DTS
Dynamic Train Systems

https://intermodal.systems

mobility

sustainable, enviromentally friendly,
Barrier-free, comfortable,
implemetable?

Präeentation on the Website under „Links“ menu item

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Wolf Germani (Herf)

- 1982 – Development of traffic census and traffic control systems for the city of Stadt Durban (Suth Afrika)
- 1987 – Design of an autonomous and intermodal vehicle concept
- 1997 – Lotus Elise – planned conversion to electric drive
- 2008 – Automotive X-Prize Participant / electric turbine range externder
- 2014 – Patentapplication DTS Switchless track choosing technology

Mobility challenges

- Emmissions, energy consumtion and energy efficiency
- Last-Mile / switching / accessability
- Infrastructure capacity
- Integration of legacy infrastructure and vehicles

Emmissions / energy consumtion and energy efficiency

- Vehicle weight and air resistance
  – Main factors in energy consumption

- Electric drive
  – high energy efficiency

- Electric drive with battery
  -> extremely high CO2 emissions during production, limited availability of battery raw materials, long charging time, high weight, limited range

- Elektric drive with fuel cell / internal combustion engine using climate neutral eFuel
  -> low efficiency, high complexity, high cost

- Charging while driving
  -> induction / upper- / lower-powerlines on main routes.
  Small battery for branch routes

Last-Mile/ switching / accessibility

- Public transport systems achieve their high capacity and good energy balance by “bundling” passengers.
- However, it is precisely this “bundeling” that causes the core problems
  - Last-Mile – People and goods must be brought to the public transport, be it 50m or 5km.
  - Switching – “intermodal” means combining different means of transport i.e. changing between vehicles.
  - Acceessibility – the two factors above make the mobility of elderly, disabled etc. difficult
    All efforts to make public transport more accessible automatically cause added travel time and capacity issues
- However, the ”high” capacitytät and “good” energy balance are strongly dependant on the utilization.
- Fixed vehicle sizes – no dynamic adjustment of capacity and consumption

Infrastructure capacity

- Roads within and between cities are busy at peak times
- Public transport system, road or rail based, are also at limit.
- Digital measures such as ride-calling, intermodal transport networks, traffic control optimisation only brings limited improvements in the lower percentile range.
- Autonomous cars, car-sharing leads to a shift from public transport to individual transportation, increasing the bottleneck on roads.
- Forecats point to a doubling of traffic volumes by 2030, both for passengers and goods.

- New road and rail networks take a long time to plan and build and are extremely expensive, especially within city limits.
- Using current train technology an improvement is only margianally possible.

Integration of legacy vehicles and infrastructure

"intermodal tracked vehicles"

O Bus – since 40 years in
Essen / Adelaide / Cambridge

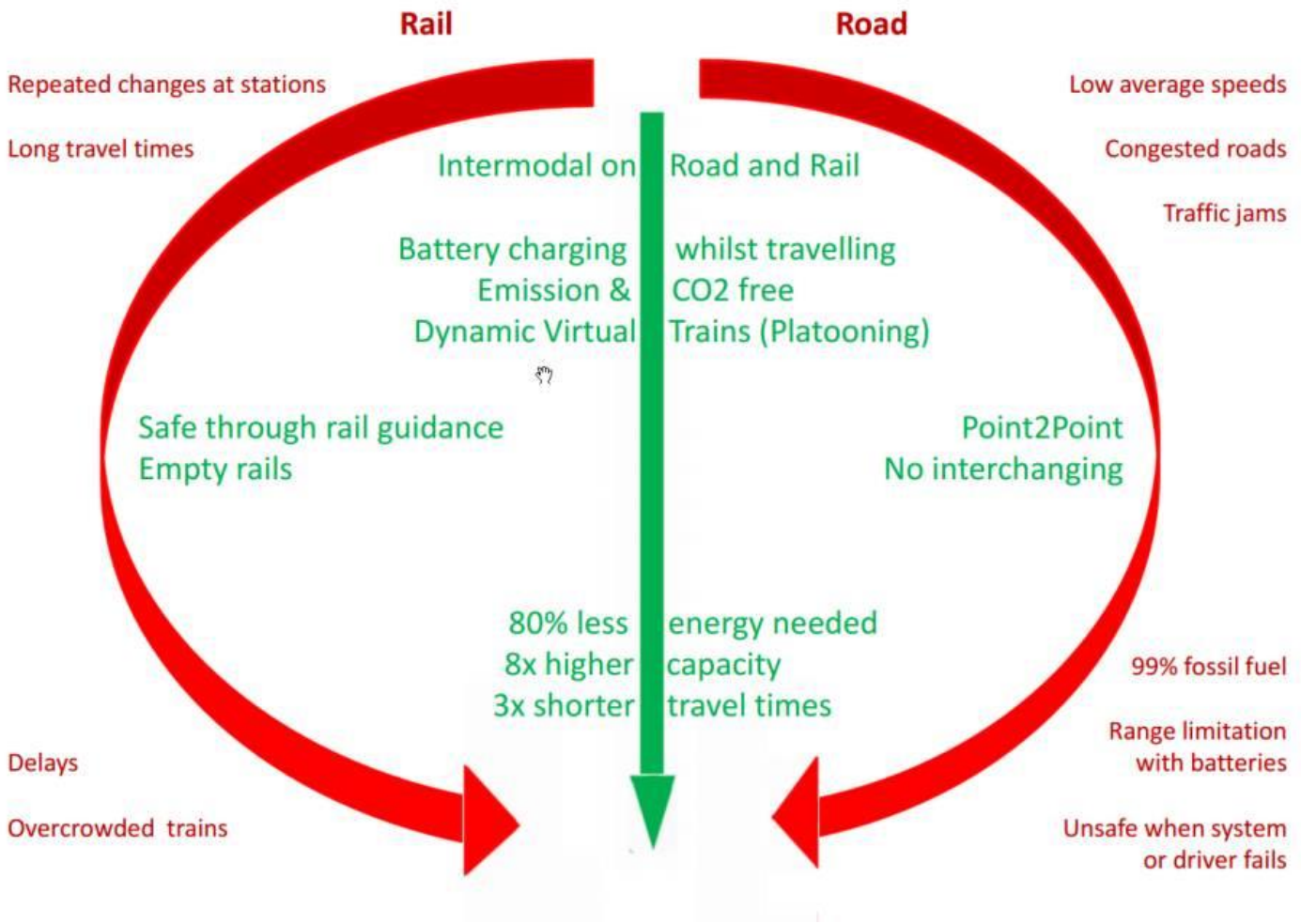
"Charge while driving"

- eHighway (A1 – Lübeck) Overhead lines
- eRoadArlanda (Stockholm) tracked rail

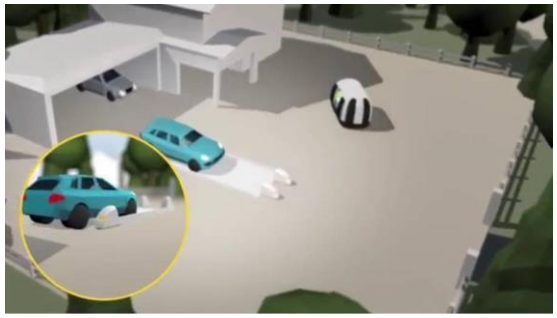
"Car Carrier"

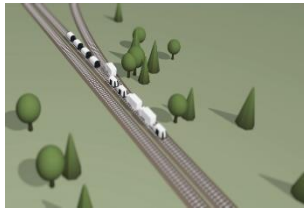
The Boring Company (Musk)

Disadvantages of road and rail – advantage by combining road and rail



DTS Technologie

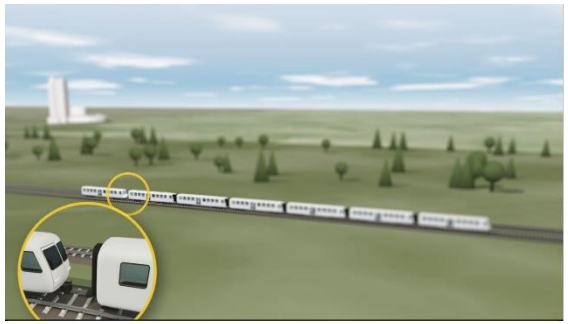




- DTS wheel set (Pat. Pend.) with control software that allows a vehicle to determine the direction of travel on exiting rails (Vignol) and DTS road tracks without interaction with the switches – a safety gap is NO LONGER necessary because of the switch movement.
- DTS road rails can be milled into existing roads ~ 250T€ / km – OnTheFly – approx. 0,5 km per day.
- DTS traffic control systems make it possible to create dynamic virtual trains – commonly known as Platooning.
- 6 fold capacity to road transport – 16 fold capacity to rail transport. A DTS line (road or rail) is like a 6 lane highway – without new construction methods.
- DTS road rails supply power to the DTS wheelset by induction.

Integration of legacy vehicles / public transport

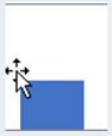
- With the CarCarrier and BusCarrier, current vehicles can drive onto a CarCarrier within the time of a traffic light phase (max. 30 sec.). They then travel autonomously and emission free to their destination – without having to convert the vehidle.



- Existing public transport buses can continue to be used with the BusCarrier until DTS Buses become available.
- DTS Busses enable transfer within moving buses, which couple inline while travelling, forming Dynamic Stations enabling passengers to change destination during travel.

- Up to 144 000 passengers per DTS route per hour – 8 times the capacity of a S-Bahn – without transfer stations.

Energieverbrauch und Kapazität

Mode	Car	CarCarrier		Train	Normal Bus	Electric Cycle / Roller		Urban Train	Bus Rapid Transit	DTS Train
		DTS								DTS
Passengers per hour in 1000										
per lane	2	14,4		4	9	11		22	43	144
kWh per 100km	★★★★★ ★★★★★	★		★★★★★ ★★★★★	★★★★	★		★★★	★★★★	★
per passenger	10	1		11	4	0,6		3	4	0,5
Time traveled in hours										
per 100 km	4	1		1	3	5		2	2	1

ART CarCarrier

Dynamic Station

Linked Bus