



Photo Source: USDOT

# DEDICATED SHORT-RANGE COMMUNICATIONS (DSRC)

## THE FUTURE OF SAFER DRIVING



DSRC is a two-way short-to-medium range wireless communications capability that permits very high data transmission critical in communications-based active safety applications. In Report and Order FCC-03-324, the Federal Communications Commission (FCC) allocated 75 MHz of spectrum in the 5.9 GHz band for use by intelligent transportation systems (ITS) vehicle safety and mobility applications.

DSRC-based communications is a major research priority of the ITS Joint Program Office (JPO) at the U.S. Department of Transportation (USDOT) Research and Innovative Technology Administration (RITA). The cross-modal program is conducting research using DSRC and other wireless communications technologies to ensure safe, interoperable connectivity to help prevent vehicular crashes of all types and to enhance mobility and environmental benefits across all transportation system modes.

The USDOT's commitment to DSRC for active safety communications contributes to safer driving. Vehicle safety applications that use vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications need secure, wireless interface dependability in extreme weather conditions, and short time delays; all of which are facilitated by DSRC.

### Who Can Develop DSRC Technologies?

DSRC developers could include device manufacturers; application developers; and representatives from the automotive, telecommunications, consumer electronics, and other industries whose products communicate alerts to vehicles, the infrastructure, or traveler's personal communication devices.

### How Is DSRC Being Used?

V2V and V2I applications utilizing DSRC may have the potential to significantly reduce many of the most deadly types of crashes through real-time advisories alerting drivers to imminent hazards (such as veering close to the edge of the road, vehicles suddenly stopped ahead, collision paths during merging, the presence of nearby communications devices and vehicles, sharp curves, or slippery patches of roadway ahead).

Convenience V2I services like e-parking and toll payment are also able to communicate using DSRC. Private information from electronic sensors in vehicles and devices can also be transmitted over DSRC to provide better traffic and travel condition information to travelers and transportation managers.

**A connected, safer transportation system includes, crash prevention and mobility applications.**

**Connected vehicle ITS applications provide connectivity:**

- Among vehicles to help prevent crashes
- Between vehicles and infrastructure to enable safety, mobility, and environmental sustainability
- Among vehicles, infrastructure, and passengers' wireless devices to provide continuous real-time connectivity to all system users

**DSRC technology behind crash prevention and mobility supports:**

- Active safety transportation applications
- Reliable, secure communications
- Fast communication speed, low latency
- Invulnerability to extreme weather
- Tolerance of multi-path transmissions
- Technology based on standards to enable interoperability



DSRC enables the most reliable, high-speed, vehicle-based technology for crash prevention safety applications



U.S. Department of Transportation

**Research and Innovative Technology Administration**



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## Why was DSRC Developed and to What Benefit?

DSRC was developed with a primary goal of enabling technologies that support safety applications and communication between vehicle-based devices and infrastructure to reduce collisions. DSRC is the only short-range wireless alternative today that provides:

- **Designated licensed bandwidth:** DSRC ensures secure, reliable communications. It is primarily allocated for vehicle safety applications by FCC Report and Order FCC 03-324.
- **Fast Network Acquisition:** Active safety applications require the immediate establishment of communication and frequent updates.
- **Low Latency:** Active safety applications must recognize each other and transmit messages to each other in milliseconds without delay.
- **High Reliability when Required:** Active safety applications require a high level of link reliability. DSRC works in high vehicle speed mobility conditions and delivers performance immune to extreme weather conditions (e.g., rain, fog, snow).
- **Priority for Safety Applications:** Safety applications on DSRC are given priority over non-safety applications.
- **Interoperability:** DSRC ensures interoperability, which is the key to successful deployment of active safety applications, using widely accepted standards. It supports both V2V and V2I communications.
- **Security and Privacy:** DSRC provides safety message authentication and privacy.

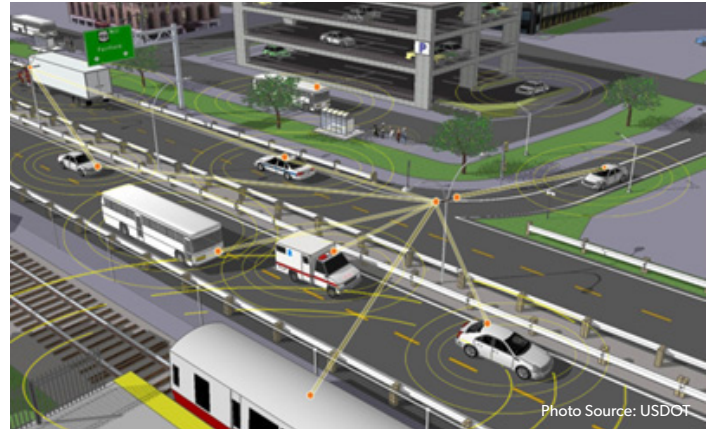


Photo Source: USDOT

DSRC provides for a broad cross-section of dedicated connectivity options for surface transportation safety



Photo Source: USDOT

DSRC-based communications serve as the basis for connected vehicle safety and mobility application integration.

### Potential DSRC Transportation Applications for Public Safety and Traffic Management

- Blind spot warnings
- Forward collision warnings
- Sudden braking ahead warnings
- Do not pass warnings
- Intersection collision avoidance and movement assistance
- Approaching emergency vehicle warning
- Vehicle safety inspection
- Transit or emergency vehicle signal priority
- Electronic parking and toll payments
- Commercial vehicle clearance and safety inspections
- In-vehicle signing
- Rollover warning
- Traffic and travel condition data to improve traveler information and maintenance services

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