

Summary

The baggage handling system can be divided into the following sub-systems: *check-in, security checking, DCV (destination coded vehicles) transportation, early luggage storing and baggage reclaim*. Three main types of baggage flows can be recognized in a baggage handling system.

Originating flow for the baggage moving from the check-in desks to departure gates, the terminating flow for the bags moving from the arrival gates to the baggage reclaim area and the transportation flow for the baggage moving between two different gates. To be able to control these different baggage streams a complex control structure is needed.

The Control structure of a baggage handling system exists out of three main layers. The lowest control layer deals with the movement and speed of the different components like conveyors and DCVs (destination coded vehicles). These controls get their information from sensors in the system, which detect the presence and the speed of a bag or vehicle at certain points in the system. The control systems in this first level are also known as movement controls. Above this level of control is a second layer which mainly deals with problems concerning merging and sorting of the bags. During the merging process several streams of bags are joined together into one single stream. During the sorting process one baggage stream is divided into several separate streams. Because sorting and merging of bags often involves a switch, these controls are called switch controls. The second layer of control stands in contact with the movement controllers and receives the information about the location and speed of the bags from there. The switch controllers are also connected to the highest level of control, the network controllers. This controlling unit monitors the complete network of conveyors and DCV tracks. It receives the information concerning the speed and location of the bags and the position of different switches from the switch controllers. The Network controller processes the incoming data and calculates a route for each bag. The route information is sent to the switch controllers which together with the information coming in from the movement controllers enables these control units to put the switches on the right spot for each bag and send the bags on the right path.

Although the current centralized control structure of the baggage handling systems can process the daily stream of baggage it doesn't enable the system to use its maximum technical capacity. At the current situation it is not possible to calculate an ideal path for each bag in the system. Computing limitation force the system to use just a number of known paths and certain alternatives routes. New developments in the field of decentralized control may provide the industry with solutions to optimize the route assignment process and baggage handling as a whole.