

Project Study – Cost Structure of Hyperloop vs. High Speed Rail

Type: Project Study
Possible start: as soon as possible
Location: Ottobrunn, Munich

TUM Hyperloop

Our group is researching Hyperloop technology for passenger transport. We focus on electromagnetic levitation, suspension, and propulsion, simulation of high-speed aerodynamic phenomena, cooling systems, and vehicle structure and infrastructure topics. Depending on the topic, we work on new test benches and the implementation of various experiments, computationally intensive simulations, or the design of new types of components. Our chair aims to motivate you and other students to develop modern technology for tomorrow – together as a strong team with the power of everyone.

Job Description

The seminar analyzes the cost structure of Hyperloop systems in comparison to high speed rail (HSR). Students investigate how expensive it is to build and operate a Hyperloop at a top level, distinguishing between fixed and variable costs. Publicly available data from Hyperloop demonstrators, Transrapid and Maglev projects, and comparable guideway systems are used to derive cost ranges, which are then benchmarked against recent HSR projects.

Your Tasks

- Analyzing the cost structure (CapEx & OpEx) of Hyperloop systems
- Benchmarking Hyperloop costs against recent HSR projects
- Estimating cost per kilometer and differentiating by infrastructure type:
 - Tunnel, at grade or elevated, bridge
- Comparing operational cost structures of Hyperloop and HSR
- Analyzing public funding and cost sharing mechanisms, with a focus on HSR

Methods

- Literature and document analysis
- Case study comparison of infrastructure projects
- High level cost modeling and benchmarking

Contact

If you are interested in working in our team, please send your application together with a motivation and supporting documentation to (elias.zorgati@tum.de). If you have any questions, do not hesitate to contact us.