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Introduction of Articulated Buses Reverberated Throughout Metro

- 60-foot vehicles pose challenges for maintainers, but new technology saves Metro money
- [More>](#) Super-Sized Americans Place Strain on Metro Buses

By NED RACINE

(Nov. 28, 2007) Once upon a time, when Mike Bottone began maintaining buses, a bus was a bus was a bus. The size and complexity of Metro's 60-foot articulated buses changed all that.

Photo by Ned Racine



Mike Bottone, director of Equipment/Vehicle Acquisition, stands with a Metro 60-foot articulated bus. Bottone began working on the vehicle design in December 2002, three years before the Metro Liner began service on the Metro Orange Line.

Bottone, director of Equipment/Vehicle Acquisition, has worked 33 years at Metro. "When I started, the longest bus we had was a 40-footer. I think the newest bus we had in our fleet was a 1972 or 1973 Rohr Flexible at the old Division 15."

The decision to purchase the 60-foot articulated bus, also known as the Metro Liner, reverberated throughout Metro, affecting parking, fueling and maintenance. That decision was a broad effort to increase seating capacity and to improve service efficiency.

"We saw an opportunity through the bus manufacturers to go with a larger bus to increase that seat capacity while still maintaining a normal degree of maintenance on the vehicle," Bottone explained.

"[Now] you have one bus carrying 80 or 100 people where before [a 40-foot bus] only carried maybe 60 people; so you gain 40 people," he said. "You didn't have to have two buses doing the same thing."

More parts, more maintenance

Not surprisingly, the new 60-foot articulated giants require additional maintenance. They have more parts, including an extra axle, extra tires, extra braking system, large-capacity air conditioning system, more fuel tanks and three doors instead of two.

Even if the larger bus takes four hours longer to maintain over 6,600 miles—the maximum period between inspections—Bottone believes it saves Metro money.

Bottone points to another kind of economy from the 60-foot articulated buses. Rather than putting two buses on the road, each getting three miles per gallon, Metro can use one bus getting 2 miles per gallon.

"When you add that all up," he said, "what is normally an eight-hour inspection on a 40-foot bus (diesel) has now ballooned to almost 12 hours" for the 60-foot, CNG vehicle."

'Most technologically advanced vehicle'

"[Metro Liner] is probably the most technologically advanced vehicle when it comes to electrical and computer systems," he said. "We're looking at probably five computer systems that tie into the overall bus electronics system." Even the Metro Liner's air conditioning system has a computer.

One of the first challenges the divisions faced was parking the Metro Liners.

"Where do you store them?" Bottone said the divisions asked. "If you park two, you need the space for three 40-foot buses." Some divisions that have received the 60-foot buses have adapted by re-striping their parking places.

Fueling was another challenge. Even though Metro required the Metro Liner manufacturer to deliver a 60-foot bus that could use the same facilities as a 40-foot bus, some divisions still needed to upgrade their fueling facilities.

Then there was the challenge of servicing the articulated giants. "The hoists and the pits had to be changed," Bottone explained. Hoists for the articulated buses at Arthur Winston Division 5, for example, ranged from \$160,000 to \$185,000.

"When the first 60-foot bus arrived, there was only one location that had two pits that were long enough to accommodate a 60-foot vehicle, he said. "That was Division 7."

West Hollywood Division 7 operated less successful articulated vehicles in the 1970s and early 1980s.

For all their advantages on busy bus lines, the 60-foot articulated vehicles bring a built-in maintenance challenge: their weight. With more passengers comes more weight. "More weight is more strain on the engine, transmission, structure of the vehicle," Bottone said.

Keeping up with new vehicle technology, Bottone believes, is easier for him because he began as a mechanic. He also worked on a General Motors assembly line and saw how vehicles were changing.

"I look forward to the new advances," he said. "I embrace it."

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Super-Sized Americans Place Strain on Metro Buses

- Average passenger weight exceeds APTA guidelines – men by 21 percent

By NED RACINE

(Nov. 28, 2007) Mike Bottone, director of Equipment/Vehicle Acquisition, monitors the strain passengers put on Metro's 60-foot articulated buses. One strain neither he nor bus manufacturers can control is the weight of the passengers.

The American Public Transportation Association (APTA) has guidelines for determining bus capacity taking into account average passenger weight, but Bottone believes those guidelines are out of date.

APTA suggests manufacturers devote so many square feet and so many pounds to an average passenger. That measurement, conceived in the 1970s, was designed to accommodate 95 percent of the male and female riders. The average weight used was 150 pounds, Bottone noted.

“One hundred-fifty pounds by today standards, 30 years later, is a pretty minimum weight, compared to what some people are carrying around,” he said.

Bottone would be right. The National Center for Health Statistics reports the average weight of United States men over 20 years old is 190 pounds. For women over 20, the weight is 163 pounds.

“I do know, through the APTA meetings I’ve gone to, there has been some serious discussion about reviewing that [weight standard], Bottone said.