## **DSSAD Data Elements based on VMAD Occurrences**

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	VMAD	Definition	Trigger	Recording	Data sample	Minimum	Accuracy	Resolution	Comment
	/Occurrences	Occurrence			interval	rate (samples	range			
						per second)				
	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	Time Series Data	[4]	[0 16]	N/A	N/A	
erception				[Threshold] Object delta velocity below [Threshold]						
d	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 lateral	1a, 1c, 2b, 2c	Object velocity	Collision with another road	Time	[4]	[-80 80	[0,2 m/s]		
velocity		in lateral	user/object	Series		m/s]		1	
		direction	Object distance below [Threshold] – indication of near miss Object direction below [Threshold] Object delta velocity below [Threshold]	Data					
	1 1 21 2			<b></b> .	F 4 3				
Object longitudinal accelerations	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 lateral accelerations	1a, 1c, 2b, 2c		Collision with another road user/object Object distance below [Threshold] – indication of near miss	Time Series Data	[4]				

		Object direction below				
		[Threshold]				
		Object delta velocity below	r			
		[Threshold]				
Object classification	1a, 1c, 2b, 2c	Collision with another road	Time	[4]		
		user/object	Series			
		user/object	Doto			
		Object distance below	Data			
		[Threshold] – indication of				
		near miss				
		Object direction below				
		[Threshold]				
		Object delta velocity below	r			
		[Threshold]				
Objection						
classification time						
stamp						
1						
Object detection						
5						
Object detection						
time stamp						
1						
Object distance						
			1	1		

Object Classificatio	n					
certainty						
5						
Object predictio	n					
position						
Position						
Object predictio	n					
longitudinal velocit	у					
Object predictio	n					
lateral velocity						
Object predictio	n					
longitudinal						
acceleration						
Object predictio	n					
lateral acceleration						
Object predictio	n					
classification						
Object predictio	n					
longitudinal velocit	v					
6						
Object predictio	n					
lateral Velocity						
5						
				1	1	

	Object prediction									
	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	Minimum range	Accuracy	Resolution	Comment
						per second)				
	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]	
<b>7ehicle Dynamics</b>	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	1a	Initial vehicle	Time	[4]	[-1.5g to	[±10%]	[0.1g]
acceleration		lateral	series data		+1.5g]		
		acceleration					
Initial vehicle yaw	1a	Initial vehicle	Time	[4]	[-75 to +75	$[\pm 10\%$ of the	[1 degree per
rate		yaw rate	series data		degrees/se	full range of	second]
					condl	the sensor]	
					]	_	
<b>X</b> 7.1.1.1	1. 11. 1. 1.1		<b>T</b> :	[ 4 ]	[0 t. 50	E + 1 1 /l- 7	[1] J /h.]
	1a, 1b, 1c, 1d,		1 ime	[4]		[±1 km/n]	[1 km/n]
velocity	1e, 2a, 2b, 3a,	in longitudinal	series data		km/h]		
	3b, 3c	direction					
<b>X7 1 1 1 4 1</b>	1 11 1 11	X7.1. <sup>6</sup> .1	т·	[ 4 ]	F 1 <i>F</i> 4	<u>[+100/]</u>	FO 1 1
Vehicle lateral	1a, 1b, 1c, 1d,	, V enicie	lime	[4]	[-1.5g to	[±10%]	[0.1g]
velocity	1e, 2a, 2b, 3a,	longitudinal	series data		+1.5g]		
	3b, 3c	acceleration					
<b>X</b> 7.1.1.1	1. 11. 1. 1.1	N7.1.1.1.	<b>T</b> :	[ 4 ]	F 1 <b>F</b>	<u>[+100/]</u>	[0,1,1]
	1a, 1b, 1c, 1d, 1c, 1d		1 ime	[4]	[-1.5g to	[±10%]	[0.1g]
acceleration	1e, 2a, 2b, 3a,	longitudinal	series data		+1.5g]		
	3b, 3c	acceleration					
Vahiala latanal	1. 11. 1. 1.	Valiala lataval	Time	[4]	[ ] <b>5</b> ~ 4a	[+100/]	[0,1-]
	1a, 1b, 1c, 1d, 1a, 1a, 2a, 2b, 2a, 2b, 2a, 2b, 2a, 2b, 2b, 2b, 2b, 2b, 2b, 2b, 2b, 2b, 2b			[4]	[-1.5g tt	[±10%]	
acceleration	1e, 2a, 2b, 3a,	acceleration	series data		+1.3g]		
	3b, 3c						
Vahiala yaw rata	10 16 10 1d	Vahiala yaw rata	Timo	[4]		$[\pm 1.00/$ of the	[1 dagree nor
venicie yaw rate	1a, 10, 1c, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10	, v chicle yaw late		[+]	1 - 13 to $+ 15$	$L^{\pm 1070}$ of the	
	1e, 2a, 2b, 3a,	2	series data		degrees/se	iuli range of	seconaj
	3b, 3c				cond]	the sensor]	

Vehicle Speed									
•									
Vehicle ODD									
position									
Vehicle position									
, emere heerien									
Vehicle longitudinal									
velocity time stamp									
Vahiala lataral									
velocity time stamp									
veroenty time stamp									
Vehicle lateral									
acceleration time									
stamp									
Vehicle longitudinal									
acceleration time									
stamp									
1									
Vehicle yaw rate									
time stamp									
Data elements	VMAD	Definition	Trigger	Recording	Data sample	Minimum	Accuracy	Resolution	Comment
Occurrences	Occurrence			interval	rate (samples	range			
					per second)				
					<b>, , , , , , , , , ,</b>				

4	ADS status	all	Status of ADS:	Time	[10]	N/A	N/A	N/A	
				stamp data					
			• off	1					
			• active						
			• passive						
	ADS status time			Time					
	stamp			stamp data					
	1			1					
	Failure flag			Time					
	e			stamn data					
				stump auta					
1	Failure flag time			Time					
5	stamn			stamn data					
atu	stamp			sump autu					
St	Acceleration			Time					
SQ	threshold			stamn data					
A	lineshold			stamp data					
	ADS Position			Time					
	(location) GNSS			stamp data					
	nositioning to at			1					
ľ	least 5 decimal								
		L							
	places								
	ADS position		+ +	Time					
Í	ADS position								
	certainty			stamp data					
-	[Engine throttle]			Time					
				stamn data					
				stamp data					
		1							

[Continue the trip or	Time			
initiate some action	stamp data	1		
(e.g. call ambulance,				
inform others)]				
ODD exit	Time			
	stamp data	ı		
ODD exit reason	Time			
	stamp data	1		
ADS Activation	Time			
ADS Activation	t line			
Status	stamp data	1		
Sensor failure status	Time			
	stamp data	1		
System failure status	Time			
	stamp data	ı		
Driver	Time			
communication	stamp data	ı		
status				
MRM activation	Time			
status	stamp data	ì		
IVIKIVI activation	lime			
time stamp	stamp data	1		

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