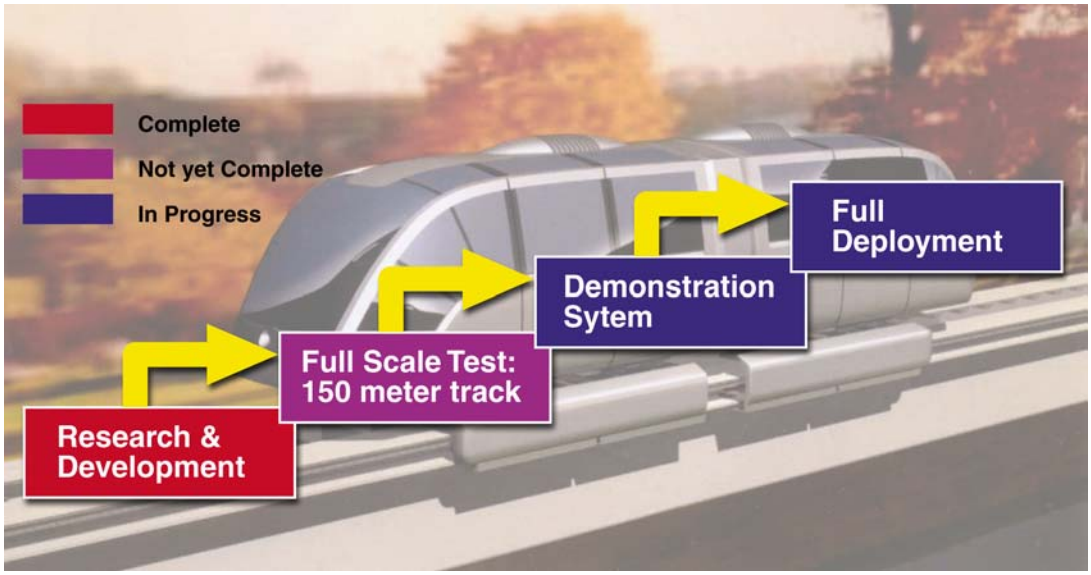
Creating an Urban Maglev Industry

By David O'Loughlin,
President, Urban Maglev Group

In 1992 a consortium of 32 industrial and financial companies was formed to develop an Urban Maglev system. The companies, called the Urban Maglev Group, are primarily based in the Pittsburgh area. They include General Atomics, Carnegie Mellon University, Lawrence Livermore National Laboratory, Hall Industries, Mackin Engineering Company, Sargent Electric Company, The International Brotherhood of Electrical Workers Pension Fund (IBEW), P.J. Dick, Union Switch and Signal, United States Maglev Development Corp., Booz-Allen and Hamilton, Mellon Bank and Western Pennsylvania Maglev Development Corporation.



Federal, State and Private Funding

Urban Maglev technology is being developed as part of the Urban Magnetic Levitation Transit Technology Development Program that is funded by the Transportation Equity Act for the 21st Century (TEA-21) through the Federal Transit Administration (FTA). The overall objective of the FTA's Low-Speed Maglev Program is to develop magnetic levitation technology that is a cost effective, reliable and environmentally sound transit option for urban mass transportation in the United States. Thirty-five million dollars of Federal funding has been appropriated for this program under the TEA-21 transportation funding bill approved in 1998. Eighteen million dollars has been awarded to the Urban Maglev Group, the largest single award of the Urban Maglev funding under TEA-21. Matching funds of $3.6 million have been provided to the Urban Maglev Group by the Pennsylvania Department of Transportation (PennDot) and the Pennsylvania Department of Community and Economic Development. Over $6.5 million of private funds have been provided by the Urban Maglev Group.

Staircase to Deployment

Step 1 — Proof of Levitation

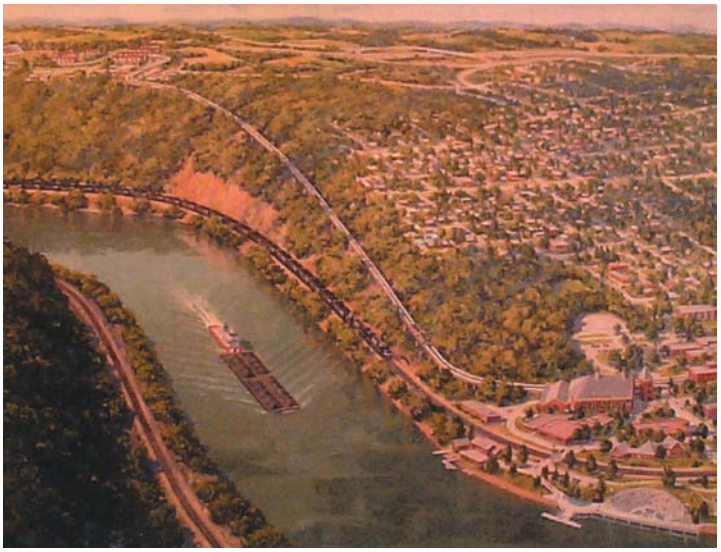
The FTA and PennDot have utilized a "Staircase to Deployment" concept beginning with a $10 million in-depth Research and Development study which was completed in December of 2001. By constructing and operating a 12-foot wheel testing system simulating vehicle operating speeds of up to 100 miles per hour the study proved that levitation could be achieved utilizing permanent magnets. The study posited attractive benefits of Urban Maglev technology including the ability to operate in challenging terrain with steep grades of up to 10%, tight, 60-foot radius turns, all weather operation, low maintenance and rapid acceleration. Perhaps most significant is the study's conclusion that Urban Maglev can meet the environmental demands of the 21st Century of little or no air or noise pollution which enables the Urban Maglev System to be built on completely grade-separated, elevated guideways on single columns with four-foot bases supporting a double-track system. This means that Urban Maglev guideways could be built on City sidewalks by utilizing cantilevering.

Projected cost savings over light rail systems that need to be placed underground to meet noise abatement requirements could be 50% or more. Operating and maintenance costs could be even greater due to the lack of friction created by the levitation of the vehicle above the guideway.

Step 2 — Test Track to Integrate Levitation, Propulsion and Guidance

Step 2 in the Stairway to Deployment is the full scale testing now underway in Dan Diego on a $10 million, 400-foot test track located at General Atomics. The Maglev chassis was built in Western Pennsylvania by Hall Industries and shipped by truck in August of 2003 to General Atomics. The testing, which will be completed in 2005, will validate the R&D study by successfully integrating magnetic levitation, propulsion and guidance. The vehicle will be levitated by permanent magnets and

First Guideway Module Being Prepared for "Flipping Over"



California University of Pennsylvania Demonstration Site

propelled by magnetic forces in the guideway utilizing a linear synchronous motor.

Step 3 — Construction of a Demonstration Test Facility at California University of Pennsylvania

Step 3 is the construction of a Demonstration Test Facility which provides a full-scale transit system that carries passengers on a regular basis in all weather conditions in challenging terrain. Federal funding support is being sought for a Demonstration Test Facility at California University of Pennsylvania that will connect California, PA with California University and a senior citizen's center. The 4-mile, double track system will link the town of California with the main campus and the University sports complex over 1 mile and a steep 7% grade away solving a difficult transportation and safety problem for the University as well as providing a linkage with the town and a senior citizen's center.

State matching funds have already been committed to the project.

Step 4 – Deployment

The final Step 4 in the Staircase to Deployment will be accomplished in urban settings such as in the city of Pittsburgh from the Universities and hospitals to downtown businesses and sports facilities. Colorado is studying the use of Urban Maglev technology from Denver to the Eagle County Airport to relieve traffic on I-70 for both tourist winter skiing activity and summer sports. Other cities are keenly interested in the success of the California University Demonstration Test Facility including Tulsa, Oklahoma City, San Diego, Irvine Santa Fe and Albuquerque. Other markets for Urban Maglev technology are the national parks and universities and colleges.

Awards

On October 14, 2004, the Urban Maglev Group and, more specifically, General Atomics and Lawrence Livermore National Laboratory (LLNL) were recognized for their "innovative research and development on the "Inductrack Magnetic Levitation System." Each year R&D Magazine recognizes the top 100 most technologically significant new products. This technology, designated Inductrack Magnetic Levitation System" was originally invented at LLNL and is being developed as part of the Urban Maglev program at General Atomics. Inductrack employs unpowered arrays of permanent magnets beneath the vehicle. When the train is in motion, the magnetic field from the permanent magnets generates levitation by interacting with a "track" made up of conductors assembled in an array that resembles a ladder with close packed rungs.