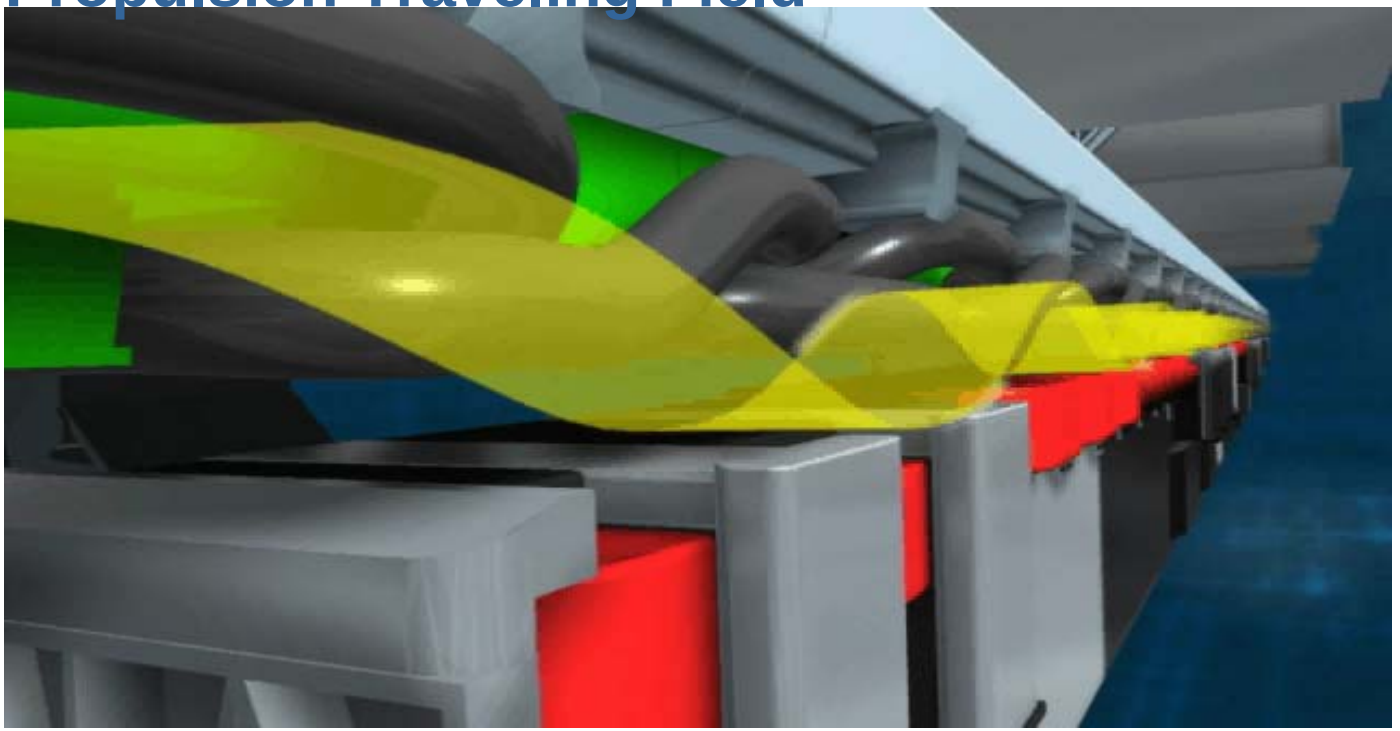
SIEMENS

Transportation Systems

Shanghai Maglev Transrapid Technology

Shanghai Maglev Transrapid Technology

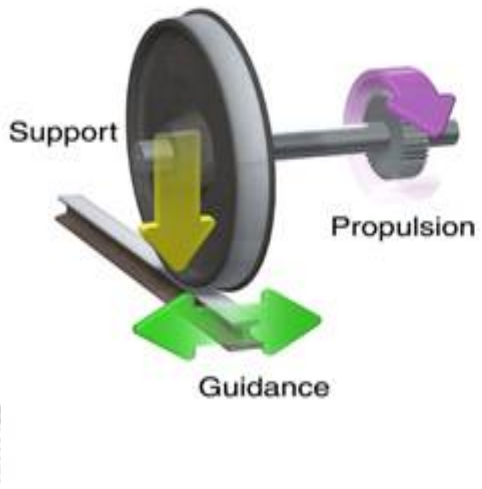
Propulsion Traveling Field

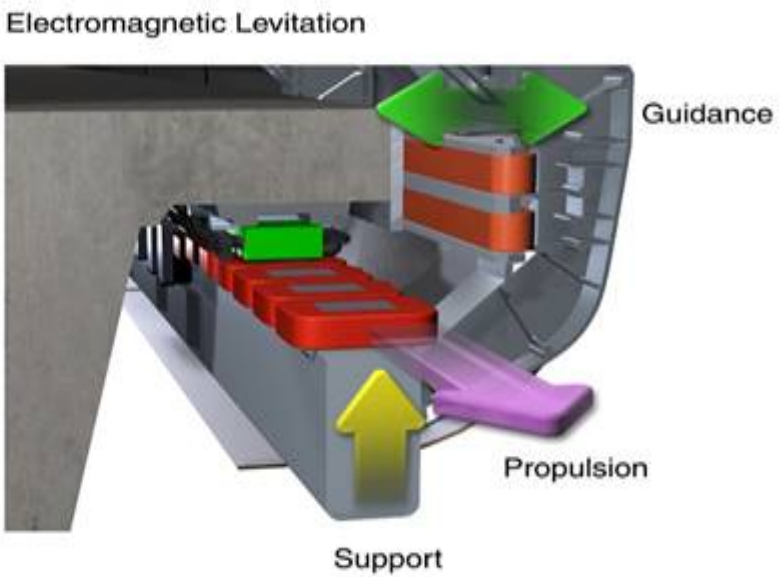


Shanghai Maglev Transrapid Technology Project SMTP

Difference Transrapid/Rail

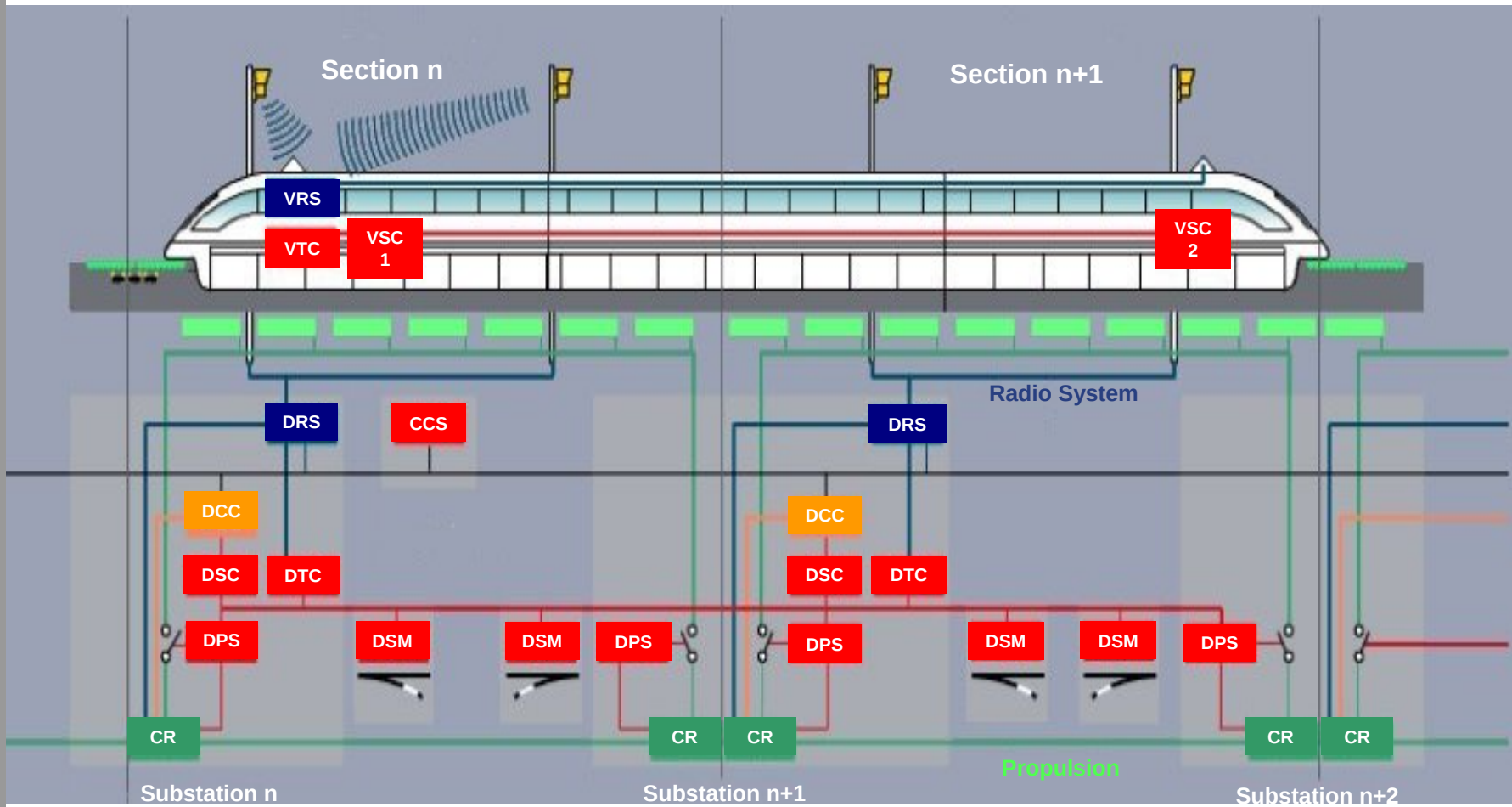
The non-contact and non-wearing levitation, guidance and propulsion technology is independent of friction





Shanghai Maglev Transrapid Technology

System Overview OCS



CCS = Centralised Control System
DCC = Decentralised Control System
DSC = Decentralised Safety Computer

DPS = Decentralised Propulsion Shut-off
DSM = Decentralised Switch Module
DTC = Decentralised Transmission Computer

VTC = Vehicle Transmission Computer
VSC = Vehicle Safety Computer
VRS = Vehicle Radiop System

DRS = Decentralised Radio System
CR = Converter

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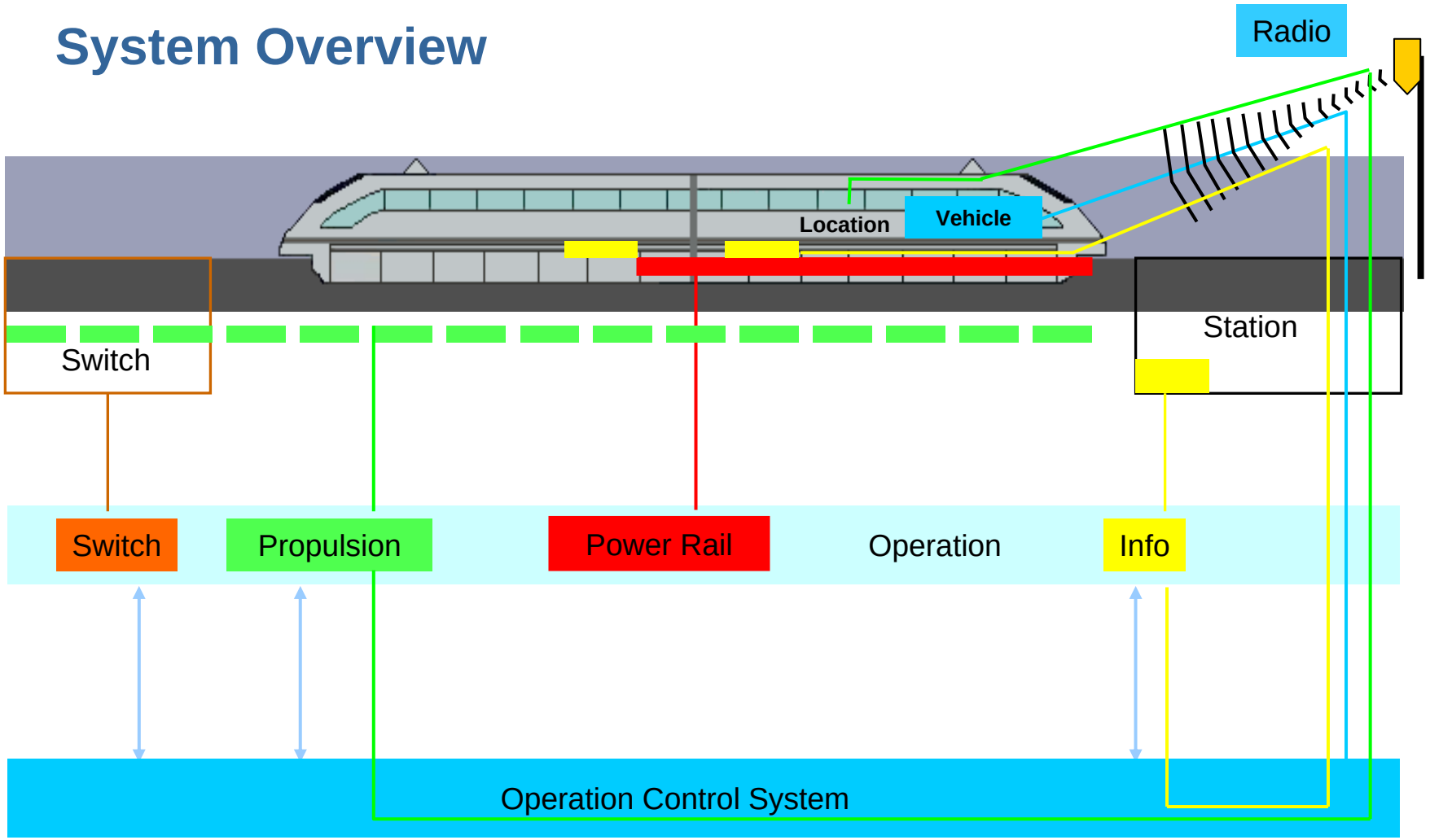
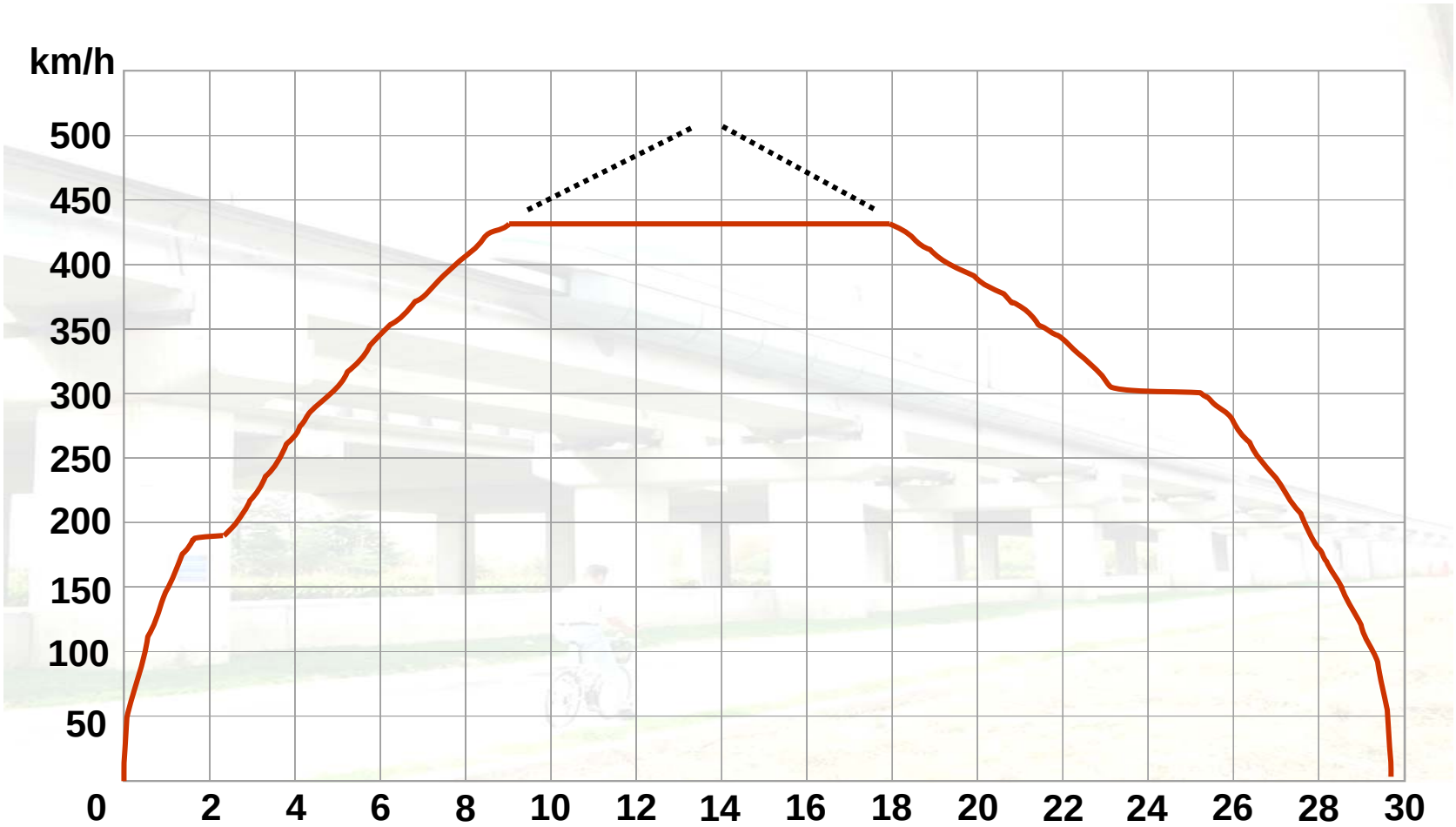
System Overview



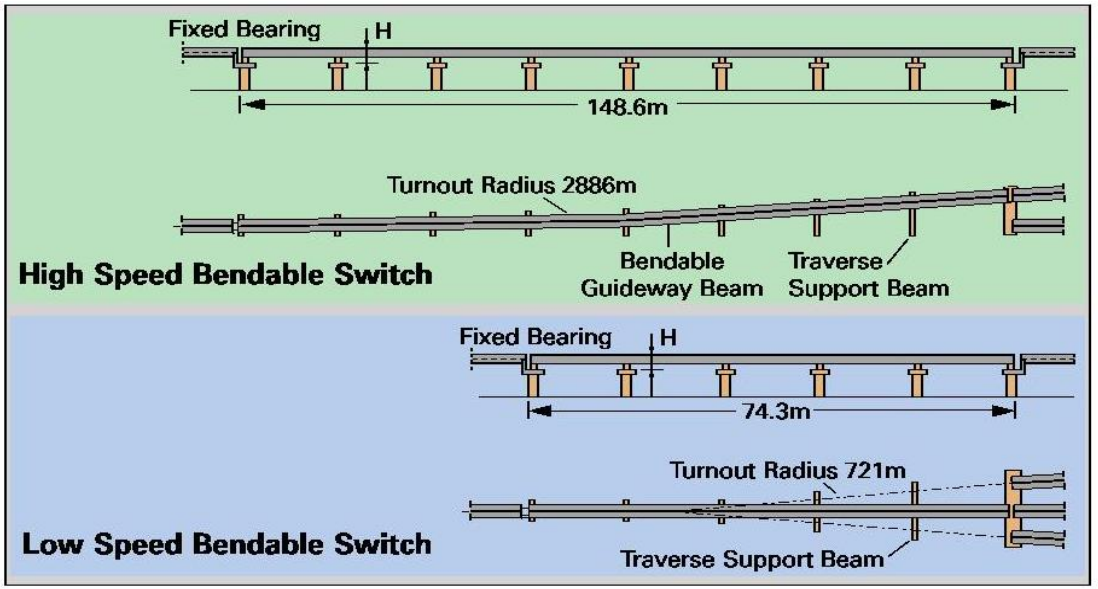
Shanghai Maglev Transrapid Technology

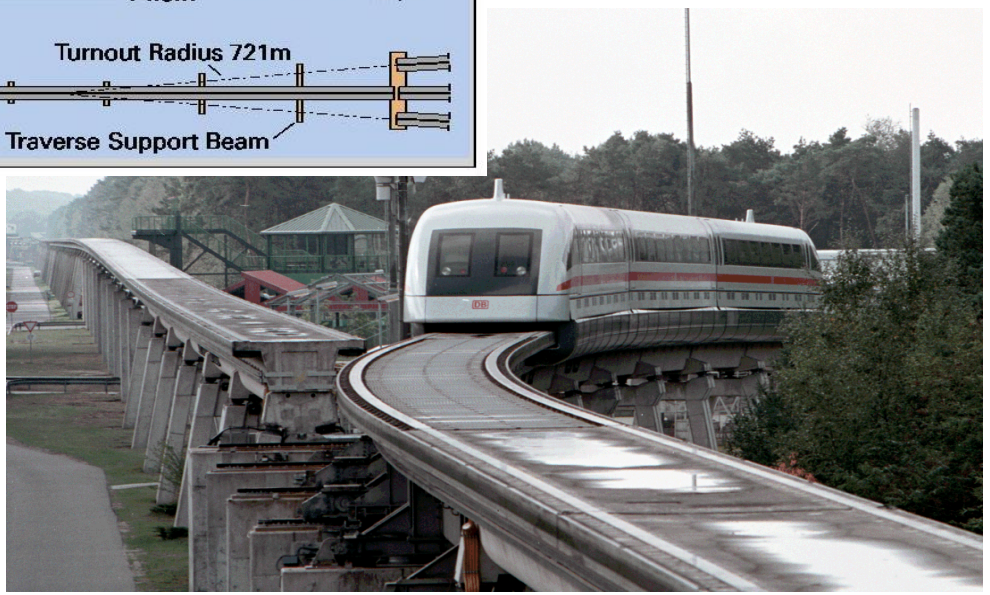
Speed Profile



Shanghai Maglev Transrapid Technology

Guideway Switches





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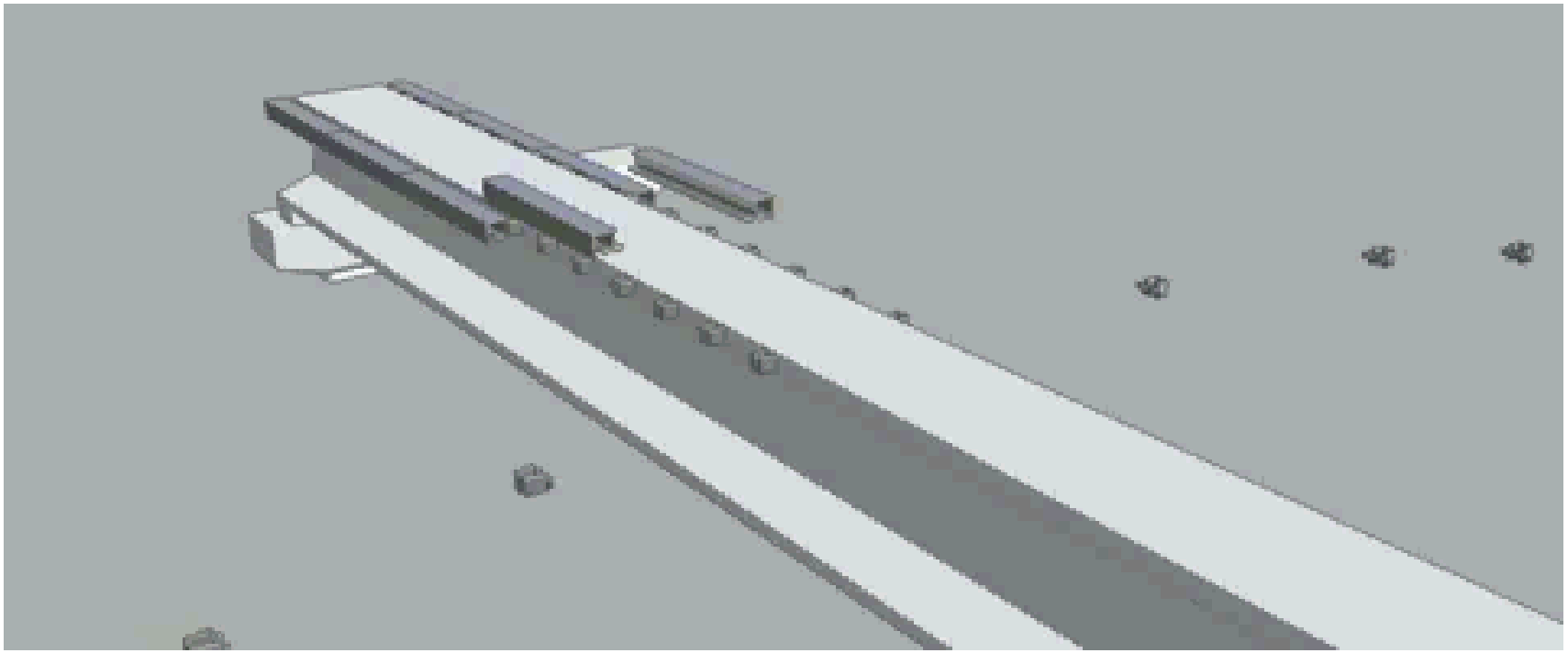
Hybrid Girder



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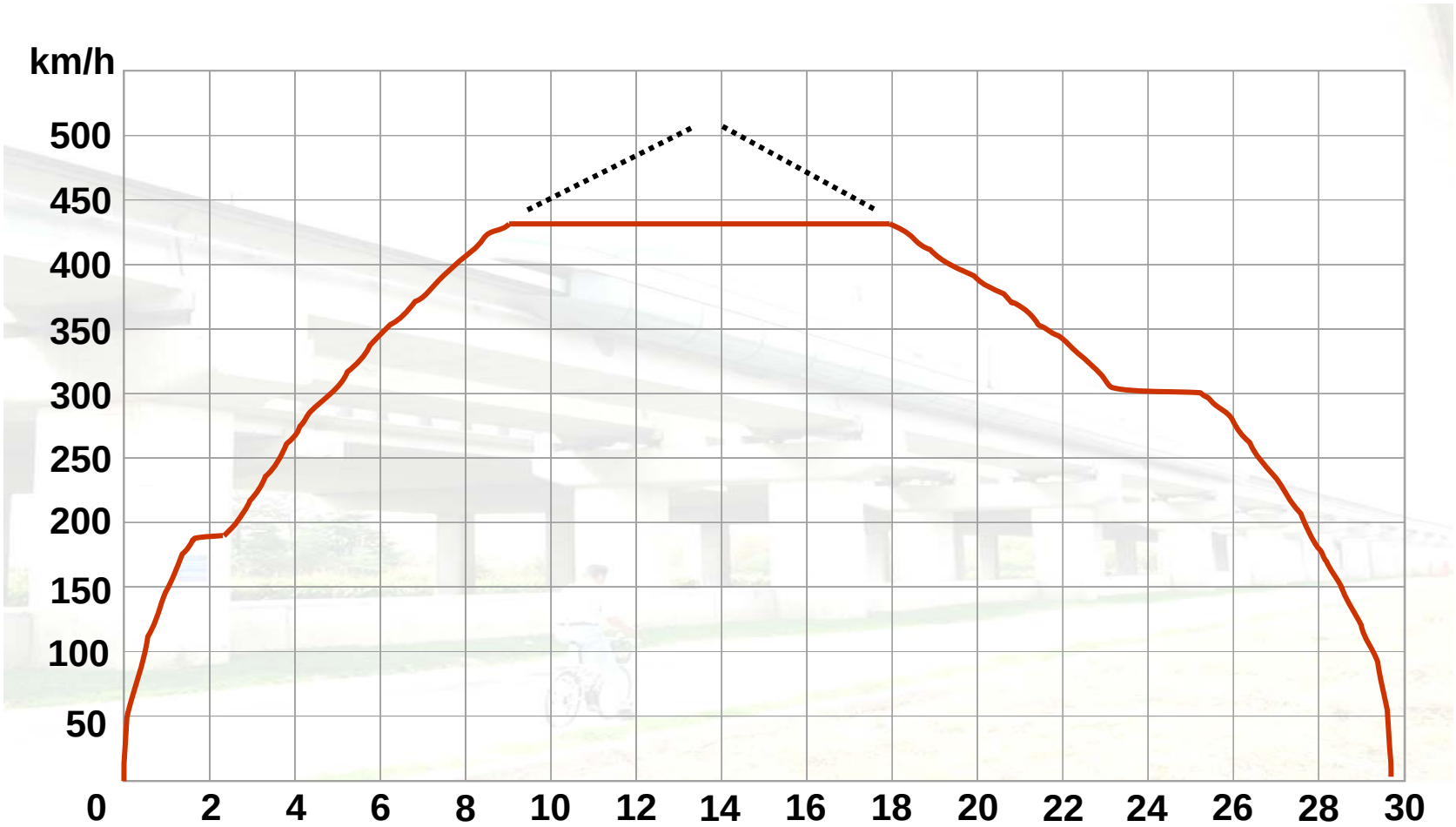
Speed Profile



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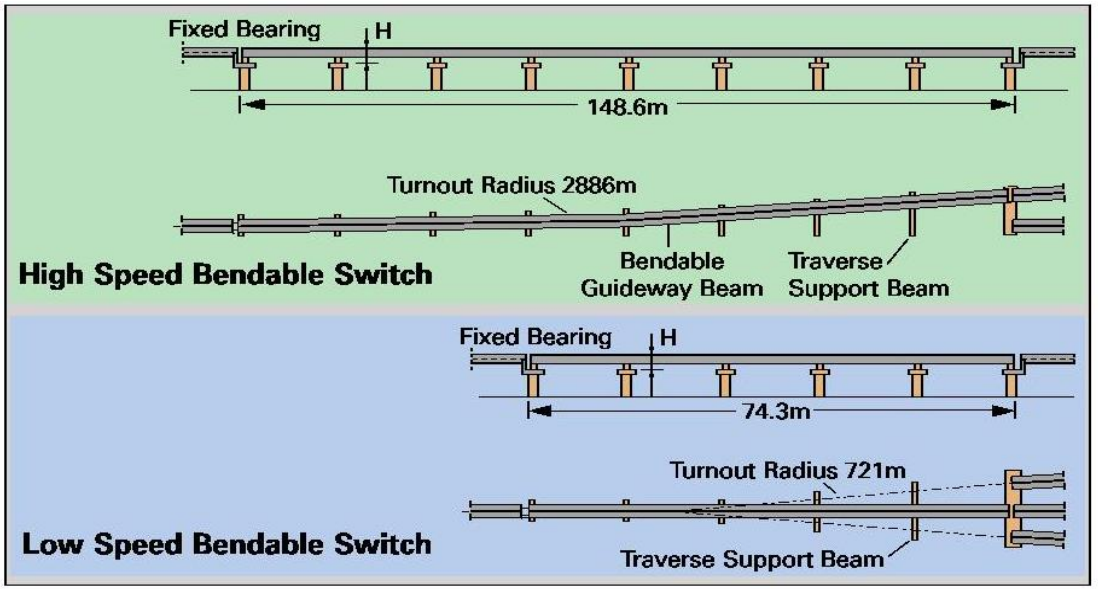
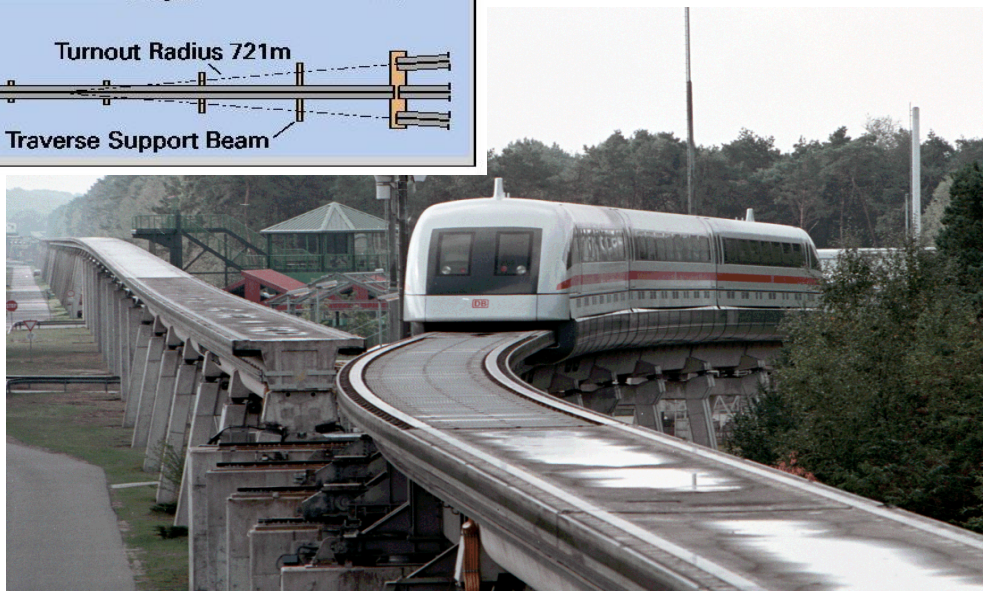
Guideway Switches





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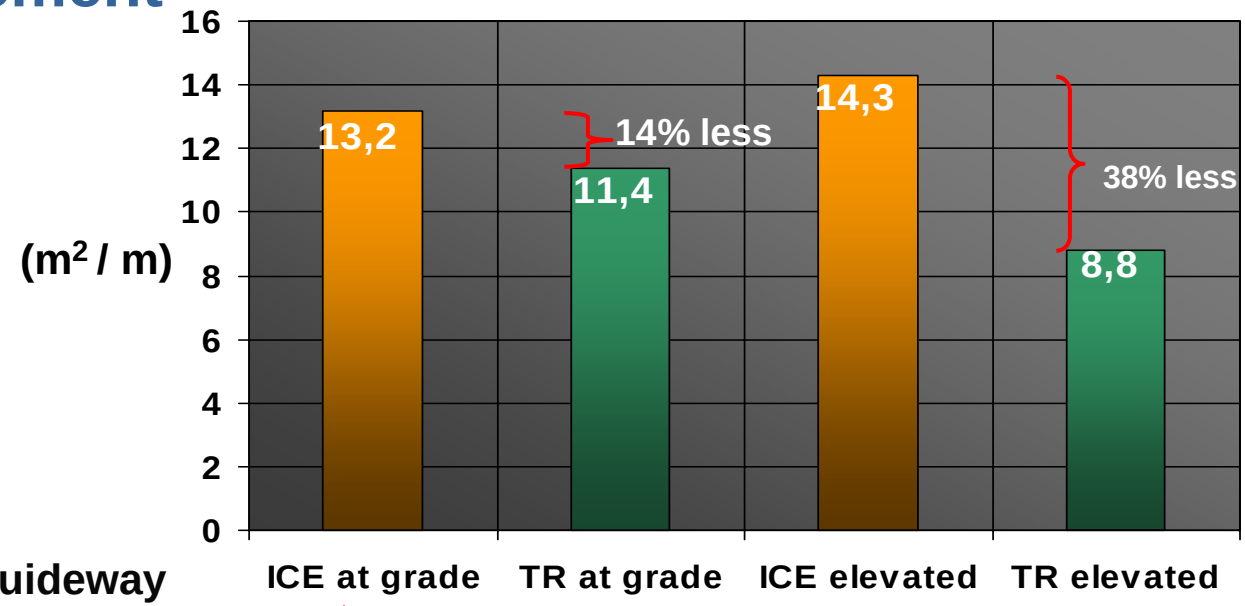
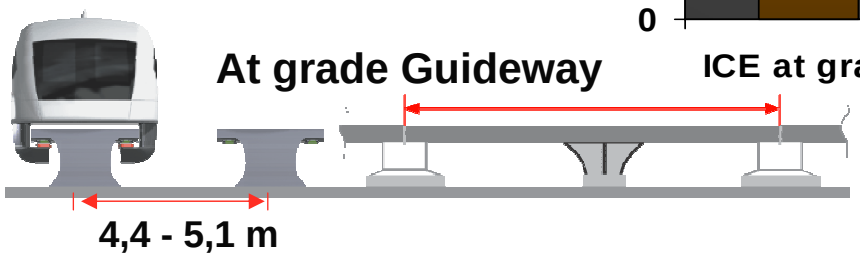
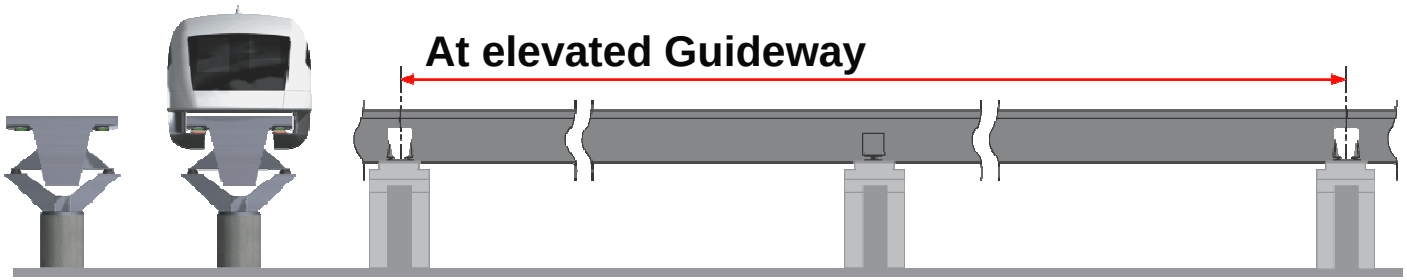
Space Requirement





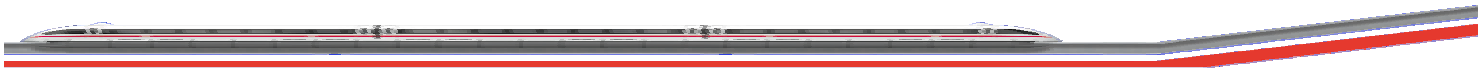


Shanghai Maglev Transrapid Technology

Aplication

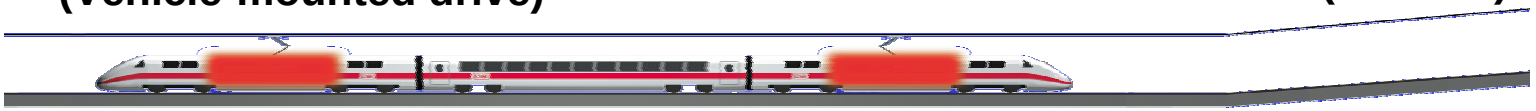
Transrapid
(Track-mounted drive)

Gradient (max 10%)



Railroad
(Vehicle-mounted drive)

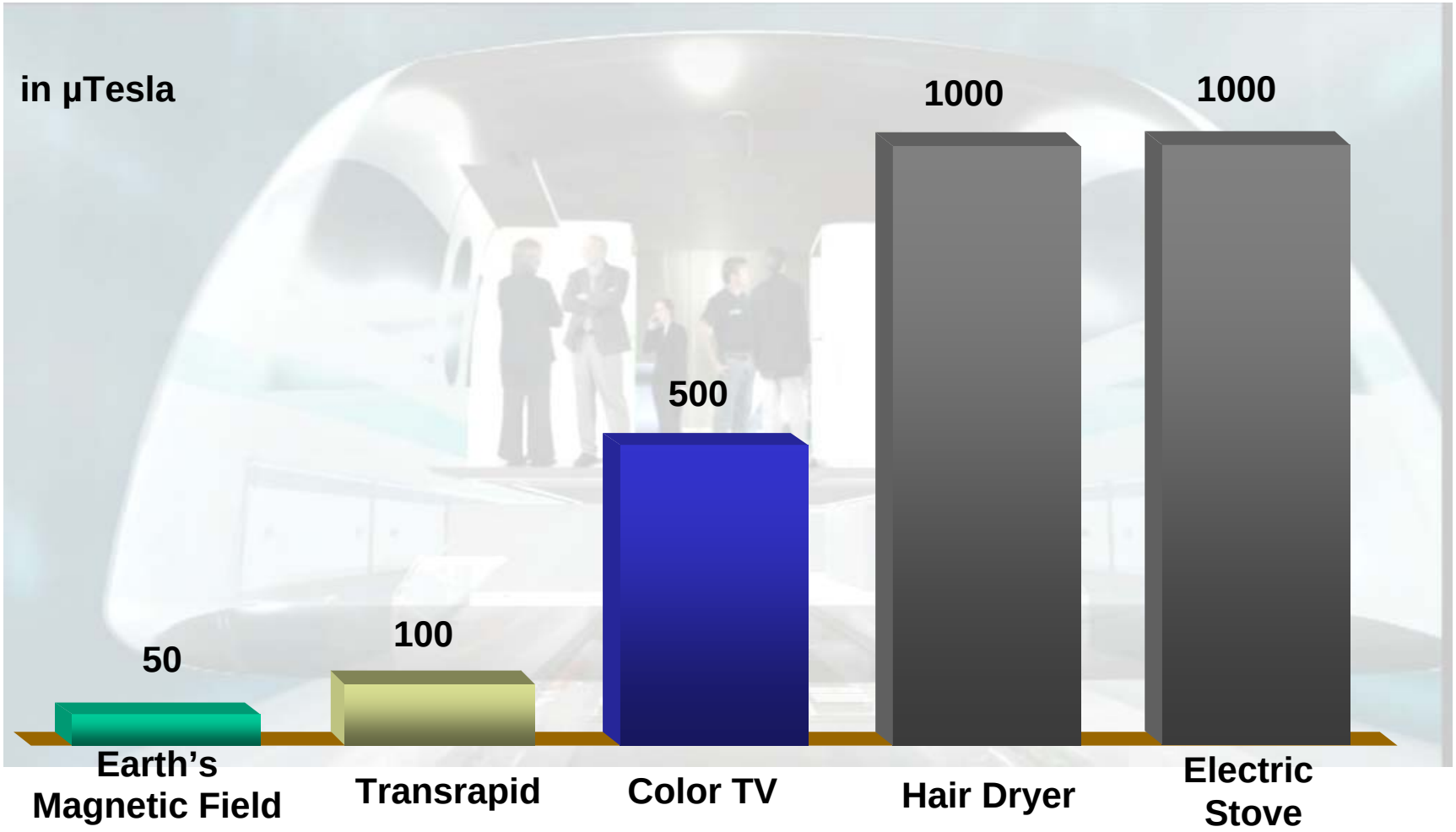
Gradient (max 4%)



- ❑ **150% higher grade climbing ability**
- ❑ **about 50% smaller curve radius by 300 km/h**

Shanghai Maglev Transrapid Technology

Magnetic Field Strength



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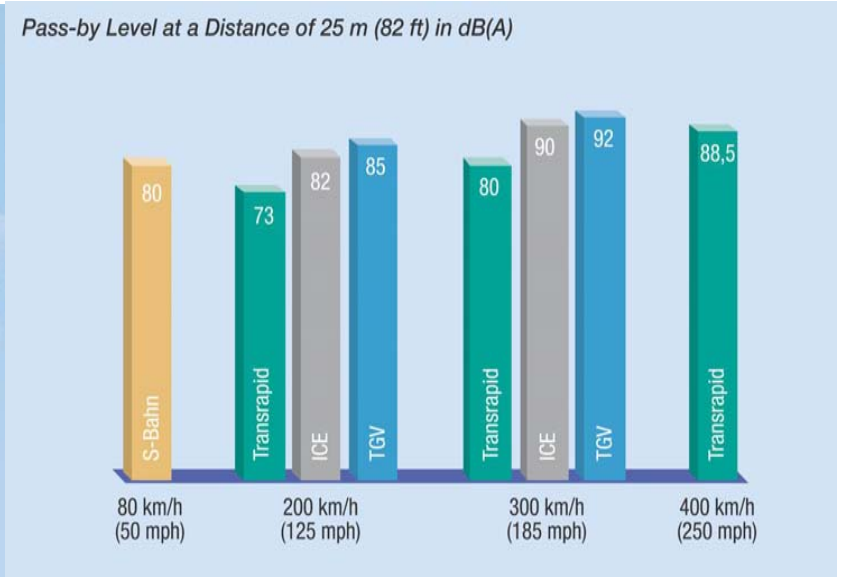
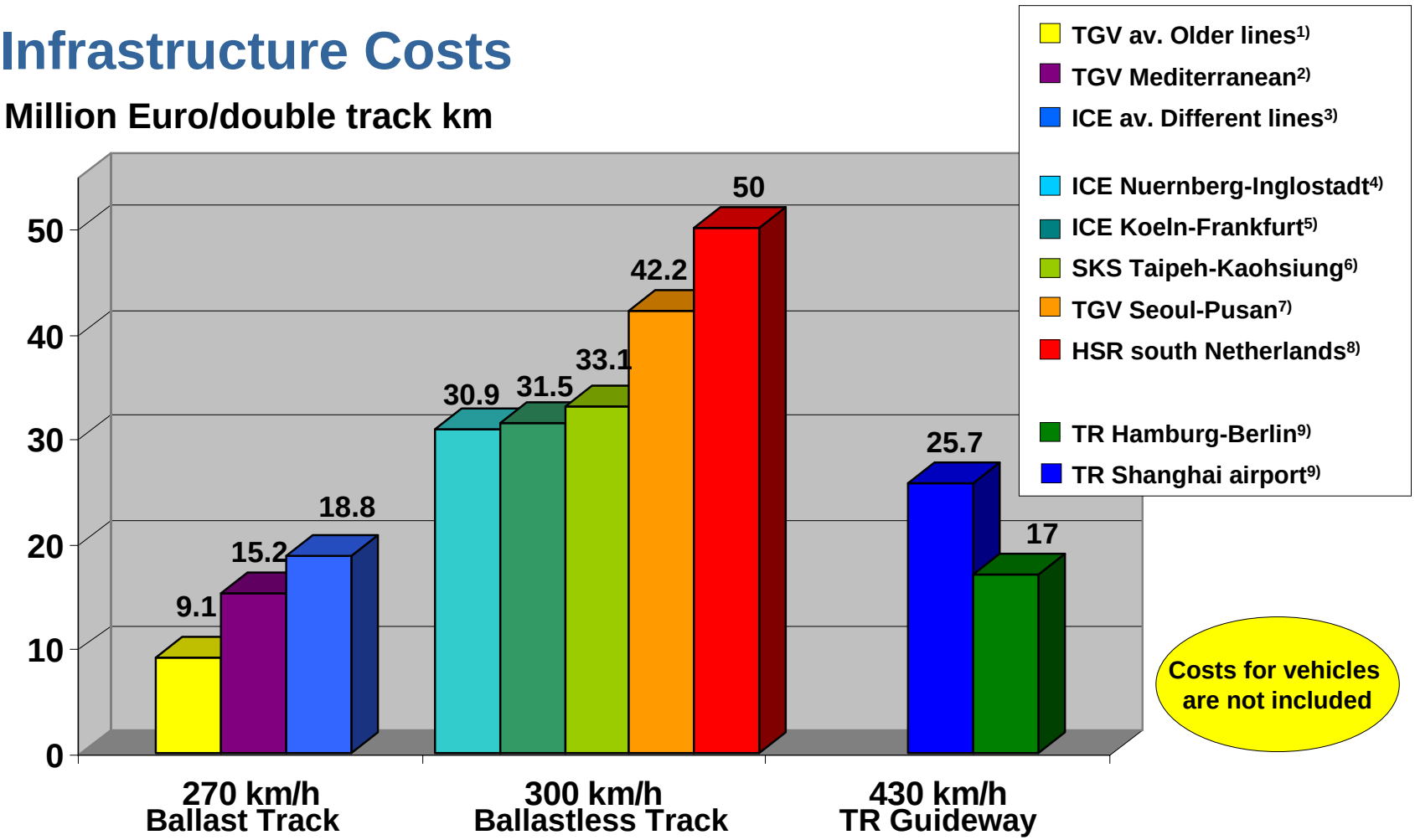
Noise Emission



- **at a speed of 300 km/h the Transrapid is perceived as half of the noise level of a high speed train**

Shanghai Maglev Transrapid Technology

Infrastructure Costs



Sources: Project Liaison Office Shanghai;
1) Average TGV older Lines include: Aquitaine, Auvergne, Bretagne, Est, Grand Sud, Interconnexion Sud, Transalpin, Limousin, Provence, Languedoc, Midi, Normandie, Picardie, Rhein-Rhone, (price level 2000); 2) TGV Mediterrane: PM 2/01 (price level 2000); 3) ICE av. diff. Line: Hannover-Wuerzburg and Mannheim-Stuttgart, Mittelsstandsarge (price level 1988); 4) ICE Nuernberg/Ingolstadt: Mittelstandsarge/Boege (price level 2002); 5) ICE Koeln/Frankfurt: DB (price level 2002); 6) Shinkansen Taipeh/Kaohsiung: Rail Gazette 3/01(price level 2000); 7) TGV Soul/Pusar: VR 201/01 and www.thsrc.com.tw (price level 2001); 8) HSR Sud: HSR Consortium Netherland; 9) TR Laison Office Shanghai and TRI Berlin (price level 2001)

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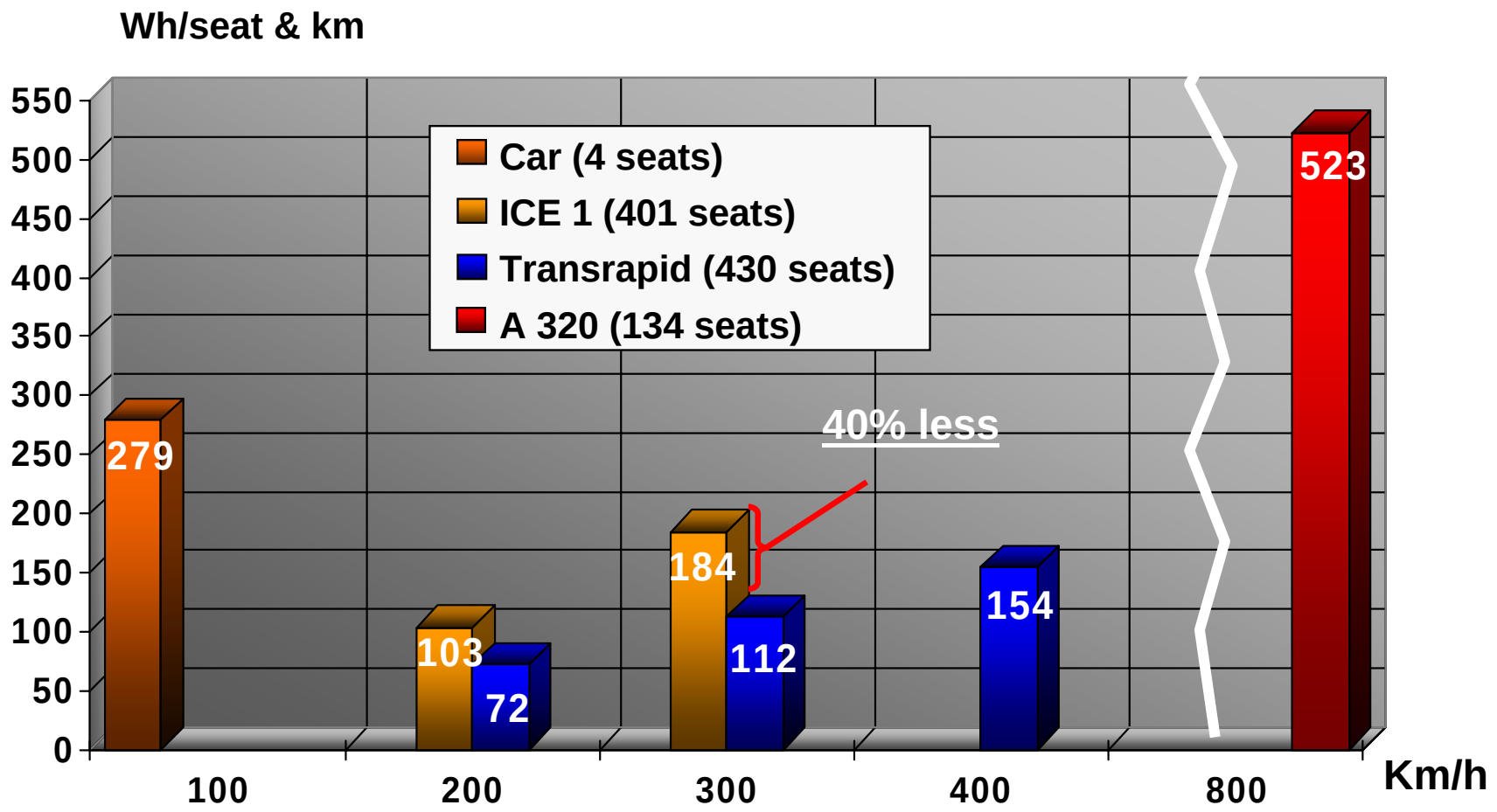
Energy Consumotion



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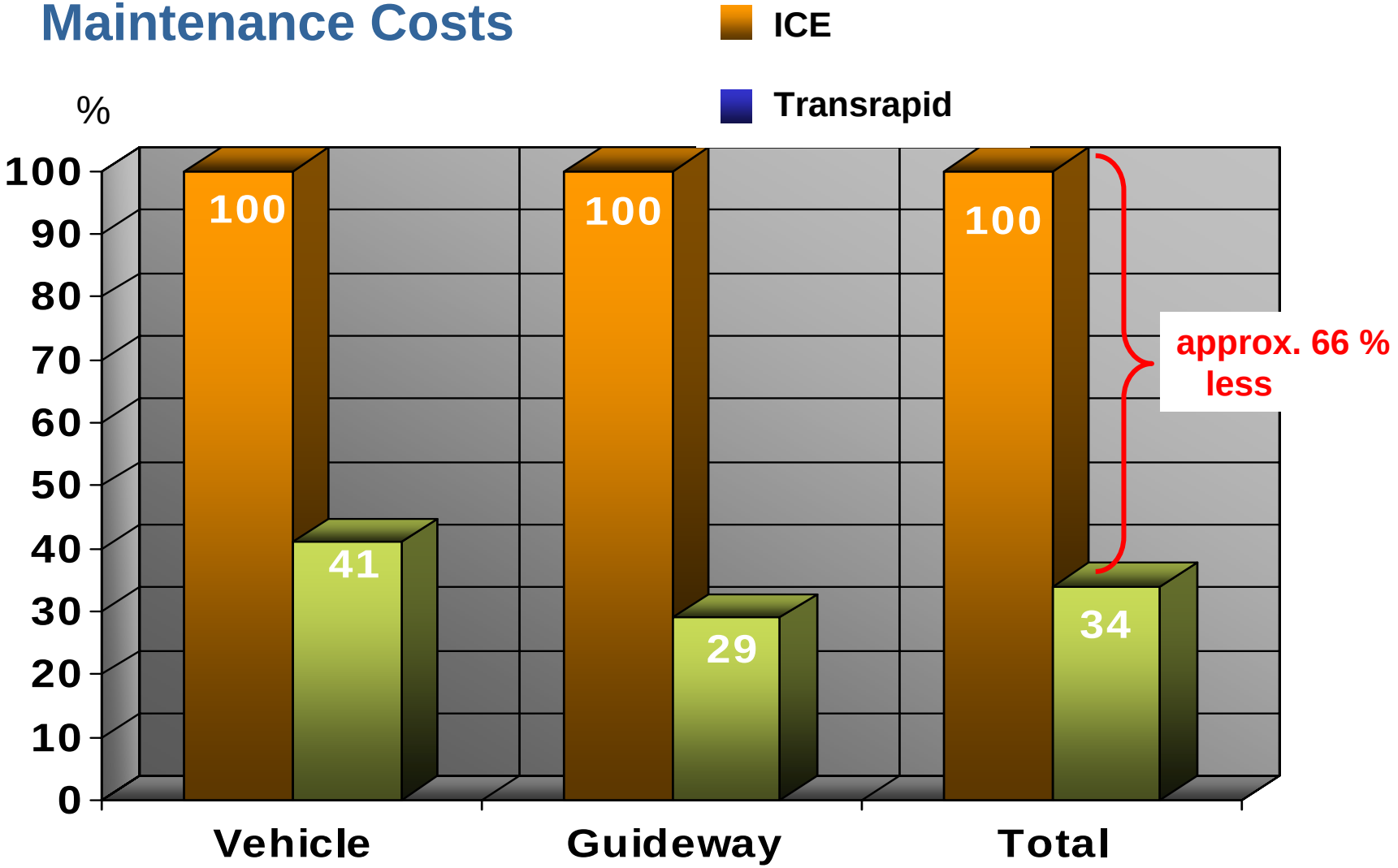
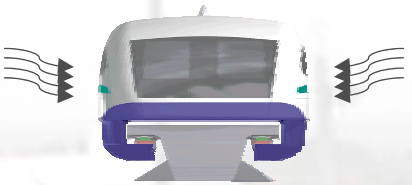
Maintenance Costs

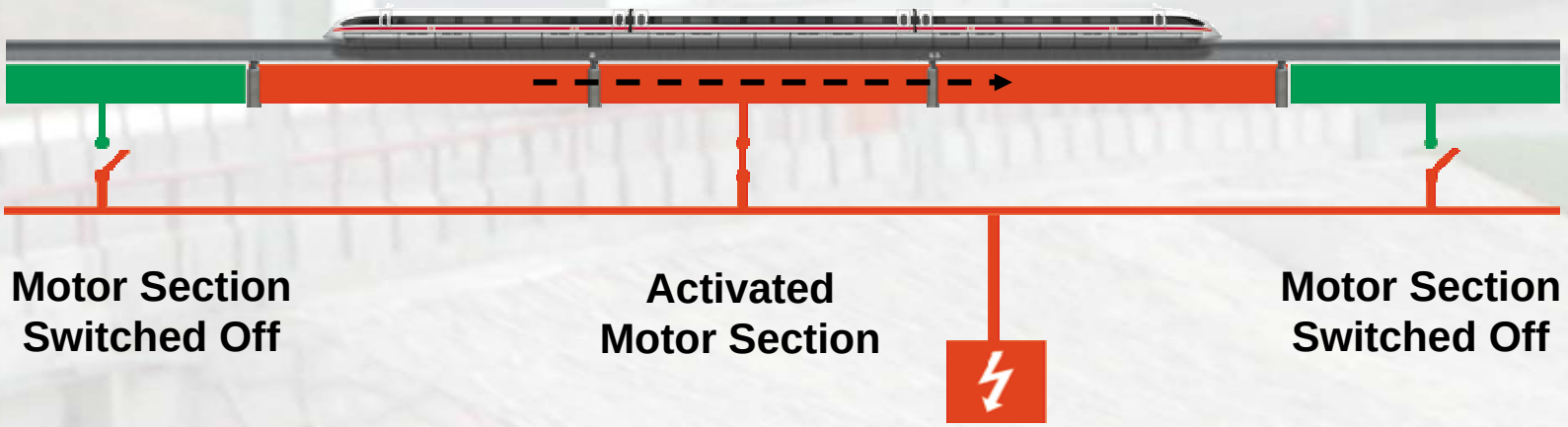


Shanghai Maglev Transrapid Technology

Safety

- Safe against derailment
- No speed reduction in case of crosswinds
- Permanent Guideway Inspection regarding Geometry Deviations
- No possibility for collision





Fully automated Transportation System

Shanghai Maglev Transrapid Technology

Safety of Transrapid

The system has been designed and simulated for the following events with a speed of 500 km/h:

- **Collision of the skid with a stone of 15 kg**
- **Collision of the nose with a stone of 50 kg laying on the guideway**
- **Collision of the nose with a tree-trunk leaning on the guideway in a 45 degree angle**
- **Collision of the nose with a tree-trunk placed on top of the guideway**

Shanghai Maglev Transrapid Technology

Transrapid Summary

- Fast in acceleration (65 % higher by only 20% distance)
- Riskless for people (pace maker)
- Environment-friendly in energy consumption (40 % less)
- Lower space requirements (15 –25% less)
- Application possibilities (curve radius 50% less, gradient 150% higher)
- Lower maintenance cost (70 % less)
- Safe against derailment and collision

Shanghai Maglev Transrapid Technology

Shanghai Long Yang Road