Future vehicles will be equipped with IEEE 802.11p wireless technology. This allows Vehicle-2-Vehicle and Vehicle-2-Roadside communications.

The Cooperative Awareness can be used by various applications, such as CACC, but also Green Wave, Crash mitigation systems, navigation, and many others.

The vehicle perceives its environment, and can respond to it.

**The issue of Scalability...**

The **Connect & Drive** demo shows 7 communicating vehicles, sending beacons at 10Hz.

Large-scale deployment requires adaptive methods to prevent overload of the wireless channel:

* transmission power control
* beacon rate control

**Successful reception**

Increasing beacon rate or the number of vehicles reduces the probability a beacon is received: there are more packet collisions.

A challenge is to coordinate these transmissions. Airtime is a scarce commodity – it needs to be shared efficiently and fairly.

**Delay**

Delay increases as the number of vehicles increases.

**Inter-arrival times**

Inter-arrival times of beacons increase due to increasing delay and packet loss.