

DSSAD Data Elements based on VMAD Occurrences

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This document provides ideas for the discussion on detailed definition of data elements corresponding to VMAD occurrences. It should be considered as an invitation for discussion, rather than any fixed position by the European Commission on this subject. **The discussion should ideally focus, at the first stage, on columns 1, 3 and 4 (Data elements, definition and trigger).**

	Data elements /Occurrences	VMAD Occurrence	Definition	Trigger	Recording interval	Data sample rate (samples per second)	Minimum range	Accuracy	Resolution	Comment
Perception	Object number	1a, 1c, 2b, 2c	Global object number of detected object	Collision with another road user/object Object distance below [Threshold] – indication of near miss Object direction below [Threshold] Object delta velocity below [Threshold]	Time Series Data	[4]	[0 ... 16]	N/A	N/A	
	Object Position: longitudinal distance	1a, 1c, 2b, 2c	Object position in relation to ego vehicle in longitudinal direction	Collision with another road user/object Object distance below [Threshold] – indication of near miss Object direction below [Threshold]	Time Series Data	[4]	[0 ... 300m]	[0,3m]		

			Object delta velocity below [Threshold]						
Object Position: lateral distance, angle	1a, 1c, 2b, 2c	Object position in relation to ego vehicle in lateral direction	Collision with another road user/object Object distance below [Threshold] – indication of near miss Object direction below [Threshold] Object delta velocity below [Threshold]	Time Series Data	[4]	[0 ... 300m]	[0,3 m]		
Object longitudinal velocity	1a, 1c, 2b, 2c	Object velocity in longitudinal direction	Collision with another road user/object Object distance below [Threshold] – indication of near miss Object direction below [Threshold] Object delta velocity below [Threshold]	Time Series Data	[4]	[-80 ... 80 m/s]	[0,2 m/s]		

Object velocity	lateral	1a, 1c, 2b, 2c	Object velocity in lateral direction	Collision with another road user/object Object distance below [Threshold] – indication of near miss Object direction below [Threshold] Object delta velocity below [Threshold]	Time Series Data	[4]	[-80 ... 80 m/s]	[0,2 m/s]		
Object accelerations	longitudinal	1a, 1c, 2b, 2c		Collision with another road user/object Object distance below [Threshold] – indication of near miss Object direction below [Threshold] Object delta velocity below [Threshold]	Time Series Data	[4]				
Object accelerations	lateral	1a, 1c, 2b, 2c		Collision with another road user/object Object distance below [Threshold] – indication of near miss	Time Series Data	[4]				

	Object prediction longitudinal acceleration									
	Object prediction lateral acceleration									
	Delta time between object detection and mitigation action									
	Data elements / Occurrences	VMAD Occurrence	Definition	Trigger	Recording interval	Data sample rate (samples per second)	Minimum range	Accuracy	Resolution	Comment
Vehicle Dynamics	Initial vehicle longitudinal velocity	1a	Vehicle velocity in longitudinal direction		Time series data	[4]	[0 to 250 km/h]	[±1 km/h]	[1 km/h]	
	Initial vehicle lateral velocity	1a	Initial vehicle velocity in longitudinal direction		Time series data	[4]	[0 to 50 km/h]	[±1 km/h]	[1 km/h]	
	Initial vehicle longitudinal acceleration	1a	Initial vehicle longitudinal acceleration		Time series data	[4]	[-1.5g to +1.5g]	[±10%]	[0.1g]	

Initial vehicle lateral acceleration	1a	Initial vehicle lateral acceleration		Time series data	[4]	[-1.5g to +1.5g]	[±10%]	[0.1g]	
Initial vehicle yaw rate	1a	Initial vehicle yaw rate		Time series data	[4]	[-75 to +75 degrees/second]	[±10% of the full range of the sensor]	[1 degree per second]	
Vehicle longitudinal velocity	1a, 1b, 1c, 1d, 1e, 2a, 2b, 3a, 3b, 3c	Vehicle velocity in longitudinal direction		Time series data	[4]	[0 to 50 km/h]	[±1 km/h]	[1 km/h]	
Vehicle lateral velocity	1a, 1b, 1c, 1d, 1e, 2a, 2b, 3a, 3b, 3c	Vehicle longitudinal acceleration		Time series data	[4]	[-1.5g to +1.5g]	[±10%]	[0.1g]	
Vehicle longitudinal acceleration	1a, 1b, 1c, 1d, 1e, 2a, 2b, 3a, 3b, 3c	Vehicle longitudinal acceleration		Time series data	[4]	[-1.5g to +1.5g]	[±10%]	[0.1g]	
Vehicle lateral acceleration	1a, 1b, 1c, 1d, 1e, 2a, 2b, 3a, 3b, 3c	Vehicle lateral acceleration		Time series data	[4]	[-1.5g to +1.5g]	[±10%]	[0.1g]	
Vehicle yaw rate	1a, 1b, 1c, 1d, 1e, 2a, 2b, 3a, 3b, 3c	Vehicle yaw rate		Time series data	[4]	[-75 to +75 degrees/second]	[±10% of the full range of the sensor]	[1 degree per second]	

Vehicle Speed									
Vehicle position ODD									
Vehicle position									
Vehicle longitudinal velocity time stamp									
Vehicle lateral velocity time stamp									
Vehicle lateral acceleration time stamp									
Vehicle longitudinal acceleration time stamp									
Vehicle yaw rate time stamp									
Data elements / Occurrences	VMAD Occurrence	Definition	Trigger	Recording interval	Data sample rate (samples per second)	Minimum range	Accuracy	Resolution	Comment

ADS Status	ADS status	all	Status of ADS: <ul style="list-style-type: none"> • off • active • passive 		Time stamp data [10]	N/A	N/A	N/A	
	ADS status time stamp				Time stamp data				
	Failure flag				Time stamp data				
	Failure flag time stamp				Time stamp data				
	Acceleration threshold				Time stamp data				
	ADS Position (location) GNSS positioning to at least 5 decimal places				Time stamp data				
	ADS position certainty				Time stamp data				
	[Engine throttle]				Time stamp data				

[Continue the trip or initiate some action (e.g. call ambulance, inform others)]				Time stamp data					
ODD exit				Time stamp data					
ODD exit reason				Time stamp data					
ADS Activation Status				Time stamp data					
Sensor failure status				Time stamp data					
System failure status				Time stamp data					
Driver communication status				Time stamp data					
MRM activation status				Time stamp data					
MRM activation time stamp				Time stamp data					

MRM status				Time stamp data					
MRM status time stamp				Time stamp data					
Communication status				Time stamp data					
Communication status time stamp				Time stamp data					
Communication message				Time stamp data					
Cybersecurity monitoring				Time stamp data					
Driver Warning Status				Time stamp data					
Driver Warning Status time stamp				Time stamp data					
Driver Monitoring System (DMS) status				Time stamp data					