



Advanced Tools for Infrastructure Design & Management

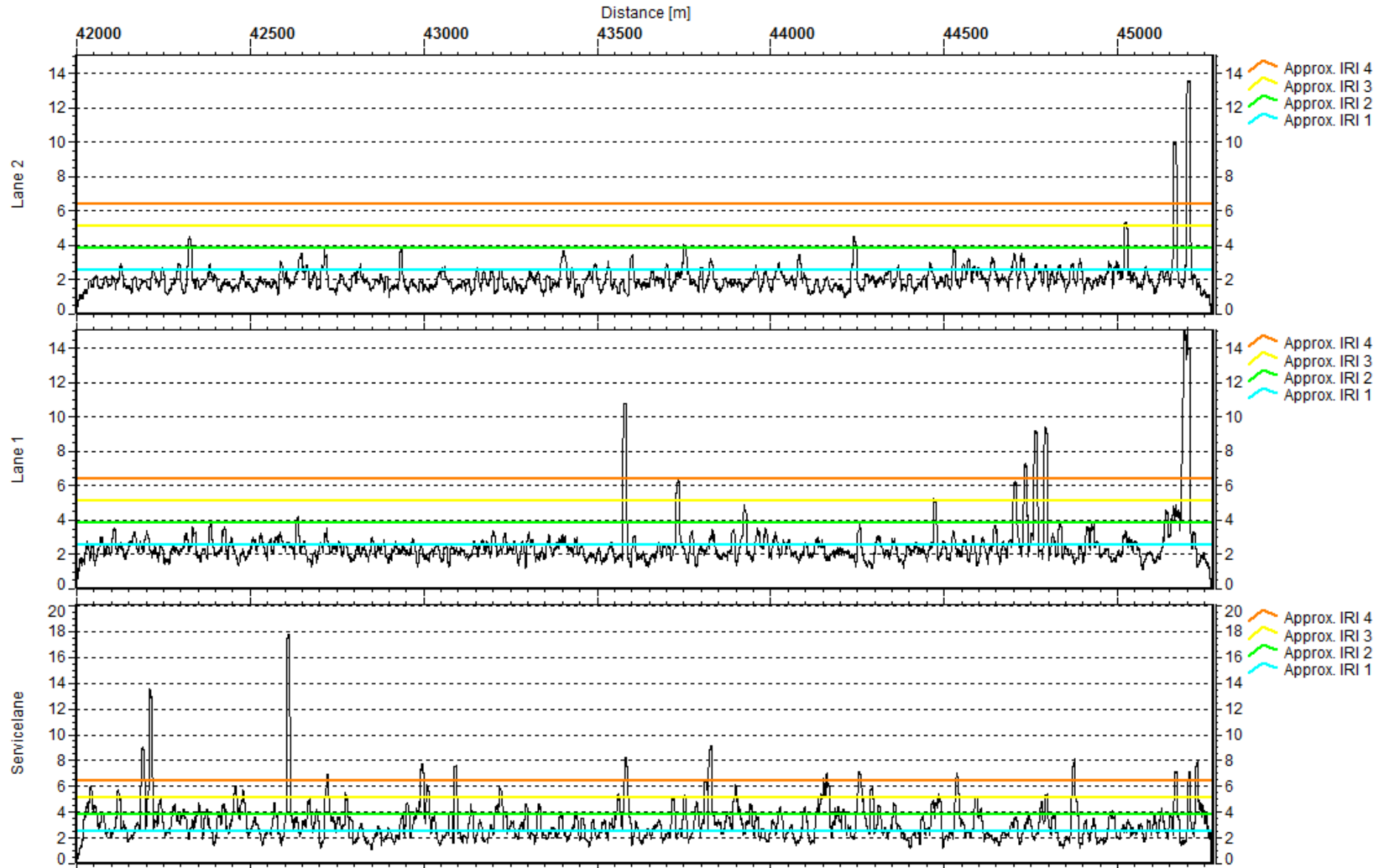
Section 3

Road 1, km 42-45



Roughness from Accelerometer Data

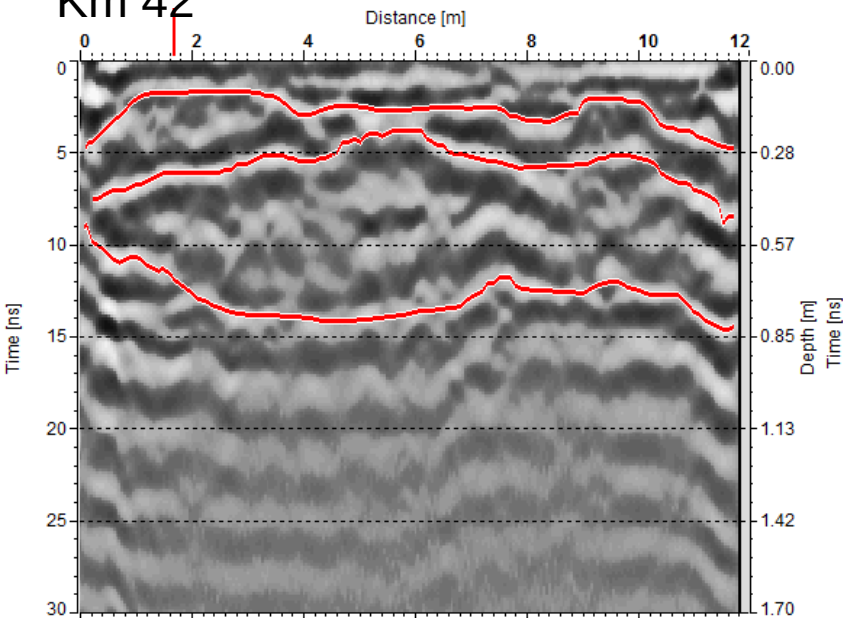
3_Road1_km42_45



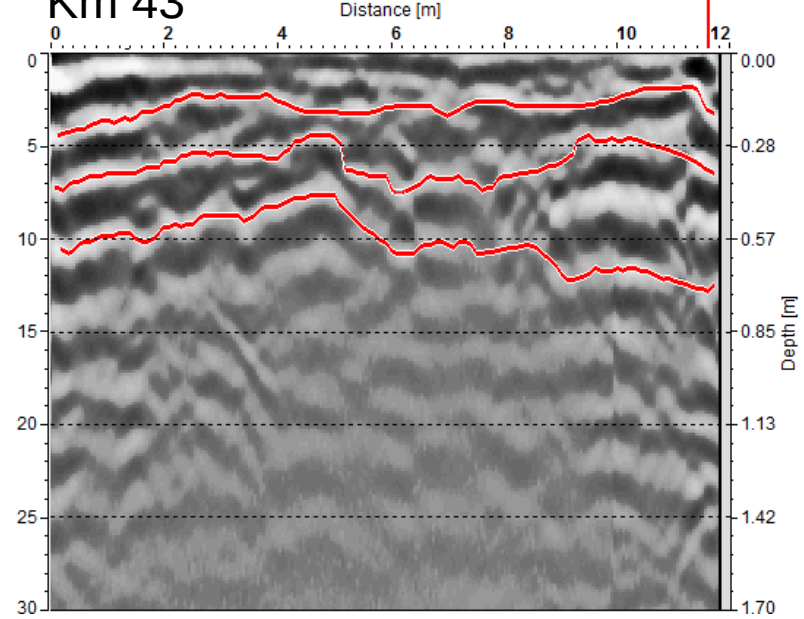
GPR Cross Sections

Materials	[cm]
Crushed aggregate mastic asphalt KMA12	4
Dense Asphalt concrete TAB 16 II	5

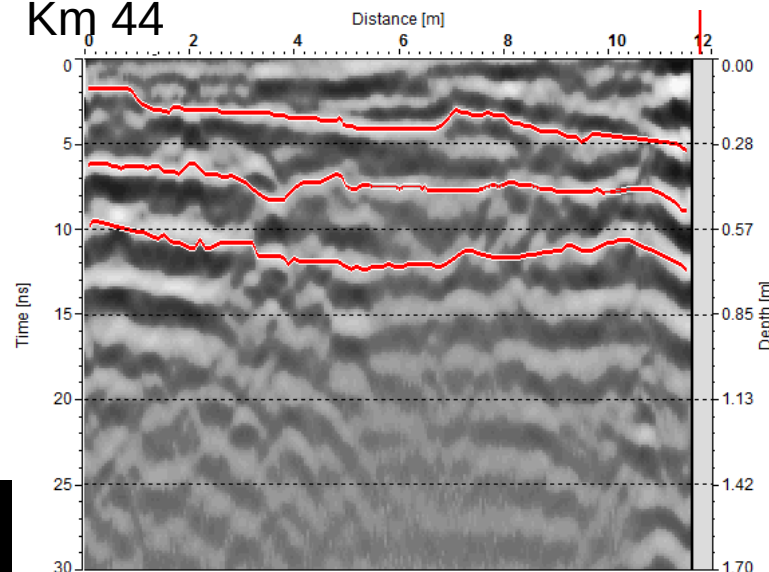
Km 42



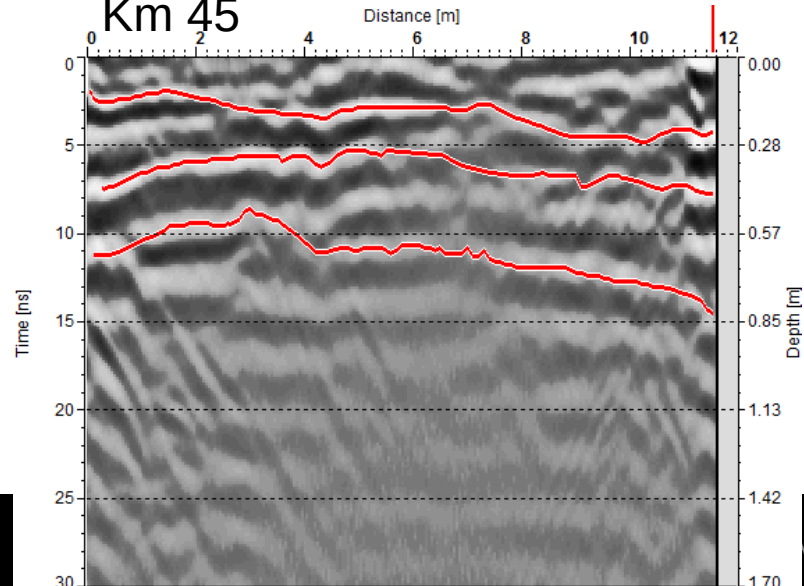
Km 43



Km 44



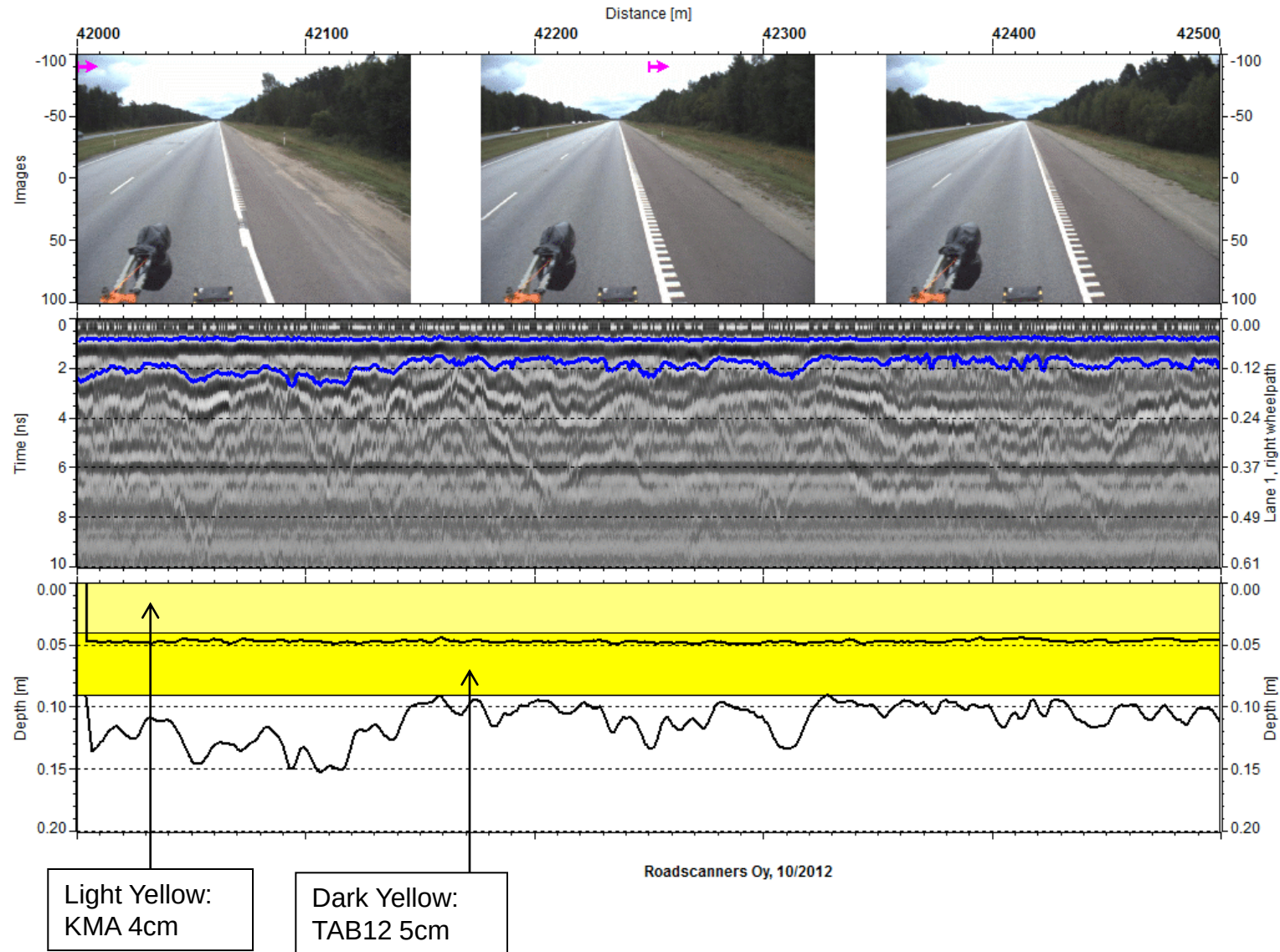
Km 45



Explanation for longitudinal profiles

-Profiles are presented from Lane 1, right wheelpath

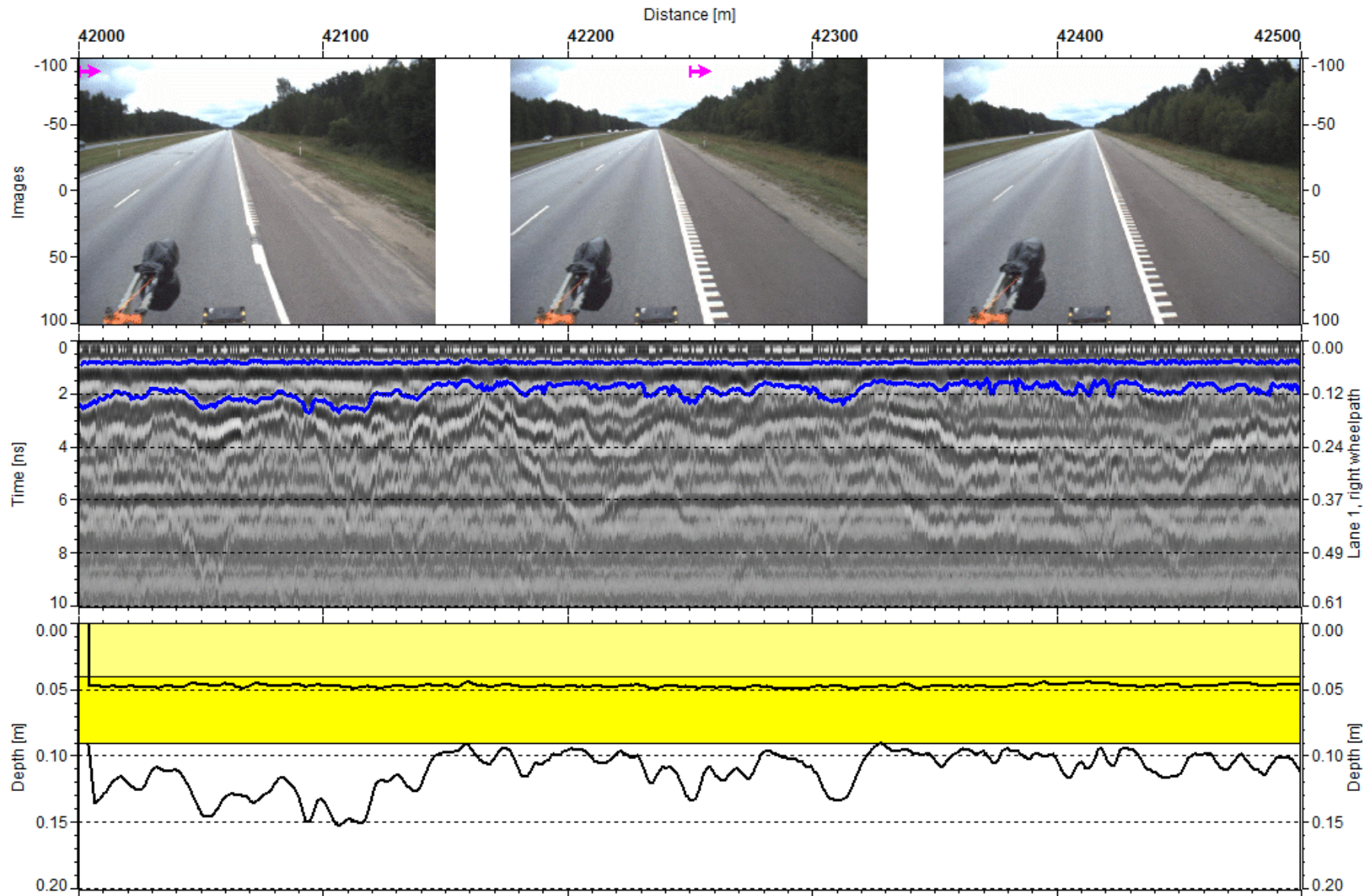
3_Road1_km42_45



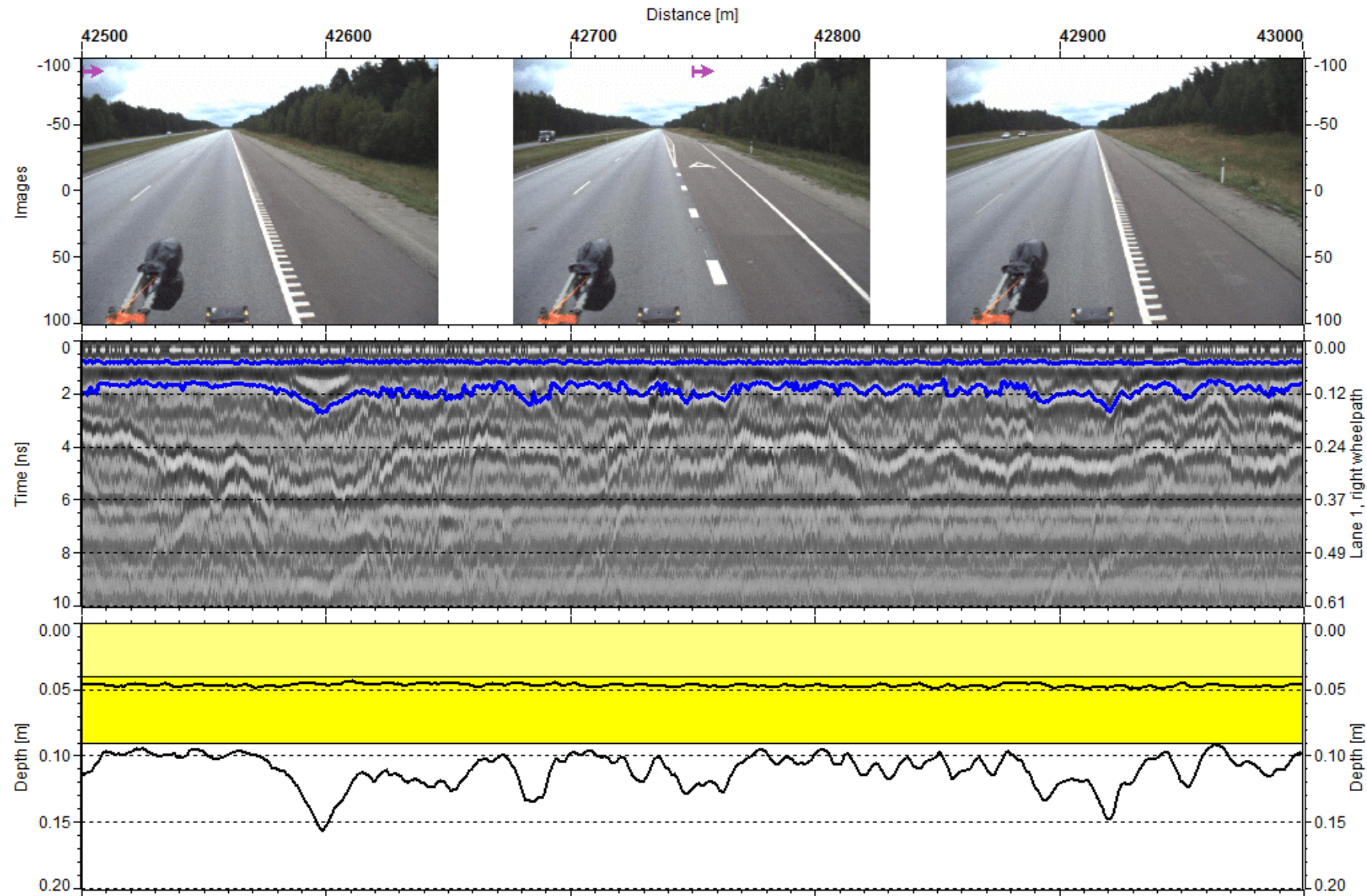
Images in
250m intervals

Air coupled
GPR data with
interpretation

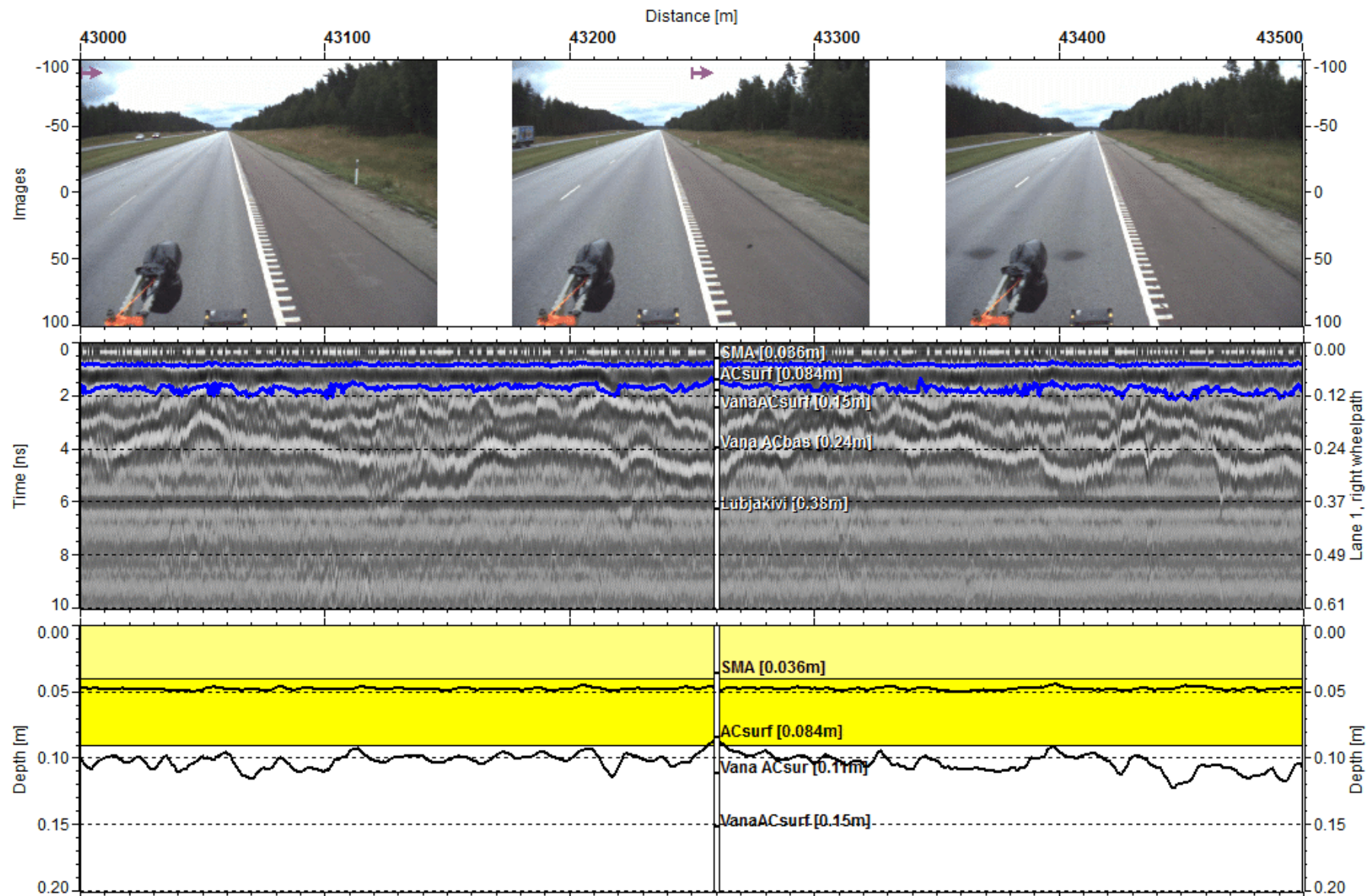
Interpretation
compared to
designed plan



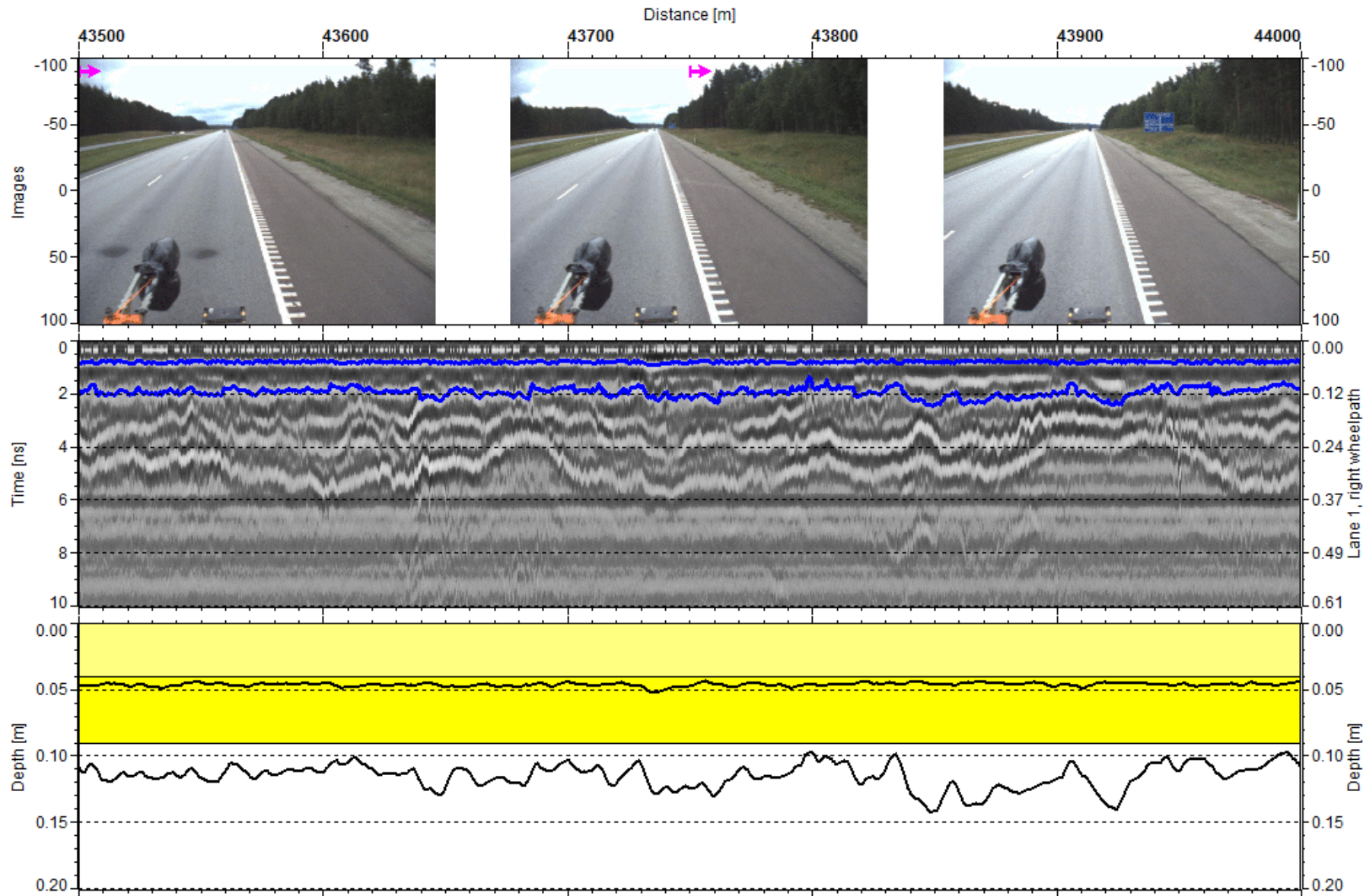
Roadscanners Oy, 10/2012



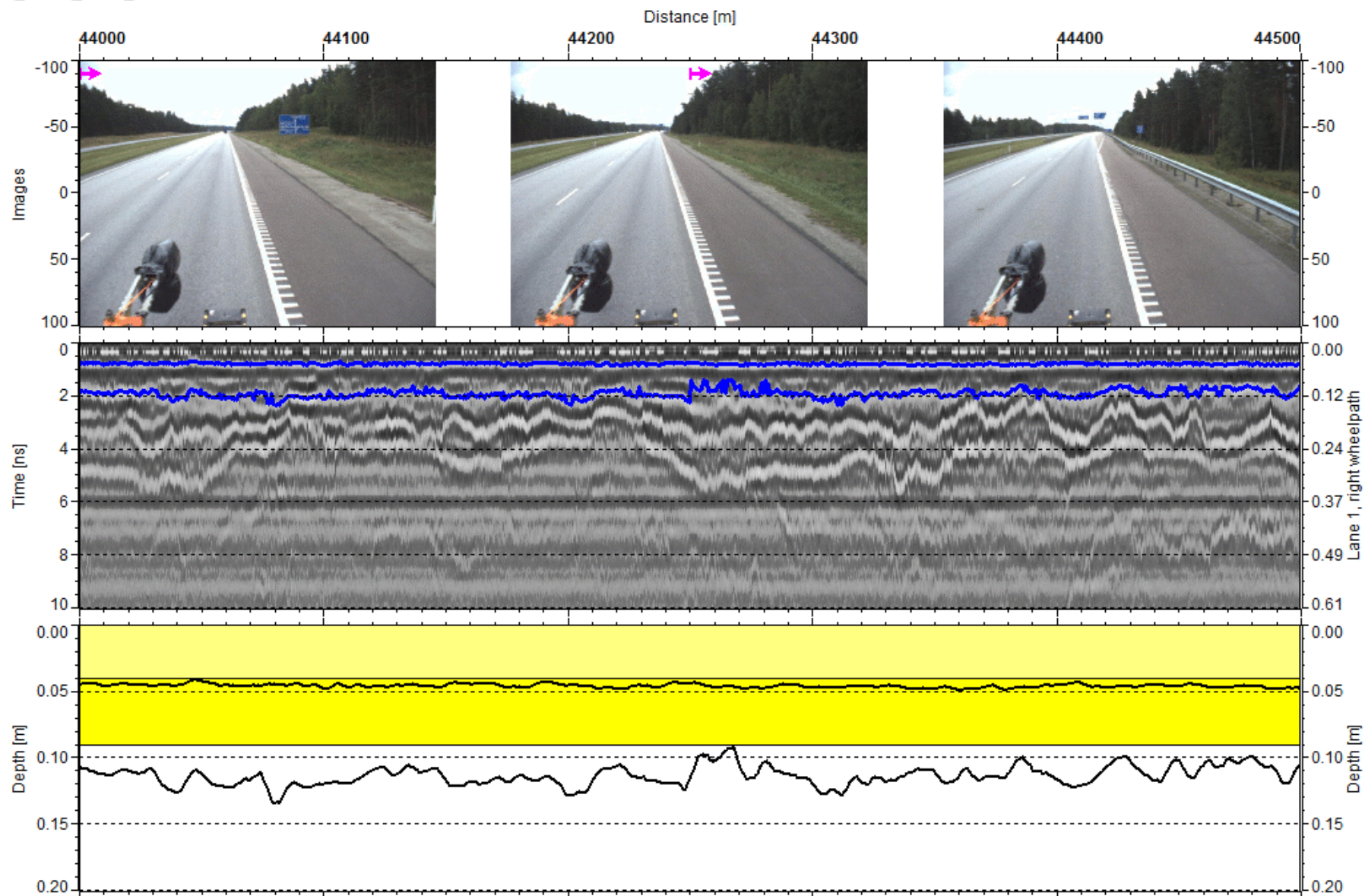
Roadscanners Oy, 10/2012



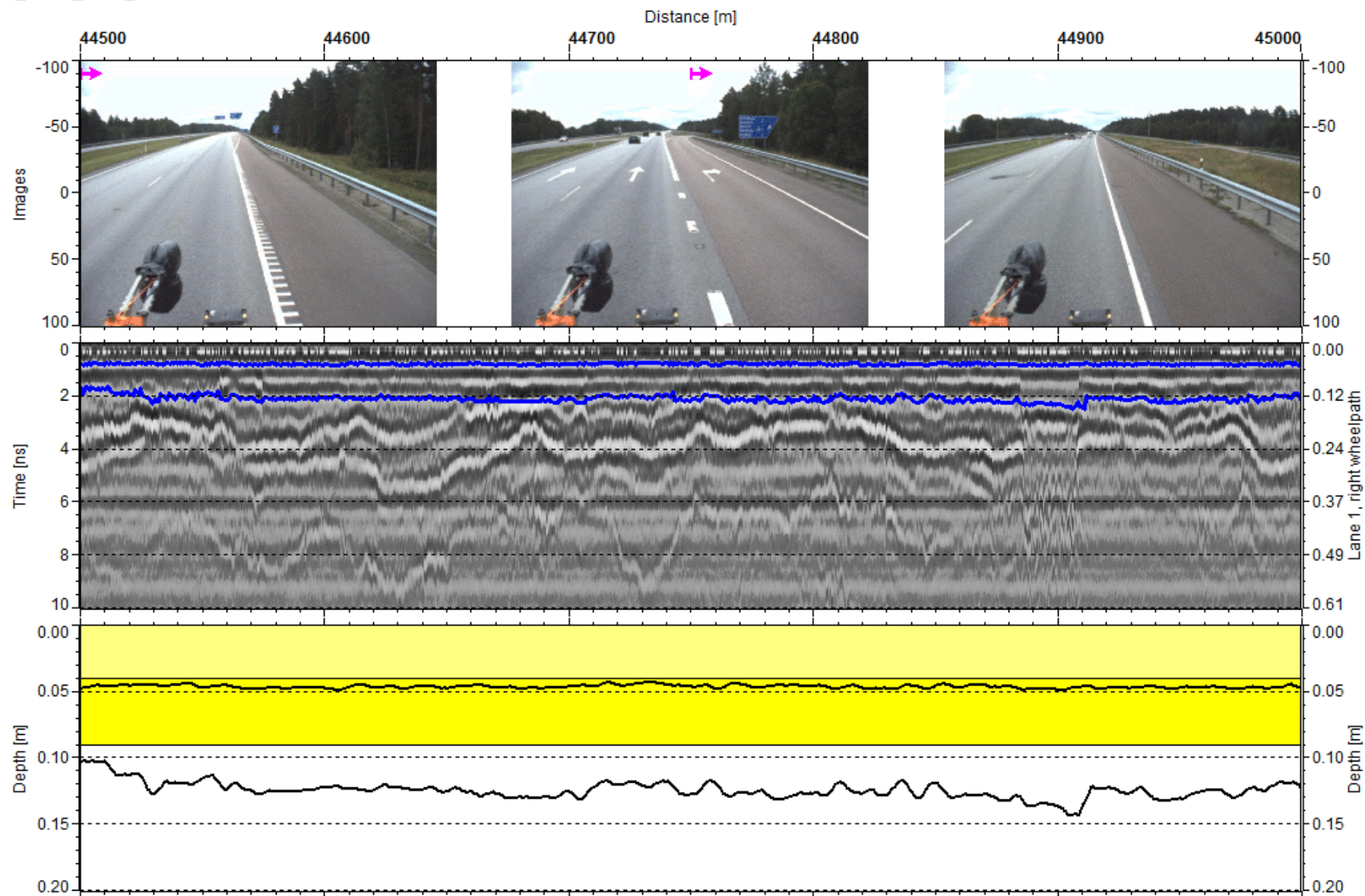
Roadscanners Oy, 10/2012



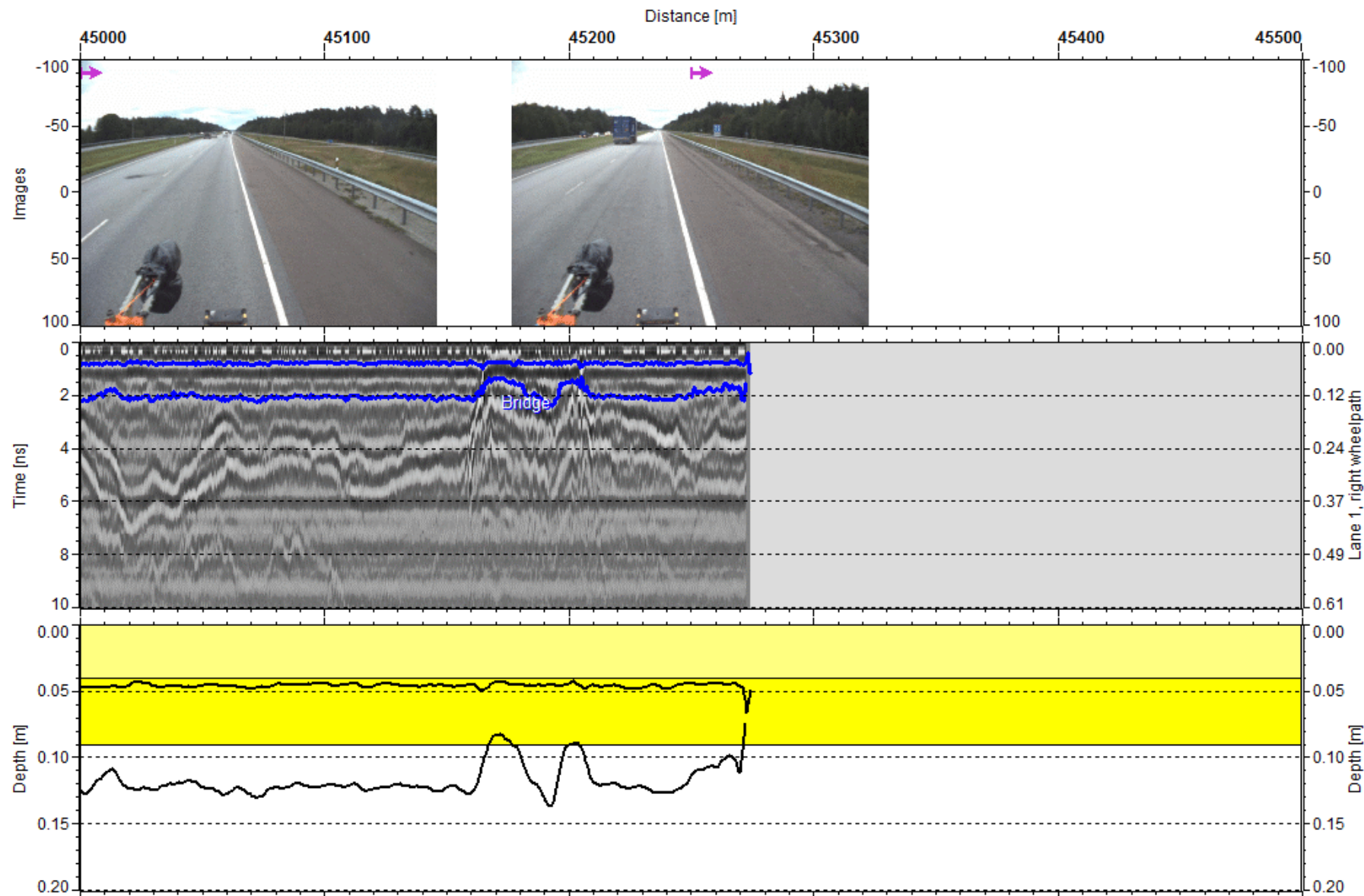
Roadscanners Oy, 10/2012



Roadscanners Oy, 10/2012



Roadscanners Oy, 10/2012

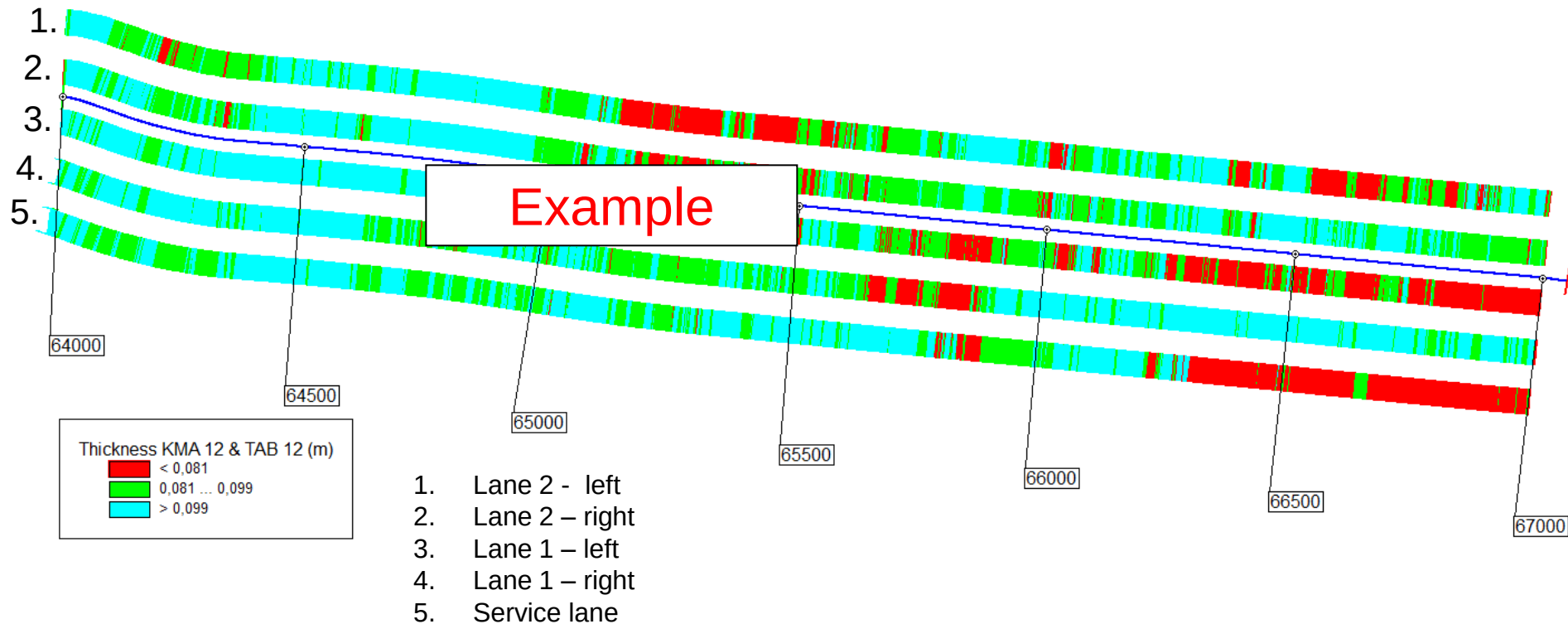


Roadscanners Oy, 10/2012

Explanation of Thickness Statistics and Maps

Table of average and statistical values:

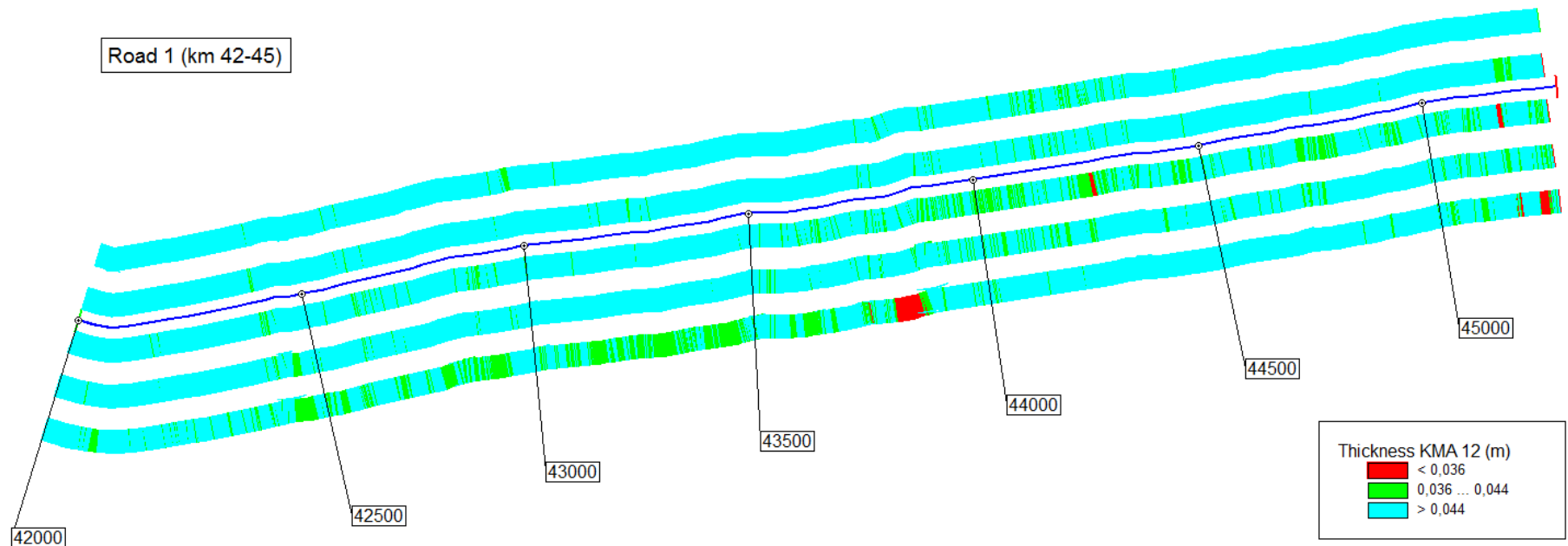
Planned thickness = 0,09 m (KMA 12 & TAB 12)		L2 left	L2 right	L1 left	L1 right
Average layer thickness (m)		0.093	0.099	0.093	0.103
% of distance where thickness is more than 10 % under		21.6	10.5	27.8	5.8
Average undershoot from planned in	Example	-0.024	-0.018	-0.021	-0.018
% of distance where thickness is more		38.3	44.3	36.2	60.4
Average overshoot from planned in "more than 10 % over" class (m)		0.024	0.025	0.025	0.022
% of distance where thickness is between +/- 10 %		40.1	45.1	36.0	33.8
Standard deviation (m)		0.020	0.017	0.020	0.014



Maps of Layer Thicknesses

[1/2]

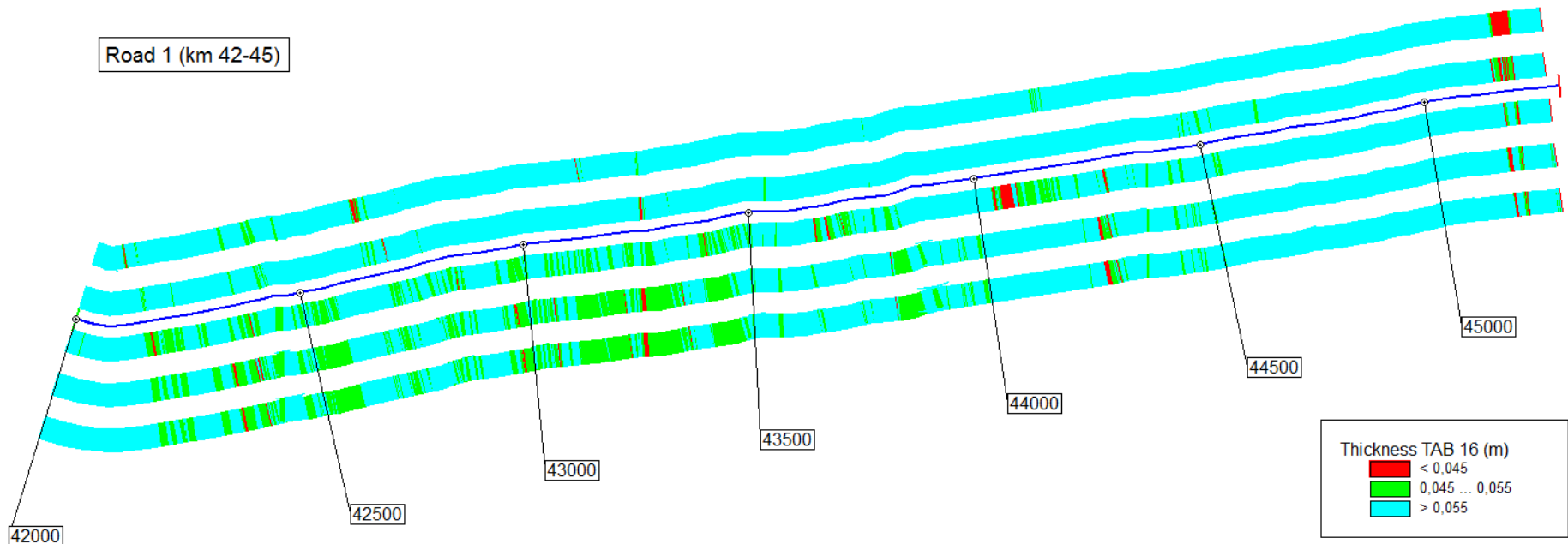
Planned thickness = 0,04 m (KMA 12)	L2 left	L2 right	L1 left	L1 right
Average layer thickness (m)	0.054	0.054	0.052	0.053
% of distance where thickness is more than 10 % under	0.0	0.0	0.3	0.0
Average undershoot from planned in "more than 10 % under" class (m)			-0.014	
% of distance where thickness is more than 10 % over	100.0	100.0	99.6	100.0
Average overshoot from planned in "more than 10 % over" class (m)	0.014	0.014	0.012	0.013
% of distance where thickness is between +- 10 %	0.0	0.0	0.1	0.0
Standard deviation (m)	0.003	0.002	0.003	0.002



Maps of Layer Thicknesses

[2/2]

Planned thickness = 0,05 m (TAB 16)	L2 left	L2 right	L1 left	L1 right
Average layer thickness (m)	0.084	0.084	0.074	0.075
% of distance where thickness is more than 10 % under	0.8	0.2	0.5	0.3
Average undershoot from planned in "more than 10 % under" class (m)	-0.012	-0.008	-0.010	-0.008
% of distance where thickness is more than 10 % over	98.1	98.5	93.3	92.3
Average overshoot from planned in "more than 10 % over" class (m)	0.034	0.034	0.026	0.027
% of distance where thickness is between +- 10 %	1.1	1.3	6.2	7.5
Standard deviation (m)	0.013	0.012	0.014	0.014



Explanation of Rut Analysis from Laser Scanner Data

- Rutting was calculated from the laser scanner data using the wire rutting method and rutting was averaged over 5m distances.
- Rutting was analyzed from both driving lanes and from both wheel tracks.

