

### Overview



400 vehicles



850 stops



15 tram lines



51 bus routes



1,800 employees



162m passengers per year

### Industry

Tram and Bus,  
Rhine-Neckar, Germany

### Challenge

Standardise equipment and technology to coordinate cities and rural areas.

### Solution

Trapeze Intelligent Transport System (ITS), On-Board Computers, Digital Radios

### Results

- ✓ Automatic Vehicle Location and Control (AVLC)
- ✓ SmartInfo passenger signs (RTPI)
- ✓ Automatic passenger counting
- ✓ Transfer protection
- ✓ Traffic light preemption

### Background

The RNV Transport Authority operates with approximately 400 vehicles, 850 stops, 15 tram lines and 51 bus routes. The company employs more than 1800 people and carries 162 million passengers a year.

### Challenge

The AVLC of the Rhein-Neckar-Verkehr GmbH facilitates the joint planning of schedules and duty rosters for the cities of Mannheim, Ludwigshafen, Heidelberg and Weinheim as well as the regions of Rhein-Neckar, Rhein-Pfalz, Bad Dürkheim and Bergstrasse. The central control centre in Mannheim coordinates all routes and is based on a TETRA-Motorola digital radio system.

### Solution

The system was implemented in two stages. The first stage involved upgrading and installing 20 vehicles with IBISplus on-board computers and commissioning the digital radio system. Stage two dealt with the introduction of LIO, complete refitting of the vehicle fleet, digital passenger information, duty planning and the interface to driver scheduling.

The functionalities

- LIO AVLC system
- Modern IBISplus on-board computers, partly with GPR
- GPS location
- Geographic Information System (GIS)
- Traffic light preemption
- Transfer protection
- Passenger information: SmartInfo stop signs, passenger information via the Internet and cell phones
- Data supply with LIO-Data
- Loading the vehicles with software and data using wireless LAN (WLAN)
- Statistical evaluation tool (ISAS2)
- Automatic passenger counting





## The system at a glance



### Control centre

9 dispatcher workplaces, 5 data supply and statistics workplaces, 17 info stations



### Radio system

TETRA-Motorola digital radio system; 9 base stations



### Vehicles

190 trams and commuter trains, 200 buses



### Dynamic passenger information

200 SmartInfo signs with audio



### Depots

12 in total, equipped with WLAN, DDM frontends



### Third-party components

Planning program (Interplan)

Passenger counting (Hamburg Consult)

Ticket printer

Trouble report and error management system

(Nettropolis, NettroBME)



### Software interfaces

Planning programs, multi-agency (VDV454)

SAS2 statistics program

Passenger counting

Import driver and duty data (VDV 455)

## Results:

- Automatic Vehicle Location and Control (AVLC)
- SmartInfo passenger signs (RTPI)
- Automatic passenger counting
- Transfer protection
- Traffic light preemption

“The AVLC from Trapeze allows us to centrally coordinate four cities and four rural areas across three counties. We use standardised modern on-board equipment including the latest in on-board computers. Our passengers particularly like the SmartInfo signs at the stops.”

Dr Peter Raue, AVLC Project Manager, Rhein-Neckar-Verkehr GmbH

## TRAPEZE GROUP

Trapeze Group works with public transport agencies and their communities to develop and deliver smarter, more effective public transport solutions. For more than 25 years we have been Here for the Journey, evolving with our customers around the world to helping them move people from point A to Z, and everywhere in between.

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