

Maglev 2024 and the art, convincing the world of something better

Travelers between Hamburg and Berlin (Germany) are currently having to put up with longer journey times once again, as the so-called “wear stock” along the railroad line needs to be replenished (this is the Deutsche Bahn AG's original phrase for such renovation work). For the third time since the planned Hamburg-Schwerin-Berlin Transrapid line was abandoned in February 2000, the replacement route will once again be closed for several months due to renovation work after 2009 and 2021.



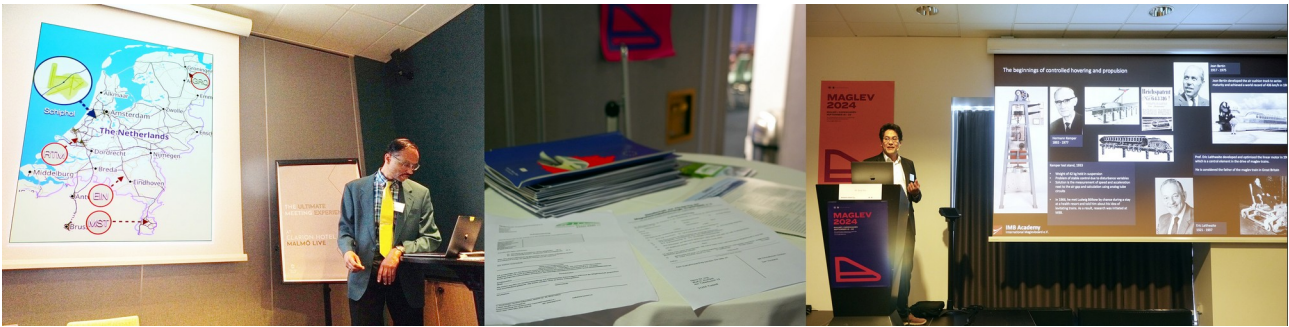
*Creativity in the lack of understanding of magnetic levitation technology on the part of artificial intelligence - before and after the presentations
(Source: The International Maglev Board / ChatGPT respectively GFM-eV / Neuroflash)*

Professional visitors to the 26th International Conference on Magnetically Levitated Systems and Linear Drives ([Maglev 2024](#)) [1] at Malmö agree that maglev lines have a much longer service life than conventional railroad lines due to their contact-free movement capability.

The conference featured presentations on the latest developments in Japan, China, South Korea, and Brazil. After temporarily suspending development activities due to the COVID-19 pandemic, Brazil returned with a new [prototype vehicle](#) [2] for superconducting magnetic levitation (SML) for urban transportation solutions. To this end, it can draw on the world's third-largest reserves of rare earth elements.

The presentations from the German side focused primarily on developments to date, such as Dr. Friedrich Loeser's "50 Years of Transrapid – The Product and Thyssen Company" and Kenji Eiler's presentation from the International Maglev Board ([IMB](#)) [3] which provided a comprehensive overview of the global development of maglev technology. In addition, the Gesellschaft zur Förderung der Magnetschwebetechnologie (GFM-eV) presented „[some binocular views onto old and new maglev systems](#)“ [4] with the aim of

promoting the SupraTrans from Dresden/Karlsruhe and the Transport System Bögl (TSB) from Sengenthal.



Nonprofit organizations (Freedom of Mobility, International Maglev Board, GFM-eV, and Förderverein Transrapid Emsland) were also represented with presentations and/or informational materials. (Source: Dittmer, edited by Fawkes)

Other non-profit organizations, such as the Dutch foundation “Freedom of Mobility” ([FroM](#)) [5], have also demonstrated their commitment to the use of maglev technology in Europe. Since 2010, FroM has been developing a holistic mobility concept that divides responsibilities between public and private transportation, and presented its report titled “Case for Maglev in the Netherlands: Connecting Airports and Stations – A Feasibility Study in Progress.” The study also aimed to determine a realistic cost estimate for transportation projects in the Netherlands, particularly those involving maglev trains.



There were lasting, three-dimensional impressions of old and new magnetic levitation technology in operation. (Source: Dittmer, edited by Fawkes)

In addition, the question was to what extent maglev trains powered by green electricity can be helpful in the transformation of a country to CO₂ neutrality. Prof. Dr. Henrik Ny from the [Department of Strategic Sustainable Development \(Sustainability Transformation of Energy and Transport Research Team\)](#) [6] part of Faculty of Engineering at Blekinge Institute of Technology, Karlskrona (Schweden), which was also responsible for [organizing](#) [7] the conference, made positive statements on this.

Health issues were also addressed, as the IMB had published a [study](#) (in German [8]) in 2020 on particulate matter emissions in track-guided high-speed rail traffic, which should not have any direct health effects for passengers, but would have a direct impact on rail staff, who would be permanently exposed to these emissions during an eight-hour working

day. So far, rail operators have not discussed separate occupational health and safety measures for those affected.

But it was also about the question of where the introduction of magnetic levitation technology could be most economically viable. These would be corridors with a high population density, which is why Ms. M.Sc. Judith Oginga Martins from Blekinge University of Technology then posed the question: “*Why not in Africa?*”. She ended her presentation with the words: “*Maglev is the future!*”.



The concept has its charm, but there is still a lot of work to be done to overcome reservations.
(Source: Dittmer, edited by Fawkes)

Prof. Rune Wigblad from the University of Skövde saw a similar socio-economic effect in the event of the construction of two maglev connections from Malmö and Copenhagen to Gothenburg as the Öresund Bridge had when Copenhagen and Malmö grew together. This was reflected in the fact that the neighboring city could be reached within 40 minutes. And the travel time between Gothenburg and Malmö/Copenhagen could also be reduced to 40 minutes. The three cities could thus grow together into one city. However, the Swedish state railroad Trafikverket would still have to be convinced to commit to a new rail technology. This does not appear to be the case at present - in contrast to Japan, where the Japanese Railways Company (JR) sees the Chuo Shinkansen magnetic high-speed train as a natural progression from the conventional Shinkansen high-speed trains in order to provide a competitive product against domestic air traffic.



Projects that are poorly planned, such as “High Speed 2,” can lead to massive public opposition.
(Source: Dittmer, edited by Fawkes)

Prof. Dr. Roderick Smith from Imperial College London pointed out how important it is to deal not only with technology, but also with social sciences in order to win the hearts of citizens for technically sensible transport projects. Acceptance should come from below

and not be imposed from above. He illustrated this with a negative example in which politics had failed miserably:

The “High Speed 2” project using conventional wheel-rail technology, which (according to information of GFM-eV) was supposed to be a more cost-effective replacement for the „[UK Ultraspeed](#)“ [9] transport solution based on Transrapid technology following its abandonment in 2007, is facing a [disaster](#) [10] that can also be described as a derailment.¹

According to Prof. Smith, the project was scrapped after the then-prime minister assessed how much political capital scrapping the project would cost, despite the fact that there was political support for it.

Citing the book „Megaprojects and Risks“, it is argued that projects are fundamentally doomed to fail if parliaments and the public are misinformed due to underestimated costs and overestimated returns, as well as underestimated environmental impacts and overestimated benefits.²



The inauguration speech, titled "A Brief Look at AI and Maglev Technologies," sparked general amusement. (Source: Dittmer, edited by Fawkes)

Prof. Dr. Johannes Klühspies from the IMB gave an impression of how difficult it can be to convey an understanding of magnetic levitation technology from the specialist world to the public. He had made several unsuccessful attempts to use an AI chatbot to generate images of the Transrapid, the Chou Shinkansen and a Hyperloop system.

The prompt “*Please provide a picture of a Transrapid Maglev in a station full of people, glass hall, evening light.*” was followed, for example, by futile correction instructions such as “*Without tracks, please*”. The strange depictions (see above, among others) left him with the impression that artificial intelligence had not yet been able to understand magnetic levitation technology. In other words, it was not yet present in the language models. The audience wondered whether this was perhaps intentional? In any case, he posed the question to the audience:

“If AI is simply not able to do this, how are politicians supposed to be able to understand magnetic levitation technologies?”.

1 See the GFM-Jahresheft (Annual Report) 2023, “A Conventional High-Speed Rail-Road Project ‘derails’,” (in German) pp. 46–48

2 See [ISBN 0-521-804-5](#). In this context, the book „Zukunftsaspekte europäischer Mobilität“ by Prof. Dr. Klühspies, ISBN [9-783940-685001](#) provides a guide for a serious evaluation of maglev and rail-bike projects, which follows a “conservative assessment standard” (p. 53 ff.).

This was the prelude to the question of how we can communicate the benefits of magnetic levitation technology to the public from the “filter bubble” of the experts, which became one of the common threads of the conference.

Magnetic levitation technologies have the potential to revolutionize the transportation sector through increased speeds, energy efficiency and reduced environmental impact. Here are some ways to convince the world of the benefits of magnetic levitation technology:

1. **Emphasize environmental friendliness:** Maglev trains use less energy compared to conventional trains, which leads to a reduction in CO₂ emissions. A campaign could emphasize the positive impact on climate protection and sustainability.
2. **Speed and efficiency:** With speeds of over 500 km/h, Maglev trains offer a faster and more efficient travel option, which can be particularly advantageous on long-distance routes.
3. **Comfort and safety:** Thanks to minimal friction and advanced technology, Maglev trains offer a smoother and more comfortable ride than conventional trains.
4. **Technological progress:** The implementation of magnetic levitation technologies promotes innovation and the growth of high-tech industries in the countries that invest in them.
5. **Economic benefits:** The expansion of the Maglev network can create jobs and boost the economy, particularly in the fields of engineering, construction and technology development.
6. **Public support and education:** To reduce skepticism and reservations, information campaigns could promote awareness and support for Maglev projects.

By combining and communicating these aspects, it is possible to stimulate discussion about the benefits of magnetic levitation technology and motivate society to be open to innovative transportation solutions in 2024 and beyond.

Michael Dittmer

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Links (valid on 21.09.2024):

[1] https://mkon.nu/maglev_2024/

[2] <https://revistapesquisa.fapesp.br/projeto-brasileiro-de-trem-de-levitacao-magnetica-inicia-nova-fase-de-testes/>

[3] <https://www.maglevboard.net/>

[4] <http://gfm-magnetbahn.org/en/news/2024/0918/index.html>

[5] <https://www.stichtingfrom.nl/>

[6] <https://a.bth.se/sustaintrans/#team>

[7] <https://a.bth.se/sustaintrans/2022/10/29/maglev-2024/>

[8] https://www.researchgate.net/publication/340849390_Feinstaubemissionen_im_spurgeführten_Hochgeschwindigkeitsverkehr_Rad-Schiene-Hochgeschwindigkeitsbahnsysteme_im_Vergleich_mit_Magnetschnellbahntechnologien

[9] <https://www.expressandstar.com/news/transport/2020/02/12/boris-johnson-uk-government-looking-at-maglev-trains/>

[10] <https://yorkshirebylines.co.uk/politics/the-shambles-of-hs2-is-down-to-a-miserable-failure-of-government/>

[11] <http://gfm-magnetbahn.org/en/news/2024/0921/index.html>

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