INTRODUCTION

The Overhead Train System (OTS) is a total transport system for passenger and freight transport, optionally including plateaus for car transport. The OTS enables transport to be set up as a fully automatic continuous process. Although it initially resembles a monorail system, several unique design features make a significant difference resulting in a high speed, high capacity, energy efficient and low cost transport system.

System features

- Maximum capacity: 4800 persons per hour in 2 directions, resulting in to 9600 persons per hour.
- Speed: 200 km/hr (whereas for stations and points 80 km/hr).
- Minimum time between two cabins 30 sec resulting in interspaces of 1800 m.
- Frequency of cabins adapted on-demand dependent on number of passengers resulting in to energy efficiency and high usage rate of assets (e.g. cabins).
- Intrinsic safety realized by cabins moving in only one direction and constructing a separate tunnel for each direction.
- Overhead track, at least 8 m. above ground level, resulting in enhanced safety because interference by people and animals is hardly possible.
- Overhead track forms no barrier in landscape and agricultural areas, rivers, canals and highways.
- Overhead track does merely occupy land.
- Reduced noise emission and no dust emission due to tunnel construction.
- Not susceptible to weather conditions such as snow, ice and sand due to tunnel construction.
- Short construction time for production of steel supporting structure, enhanced quality and lower costs due to industrial production and mounting. In addition, production of modules can be undertaken by multiple companies.
- No need of timetable, very short waiting time.
- Simple, low-cost stations due to continuous departures resulting in low number of passengers waiting at platforms.

ots - overhead train system b.v.

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TECHNICAL SPECIFICATION

The OTS system (and corresponding patent) is a package of technologies with the following main components:

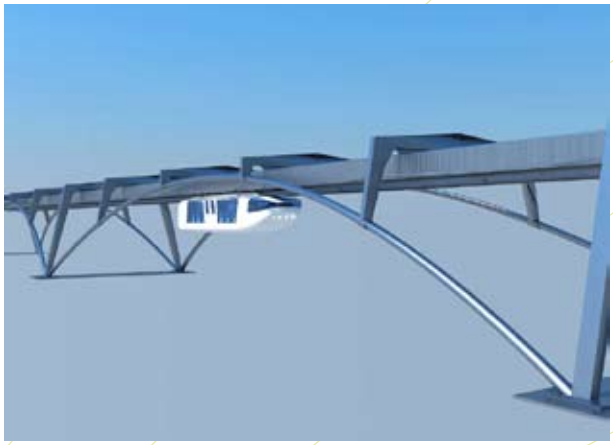
- The supporting structure
- The tunnel the bogies run through
- The expansion joints in the tunnel
- The points
- The direction change device
- The stations

The basic design of all components listed above is available whereas detailed engineering will be conducted with specialized manufacturers. All data and values should be considered as indicative taking account that client requirements and local conditions may lead to modifications.

Supporting structure and bogie tunnel

The supporting structure consists of arches and columns made out of (high strength) steel. The arch span is 60 meter according to OTS design whereas each section of 60 m. is similar. Minimum clearance below the cabins is 4.5 m implying that the height of the tunnel is about 8 m.

Supporting structure



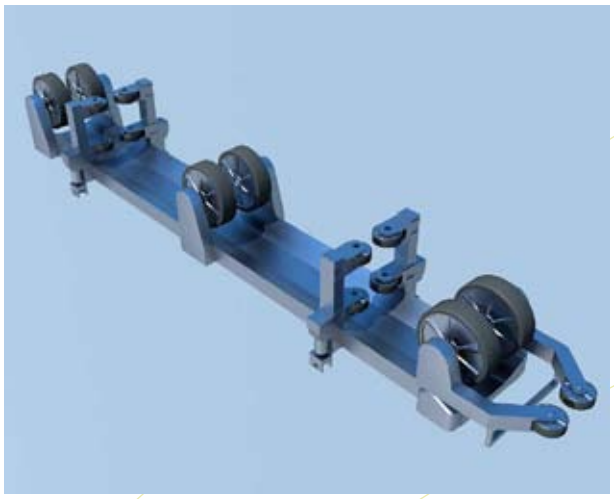
Bogie tunnels

Bogie, cabin and freight plateau

- Bogie

The bogies are constructed with 3 independently controlled sets of load-bearing wheels and 2 sets of guiding wheels to balance for horizontal loads/movements. The 6 carrying wheels are driven and braked by motors built in the rims, or alternative systems. In addition, traditional automatic braking systems are used to decelerate within 900 m. in the event of a power failure. Low-voltage power supplied by a battery or a low-voltage rail will take the cabin on or back to the nearest station. The bogie is constructed such that horizontal and vertical curves can be made. Sensoring for detection of location, speed, (de-)acceleration making use of radar.

Bogie structure



- Drive:

OTS propose to make use of electric motors possibly installed in the rims.
Power about 40 kW for each motor resulting in a total of 240 kW for a bogie; to be detailed with specialized manufacturer.

- Cabin

Capacity: 40 persons, weight 8 ton including bogie and passengers.
Length: 10 - 12 m.; width: about 3 m.
Completely enclosed and airconditioned.
All cabins have cameras and audio systems connected to the nearest stations; from there it is possible to intervene e.g. to side track a cabin, implement emergency measures, open doors, or activate escape devices (lower plastic roll-out chutes).

- Freight plateau

Carrying standard containers: maximum weight 8 ton including bogie, plateau and container; obviously maximum weight can be increased upon customer's wish requiring modification of supporting structure.

Electric power, traffic control, safety and communication

All features have to be detailed with specialized manufacturers.

- High voltage power supply
  1. Direct Current: 1200 - 1600 V.
  2. Estimated power consumption: 120 kWh per 100 km.
- The electric power supply along the track is divided in sections of each 1800 m. enabling automatic switch-off in the sections next to the section where a moving bogie is located implying intrinsic safety.
- Cabin-detection by radar or laser maintaining a safe distance of 1800 m.; emergency stop within 900 m.
- All additional safety systems are mounted in the bogie tunnel.
- Communication system (audio and video) between traffic control room and cabins.
- Back-up emergency power supply for the cabins to enable audio-visual communication to the nearby station as well as continuation of the cabin ventilation and lighting.
- A low-voltage power line can be installed in the tunnel as a back-up to supplement the battery capacity if the emergency power is activated at low-speed as a get-you-home measure. In the event of a total power failure an emergency power unit takes over the power supply to the line.

Optional facilities

- 4-lane highway on top of supporting structure for light traffic.
- Solar cells (100 Watt/m^2) producing 140 kW per kilometer track enabling transport of one cabin (consuming 240 kW) per 1700 meter.