Lower operating costs thanks to voice over GPRS

Local public transport companies are making increasing use of public mobile radio networks for data exchange and voice communications between the control center, the vehicles, and stop displays. Unlike a company’s own radio network, the public GSM/GPRS networks offer almost total geographic coverage. This enables existing route networks to be flexibly expanded without requiring any additional capital investment in the company’s own radio system, or regional route networks can be integrated in an urban multi-agency network.

Though such flexible public mobile radio networks offer many advantages, their operating costs for voice and data traffic must also be taken into account. Especially voice communications using the GSM service are very costly given the special requirements of local public transport operations. Making announcements to a route or a whole network requires parallel connection of a large number of exchange lines. Beside high installation costs in the control center, this also results in high base rates and connection costs.

Voice over GPRS offers convincing benefits that additionally help to reduce the operating costs for group communications. Voice over IP (VoIP) technology and suitable compression processes permit data and voice communications through package-oriented GPRS radio services. The advantage over GSM lies in the spontaneous build-up of a connection to a group of GPRS subscribers, which is crucial for live announcements to passengers and drivers. In addition, unlike GSM, sending a group call via GPRS does not require any exchange lines. To provide a fallback in the event of system failure, voice over GPRS can be combined with GSM or analog radio.

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**Easy to retrofit**

For supporting voice over GPRS, the VoIP-based voice system in the control center is fitted with a software (gateway) which compresses the voice packages and transmits them via GPRS to subscribers. The control center receives voice packages from subscribers in the same way.

The on-board computers in the vehicles and the stop displays are also equipped with an appropriate software (client), which converts the data packages into analog voice signals and broadcasts them via the audio system inside the vehicle or at the stop. Since this is a software solution, vehicles and stops can be easily and inexpensively retrofitted with voice over GPRS without the need for any additional hardware.

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**Prepared for the multi-agency network**

Voice over GPRS can also be combined with GSM or analog radio for existing ITCS systems from Trapeze or for integration in the network of an urban multi-agency authority. To this end, the vehicles can be operated in hybrid mode within the various radio networks. This offers transport companies additional flexibility in the dispatch planning of their vehicles.
**Product Information**

**Voice over GPRS**

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**Fully integrated operation in ITCS**

Voice communications with voice over GPRS can be operated directly from the ITCS system of Trapeze. The dispatcher can dial a route or selected group for making an announcement without having to worry about which service has to be used to reach the vehicles or which vehicles are currently running on the relevant route. The control system continuously calculates group allocation of the vehicles and the service (GSM, GPRS, or analog radio) that can be used to reach them. The dispatcher can thus concentrate completely on the traffic situation and provide passengers and drivers with efficient information.

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**Continuous support for all types of connection**

Beside announcements to groups, voice over GPRS also allows bi-directional calls to be made between the control center and drivers or between several drivers. Such calls are established by the dispatcher at the drivers’ request. Communication via GPRS takes place on a semi-duplex basis using the driver’s push-to-talk (PTT) key. Calls between vehicles using different radio technology can be switched by the dispatcher through the central voice over IP system.

However, in voice communications via GPRS, interruptions of two or three seconds must basically be expected when a vehicle passes from one radio cell to another. In voice announcements, this effect is prevented by appropriate buffering of the flow of communication so that transmission without any gaps is ensured.

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**High availability**

Voice connection availability to the vehicles is of major significance for urban public transport companies. The VoIP system has been designed for redundant standby operation. With the appropriate equipment, the vehicle on-board computer automatically selects the currently available radio technology. This ensures permanent availability of voice communications even in the event of a subsystem failure.