*Current Research in Public Transportation*

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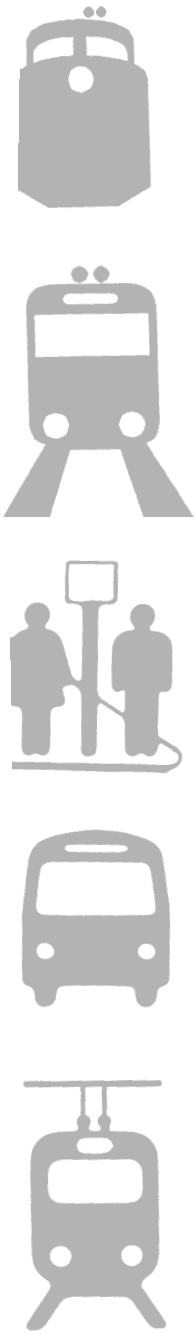

# NEWSLINE

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## Report Discusses Airport Access Issues

Flying promises the public high-speed travel between origin and destination. However, getting to and from an airport at either end of a trip may take longer and be far more difficult than the actual line-haul flight.

Access to airports has been under study as a significant and growing transportation problem in the United States ever since the early 1970s. Urban congestion and environmental concerns have increased substantially, as has air travel. Intermodal access to airports has become a matter of even greater concern. *Intermodal Ground Access to Airports: A Planning Guide* is designed to provide policy guidance, associated rules of thumb, data, and analytical techniques related to airport access.

The guide was prepared to help airport operators, local governments, metropolitan planning organizations, consultants, and others identify airport access problems and find alternative solutions while evaluating their effectiveness. The guide identifies key components of an airport access work program. It contains detailed sections on airport groundside access planning methods, including data collection methods and analysis, identification of current travel patterns and emerging trends, techniques that might be used in forecasting demand and estimating modal split, the evaluation of alternatives, and project implementation.

The guide describes airport access problems and the roles played by state and local agencies and the relationship between airport access and the Clean Air Act. The development of performance measures is discussed. The types of data that might be collected to qualify performance measures and determine access patterns and demand are described. Techniques for obtaining data and guidance for conducting passenger origin-destination surveys are provided. An overview of how to estimate future airport access patterns and demand and how to identify potential capacity deficiencies is given. Alternative access improvements, including high-occupancy-vehicle options, intermodal facilities, and improvements to airport infrastructure, such as access roads, parking facilities, and terminal curbside access, are described. How to evaluate alternative improvements and implement them is discussed.

For more information, contact Phillip S. Shapiro, Marcy G. Katzman, Warren E. Hughes, Joseph McGee, or Matthew Coogan, Bellomo-McGee, Inc., 8330 Boone Blvd., Suite 700, Vienna, Virginia 22182 (703-847-3071). The report is available through the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161 (703-487-4650). The report (DOT-T-97-15) is available from the Technology Sharing Program of the U.S. Department of Transportation. The study was prepared for the Federal Highway Administration and the Federal Aviation Administration.

# Magnetic Energy Storage May Increase Train Capacity

The problem to be solved is how to increase train capacity in the Bay Area Rapid Transit's (BART's) Transbay tube. The tunnel connects the East Bay Area with San Francisco under the waters of San Francisco Bay. At present, the system's capacity is limited by the inability to maintain acceptable voltage levels when traffic densities are high and multiple trains draw power simultaneously from the trackage power distribution system.

Excessive loading on the system leads to short periods of voltage below 750 on the third rail, causing train motors to shut down to minimize equipment damage. This problem causes excess wear and failure of traction power system components and significant passenger discomfort. Adding lines to the BART service area or increasing the amount of service on the lines will make the problem worse.

*NEWSLINE* reports current research and development in public transportation. Although great effort is made to select unbiased research studies, the findings and conclusions are those of the authors and not the Transportation Research Board. The publication of *NEWSLINE* is made possible through funding under the Technical Assistance Program of the Federal Transit Administration. *NEWSLINE* is published periodically by the TRB Committee on Public Transportation Planning and Development (George M. Smerk and Mary Ann Smerk, editors; Brenda Crohn, staff; Peter L. Shaw and Pierre-Marc Daggett, TRB staff). Submit research summaries and other news items to the Institute for Urban Transportation, Indiana University, 809 East 9th Street, Bloomington, Indiana 47405, or to *NEWSLINE,* Transportation Research Board, 2101 Constitution Avenue, N.W., Washington, D.C. 20418 (202-334-2966). ISSN 0148-8511.

A collaborative program was begun in 1991 between Pacific Gas and Electric, BART, and the Electric Power Research Institute to fund and participate in the application of superconducting magnetic energy storage (SMES) to the BART system, especially at the center of the Transbay tube. This effort was later joined by the Federal Transit Administration. The result of the research is *Application of Superconducting Magnetic Energy Storage for Third Rail Voltage Support*.

SMES, battery, and conventional solutions to the problem were investigated. Computer simulations allowed identification of situations most prone to voltage sag below 750. Three vendors responded with SMES designs and cost information. Battery and pulse-duty rectifiers were also explored. A number of systems were reviewed, including batteries, DC batteries, rectifiers, and various types of SMES. Three SMES designs were compared with three battery system designs and one pulse-duty rectifier design to determine where SMES technology stood in relation to more conventional technologies from the standpoint of both cost and performance. The most useful application appeared to be modification of the automatic train control system to prevent multiple simultaneous high-acceleration starts. Also considered was increased understanding of system operation that could be gained from monitoring track voltage at several points in the tube over a period of time.

For more information, contact Melissa M. Reading, Pacific Gas and Electric Company, 3400 Crow Canon Road, San Ramon, California 94583; or Eugene Nishinaga, Jay Burns, Peter Todd, Kevin Reilly, or Victoria Nerenberg at the Bay Area Rapid Transit District, 800 Madison Street, Oakland, California 94604 (510-464-600). The report (FTA-CA-26-0018-97-1) is available through the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161 (703-487-4650).

# SEPTA Modernizes Power Supply and Distribution

The Southeastern Pennsylvania Transportation Authority (SEPTA) is modernizing its traction power supply and distribution system for its surface rail, rapid transit, and trolleybus lines. *Traction Power Autotransformer Substation Modernization and Switch Gear Development: Phase One Final Report* describes design requirements for circuit breakers, disconnect switches, bus structure, switch gear, and other system components.

SPD Technologies was awarded a contract to develop 12- and 24-kV switch gear. Using three-dimensional computer modeling analysis, SPD developed a conceptual switch gear layout for each voltage class.

The design approach has been an iterative one. Starting with the program requirements and working toward a conceptual design, there was sufficiently detailed information available to use three-dimensional computer design. The design analysis repetition continues until a solution is found. The results of the analysis were reviewed each month at SEPTA to gain feedback and ensure compliance with specifications.

For more information, contact the Southeastern Pennsylvania Transportation Authority, Office of Engineering and Construction, 1234 Market Street, Philadelphia, Pennsylvania 19107 (215-580-4000). The report (FTA-PA-26-7002-97-01) is available through the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161 (703-487-4650).

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# Hydrogen as Power Source for Advanced Technology Transit Bus Is Evaluated

Working together with the Los Angeles County Metropolitan Transportation Authority and the Metropolitan Transit Authority of Houston, Texas, the Federal Transit Administration is funding the design, prototype development, and demonstration of a new generation of lightweight, low-floor, high-technology transit buses, the Advanced Technology Transit Bus (ATTB). The principal contractor involved in the design, development, and fabrication is Northrop Grumman, Inc. Six prototype units are being built.

The ATTB design at the time of the study *Clean Air Program: Use of Hydrogen To Power the Advanced Technology Transit Bus: An Assessment* calls for electric motor drives at the rear wheels with an electric generator driven directly by an internal combustion engine, a series DDC-30 Detroit Diesel natural gas engine, which feeds power to the wheel motors.

One of the candidate power sources is a fuel cell that generates electricity by the electrochemical action between oxygen and hydrogen. The advantage of the fuel cell is that there are no tailpipe pollutants in the form of gas or other emissions. Fuel cells have a high chemical electrical energy conversion efficiency, and there are no idling energy losses. Finally, with the provision of an electric storage device in the form of a battery, ultracapacitor, or energy storage flywheel, braking energy can be recovered, which improves the overall conversion of chemical energy to useful mechanical energy. On behalf of the Federal Transit Administration, Technology and Management Systems, Inc., performed a preliminary assessment of safety issues involved with use of a hydrogen-based fuel cell in the ATTB. The report describes the analysis.

Involved in the project is evaluation of the following issues: storage economy and safety properties of hydrogen; energy balance in the production of hydrogen; hydrogen requirements to operate an ATTB in a central business district environment; fuel cell type and size compatibility with the ATTB design; types of hydrogen storage, both on board the bus and at the fueling station; preliminary safety assessment; and infrastructure.

For more information, contact Phani K. Raj, Technology and Management Systems, Inc., 99 South Bedford Street, Suite 211, Burlington, Massachusetts 01803 (617-272-3033). The report (FTA-MA-26-0001-97-1) is available through the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161 (703-487-4650).

# Transit Agencies Are Given Bus Signage Guidelines

*Bus Signage Guidelines* provides transit agencies with a reference concerning regulations and guidelines contained in the Americans with Disabilities Act of 1990 and its subsequent amendments related to visual communications with persons having visual impairments. The handbook clarifies the responsibilities and choices transit agencies face when they attempt to improve visual communications to provide accessible transportation to persons with disabilities. The handbook's aim is to go beyond regulations to help train professionals to understand various communication issues from the point of view of the customer.

The handbook offers general conclusions about the readability of transit bus destination signs. They refer to the familiar head sign located above the windshield of a bus as well as the sign located to the left of the front door of a bus. Examples of signage characteristics that make it easier for persons with low vision to read both conventional and electronic signs are given. Sign characteristics that enhance readability by persons who are visually impaired also enhance readability for those with normal sight.

Other variables in the transit environment can enhance or detract from sign readability. The report recommends that printed signs should have a minimum character height of 6 in. for the head sign and a minimum of 2 to 4 in. for the side-mounted sign on the transit vehicle. Changeable message signs should have a minimum character height of 5.5 in. in the front and a minimum of 4 in. on the side. Recommendations concerning the spacing of letters on the signs are also given. High contrast should be maintained in all destination signs; ideally, white characters on a black background should be used. Materials covering the destination signs should minimize glare. All destination signs should be positioned at an angle to minimize glare.

Visual clutter is often a problem in signage. Competing items of numerical information—such as route number and street number—should not be displayed near one another on the destination sign to avoid confusing passengers with visual impairments. Text messages should be limited to destination information only. Extraneous messages, such as "Have a nice day," are confusing to persons with visual impairments. Where changeable message electronic signs are used, the route number should be displayed continuously and should be larger than the text. Only uppercase characters should be displayed, and messages should ideally consist of

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Bus Signage Guidelines
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only a single line of text. If two-line messages must be used, the route number should be at least 8 in. high.

For more information contact Booz, Allen and Hamilton, Inc., 8251 Greensburg Drive, McLean, Virginia 22102 (703-902-5000). The report (FTA-MD-26-0001-98-1) is available from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161 (703-487-4650).

## Studies on Public Involvement in Transportation Are Available

It is obvious that public involvement in making decisions concerning transportation is important. No one likes to be left out, and the U.S. Department of Transportation is working to stimulate more and better engagement and participation by citizens. The Federal Highway Administration has sponsored a number of public involvement studies, which are available:

- South Sacramento, California: *Light Rail Transit/La Linea Del Sur;*
- Metroplan (Little Rock, Arkansas): *Pouring Water On Dry Ground;* and
- *Public Involvement at Oregon Department of Transportation*.

Copies of these case studies are available from the Federal Highway Administration, Office of Environment and Planning, HEP 30, 400 7th Street, S.W., Washington, D.C. 20590 (202-366-3409).

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Effective with the first issue (Volume 25, Number 1) in 1999, *NEWSLINE* will be published on the Internet. Electronic publication of *NEWSLINE* will permit continued distribution *at no charge* to its large readership. Paper publication will be discontinued at that time.

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