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September 21, 2001

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

VIA COURIER

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, SW
Room TW A325
Washington, DC 20554

Re: Ex Parte Notice in WT Docket No. 01-90

Dear Secretary Salas:

Pursuant to Section 1.1206 of the Commission's Rules, 47 C.F.R. § 1.1206, noticed is hereby given to WT Docket No. 01-90 regarding an *ex parte* presentation made by representatives of the Intelligent Transportation Society of America ("ITS America") and ARINC, Inc. to members of the Wireless Bureau's Public Safety and Private Wireless Division on September 20, 2001.

Representing ITS America were Paul Najarian, Director of Telecommunications for ITS America, and Robert Kelly and Mark Johnson of Squire, Sanders & Dempsey L.L.P., counsel to ITS America. Also in attendance was Broady Cash, a Senior Engineer with ARINC, Inc. Mr. Cash also serves as the Chairman of the DSRC Standards Writing Group of the American Society for Testing and Materials ("ASTM") Working Group E17.51 ("DSRC Standards Writing Group"). Attending from the Wireless Bureau's Public Safety and Private Wireless Division were D'wana Terry, Chief, Herb Zeiler, Deputy Chief (Technical), Nancy Zaczek, Staff Attorney, Gerardo Mejia, Electronics Engineer, and Peter Daronco, Deputy Chief of the Policy and Rules Branch.

The purpose of this meeting was to update the Commission regarding efforts by the DSRC Standards Writing Group to select a single communications standard and to develop a proposed band plan and licensing and service rules for the DSRC-based Intelligent Transportation Services in the 5.850-5.925 GHz Band ("5.9 GHz Band"). The participants discussed several specific implicated issues, including, among others, the role of a frequency coordinator, national operability, band channelization, license eligibility and transition to the 5.9 GHz band by incumbents currently located elsewhere.

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Attached hereto is a copy of the presentation materials given to FCC staff at the meeting. This document was presented as a possible approach to a band plan and licensing and service rules. While these issues have been part of a continuing examination by the DSRC Standards Writing Group, this particular band plan proposal has not been balloted and approved by either the writing group or ASTM generally. It was presented to the Commission solely for informational purposes and as a basis for discussion. Moreover, it is expected that other proposed band plans and licensing and service rules will be submitted to the FCC as part of its rulemaking proceeding.

Please do not hesitate to contact me if there are any questions. An original and one (1) copy of this letter and enclosure are included.

Sincerely,

Mark D. Johnson

Enclosure

cc: D'wana Terry, w/ enclosure
Herb Zeiler, w/ enclosure
Nancy Zaczek, w/ enclosure
Gerardo Mejia, w/ enclosure
Peter Daronco, w/ enclosure

PROPOSED NORTH AMERICAN 5.9 GHz DSRC BAND PLAN

PUBLIC SAFETY and PRIVATE APPLICATIONS share the band

PUBLIC SAFETY

- **PROBE DATA COLLECTION***
- **TRAFFIC INFORMATION***
- *TOLL COLLECTION*
- **IN-VEHICLE SIGNING**
  - **WORK ZONE WARNING**
  - **HIGHWAY/RAIL INTERSECTION WARNING**
  - **ROAD CONDITION WARNING**
- **INTERSECTION COLLISION AVOIDANCE**
- **VEHICLE TO VEHICLE**
  - **VEHICLE STOPPED or SLOWING WARNING**
  - **VEHICLE-VEHICLE COLLISION AVOIDANCE**
- **ROLLOVER WARNING**
- **LOW BRIDGE WARNING**
- *MAINLINE SCREENING*
- *BORDER CLEARANCE*
- *ON-BOARD SAFETY DATA TRANSFER*
- *DRIVER'S DAILY LOG*
- *VEHICLE SAFETY INSPECTION*
- **TRANSIT VEHICLE DATA TRANSFER (gate)**
- **TRANSIT VEHICLE SIGNAL PRIORITY**
- **EMERGENCY VEHICLE SIGNAL PREEMPTION**
- **EMERGENCY VEHICLE VIDEO RELAY**
- **EMERGENCY VEHICLE APPROACH WARNING**
- **TRANSIT VEHICLE DATA TRANSFER (yard)**
- **TRANSIT VEHICLE REFUELING**

PRIVATE

- **ACCESS CONTROL***
- GAS PAYMENT #
- DRIVE-THRU PAYMENT #
- **PARKING LOT PAYMENT***
- **DATA TRANSFER (IDB, J1708, J1939, PCI, etc.)**
  - **ATIS DATA**
  - **DIAGNOSTIC DATA**
  - **REPAIR-SERVICE RECORD**
  - **VEHICLE COMPUTER PROGRAM UPDATES**
  - **MAP and MUSIC DATA UPDATES**
- **RENTAL CAR PROCESSING**
- **UNIQUE CVO FLEET MANAGEMENT**
- **CVO TRUCK STOP DATA TRANSFER**
- **LOCOMOTIVE FUEL MONITORING**
- **LOCOMOTIVE DATA TRANSFER**

ATIS - Advanced Traveler Information Systems
CVO - Commercial Vehicle Operations
EV - Emergency Vehicles
IDB - ITS Data Bus
THRU - Through

ITALIC - Primarily 915 MHz Applications
REGULAR # - Currently 134 kHz DL + 903 MHz UL
BOLD - Primarily 5.9 GHz Applications
BOLD* - Both 915 MHz and 5.9 GHz Applications
GREEN - One-Way Communication from RSU to OBU

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DSRC APPLICATIONS by RANGE and VEHICLE CATEGORIES

CORE APPLICATIONS (< 50 ft RANGE) (FOR ALL VEHICLES)

- **ACCESS CONTROL***
- **PROBE DATA COLLECTION***
- **TRAFFIC INFORMATION***
- *TOLL COLLECTION**
- GAS PAYMENT #
- *DRIVE-THRU PAYMENT*
- **DATA TRANSFER (IDB, J1708, J1939, PCI, etc.)**
  - **ATIS DATA**
  - **DIAGNOSTIC DATA**
  - **REPAIR-SERVICE RECORD**
  - **VEHICLE COMPUTER PROGRAM UPDATES**
  - **MAP and MUSIC DATA UPDATES**
- **RENTAL CAR PROCESSING**

CORE APPLICATIONS (300-1100 ft RANGE) (FOR ALL VEHICLES)

- **IN-VEHICLE SIGNING**
  - **WORK ZONE WARNING**
  - **HIGHWAY/RAIL INTERSECTION WARNING**
  - **ROAD CONDITION WARNING**
- **INTERSECTION COLLISION AVOIDANCE**
- **VEHICLE TO VEHICLE**
  - **VEHICLE STOPPED or SLOWING WARNING**
  - **VEHICLE-VEHICLE COLLISION AVOIDANCE**

APPLICATIONS FOR HEAVY TRUCKS, BUSES, TRAINS (< 50- 300 ft RANGE)

- *MAINLINE SCREENING*
- *BORDER CLEARANCE*
- *ON-BOARD SAFETY DATA TRANSFER*
- **UNIQUE CVO FLEET MANAGEMENT**
- *DRIVER'S DAILY LOG*
- *VEHICLE SAFETY INSPECTION*
- **TRANSIT VEHICLE DATA TRANSFER (gate)**
- **TRANSIT VEHICLE REFUELING**
- **LOCOMOTIVE FUEL MONITORING**

APPLICATIONS FOR HEAVY TRUCKS, BUSES, TRAINS, EV (300 - 1100 ft RANGE)

- **ROLLOVER WARNING**
- **LOW BRIDGE WARNING**
- **TRANSIT VEHICLE DATA TRANSFER (yard)**
- **CVO TRUCK STOP DATA TRANSFER**
- **LOCOMOTIVE DATA TRANSFER**

APPLICATIONS FOR BUSES and EV (1000 - 3000 ft RANGE)

- **EMERGENCY VEHICLE SIGNAL PREEMPTION**
- **TRANSIT VEHICLE SIGNAL PRIORITY**
- **EMERGENCY VEHICLE APPROACH WARNING**
- **EMERGENCY VEHICLE VIDEO RELAY**

ATIS - Advanced Traveler Information Systems
CVO - Commercial Vehicle Operations
EV - Emergency Vehicles
IDB - ITS Data Bus
THRU - Through

ITALIC - Primarily 915 MHz Applications
REGULAR# - 134 kHz DL + 903 MHz
BOLD - Primarily 5.9 GHz Applications
BOLD* - Both 915 MHz and 5.9 GHz Applications
GREEN - One-Way Communication from RSU to OBU

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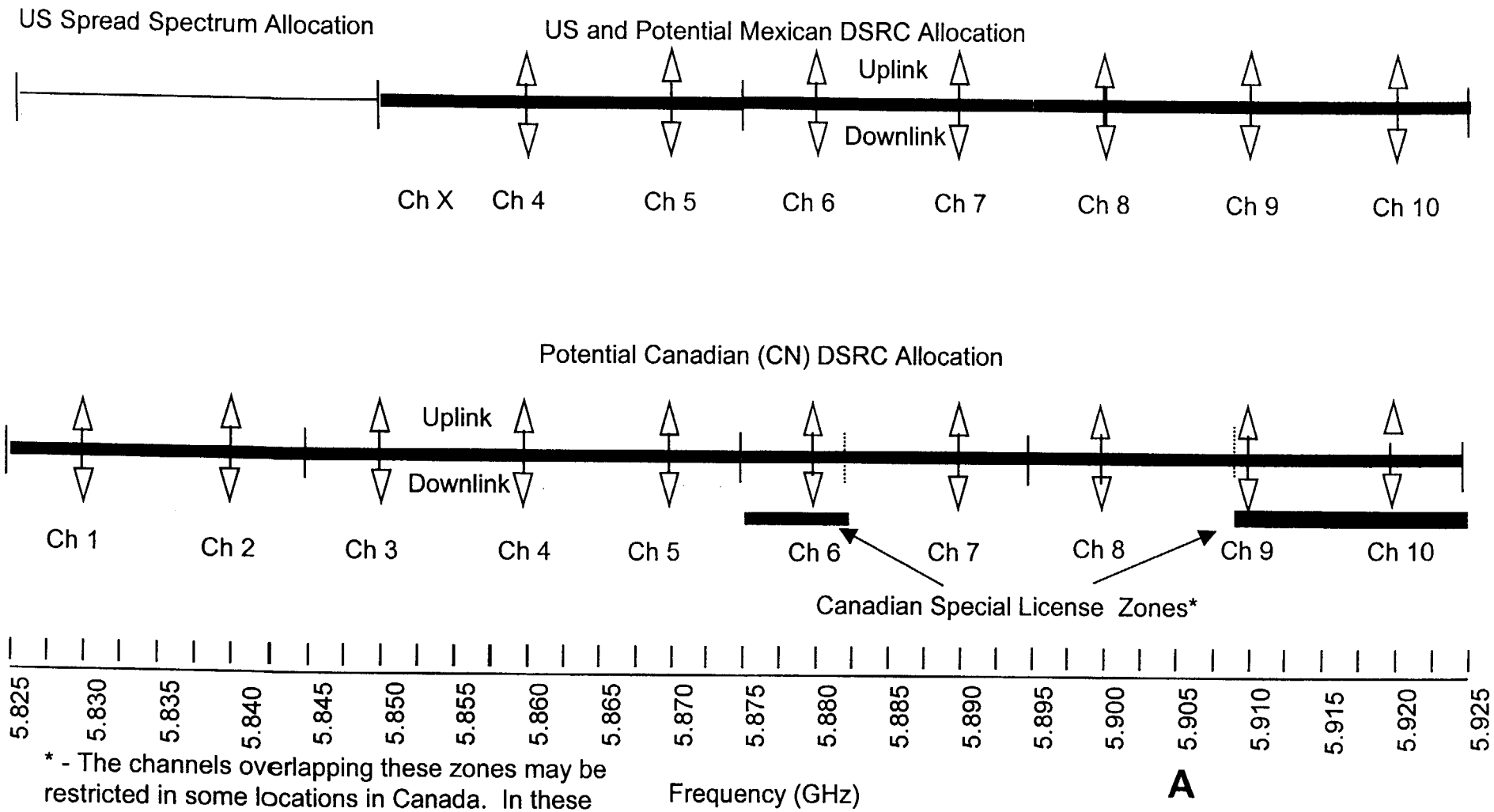
OFDM PHYSICAL LAYER CHARACTERISTICS

- Active - Vehicle Powered - 100 MHz (5.825 - 5.925 GHz) Bandwidth - 75 MHz in U.S.
- Modulation: QPSK OFDM (with 16QAM and 64QAM options) (with BPSK preamble)
- Channels: 10 MHz - 7 to 10 single channels (with optional 20 MHz - 2 channels)
- Data Rate: 6, 9, 12, 18, 24, and 27 Mbps with 10 MHz Channels (with 3 Mbps preamble) (or 6, 9, 12, 18, 24, 36, 48, and 54 Mbps with 20 MHz Channel option)
- RSE EIRP: Nominal 0 - 20 dBm (1 - 100 mW) / Maximum 44.77 dBm (30 W)
- RSE Sensitivity: -82 dBm (QPSK with nominally 20 dB front to back ratio in the antenna)
- OBE EIRP: 0 - 20 dBm (1 - 100 mW) (Cars/Trucks/Transit) / 36- 44.77 dBm (4-30 W) (EV)
- OBE Sensitivity: - 82 dBm (QPSK with nominally 15 dB front to back ratio in the antenna)
- C/I: 2 - 6 dB (for QPSK @ 10^{-4} coded)
- Band Sharing Strategy - Isolation of Installations where possible. Selection of alternate channels for adjacent zones. On-site Frequency Coordination. Use CSMA to prevent interference between users in the zone. A

RSE - Roadside Unit; OBE - Onboard Unit; EV - Emergency Vehicle; EIRP - Effective Isotropic Radiated Power; CSMA - Carrier Sense Multiple Access

5.9 GHz DSRC BAND PLAN with 10 MHz CHANNELS



* - The channels overlapping these zones may be restricted in some locations in Canada. In these cases use channels 1, 2, and 3 in their place.

5.9 GHz DSRC DRAFT OPERATIONAL CONCEPTS*

1. 5.9 GHz DSRC channels are categorized into Public Safety channels, Private channels, and shared (Public Safety and Private) channels and are managed by a Frequency Coordinator.

2. All Public Safety applications and Control Channel operations shall be implemented with the ASTM XXX.XX DSRC standard.

3. One shared channel is designated as the Control channel, where all application announcements are made, and the other channels are designated as Service channels, where large data transfers and special operations occur.

4. Except for designated applications, all ASTM XXX.XX DSRC standard compliant OBUs automatically select the Control channel and wait for application announcements or warning messages. Some applications transfer implementation (service) data on the Control channel. Other applications transfer implementation data on a DSRC Service channel or UNII band channel. The application announcement will identify the DSRC service channel or UNII band channel to switch to if the data transfer is to continue on one of these channels.

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* - Current Proposal -Content subject to change based on further discussions prior to final submittal

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ASTM - American Society for Testing and Materials
OBU - On-board Unit
DSRC - Dedicated Short-Range Communications
RSU - Roadside Unit
UNII - Unlicensed National Information Infrastructure

5.9 GHz DSRC DRAFT OPERATIONAL CONCEPTS*

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5. Each RSU is operated under a license, which at least specifies the location, power level, antenna height, antenna gain, bore sight azimuth, bore sight elevation, maximum announcement repetition rate and the minimum message interval on the Control channel, and, when required, the Service channel frequency and maximum data rate.

6. All roadside to vehicle or vehicle to vehicle Public Safety warning messages are sent on the Control channel.

7. The DSRC band provides a dedicated channel for all Private users seeking a license to operate in compliance with the ITS-RS DSRC operating rules. The appropriate State or Local Governmental Agency provides Public Safety application implementers coordinated access to shared or dedicated channels as appropriate under an area license.

8. Applications that implement public safety related functions at intersections are assigned one service channel because of their longer range and high reliability requirements. Signal priority control will receive priority access to the channel. The intersection application OBU is expected to be the second OBU in the vehicle and does not use the Control channel. Only the primary OBU uses the Control channel when sending Public Safety warning messages.

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* - Current Proposal -Content subject to change based on further discussions prior to submittal

5.9 GHz DSRC DRAFT OPERATIONAL CONCEPTS*

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9. To prevent channel over loading and minimize latency, Vehicle to Vehicle communications in the DSRC band are limited to Public Safety related messages (vehicle location, status, acceleration, etc.) only. One DSRC channel is assigned to this purpose. The vehicle to vehicle OBU is expected to be the second OBU in the vehicle and does not use the Control channel. Only the primary OBU uses the Control channel when sending Public Safety warning messages.

10. All other applications are assigned operating frequencies on a shared channel basis dependent on adequate physical separation. More densely located or higher data rate applications are implemented by assigning separate frequencies where adequate physical separation cannot be achieved. Carrier Sense Multiple Access operation or time slot coordination are use to share the channel with DSRC installations on the same service provider site or in the same Public Safety area.

11. Private application installations in the 5.9 GHz DSRC band are normally limited to a range of 15 m or less and an interference power level of no more than -5 dBm EIRP above 70 degrees elevation. Individual Private application installations may use longer range when the frequency coordinator determines that the interference level, in the authorized configuration, is -95 dBm at any co-channel DSRC site adjacent to the service provider site. The maximum single installation range is 100 m.

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5.9 GHz DSRC DRAFT OPERATIONAL CONCEPTS*

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12. Multiple DSRC RSU installations may be constructed at any DSRC service site to cover a large area as long as no single installation exceeds a 100 m range and the remaining conditions of paragraph 11 are met.

13. Only the power needed to communicate over the distance required to implement the licensed application shall be used. All RSUs and OBUs with more than the minimum power capability shall implement power control in fixed steps.

14. Public safety applications all operate on 10 MHz channels and service the minimum capability - 6 Mbps - OBUs.

15. Public Safety applications are not range limited in the exclusive public safety channels. However, Public Safety applications with ranges greater than 100 m must limit their range to a non interfering level when there is a potential of interfering with private applications in the shared bands.

16. Private Applications in the shared channels operate on a secondary basis to Public Safety Applications with ranges of less than 100 m. This means that short range Public Safety applications effectively have priority for installation location and channel selection over Private Applications in the shared channels.

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* - Current Proposal -Content subject to change based on further discussions prior to submittal

5.9 GHz DSRC DRAFT OPERATIONAL CONCEPTS*

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17. Any one DSRC service site may be assigned only one 10 MHz channel in the DSRC band unless the applicant provides documentation to show that more channels (i.e., 2 - 10 MHz or 1 -20 MHz) are necessary or would provide substantial improvement in the operation of the business and that it would not endanger the non-mutually exclusive use of the band.

18. Channel pairs 1 and 2, 4 and 5, and 9 and 10 may each be combined to provide 20 MHz channels for private applications when the data rate requirements of an application exceed 27 Mbps and when the frequency coordinator determines that the interference level in the authorized configuration is -95 dBm or less at any service provider DSRC site occupying either of the two channels.

19. OBU antenna installations for all applications, except vehicle to vehicle applications, will comply with standard specified parameters including directionality, field of view, and polarization.

20. Horizontal plane multi-directional OBU antennas or multiple OBU antennas may be used in vehicle to vehicle communications.

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* - Current Proposal -Content subject to change based on further discussions prior to submittal

5.9 GHz DSRC DRAFT OPERATIONAL CONCEPTS*

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21. DSRC roadside equipment may implement un-licensed operations under the following conditions. A transmission rate of once every second or longer and an EIRP of -5 dBm or less is used for OBU access on the Control channel. Or, OBUs access the RSU directly by scanning the channel being used in the UNII band. All data transfers must be accomplished in the UNII band.

22. DSRC OBUs may be used to implement a data link between Tractors and Semi-Trailers or Trailers of Commercial Trucks in the 10 MHz between 5.815 and 5.825 GHz on an un-licensed basis. This data link must operate properly in the presence of the maximum density of trucks it is likely to encounter on the road, truck stop, or fleet parking area. In addition, this data link must not interfere with point to point or in-building UNII band operation or be susceptible to point to point or in building UNII band operation of IEEE 802.11a or other radios.

24. There are no FCC license fees for governmental agencies. The private users (i.e., McDonalds™, Burger King™, etc.) pay a license fee to the FCC.

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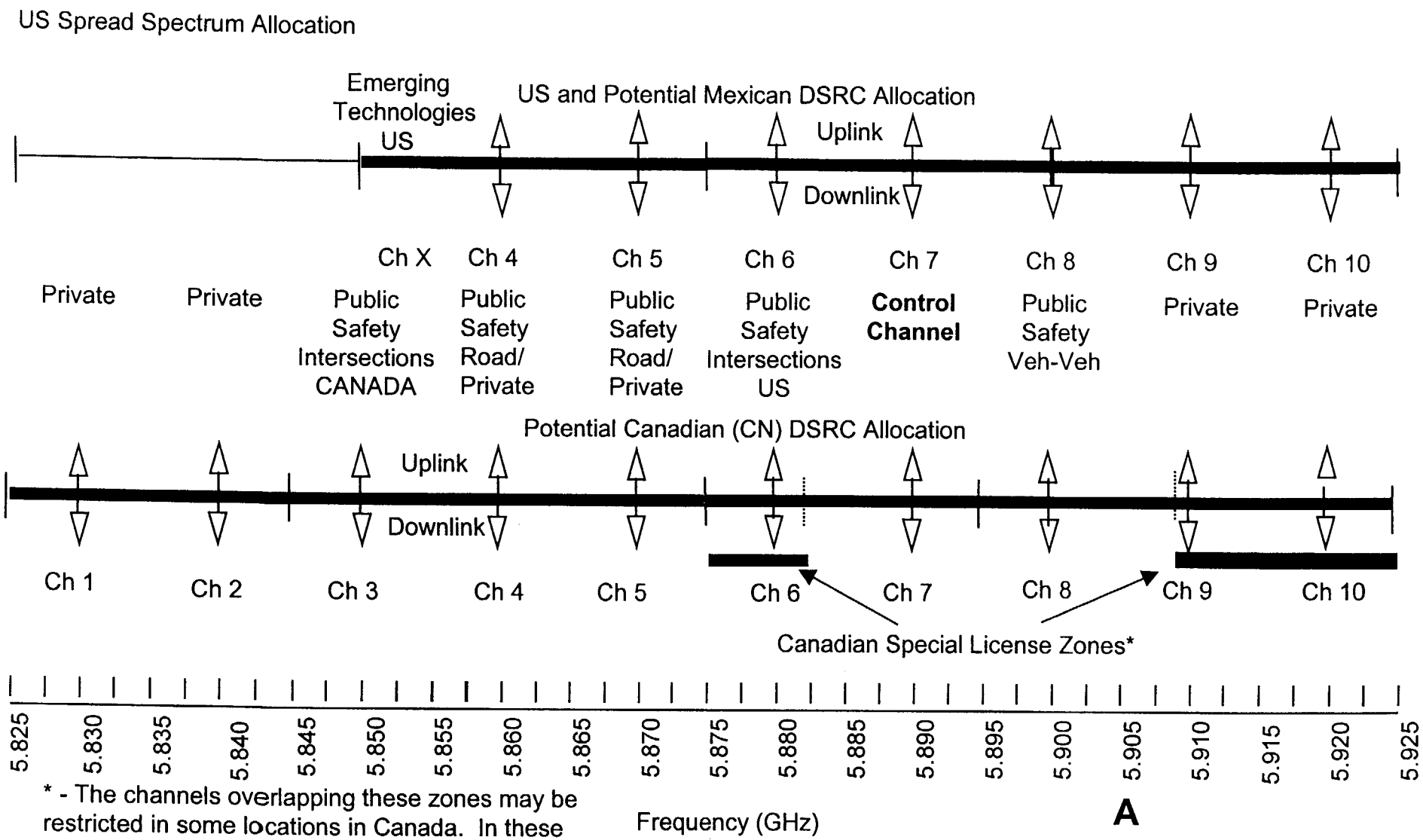
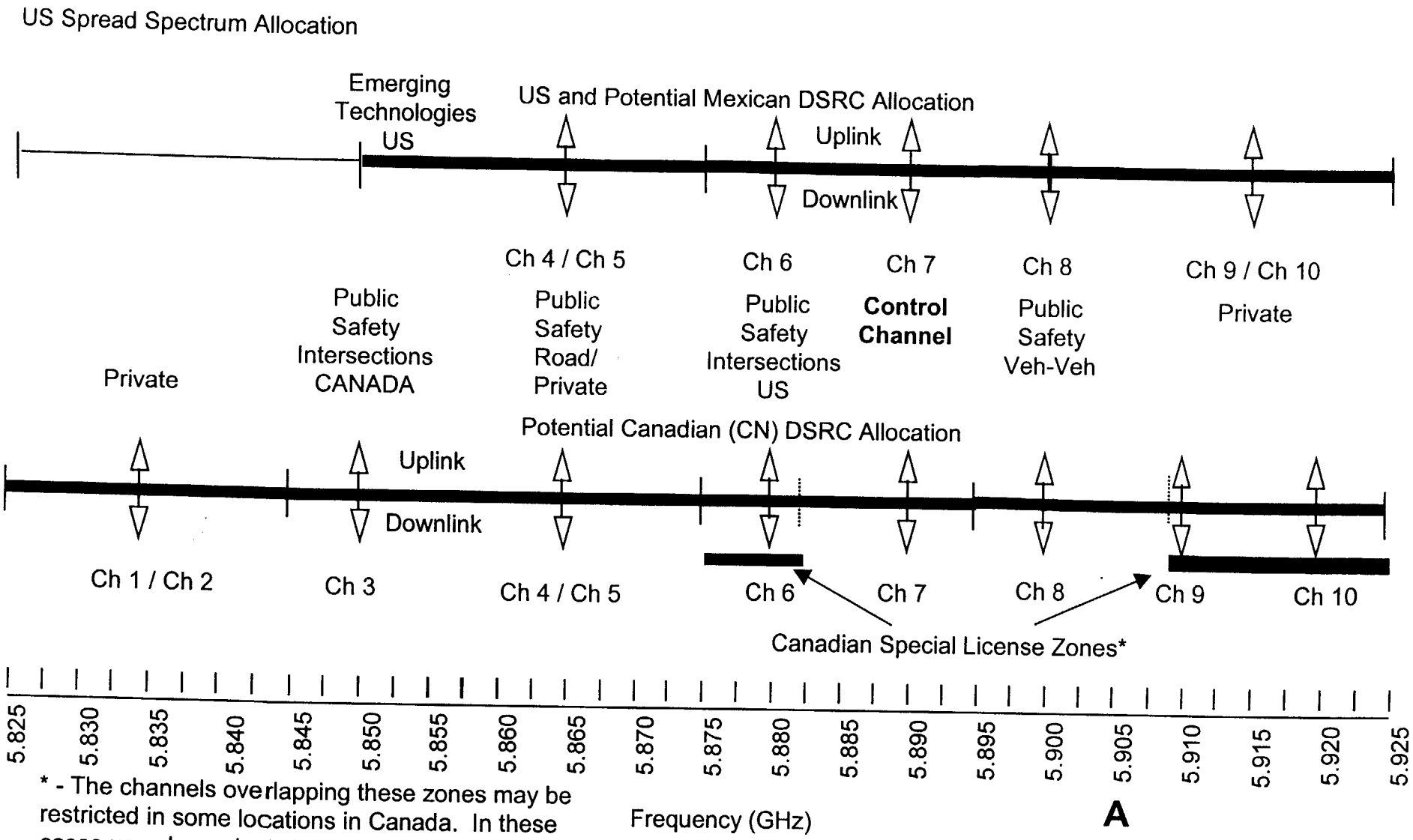
5.9 GHz DSRC CHANNEL ALLOCATION with 10 MHz CHANNELS



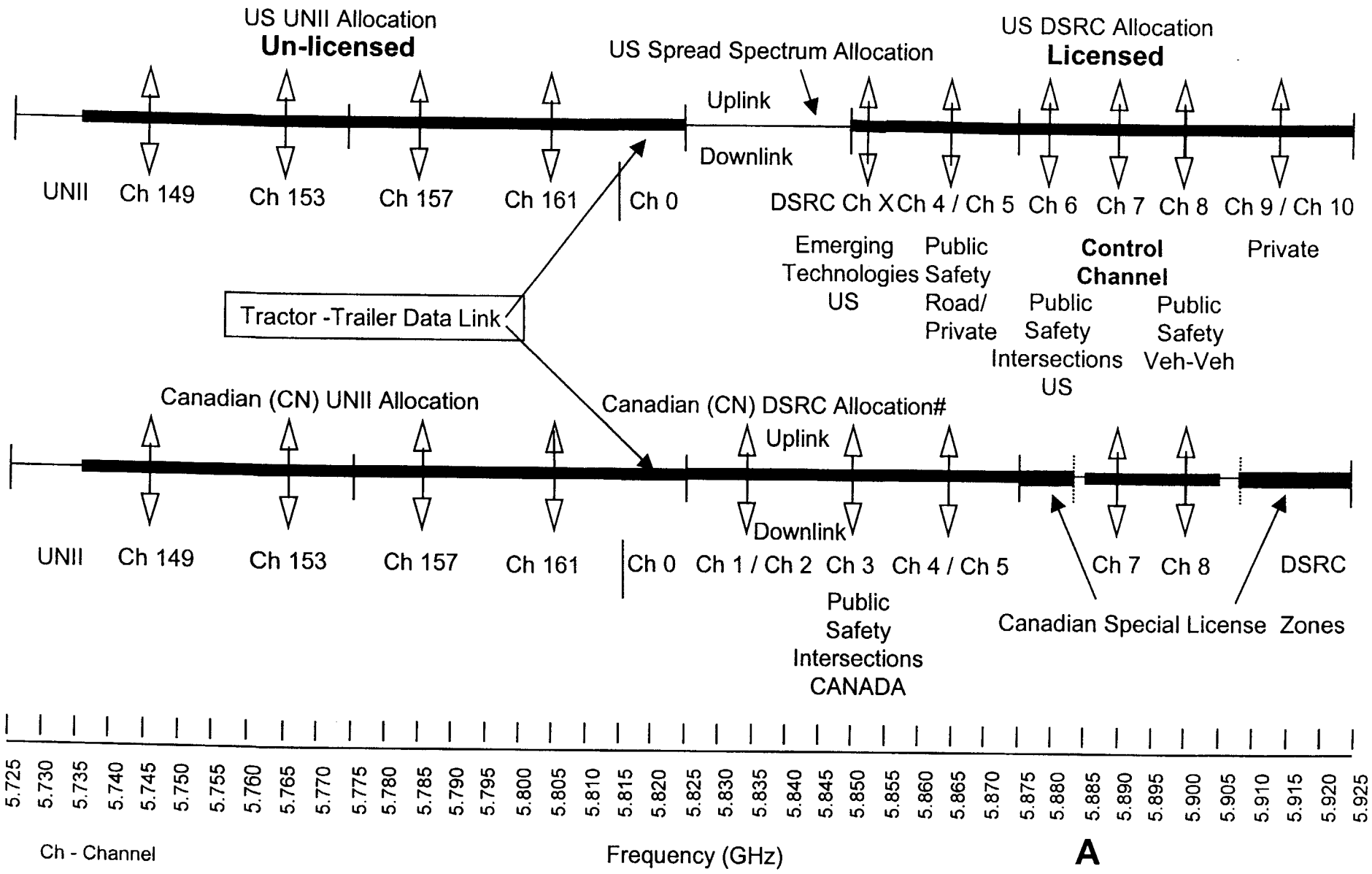
* - The channels overlapping these zones may be restricted in some locations in Canada. In these cases use channels 1, 2, and 3 in their place.

5.9 GHz DSRC CHANNEL ALLOCATION with 10 and optional 20 MHz CHANNELS



* - The channels overlapping these zones may be restricted in some locations in Canada. In these cases use channels 1, 2, and 3 in their place.

5.7250 to 5.925 GHz
DSRC and UNII CHANNELS



MOST PROBABLE APPLICATION and US / MEXICAN CHANNEL ASSOCIATIONS

ACCESS CH	SERVICE CH	APPLICATIONS
Seven	Seven	ACCESS CONTROL
Seven	Seven	PROBE DATA COLLECTION
Seven	Four - Five	TRAFFIC INFORMATION
Seven	Seven	TOLL COLLECTION (option 1)
Seven	Four - Five	TOLL COLLECTION (option 2)
Seven	Nine -Ten	GAS (FUEL) PAYMENT
Seven	Nine -Ten	DRIVETHRU PAYMENT
Seven	Four - Five	DATA TRANSFER (option 1) (Maps, Programs, Music, Internet)
Seven	Nine -Ten	DATA TRANSFER (option 2) (Maps, Programs, Music, Internet)
Seven	Nine -Ten	RENTAL CAR PROCESSING
Seven	Seven	IN-VEHICLE SIGNING
Seven	Seven	WORK ZONE WARNING
Seven	Seven	HIGHWAY/RAIL INTERSECTION WARNING
Seven	Seven	ROAD CONDITION WARNING
Seven/Six	Seven/Six	INTERSECTION COLLISION AVOIDANCE (Advance Station/Central)
Eight	Eight	VEHICLE-VEHICLE COLLISION AVOIDANCE
Seven	Seven	EMERGENCY VEHICLE APPROACH WARNING
Six	Six	EMERGENCY VEHICLE SIGNAL PREEMPTION
Six	Six	TRANSIT VEHICLE SIGNAL PRIORITY
Seven	Nine -Ten	TRANSIT VEHICLE DATA TRANSFER
Seven	Nine -Ten	TRANSIT VEHICLE REFUELING
Seven	Seven	ROLLOVER WARNING
Seven	Seven	LOW BRIDGE WARNING
Seven	Four - Five	MAINLINE SCREENING
Seven	Four - Five	BORDER CLEARANCE
Seven	Nine -Ten	ON-BOARD SAFETY DATA
Seven	Nine -Ten	UNIQUE CVO FLEET MANAGEMENT
Seven	Nine -Ten	DRIVER'S DAILY LOG
Seven	Nine -Ten	VEHICLE SAFETY INSPECTION

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PROPOSED APPLICATION and US / MEXICAN CHANNEL ASSOCIATIONS

ACCESS CH	SERVICE CH	APPLICATIONS
• Seven	• Nine -Ten	• CVO TRUCK STOP DATA TRANSFER
• Seven	• Nine -Ten	• LOCOMOTIVE DATA TRANSFER
• Seven	• Nine -Ten	• LOCOMOTIVE FUEL MONITORING
• Seven	• Four - Five	• EMERGENCY VEHICLE VIDEO RELAY
• Zero	• Zero	• TRACTOR-TRAILER DATA TRANSFER

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PROPOSED APPLICATION and CANADIAN CHANNEL ASSOCIATIONS

ACCESS CH	SERVICE CH	APPLICATIONS
Seven	Seven	ACCESS CONTROL
Seven	Seven	PROBE DATA COLLECTION
Seven	Four - Five	TRAFFIC INFORMATION
Seven	Seven	TOLL COLLECTION (option 1)
Seven	Four - Five	TOLL COLLECTION (option 2)
Seven	One - Two*	GAS (FUEL) PAYMENT
Seven	One - Two*	DRIVETHRU PAYMENT
Seven	Four - Five	DATA TRANSFER (option 1) (Maps, Programs, Music, Internet)
Seven	One - Two*	DATA TRANSFER (option 2) (Maps, Programs, Music, Internet)
Seven	One - Two*	RENTAL CAR PROCESSING
Seven	Seven	IN-VEHICLE SIGNING
Seven	Seven	WORK ZONE WARNING
Seven	Seven	HIGHWAY/RAIL INTERSECTION WARNING
Seven	Seven	ROAD CONDITION WARNING
Seven/Three*	Seven/Three*	INTERSECTION COLLISION AVOIDANCE (Advance Station/Central)
Eight	Eight	VEHICLE-VEHICLE COLLISION AVOIDANCE
Seven	Seven	EMERGENCY VEHICLE APPROACH WARNING
Three*	Three*	EMERGENCY VEHICLE SIGNAL PREEMPTION
Three*	Three*	TRANSIT VEHICLE SIGNAL PRIORITY
Seven	One - Two*	TRANSIT VEHICLE DATA TRANSFER
Seven	One - Two*	TRANSIT VEHICLE REFUELING
Seven	Seven	ROLLOVER WARNING
Seven	Seven	LOW BRIDGE WARNING
Seven	Four - Five	MAINLINE SCREENING
Seven	Four - Five	BORDER CLEARANCE
Seven	One - Two*	ON-BOARD SAFETY DATA
Seven	One - Two*	UNIQUE CVO FLEET MANAGEMENT
Seven	One - Two*	DRIVER'S DAILY LOG
Seven	One - Two*	VEHICLE SAFETY INSPECTION

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* - US and Canada use different Channels

PROPOSED APPLICATION and CANADIAN CHANNEL ASSOCIATIONS

ACCESS CH	SERVICE CH	APPLICATIONS
• Seven	• One - Two*	• CVO TRUCK STOP DATA TRANSFER
• Seven	• One - Two*	• LOCOMOTIVE DATA TRANSFER
• Seven	• One - Two*	• LOCOMOTIVE FUEL MONITORING
• Seven	• Four - Five	• EMERGENCY VEHICLE VIDEO RELAY
• Zero	• Zero	• TRACTOR-TRAILER DATA TRANSFER

A

* - US and Canada use different Channels

5.9 GHz DSRC
BAND PLAN RATIONALE

1. An expected channel switching time of one millisecond does not form the basis for a good channel scanning mechanism. The Control channel method does not waste time on channels where no signals will appear or expend energy switching from one channel to another. The Control channel enables access times that are very much faster than scanning. In addition, the Control channel enables entry level inexpensive single channel OBUs. Also, long range and short range applications mix well in this short packet environment. The Control channel access method makes the best use of the spectrum.

2. Multiple service channels allow easier frequency coordination by not allowing all the free channels to be exhausted easily in a high density deployment environment. Four short range 10 MHz channels for the private sector should be adequate for this technology that has a high short range channel reuse capability.

3. Vehicle to vehicle operations will interfere with any co-channel stationary application that the vehicles pass and must therefore operate in a separate channel. Vehicle to vehicle OBUs are expected to be secondary OBUs specifically allocated to this task.

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DSRC - Dedicated Short-Range Communications
OBU - On-board Unit RSU - Roadside Unit CSMA - Carrier Sense Multiple Access

5.9 GHz DSRC
BAND PLAN RATIONALE

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4. Intersection operations are time critical and can occupy substantial channel time. All intersections transmissions are scheduled to prevent interference and will not share well with other CSMA operations. The ranges of intersection operations are much longer than the average DSRC application and therefore do not share well with other DSRC operations. Intersection operations must have a separate channel. Intersection OBUs are expected to be secondary OBUs specifically allocated to these high duty cycle tasks.

5. 6 Mbps is set as the base data rate with 3 Mbps only used for the preamble and header. The minimum data rate allowed sets the maximum number of users that can share a site or a channel. The higher the minimum data rate the more users any installation or channel can support. We should set the minimum data rate at the highest value consistent with the minimum chip set capability, the maximum range requirements, and reliability of the applications. 9 Mbps might also be a good minimum number to consider.

6. Non-control channel single channel or scanning only systems are not allowed. The primary goal of interoperability is defeated if we allow a large group of single channel or scanning OBUs to function without accessing the control channel. They cannot be used for receiving Safety related messages or other general messages.

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DSRC - Dedicated Short-Range Communications
OBU - On-board Unit RSU - Roadside Unit CSMA - Carrier Sense Multiple Access

5.9 GHz DSRC
BAND PLAN RATIONALE

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7. Most public safety applications that are expected to operate on the general service channels (i.e., toll collection, mainline screening, etc.) are short range applications. Short range applications share well in the DSRC environment and every effort should be made to keep them together and free of interfering long range applications. Therefore, mixing the short range Public Safety application service channels with the Private service channel on channels 4 and 5 provides an opportunity to take maximum advantage of the high density application deployment capability of DSRC.

8. Some applications can be implemented more effectively with more that the 27 Mbps that is available in a 10 MHz channel. Data transfers of large data files (i.e. movies, data logs from long trips, transit video storage, Maps, etc.) need all the speed they can get. DSRC devices will be more marketable with the capability to implement current IEEE 802.11a applications at full speed. A small channel reuse distance allows two channels to be combined in one location and a short distance away used separately for different applications. Two 20 MHz channels can be created in both the US and Canada by making channels 1 and 2; 4 and 5; and 9 and 10 available for this option. This is enough to provide an alternative channel in case a service provider's neighbor is also using an application requiring a 20 MHz channel.

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DSRC - Dedicated Short-Range Communications
OBU - On-board Unit RSU - Roadside Unit CSMA - Carrier Sense Multiple Access

5.9 GHz DSRC
BAND PLAN RATIONALE

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9. Every effort must be made to keep the Control channel and the most commonly used applications and border crossing applications in common channels between the US, Canada, and Mexico. Therefore, the Control, vehicle to vehicle, and short range safety channels were placed on the common channels between the US and Canada. There was no room in the common band for the Private service channels and the Intersection channel. However, Private service channels are designated in the application announcement and are easily changed. The Intersection channel is a special, location specific parameter that can be set at the time of RSU and OBU installation and does not usually change. It also does not need to be accessed by all mobile OBUs. The special OBUs that do use this channel can be programmed to scan between the two possible channels when outside of their home area.

10. The Tractor-Trailer Data Link would be installed on trucks that travel between the US and Canada. We cannot use a channel or part of a channel that would interfere with the operations of applications in either country. The UNII band has a guard band at the band edge that is 10 MHz wide with very little signal in it, if any at all. With the steeper filters of the DSRC equipment, low power levels, high C/I ratios, and the protected environment that the application is operating in we can build a device that will experience no interference from the UNII devices and give no interference to UNII devices if operated in the 5.815 to 5.825 GHz channel.

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DSRC - Dedicated Short-Range Communications
OBU - On-board Unit RSU - Roadside Unit CSMA - Carrier Sense Multiple Access

5.9 GHz DSRC
BAND PLAN RATIONALE

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11. To prevent interference between incompatible access techniques, all Control channels operations are implemented in compliance with the ASTM XXX.XX DSRC standard.

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DSRC - Dedicated Short-Range Communications
OBU - On-board Unit RSU - Roadside Unit CSMA - Carrier Sense Multiple Access