

# OPS E39 Klett – Bårdshaug Norway's first Infrastructure PPP project.

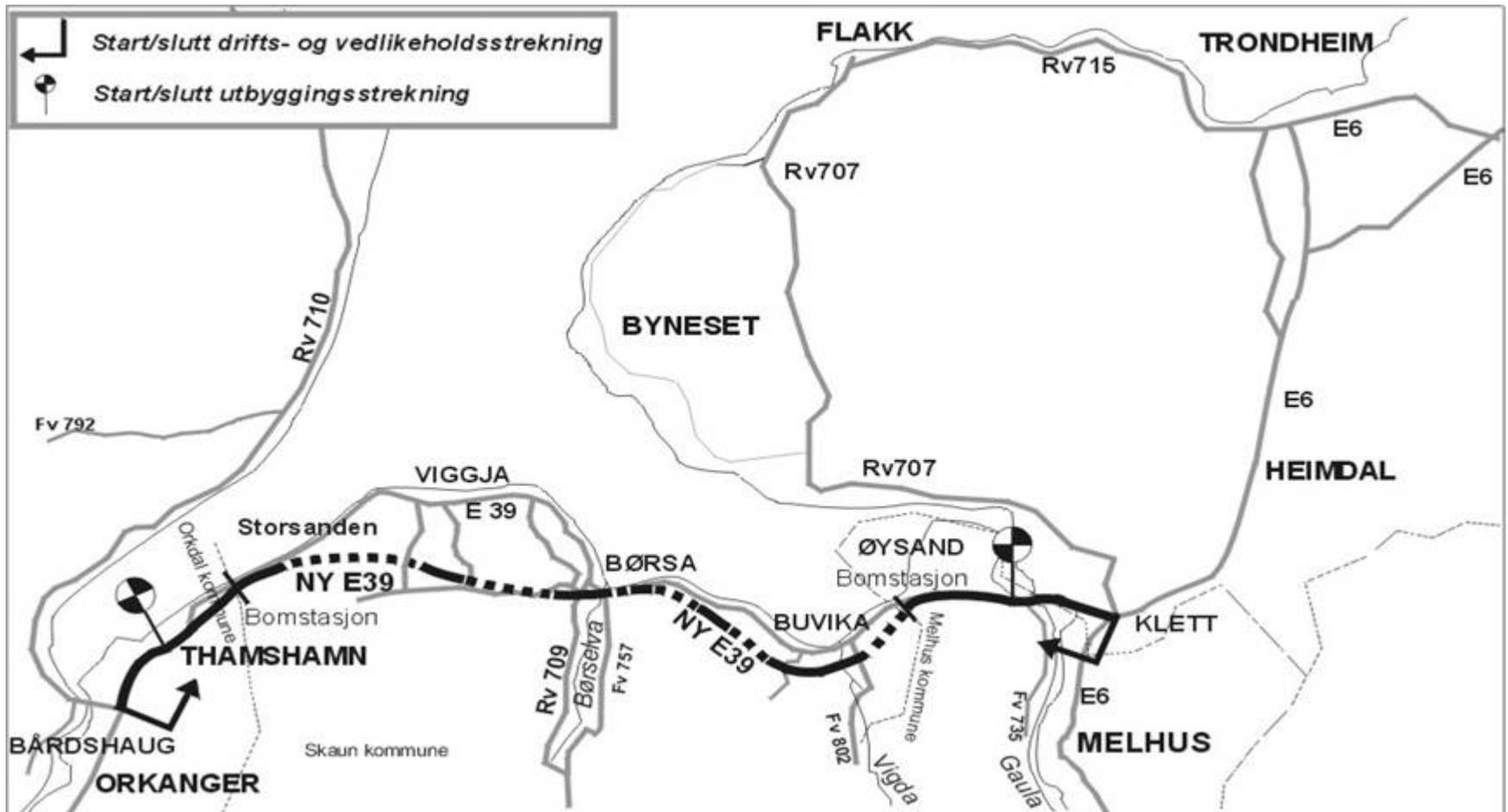


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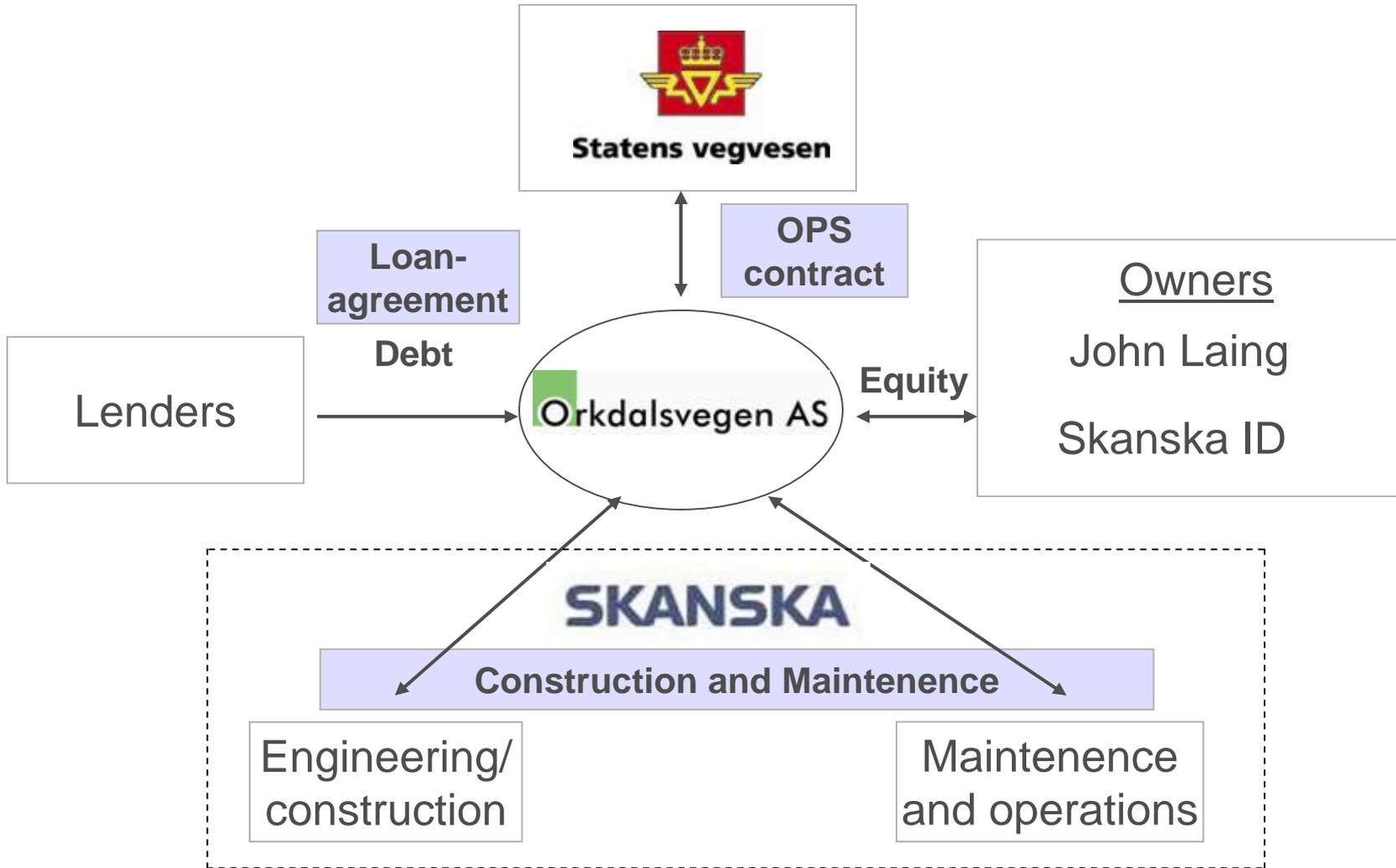


The scope of the project:

- 22 km construction
- 27 km O&M



# OPS E39 Klett – Bårdshaug, Contract structure



## Technical challenges during construction



- Tunnels, 10,5 km
- Quick clay cuttings
- Optimize resources between sections of the road
- Construction period, 27 Months

## Focus areas during construction

- schedule and progress
- methods to reduce construction period was thoroughly analyzed and included amongst others extensive cement/lime stabilization
- we started as soon as possible, design was always on the critical path
- result; 40 % shorter construction period compared to traditional contract model

## Optimizations for the operational phase

What I interpret as an optimization is:

to invest *more* during construction, to *reduce* O&M Cost ( and possibly increase quality) and consequently have a *reduced total cost*

Our approach was basically:

Use well known, well-proven technical solutions during design, if possible reduce risk for the construction phase.

However,

## Optimizations for the operational phase

We did actually accomplish some thoughts and work for the operational phase as well:

- extended road sub-base by 200 mm ⇒ strengthen road foundation/ increase asphalt surface periods.
- rock pitching of 20 000 m<sup>2</sup> clay slopes ⇒ reduced yearly maintenance to clean ditches/ reduce water problems

## Optimizations for the operational phase

- The Storsand tunnel was extended 200 meters ⇒ Predictable maintenance cost and safer road. Reduced risk for rock avalanche down the hillside.  
( I only regret we did not propose to prolong the tunnel some additional 400 m )

## Optimizations for the operational phase

- We brought in key people in our Operational team one year prior to start of operations, to bring in some practical experience and establish “ownership” to the road.

## Experiences from 3 years of operations

- traffic load has increased more than expected; + 15 % above forecast after 3 years
- we have established a small, effective team, locally, to operate the road
- daily maintenance has been as expected incl. winter service
- asphalt surface is better than expected; resurfacing can be delayed

## Experiences from 3 years of operations

We work to improve our operations, for instance by

- optimize tunnel cleaning with regards to air quality and visibility
- optimize power consumption

And at last; learn from our experience for the remaining 22 years of the Contract!