European Low-Floor LRVs Woo North America

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Lower-cost compliance with ADA mandates, more efficient boarding and scheduling are the main attractions. But how much of what runs in Europe is compatible with North American conditions?

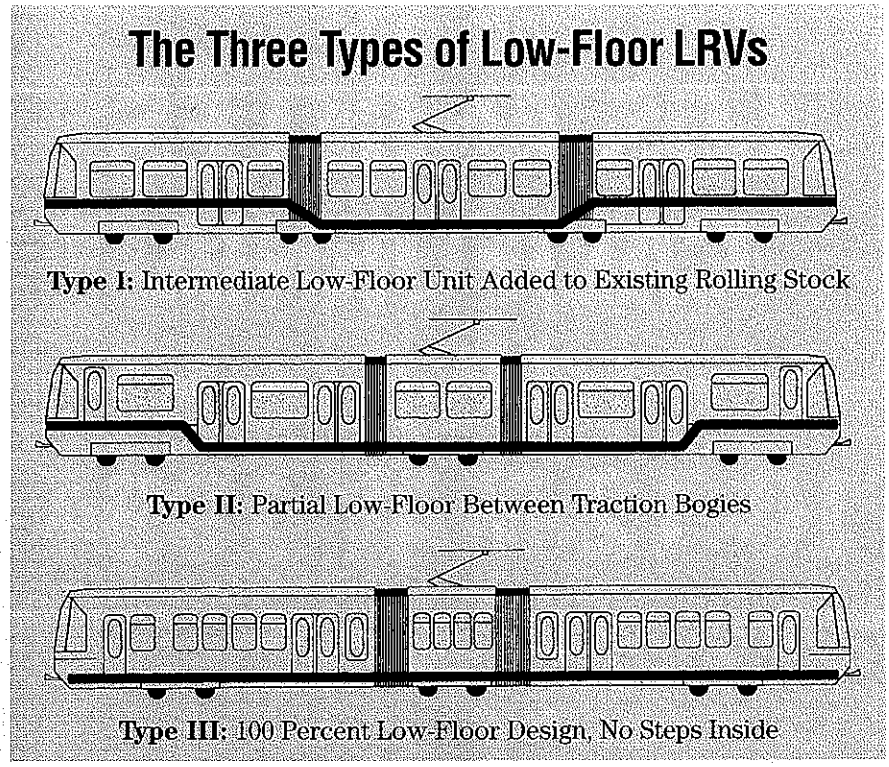
BY CLIFF HENKE

Even more than AC traction power, low-floored light rail vehicles are the hottest thing to hit the light-rail vehicle market. And although only one North American transit property has ordered this type of LRV so far—Tri-Met of Portland's award to Siemens Duewag for 39 cars—many others are giving low-floored LRVs serious consideration.

"Low floors [on LRVs] are going to take hold in North America just as they have in Europe," predicted Andrew Braddock, an executive with London Underground, in his presentation at "Light Rail 94," recently held in Birmingham, United Kingdom. "Indeed, the future of transit is electric and accessible."

Accessibility is key

The decision in Portland, OR, to purchase low-floor LRVs was based on a number of factors after extensive study and deliberation, but chief among them was accessibility, says John Post, deputy general manager for Tri-County Metropolitan Transit District (Tri-Met) in Portland. "Foremost of these factors was integrated operation of our entire light-rail system with the requirements of ADA," he says. Extensive consultation of Tri-Met's user groups, particularly those in the disability community, and extensive review of high-level platforms in American cities and of European properties that are currently using low-floor technology also figured prominently in the decision, he adds.



More than 1,000 low-floor light rail vehicles will be in operation by the end of 1994, according to Herve B. Chaine, CEO of the French engineering firm Semaly.

"What began to drive our decision to consider low-floor light railcars was that as we were making our bus fleet increasingly more accessible we observed our ridership, particularly among the disabled community, to be increasing," Post notes—by ten-fold in four years, to be exact. "Much of that increase occurred on our light-rail system, and the current method of access for wheelchair passengers is a lift." However, lift operation can be time-consuming and thus limits train headways.

In addition, Portland's first stab at better accessibility—street lifts that require vehicles to be in a perfect position to use them—resulted in even slower train operation than on-board lifts used in San Diego, for example. This further restricted the system's ability to increase train frequency.

The order will be used to serve Portland's Westside Project, which is an 11.4 mile extension of the existing Banfield Corridor. Like the Banfield project before it, the Westside extension is a joint highway/transit project, so that the LRT right-of-way runs in a grade-separated section of a highway corridor that will also be upgraded. The extension will consist of 11 new passenger stations, one of which will be in an underground section and

three will serve as intermodal transit centers for the neighborhoods they serve. Total cost of the Westside project is $688 million.

The Portland cars, which are married-pair articulated sets, will be similar in concept to those in Grenoble, France (see Type II diagram). Built by Siemens Duewag, they will feature short high-platform sections at each end of each car set, to accommodate the AC power traction gear, with a low-floor (14 inches above the rail) center section, where all four doors will be located.

These cars will require some modifications to existing stations in Portland. Boarding areas will be raised one to two inches higher than their current ground-level. Small door threshold plates will bridge the remaining gap between platform and railcar floor, in much the same fashion as ramps are used on new low-floor buses. Bridging this remaining gap is required by provisions of the ADA.

The low-floor design is achieved by supporting each articulation unit of the car pairs with four independent center stub axles. "We antici-

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Breda's new low-floor LRV is called the VLC, which features a 100 percent low-floor design.

pate the cars will not only improve service to the disabled community but also speed boarding for all passengers on the system," Post says.

The first of the 39 LRV sets are scheduled to be delivered to Tri-Met in September 1995, with the remainder throughout 1996 and completion of delivery slated for May 1997. The contract also calls for an option of up to 18 more cars valued at between $36.9 million and $41 million (depending on when Tri-Met exercises the option), to be used on future extensions of the LRT system that are in various stages of preliminary engineering and planning.

First low-floor LRV in 1987

Low-floored light rail is not exactly a new technology. Some of the earliest 20th Century streetcar and interurban railcar designs involved stepless entry. However, the advent of the motorman-as-fare-collector era made center entrances impractical, so the idea was eventually abandoned.

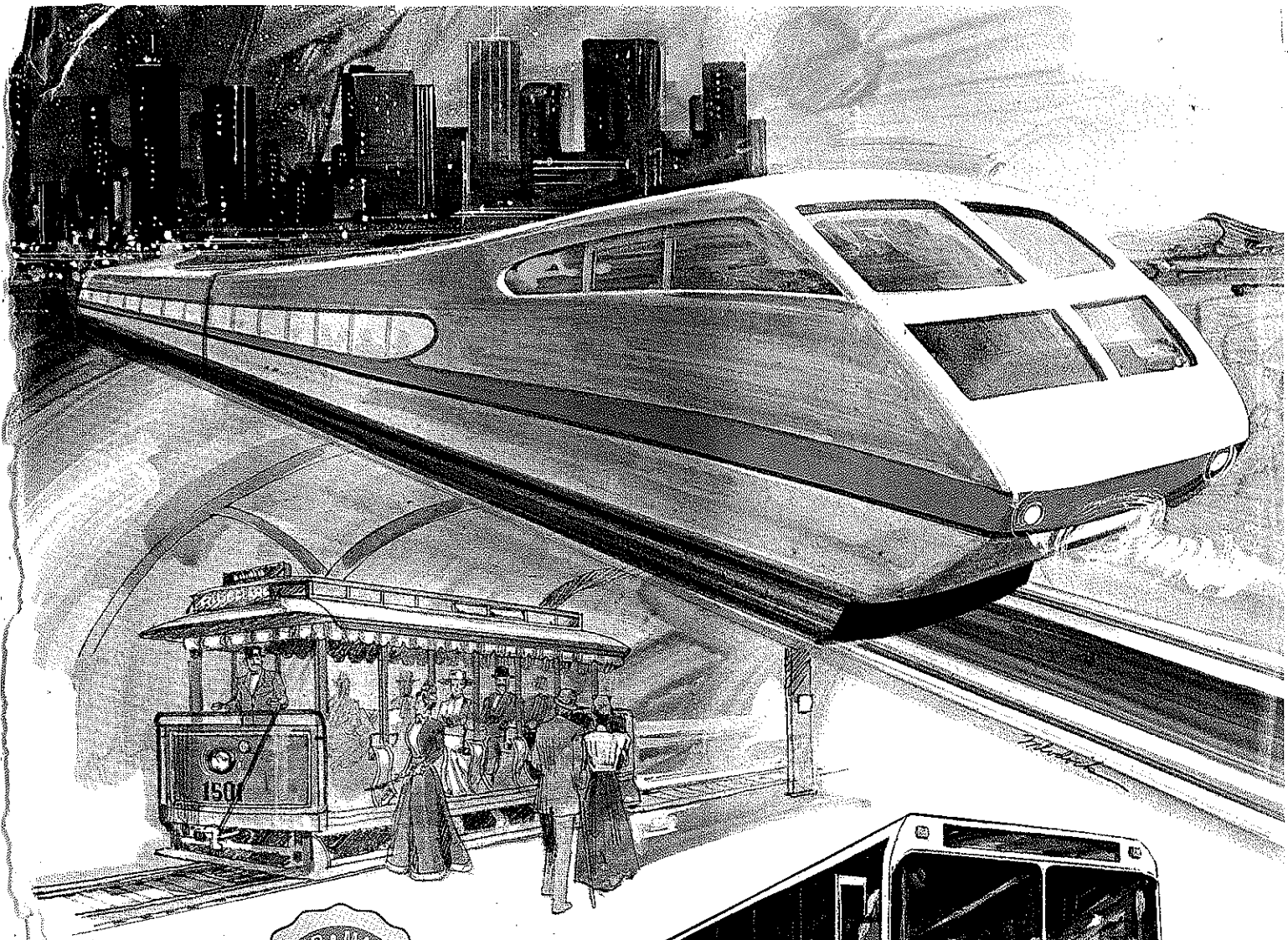
However, that was in a far less "politically correct" era and one in which the mobility impaired were not as politically or economically important a constituency to transit systems as they are today. In addition, the renaissance of barrier-free "honor system" fare collection schemes made center entry a possibility again.

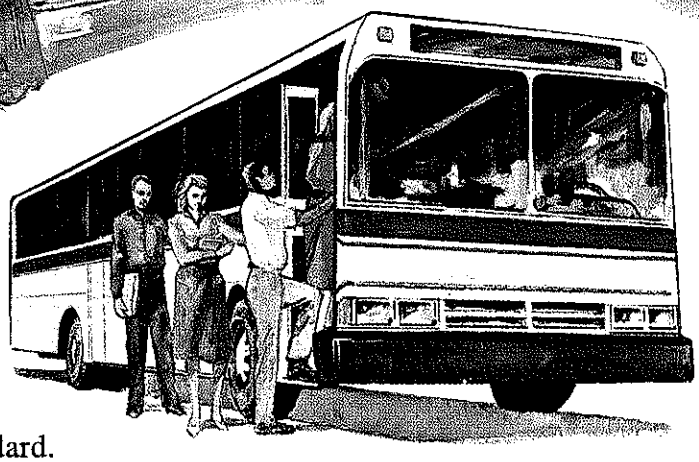
The first modern low-floor LRVs entered revenue service in Geneva, Switzerland, in 1984. Passengers still had one step to traverse, however, to reach the vehicle's floor, which was 48 centimeters (roughly 19 inches) above the street.

The first true stepless low-floor LRV was introduced in Grenoble in 1987 by the French railcar manufacturer GEC Alsthom. According to French engineering firm Semaly CEO Herve B. Chaine, "The floor height of 35 centimeters [under 14 inches] above the rail over the major part of the vehicle length can be reached without steps from the sidewalk, smoothly elevated at the stops."

Today, adds Chaine, more than 900 low-floor LRVs are in use in European cities. These can be categorized into two types of designs. The first, and least popular, consists of a low-floor articulated unit added between two high-floor cars. Approximately 150 of this design are in use. This type of car is in service in Amsterdam, Netherlands; Wurzburg, Darmstadt and Freiberg, Germany; Basel, Switzerland; and Nantes, France. Manufacturers include the Bombardier subsidiary BN in Belgium, Siemens Duewag and Linke Hofmann Busch of Germany, Schindler of Switzerland and GEC Alsthom.

The second type of low-floor vehicle is the most common in operation today, and is the kind that Siemens Duewag will deliver in Portland. Also manufacturing this





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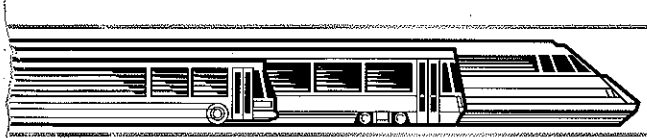

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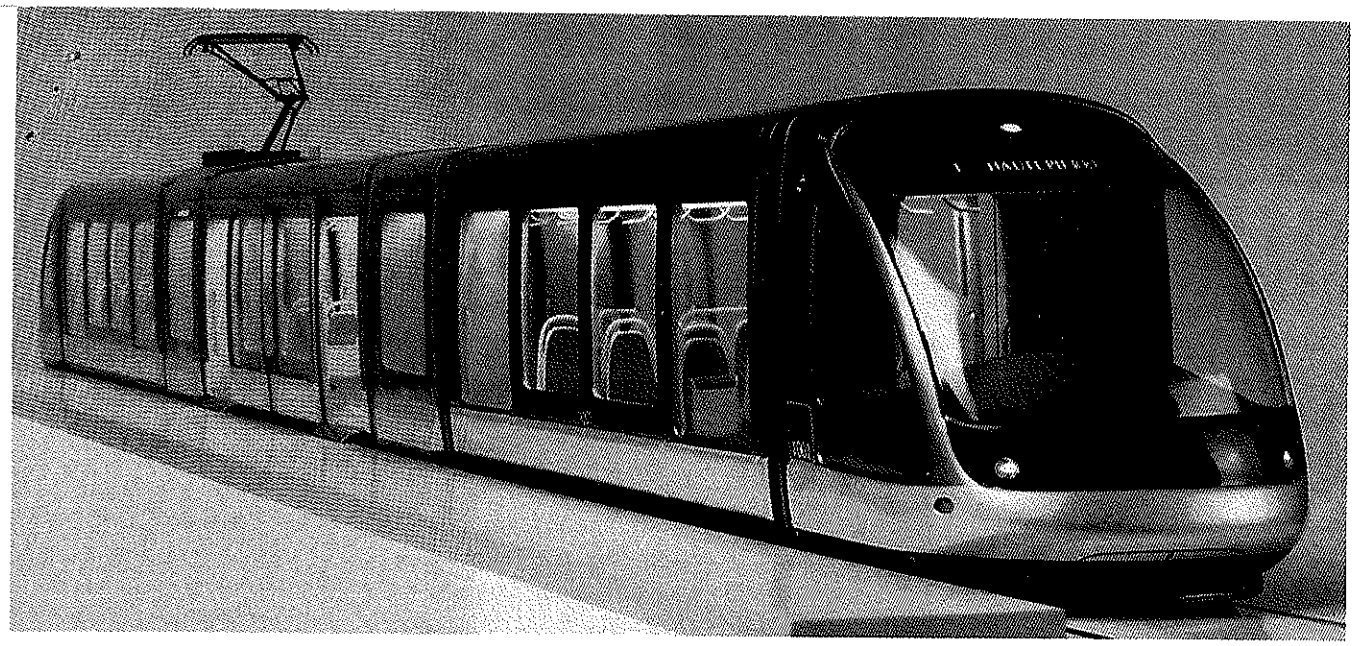

ABB Transportation Ltd., the British subsidiary of ABB Transportation, will introduce its 100-percent low-floor LRV in Strasbourg, France, dubbed "Eurotram." The prototype made its debut at the "Light Rail 93" meeting in Birmingham, England, last fall.

type of LRV are GEC Alsthom; Fiat/Firema and Socimi of Italy; Vevey and Asea Brown Boveri of Switzerland; and Linke Hofmann Busch, AEG Westinghouse and Deutche Waggonbau of Germany. More than 750 LRVs of this design are in service or on order in Europe, according to Chaine. (The latest to be delivered at press time are the Siemens Duewag cars for the Sheffield "Supertram," in the United Kingdom.)

The final, and newest, design is 100 percent low floor. Last year, Lille, in France; Brussels, Belgium; and the German cities Bremen and Frankfurt became the first cities to operate low-floor LRVs. This year, Strasbourg, France, and Munich, Zwickau and Braunschweig, Germany, will join their ranks. Vienna, Austria, and Turin, Italy, are scheduled to follow in 1995. In all, more than 400 all-low-floor vehicles have been delivered or ordered, with 120 additional cars under options, adds Chaine.

Now, at least four Europe-based manufacturers are actively courting North American cities for orders. "Low-floor vehicles, which have been developed in less than a decade, have brought a change in the technology of light rail unseen since the President's Conference Committee concept of the 1930s," declares Chaine.

Because the technology is so new and development has occurred so swiftly, there has yet to emerge one or two designs within these three types of vehicles that can serve as an industry standard. "At last count, and depending on how you count them, there are between 29 and 33 different designs," says Keith Chapman, manager, advance engineering, at Bombardier's Kingston, ON, research facility. Bombardier's Belgian subsidiary BN began delivering 100 percent low-floor LRVs to Brussels in September 1993.

Appropriate for North America?

However, some are concerned that the characteristics of the North American transit industry might not lend themselves to adopt low-floor technology as easily as Europe has. First, these skeptics are concerned about "buff strength," another term for tractive power or torque, which is needed because of quick acceleration to high speeds required in many North American cities.

Another concern is high-speed operation itself, which is virtually a separate kind of transit operation from many in Europe, says Chapman. "When I discuss this with my colleagues in Europe, they say, 'You keep talking about light rail but it is more like our heavy [metro]. We are talking about a *strassenbahn*, a streetcar, when you are talking about a *statbahn*. We run at 30 miles per hour and you want to run at 60 miles per hour.'"

"It is not the same equipment, and you begin to run out of space" for the heavier-duty equipment needed to run at higher speeds, he continues. "You find you need hydraulic braking, which is not popular with some people," but necessary in these applications, he adds. "You get to the point where you begin to run out of space to put the equipment."

Breda's answer in developing its new VLC low-floor vehicle was to take out some seated positions and place the needed componentry in the rear, similar to some of the low-floor bus concepts that locate the engine and ancillary components in a rear compartment or under a sloped floor. "There are a lot of constraints to be worked out before we see the full efficiency of a 100 percent low-floor car" applied to the North American experience on as wide a scale as in Europe, Chapman says.

But these challenges notwithstanding, "they are efficient," he and others say. According to studies for low-floor buses, passenger boarding on low-floor vehicles averages one to two seconds per passenger per stop—for non-wheelchair-using passengers, let alone the lift operating time for those using wheelchairs and other mobility aids.

In addition, low-floor vehicles are popular for all types of people who need special assistance on a given journey, ranging from those with shopping carts to those pushing children in strollers to those who simply aren't as spry as they used to be. For these reasons he and others believe that these technical challenges will be solved. It's simply too expensive any more for transit systems to keep adapting civil works, or to turn passengers away without them. M

Metro People


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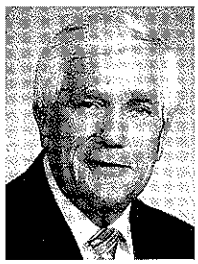
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Joshua N. Bennett has been named chairman of the *Trailways National Bus System.* He is president of *Capitol Bus Co.* in Harrisburg, PA.

Harold C. Jenkins, former general manager of the *Cambria County Transit Authority* in Johnstown, PA, has formed a transportation consulting firm, *Jenkins & Quinn,* in Johnstown. He is joined by **Michael A. Quinn,** former director of planning and marketing at Cambria.

Bradley T. Harslem has joined *Greyhound Lines Inc.* as vice president and chief information officer. He had been at *American Airlines.*

Dr. Minnie Fells Johnson has been promoted to deputy executive director of the *Miami Valley Regional Transit Authority* in Dayton, OH.

Richard G. Raymond has been appointed associate general counsel and assistant secretary of *General Automotive Corp.* of Ann Arbor, MI, parent of *The Flxible Corp.* He had been assistant general counsel for *Fruehauf Trailer Corp.*

Alfonso M. Pavese has been appointed vice president for purchasing and quality at *Carrier Transicold* in Syracuse, NY. **Randy Williams** has been appointed vice president of the company's Replacement Components Group.

The following appointments have been made at *Motor Coach Industries* new Coach Sales Group: **Bill Chaddock,** executive vice president of business development; **Sandy Baker,** vice president of U.S. coach sales; **Patricia Ziska,** director of customer relations; **Jim Morrison,** regional sales manager; and **Lois Kacprowski, sales coordinator.**

Ron Strickland has been named president and general manager of *Luminator Mass Transit.* **Gordy Treichler** has been named executive vice president of operations.

Kenneth Chmiel has been promoted to executive vice president for group business development at Morrison Knudsen Corp.'s Rail Systems Group.

Paul Larson has been named division vice president and responsible for all Mayflower Contract Services Inc. public transportation operations in the eastern United States. **Roland Mross** has been promoted to vice president for market development.

Gary Berkley has been promoted to assistant director of operations for the Transit Authority of Northern Kentucky in Fort Wright. **Andrew Discher** has been promoted to director of finance. **Terri Pierce** has joined the authority as risk manager.

William Lappalainen has rejoined Peter Pan Bus Lines Inc. as Washington, DC, regional manager. He had been president and general manager of Gold Star Tours in Norfolk, VA. **Colin Johnson** has been named general manager of Peter Pan Tours and Charters.