Automated Vehicle Management System (AVM) for DoT Abu Dhabi

init

The Future of Mobility

Being a pioneer in environmental consciousness, the Emirate of Abu Dhabi developed a Surface Transport Master Plan to create an effective intermodal transportation system, contributing to the economic growth, quality of life and environmental sustainability over the coming years. The Emirate wanted to make its bus services more attractive, accessible and reliable. Therefore, Abu Dhabi's Department of Transportation decided to implement a Fleet Management and Real-time Passenger Information System. With INIT, they found a technology partner capable of fulfilling DoT's high requirements.

Department of Transport (DoT) Abu Dhabi

520 busses

113 service routes

50m passengers per year

High-end technology from INIT makes bus services in Abu Dhabi more attractive, accessible and reliable.

The task

As a fast growing city, Abu Dhabi had to face a corresponding growth in the volume of traffic. Well-known for their environmental awareness it was no surprise that strengthening public transport was one of the main goals of the Emirate's Surface Transport Master Plan (STMP). A key element is seen in the focused deployment of Intelligent Transportation Systems (ITS) in particular an Intermodal Transport Control System (ITCS). In order to find a technology partner to provide an Automated Vehicle Management System (AVM), as they call it in Abu Dhabi, the Bus Office of DoT performed an international tendering. The perfect partner was found with INIT.

The solution

INIT's permanent presence in the Middle East with a team of experts has enabled a fruitful cooperation with DoT when implementing the ITS system, consisting mainly of the Intermodal Transport Control System, the Real-Time Passenger Information system and the data management.

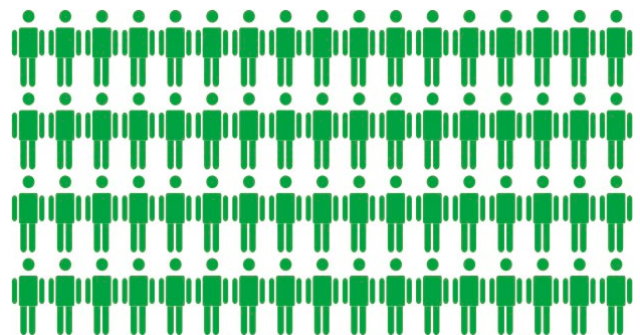### Sophisticated fleet management

The Intermodal Transport Control System (MOBILE-ITCS) allows the dispatchers in the Operation Control Center (OCC) to monitor and manage the fleet proactively. INIT was commissioned not only to deliver their leading-edge ITCS System but also to equip all DoT busses with modern on-board computers and to build up the complete Control Center including the server infrastructure, workstations and a large latest generation video wall enabling the dispatchers to keep track of the fleet situation in Abu Dhabi.

The ITCS system is the heart of operations, it provides a close overview of the fleet. Clear and concise displays provide all necessary information at a glance, enabling the dispatchers to quickly recognize disturbances. Comprehensive dispatching measures provide the tools to immediately restore services. The ITCS System itself is also capable of restoring the busses timetable adherence automatically, thus enhancing service quality remarkably for passengers to enjoy busses arriving on time.

A feature that has also contributed to smoother rides and satisfied customers is "connection protection" which makes taker busses wait for delayed feeder busses within a defined threshold. In this manner, passengers no longer have to worry about a connecting bus departing without them.

50 MILLION

passengers per year

Thanks to the foreseen intermodal interfaces, this will also work for connections with trams or the metro in the future and it will support DoT's strategy for an intermodal transportation network.

The system includes a 3-D map display providing the dispatcher with a more realistic picture of the location, and an Online Diversion feature that won INIT an ITCS Innovations Award and that allows for a straightforward approach to rerouting busses in case of a disturbance. Even more important, the INIT solution is capable of transmitting all information instantly to drivers and passengers automatically. The ITCS System also supports the prioritization at traffic lights giving the busses right of way at numerous key intersections. This has facilitated Abu Dhabi's goal of making the bus service more punctual, more reliable and more appealing for the passengers.

Analyzing operations

For being able to further optimize operations and service quality DoT needs sound information on the fleet's performance. MOBILEstatistics provides them the assistance demanded to evaluate and analyze their daily operations.

The on-board computer COPILOTpc2 fulfills DoT's high requirements.

520 BUSSES

Operational data captured by the on-board computers is set in relation to the schedule data imported from the planning system in order to create evaluations, based on individual stops, trips, lines or the entire network. Hence, a clear picture of the operational quality achieved is presented and opportunities for improvement can be identified easily. In addition, key performance indicators provide an instant understanding of the service quality delivered.

Further potential for service optimizations in terms of service frequency and vehicle sizes is demonstrated by the ridership counts of the Automatic Passenger Counting System, installed in parts of the fleet. In addition, the counts are compared with the data from the ticketing system to identify fare evasions and for being able to direct inspectors to the relevant areas.

Monitoring the entire ITS environment

MOBILEsymon helps system administrators to monitor the complex and often diverse environment of a modern intelligent transportation system. The comprehensive monitoring tool regularly receives status, warning or error messages from all connected components, and also shows information from related monitoring systems. It presents all information in an organized way. As a result administrators are able to keep track of the entire system on one user interface - allowing them to immediately detect problems and initiate the counter actions.

With the ITS system from INIT, passengers in Abu Dhabi benefit from a more punctual and reliable bus service.

Real-time passenger information for satisfied customers

To improve passenger information and therefore customer satisfaction, a Real-Time Passenger Information System will be implemented which will include wayside signs at many bus stops as well as a Journey Planner providing Internet users with personalized trip information, including real-time departures. This will improve the accessibility of DoT services dramatically and contribute to the overall objective to increase the market share of public transportation in Abu Dhabi.

State-of-the-art technology on the busses

In a first step, INIT equipped more than 500 busses with its on-board computer COPILOTpc2. New busses that DoT plan to purchase in the near future will also be equipped. The on-board computer COPILOTpc2 builds a vehicle IT-platform managing all ITCS functions like vehicle position calculation or schedule adherence. It also controls all peripheral devices in the vehicle such as destination signs and information screens, and it acts as central communication gateway for the Fare Collection System. Moreover, COPILOTpc2 controls the voice and 3G data radio communication. The use of public wireless networks was the key for the very fast system deployment.

Bus drivers operate all functions comfortably with the large 8.4" mobile data terminal, TOUCHmon, which provides clear and easy-to-understand menus supported by touchscreen technology. The drivers can even receive navigation support along their routes through their terminals via turn-by-turn instructions. The integrated fingerprint reader ensures that the correct driver takes charge of his duty.

System deployment on site

As in numerous other similar emerging metropolitan areas, modernizing the public transportation infrastructure in Abu Dhabi is part of large public investment programs. At DoT, numerous projects with very significant dependencies amongst each other evolve concurrently. Examples are, the systems for Scheduling and Rostering, Ticketing, ITCS, RTPI, Information Dissemination, Civil Construction and IT Infrastructure which run in parallel and demand highly responsive project management on-site. Another very important factor that has accompanied the deployment of this project was the change of management processes, which were necessary within the DoT organisation in order to adapt and expand their standard operating procedures. An intense training schedule that included staff from all affected departments was part of INIT's ITS Project.

The conclusion

Thanks to INIT's extensive experience in the implementation of large scale, complex ITS projects, the integrated ITS System could be developed, deployed, tested and validated successfully within a short period.

The project at a glance

DEPARTMENT OF TRANSPORT ABU DHABI

Intermodal Transport Control System

Real-Time Passenger Information

2D and 3D GIS

System monitoring

Evaluation and statistics

Data management

Automatic route survey

On-board IT platform

Vehicle health monitoring

TASK

- Implement an integrated Intelligent Transportation System to make bus services in the Emirate of Abu Dhabi more attractive, accessible and reliable
- Equip all DoT busses with modern on-board computers
- Build up the complete control center including the server infrastructure, workstations and a large video wall
- Integrate various third party systems

SOLUTION

- Installation of an innovative, integrated telematics solution

ADVANTAGES

- Sophisticated fleet management system
- High-performance vehicle equipment

If you would like to know more about this project and featured INIT products, please contact us at sales@initse.com. We look forward to hearing from you.

More than 600 customers worldwide rely on our integrated solutions to support them with their daily tasks

- *Planning & Dispatching*
- *Ticketing & Fare Management*
- *Operations Control & Real-Time Passenger Information*
- *Analyzing & Optimizing*

and they also benefit from our proven Service & Maintenance support.

INIT is the worldwide leading supplier of integrated planning, dispatching, telematics and ticketing systems for buses and trains. For more than 30 years, we have been assisting transport companies in making public transport more attractive, faster and more efficient.

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