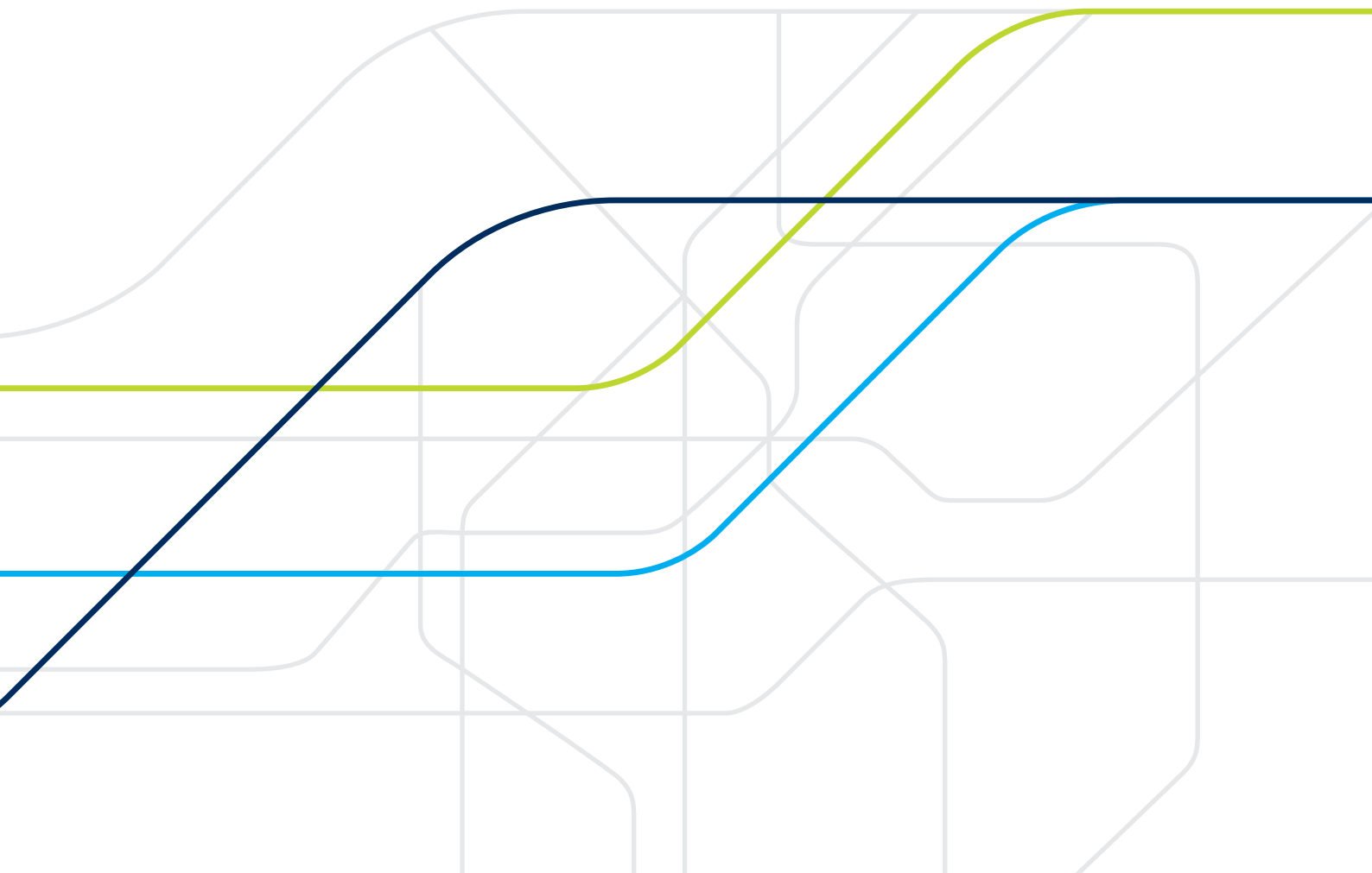


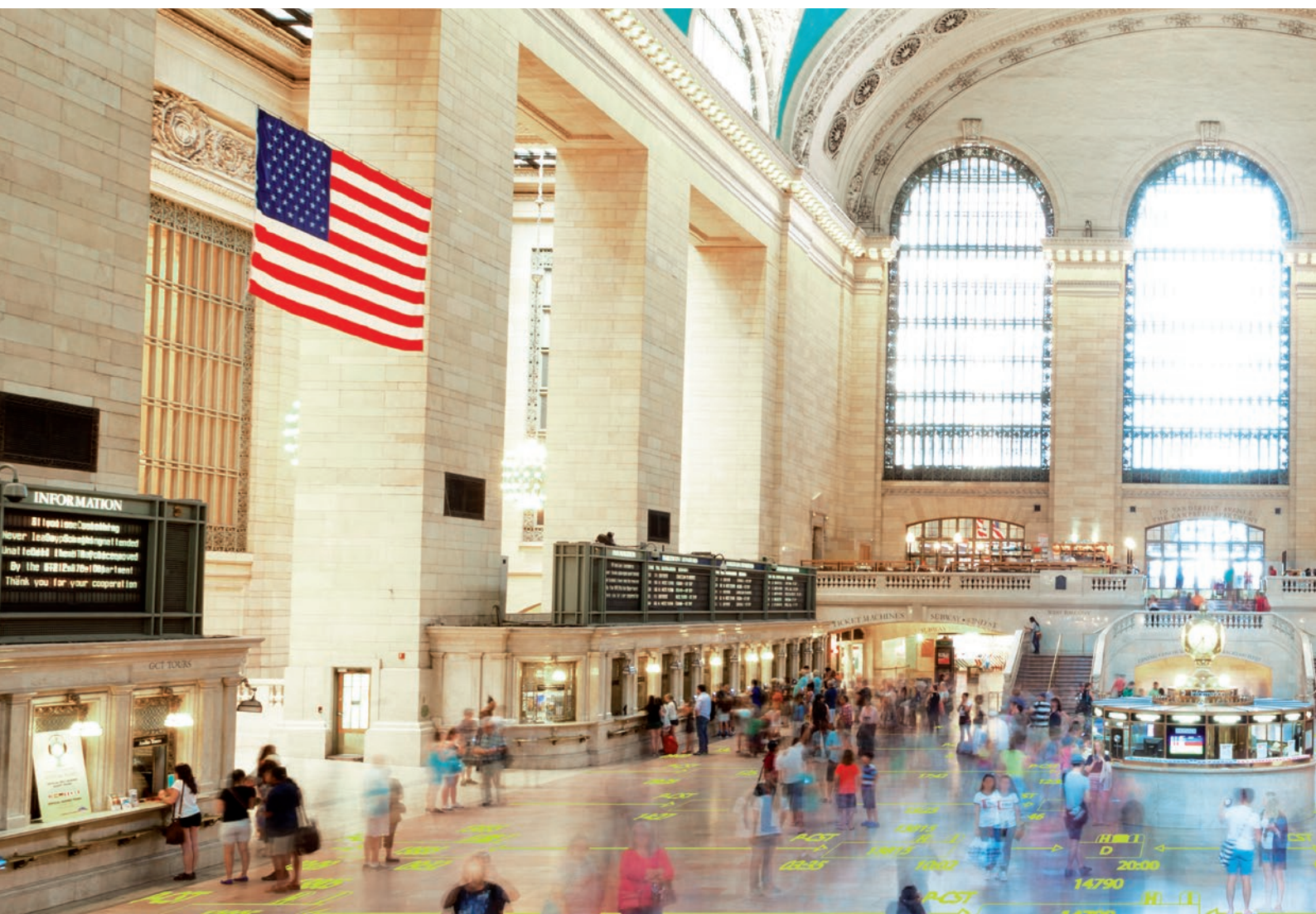
# INTEGRATED IT SYSTEMS FOR BUS AND RAIL



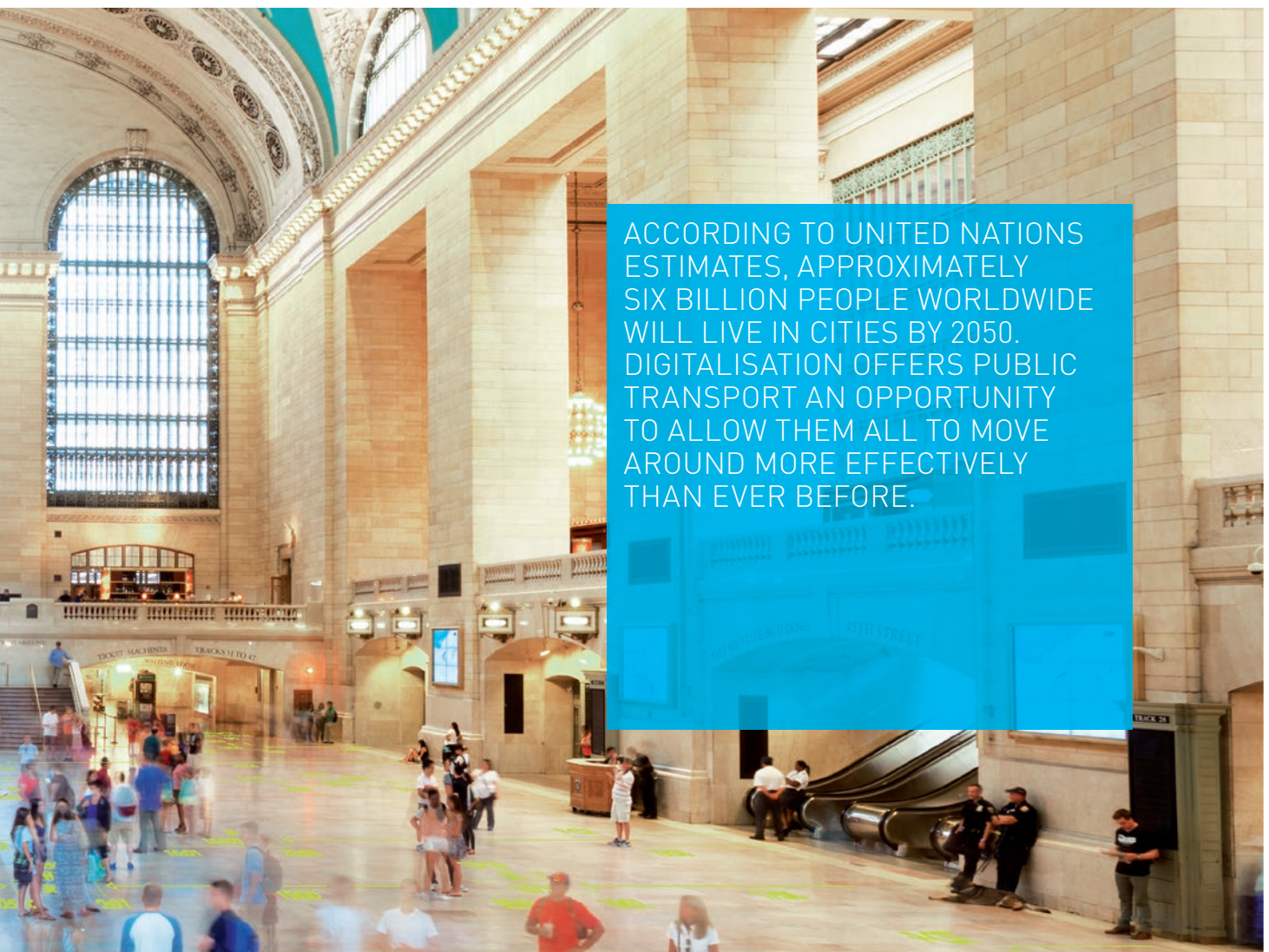
# TRANSPORT EXPERTS MOVING PEOPLE

Public transport helps people connect. Every day, millions of people around the world use its services to reach their destinations – work, school, meeting friends or visiting family. Buses and trains bring people together. In an age of urbanisation with cities expanding ever further, they are the lifelines of modern society. They are prerequisites for a high quality of life as well as for economic growth and sustainability.

At the same time, mobility is constantly changing. From horse-drawn carriages to metro systems, the main aim of transport has always been to get from one place to another as quickly and easily as possible. Continuous innovation is a key characteristic of public transport. Digitalisation presents an opportunity to transport people in entirely new ways. IVU systems help transport operators to provide the best possible services and safeguard the long-term future of mobility.



PUBLIC TRANSPORT  
BRINGS **CITIES** TO LIFE. IT  
KEEPS PEOPLE MOVING  
AND CONTRIBUTES TO A  
CERTAIN **QUALITY OF LIFE**.  
USING BUSES AND TRAINS  
EFFICIENTLY REQUIRES  
**RELIABLE IT SYSTEMS**.



ACCORDING TO UNITED NATIONS  
ESTIMATES, APPROXIMATELY  
SIX BILLION PEOPLE WORLDWIDE  
WILL LIVE IN CITIES BY 2050.  
DIGITALISATION OFFERS PUBLIC  
TRANSPORT AN OPPORTUNITY  
TO ALLOW THEM ALL TO MOVE  
AROUND MORE EFFECTIVELY  
THAN EVER BEFORE.

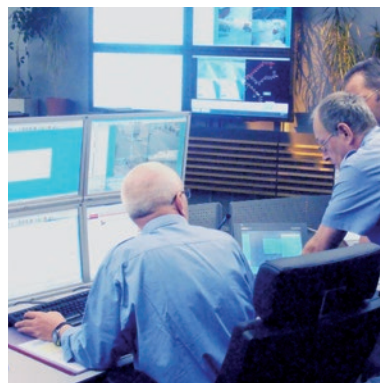
# WE UNDERSTAND YOUR BUSINESS

Whether with five vehicles or fifty, a dozen employees or ten thousand, two routes or two hundred: transport operators do something admirable every day. We know the challenges that you face.

The process of planning resources amounts to a puzzle in itself. Before the first bus or train can set off, planners have to draw up complex timetables, vehicle schedules and duties. Ticketing has to be organised and ticket prices set. Dispatch managers take care of the deployment of vehicles and employees, while fleet management responds to disruptions, swaps vehicles and rearranges routes so that everything runs

smoothly. Background systems ensure that passengers are kept up to date with accurate real-time information. The final step is settlement with the public transport authority in accordance with the agreed contract. Several key aspects must be kept in mind at all times: customer expectations, employee requests and, last but not least, the financial efficiency of the operation as a whole.

To handle all this, IVU offers high-performance solutions. We help you to keep all requirements manageable and to fulfil your tasks as effectively as possible.



**FLEET  
MANAGEMENT**



**PLANNING**

**DISPATCHING**



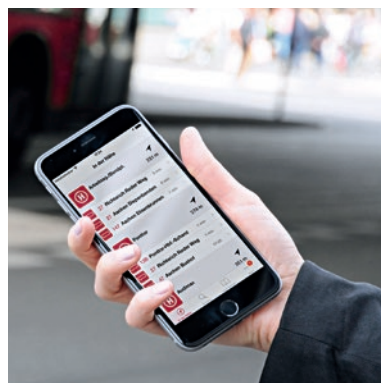
CREATING CONSISTENT  
TIMETABLES, ENSURING THAT  
CONNECTIONS CAN BE MADE,  
UPDATING PASSENGERS IN  
REAL TIME: TRANSPORT  
OPERATORS PERFORM  
**HIGHLY COMPLEX TASKS.**  
THIS REQUIRES A PASSION  
FOR DETAIL AND A CLEAR  
OVERVIEW OF THE BIG PICTURE.



## TICKETING



## PASSENGER INFORMATION



## CONTROLLING



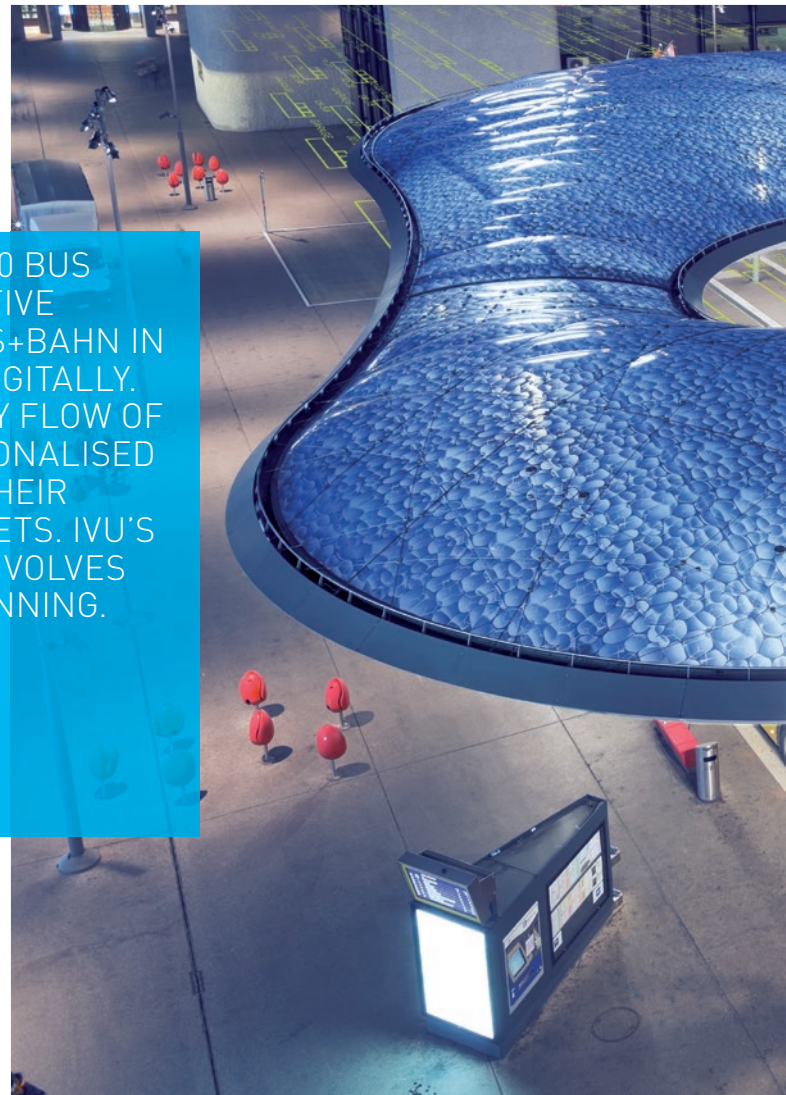
Next trains				07:23:07	
Platform	Westbound	Platform	Eastbound		
	Towards Central London		Towards Shenfield		
1	London Liverpool Street	1 min	Shenfield	9 mins	
	London Liverpool Street	11 mins	Shenfield	19 mins	
	London Liverpool Street	21 mins	Shenfield	29 mins	
	London Liverpool Street	31 mins	Shenfield	39 mins	
To help reduce flooding due to:				12 °C	

# STANDARD SOFTWARE FOR INDIVIDUAL REQUIREMENTS

Transport operators' requirements are as diverse as the regions in which they operate. IVU systems offer all the benefits of a standard solution, such as minimal development outlay and predictable project durations. At the same time, thanks to their modular structure, they can be easily adapted to suit individual needs. Tailor-made interfaces provide connections to peripheral systems. IVU solutions fit seamlessly into any environment and are ready for use immediately.

EVERY COMPANY IS DIFFERENT. THE **STANDARD SOLUTIONS** FROM IVU ADAPT ACCORDINGLY. FOR OUR SCALABLE SYSTEMS, **NO CHALLENGE IS TOO BIG OR TOO SMALL.**

THE APPROXIMATELY 170 BUS DRIVERS AND LOCOMOTIVE ENGINEERS AT AAR BUS+BAHN IN SWITZERLAND WORK DIGITALLY. THEY RECEIVE A STEADY FLOW OF UP-TO-DATE AND PERSONALISED INFORMATION ABOUT THEIR DUTIES VIA THEIR TABLETS. IVU'S INTEGRATED SYSTEM INVOLVES THEM DIRECTLY IN PLANNING.



# IVU.SUITE

## SERVICE PLANNING

**IVU.timetable**  
Network and  
timetable planning

## RESOURCE PLANNING

**IVU.run**  
Vehicle scheduling

## DISPATCHING

**IVU.vehicle**  
Vehicle dispatch

## FLEET MANAGEMENT

**IVU.fleet**  
Control centre

## TICKETING

**IVU.fare**  
Tariff management  
and fare collection

## PASSENGER INFORMATION

**IVU.realtime**  
Dynamic passenger  
information

## CONTROLLING

**IVU.control**  
Accounting and  
reporting

**IVU.pool**  
Data integration

**IVU.duty**  
Duty scheduling

**IVU.crew**  
Personnel dispatch

**IVU.cockpit**  
On-board software

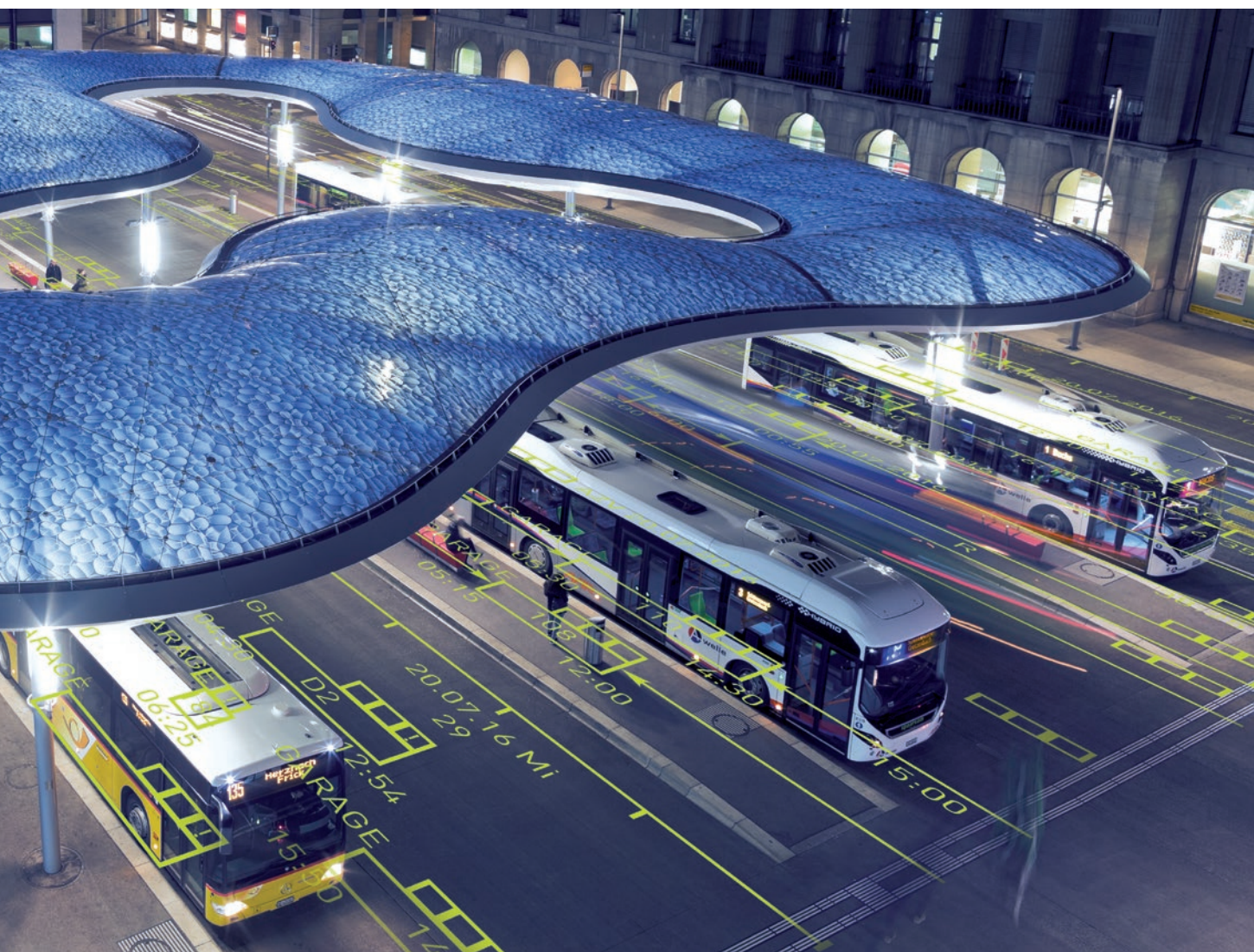
**IVU.ticket**  
On-board ticketing

**IVU.journey**  
Integrated journey  
planner

**IVU.pad**  
Digital workplace

**IVU.box**  
On-board unit

**IVU.validator**  
E-Ticketing  
terminal

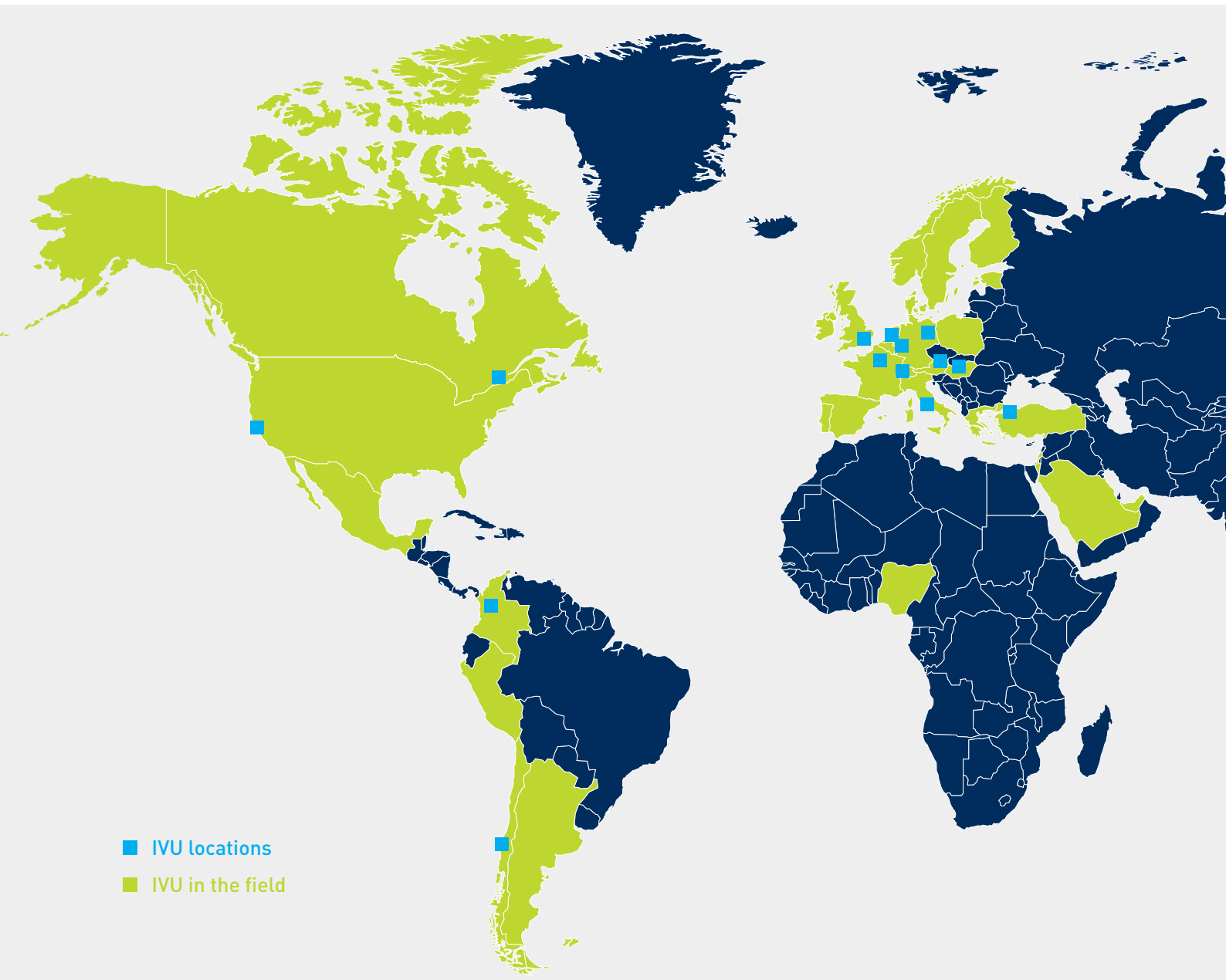


# MADE IN GERMANY

## MOVING THE WORLD

Engineering ingenuity, IT expertise and mathematical research are the cornerstones of systems that enable public transport to flow smoothly. More than 500 customers trust this tried-and-tested combination.

With more than a dozen locations worldwide, IVU is always near at hand for its customers. Our team includes employees from more than 20 different countries. No matter the location, we speak the language of transport operators and understand their needs.



## LOCATIONS

**BERLIN** (HEADQUARTERS, DE),  
**AACHEN** (DE), **OLTEN** (CH), **VIENNA** (AT),  
**VEENENDAAL** (NL), **PARIS** (FR),  
**ROME** (IT), **BIRMINGHAM** (GB),  
**BUDAPEST** (HU), **ISTANBUL** (TR),  
**MONTREAL** (CA), **SAN FRANCISCO** (US),  
**BOGOTÁ** (CO), **SANTIAGO** (CL),  
**HANOI** (VN), **HO CHI MINH CITY** (VN)



## SELECTED REFERENCES

### **BKK, BUDAPEST (HU)**

The Budapest transport authority uses **IVU.suite** for fleet management and passenger information for approximately 2,500 vehicles. Thanks to **IVU.xpress**, the project duration was less than two years.

### **BVG, BERLIN (DE)**

In Berlin, **IVU.realtime** provides live bus and tram departure data while **IVU.plan** optimises vehicle and crew deployment, including for the city's lifeline: its famous yellow metro.

### **MIO, CALI (CO)**

Planning and dispatch, fleet management, passenger information and controlling are all carried out using **IVU.suite** for the BRT system in Cali, a Colombian city of two million people.

### **STIF, PARIS (FR)**

The Syndicat des transports d'Île-de-France uses **IVU.plan** to manage transport services in the metropolitan area of Paris – entirely within the **IVU.cloud**.

### **TFL, LONDON (GB)**

Transport for London uses **IVU.realtime** to keep its passengers informed. Real-time data from more than 8,500 buses is available online, via apps and on displays at 19,000 stops.

### **VBZ, ZÜRICH (CH)**

Individual duties for approximately 1,400 drivers: With **IVU.crew**, Verkehrsbetriebe Zürich involves its employees directly in the planning process.

### **VIA RAIL, MONTREAL (CA)**

The Canadian railway company uses **IVU.rail** for central duty scheduling and dispatch – with optimisation included.

### **VNR, HANOI (VN)**

The Vietnamese state railway company relies on the modules from **IVU.rail** for all planning and dispatch tasks as well as fleet management and passenger information.

# GOING FURTHER WITH IT SOLUTIONS

There are few things as complex as a transport operator's day-to-day business. Customers, public transport authorities, employees – all have high expectations that need to be taken into account. There are many questions that shape the work of a planner: Are seven vehicles really needed for this route? How can drivers and vehicles be deployed to minimize unnecessary downtime and dwell times? Above all, how can passengers be offered the best possible service while keeping costs under control?

Digitalisation helps to overcome these challenges effectively and improve services. Planning and

deploying resources, managing operations, informing passengers, settling services – every task and process benefits from the possibilities offered by digital systems.

With IVU's smart IT solutions, transport operators can realise their full potential. Vehicles communicate independently with the control centre and dispatchers respond to disruptions in a matter of seconds. Passengers and drivers can be informed about changes at the click of a button as payroll accounting processes duty changes immediately. Everyone benefits: customers, employees and operators.



EACH NEW ROUTE, BUS  
OR TRAIN INCREASES  
COMPLEXITY. SMART  
IT SYSTEMS HELP YOU  
MAINTAIN AN OVERVIEW  
AND OFFER PASSENGERS  
AN OPTIMAL SERVICE. IN  
THIS WAY, YOU CAN ACHIEVE  
**MORE WITH LESS.**

MORE THAN 180 MILLION  
PASSENGERS USE THE  
ROTTERDAM METRO EVERY YEAR.  
EN ROUTE, INFORMATION ABOUT  
THE NEXT CONNECTION IS EASILY  
AVAILABLE, THANKS TO REAL-TIME  
DATA – GATHERED AND DELIVERED  
BY IVU SYSTEMS.



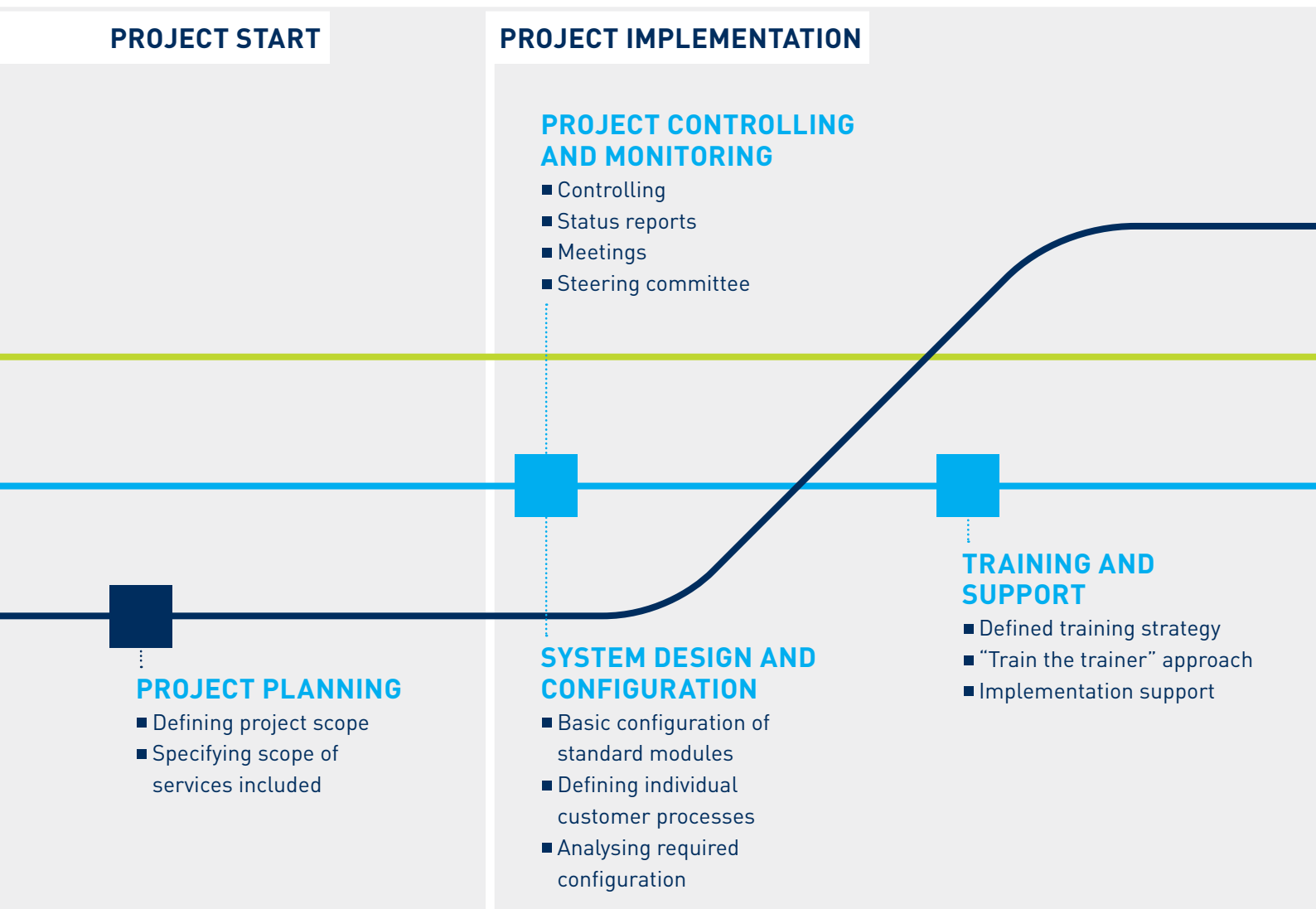
# ON THE FAST TRACK TOGETHER

Successful IT projects are based on trust. We value that and work in partnership with our customers. Whether it involves city, regional or long-haul transport, each project receives our full attention. We work together to analyse the specific project needs and identify the best possible solution.

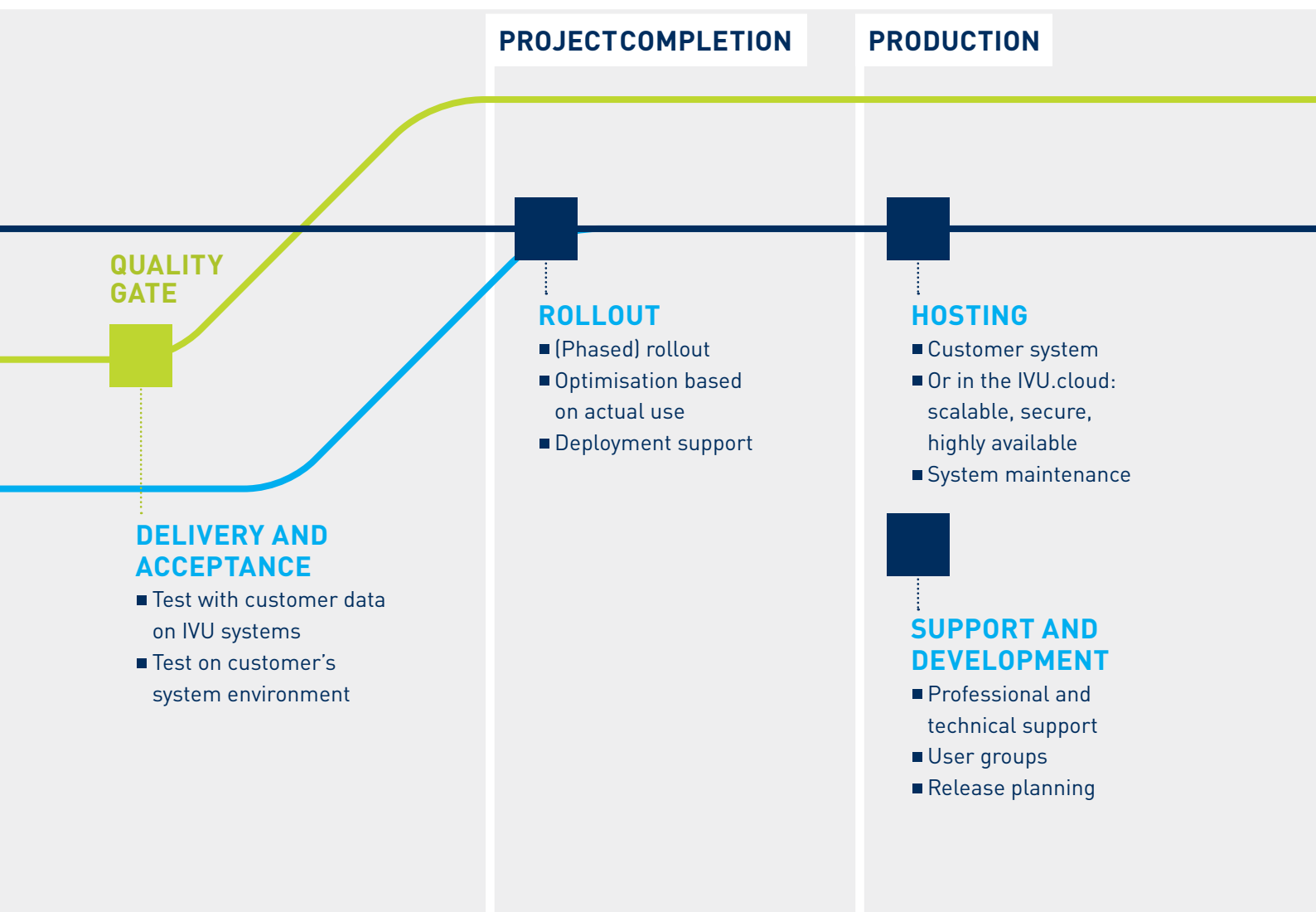
With our special IVU.xpress process, we implement our systems rapidly and efficiently in all environments. Clear objectives ensure a well-defined project process and reliable schedules, from the start of the project to

system design, configuration and the final rollout. Each system can be used productively from the outset and covers all use cases that are needed for smooth operation.

Our work does not end with the commissioning of our systems. We provide you with support throughout the entire project – and beyond. The IVU team is there to support you in the long-term to improve your operations and provide the best possible service to your customers.



IVU PROJECTS ARE PLANNED WITH **A LONG-TERM VIEW**. WE WORK **TOGETHER** WITH YOU TO FIND AND IMPLEMENT THE BEST SOLUTION. CLEAR GUIDELINES ENSURE **SHORT PROJECT DURATIONS** AND LOW DEPLOYMENT COSTS.



# TRANSPORT AND MORE

## URBAN INFRASTRUCTURES

A high-performing transport service requires efficient organisation. Buses need to go precisely where they are needed, employees need to be in the right place at the right time, and connections need to be reached. The key to mastering all of these elements is optimisation.

Complex mathematical algorithms are fundamental to this behind the scenes. Transport companies use them to automate multi-layered tasks and to achieve better results in less time: optimally coordinated journeys, fewer buses providing the same service,

fairer duties for employees. This requires the highest level of expertise. Therefore, IVU cooperates with the mathematicians at LBW Optimization GmbH – a spin-off of the Zuse Institute Berlin (ZIB) – to develop its leading optimisation components.

IVU systems help companies to deploy their resources appropriately and to exploit their full potential. They create scope for decision-making and lay the groundwork for new services. In doing so, they ensure that public transport always keeps moving.



**OPTIMISATION** CREATES EFFICIENCY. IVU IS AN EXPERT IN THIS AREA. FROM INITIAL **TIMETABLE PLANNING** TO THE **DEPLOYMENT OF RESOURCES**, THE IVU SYSTEM ALGORITHMS SOLVE HIGHLY COMPLEX PROBLEMS.

MAJOR CITIES SUCH AS BERLIN REQUIRE A FUNCTIONING PUBLIC TRANSPORT. MORE THAN 1 BILLION PEOPLE USE THE BUSES AND TRAINS IN BERLIN EACH YEAR. IVU'S INTELLIGENT SYSTEMS GUARANTEE OPTIMUM PROCESSES.



# EXPERTISE AND EXPERIENCE

Our 500 employees give IVU its identity. Their dedication and expertise make IVU what it is. They develop software and draw up concepts, implement systems and support projects. They enhance processes and advise customers - they are spurred on by the opportunity to tackle complex challenges.

Behind each timetable, duty and set of real-time information is a diverse array of mathematical problems. Optimising vehicle working and service planning calls

for precise algorithms that can process millions of data records in a matter of seconds. IVU's highly qualified experts design and develop these systems.

Our employees have backgrounds in diverse fields. The IVU team includes software and project engineers, mathematicians, transport experts and geographers. People who welcome the challenge of taking on demanding projects and are able to guide them to a successful outcome in partnership with our customers.



IVU EMPLOYEES ARE  
**HIGHLY QUALIFIED  
EXPERTS** WHO KNOW  
WHAT IS IMPORTANT  
AND **HANDLE COMPLEX  
SITUATIONS WITH  
EXPERTISE.** THEIR  
SPECIALIST KNOWLEDGE  
AND VERSATILITY MAKE  
IT PROJECTS **SUCCESSFUL.**



# FOR THE MOBILITY OF TOMORROW

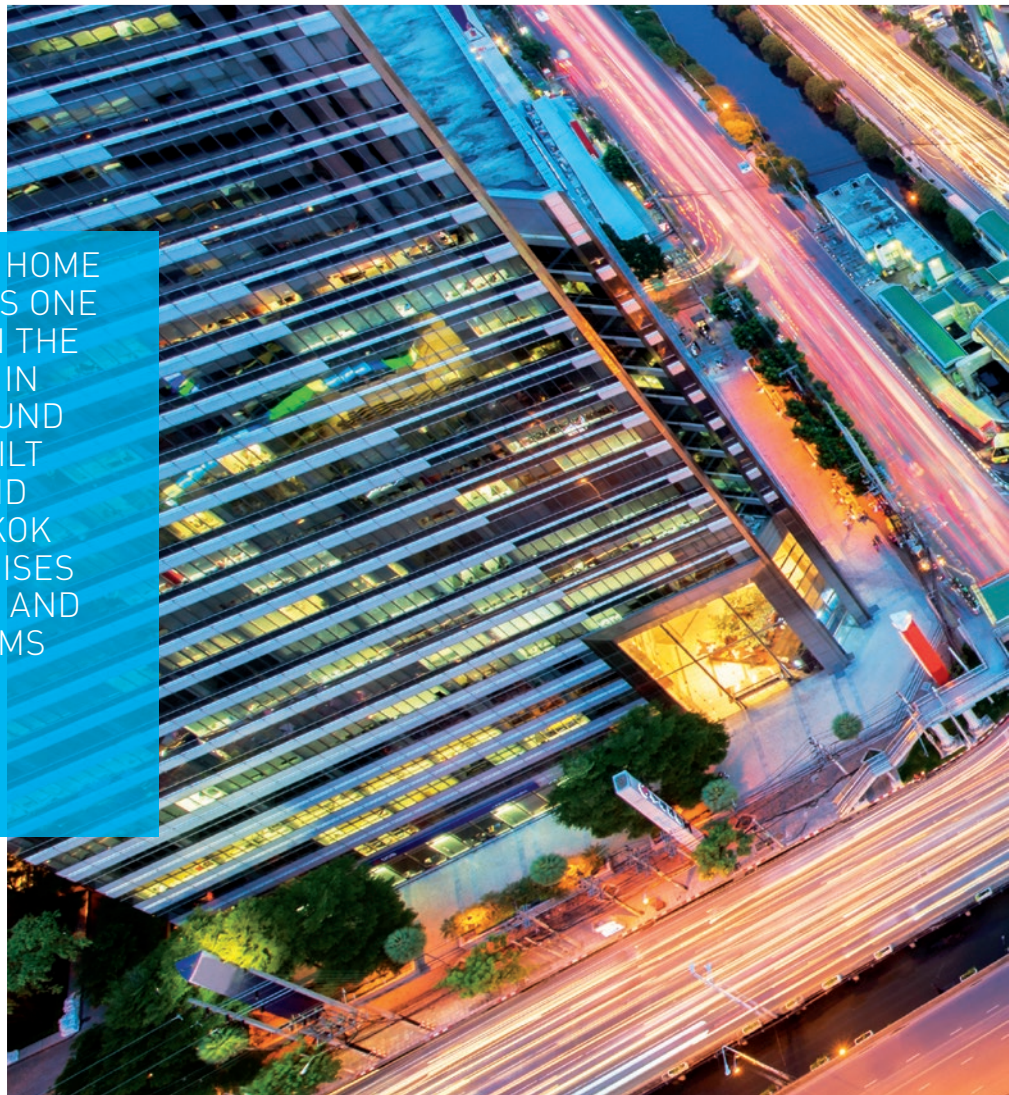
Digitalisation, urbanisation, mobility: These megatrends are revolutionising everyday society. Never before have humans been so interconnected, lived in cities in such great numbers and travelled so much at the same time. Our systems are helping to shape this change – and have been for more than 40 years.

As cities grow, the role of public transport becomes ever more important. Intelligent IT systems make it

more efficient, demand-orientated and environmentally friendly. They fully support the operation of bus and train services and improve the quality of life in our cities.

In the future, when people travel, they will be able to choose from a range of different mobility services. Flexible, multi-modal journey chains are being developed. Thanks to smartphones and apps, the next connection is just a screen tap away.

BANGKOK, A METROPOLIS HOME TO MILLIONS OF PEOPLE, IS ONE OF THE LARGEST CITIES IN THE WORLD AND CONSTANTLY IN MOTION. NEW UNDERGROUND RAIL LINES ARE BEING BUILT TO SATISFY RISING DEMAND FOR MOBILITY. THE BANGKOK METRO PLANS AND OPTIMISES ITS NETWORK, TIMETABLE AND PERSONNEL USING SYSTEMS FROM IVU.



The smart software solutions from IVU enable transport operators and cities to offer innovative and modern services. Well designed, intelligently implemented and adapted to customer-specific requirements, IVU software is already supporting the organisation of transport for the passengers of tomorrow.

**IVU. SYSTEMS FOR VIBRANT CITIES.**

THE FUTURE OF PUBLIC  
TRANSPORT BEGINS TODAY.  
**IT SYSTEMS** MAKE IT POSSIBLE  
TO TRANSPORT PEOPLE  
**FASTER, MORE EFFICIENTLY  
AND WITH A HIGHER LEVEL OF  
COMFORT.** THE MOBILITY OF  
TOMORROW IS OUR MISSION.



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[www.ivu.com](http://www.ivu.com)

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