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Experiences from a Finnish PPP project using project life-cycle management from the order perspective to maximise efficiency

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Use of the life-cycle model in Finland

- Decision-in-principle of the Finnish Government's Ministerial Committee for Economic Policy 12/2003:

  The life-cycle model can be used for traffic infrastructure projects

- The Ministerial Committee's decision in February 2004 on use of the life-cycle model for the E18 Muurla - Lohja project
  - Good experiences with the life-cycle model in Finland and internationally.
  - The EU promotes use of the life-cycle model for traffic infrastructure construction.
  - Quick completion of the project is particularly important, and the life-cycle model makes faster completion possible.
  - Preliminary calculations indicate that the life-cycle model is the most economic overall solution.
  - The life-cycle model provides the opportunity to implement other traffic infrastructure projects in the near future.

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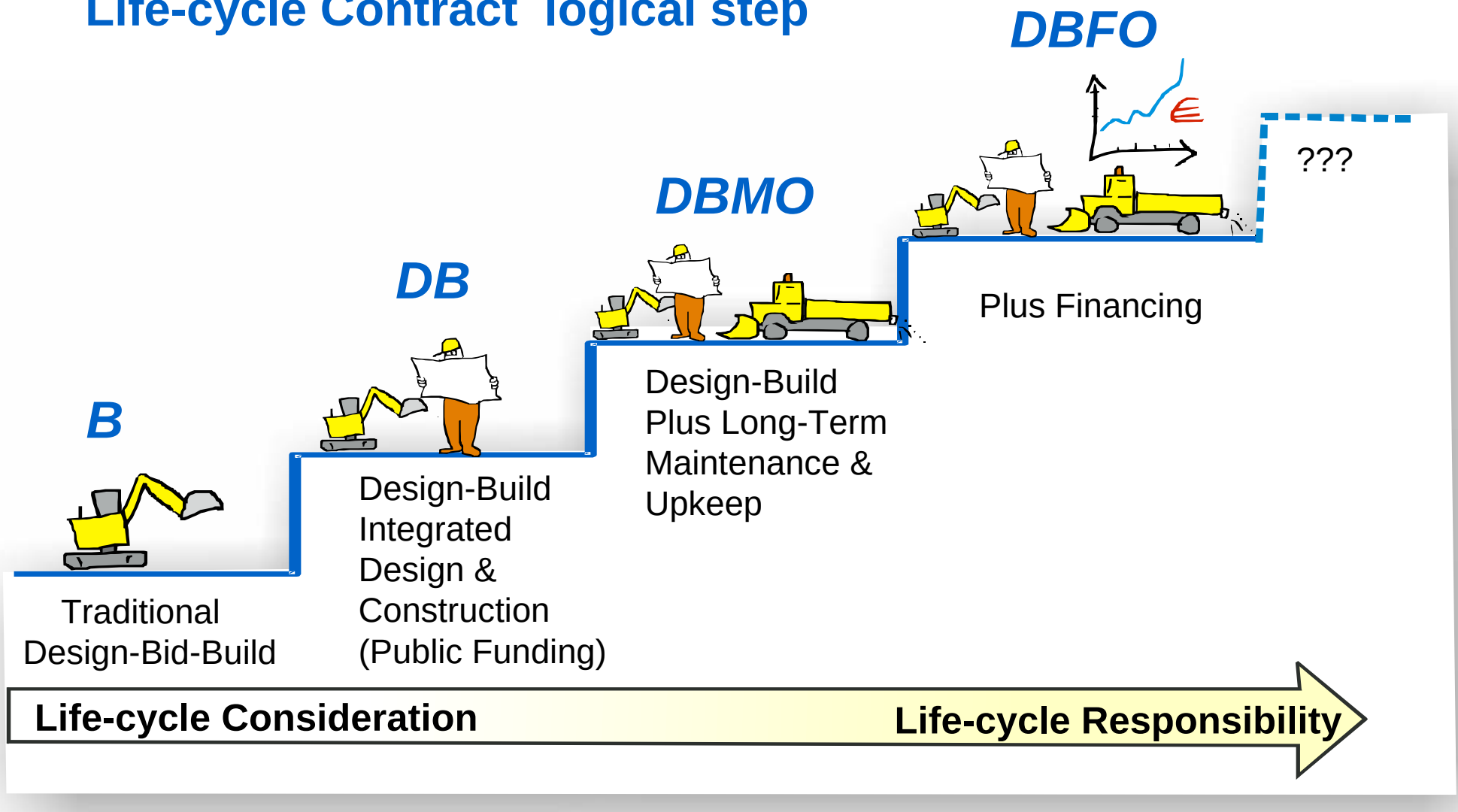
Life-cycle Contract logical step



Procurement model of E18

- Finnish application of the PPP model: life-cycle model
- The client orders the long-term service entity by means of a service contract - Contract period autumn 2005 - autumn 2029
- The service provider must establish a special purpose company (SPC) to take responsibility for construction design, construction, maintenance and financing.
- The service requirements are described as
  - performance specifications (top surface of the road, environmental factors, fittings and equipment etc.)
  - technical product requirements (long-term structures)
- The payment mechanism combines the quality and quantity of services produced with the service fee
  - availability of service defines the basic amount
  - monitored criteria create variability

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GROSS SERVICE PAYMENT *(Price of the service when quality at agreed level)*

AVAILABILITY PAYMENT

PERFORMANCE PAYMENT

Measurement of the Service

Availability

Unavailability

- Extent and duration
- Location
- Time Period

Performance

- Maintenance
- Surface Condition
- Fixed dates
- Failures

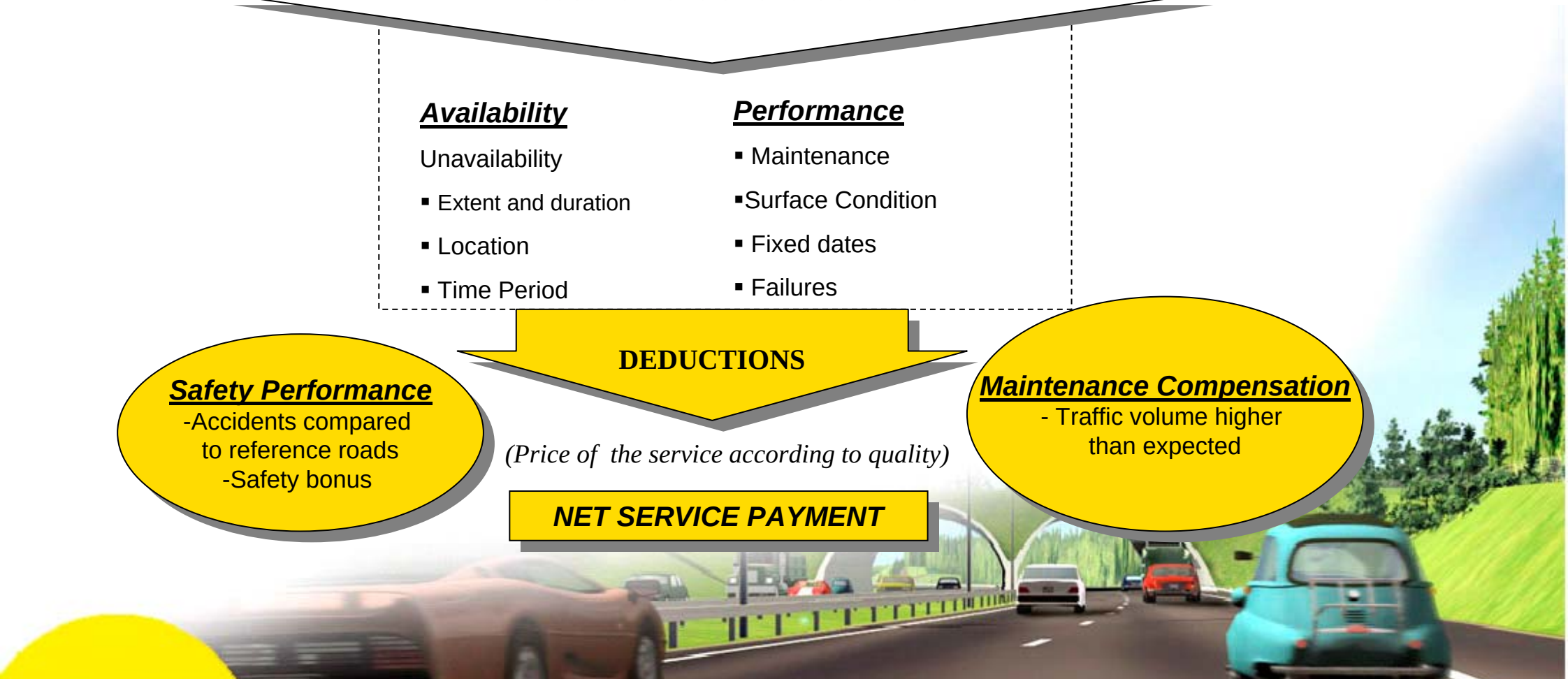
DEDUCTIONS

Safety Performance
-Accidents compared to reference roads
-Safety bonus

Maintenance Compensation
- Traffic volume higher than expected

(Price of the service according to quality)

NET SERVICE PAYMENT



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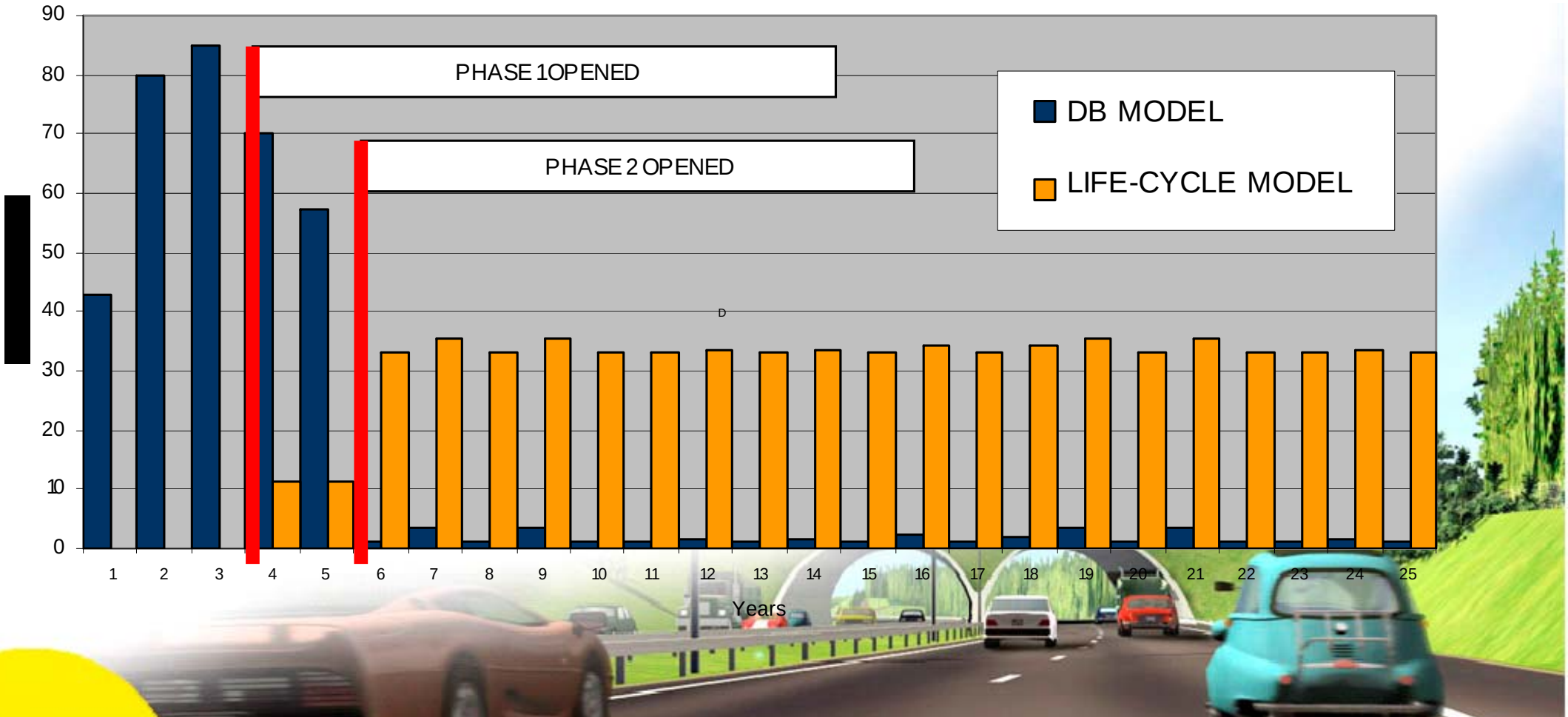
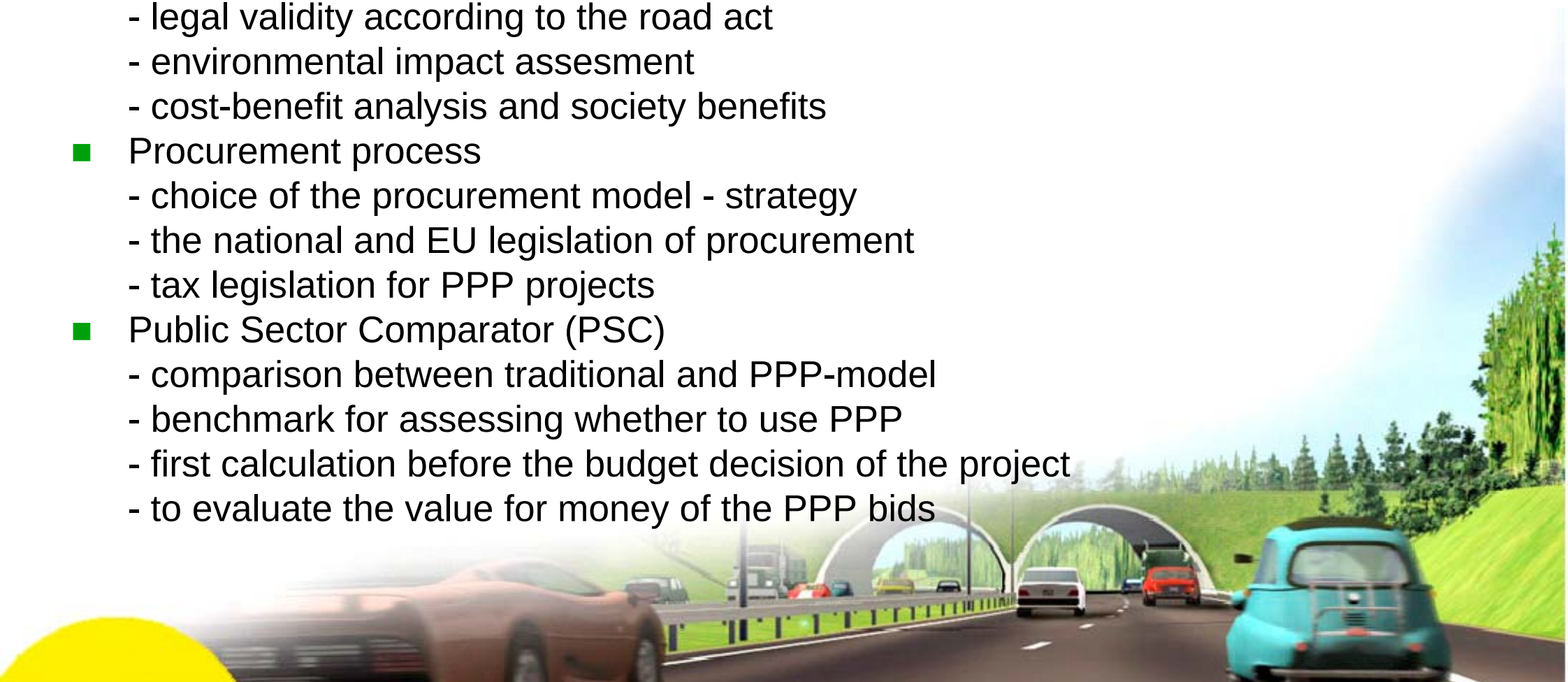
The client´ s cashflow in traditional (DB) and life-cycle model



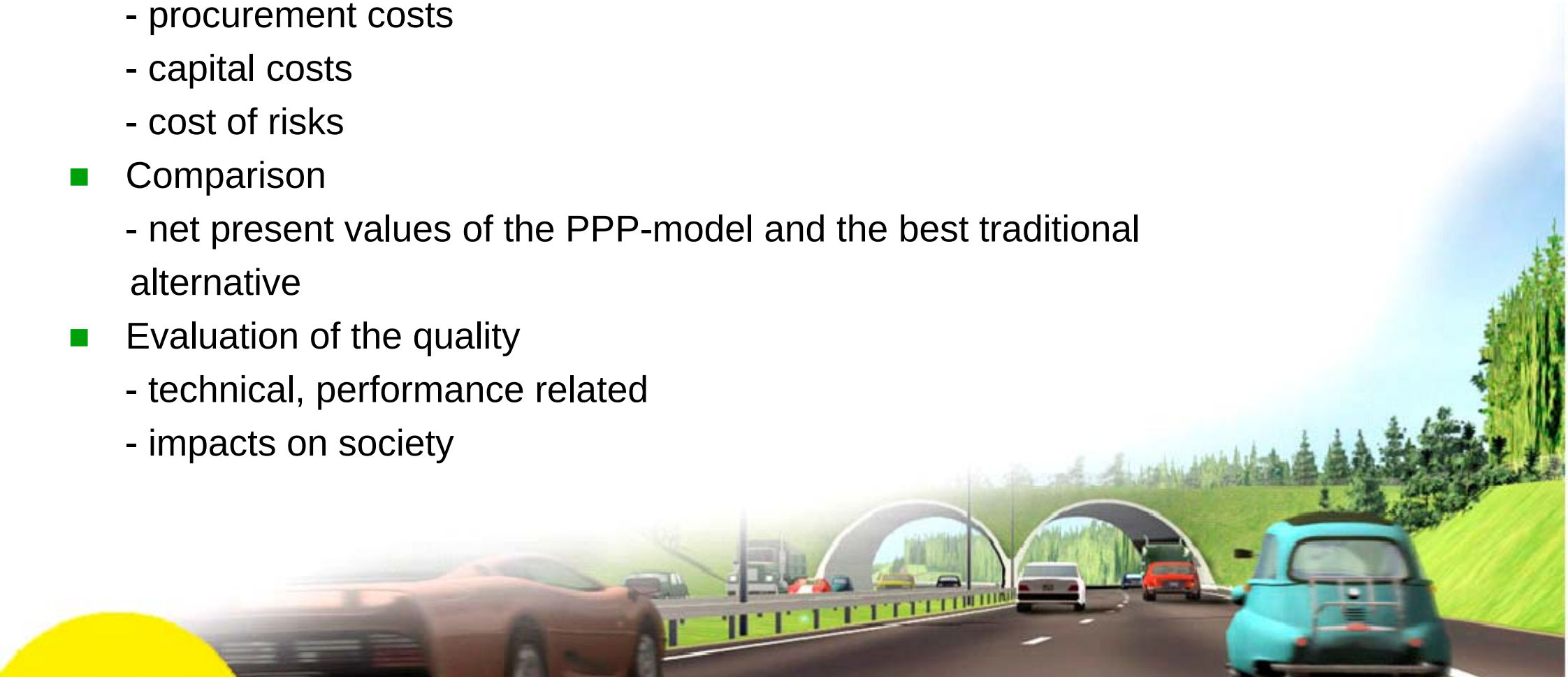
Three processes of a PPP road project

- Administrative process
  - legal validity according to the road act
  - environmental impact assesment
  - cost-benefit analysis and society benefits
- Procurement process
  - choice of the procurement model - strategy
  - the national and EU legislation of procurement
  - tax legislation for PPP projects
- Public Sector Comparator (PSC)
  - comparison between traditional and PPP-model
  - benchmark for assessing whether to use PPP
  - first calculation before the budget decision of the project
  - to evaluate the value for money of the PPP bids



PSC calculation

- Costs of the PPP and the best traditional realisation
  - design, building, maintenance and service costs
  - procurement costs
  - capital costs
  - cost of risks
- Comparison
  - net present values of the PPP-model and the best traditional alternative
- Evaluation of the quality
  - technical, performance related
  - impacts on society



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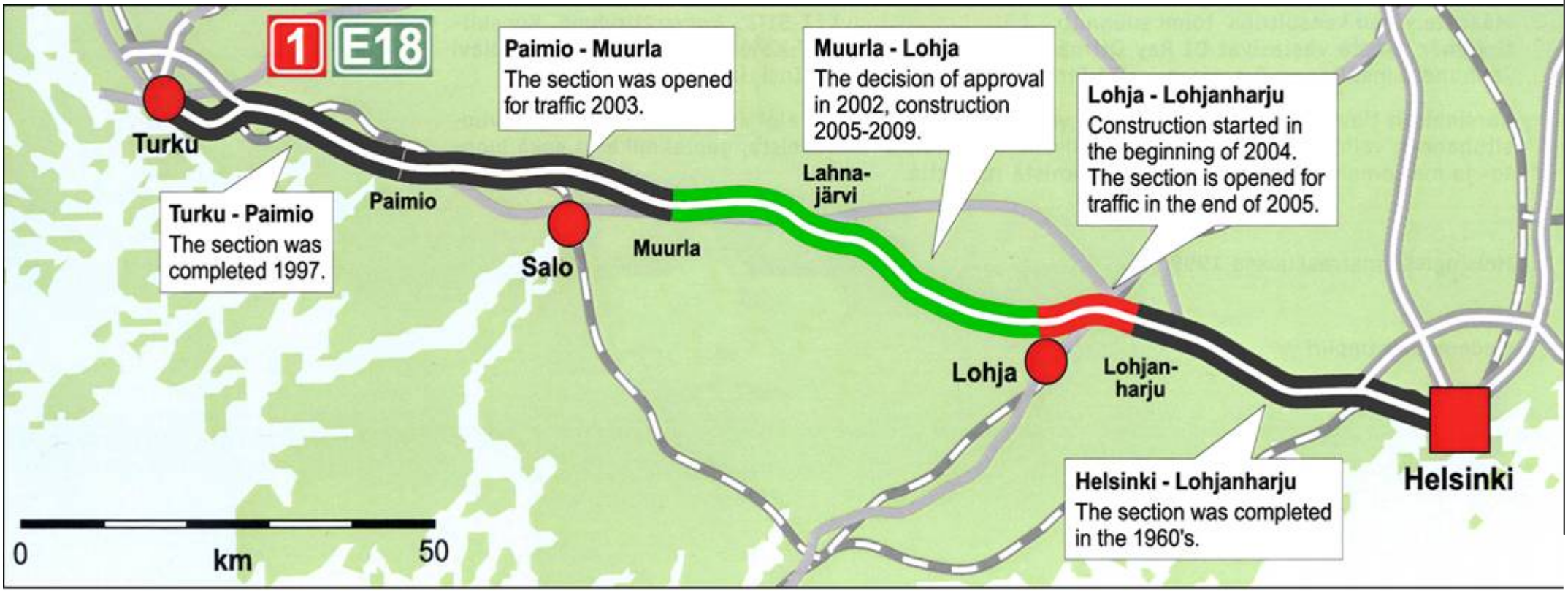
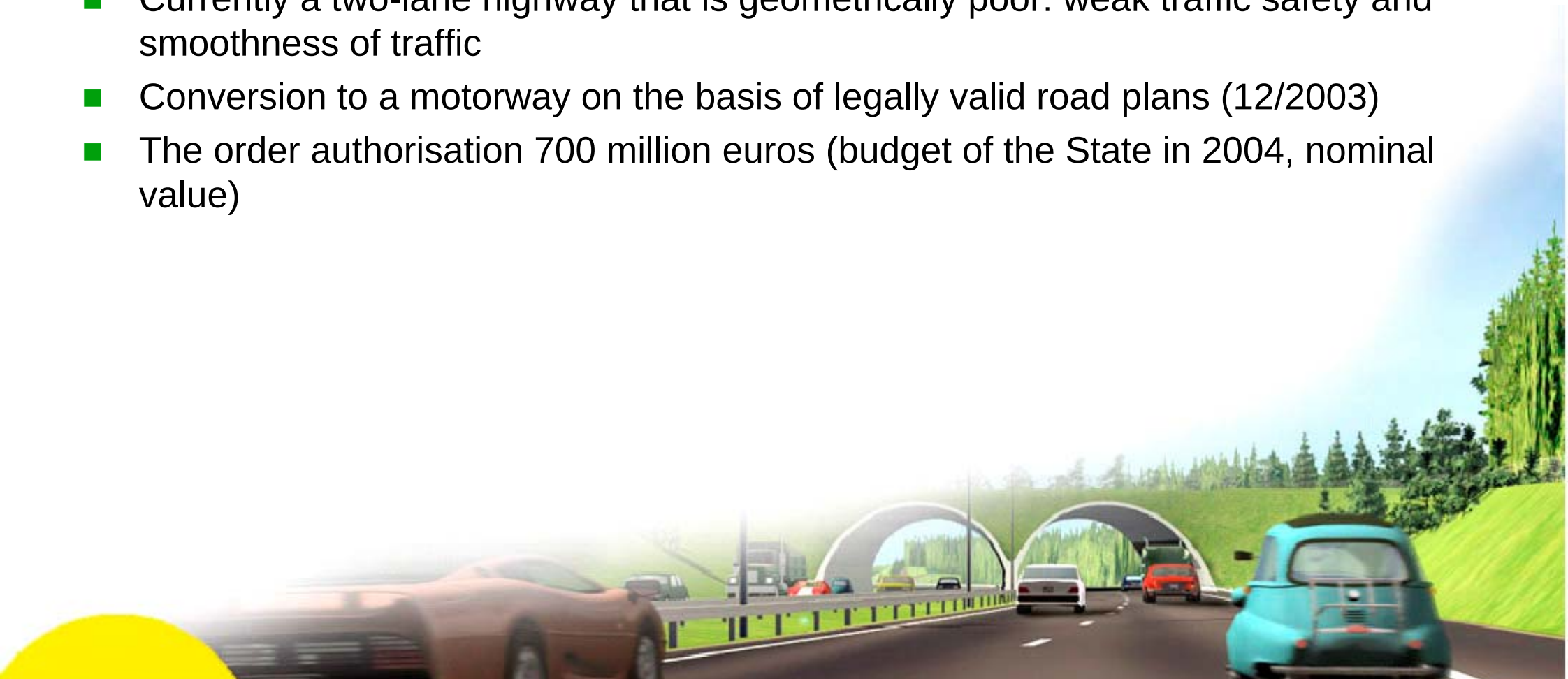
E18 Muurla-Lohja
the 2nd PPP project of FINNRA



E18 Turku-Helsinki

E18 Muurla - Lohja

- Part of the Nordic Triangle, prioritised by the EU
- Currently a two-lane highway that is geometrically poor: weak traffic safety and smoothness of traffic
- Conversion to a motorway on the basis of legally valid road plans (12/2003)
- The order authorisation 700 million euros (budget of the State in 2004, nominal value)



E18 Muurla - Lohja motorway

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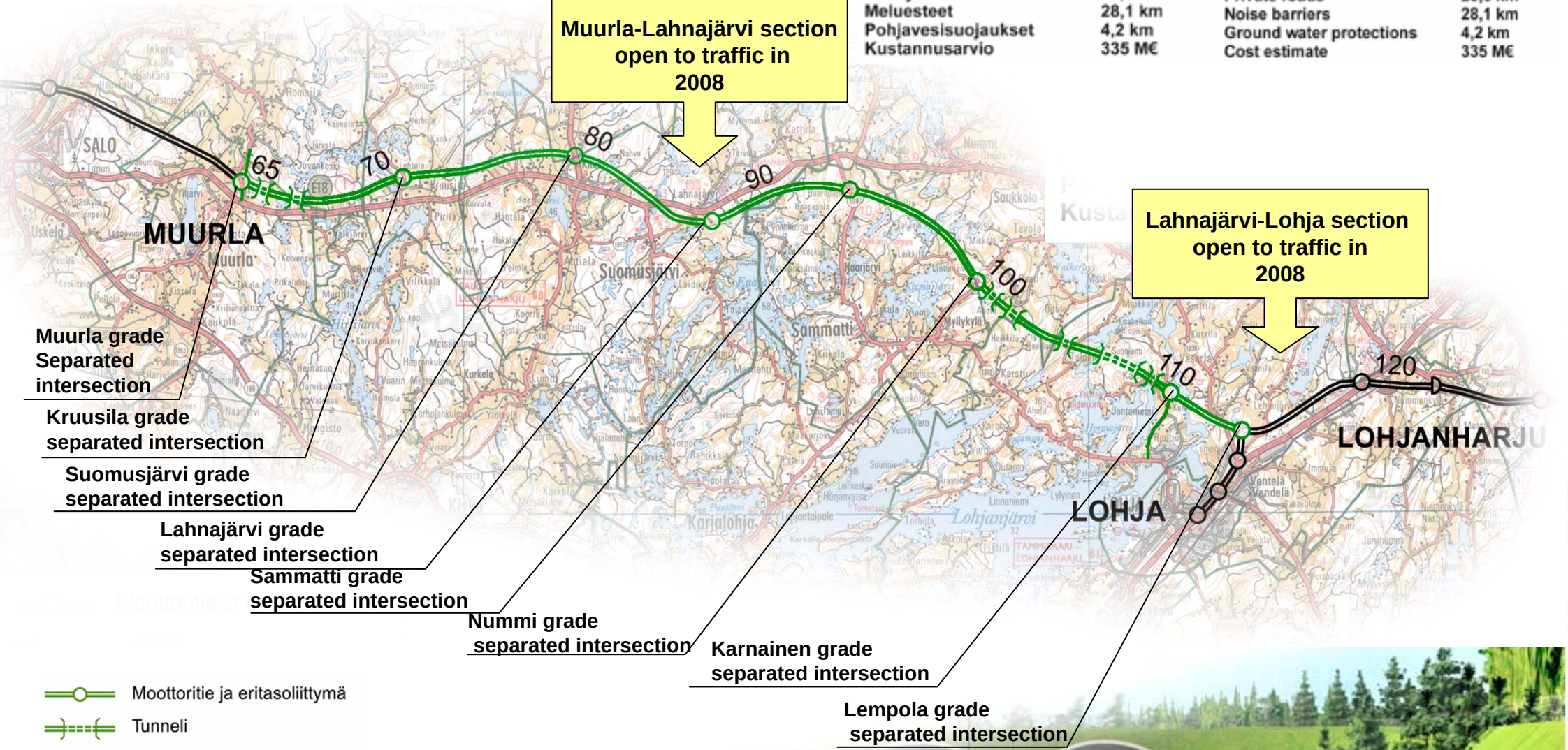
Moottoritie	50 km	Motorway	50 km
Eritasoliittymät	8 kpl	Grade separated intersections	8 pcs
Palvelualueet	2 kpl	Service areas	2 pcs
Sillat	49 kpl	Bridges	49pcs
Tunnelit	7 kpl/5,1 km	Tunnels	7 pcs/5,1 km
Yleiset tiet	12,5 km	Other public roads	12,5 km
Yksityistiet	23,8 km	Private roads	23,8 km
Meluesteet	28,1 km	Noise barriers	28,1 km
Pohjavesisuojaukset	4,2 km	Ground water protections	4,2 km
Kustannusarvio	335 M€	Cost estimate	335 M€

Muurla-Lahnajärvi section open to traffic in 2008

Lahnajärvi-Lohja section open to traffic in 2008



Muurla grade Separated intersection

Kruusila grade separated intersection

Suomusjärvi grade separated intersection

Lahnajärvi grade separated intersection

Sammatti grade separated intersection

Nummi grade separated intersection

Karnainen grade separated intersection

Lempola grade separated intersection

Moottoritie ja eritasoliittymä

Tunneli

Rakenteilla oleva/ nykyinen moottoritie

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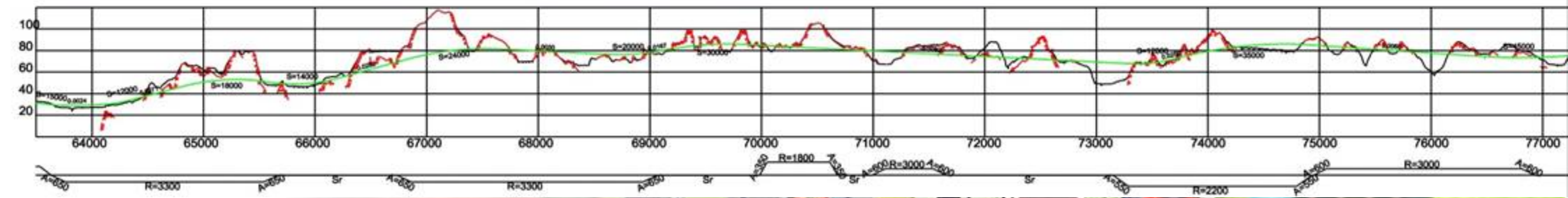

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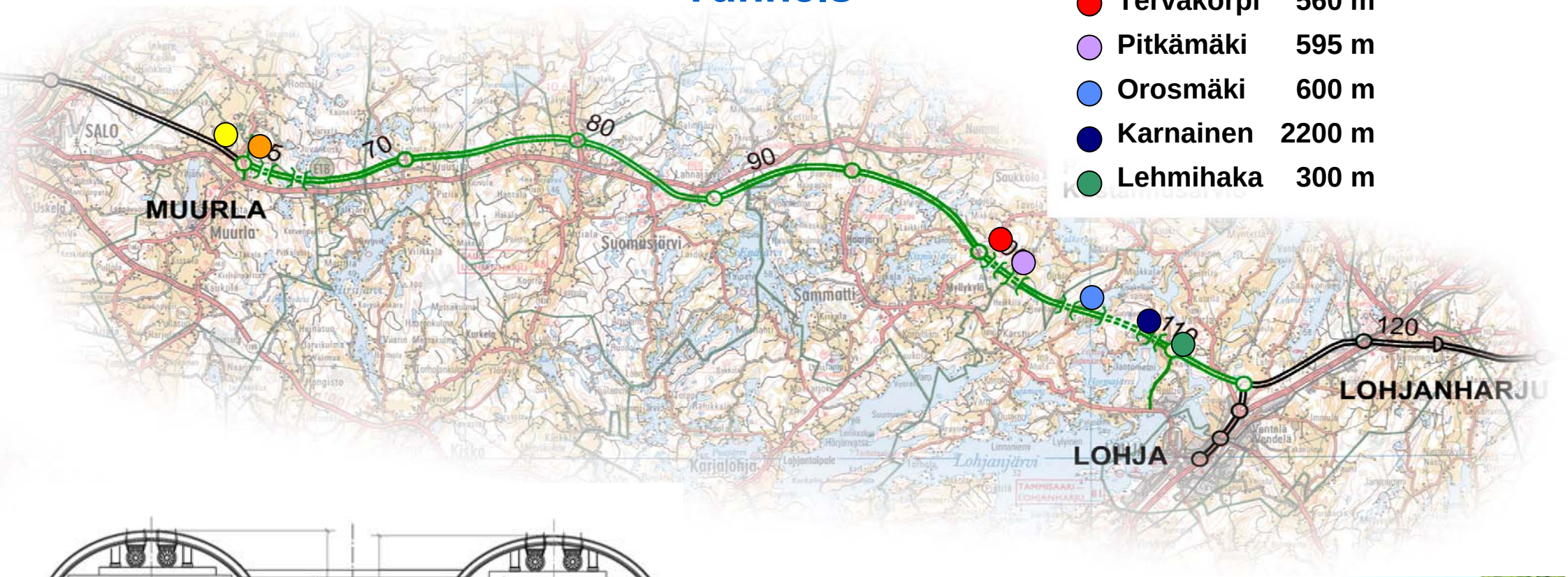
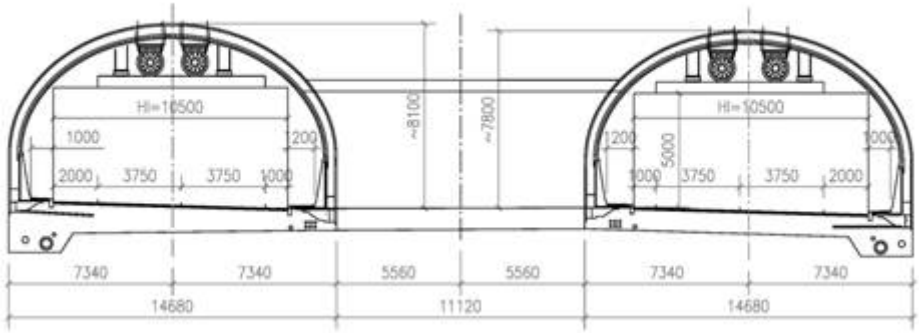
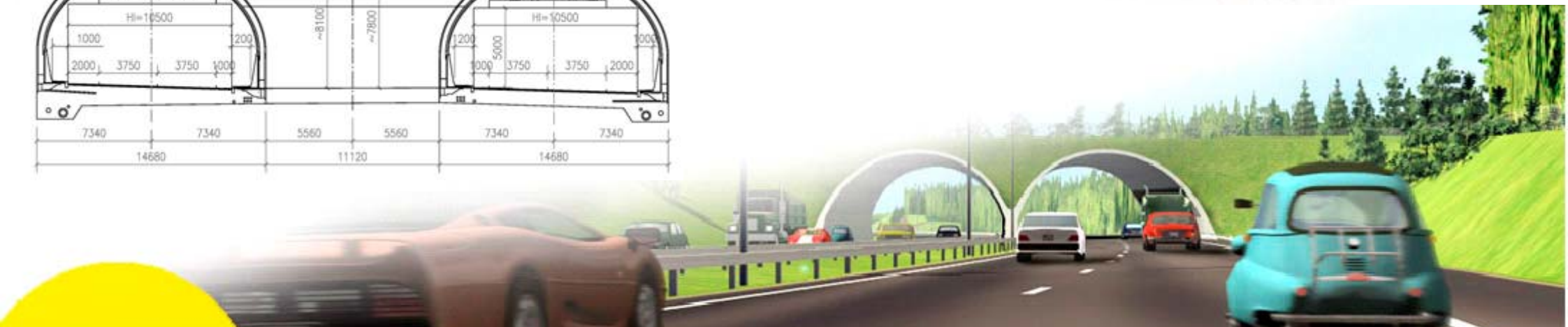
Tunnels

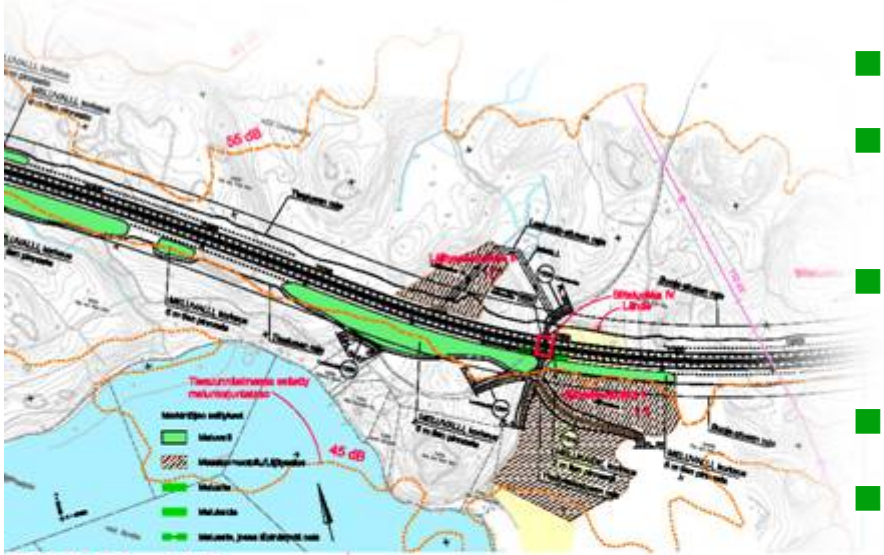
- Hepomäki 270 m
- Lakiamäki 430 m
- Tervakorpi 560 m
- Pitkämäki 595 m
- Orosmäki 600 m
- Karnainen 2200 m
- Lehmihaka 300 m



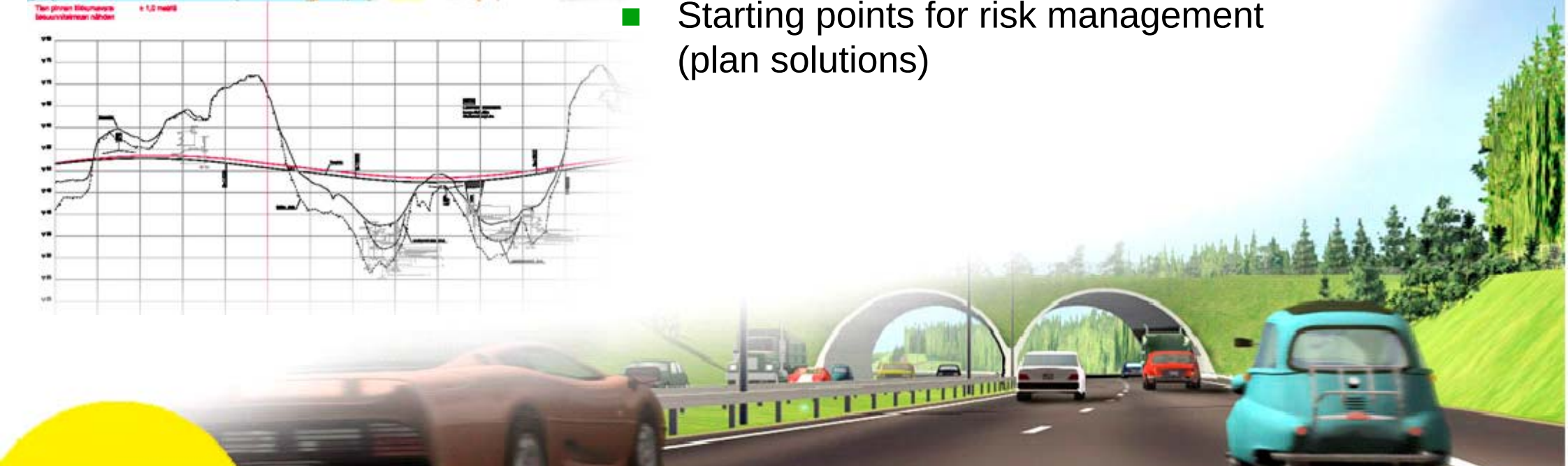




Complemented road plan



- Extensive, documented soil and bedrock surveys
- Basic road plan solution with updated starting information
- Degrees of freedom in the plan – for example, motorway altitude 0 - ± 2 m
- Absolute boundary conditions - environmental impact
- Graphic thematic maps
- Starting points for risk management (plan solutions)



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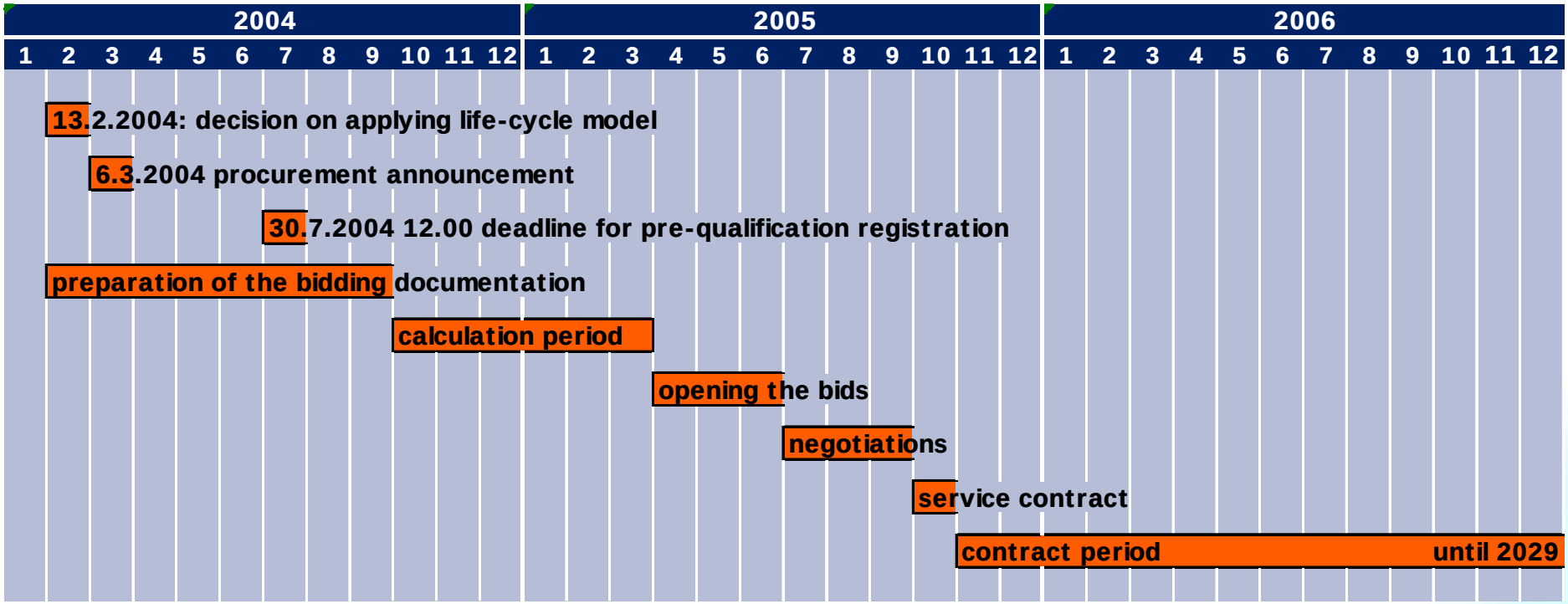
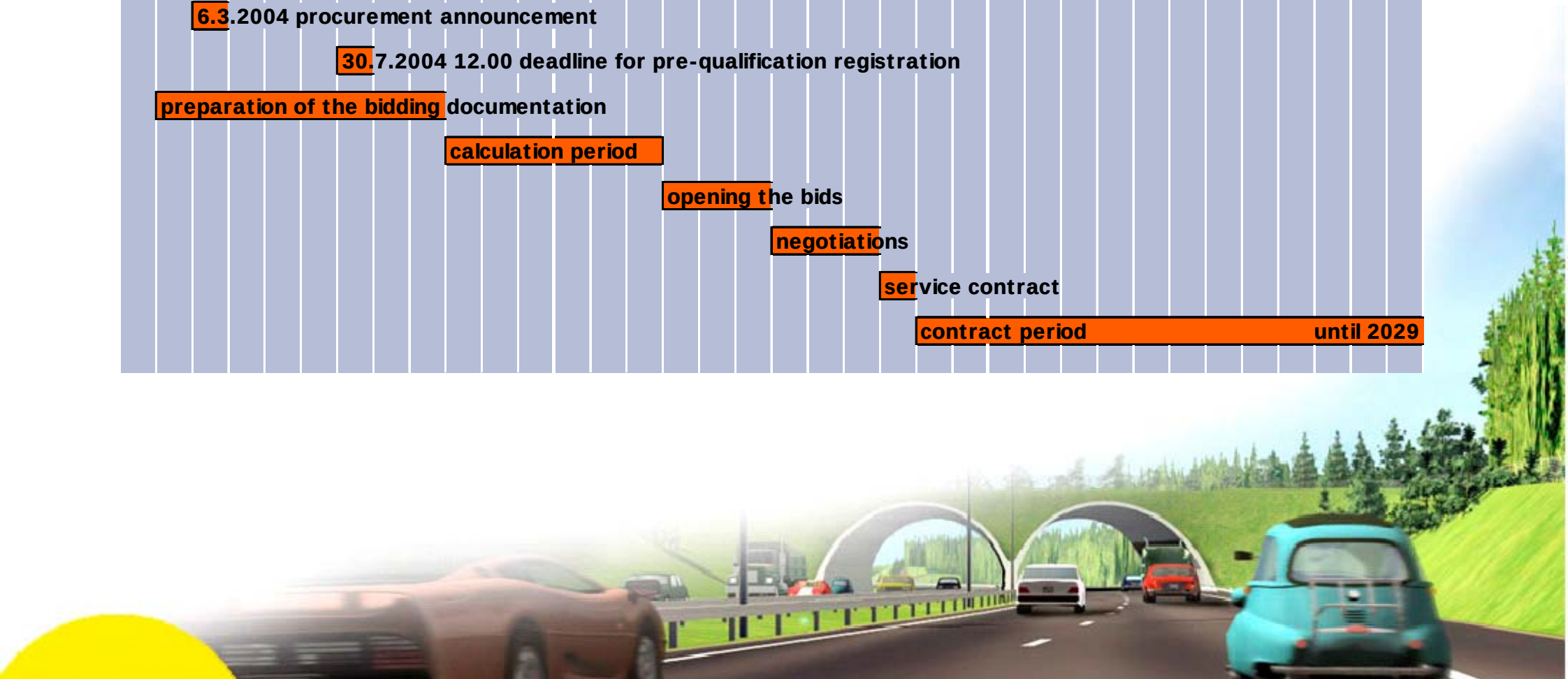
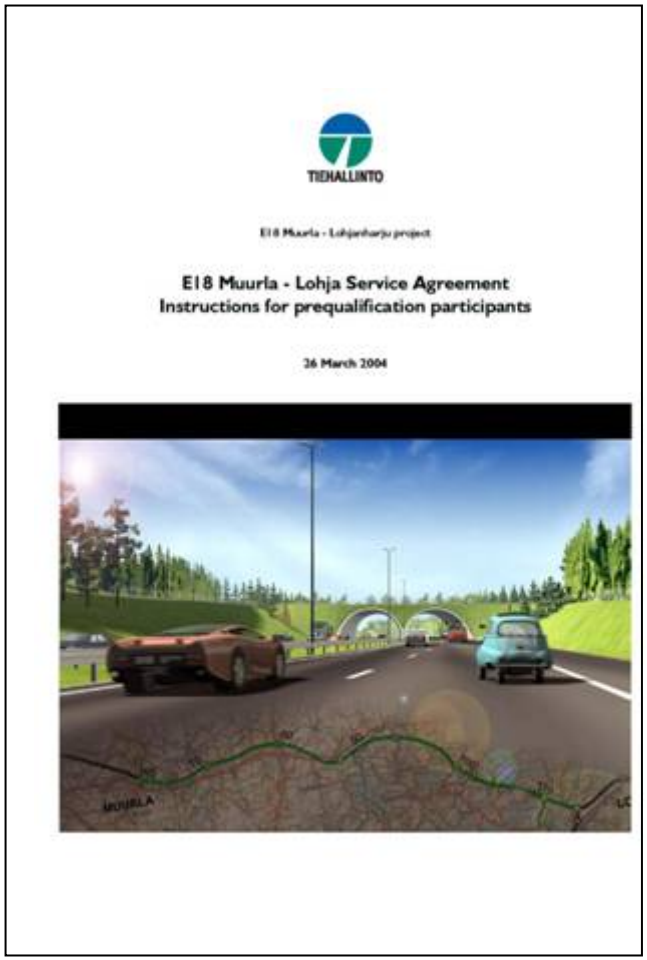
Schedule for the bidding process





Road shows
E18 Muurla-Lohja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E18 Muurla - Lohjanharju project

E18 Muurla - Lohja Service Agreement
Instructions for prequalification participants

26 March 2004

- Helsinki 26.3.2004
- Bryssel 24.5.2004

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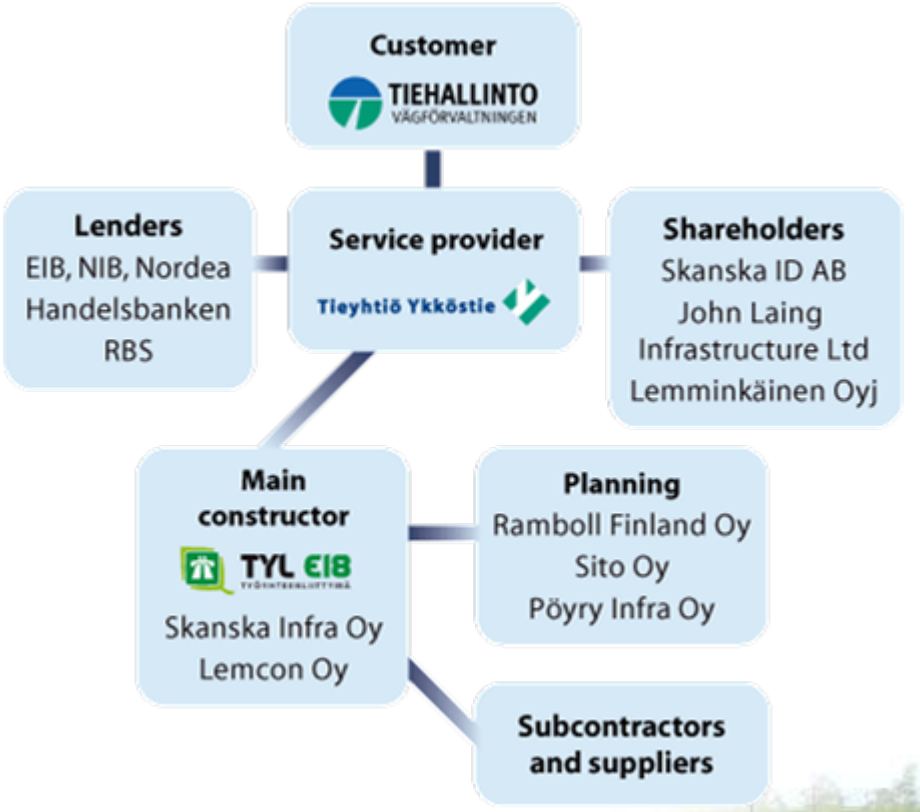
Shortlisted bidders

BOUYGUES / KESÄLAHDEN MAANSIIRTO OY	**- Bouygues Travaux Publics** **- Kesälahden Maansiirto Oy** **(- NCC Roads aliurakoitsijana)**	France and Finland
Cintra / SRV Teräsbetoni	**- Cintra Concesiones de Infrastructuras de Transporte, S.A** **- SRV Teräsbetoni Oy** **(- Ferrovial Agroman aliurakoitsijana)**	Spain and Finland
Tieliikelaitos / YIT	**- Tieliikelaitos** **- YIT Rakennus Oy**	Finland
LAING / SKANSKA / LEMMINKÄINEN	**Tieyhtiö Ykköstie Oy:** **- Skanska BOT AB** **- Laing Roads Ltd** **- Lemminkäinen Oyj**	Sweden, UK and Finland
VINCI	**- Vinci Concessions**	France

Structure of contract (investment period)



2. The goals for the E18 procurement (invitation to tender October 2004)

- Quick opening of the motorway to traffic
- High quality road maintenance service for road users

-> ok

-> technical requirements for the maintenance period and availability are the basis for the payment mechanism -> expected to be ok

- Good traffic safety
- Reduction of congestion
- Optimal implementation of risk distribution
- The most economic overall solution even taking residual value into consideration
- Sufficiency of order authorisation for the entire contract period

-> motorway standard, payment mechanism -> ok

-> such as traffic safety

-> ok (the client´s view)

-> expected to be ok ?

-> including changes in cost level, additional and change work, client´s procurement expenditures

-> expected to be ok ?

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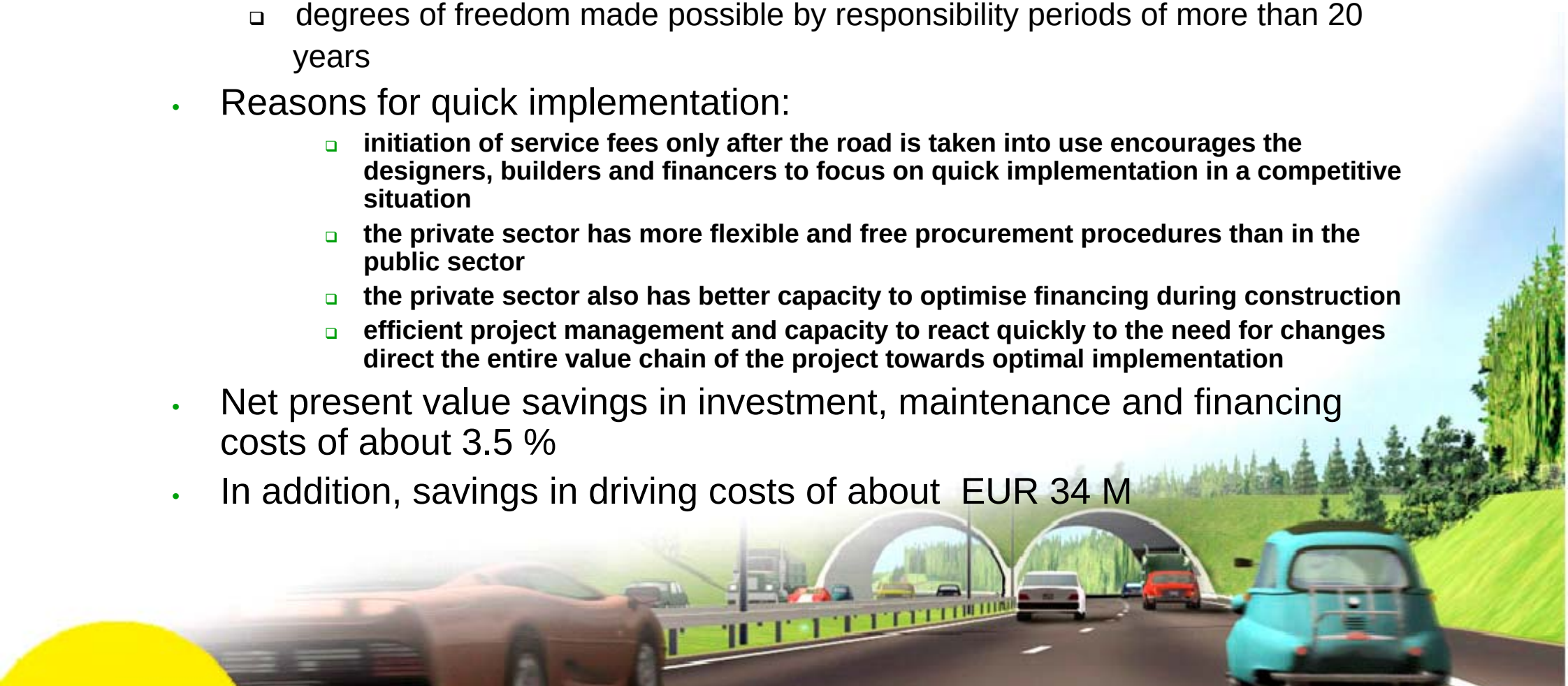
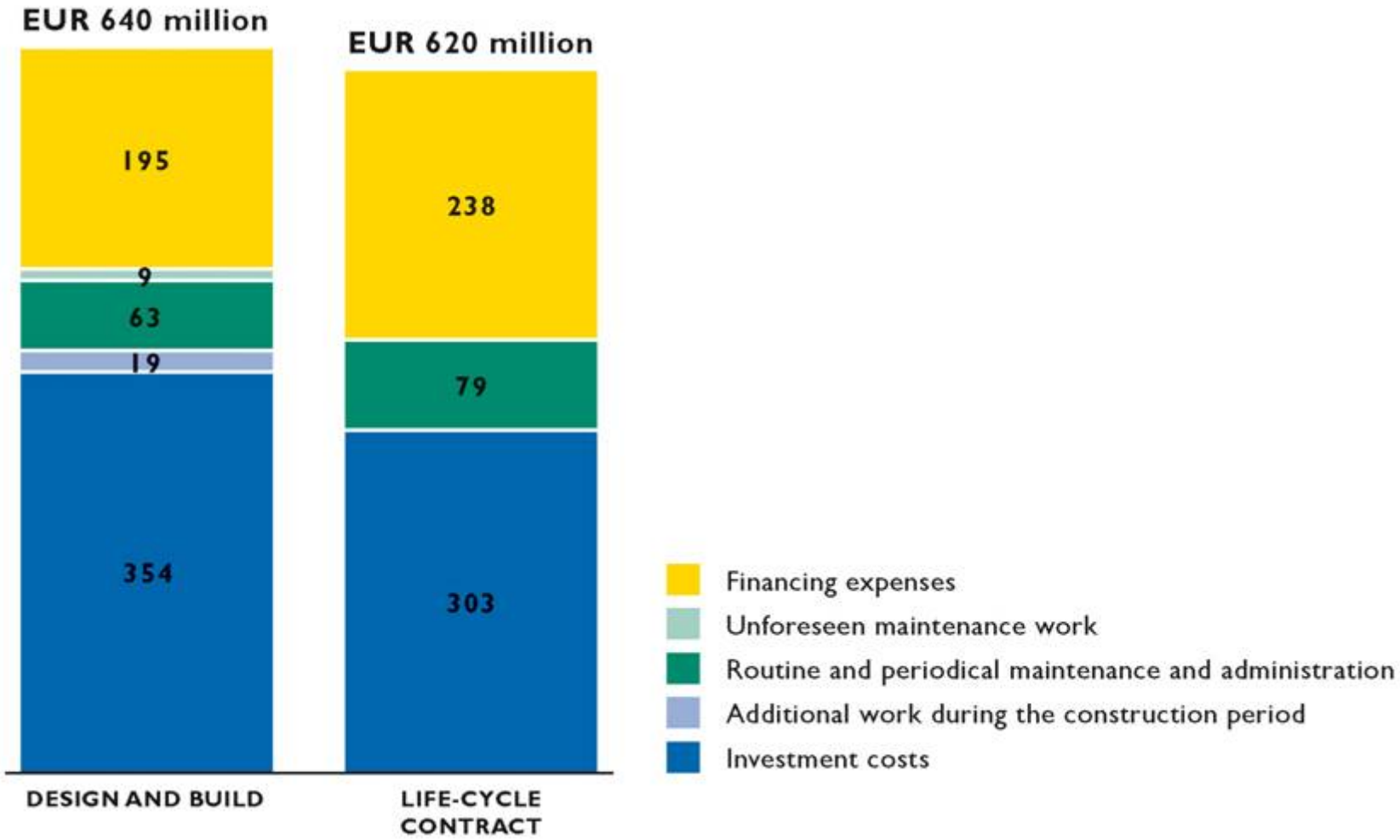
Overall economy of the E18 Muurla – Lohja contract

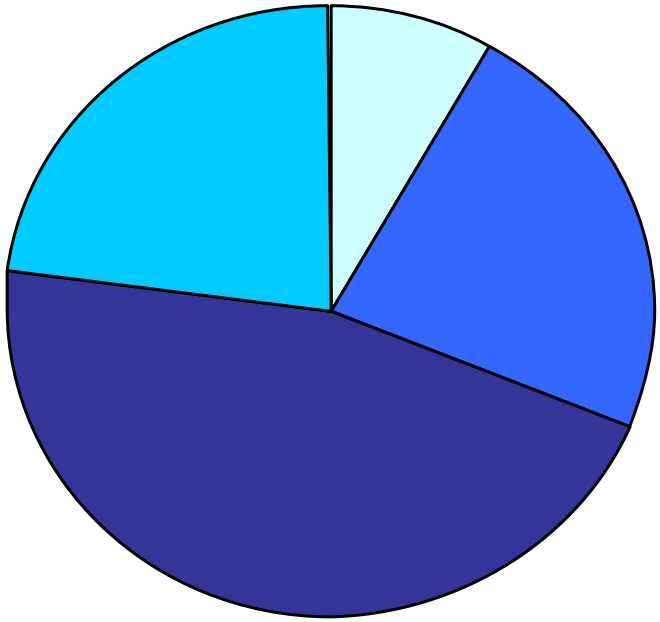
- Main benefits of the life-cycle model in comparison to budget-financed implementation
  - quick and cost-effective construction
  - degrees of freedom made possible by responsibility periods of more than 20 years
  - Reasons for quick implementation:
    - **initiation of service fees only after the road is taken into use encourages the designers, builders and financers to focus on quick implementation in a competitive situation**
    - **the private sector has more flexible and free procurement procedures than in the public sector**
    - **the private sector also has better capacity to optimise financing during construction**
    - **efficient project management and capacity to react quickly to the need for changes direct the entire value chain of the project towards optimal implementation**
  - Net present value savings in investment, maintenance and financing costs of about 3.5 %
  - In addition, savings in driving costs of about EUR 34 M



E18 Muurla-Lohja (PSC 2)

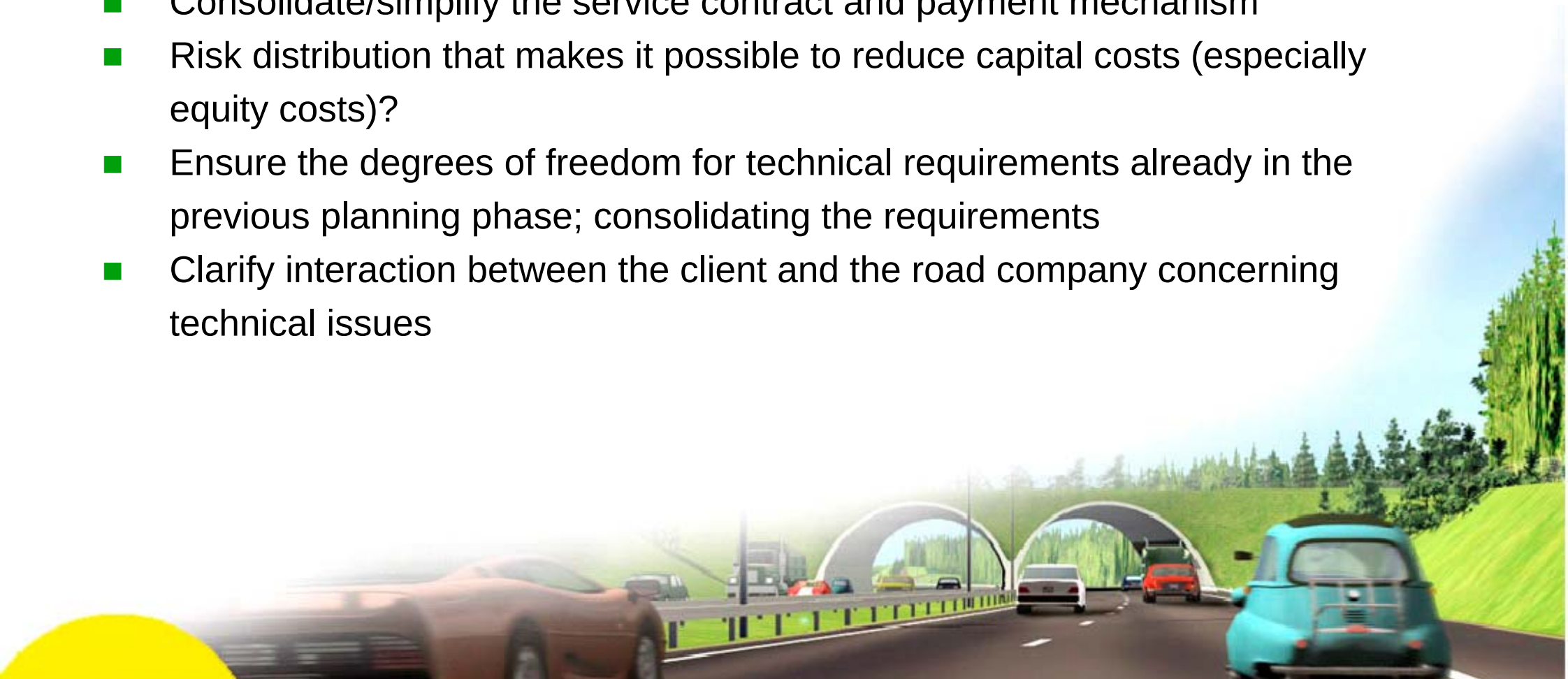


Capital structure of the E18 Muurla - Lohja contract



Proposals for changes in future life-cycle model projects

- Procurement procedure similar in type to that for E18
- Consolidate/simplify the service contract and payment mechanism
- Risk distribution that makes it possible to reduce capital costs (especially equity costs)?
- Ensure the degrees of freedom for technical requirements already in the previous planning phase; consolidating the requirements
- Clarify interaction between the client and the road company concerning technical issues



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How to succeed in PPP projects ?

- legally valid plans including EIA completed before bidding
- technically challenging project - optimization of investment and maintenance
- grades of freedom facilitating innovations – performance specifications largely instead of technical requirements
- availibility based payment mechanism preferred in the Nordic countries – traffic volume risk taken mainly by the client
- contract period at least 20-25 years
- early marketing of the projects by international road shows
  - 3, max. 5 shortlisted bidders as a goal
- use of the general European documents – if possible
- early contacts with the lenders, especially with the international financial institutions – e.g. EIB and NIB
- dialogue with bidders throughout the procurement process

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Eastern section of E18 by 2015 ?

		Total costs estimate (€ M)	2007	2008	2009	2010	2011	2012	2013	2014	2015
H1	Highway 1 Muurla - Lohja	299									
H2	Ring Road III Vantaankoski - Lentoasemantie, 1. phase	30									
H2	Ring Road III Vanhakartano - Lentoasemantie	150									
H3	Highway 7 Koskenkylä - Loviisa - Kotka	195									
H4	Highway 7 Hamina by-pass	111									
H5	Highway 7 Hamina - Vaalimaa	100