ReLUT

Issue Nr. 2
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Welcome!

Updates from Frankfurt University ReLUT

ReLUT - Research Lab for Urban Transport is an interdisciplinary team of researchers in Frankfurt, Germany working on current and future challenges of mobility. Our research focuses on the development of economic and ecological solutions for new mobility models. In addition to the disciplines of transport planning and logistics, ReLUT combines a wide range of competencies: urban planning, social science, data science (Big Data), computer science (AI), geoinformation, law, automotive engineering, and economics.

In the second half of 2024, we continued to work on various research projects in the areas of mobility in rural areas, emissions reduction and simulation-based analysis.

We hope you enjoy reading about what we are working on. We are always open to collaboration on existing and new projects. Please contact us if you have any ideas of future endeavors.

Best wishes,


Petra Schäfer


Tobias Hagen


Anne Lange


Dennis Knese

ReLUT
RESEARCH LAB FOR URBAN TRANSPORT
FRANKFURT UAS

ETC

European Transport Conference

Our team was again actively involved in this year's European Transport Conference (ETC) 2024 in Antwerp. The conference, held from 18-20 September, brought together transport policy makers, practitioners and researchers across Europe to discuss the future of transport.

Jonas Hamann held the first of our presentations with his research on "Increasing the Attractiveness of Park and Ride by Reducing Uncertainty with the Help of a Forecasting Model for Capacity Utilization." His work demonstrated how predictive models can minimize uncertainty and make Park and Ride facilities more appealing to commuters.
Franziska Weiser presented her study, "Current Mobility Behavior and Theoretical Willingness to Use of Residential Shared Electric Mobility Concepts in Medium-Sized Cities in Germany." Her research explored how new shared electric mobility systems could be integrated into urban mobility strategies, focusing on medium-sized cities.

Nicole Reinfeld followed with her presentation titled, "How Would People Travel Today if They Had the Same Characteristics as People in 1980? – Using Entropy Balancing to Decompose Changes in Observed Travel Behavior Over Time in Repeated Cross Sections." Her analysis offered a unique perspective on how travel behavior has evolved over the decades.
Elisabeth Lerch contributed by introducing a "Concept for Surveying Traffic Conflicts Involving Vulnerable Road Users at Selected Intersection Types." Her research focuses on preventive methods for evaluating road safety in order to improve the safety of cyclists and pedestrians in urban environments, particularly at intersections.

Lastly, Tobias Hagen chaired two sessions: „Passive Data Analysis (GPS, Smartcard)" and „Machine Learning and AI," facilitating discussions on the role of emerging technologies in transport research.

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Overall, our presence at ETC 2024 sparked meaningful discussions, expanded our professional network, and reinforced our enthusiasm for being part of this great conference in the years to come. We look forward to participating next year – again in Antwerp!

Prof. Tobias Hagen
Elisabeth Lerch, M. Eng.
Jonas Hamann, M. Sc.
Nicole Reinfeld, M. Sc.
Franziska Weiser, M. Eng.

Nemo - New Mobility Design Congress

All eyes on Transportation Design

The “Nemo - New Mobility Design Congress” brought together experts of the design and mobility industry to discuss technologies and concepts of future mobility. The focus was on public transportation design. Which factors influence modal choice and which relevance does design have? These and other topics got presented and discussed during the congress of the Stuttgart Region Economic Development Corporation on October 17 in Stuttgart.

Dominic Hofmann presented his research together with experts from the fields of industrial design, product design and public transport. Once more it was highlighted, that the influence of design should not be neglected during the whole planning process of transport infrastructure. The automobile industry proofs how high the relevance of design can be and in which extent customers can be influenced during the modal choice process. This impact can and should also be used to push customers towards a sustainable mode of transport.

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Prof. Dominic Hofmann
Professor for Infrastructure and Enviroment

RADLÄR

Kick-off “RADLÄR”: Research project examines the implementation of cycle logistics in rural areas

Bundesministerium für Digitales und Verkehr

aufgrund eines Beschlusses des Deutschen Bundestages

Modellvorhaben NICHT-INVESTIV Radverkehrsförderung des Bundes

The transport sector in Germany accounts for a significant share of greenhouse gas emissions, underscoring the urgent need for research into new transport concepts. While cargo bikes have gained ground in cities, their potentials in rural areas remain largely untapped. RADLÄR, our recently launched research project, seeks to address this gap by identifying the needs, possible applications and obstacles to the implementation of cargo bikes as logistics solutions in rural areas.

With the objective to improve commercial transport by cargo bikes in rural areas, RADLÄR will develop and test new, generally applicable processes for cycle logistics, such as for last-mile cargo transport. The project targets both businesses and public entities that are interested in promoting sustainable mobility and logistics solutions. Ultimately, RADLÄR hopes to generate economically viable, low-emission and future-oriented transport solutions as sustainable alternatives in cargo transport.

In order to achieve these goals, participatory workshops will be held as the first step in the six model regions: Bad Soden-Salmünster, Landkreis Emsland, Havixbeck, Herzberg (Elster), Hochsauerlandkreis and Hofstetten. These workshops will bring together the residents, businesses and administrations to share their needs, ideas and visions for the use of (cargo) bikes. The RADLÄR project team will then develop logistics concepts that integrate cargo bikes into the regional value chains, addressing the specific requirements and challenges on site. Processes and supply chains will be tested and optimized through simulations. Subsequently, the findings from the model regions will be analyzed to identify commonalities in order to derive broader implications for Germany as a whole.

Photo from the internal kick-off on September 20, 2024 in the Houes of Logistics and Mobility (HOLM) in Frankfurt am Main

RADLÄR

RADLÄR is supported by the administrations of the six model regions as associated partners, as well as by Hermes Germany GmbH, a courier, express and parcel service provider that has already been employing cycle logistics for deliveries in major German cities. The project commenced with the internal kick-off on September 20, 2024 in Frankfurt am Main.

Fraunhofer INT, Fulda University of Applied Sciences, Frankfurt University of Applied Sciences (represented by ReLUT) and Hermes have agreed on plans to engage the population, businesses, administrations and politicians in the project. Surveys with experts and interested citizens in the municipalities will be conducted in the near future. The Federal Ministry for Digital and Transport (BMDV) is funding the project with around 1.3 million euros, with the Federal Office for Logistics and Mobility (BALM) being the managing authority in the funding programme. RADLÄR is part of the directive on the promotion of non-investment measures for the implementation of the National Cycling Plan 3.0. It is set to run for three years.

Project Website

M. Sc.
Canathy Wong
Research Assistant

SAVE THE DATE

TRB - Transportation Research Board
Annual Meeting 2025
Washington, DC

At the TRB in Washington, DC, two of our colleagues - Nicole Reinfeld and Jonas Hamann - will participate and present their current research.

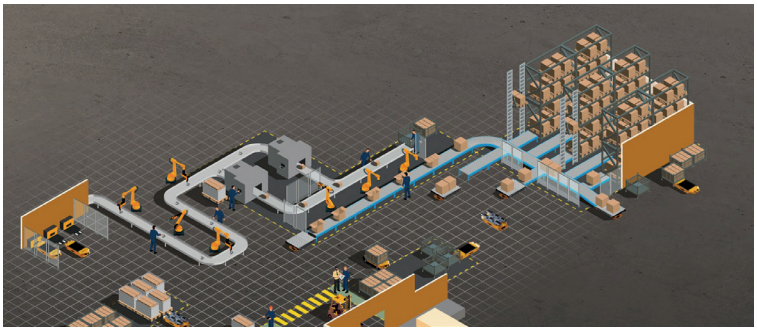
SIMOBOT

Developing Smart Solutions for the Future of Intralogistics: An Insight into SIMOBOT

The newly launched research project SIMOBOT (Simulation-based Analysis for the Intelligent Adaptation of the Autonomy Level of Mobile Transport Robots in Intralogistics) stands out for its innovative approach to mobile robotics in intralogistics. It also benefits from a robust, multi-perspective network of industrial and scientific partners, including SimPlan AG, Continental AG, and Synaos GmbH. The project's results aim to directly support the strategic goals of Hesse's innovation strategy, significantly strengthening the region as a hub for business and technology.

The automotive and supplier industries face major challenges due to increasing complexity, shorter innovation cycles, a growing variety of products, and rising individualization of mobility solutions. These challenges are further amplified by digitalization and demographic change. In the context of Industry 4.0 and the smart factory, mobile transport robots and their predictive simulations are pivotal components on the path to the factory of the future.

As part of the SIMOBOT project, an interdisciplinary consortium will employ data-driven modeling and material flow simulations to assess the impact of different degrees of autonomy for mobile robots on overall system productivity in production plants. The project seeks to uncover and optimize unquantified potential within intralogistics material flows. In particular, it will analyze the area- specific adaptation of autonomy levels.



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The project's anticipated advancements aim to enhance the efficiency of intralogistics material flows and improve the resilience of value chains. Furthermore, these findings have the potential to shape the mobility and logistics sectors by redesigning the workplace of the future. Through intelligent collaboration between humans and machines in intralogistics and production infrastructures, employees can take on more creative and responsible roles, supported by mobile robots. This innovation not only improves workplace efficiency but also increases its attractiveness for the workforce.

This project (HA project no. 1771/24-118) is financed with funds of LOEWE – Landes-Offensive zur Entwicklung Wissenschaftlich-ökonomischer Exzellenz, Förderlinie 3: KMU-Verbundvorhaben (State Offensive for the Development of Scientific and Economic Excellence).

Prof. Dr.-Ing.
Tobias Bornemann
Professor

M. Sc.
Leon Siegl
Research Assistant

Forum on Cycling

Recap of the 4th Annual Research Forum on Cycling

Bundesministerium für Digitales und Verkehr
aufgrund eines Beschlusses des Deutschen Bundestages

On September 16-17, 2024, the Frankfurt University of Applied Sciences hosted the 4th Annual Meeting of the BMDV Endowed Chairs in Cycling Research. The event brought together about 40 researchers from seven universities across Germany, all focused on advancing sustainable mobility and cycling research.

The meeting provided a platform for sharing insights into ongoing phd projects and studies on topics like the gender gap in bike-sharing and the development of leisure cycling typologies. Professors from the University of Applied Sciences Karlsruhe, Hochschule RheinMain, Technical University of Applied Sciences Wildau, University of Wuppertal, University of Applied Sciences Ostfalia, University of Kassel, and Frankfurt University of Applied Sciences discussed how to enhance collaboration across universities. Dennis Knese from Frankfurt UAS highlighted the value of in-person interactions, emphasizing how these exchanges help address both research methodologies and practical challenges in the field.

A key focus of the event was exploring the role of cycling in the urban fabric of Frankfurt. Participants learned about the city's approach to promoting cycling through a presentation by Wolfgang Siefert, the city's Mobility Councillor, who highlighted current strategies for integrating cycling into urban planning. A guided cycling tour allowed participants to experience these strategies firsthand and observe the city's efforts to create a more bike-friendly environment.

With BMDV funding scheduled to end at some universities next year, discussions centered on maintaining momentum and finding ways to continue the collaboration between these research institutions. Participants explored ideas for joint projects, shared insights into challenges, and reaffirmed their commitment to advancing sustainable mobility through research and education. The event highlighted the strengths of each institution and set the stage for future partnerships in the field of cycling and urban mobility.

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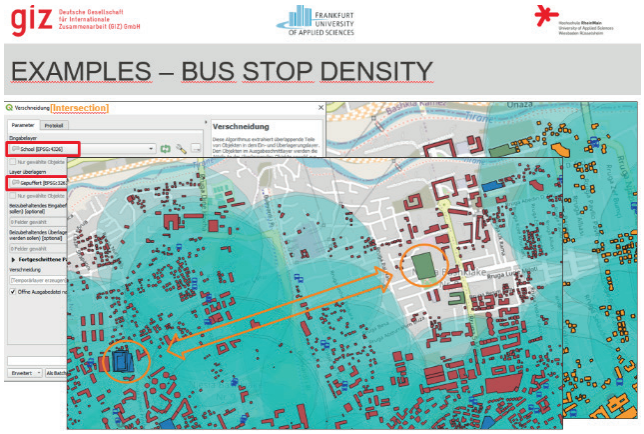
M. Sc.
Nicole Reinfeld
Research Assistant

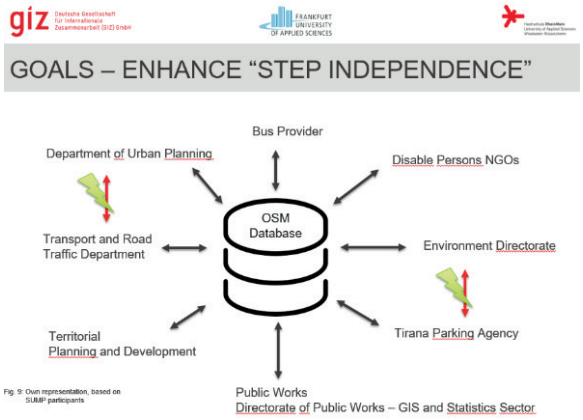
Master degree program

Master goes International!

Since 2022, Frankfurt University of Applied Sciences is offering a Master's degree program in Sustainable Mobility, in collaboration with the UAS in Wiesbaden, Darmstadt and Gießen. Part of the German-language study program is an international project where students work in small groups on specific mobility topics around the globe. Dennis Knese supervises the project.
The first run of this international project module was completed in early 2024. In collaboration with the German Agency for International Cooperation GIZ, exciting challenges in Albania, India, Indonesia and Morocco were developed. The students came together with local GIZ experts from the countries in order to collect data, information and contacts for expert interviews. The topics ranged from creating a public transport inventory using open data, to inclusive mobility solutions for the elderly, to land value change analyses for a Bus Rapid Transit project.



Extract from a student presentation for Albania



It was a great chance for the students to reflect international approaches to transport policy and planning in interdisciplinary groups. As the local contexts and planning cultures sometimes differed greatly from those in Germany, intercultural skills and an understanding of alternative practices were significantly strengthened. At the same time, the results of the student projects are intended to support the project teams in the countries in achieving their sustainability goals.

In October 2024, the next run started with new projects in Asia, Africa and Latin America.

Prof. Dennis Knese
Professor for Sustainable Mobility and Cycling

Picture 1: Group of students at the kick-off event at GIZ headquarters in Eschborn
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U!REKA Research Days in Gent

U!REKA Research Days in Gent
The first Research Days of the Urban Research and Education Knowledge Alliance (U!REKA) took place from the 3rd until 5th of December at the HOGENT University of Applied Sciences and Arts in Belgium. Dominic Hofmann represented the expertise and interests of Faculty 1 including ReLUT. The goal of the transnational alliance of six universities of applied sciences is working together to shape the transition to climate-neutral societies. Beside research, the focus is also on studies and teaching. The research days in Gent were used to exchange knowledge and built groups of experts to start the process of project proposals for future collaboration. Beside research projects, U!REKA is also strengthening the international collaboration on student level as well. Several international exchange formats already exist and will be expanded during the upcoming years.

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Prof. Dominic Hofmann
Professor for Infrastructure and Enviroment

IMPRESSUM

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