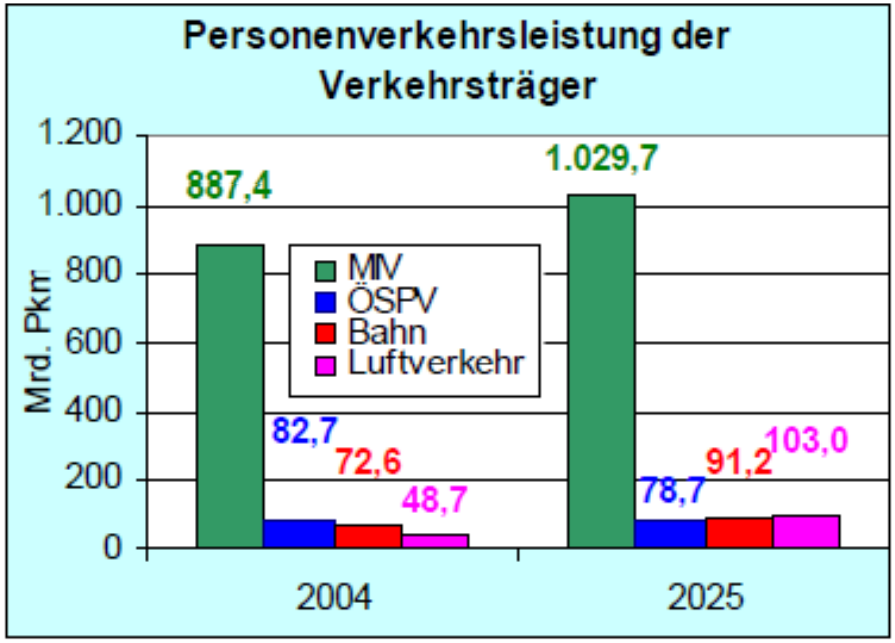
the solution to tomorrow's transport challenges

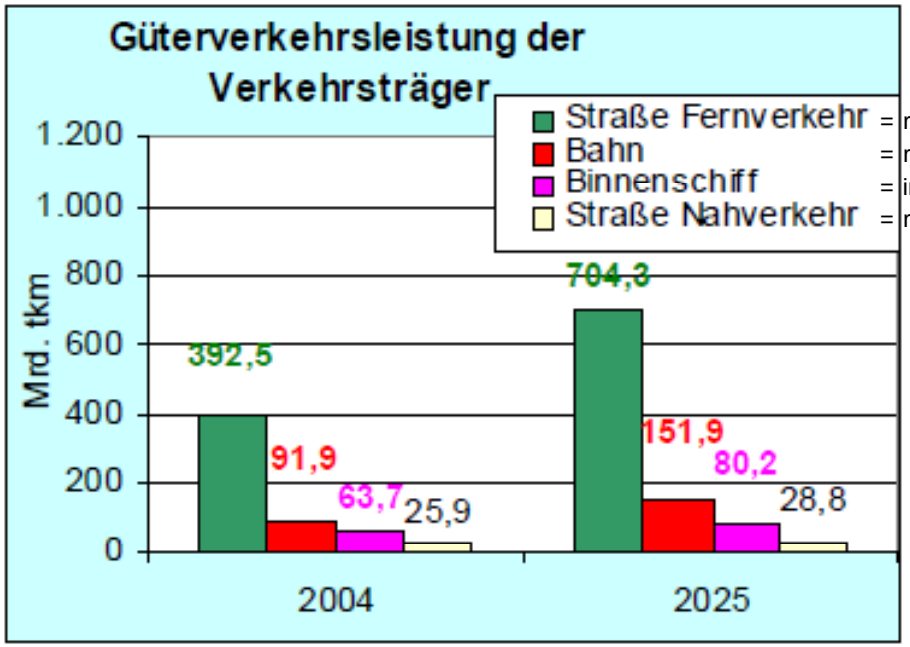
synchrotrain

personal transport system on rail tracks

How to combine the advantages of both rail and personal transport?

Traffic developement



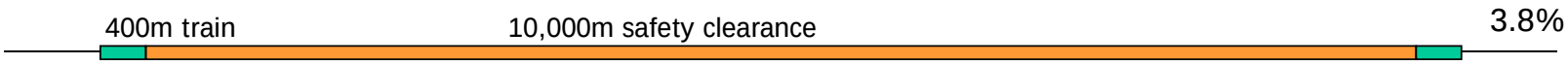


MIV = motorised passenger transport
ÖSPV = public passenger transport on road
Bahn = rail
Luftverkehr = air traffic

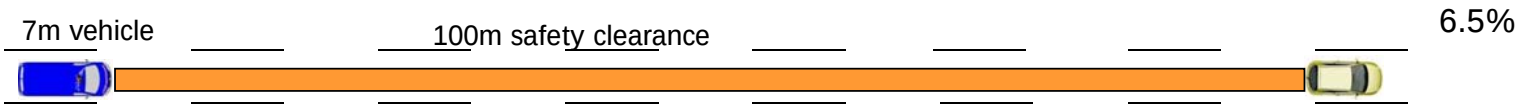
Quelle: http://www.adac.de/_mmm/pdf/statistik_fi_verkehrsprognose2025_0910_47606.pdf

Current capacity @200km/h

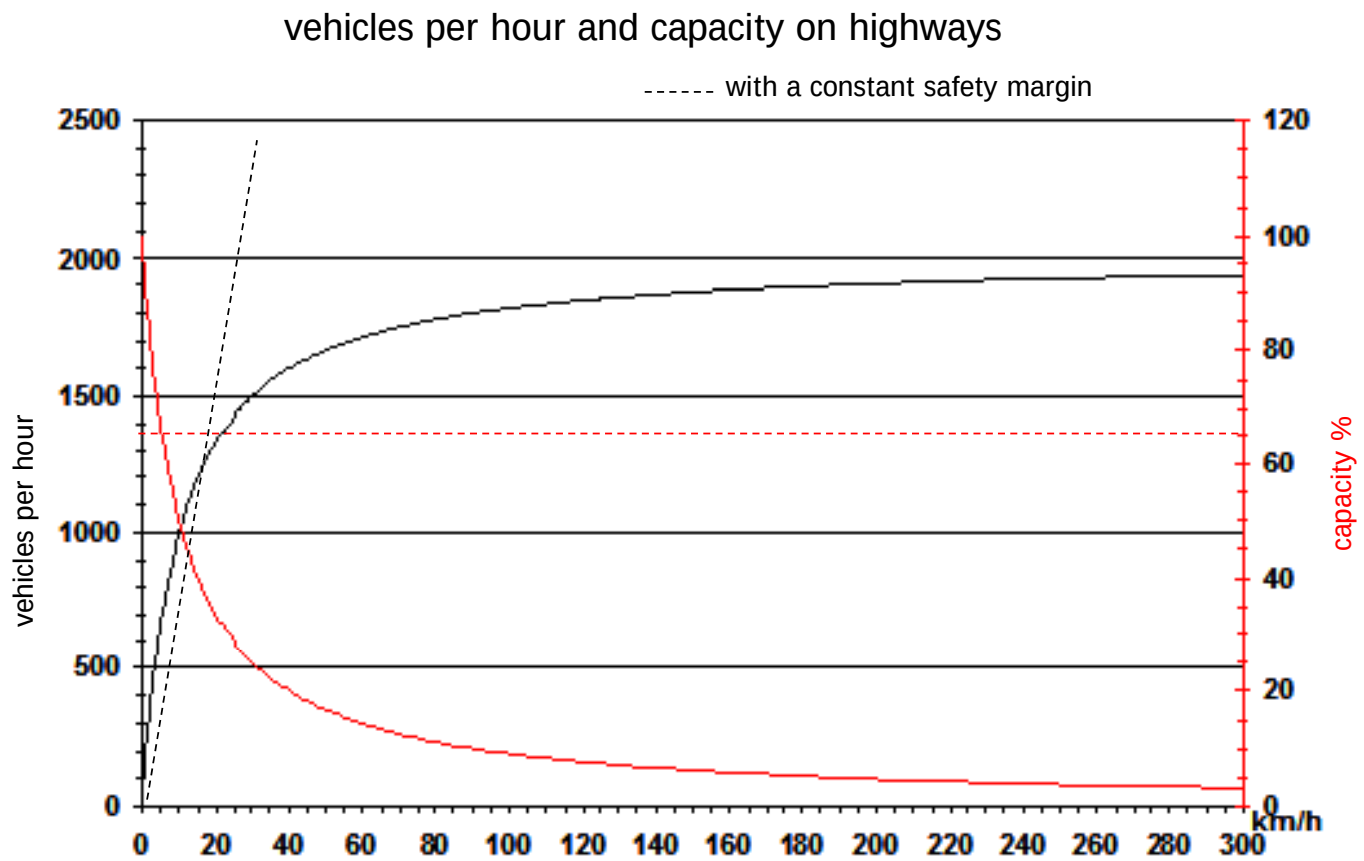
rails



highway



Road system (GER)



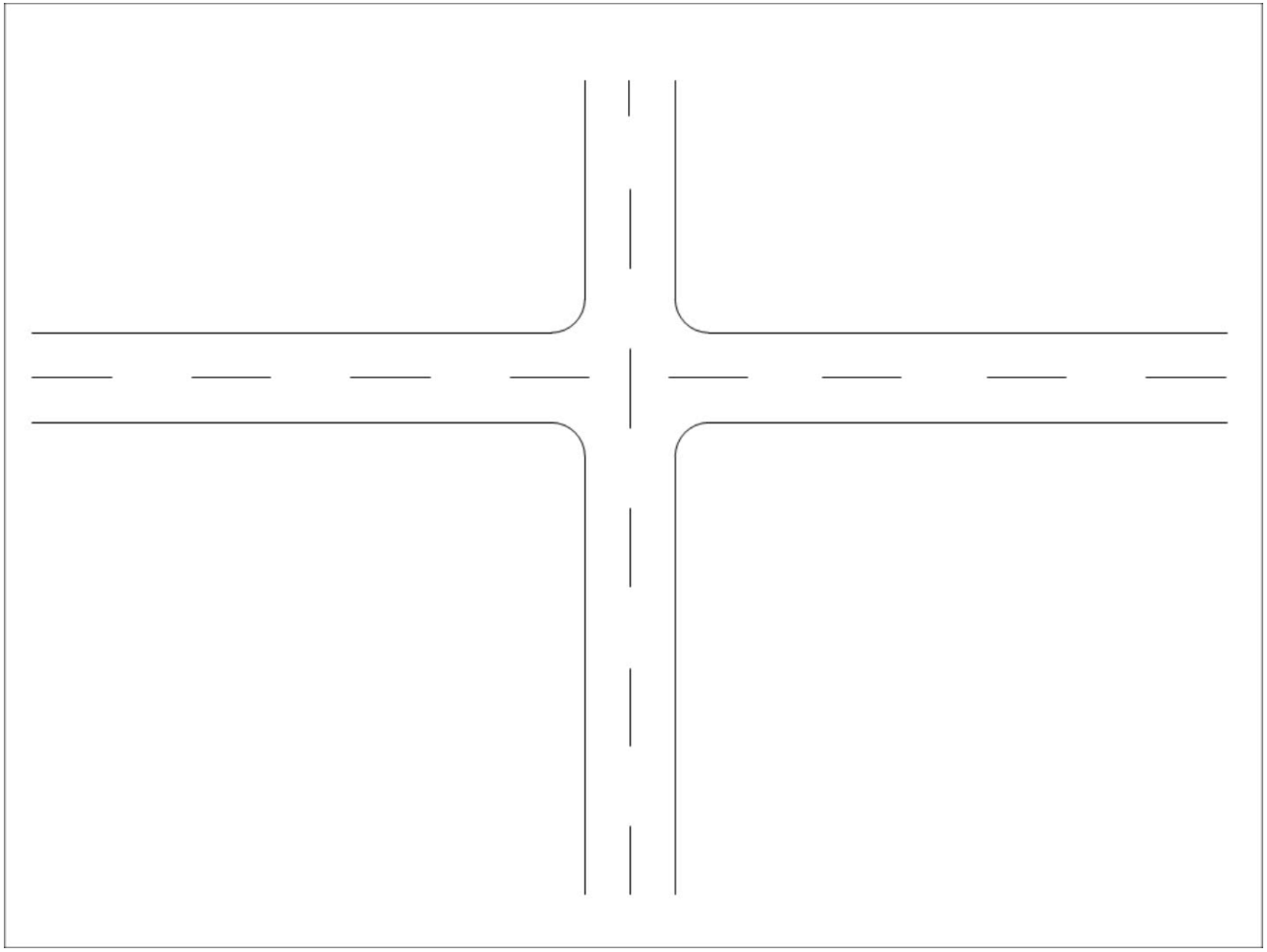
Rail system

Challenge: track switch

- Train must stop before in case of malfunctioning switch
  (stopping distance ~10.000m, for a 400m train)
- Communication track <-> train needed
- Switch can only operate when clear

Challenge: lost wagons (train integrity)

Fully autonomous driving



Fully autonomous driving

e.g. 7m vehicle & 1m clearance & 3m lane width & 3m/s² acceleration

- Accelerating for intersection
  - 30km/h -> 71 km/h, covered distance 54m
  - 40 km/h -> 95 km/h, covered distance 95m

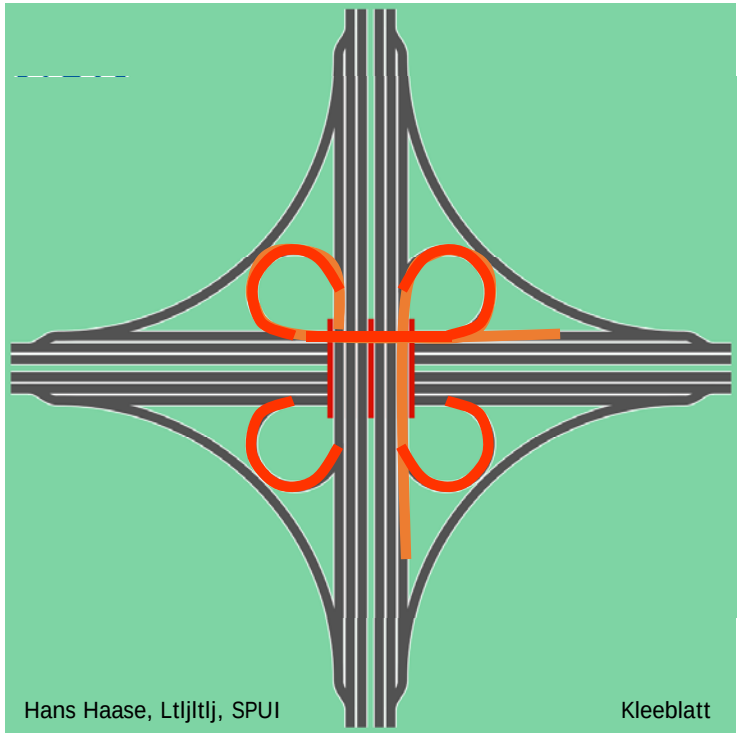
- alternatively: constant speed
  - distance 11m -> ratio of capacity: 39%

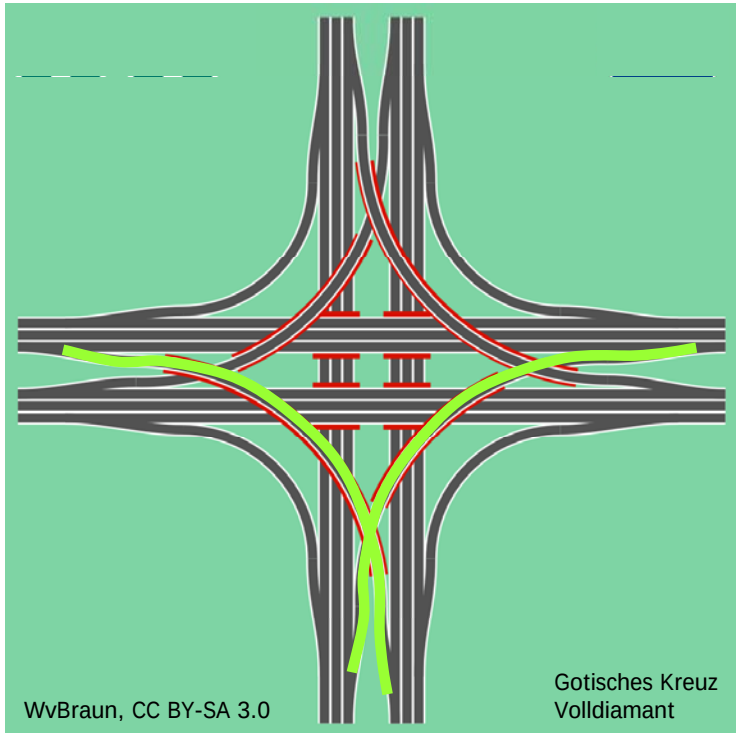
Without having additional lanes
Without turning vehicles
Without motorbikes, bikes, pedestrians, etc...

Autonomous driving – highway

- Should replace the driver
- Should increase security
- Designed for up to 130km/h [BMW-chief of developement Klaus Fröhling]
- 300 M programming lines [BMW-Entwicklungschef Klaus Fröhling]
- Need time to calculate next action – increased safety clearance

Autonomous driving – highway





Quelle: https://de.wikipedia.org/wiki/Autobahnkreuz

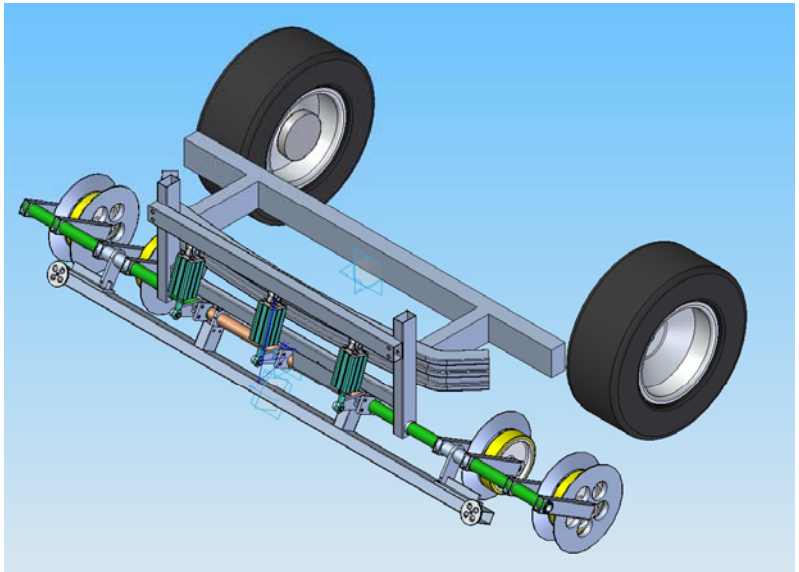
Requirements for an automatic transport system

- track recognition/tracking
- ecological energy supply
- speed monitoring and control
- clearance monitoring and control
- interference-free intersections
- isolated from other modes of transport
- driving without stopovers
- no traffic jams

The soulution - Synchrotrain

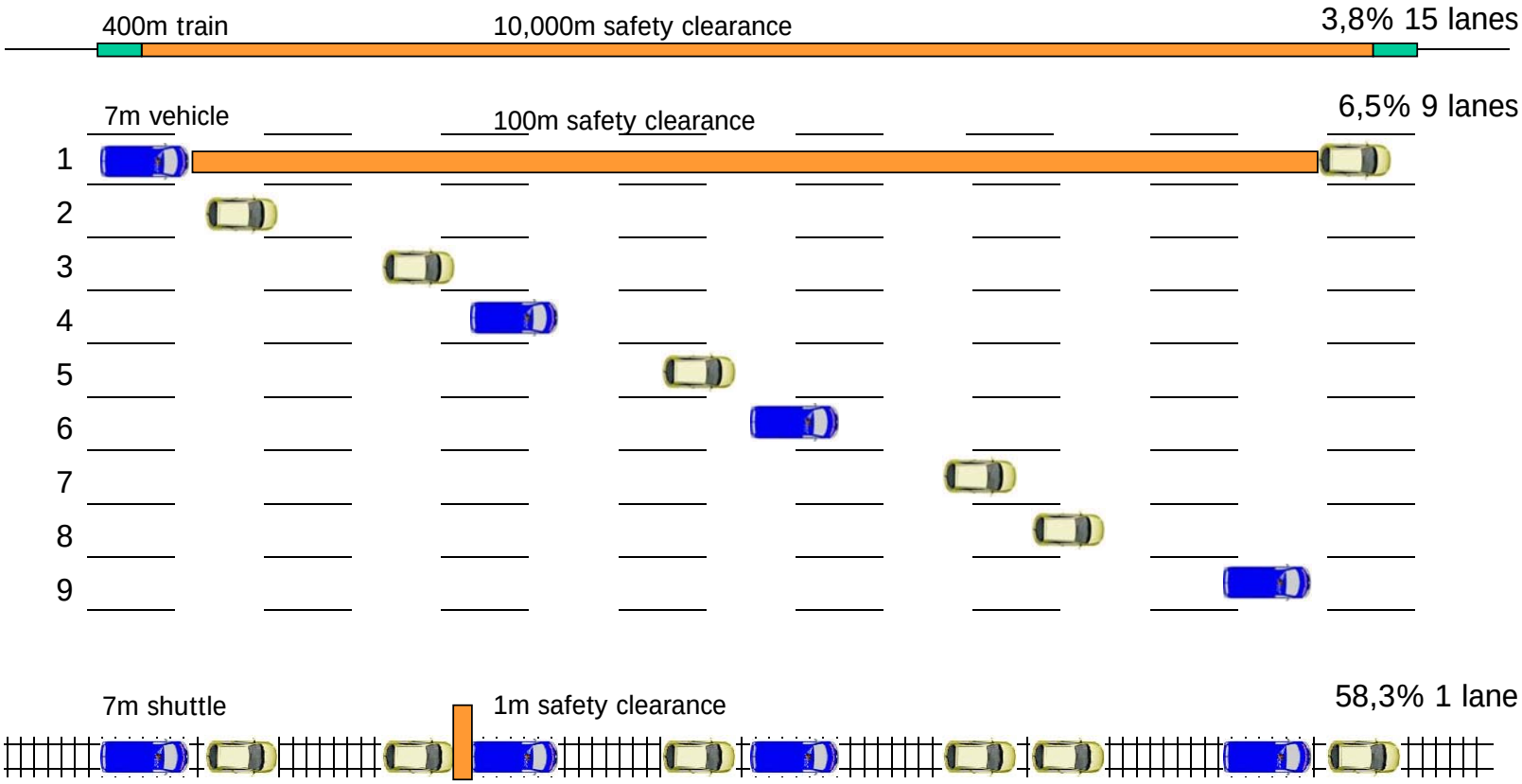
tracking	✔
ecological energy supply	✔
speed control	✔
clearance control	✔
interference-free intersections	✔
solated from other modes of transport	✔
driving without stopovers	✔
no traffic jams	✔

Solved



Space and capacity comparison

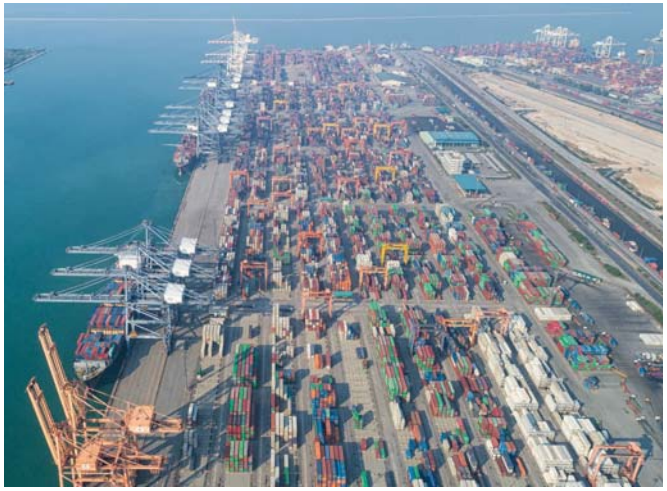
At 200km/h und filled to 2/3



Some values

System	speed [km/h]	max [Veh/h]	ø [P/Veh]	ø [P/h]	dist [m]	dist [s]
train	200	12	500	6000	16260	293
road	130	2000	2.9	5882	65	1.8
hyperloop	1000	600	20	12000	1647	6
synchrotrain	200	40000	1	40000	5	0.09

Initial applications



container ports

tunnels / bridges

model cities

Thank you for your kind attention!

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Integration