LETTING THE TRAIN TAKE THE STRAIN

News / Airports / Routes

Airport railway and monorail systems can be very complex but, as Keith Mwanalushi finds, advanced mobility solutions for major facilities in the Middle East are increasingly important.

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Rail transportation is gaining momentum across the Middle East North Africa (MENA) region. Investment is at an all-time high and rail projects are being prioritised at the regional, national and local levels.

The very best in rail technology was showcased at the recent Middle East Rail 2015 exhibition in Dubai. On display were the various solutions for airports, as well as cities.

“The Middle East continues to be one of the world’s most dynamic markets for rail systems, with upcoming projects ranging from airport people movers to urban mass transit and high-speed lines,” said Philippe Casgrain, Bombardier Transportation’s VP for Europe, Middle East and Africa, systems division.

In fact, Bombardier has established hubs in Dubai and Riyadh to support its customers in the region.

Airport projects include two applications of the latest Bombardier Innovia automated people mover 300 (APM) system and at Dubai International, a 1.3km turnkey system with 18 vehicles that will transport passengers between the existing terminal 1 and the new concourse 4.

Casgrain also said a 1.5km Innovia APM 300 system, with 10 vehicles, would run through the King Abdulaziz International Airport building in Jeddah, linking the main terminal to the international hub.

“Transit system development and integration is a complex undertaking,” he acknowledged. “System integration is the process of transforming operational requirements into a system configuration that best satisfies the operational needs.”

He continued to say that this incorporates all related technical parameters and interfaces in a manner that optimises the entire system. “It also combines the efforts of all engineering disciplines and specialities into one single engineering effort.”

To develop and implement rail transportation at airports, Casgrain stressed the importance of decision-makers having the right partnerships with a multi-disciplined team of transit experts.

“They must plan a realistic project schedule and forge working relationships that generate rapid decision-making, and interact effectively with contractors and project stakeholders,” he said.

“Bombardier has an experienced team of project managers with the mandate to successfully deliver rail system projects to the satisfaction of customers, project stakeholders and the community.”

Industry sources suggest that the MENA region is one of the world’s fastest-growing markets for rail and metro projects, with more than $35 billion-worth of contracts awarded in 2013. Projects planned or under way in the region are valued at just under $170 billion, including more than $50 billion-worth in Saudi Arabia and $35 billion in Qatar.

As Casgrain noted, there are some key considerations when planning railway or monorail system for airports. He said, when developing an urban or airport rail system, the first step was deciding on the approximate route for the system in terms of alignment, station locations and positioning of a maintenance and storage depot.

“Typically, the system operator, together with the municipal and or regional governments involved,

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will be responsible for these decisions based on the master plan for the airport," he said.
"Passenger forecasts will include ridership estimates between stations in each direction and station boardings and alightings at different times of the day and week."
With this data, planners would then determine how many vehicles/trains were needed, how often trains should serve each station at different times of the day and week, and how much electrical power would be required.
"They also must consider the size and shape of the maintenance and storage facilities, as well as the land available, power supply and distribution, and entry and exit points between depot and the mainline," explained Casgrain.
"Planners should carefully consider the likely future ridership growth as they create the initial design of the system and possibility of future expansion. With advanced planning, a system can be expanded easily without disrupting daily service," he advised.
The cost of developing and connecting rail systems can be a deterrent for some airports but there are also other economic benefits that can act as an enticement. For instance, airports that had implemented transit systems to provide passengers with a link to new terminals or satellites, generally improved connections to amenities such as car parking, regional transit, conference centres and hotels; and connected directly with the city centre.
"As passenger numbers continue to rise, improving services is the key driver for investment," said Casgrain. "This means providing train-to-plane solutions that help airports to manage passenger flows and reduce congestion."
In the cost-sensitive world of public transportation, Casgrain believes a turnkey transit system is the most efficient and comprehensive approach for mobility at airports.
Design-build-operate-maintain, (BDOM) concession contracting, and planning the whole life of the product and systems, are seen as attractive options. Casgrain said this allowed airports to optimise the system design and add value during the project execution stage; for example, by reducing energy consumption, decreasing fleet mileage and using less space for maintenance facilities and depot buildings. In an ideal set up, all the savings would then translate into lower capital and operational costs for the operator.
"Smooth and reliable connections for passengers provide stress-free and enjoyable travelling," he emphasised. He also said better passenger flow enhanced an airport's global reputation and resulted in increased air traffic and investment from airlines.
He continued: "A well-planned transit system that conveniently connects the airport with the surrounding city will have a positive impact on local amenities and retail vendors. Many airports become popular shopping and dining destinations with the local residents. An APM system, especially one with 24-hour operation, provides quick and comfortable mobility for members of the public, allowing them to easily access the hottest shopping spot in the city."
Bombardier's Innovia family of driverless systems also includes automated metro and automated monorail technologies. The company says these fit seamlessly in new and existing infrastructure, and meet the most stringent environmental and safety standards.
"With four Innovia systems currently in delivery in the MENA region, it's clear that this market has really embraced driverless technology."
Casgrain added: "The APM system can be supplied in many different configurations due to its customisable features and flexible operating modes, enabling it to meet the specific airport requirements. Sleek, aerodynamic vehicles can operate in coupled trains of up to six cars providing generous passenger capacities. The APM's advanced suspension and guidance system, coupled with rubber-tires, reduces noise and vibration to achieve exceptional ride quality. The propulsion system allows the trains to operate at speeds up to 80km per hour."
Bombardier is convinced that automated systems have reached a new level of maturity and are now seen as the most practical choice for airport and urban mobility. Casgrain said these systems had brought a number of benefits for operators and passengers, including improved safety, high

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reliability, head-ways as short as 60 seconds, and optimised energy usage.
“Automated scheduling means that day-to-day operations are easily adjusted to accommodate the changing traffic demands at peak times, weekends or for special events, resulting in shorter waiting times for passengers and maximum use of assets for owners. All functions are monitored from the control centre, affording split-second analysis and fast resolution should service disruptions arise,” Casgrain concluded.

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