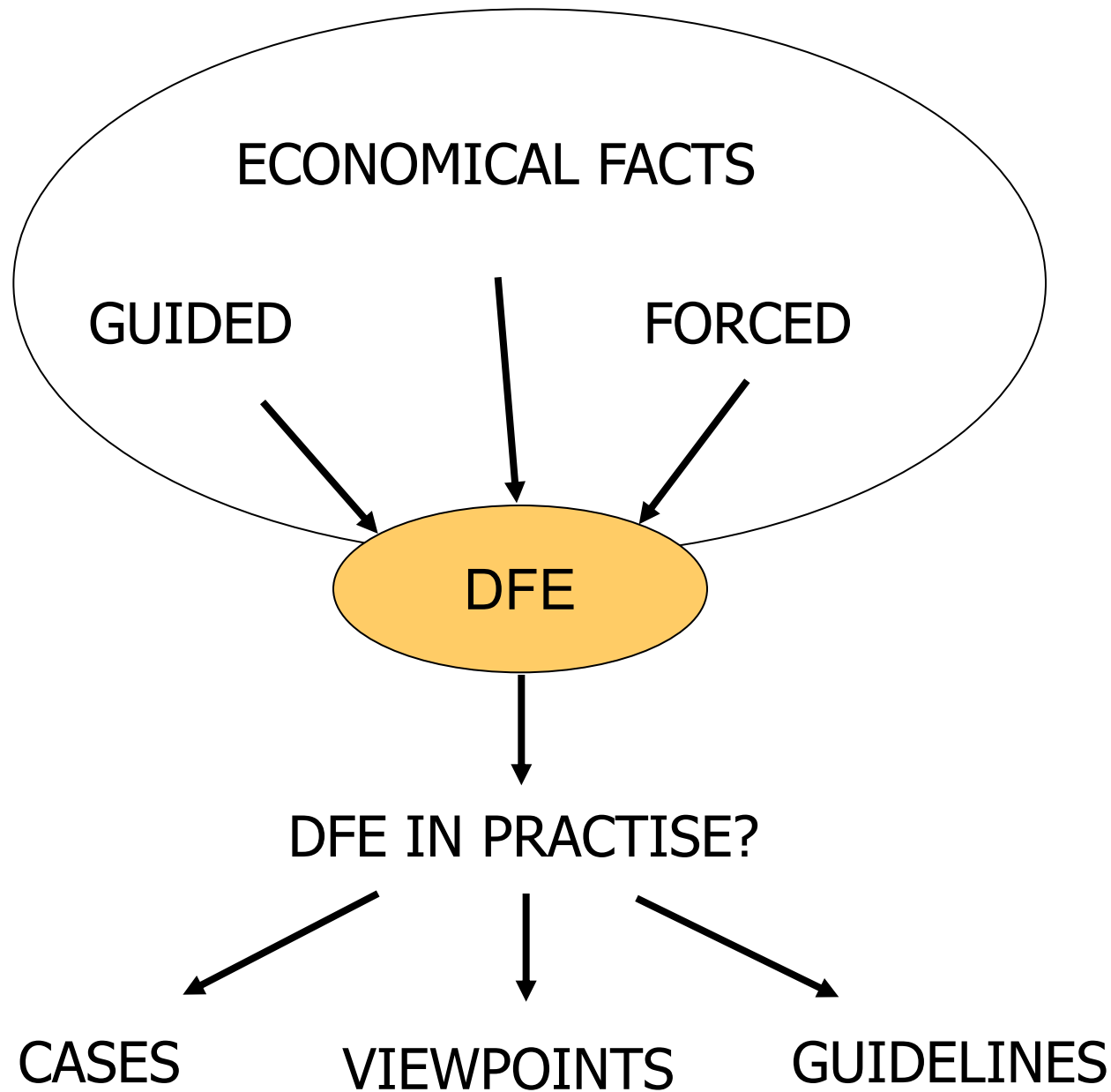




Aalto University
Design Factory

DFE

Design for Environment



POPULAR STANDARDS

ISO 14000 FAMILY

ENVIRONMENTAL MANAGEMENT

FORCED

- Legislation
- Norms, standards, EN
- Customer requirements [for processes]
- Minimum requirements
 - ISO 9000 Quality
 - ISO 14000 Environment
 - ISO 50001 Energy



Call to Action for Shipping Decarbonization

**We are a signatory to the
Call to Action for Shipping
Decarbonization**

#ZeroEmissionShipping

GUIDED

- Market forces
- Clients customers
- proactiveness
- Competitors actions
- good will, PR, imago

Economical facts

- Costs of DFE
- Cost of non-DFE
- Competitive edge
- New business opportunities

Volvo Cars to go fully electric by 2030

🕒 2 March | 💬 Comments





Viewpoints to DFE

- Causing danger or harm
- Product life cycle
 - pre-production
 - production
 - use
 - retirement, EOL
- reuse
- recycling
- logistics

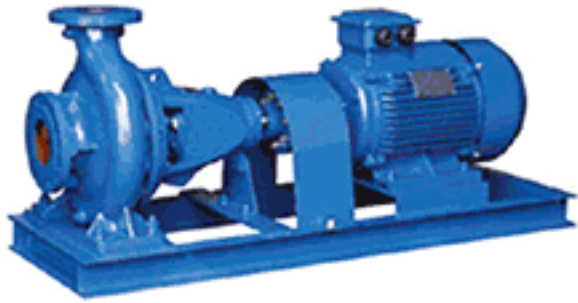
DESIGN GUIDELINES



DESIGN GUIDELINES







Initial Cost
9%
(\$68,333)

Installation Cost
8%
(\$61,000)

Operating Cost
55%
(\$415,812)

Maintenance Cost
28%
(\$212,000)

Includes Energy

83%

Total 20 Year Life Cycle Cost = \$757,145





Design for Maintenance Principles Explained



- 1. Standardisation**
- 2. Modularisation**
- 3. Accessibility**
- 4. Malfunction Annunciation**
- 5. Weak link design**
- 6. Easy identification**
- 7. Efficient packaging**
- 8. Use of quick fasteners**
- 9. Safety by design**
- 10. Use of standard interfaces**





[Linkki](#)



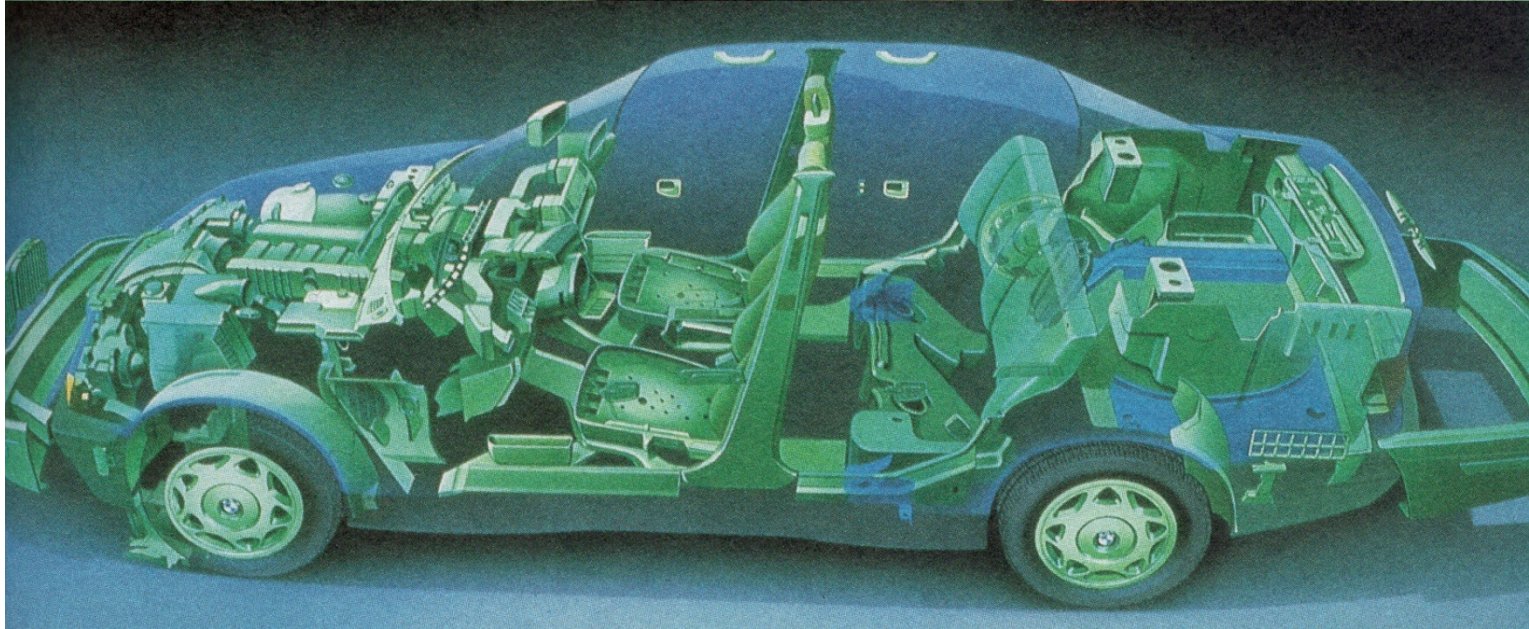
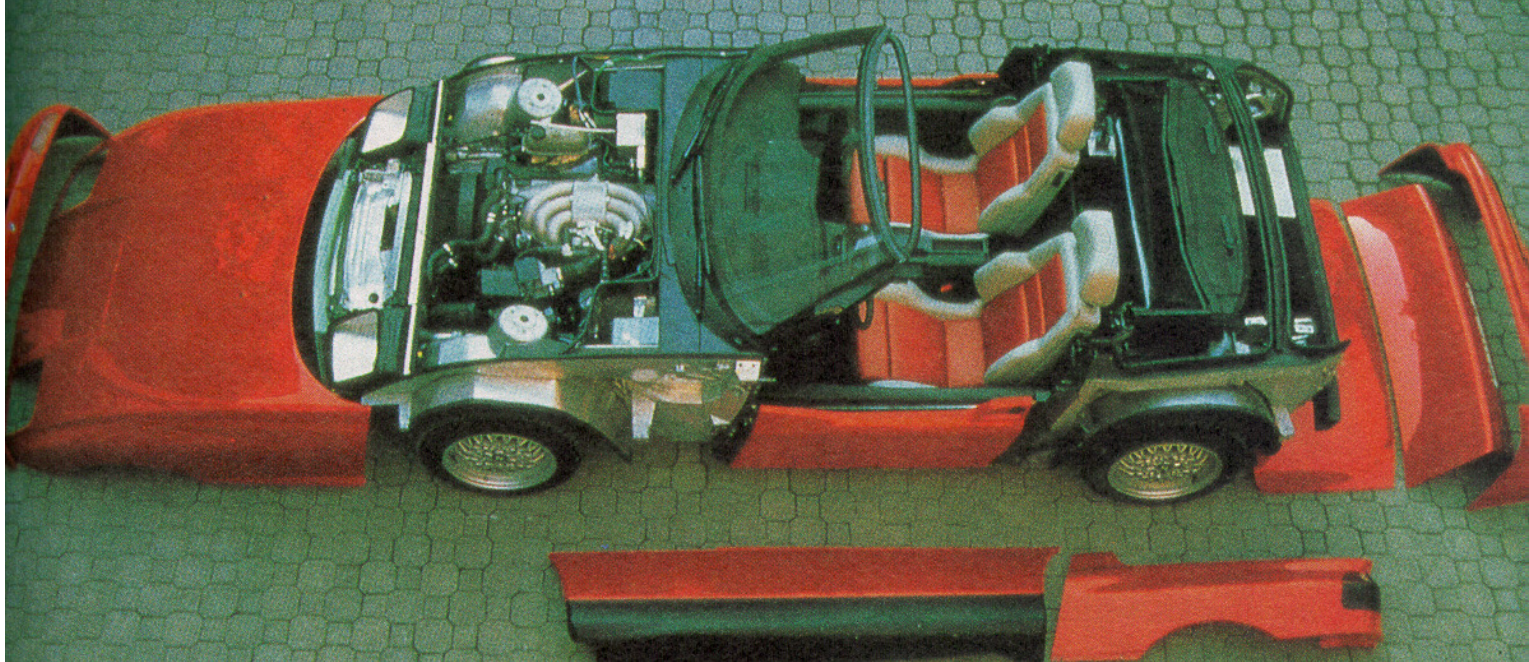




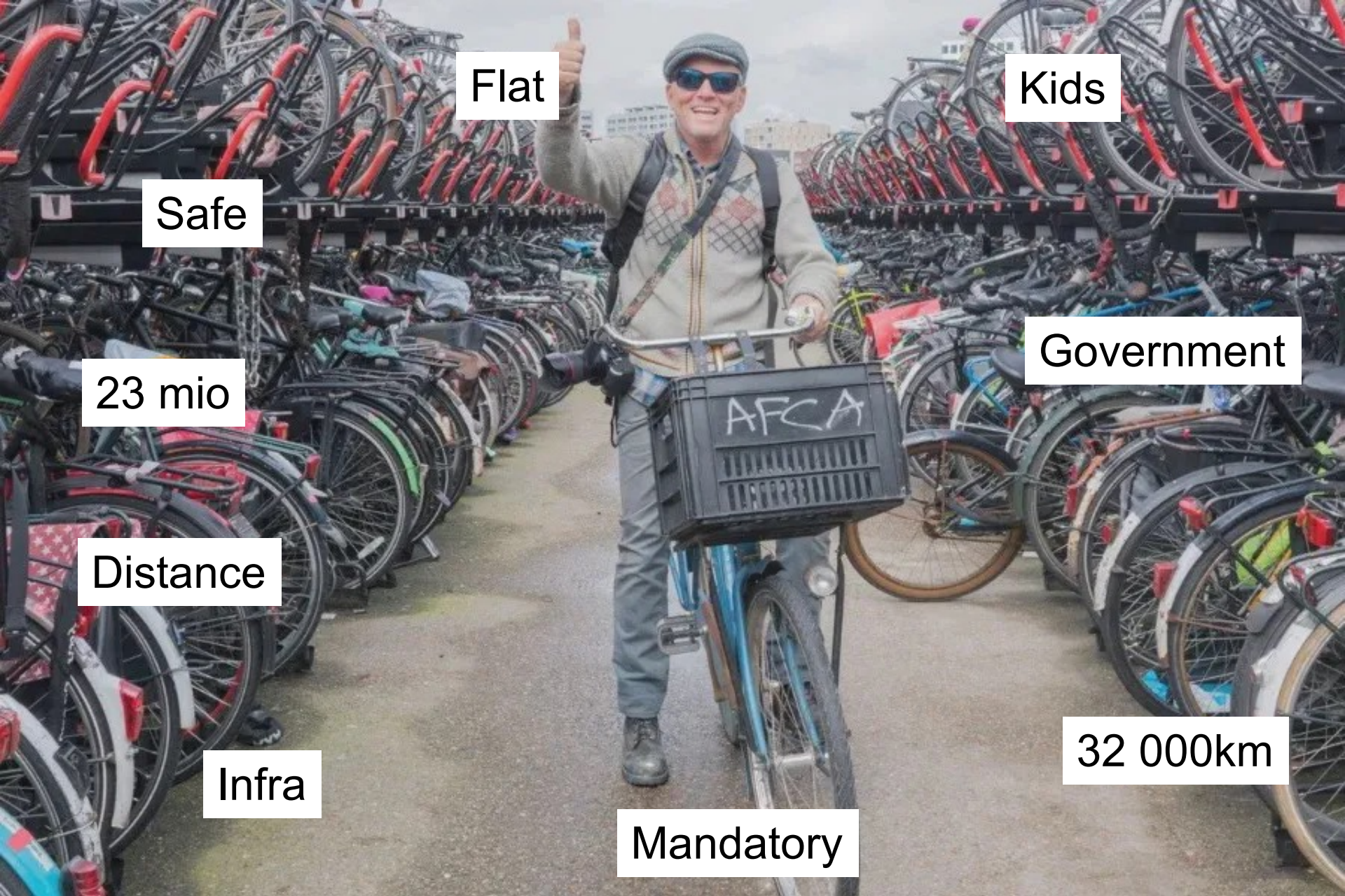












Flat

Kids

Safe

Government

23 mio

Distance

32 000km

Infra

Mandatory



