

## Passenger and Vehicular Flow Analyses



*Retail Shopping Facility and Attached Rental Car Operation New Design*

**Client Name:** DFS Asia Group

**Date Started:** August 2003

**Date Completed:** October 2003

TransSolutions assisted DFS Asia Group in developing a combination retail shopping complex and rental car facility in Okinawa, Japan. The unique complex will provide the public with many conveniences: transportation to/from the airport via monorail, dining, convenient luggage handling, rental cars, and retail mall shopping.

A detailed discrete event simulation model was developed for the shopping complex lobby and attached rental car garage to identify bottlenecks in the design and generate alternative solutions to alleviate them. The tool was used repeatedly in the design cycle, and a final design was identified that minimizes cost while providing excellent level of service to patrons.

The primary mode of access to the shopping complex is the monorail, which connects to the airport. Other transportation modes include private cars, taxis, shuttle buses from neighboring hotels, rental cars, airport buses, and charter buses. There are several rental car agency counters located in the main lobby. Simulation was used to right-size the lobby and provide level of service measures under different demand scenarios.

The multi-level rental car garage is attached to the shopping complex. Eight rental car agencies use a consolidated 'ready and return' area on the ground level of the garage. TransSolutions determined the number of 'ready and return' parking spaces and required processing capacity of the quick turn around (QTA) area. Recommendations were made for the number of fueling positions, wash and vacuum bays, as well as the required number of overnight storage spaces.

DFS Asia Group used TransSolutions' simulation modeling capabilities as well as the detailed animations to support the design, and presented alternatives to retail operators as well as to the rental car agencies. The simulation model made it easy for all involved parties to understand the proposed flow. TransSolutions' detailed simulations had a significant impact in designing this new facility from the ground up, with the final design meeting all stakeholder requirements.