Schaffnit Consulting Inc

# International Workshop on Vehicle Safety Communications - Session 1 -

Tom Schaffnit
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# Vehicle Safety Communications (VSC) Project

- Two year USDOT project under CAMP, started May 2002
- VSC Consortium Members: BMW, DaimlerChrysler, Ford, GM, Nissan, Toyota, and VW
- Facilitate the advancement of vehicle safety through communication technologies
  - Identify and evaluate the safety benefits of vehicle safety applications enabled or enhanced by communications
  - Assess associated communication requirements including vehicle-vehicle and vehicle-infrastructure communications
  - Contribute to DSRC standards and ensure they effectively support safety

# Potential for Active Vehicle Safety Enabled by Wireless Communications

- Intelligent on-board systems for active safety application processing
- Coupled with wireless communications for real time access to relevant off-board data
- Enhancing planned active safety applications
- Enabling new safety applications

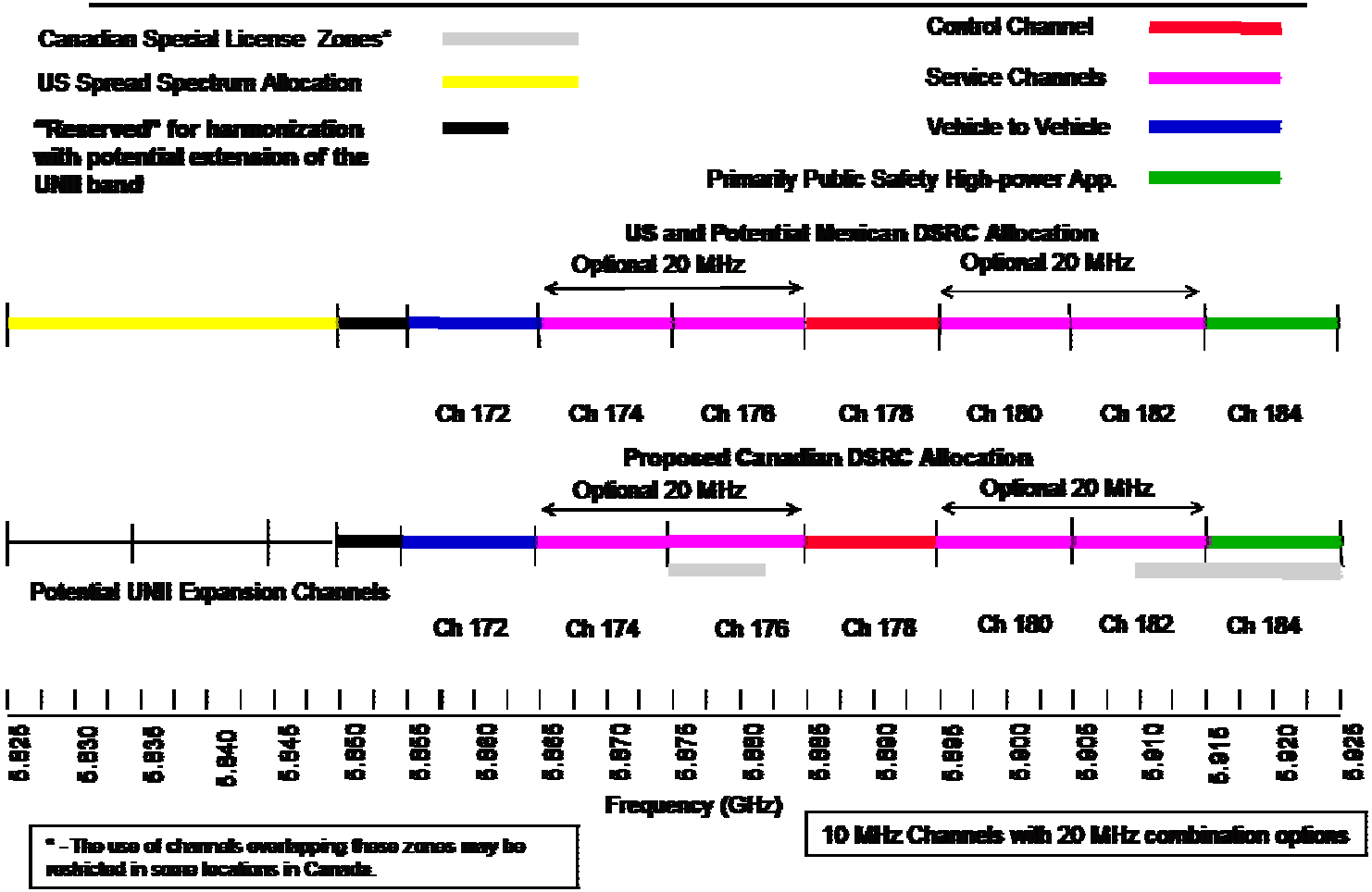
# Future Focus – Prevent/Mitigate Crashes

- Many vehicle safety application scenarios are potentially enabled by wireless communications
- Communications between vehicles, and between vehicles and infrastructure, to warn drivers of dangerous situations and avoid crashes
- Potential for crash severity mitigation, for example:
  - Pre-arming airbags
  - Pre-tensioning seatbelts
- Future developments may possibly allow automated crash avoidance systems, potentially:
  - braking assistance
  - steering assistance

# Evaluation of Wireless Technologies

- Digital Cellular/ PCS / 2.5 - 3G – issues with addressing, latency, cost, interoperability
- Bluetooth – issues with range, scalability
- IR – issues with range, interference
- UWB – issues with range, technological maturity
- WiFi + – issues with latency, mobility
- 5.9GHz DSRC – appears to offer the best potential to support vehicle safety applications

# HARMONIZED 5.9 GHz DSRC BAND PLAN



# 5.9 GHz DSRC Standards Development

- ASTM lower layer standard completed in 2003
- Plan is for integration into IEEE 802.11
- IEEE 802.11 DSRC study group has been formed
- Upper layer standards are being developed in IEEE P1609
- IEEE upper layer standards are to be completed by the end of 2003
- Other related standards are under development or planned

# Major Challenges

- Interoperability
- Sharing spectrum effectively and efficiently
- Maintaining priority channel access for safety applications
- Economics
  - Minimize costs (communications, on-board equipment, infrastructure)
  - Develop convincing value proposition
  - Coordinate deployment – on-board, infrastructure

# Potential Benefits of Global Coordination

- More resources may be focused upon creating consistent solutions
- Potential for creation of economies of scale
- Facilitation of supplier base development
- Possibilities for synergies in planning
- Accelerated deployment potential

# Conclusions

- There appear to be significant potential vehicle safety benefits from the use of wireless technologies
- 5.9 GHz DSRC appears to be the most likely wireless technology to meet most vehicle safety communications requirements in the US
- Long-term planning and investment is required to enable large scale deployment in vehicles and infrastructure
- Standards are very important to ensure interoperability and priorities for safety applications

## Contact Information:

Tom Schaffnit
Schaffnit Consulting, Inc.
phone: 1-734-495-9281
fax: 1-734-495-1256
email: tom@schaffnit.com
web: www.schaffnit.com