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VMR

– VALLEY METRO RAIL –

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Phoenix, a city with a population of 1.5 million, is a state capital located at the center of the State of Arizona, a southwestern state bordering Mexico. The city came into existence simultaneously with the start of an irrigation project in the latter half of the 19th century. The growth of Phoenix was triggered by hydraulic power development in the Colorado River area as part of the New Deal in the first half of the 20th century. Later, it developed further with the growth of munitions industries including aircraft and electric machinery. The city's weather is mild throughout the year; the summer is hot but dry, and mostly comfortable. This dry weather is suitable for the production of precision machinery. This characteristic, along with the closeness to a major consumption center, has helped the recent migration and development of electronic industries in Phoenix. The city is also attracting a national attention as a health resort. It is also endowed with many tourist attractions, such as many national parks nearby, monuments built by native Americans, and a street scenery redolent of its past in the age of pioneers. Furthermore, Phoenix has developed markedly as a resort for a longer stay, as conventions held in the city by various social organizations attract people from around the U.S. In sum, the city is developing at a striking pace, with the population of its metropolitan area (including such surrounding cities as Mesa, Glendale, Scottsdale and Tempe, exceeding 3 million and still increasing.

A New Means of Daily Transportation for Citizens

In Phoenix, LRT construction was planned as a means of improving traffic in the city. VMR is responsible for the development and operation of LRT. Kinki Sharyo contracted the design and manufacture of low-floor LRVs in 2003, and will deliver 50 trains in 2008 according to plan.

Phoenix has neither any subway lines nor any other railway systems, with only bus lines operated as a main public transport. Therefore, the LRT line, to be inaugurated at the end of December 2008, represents the first railway line in the city. The first stage of the plan involves the construction of a line, with an operating extension of about 32 km, which links the downtown Phoenix to Tempe and the western district of Mesa. The line will include 28 stations at first, with the construction of extensions envisaged in future. It is decided to call the line "METRO" as a result of a public invitation for the naming.

Located in the downtown Phoenix is Chase Field, the home field of Arizona Diamondbacks (MLB); as well as the home stadiums of Phoenix Suns (NBA) and Phoenix Mercury (WNBA). On the days of baseball or basketball

matches, many people will use LRVs to move from the suburbs to the downtown. Also, the main campus of Arizona State University (with about 60,000 students) is located in Tempe, and branch campuses of the university in the downtown Phoenix. Therefore, many students are expected to use LRVs.

Artworks made by more than 25 artists are used for the design of METRO stations. Also, a 1,535 ft. (470 m)-long bridge over Tempe Town Lake is provided with equipment to display tens of thousands of color patterns, enabling the creation of visual pleasure through lighting. This bridge is a symbol of METRO that emphasizes the use of artistic design.

Vehicle Characteristics

LRT vehicles mainly consist of 70% low-floor articulated cars composed of three bodies. The most important characteristic of the vehicle lies in its outer plate material. Ordinarily, such materials as steel plates, stainless steel and aluminum are used for the outer plates of most train cars. However, FRP panels are used for LRT vehicles to facilitate panel replacement in the event of damage to a vehicle. Also, this material has been selected to ensure the highly smooth finish of outer plates, by minimizing openings and level differences between adjoining panels and between a panel and a side window in the same bonding structure. FRP panels are also used for such parts as the front, side skirts and indoor side window areas and lintels. The material contributes to creating a vehicle design suitable for an ultramodern LRV by enabling a beautiful finish and a free design.

Regarding the external design, curved-surface glass is used for the front window, which is linked organically to FRP parts with smooth curved surfaces. Also, side skirts, a roof cover, a hood between bodies and other parts are used to secure a finish that is uniform over the entire vehicle. As for paint colors, silver black and metallic green are used in combination to follow the coloring of Valley Metro Bus, with which LRT shares common operation and fare systems.



As LRT vehicles run not on a special track but on a road track, the vehicle front is provided with an energy absorption construction similar to that of vehicles for New Jersey, to mitigate a shock from a crash and thereby ensure safety. The front lower part consists of an anticlimber cover and a bumper cover. When coupling vehicles or in the event of an emergency, the bumper cover is opened automatically, and a coupler stored in a folded condition is extended manually for use. A camera is installed at the tip of the anticlimber to enable an operator to monitor vehicle position from his/her seat in the above-mentioned operation. Other cameras are equipped on both sides of the front upper part to enable a safety check from the operator's seat for the rear parts of a train.

Large glass panels are used for side and side door windows to provide a fine view and a sense of freedom. Also, the vehicle has some features to give a spacious look to a carriage (e.g. the upper part of a stanchion pole has a sidewise curvature to mitigate an oppressive feeling resulting from the view of the carriage upper part). Further, a large window is provided to the partition between the cab and a carriage. One may suppose that "first class" compartments with a good view can be created by having seats on the high-floor area face the partition. In actual design, however, the seats face the entrance because, if otherwise, passengers may feel uneasy with their back directed to the entrance, where many people move in or out of the car. For Japanese, this consideration is interesting because it hints at circumstances in America different from their own regarding safety consciousness.

For the carriage, the highest priority was given to appearance, and efforts were made accordingly e.g. to reduce the use of fittings in areas easily visible to passengers, and minimize level differences and joints between parts. These efforts are based on a design concept that focuses on the reduction of accumulating dust, which contributes to improving the ease of cleaning.

As I have explained, many new and ambitious features have been incorporated into the LRT vehicles based on demands and directions from authorities, as well as Kinki Sharyo's voluntary proposals. These vehicles will debut simultaneously with the grand opening of the line toward the end of 2008. I hope that they will provide a railway service contributive to the development of Phoenix and the comfortable life of citizens.