



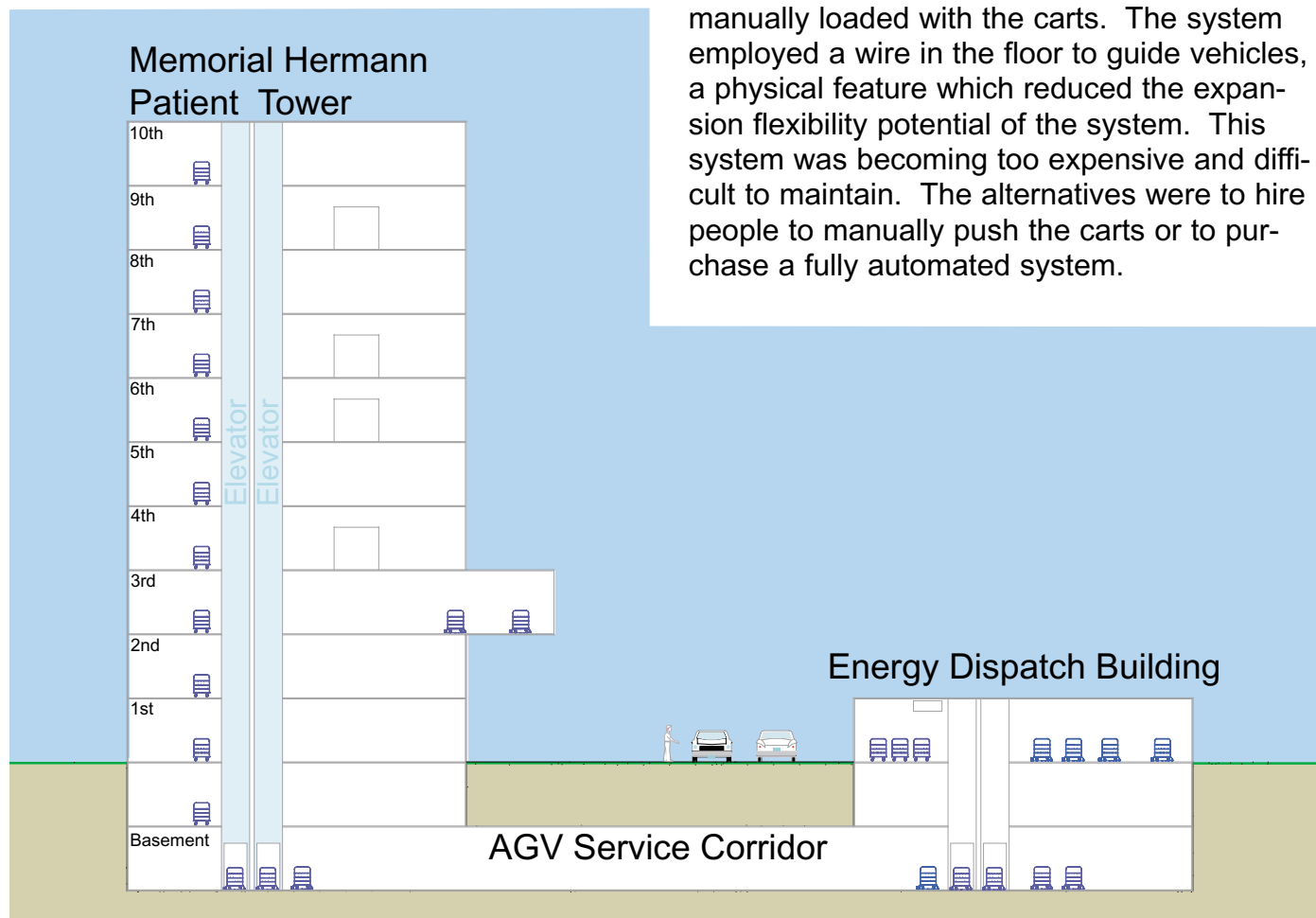
Memorial Hermann Southwest Hospital

TransCar AGV Robot System Automates Hospital Bulk Transport

As one of Houston's largest and most sophisticated suburban hospitals, Memorial Hermann Southwest has been serving this growing community since 1977. This 485-bed tertiary care facility features inpatient, outpatient and obstetrical services.

The Challenge

Memorial Hermann previously employed a 26-year-old automated guided vehicle (AGV) system that required 60-plus vehicles to deliver materials. The old system was inefficient at coordinating the vehicles, which also had to be manually loaded with the carts. The system employed a wire in the floor to guide vehicles, a physical feature which reduced the expansion flexibility potential of the system. This system was becoming too expensive and difficult to maintain. The alternatives were to hire people to manually push the carts or to purchase a fully automated system.



The Solution

Memorial Hermann Southwest selected TransCar automated guided vehicle system from Swisslog. The TransCar AGV is a robotic cart transport system featuring contour-following laser guidance system.

Each vehicle contains a microprocessor that electronically stores a virtual map of the hospital facility to ensure accurate navigation. This is combined with dual range laser obstacle detection at both ends of the vehicle to ensure safety and eliminate potential for facility damage. An added benefit of the contour-following laser guidance system is that, unlike other AGV systems, this one requires no wall targets, embedded wires, floor tape or other building modifications.

The Memorial Hermann system replaces more than 60 delivery vehicles from the previous system with 16 battery-powered, computer-controlled, laser-guided vehicles, which move tons of materials in carts including:

- Trash
- Clean and soiled linen
- Medical and surgical supplies
- Bio-hazard waste
- Patient meals and nourishment

AGV vehicles transport carts horizontally through a 500-foot long tunnel connecting the energy building and vertically via elevators to the hospital's 10-floor patient tower. In the tower, materials are delivered in a clean holding room located on one side of the elevator. Returning carts are picked up from the soiled holding room on the opposite side.

The "energy building" is located across the street from the patient tower and has loading docks situated out of the sight of patients. This building houses the kitchen, laundry, receiving dock and a warehouse. The remote dock at this facility increases flexibility for future expansion of the 485-bed tertiary care facility, which recently added a new radiology and surgery pavilion, and is planning a new heart and vascular institute.



In addition the TransCar Management system (TCMS) features a central PC computer that directs all vehicle movement, tracking, diagnostics and collects time and location data on all material movements. It dispatches the most opportune vehicle for pending cart movements maximizing travel efficiency.

The TCMS also monitors vehicle battery levels and routes them to automatic charging stations when required.



TransCar AGV with food carts

Results

Because the vehicles are in continuous communication with the central computer, a smaller fleet of TransCar vehicles (16 vs. 60) now do the heavy delivery work. The new TransCar vehicles also carry a heavier payload, allowing more materials per transport. Wear and tear on the building walls and elevator doors is reduced due to the new automatic interfaces. Best of all, the new TransCar system is in operation for 18 to 20 hours a day, 7 days a week providing a positive justification. Even at a fully burdened hourly wage rate of \$9.63 for material handlers, the system payback calculated in a post-installation study at 2.64 years. Over a 15-year period, the projected savings are projected at over \$11 million. This calculation includes cost of maintenance and battery replacements.

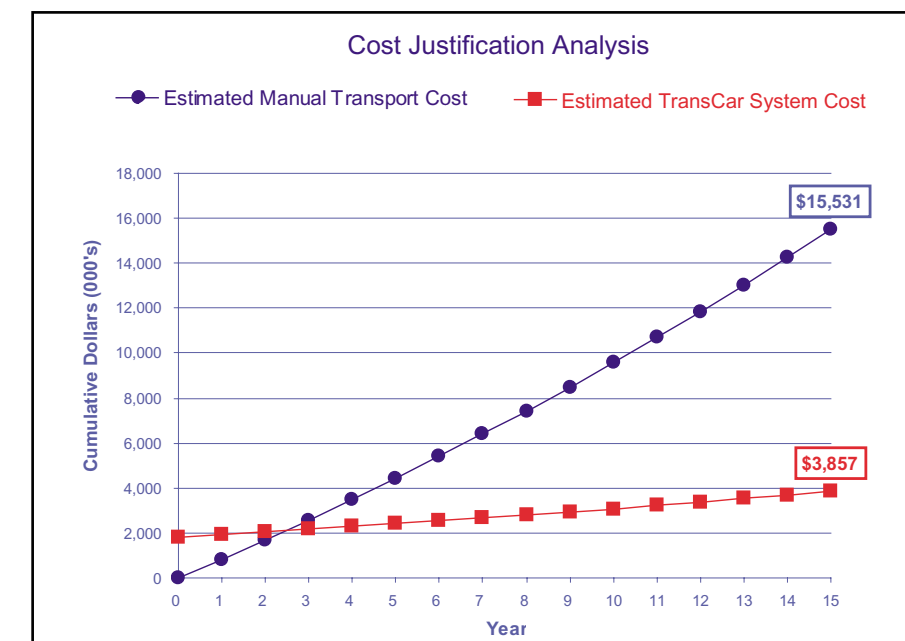
An additional money-saving benefit was realized when the existing fleet of carts only required slight modifications in order to adapt to the new TransCar vehicles. Swisslog Healthcare Solutions was chosen to implement the new system based on TransCar's flexibility, its fully automatic operation, service and support organization and projected savings over manual material transport operation.

Speaking on behalf of the Swisslog TransCar system performance, Memorial Hermann's



Director of Environmental Services said: "It serves an important function here. If we didn't have the AGV system, we would have to use trash techs, linen techs and other staff throughout the building. Being based in a separate building, the AGV system makes sense for us."

TransCar Provides Payback in 2.64 Years



TransCar AGV Major Features at Memorial Hermann Hospital

- Laser guided - contour following requires no reflectors, wires or tape
- Rapid charging NiCad batteries, provide continuous vehicle operation capability, up to 22 hours per day
- Dual-range obstacle detection slows vehicle travel speed or stops travel when encountering people and/or obstructions.
- Audible tones and voice recordings give notice of vehicle movements
- Turn signals and lights flash during travel
- Automatic interface with elevators and fire doors provides fully automatic operation
- Automatically delivers and retrieves carts weighing up to 1,000 lbs
- Operator dispatch panels queue cart deliveries, freeing staff and improving patient care
- WiFi communication between the vehicles and the central control computer maximizes system efficiency
- Easily reconfigured electronic guidance maps provides maximum logistics efficiency for accommodating future building changes



Elevators in the patient tower are dedicated to transport automatic guided vehicles between the hospital floors

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