No 110
Autumn 2026 | 37. Volume

Traffic Light REPORT

The magazine for traffic technology



PEOPLE ARE GOOD!



EDITORIAL

CONTENT & EDITORIAL 2

LOC.ID OCULI -
WHEN THE ENVIRONMENT RESPONDS 3

PEOPLE ARE GOOD 4-5

BLIND FOOTBALL AT FORTUNA DÜSSELDORF 6

84 DEVICES, 1 WIRELESS NETWORK 7

TOPO.BIKE PUT THE TEST IN FRANKFURT 8-9

PARKING IS GOING DIGITAL 10-11

OPEN DOORS WITH THE MOUSE 11

Dear Readers,

People are at the heart of my work every day. That's why the title of this issue of Traffic Light Report resonates with me so deeply: "People Are Good." After all, behind every idea, every development, and every project are people - with different experiences, needs, and perspectives.

The stories in this issue demonstrate just how important it is to incorporate these perspectives. For decades, Gerhard Renzel has been exploring how technology can enable blind and visually impaired people to live more independently. For him, technology should do one thing above all else: relieve burdens and create freedom.

Blind football at Fortuna Düsseldorf is also about independence, trust, and communication. The rattling ball, clear calls, and teamwork provide orientation and demonstrate what's possible when the right conditions are in place.

Our technical topics, too, always come back to people: In Frankfurt, TOPO.bike provides data on the use of public space, while in Düsseldorf, a large NET.2 pilot project demonstrates how existing infrastructure can be further developed. When it comes to parking, a larger touchscreen and a digital ticket open up new possibilities for user interaction.

As diverse as these topics may be, they're united by a common idea: Technology is most valuable when it's people-centered and makes everyday life easier and safer while enabling greater independence.

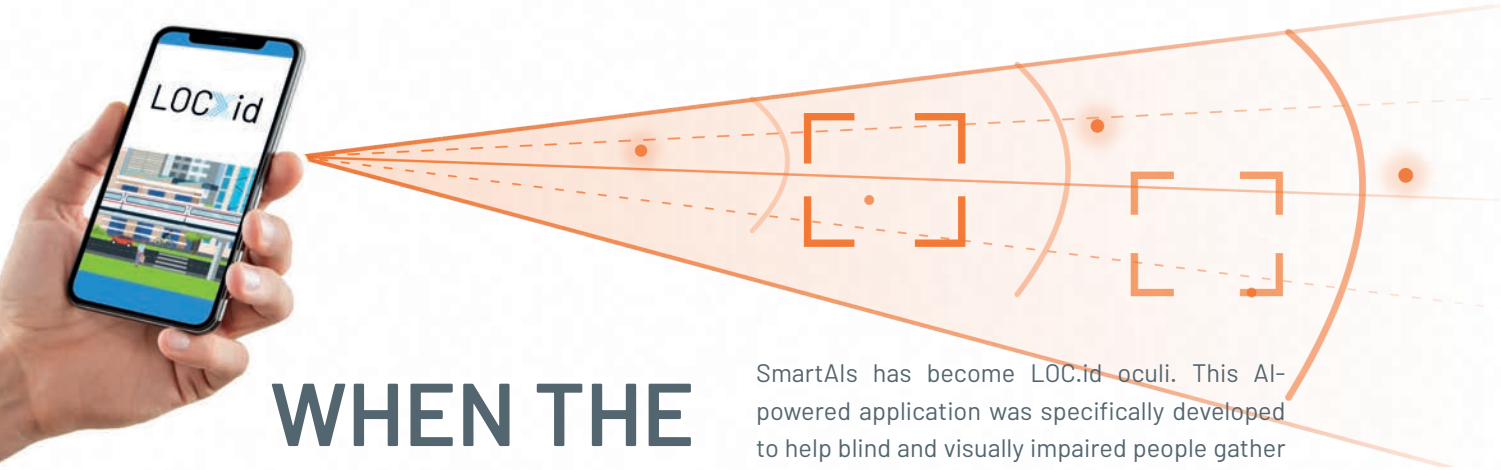
And because there's naturally more to being human than that, we're taking our title quite literally this time: With "People Eat Well!" we're launching a new column featuring special places and restaurant recommendations.

I hope you enjoy reading and discovering these stories.

Warm regards,

L. Sicken

Linda Sicken
Human Resources



WHEN THE ENVIRONMENT RESPONDS

Where is the door? Where is an empty chair? What's in front of me? With LOC.id oculi, RTB expands the possibilities of digital accessibility by adding a new perspective: the immediate surroundings.

SmartAIs has become LOC.id oculi. This AI-powered application was specifically developed to help blind and visually impaired people gather visual information more independently in their daily lives. LOC.id oculi is currently still in a testing and integration phase and is being trialed with a select group of users.

The app uses the smartphone's camera and artificial intelligence. A captured image can be described and then queried in specific ways: What is in front of me? How many people are in the room? What color is a piece of clothing?

But LOC.id oculi can do more than just describe situations. For example, using a panoramic image, you can search for a door or an empty chair. Once the desired object is detected, the app describes its location. If desired, tactile signals can then help guide you in the right direction. As soon as the destination is reached, the app provides corresponding feedback. The user interface itself is also designed with accessibility in mind. LOC.id oculi can be used with VoiceOver; responses, image processing, and navigation can be paused at any time.

The next step is already planned: In the future, LOC.id oculi will be integrated into the existing LOC.id app as an additional feature. This brings together what were previously separate areas: LOC.id connects people with infrastructure- LOC.id oculi helps make the immediate surroundings more understandable as well.

This development is still undergoing field testing. However, one of the testers - Gerhard Renzel - already demonstrates just how personal the benefits of such technology can be. On the following pages, he explains what independence means to him and what role technology can play in achieving it.

LOC id OCULI



PEOPLE ARE GOOD



Gerhard Renzel

> "TECHNOLOGY SHOULDN'T BE A BURDEN, IT SHOULD MAKE LIFE EASIER."
>
> Gerhard Renzel

WHEN TECHNOLOGY CREATES FREEDOM

For decades, Gerhard Renzel has been exploring how technology can enable people to live more independently. For him, one thing matters above all else: being able to move freely and manage daily life as independently as possible.

Gerhard Renzel lives in Georgsmarienhütte near Osnabrück. He has had retinitis pigmentosa since birth and has been completely blind for about 30 years. But anyone who speaks with him quickly realizes that his focus is not on his limitations, but on the possibilities that can arise.

Technology has been a part of his life for a long time. After completing administrative training, he worked in the IT department of the local government. Even in retirement, he has remained active and is involved in various projects and committees through the German Association for the Blind and Visually Impaired (DBSV) - ranging from information technology to accessible mobility and public spaces.

A CONNECTION DATING BACK NEARLY 40 YEARS

His connection to RTB also goes back a long way. In the 1980s, Renzel met Rudolf Broer, who was working as a mobility trainer at the time. For four weeks, Broer accompanied him during an orientation training program - a period that, according to Renzel, had a profound impact on him.

Over the decades, this initial contact evolved into an ongoing exchange focused on technical solutions for blind and visually impaired people. Renzel consistently drew on his personal experience and contributed to research projects as well as standardization efforts for accessible transportation technology. For him, it is crucial to involve future users early on. After all, it is only

in everyday life that it becomes clear whether a development truly works.

NO LONGER HAVING TO SEARCH FOR EVERYTHING

Just how important this can be became clear recently during a meeting in Berlin. The focus there was on enabling people to navigate public transportation as independently as possible.

Even an elevator can pose a challenge: First, you have to find it; then, the controls must be accessible. Modern touchscreen interfaces, in particular, can be difficult for blind people to use. Connected solutions can provide support precisely in this area.

LOC.id, for example, can help people locate infrastructure and provide targeted information. When different systems are connected, an environment is created that supports people without taking decisions away from them.

A VERY PERSONAL MOMENT

Renzel has also experienced firsthand how technology can enable independence through LOC.id oculi. He is one of the app's test users.

After surgery, he had a scar on his neck. What a sighted person would naturally check in the mirror was, until then, something he could only do with the help of others. Using LOC.id oculi, he had the area described to him and received information about what the scar looked like and whether, for example, it was still bleeding or had already healed. It's a small example, but one that illustrates what independence can mean in everyday life. Questions such as "How do I look today?", "What's in front of me?", or "What does this room look like?" can suddenly be answered independently.

TECHNOLOGY SHOULD MAKE LIFE EASIER

Finding one's way in unfamiliar places is particularly important to Renzel. Technology shouldn't create extra work; rather, it should provide support as naturally as possible. "Technology shouldn't be a burden—it should make life easier." When this is achieved, he believes it not only opens up new technical possibilities but, above all, fosters greater self-confidence and independence. In addition to blind and visually impaired people, older adults and people with other disabilities can also benefit from this.

AND SOMETIMES, YOU JUST NEED PEOPLE

Despite all the technical possibilities, human interaction remains crucial for Renzel. When technology reaches its limits, a simple question can help: "Can I help you?" It's important to offer support rather than stepping in without being asked or touching someone. Renzel has found that many people are attentive and offer support at just the right moment. And this is precisely where the circle closes, bringing us back to the title of this issue: People are at their best when technology enables their freedom and when people are there for one another in situations where technology alone cannot help.



RTB-RESTAURANT-TIPP

PEOPLE EAT WELL!

ROSSINI, MUNICH

Rossini isn't just a place to eat and enjoy yourself—it's also famous for Helmut Dietl's film "Rossini." That makes it a perfect fit for our new column, "People Eat Well!"—and at the same time, it ties right back into our film theme from Intertraffic.

A lovely spot for anyone who enjoys good food and wants to experience a bit of a movie set while they're at it.



BLIND FOOTBALL AT FORTUNA DÜSSELDORF

WHEN HEARING DETERMINES THE GAME

Blind football is fast-paced, physical, and demanding, and relies above all on sounds, communication, and trust. Stefan Felix, head of inclusion at Fortuna Düsseldorf and blind himself, explains what matters on the field and why accessibility goes far beyond that.

FROM FAN ENGAGEMENT TO BLIND FOOTBALL

Stefan Felix has long been involved in inclusion in football—from play-by-play commentary for the blind and audio description to awareness programs about the everyday lives of blind people.

In 2018, the final match day of the Blind football Bundesliga took place at Düsseldorf's Burgplatz. A year later, Fortuna Düsseldorf launched a small training group.

This evolved into an independent team that now plays in the Blind football Bundesliga.

ORIENTATION THROUGH SOUND

Blind football relies primarily on hearing. To ensure a level playing field for everyone, the outfield players wear blackout eye masks. Some still have residual vision, while others are completely blind - the blackout eye masks ensure that conditions are the same for everyone.

The ball contains noisemakers that allow players to track its position as it moves. Each team has four outfield players and a sighted goalkeeper. In addition, guides help with orientation by calling out clear instructions.



Stefan Felix with our LOC.id Construction

"Acoustic orientation is one of the main components of the sport," explains Felix. That's why spectators must also remain quiet during the game. Blind football demands a great deal of concentration, quick reactions, and trust in one's own team.

TECHNOLOGY AS PART OF TRAINING

Technical support plays a role not only in the players' daily lives but now also directly in training: Thanks to a software adaptation, RTB's LOC.id Construction has become an integral part of training at Fortuna Düsseldorf.

This allows barrier-free orientation to be integrated into training routines in a very practical way. Felix also sees potential for technical support beyond this: Training equipment that can be identified by sound could create additional opportunities and make training more varied.

THE GOAL: A DEDICATED FIELD

One of the biggest challenges right now is the lack of dedicated infrastructure for blind football. A dedicated, suitable field would create additional training opportunities, facilitate youth development, and, in the long run, make it possible to host Bundesliga match days at Fortuna Düsseldorf.





NET.2 IN PRACTICAL TESTING

84 DEVICES 1 WIRELESS NETWORK

In Düsseldorf, one of the largest NET.2 pilot systems to date demonstrates how existing traffic signal systems can be expanded with relatively little effort. The system is located at a major intersection in the immediate vicinity of the Nordfriedhof cemetery and comprises a total of 42 BLX NET.2 devices and 42 BLE push buttons.

What makes this system special is not just its size. Despite the large number of connected devices, experience to date has shown that latency is virtually nonexistent. This makes the system a good real-world example of how the NET.2 mesh network functions even across larger and more complex intersections.

Technically, NET.2 supplements existing traffic signal systems by providing a wireless data path for non-safety-critical signals. The individual nodes can relay information within the mesh network, thereby creating alternative communication paths. Safety-critical signal paths remain within the existing control system.

RETROFIT WITHOUT CIVIL ENGINEERING

Another advantage became apparent right away during the retrofit in Düsseldorf: Neither civil engineering work nor new poles were necessary. Instead, the existing devices could be replaced with NET.2-compatible components.

This can make a big difference, especially for existing systems. Additional functions can be transmitted wirelessly without having to install new cables between the pole and the control unit for each signal path. This simplifies retrofits in particular and provides greater flexibility when modernizing existing infrastructure.

As a result, the Düsseldorf pilot system serves not only as a test bed for 42 push buttons and 42 audible signals, but also as a vivid example of what a mesh network can achieve in a larger traffic signal system.





EXISTING INFRASTRUCTURE. NEW POSSIBILITIES.
NET.2 adds a wireless data path to existing systems.





TOPO.BIKE PUT TO THE TEST IN FRANKFURT

HOW TRAFFIC DATA MAKES URBAN TRAFFIC VISIBLE

Frankfurt RheinMain will hold the title of "World Design Capital" in 2026. This isn't just about how a city looks, but also about how it functions and how people move through it. This is exactly where a current field test with TOPO.bike comes in.

TOPO.bike uses radar technology and can detect road users with varying levels of detail depending on the selected classification. The classification ranges from a combined detection of all classes to a distinction between bicycle-like road users, scooters, and pedestrian-like road users. Depending on the configuration, the "unclassifiable" group can also be identified.

The table provides an overview of the various classification levels. In the simplest version, all classes are considered together. In the subsequent levels, a distinction is first made between bicycle-like and pedestrian-like vehicles; in the more detailed 3+1 classification, the scooter group is added.

Especially in areas where cyclists and pedestrians share confined spaces or where different routes intersect, such data can provide an important foundation for traffic planning.

THREE LOCATIONS, THREE TRAFFIC SITUATIONS

At Bockenheimer Landstraße / Kettenhofweg, the focus is on a two-way bike path. At Eschenheimer Tor, the focus is on a particularly complex situation: there, cyclists are riding against traffic on the sidewalk, which is prohibited. These cyclists must also be reliably detected. At Theodor-Stern-Kai, pedestrian and bicycle traffic come into direct contact and must be reliably distinguished from one another. In this way, TOPO.bike





	CLASSIFICATIONS OF CLASSES / GROUPS (WITH CODE)							
1	All classes >98 %							
2	Bicycle-like >95 %						Pedestrian-like >85 %	
2+1	Unclassifiable	Bicycle-like >95 %					Pedestrian-like >85 %	
3+1	Unclassifiable	Bicycle-like >95 %		Scooter >80 %			Pedestrian-like >85 %	
Designation	Physical detection threshold of the sensor	Bicycle	Bicycle with trailer / cargo bike	E-Scooter	Moped/ Motorcycle		Pedestrian, Jogger	Pedestrian with stroller

is being tested under very different conditions in real-world urban traffic.

TOGETHER UNDER REAL-WORLD CONDITIONS

The project is supported by several partners. Benz + Walter is responsible for project management and is preparing the report. Darmstadt University of Applied Sciences is providing scientific support for the report. The City of Frankfurt is providing the test sites, and RTB is installing the TOPO.bike systems.

The measurements were taken over a full week. This ensures that both weekdays and weekends are included, allowing for variations in traffic volume to be taken into account.

An optical sensor was also used for scientific validation. TOPO.bike itself does not require any imagery for data collection. The additional images were used solely to verify the measured data and determine whether road users were correctly identified and classified according to their respective modes of transportation.

RESULTS TO FOLLOW

The tests in Frankfurt are now being analyzed. We will present the results in more detail in the next issue of the Traffic Light Report.

Even at this early stage, the project demonstrates how varied the requirements for traffic data collection can be within a single city and how important reliable data is for needs-based traffic planning.



PARKING IS GOING DIGITAL

10 INCHES, MORE FEATURES,
AND A TICKET ON YOUR SMARTPHONE

10 INCHES, MORE FEATURES, AND A TICKET ON YOUR SMARTPHONE

In the last issue, we got a brief glimpse of the 10-inch touchscreen on our parking ticket machines. This time, we're taking a closer look: What can the larger user interface do, and how does the digital ticket enhance the parking experience?

EVERYTHING ON ONE SCREEN

The touchscreen combines the parking meter's most important display and control functions. Parking duration, rate, and payment method can be clearly displayed and selected directly. Resident rates, as well as the entry of license plate numbers or parking space numbers, can also be managed through the screen.

The interface can be flexibly adapted to the specific application. Up to twelve tiles are available for rate selection, on which, for example, fixed amounts can be pre-set for quick selection. Up to five languages are supported for language selection, which can be chosen via corresponding country flags. A QWERTZ keyboard is also available for entering license plate numbers.

The 10-inch display offers more space for clear and intuitive user guidance. Especially at locations with an international clientele, the language selection feature makes operation easier. Solar operation remains possible as well: In power-saving mode, the display is activated only when needed, making it particularly energy-efficient.

TICKETS GO DIGITAL

Another new feature is the digital ticket. After parking, a QR code appears that can be scanned with a smartphone.

This takes you to a website where the ticket is available as a PDF. It can be viewed immediately, downloaded, or displayed again later.

This replaces the traditional paper receipt, saving paper and making the parking receipt available digitally.

A PARKING METER THAT GROWS WITH YOU

The 10-inch touchscreen and digital ticket complement each other at two stages of the parking process: The display offers more options for operation and information, while the digital ticket then continues the process on your smartphone. This is how the parking meter continues to evolve, featuring flexibly configurable operation and additional digital functions.

TAKING COUNTRY-SPECIFIC REQUIREMENTS INTO ACCOUNT

A recent implementation for the Croatian market demonstrates just how differently digital parking solutions must be designed. The customization was initially implemented for the project in Osijek and can also be used for future projects in Croatia.

These include output in Croatian, a customized layout, and changes to transaction and invoice IDs. For other markets, specific adaptations may be necessary. After all, a digital parking process doesn't end with the QR code: billing and documentation must also meet the requirements of the respective country of operation.



KI-generiert

01 SCAN THE QR CODE

02 OPEN PDF

03 SAVE TICKET

After parking:
Scan the QR code at the machine and open the ticket on your smartphone.

OPEN DOORS WITH THE MOUSE

TECHNOLOGY TO **EXPLORE**



On October 3, RTB opened its doors for the "Open Doors with the Mouse" event. Around 140 children had the chance to discover, through play, where transportation technology plays a role in their everyday lives and what lies behind RTB's solutions.

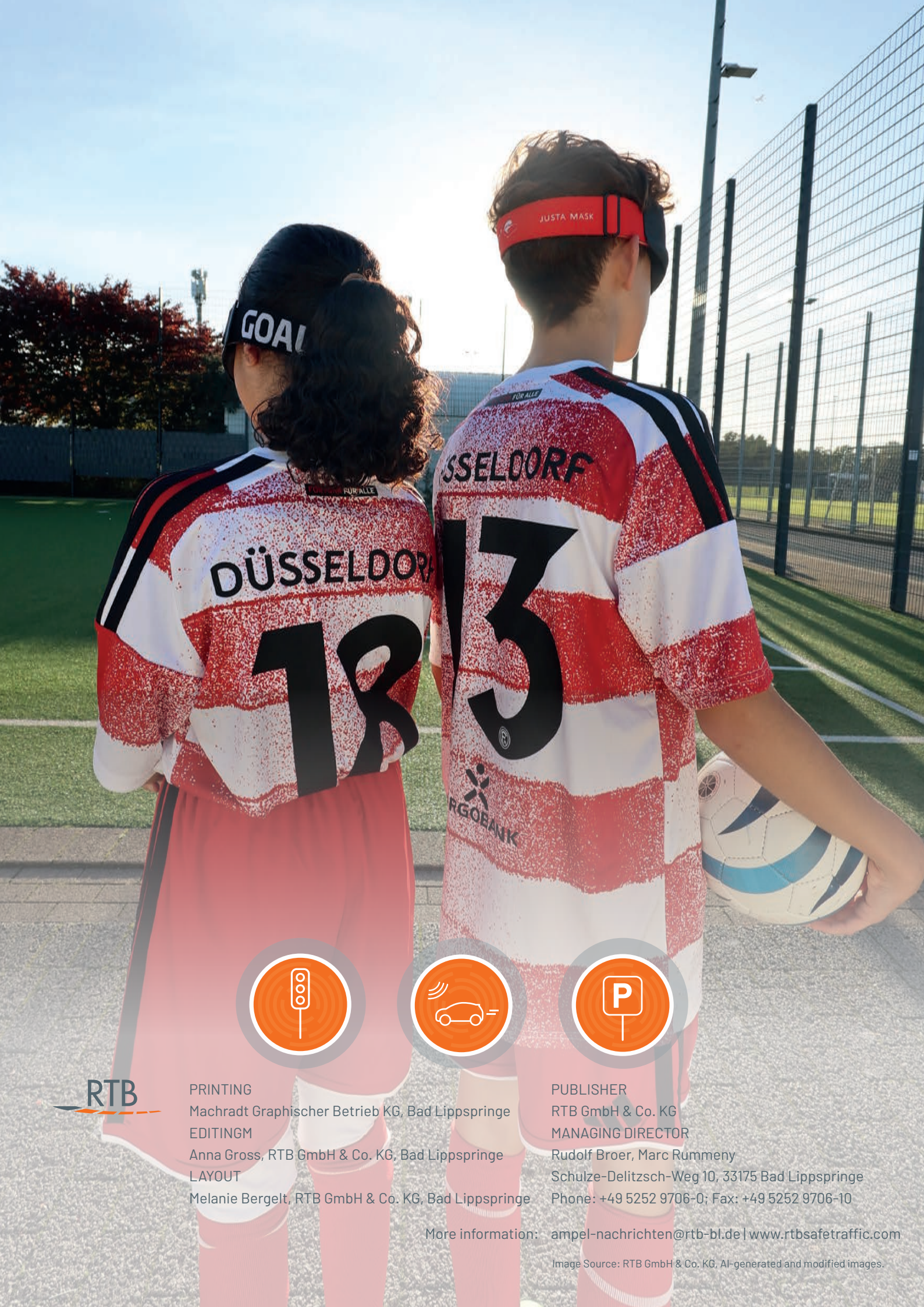
Various stations focused on topics such as 3D printing, LOC.id, accessible wayfinding, and sensing and measurement technology. The main emphasis was on trying things out, discovering, and understanding.











PRINTING
Machradt Graphischer Betrieb KG, Bad Lippspringe
EDITINGM
Anna Gross, RTB GmbH & Co. KG, Bad Lippspringe
LAYOUT
Melanie Bergelt, RTB GmbH & Co. KG, Bad Lippspringe

PUBLISHER
RTB GmbH & Co. KG
MANAGING DIRECTOR
Rudolf Broer, Marc Rummeny
Schulze-Delitzsch-Weg 10, 33175 Bad Lippspringe
Phone: +49 5252 9706-0; Fax: +49 5252 9706-10

More information: ampel-nachrichten@rtb-bl.de | www.rtbsafetraffic.com

Image Source: RTB GmbH & Co. KG, AI-generated and modified images.