

# DENM Mapping

## CAR 2 CAR Communication Consortium



### About the C2C-CC

Enhancing road safety and traffic efficiency by means of Cooperative Intelligent Transport Systems and Services (C-ITS) is the dedicated goal of the CAR 2 CAR Communication Consortium. The industrial driven, non-commercial association was founded in 2002 by vehicle manufacturers affiliated with the idea of cooperative road traffic based on Vehicle-to-Vehicle Communications (V2V) and supported by Vehicle-to-Infrastructure Communications (V2I). The Consortium members represent worldwide major vehicle manufactures, equipment suppliers and research organisations.

Over the years, the CAR 2 CAR Communication Consortium has evolved to be one of the key players in preparing the initial deployment of C-ITS in Europe and the subsequent innovation phases. CAR 2 CAR members focus on wireless V2V communication applications based on ITS-G5 and concentrate all efforts on creating standards to ensure the interoperability of cooperative systems, spanning all vehicle classes across borders and brands. As a key contributor, the CAR 2 CAR Communication Consortium and its members work in close cooperation with the European and international standardisation organisations.

### Disclaimer

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Codes according to DENM/CDD standard			TPEG2-TEC (ISO 21219-15:2023)			
DENM index	CauseCode	SubCauseCode	code	warn level	referenceWordCC	referenceWordSCC
1_0	trafficCondition	unavailable	1_0	1	traffic congestion	
1_1	trafficCondition	increasedVolumeOfTraffic	1_1	1	traffic congestion	increased volume of traffic
1_2	trafficCondition	trafficJamSlowlyIncreasing	1_0	2	traffic congestion	
1_3	trafficCondition	trafficJamIncreasing	1_0	2	traffic congestion	
1_4	trafficCondition	trafficJamStronglyIncreasing	1_0	2	traffic congestion	
1_5	trafficCondition	trafficStationary	1_0	2	traffic congestion	
1_6	trafficCondition	trafficJamSlightlyDecreasing	1_0	2	traffic congestion	
1_7	trafficCondition	trafficJamDecreasing	1_0	2	traffic congestion	
1_8	trafficCondition	trafficJamStronglyDecreasing	1_0	2	traffic congestion	
1_9	trafficCondition	trafficJamStable	1_1	2	traffic congestion	increased volume of traffic
2_0	accident	unavailable	2_0	3	accident	
2_1	accident	multiVehicleAccident	2_1	3	accident	multi-vehicle accident
2_2	accident	heavyAccident	2_2	3	accident	major accident
2_3	accident	accidentInvolvingLorry	2_3	3	accident	accident involving lorry
2_4	accident	accidentInvolvingBus	2_4	3	accident	accident involving bus
2_5	accident	accidentInvolvingHazardousMaterials	2_5	3	accident	accident involving hazardous materials
2_6	accident	accidentOnOppositeLane	2_6	3	accident	accident in opposite lane
2_7	accident	unsecuredAccident	2_7	3	accident	unsecured accident
2_8	accident	assistanceRequested	2_0	3	accident	
3_0	roadworks	unavailable	3_0	3	roadworks	
3_1	roadworks	majorRoadworks	3_1	3	roadworks	major roadworks
3_2	roadworks	roadMarkingWork	3_2	3	roadworks	road marking work
3_3	roadworks	slowMovingRoadMaintenance	3_3	3	roadworks	slow moving road maintenance
3_4	roadworks	shortTermStationaryRoadworks	3_0	3	roadworks	
3_5	roadworks	streetCleaning	3_0	3	roadworks	
3_6	roadworks	winterService	3_0	3	roadworks	
4_0	reserved for future usage	-				
5_0	impassability	unavailable	5_0	1	impassability	

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DENM index	CauseCode	SubCauseCode	code	warn level	referenceWordCC	referenceWordSCC
5_1	impassability	flooding	5_1	1	impassability	flooding
5_2	impassability	dangerOfAvalanches	5_2	1	impassability	danger of avalanches
5_3	impassability	blastingOfAvalanches	5_3	1	impassability	blasting of avalanches
5_4	impassability	landslips	5_4	1	impassability	landslips
5_5	impassability	chemicalSpillage	5_5	1	impassability	chemical spillage
5_6	impassability	winterClosure	5_6	1	impassability	winter closure
5_7	impassability	sinkhole	5_0	1	impassability	
5_8	impassability	earthquakeDamage	5_0	1	impassability	
5_9	impassability	fallenTrees	5_0	1	impassability	
5_10	impassability	rockfalls	5_0	1	impassability	
5_11	impassability	sewerOverflow	5_0	1	impassability	
5_12	impassability	stormDamage	5_0	1	impassability	
5_13	impassability	subsidence	5_0	1	impassability	
5_14	impassability	burstPipe	5_0	1	impassability	
5_15	impassability	burstWaterMain	5_0	1	impassability	
5_16	impassability	fallenPowerCables	5_0	1	impassability	
5_17	impassability	snowDrifts	5_0	1	impassability	
6_0	adverseWeatherCondition-Adhesion	unavailable	6_0	3	slippery road	
6_1	adverseWeatherCondition-Adhesion	heavyFrostOnRoad	6_1	3	slippery road	heavy frost on road
6_2	adverseWeatherCondition-Adhesion	fuelOnRoad	6_2	3	slippery road	fuel on road
6_3	adverseWeatherCondition-Adhesion	mudOnRoad	6_3	3	slippery road	mud on road
6_4	adverseWeatherCondition-Adhesion	snowOnRoad	6_4	3	slippery road	snow on road
6_5	adverseWeatherCondition-Adhesion	iceOnRoad	6_5	3	slippery road	ice on road
6_6	adverseWeatherCondition-Adhesion	blackIceOnRoad	6_6	3	slippery road	black ice on road
6_7	adverseWeatherCondition-Adhesion	oilOnRoad	6_7	3	slippery road	oil on road
6_8	adverseWeatherCondition-Adhesion	looseChippings	6_8	3	slippery road	loose chippings
6_9	adverseWeatherCondition-Adhesion	instantBlackIce	6_9	3	slippery road	instant black ice
6_10	adverseWeatherCondition-Adhesion	roadsSalted	6_10	3	slippery road	roads salted
7_0	aquaplaning	unavailable	7_0	3	aquaplaning	

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DENM index	CauseCode	SubCauseCode	code	warn level	referenceWordCC	referenceWordSCC
8_0	reserved for future usage	-				
9_0	hazardousLocation-SurfaceCondition	unavailable	9_0	3	hazardous driving conditions	
9_1	hazardousLocation-SurfaceCondition	rockfalls	9_1	3	hazardous driving conditions	rock falls
9_2	hazardousLocation-SurfaceCondition	earthquakeDamage	9_2	3	hazardous driving conditions	earthquake damage
9_3	hazardousLocation-SurfaceCondition	sewerCollapse	9_3	3	hazardous driving conditions	sewer collapse
9_4	hazardousLocation-SurfaceCondition	subsidence	9_4	3	hazardous driving conditions	subsidence
9_5	hazardousLocation-SurfaceCondition	snowDrifts	9_5	3	hazardous driving conditions	snow drifts
9_6	hazardousLocation-SurfaceCondition	stormDamage	9_6	3	hazardous driving conditions	storm damage
9_7	hazardousLocation-SurfaceCondition	burstPipe	9_7	3	hazardous driving conditions	burst pipe
9_8	hazardousLocation-SurfaceCondition	volcanoEruption	9_8	3	hazardous driving conditions	volcano eruption
9_9	hazardousLocation-SurfaceCondition	fallingIce	9_9	3	hazardous driving conditions	falling ice
9_10	hazardousLocation-SurfaceCondition	fire	8_1	3	fire	major fire
10_0	hazardousLocation-ObstacleOnTheRoad	unavailable	10_0	3	objects on the road	
10_1	hazardousLocation-ObstacleOnTheRoad	shedLoad	10_1	3	objects on the road	shed load
10_2	hazardousLocation-ObstacleOnTheRoad	partsOfVehicles	10_2	3	objects on the road	parts of vehicles
10_3	hazardousLocation-ObstacleOnTheRoad	partsOfTyres	10_3	3	objects on the road	parts of tyres
10_4	hazardousLocation-ObstacleOnTheRoad	bigObjects	10_4	3	objects on the road	large objects
10_5	hazardousLocation-ObstacleOnTheRoad	fallenTrees	10_5	3	objects on the road	fallen trees
10_6	hazardousLocation-ObstacleOnTheRoad	hubCaps	10_6	3	objects on the road	hub caps
10_7	hazardousLocation-ObstacleOnTheRoad	waitingVehicles	10_7	3	objects on the road	stationary vehicle

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DENM index	CauseCode	SubCauseCode	code	warn level	referenceWordCC	referenceWordSCC
11_0	hazardousLocation-AnimalOnTheRoad	unavailable	11_0	3	animals on roadway	
11_1	hazardousLocation-AnimalOnTheRoad	wildAnimals	11_1	3	animals on roadway	wild animals
11_2	hazardousLocation-AnimalOnTheRoad	herdOfAnimals	11_2	3	animals on roadway	herd of animals
11_3	hazardousLocation-AnimalOnTheRoad	smallAnimals	11_3	3	animals on roadway	small animals
11_4	hazardousLocation-AnimalOnTheRoad	largeAnimals	11_4	3	animals on roadway	large animals
11_5	hazardousLocation-AnimalOnTheRoad	wildAnimalsSmall	11_1	3	animals on roadway	wild animals
11_6	hazardousLocation-AnimalOnTheRoad	wildAnimalsLarge	11_4	3	animals on roadway	large animals
11_7	hazardousLocation-AnimalOnTheRoad	domesticAnimals	11_0	3	animals on roadway	
11_8	hazardousLocation-AnimalOnTheRoad	domesticAnimalsSmall	11_0	3	animals on roadway	
11_9	hazardousLocation-AnimalOnTheRoad	domesticAnimalsLarge	11_4	3	animals on roadway	large animals
12_0	humanPresenceOnTheRoad	unavailable	12_0	3	people on roadway	
12_1	humanPresenceOnTheRoad	childrenOnRoadway	12_1	3	people on roadway	children on roadway
12_2	humanPresenceOnTheRoad	cyclistOnRoadway	12_2	3	people on roadway	cyclists on roadway
12_3	humanPresenceOnTheRoad	motorcyclistOnRoadway	12_3	3	people on roadway	moped rider on roadway
12_4	humanPresenceOnTheRoad	pedestrian	12_0	3	people on roadway	
12_5	humanPresenceOnTheRoad	ordinary-pedestrian	12_0	2	people on roadway	
12_6	humanPresenceOnTheRoad	road-worker	12_0	3	people on roadway	
12_7	humanPresenceOnTheRoad	first-responder	12_0	3	people on roadway	
12_8	humanPresenceOnTheRoad	lightVruVehicle	12_0	1	people on roadway	

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DENM index	CauseCode	SubCauseCode	code	warn level	referenceWordCC	referenceWordSCC
12_9	humanPresenceOnTheRoad	bicyclist	12_2	1	people on roadway	cyclists on roadway
12_10	humanPresenceOnTheRoad	wheelchair-user	12_0	3	people on roadway	
12_11	humanPresenceOnTheRoad	horse-and-rider	11_4	3	animals on roadway	large animals
12_12	humanPresenceOnTheRoad	rollerskater	12_0	3	people on roadway	
12_13	humanPresenceOnTheRoad	e-scooter	12_2	3	people on roadway	cyclists on roadway
12_14	humanPresenceOnTheRoad	personal-transporter	12_0	3	people on roadway	
12_15	humanPresenceOnTheRoad	pedelec	12_2	1	people on roadway	cyclists on roadway
12_16	humanPresenceOnTheRoad	speed-pedelec	12_2	2	people on roadway	cyclists on roadway
12_17	humanPresenceOnTheRoad	ptw	12_3	1	people on roadway	moped rider on roadway
12_18	humanPresenceOnTheRoad	moped	12_3	1	people on roadway	moped rider on roadway
12_19	humanPresenceOnTheRoad	motorcycle	12_3	1	people on roadway	moped rider on roadway
12_20	humanPresenceOnTheRoad	motorcycle-and-sidecar-right	12_3	2	people on roadway	moped rider on roadway
12_21	humanPresenceOnTheRoad	motorcycle-and-sidecar-left	12_3	2	people on roadway	moped rider on roadway
13_0	reserved for future usage	-				
14_0	wrongWayDriving	unavailable	14_0	4	vehicle on wrong carriageway	
14_1	wrongWayDriving	wrongLane	14_0	4	vehicle on wrong carriageway	
14_2	wrongWayDriving	wrongDirection	14_0	4	vehicle on wrong carriageway	
15_0	rescueAndRecoveryWorkInProgress	unavailable	15_0	3	rescue and recovery work in progress	
15_1	rescueAndRecoveryWorkInProgress	emergencyVehicles	15_1	3	rescue and recovery work in progress	emergency vehicles
15_2	rescueAndRecoveryWorkInProgress	rescueHelicopterLanding	15_2	3	rescue and recovery work in progress	rescue helicopter landing
15_3	rescueAndRecoveryWorkInProgress	policeActivityOngoing	15_3	3	rescue and recovery work in progress	police activity ongoing
15_4	rescueAndRecoveryWorkInProgress	medicalEmergencyOngoing	15_4	3	rescue and recovery work in progress	medical emergency ongoing
15_5	rescueAndRecoveryWorkInProgress	childAbductionInProgress	15_5	3	rescue and recovery work in progress	child abduction in progress

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DENM index	CauseCode	SubCauseCode	code	warn level	referenceWordCC	referenceWordSCC
15_6	rescueAndRecoveryWorkInProgress	prioritizedVehicle	15_1	3	rescue and recovery work in progress	emergency vehicles
15_7	rescueAndRecoveryWorkInProgress	rescueAndRecoveryVehicle	15_1	3	rescue and recovery work in progress	emergency vehicles
16_0	reserved for future usage	-				
17_0	adverseWeatherCondition-ExtremeWeatherCondition	unavailable	17_0	3	extreme weather conditions	
17_1	adverseWeatherCondition-ExtremeWeatherCondition	strongWinds	17_1	3	extreme weather conditions	strong winds
17_2	adverseWeatherCondition-ExtremeWeatherCondition	damagingHail	17_2	3	extreme weather conditions	damaging hail
17_3	adverseWeatherCondition-ExtremeWeatherCondition	hurricane	17_3	3	extreme weather conditions	hurricane
17_4	adverseWeatherCondition-ExtremeWeatherCondition	thunderstorm	17_4	3	extreme weather conditions	thunderstorm
17_5	adverseWeatherCondition-ExtremeWeatherCondition	tornado	17_5	3	extreme weather conditions	tornado
17_6	adverseWeatherCondition-ExtremeWeatherCondition	blizzard	17_6	3	extreme weather conditions	blizzard
18_0	adverseWeatherCondition-Visibility	unavailable	18_0	2	visibility reduced	
18_1	adverseWeatherCondition-Visibility	fog	18_1	2	visibility reduced	visibility reduced due to fog
18_2	adverseWeatherCondition-Visibility	smoke	18_2	2	visibility reduced	visibility reduced due to smoke
18_3	adverseWeatherCondition-Visibility	heavySnowfall	18_3	2	visibility reduced	visibility reduced due to heavy snowfall
18_4	adverseWeatherCondition-Visibility	heavyRain	18_4	2	visibility reduced	visibility reduced due to heavy rain
18_5	adverseWeatherCondition-Visibility	heavyHail	18_5	2	visibility reduced	visibility reduced due to heavy hail
18_6	adverseWeatherCondition-Visibility	lowSunGlare	18_6	2	visibility reduced	visibility reduced due to low sun glare

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DENM index	CauseCode	SubCauseCode	code	warn level	referenceWordCC	referenceWordSCC
18_7	adverseWeatherCondition-Visibility	sandstorms	18_7	2	visibility reduced	visibility reduced due to sandstorms
18_8	adverseWeatherCondition-Visibility	swarmsOfInsects	18_8	2	visibility reduced	visibility reduced due to swarms of insects
19_0	adverseWeatherCondition-Precipitation	unavailable	19_0	2	precipitation	
19_1	adverseWeatherCondition-Precipitation	heavyRain	19_1	2	precipitation	heavy rain
19_2	adverseWeatherCondition-Precipitation	heavySnowfall	19_2	2	precipitation	heavy snowfall
19_3	adverseWeatherCondition-Precipitation	softHail	19_3	2	precipitation	soft hail
20_0	violence	unavailable	20_0	4	reckless persons	
20_1	violence	reserved for future usage				
20_2	violence	reserved for future usage				
20_3	violence	stoneThrowingPersons	20_3	4	reckless persons	persons throwing objects
21_0	reserved for future usage	-				
22_0	reserved for future usage	-				
23_0	reserved for future usage	-				
24_0	reserved for future usage	-				
25_0	reserved for future usage	-				
26_0	slowVehicle	unavailable	26_0	3	slow-moving vehicles	
26_1	slowVehicle	maintenanceVehicle	26_1	3	slow-moving vehicles	slow-moving maintenance vehicle
26_2	slowVehicle	vehiclesSlowingToLookAtAccident	26_2	3	slow-moving vehicles	vehicles slowing to look at accident
26_3	slowVehicle	abnormalLoad	26_3	3	slow-moving vehicles	abnormal load
26_4	slowVehicle	abnormalWideLoad	26_4	3	slow-moving vehicles	abnormal wide load
26_5	slowVehicle	convoy	26_5	3	slow-moving vehicles	convoy
26_6	slowVehicle	snowplough	26_6	3	slow-moving vehicles	snowplough
26_7	slowVehicle	deicing	26_7	3	slow-moving vehicles	de-icing

Codes according to DENM/CDD standard			TPEG2-TEC (ISO 21219-15:2023)			
DENM index	CauseCode	SubCauseCode	code	warn level	referenceWordCC	referenceWordSCC
26_8	slowVehicle	saltingVehicles	26_8	3	slow-moving vehicles	salting vehicles
27_0	dangerousEndOfQueue	unavailable	27_0	3	dangerous end of queue	
27_1	dangerousEndOfQueue	suddenEndOfQueue	27_1	3	dangerous end of queue	sudden end of queue
27_2	dangerousEndOfQueue	queueOverHill	27_2	3	dangerous end of queue	queue over hill
27_3	dangerousEndOfQueue	queueAroundBend	27_3	3	dangerous end of queue	queue around bend
27_4	dangerousEndOfQueue	queueInTunnel	27_4	3	dangerous end of queue	queue in tunnel
28_0	reserved for future usage	-				
90_0	reserved for future usage	-				
91_0	vehicleBreakdown	unavailable	13_0	3	broken down vehicles	
91_1	vehicleBreakdown	lackOfFuel	13_0	3	broken down vehicles	
91_2	vehicleBreakdown	lackOfBatteryPower	13_0	3	broken down vehicles	
91_3	vehicleBreakdown	engineProblem	13_0	3	broken down vehicles	
91_4	vehicleBreakdown	transmissionProblem	13_0	3	broken down vehicles	
91_5	vehicleBreakdown	engineCoolingProblem	13_0	3	broken down vehicles	
91_6	vehicleBreakdown	brakingSystemProblem	13_0	3	broken down vehicles	
91_7	vehicleBreakdown	steeringProblem	13_0	3	broken down vehicles	
91_8	vehicleBreakdown	tyrePuncture	13_0	3	broken down vehicles	
91_9	vehicleBreakdown	tyrePressureProblem	13_0	3	broken down vehicles	
91_10	vehicleBreakdown	vehicleOnFire	13_1	3	broken down vehicles	broken-down vehicle on fire
92_0	postCrash	unavailable				
92_1	postCrash	accidentWithoutECallTriggered				
92_2	postCrash	accidentWithECallManuallyTriggered				
92_3	postCrash	accidentWithECallAutomaticallyTriggered				
92_4	postCrash	accidentWithECallTriggeredWithoutAccessToCellularNetwork				
93_0	humanProblem	unavailable				
93_1	humanProblem	glycemiaProblem				
93_2	humanProblem	heartProblem				

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DENM index	CauseCode	SubCauseCode	code	warn level	referenceWordCC	referenceWordSCC
94_0	stationaryVehicle	unavailable	10_7	3	objects on the road	stationary vehicle
94_1	stationaryVehicle	humanProblem	10_7	3	objects on the road	stationary vehicle
94_2	stationaryVehicle	vehicleBreakdown	13_0	3	broken down vehicles	
94_3	stationaryVehicle	postCrash	10_7	3	objects on the road	stationary vehicle
94_4	stationaryVehicle	publicTransportStop	10_7	3	objects on the road	stationary vehicle
94_5	stationaryVehicle	carryingDangerousGoods	10_7	3	objects on the road	stationary vehicle
94_6	stationaryVehicle	vehicleOnFire	13_1	3	broken down vehicles	broken-down vehicle on fire
95_0	emergencyVehicleApproaching	unavailable	15_1	3	rescue and recovery work in progress	emergency vehicles
95_1	emergencyVehicleApproaching	emergencyVehicleApproaching	15_1	3	rescue and recovery work in progress	emergency vehicles
95_2	emergencyVehicleApproaching	prioritizedVehicleApproaching	15_1	3	rescue and recovery work in progress	emergency vehicles
96_0	hazardousLocation-DangerousCurve	unavailable				
96_1	hazardousLocation-DangerousCurve	dangerousLeftTurnCurve				
96_2	hazardousLocation-DangerousCurve	dangerousRightTurnCurve				
96_3	hazardousLocation-DangerousCurve	multipleCurvesStartingWithUnknownTurningDirection				
96_4	hazardousLocation-DangerousCurve	multipleCurvesStartingWithLeftTurn				
96_5	hazardousLocation-DangerousCurve	multipleCurvesStartingWithRightTurn				
97_0	collisionRisk	unavailable				
97_1	collisionRisk	longitudinalCollisionRisk				
97_2	collisionRisk	crossingCollisionRisk				
97_3	collisionRisk	lateralCollisionRisk				
97_4	collisionRisk	vulnerableRoadUser				
98_0	signalViolation	unavailable				
98_1	signalViolation	stopSignViolation				
98_2	signalViolation	trafficLightViolation				
98_3	signalViolation	turningRegulationViolation				

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DENM index	CauseCode	SubCauseCode	code	warn level	referenceWordCC	referenceWordSCC
99_0	dangerousSituation	unavailable				
99_1	dangerousSituation	emergencyElectronicBrakeEngaged				
99_2	dangerousSituation	preCrashSystemEngaged				
99_3	dangerousSituation	espEngaged				
99_4	dangerousSituation	absEngaged				
99_5	dangerousSituation	aebEngaged				
99_6	dangerousSituation	brakeWarningEngaged				
99_7	dangerousSituation	collisionRiskWarningEngaged				