



Transit



Urban Maglev Research Program – Updated Lessons Learned

Background

In 1999, the Federal Transit Administration (FTA) initiated the Low-Speed Urban Magnetic Levitation (Urban Maglev) Program to develop magnetic levitation technology that offers a cost-effective, reliable, and environmentally-sound transit option for urban mass transportation in the United States. Maglev is an innovative approach for transportation in which trains are supported by magnetic forces without any wheels contacting the rail surfaces. Maglev promises several attractive benefits, including the ability to operate in challenging terrain with steep grades, tight turns, all-weather operation, low maintenance, rapid acceleration, quiet operation, and superior ride quality, among others. Maglev typically is unmanned and operates on elevated guideway, although it can operate at grade level or in tunnels if that is more beneficial. For urban alignments, maglev potentially could eliminate the need for tunnels for noise abatement, resulting in significant cost savings.

The Urban Maglev program is now effectively completed.

Objectives

The objective of this report is to update an earlier Lessons Learned report that was published by FTA in 2009, with additional lessons learned by the two teams that received additional funding from 2005 through 2012. The lessons learned in this report have been captured through a multi-faceted assessment of general project impressions, project execution, project conclusions and deliverables, project team performance, stakeholder participation, risk management, and project communications. The assessments are drawn from project documentation, discussions with the performing teams, and direct experience with the five participating Urban Maglev projects.

Findings and Conclusions

The FTA Urban Maglev program has demonstrated that low-speed magnetic levitation systems are advanced enough to merit consideration as system alternatives in the United States, but the initial infrastructure costs and availability of safety and operationally-certified maglev technologies are intimidating.

The major findings from the lessons learned assessment are:

- The FTA urban maglev program has demonstrated that low-speed magnetic levitation systems are advanced enough to merit consideration as system alternatives in the United States, but the initial infrastructure costs and

availability of safety and operationally-certified maglev technologies are intimidating. The efforts taken under this program have shown that low-speed maglev is feasible, but the results of multiple projects have indicated that substantial up-front costs exist.

- Most large urban areas in the United States have already invested in some type of mass transit system (subway or light rail), and urban maglev poses a fundamental change in technology that is viewed as being a major risk that is cost-prohibitive and incompatible with existing assets by transit agencies and investors.
- The lack of an actual system in place to demonstrate the anticipated operational advantages and projected savings in maintenance and operation costs contributes to a reluctance to embrace the technology. Systems under development in Japan and China may help demonstrate savings in the future.

Benefits

The FTA Low-Speed Urban Maglev Program resulted in exploration of several approaches to low-speed maglev, and significant technical development and testing of important elements of two different full-scale systems. Had greater resources been available, it is reasonably likely that remaining uncertainties could have been satisfactorily addressed. This report is offered to help jurisdictions or organizations that are considering new or upgraded urban transit systems to learn about the advantages and challenges of magnetic levitation systems and make informed decisions in light of what has been learned under FTA's Low-Speed Urban Maglev Program.

Project Information

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