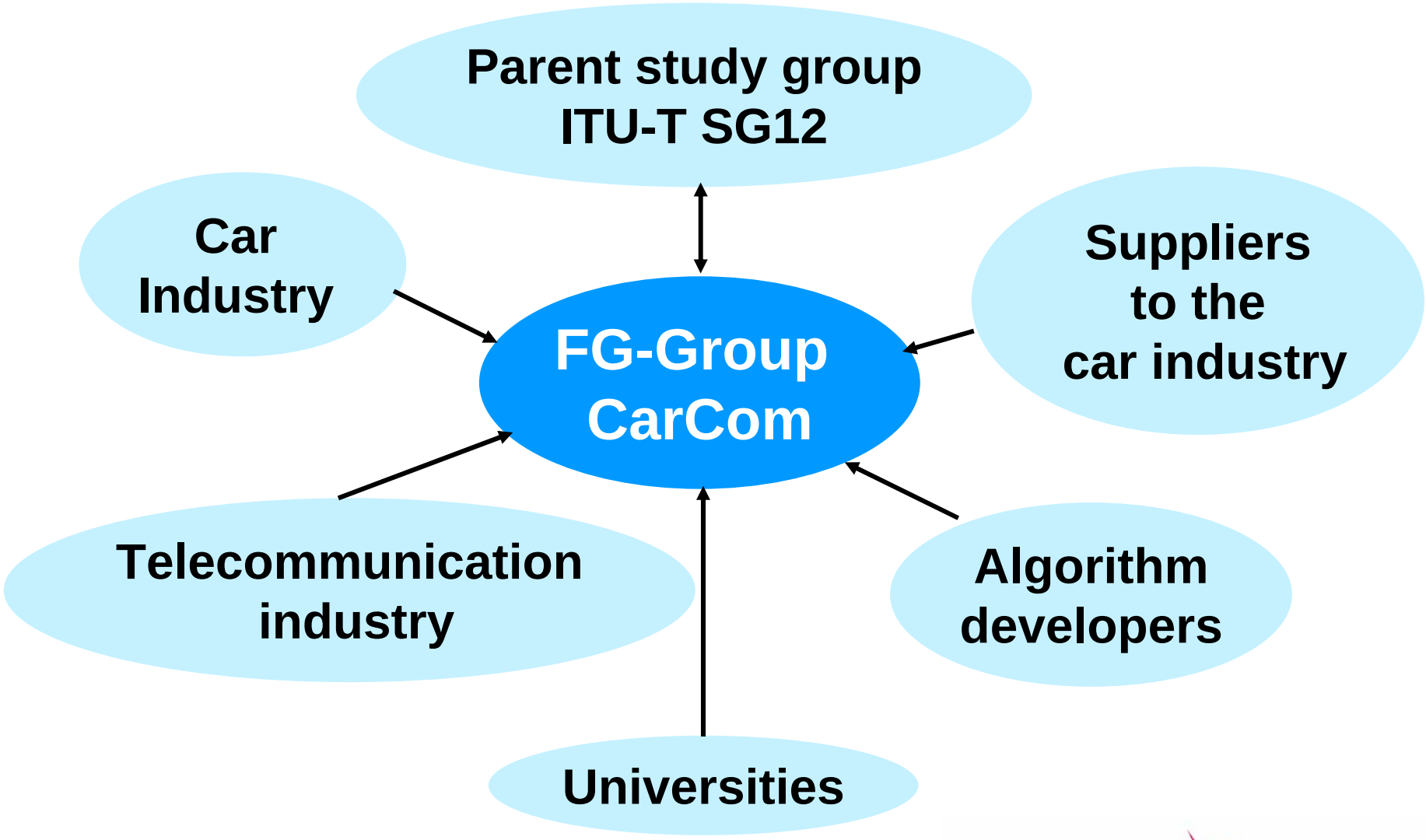
Outline

- The stakeholders
- The goals
- The challenges
- Schedule and future work
- Conclusions

The stakeholders



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Why we do the work?

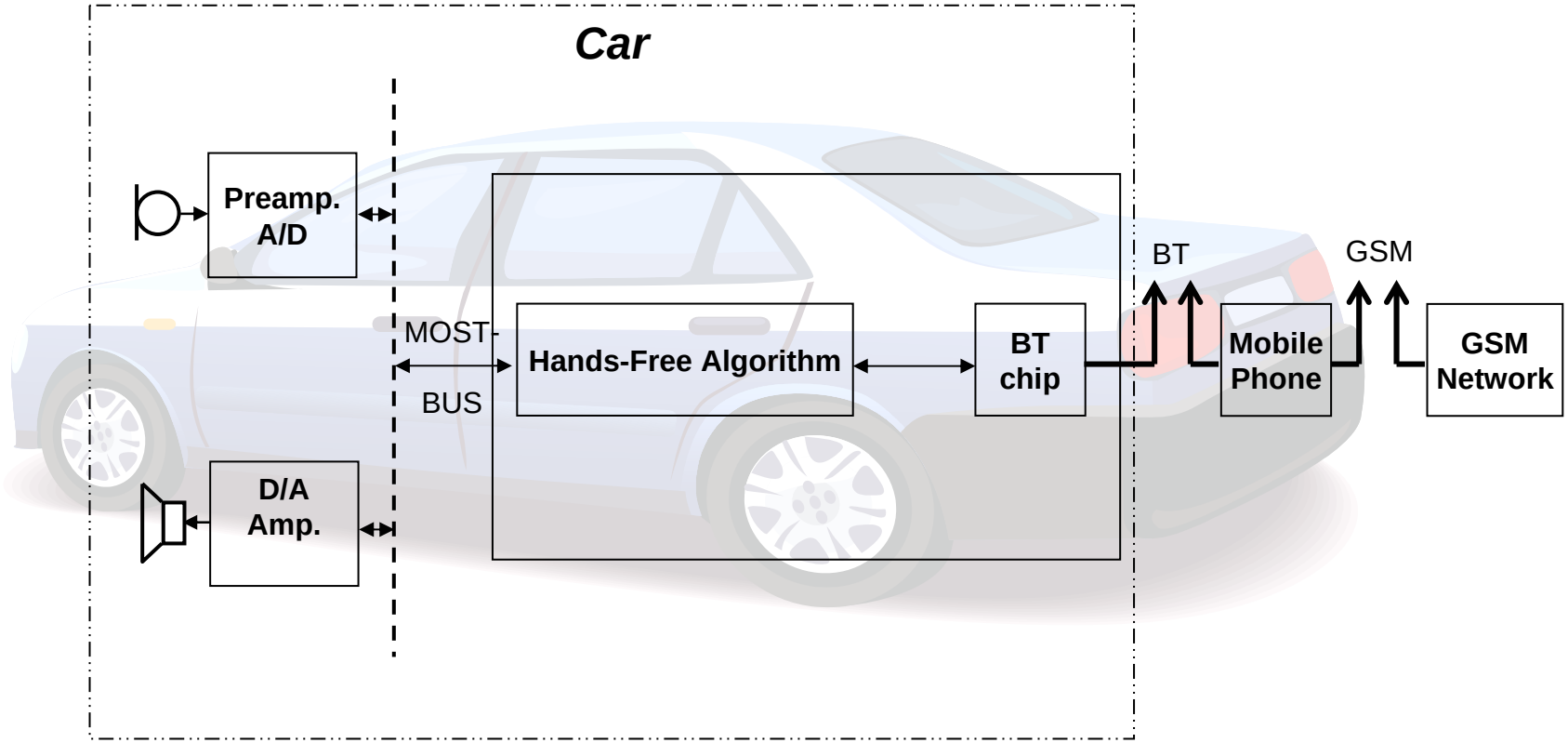
- Wideband services in mobile networks available soon ->
- Enabling wideband telephony (100 Hz- 8 kHz) in cars
  - Fullband
  - Narrow band
  - Wideband
- *Efficient use of the high quality audio systems in cars:*
  - Getting superior sound quality
  - Increasing speech intelligibility
  - Increasing naturalness of a conversation
  - Reduce drivers distraction due to poor speech quality

The Goal

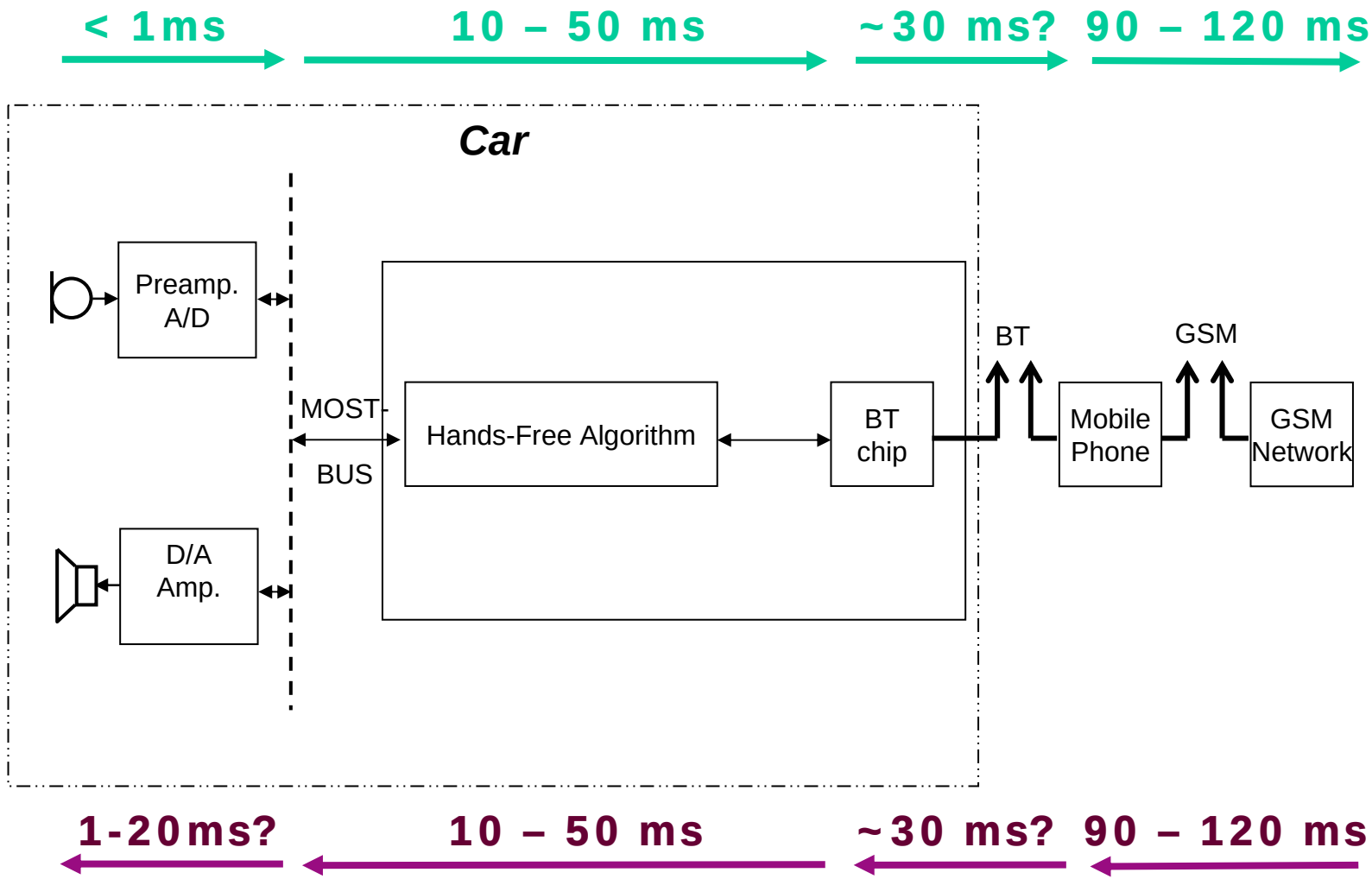
- Development of a standard for testing and optimization

  - the communication quality
    - from cars to the mobile/fixed network
    - from the car infrastructure to the mobile devices
    - of audio components installed in a car and used for hands-free communication
    - wireless devices e.g. headsets used in a car

The Configuration



The Challenges - Delay



Delay

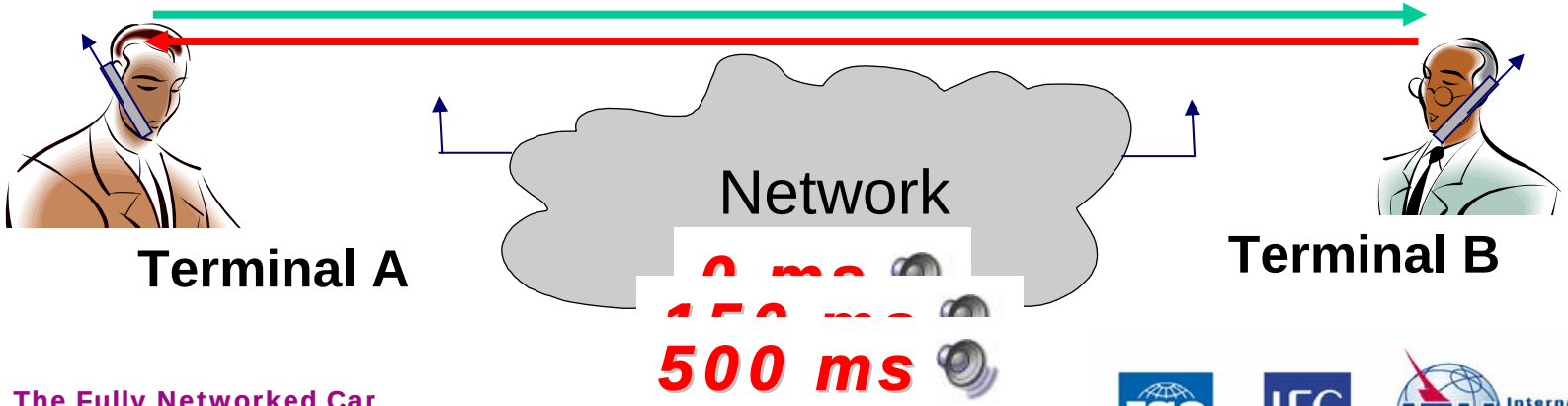
- Best case car to car:

  ~200 ms (no Bluetooth delay)

- Worst case car to car:

  ~400 ms (incl. Bluetooth delay 30 ms)

For superior conversational quality: delay < ~150 ms
(from the users perspective)



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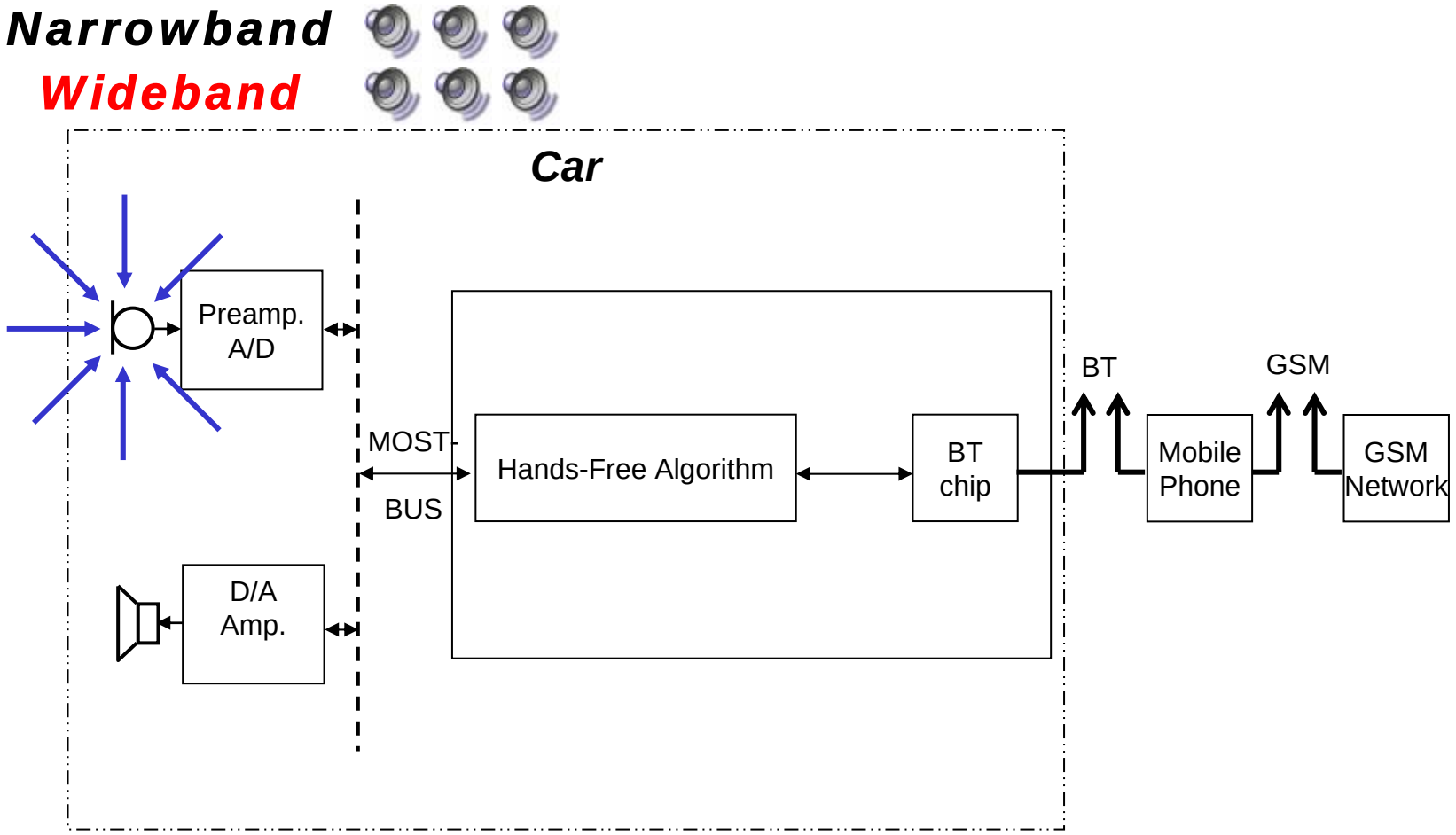
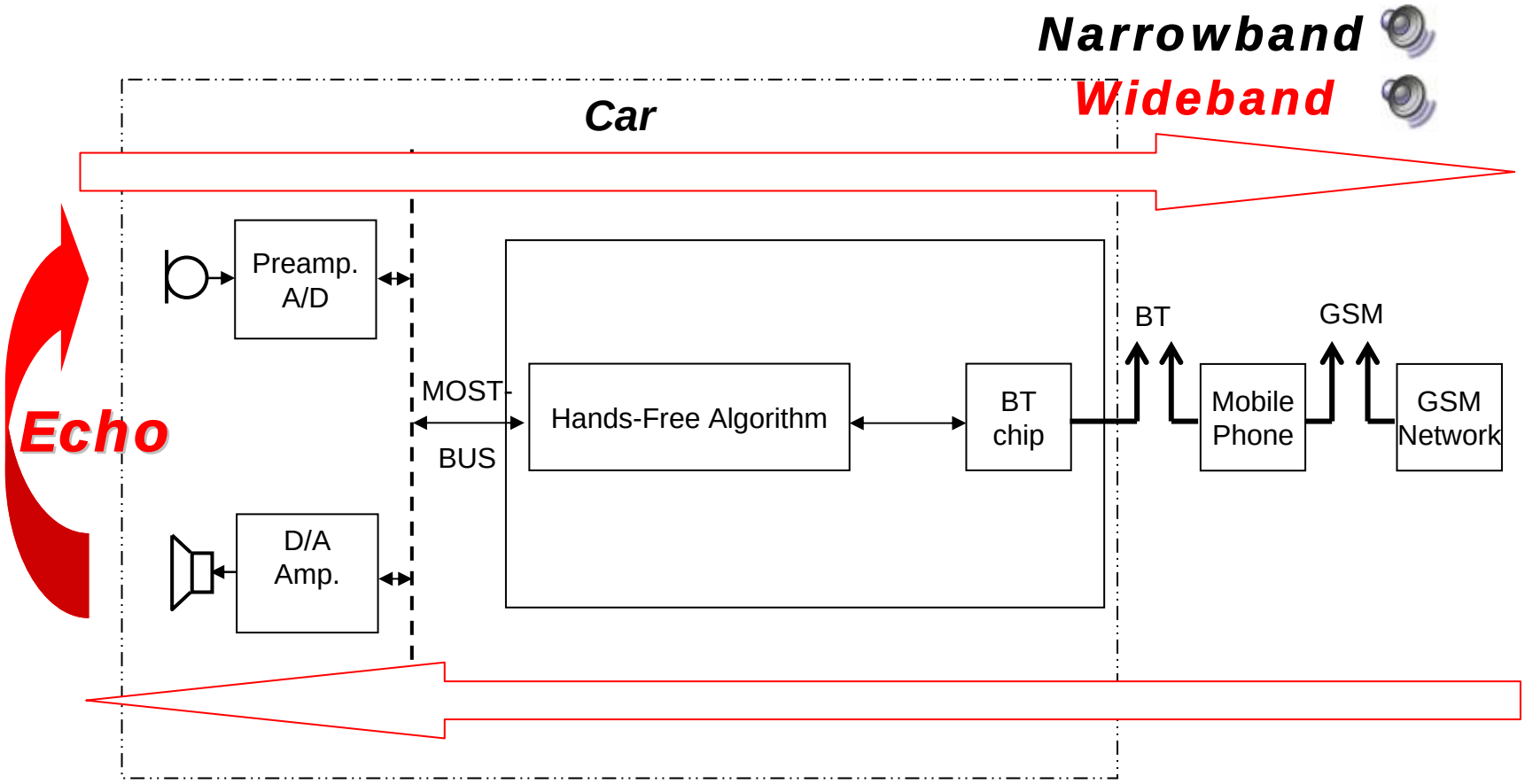
The Challenges – Superior Noise Cancellation



The Challenges – Superior Echo Cancellation



Main Focus of the CarCom Spec

- For a *good conversational performance* we need to ensure:

  Superior sound quality in all conversational situations

  - define requirements optimum frequency responses and
  - optimum loudness
  - requirements for good performance in background noise

Main Focus of the CarCom Spec

- We need to ensure:
  - Low delay including all components of the connection
    - limiting the delay usage in each component
    - get in touch with other standards bodies to
      - enable tandem free operation
      - develop and implement protocols for providing signalling information of signal processing in the components involved in a connection

Main Focus of the CarCom Spec

- We need to ensure:
  - Excellent *echo performance*
  - ➢ define requirements for required echo loss in wideband:
    - ➢ ensure superior echo loss in all conversational situations, esp. double talk
    - ➢ ensure sufficient echo loss with high delay
    - ➢ avoid any impairment in double talk situations

Schedule and Future Work: The Focus Group CarCom

- Input of FITCAR specification to ITU-T SG12
- "Kick off" new group FG CarCom – meeting June 08

:

:

- Autumn 2009

- *Input from FITCAR Specification for Narrowband Hands-Free*

:

- *Draft specification available*

:

- *New Specification, Wideband*

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Conclusion

- Wideband speech services in the car would be a great improvement for the user
- The requirements for a superior service are much stronger than for narrowband
- Not all effects are yet fully understood
- The focus group *CarCom specification* will be the first comprehensive standard covering all conversational aspects of wideband handset and speakerphone conversation in cars

http://www.itu.int/md/T09-FG.CARCOM-090306/sum/en

next meeting: tomorrow, join now!