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# The effect of reduced road standards on the delivered cost



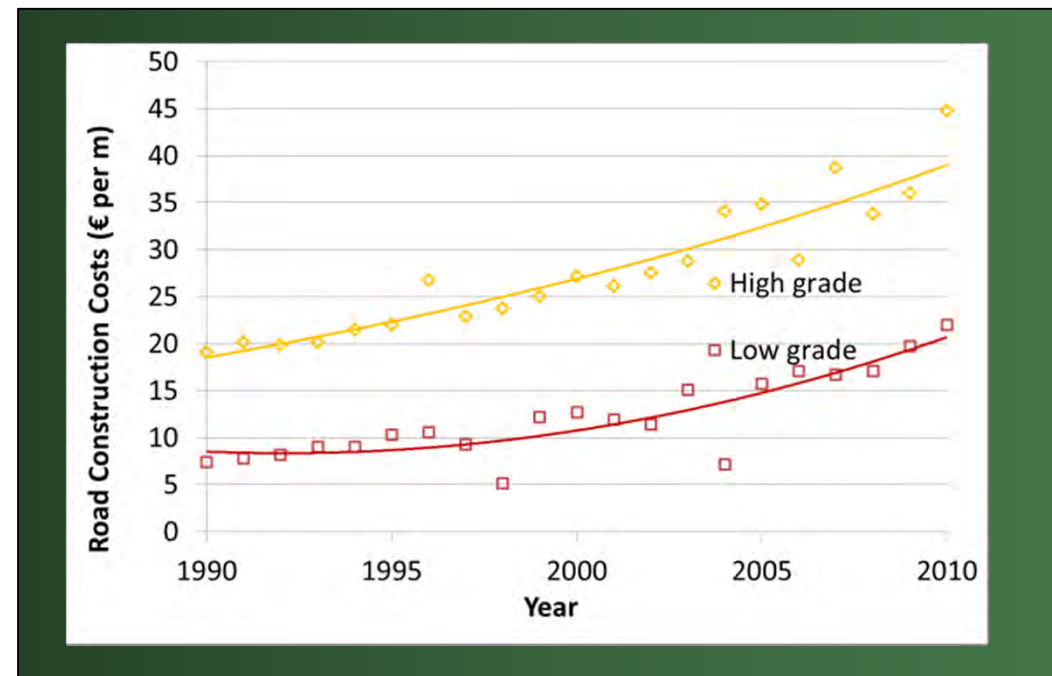
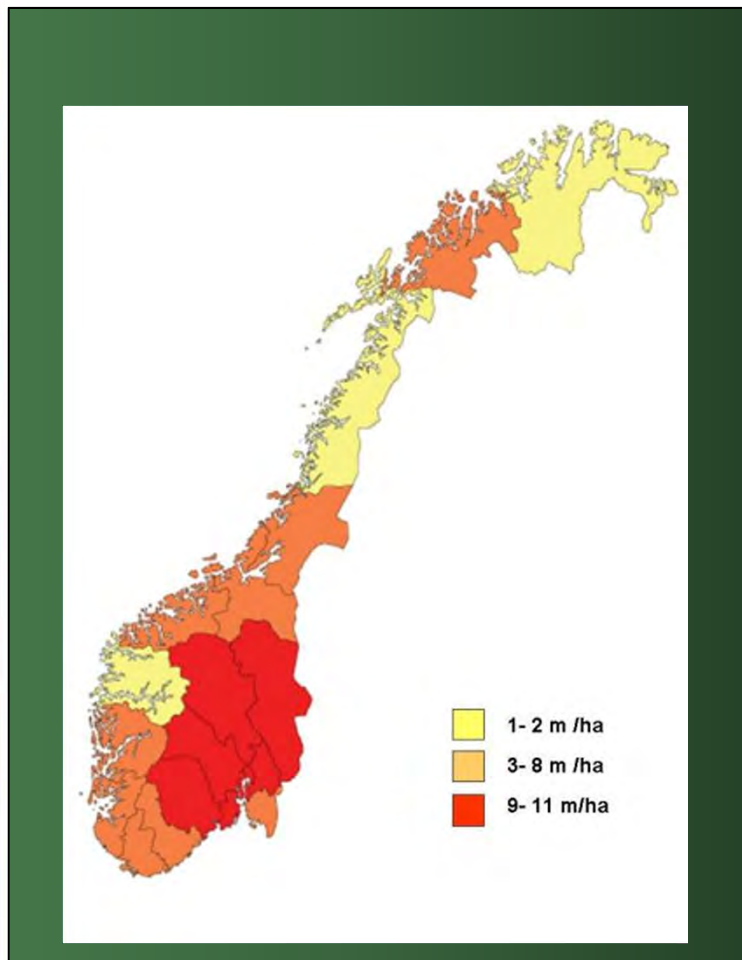
Bruce Talbot  
Morten Nitteber  
Audun Aasmun  
Photo: Scania AB

# Road Density & Costs



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Data source: Statistics Norway



# Research Question



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Is the investment in roads always justified, or should we rather accept a reduction in transport efficiency ?





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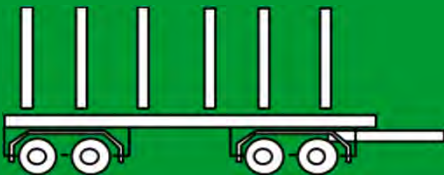

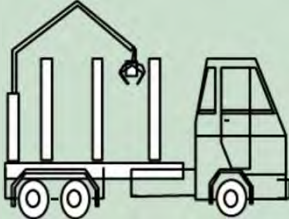
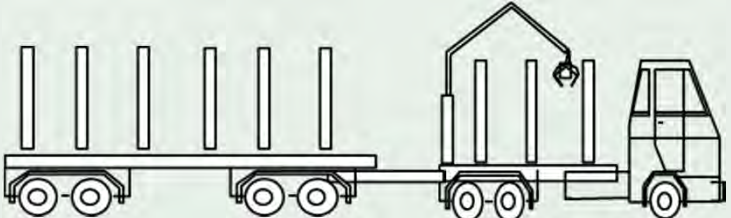




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# 3 Scenarios Investigated

<b>Sc1</b> Transloading On LG road		
Sc2 Rigid only on LG road		
Sc3 Full rig on HG road		

# Variables



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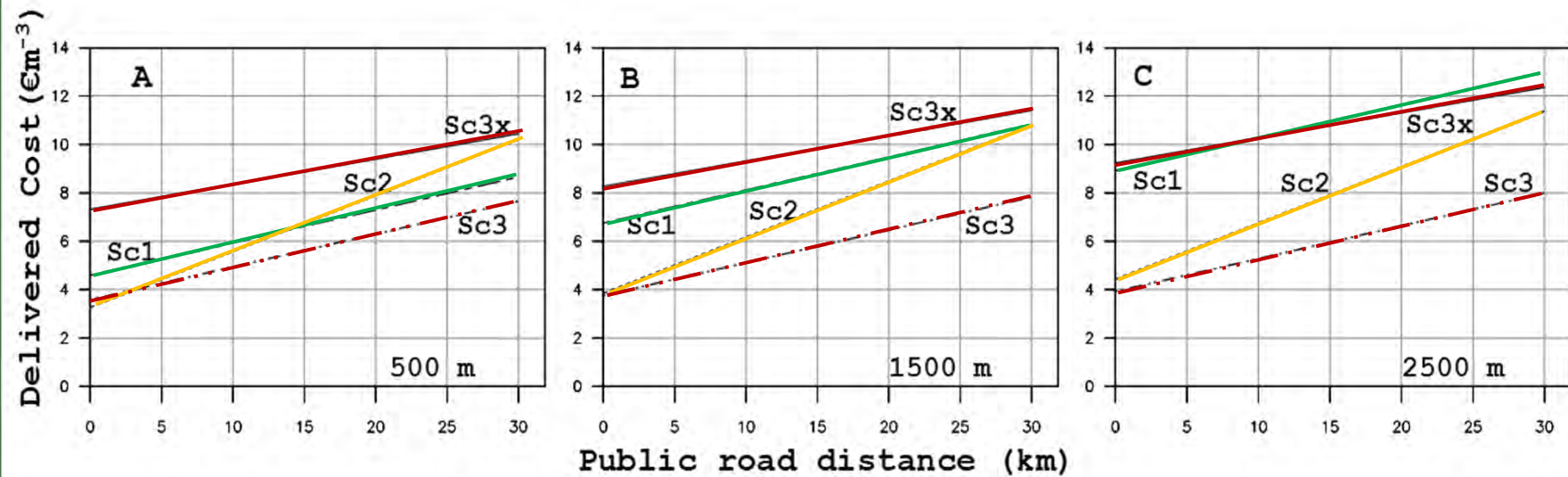
Terminal (data source)	Driving (data source)
Load truck (time study)	Drive speed Forest Road (est.)
Load trailer (time study)	Drive speed Public Road (est.)
Transload (time study)	Distance Forest Road (category)
Unload truck (estimated)	Distance Public Road (category)
Unload trailer (estimated)	Operating cost (report, 2011)
Capital costs (report, 2011)	Road segment distances
Truck / Trailer capacity (industry)	Harvest volumes



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# Result - transport model



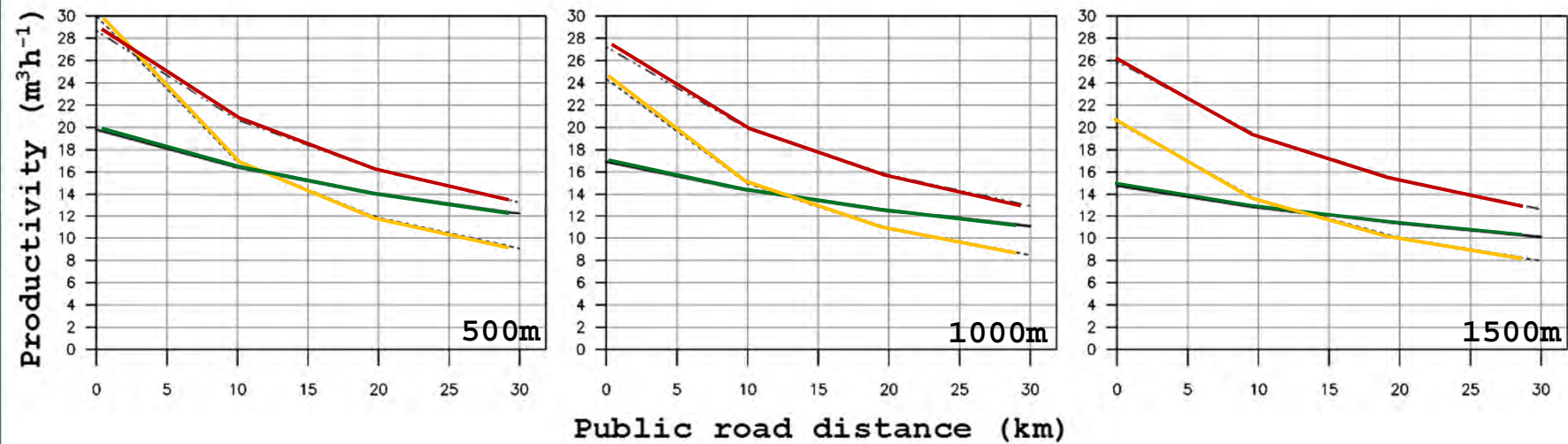
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# Productivity - transport model



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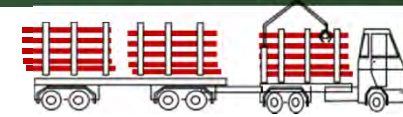
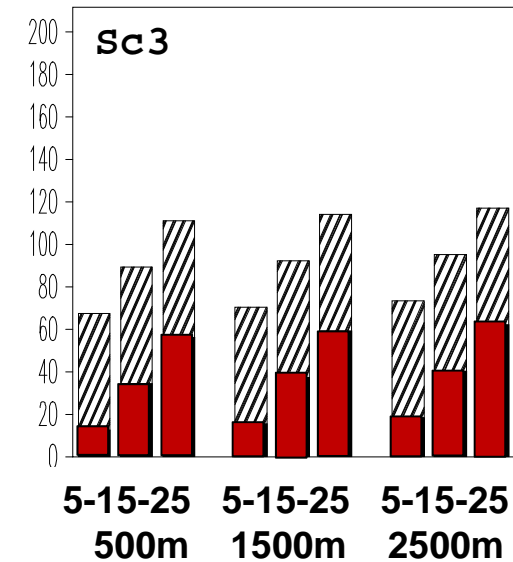
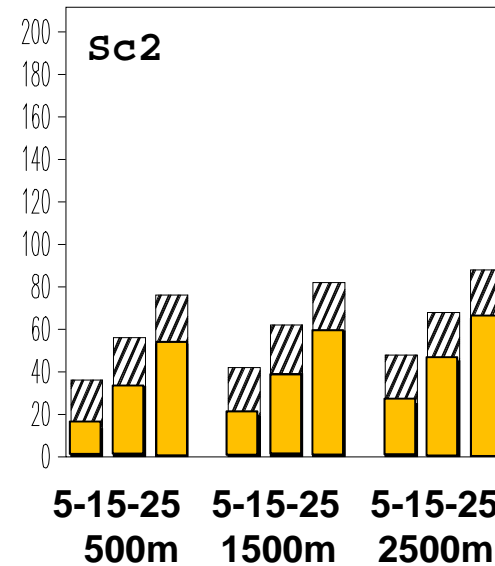
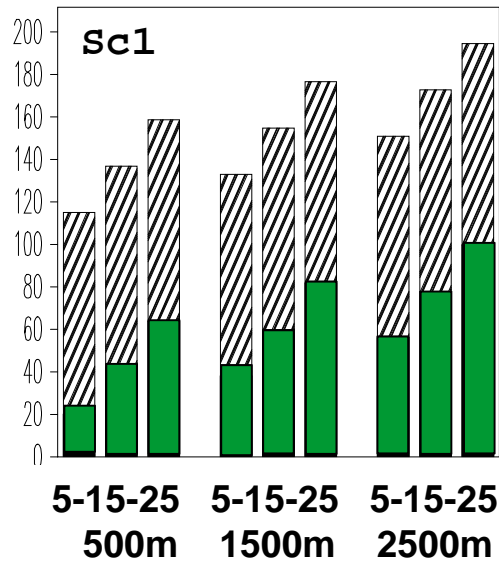


# Driving time vs. terminal time



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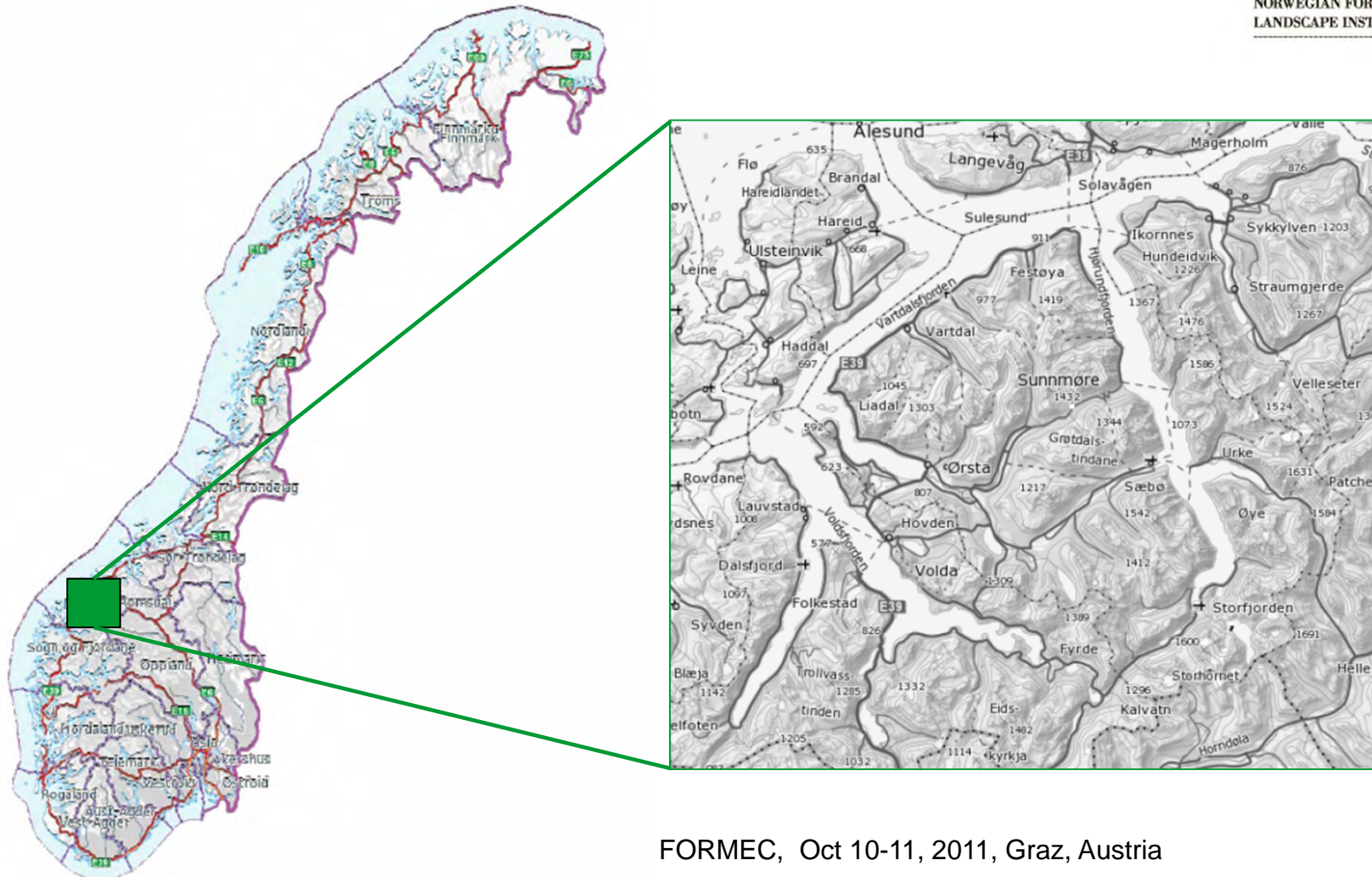
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# Application –coastal Norway



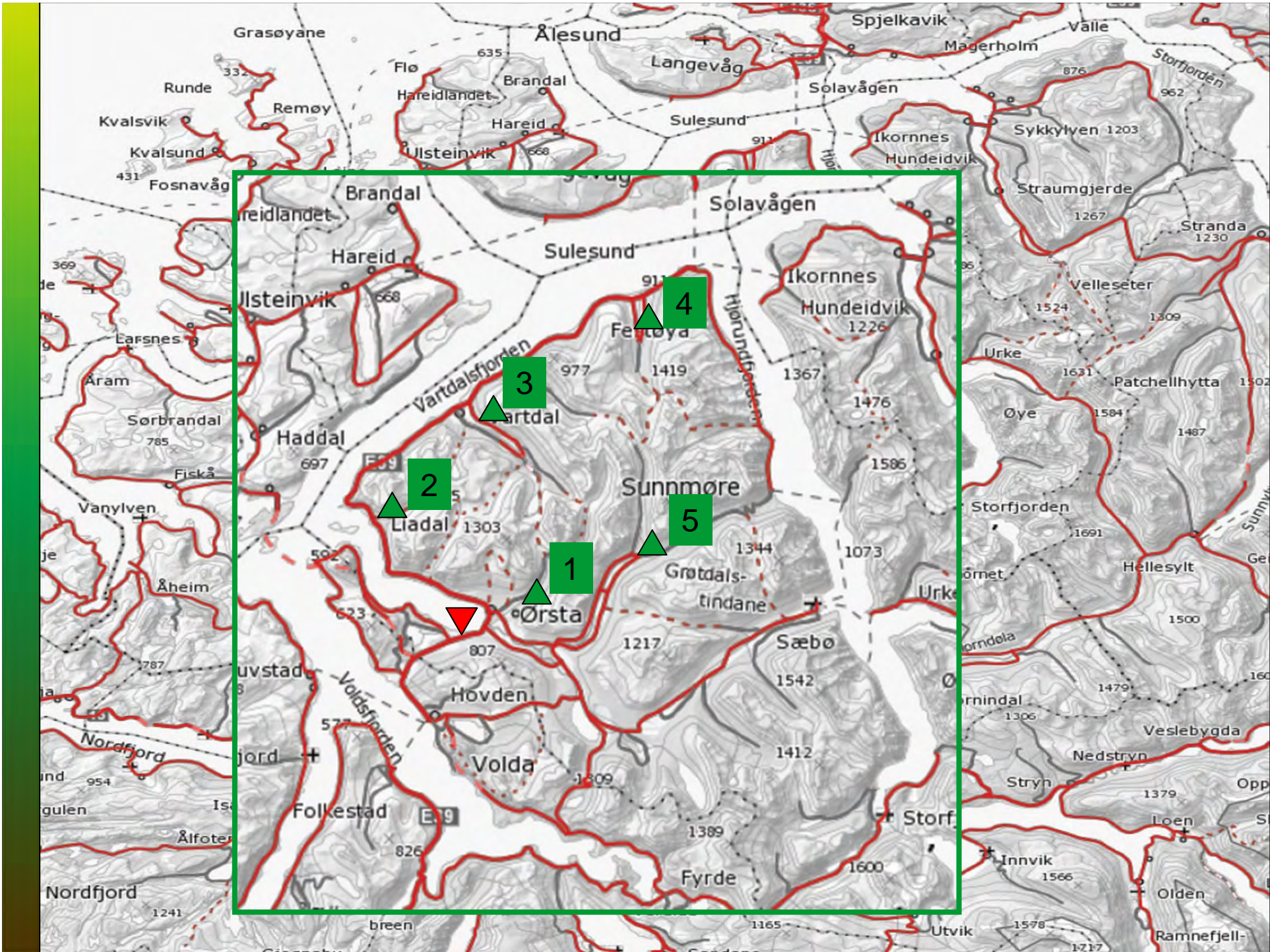
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# Road planning challenges - Ownership



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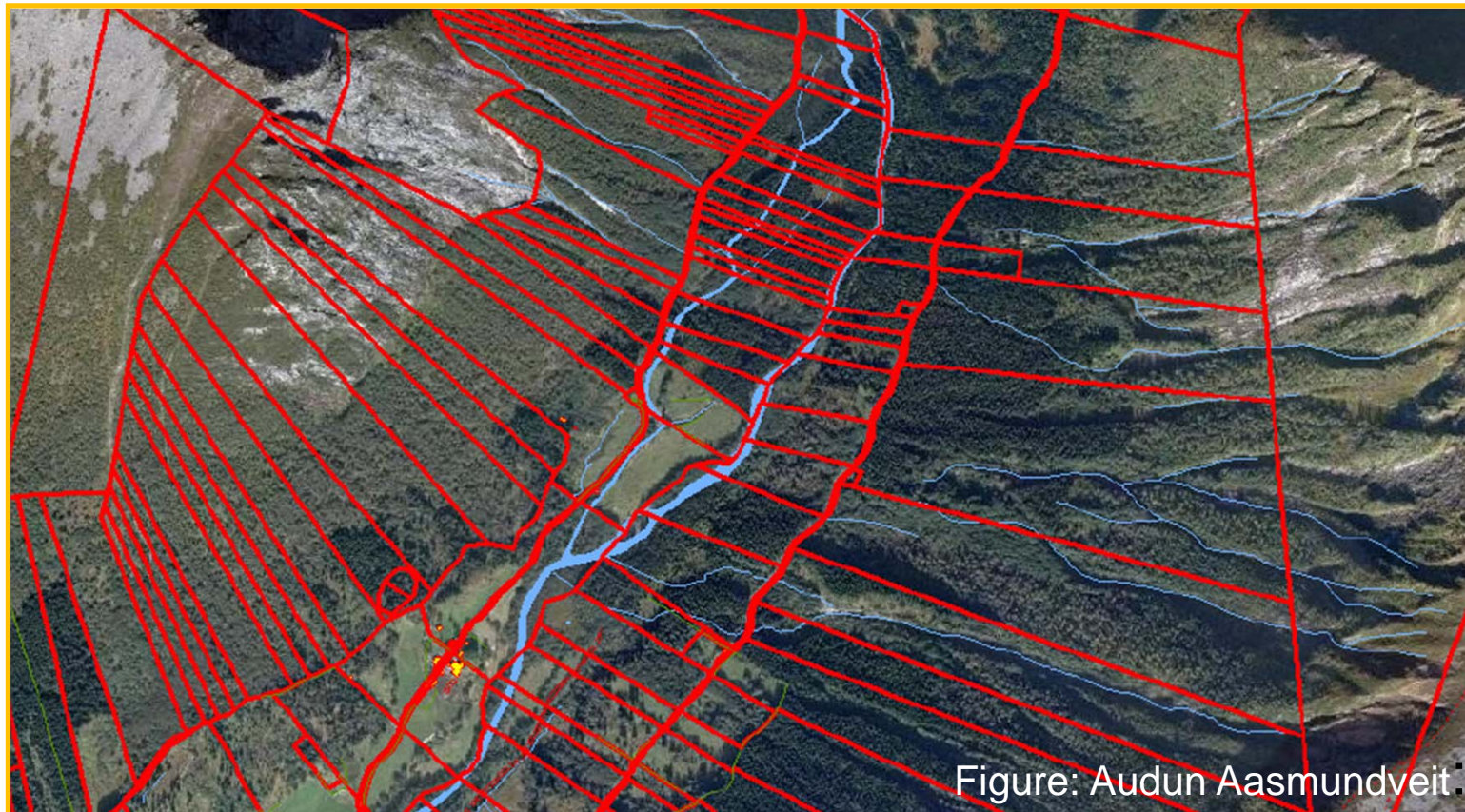


Figure: Audun Aasmundveit

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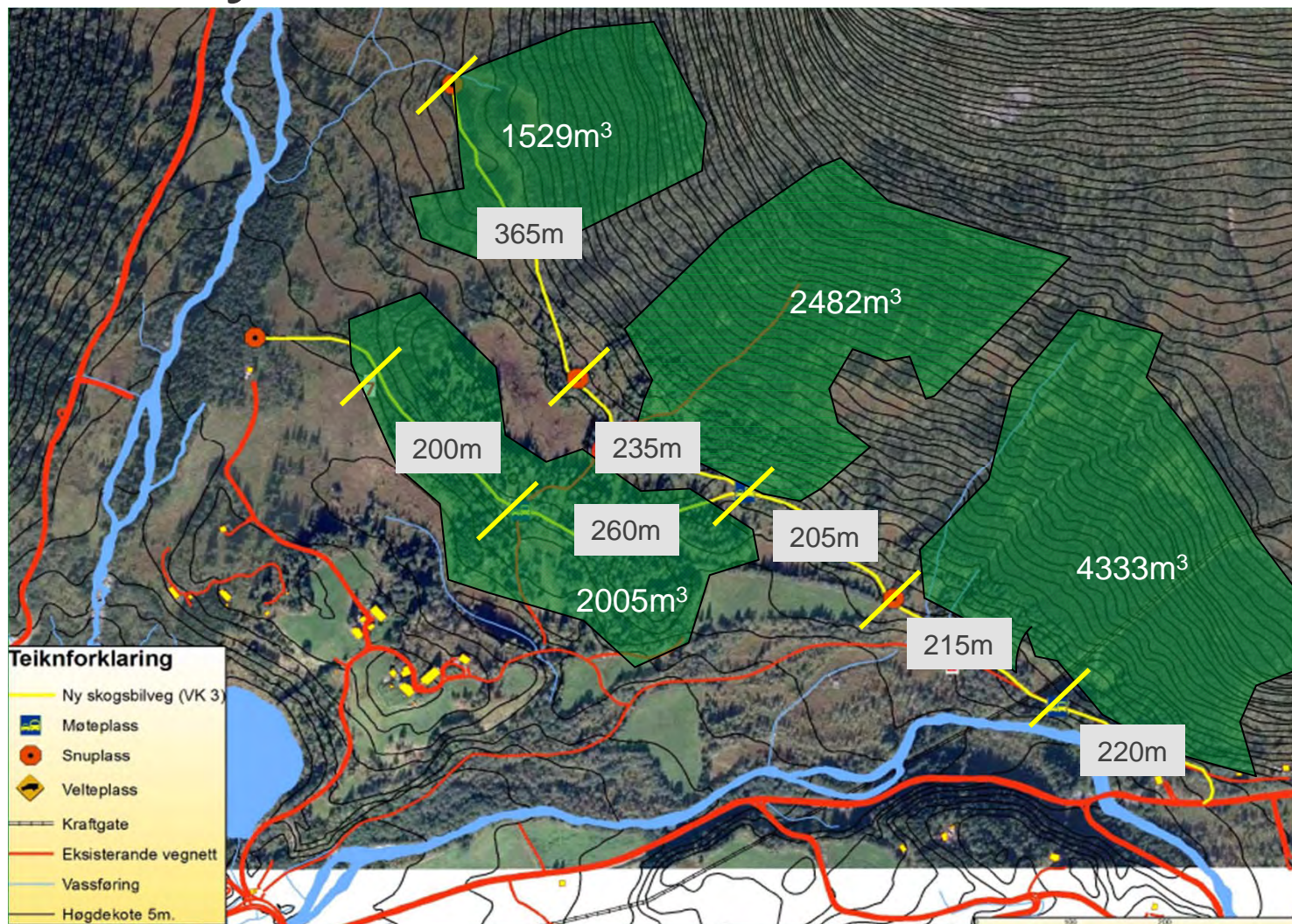


# Road planning - Case Study



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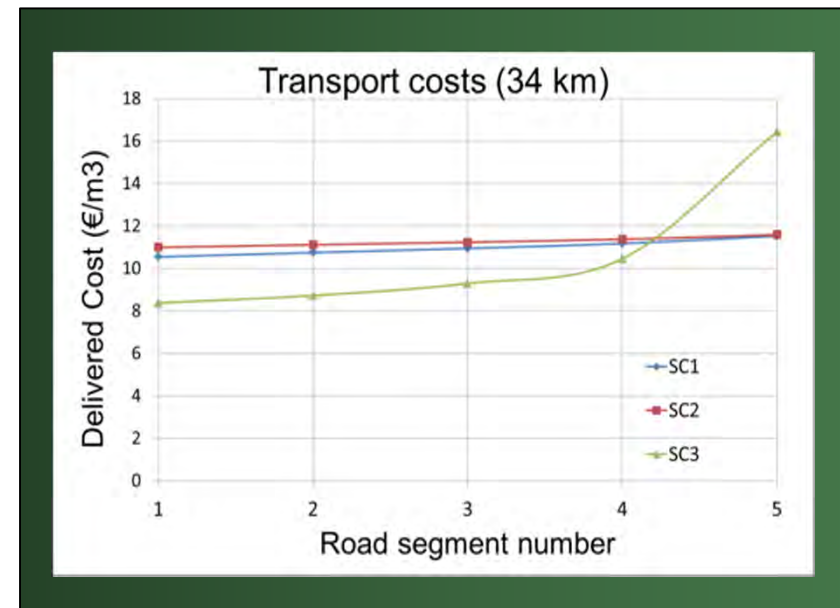
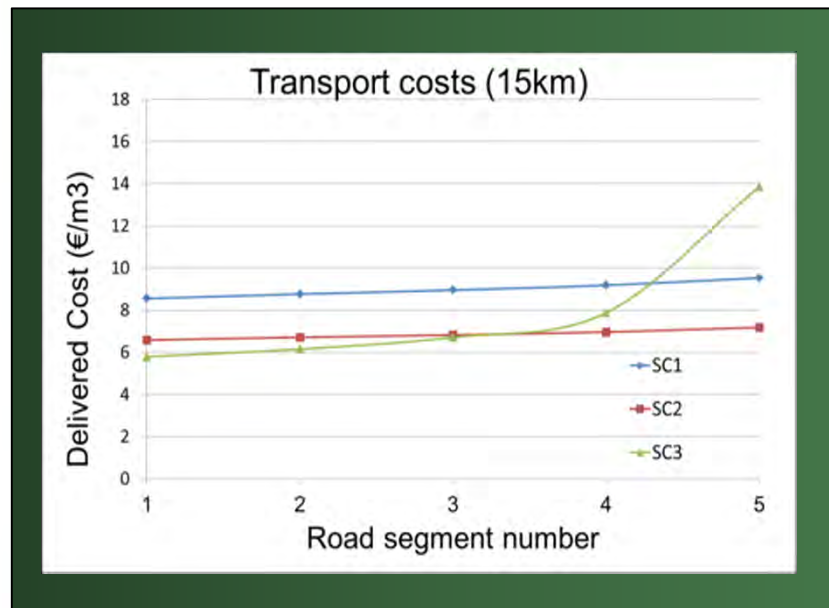


# Summary Results - Case Study



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# Conclusions

- > Combined road and transport planning has many dimensions to it - requires better decision support
- > Every road, and road segment, should be evaluated individually – all the way to market
- > Road planners and transport operators need to be more aware of influences / consequences of variables



Photo: Oskar Puschmann,  
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Thank you for your attention

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