Summary

With the expanding airports, the passengers have to travel increasing distances. To decrease travel time the conventional moving walkways already have been used since the last decades. However, for distances longer than 200 meter, faster transportation systems are required. Different passenger transport systems are available for distances longer than 200 meter, for example busses, light rail, automated people mover, personal rapid transport or the accelerating moving walkway (AMW). An AMW is in fact a conventional moving walking where the speed accelerates to a high-speed section. The opposite occurs at the end of the walkway, where the speed smoothly decelerated to the same speed as a conventional moving walkway. For implementing such an accelerating moving walkway at an airport, the design rules and boundaries must be determined. Subsequently can be decide whether an accelerating moving walkway is competitive with other transport systems and to determine the best location is to install the accelerating moving walkway.

Since, the first high-speed walkway has been introduced in 1893; nowadays four types of AMW can be distinguished. Inline sequence belts are the first one. Each belt has a different speed, which causes the passengers to smoothly accelerate or decelerate. The longest belt is in the high-speed middle section, which section passengers reach after a few shorter belts. The entry and exit belt have exactly the same speed as the conventional moving walkway. The second type of AMW uses rollers to accelerate and decelerate instead of short inline belts. The high-speed middle section also consists of a high-speed moving belt. The third system uses plates that slide off each other to extend the walkway, which allow the system to accelerate. At the high-speed middle section, no plates cover each other anymore and the end the plates slide over each other and provide a safe exit. The fourth and last system uses parallelogram pallets to accelerate. The parallelogram pallets, which are keep parallel to each other, slide sideways in the accelerating/ decelerating zone. The passengers transported over the S-shaped walkway.

The characteristics and general aspects of the AMW are given to improve the system and to compare the system with other transport modes. The characteristics and aspects handled are capacity, speed, acceleration and deceleration, inclination, maximum length of the system, time, costs, safety, reliability and malfunction, environmental issues and weather conditions. All of those characteristics have their own influence whether an AMW will be implemented. The alternative systems where the AMW is compared with are bus, light rail, automated people movers, personal rapid transport, horizontal lift and the conventional moving walkway.

Since 2007 there are two high-speed moving walkways build, one in the Paris metro and one at Toronto airport. The first one is of the accelerating rollers type and the second one makes use of sliding pallets. An overview of the initiatives is given, which consist of all types of AMW systems. This

part includes a comparison between the five most promising systems and the reason for failure or abortion of the project is given.

Research at the Technical University Delft is discussed together with research at other research facilities. At the TU Delft there have been done research on component wear, multiple drives, intelligent control and the competitive of the AMW to other transport modes. Other researchers investigated intermediate entries and exits, user's experiences and human behavior on a moving walkway. Whether it is advisable to implement an AMW at an existing location at an airport depends on possible locations, airport layout, infrastructure demands, design boundaries /rules and limitation causes by human factors. A corridor is the best solution, but also some piers and parking areas could be suitable for AMW implementation.

For distances below the 200 meters, the conventional moving walkway is the best option. Above the 3,000 meters, other transport systems like light rail, train or bus may be a better solution. Between those values, the AMW is a good alternative for the automated people mover. The high capacity, relative low costs and the continuous character makes it even a better solution than the APM.

Passengers have to get familiar with the AMW before the maximum technical possibilities are possible. For longer distance, some extra research is necessary and a simple and proven technology is preferred. The system has to look familiar and require less experience for implementation and an international airport.