Global Study Program

Collaborative Learning Abroad

2023

Sustainable micro-mobility with Light Electric Vehicles - LEV

Chiba University, Japan
Dresden University of Applied Sciences, Germany

Topic & Research Questions

In an era marked by escalating concerns about environmental sustainability and urban congestion, Light Electric Vehicles (LEVs) have emerged as a compelling solution. Also, LEVs have gained significant traction in recent years, thanks to their eco-friendly and cost-effective nature. LEVs encompass a wide range of electrically powered vehicles, including electric bicycles, e-scooters, e-skateboards, and even small electric cars. As society becomes increasingly concerned with environmental sustainability and urban mobility, LEVs have emerged as a promising solution. But what are the current topics and research questions surrounding LEVs?

Sustainability and Environmental Impact / Green mobility: One of the foremost concerns is the environmental impact of LEVs. While they are generally considered more eco-friendly than traditional fossil fuel-powered vehicles, questions remain about the entire lifecycle of LEVs. Researchers are investigating the environmental consequences of manufacturing, battery production (renewable energy sources for charging), and disposal of these vehicles – the overall carbon footprint. Furthermore, a key research question is how to optimize the energy sources used to charge LEVs, moving towards renewable and cleaner energy options.

Safety: With the surge in LEV adoption, safety concerns have come to the forefront. Accidents involving e-scooters and e-bicycles have become common. Researchers are investigating how to make LEVs safer for riders, pedestrians, and other road users. This includes improving vehicle design, developing advanced collision avoidance systems, and studying traffic patterns to better integrate LEVs into urban environments. It is not a task of one stakeholder, society must work together to realize better overall road safety.

Infrastructure and Urban Planning: Infrastructure remains a pivotal aspect of LEV integration. Researchers are exploring how cities can adapt and expand their infrastructure to accommodate the growing demand for LEV usage. This includes developing dedicated bike lanes, charging stations, and secure parking facilities. Moreover, there are questions about how LEVs can be integrated into existing public transportation systems, providing a hollistic, seamless and efficient urban mobility solution.

Battery Technology: Batteries are the heart of any electric vehicle. Researchers are continually working on improving the energy density, charging speed, and longevity of batteries used in these vehicles. Additionally, the question of how to safely and sustainably dispose of or recycle used batteries remains a top priority.

Regulations and Policy: The regulatory landscape for LEVs varies widely from one region to another. Researchers are exploring how governments can create effective policies to ensure the safe and responsible use of LEVs.

This includes issues such as speed limits, helmet requirements, and the licensing of LEV users. Here, also age restrictions are of concern.

Consumer Behavior and Adoption: Understanding consumer behavior is vital to the widespread adoption of LEVs. Researchers are investigating factors that influence people's decisions to choose LEVs over traditional vehicles, as well as their usage patterns. This research helps manufacturers and policymakers tailor their strategies to encourage the transition to LEVs.

After all, Light Electric Vehicles are a promising solution to many of the urban mobility and environmental challenges we face today. Researchers and policymakers are actively engaged in addressing various research questions and current topics surrounding LEVs, from sustainability and safety to infrastructure and battery technology. As research and development efforts continue to advance, we can anticipate LEVs playing an increasingly integral role in our daily lives, facilitating a greener and more efficient future for urban transportation. Thus, for this GSP, we initially thought about the main questions for topics as follows:

How can we raise public awareness and acceptance of LEVs, how can we create a felt need for LEVs?

How can the environmental aspects of LEV, be they privately owned or publicly rented out by a company or city, be mitigated?

What are the visions for LEV infrastructure? Rental possibilites, charging stations, special roads? How can such concepts be integrated in nowadays traffic?

What are the technical issues of LEV? What needs to be done to arrive of at a dream-LEV that appeals to the masses?

GSP とは、千葉大学が海外の協定大学と実施する留学プログラムです。2 週間という限られた期間の中、異なる出身国、年齢、専門分野の学生同士で交流しながら、ひとつのテーマについて学習します。今回はドイツのドレスデン応用科学大学から 11 名、千葉大学から 12 名参加し、ドレスデンにて行われました。テーマは "Sustainable micro-mobility with Light Electric Vehicles - LEV"、「軽量電気自動車による持続可能な小型乗用車について」です。LEV とは、小型電気自動車や電動自転車、電動スクーターなどの乗物です。環境に良いだけでなく、便利で手軽な移動手段として注目されている LEV について、実際に自動車最先端の技術を見学・体験しながらグループでの最終プレゼンを成功させるため取り組みました。GSP では終始英語での交流・議論のため、コミュニケーションが難しい場面もありますが、短い時間の中で最大限の結果を残せるよう主体的に参加することが求められます。（竹之内汐望 / Shiomi）

Schedule of Activities

	Day	Contents
Pre-course	18 April	Online meet & greet, Introduction to the Program
	02 May	Online Lecture by Prof. Tajima Shota about E-Mobility in Japan
	16 May	Online lecture by Prof. Zipser about E-Mobility and LEV in Germany
	23 May	Documentary Screenings about LEV
	01 June	Guidance session on OPAL and registration (for Japanese students)
	13 June	Japanese Students present about their experiences with LEV projects in Japan
	27 June	Instructions on Cultural Presentations and Groups
	11 July	Safety Session by JTB (for Japanese students)
Main Program	**September**	
	17	Arrival of ChibaU students in Dresden
	18	Welcome and Cultural Presentations
	19	Lecture by Axel Wittkuhn and Teamwork I
	20	HTW Laboratory Tour, Visit to Mobi Points
	21	Visit to ADFC and talk with Mr. Vollmer
	22	Teamwork III and visit to Fraunhofer IWS
	23	Mid-Term Presentations
	24	Visit to Moritzburg and Indivudal activities
	25	Visit to DHL in Ottendorf-Okrilla
	26	Transfer to Prague and Individual activities in the afternoon
	27	Visit to Technical Museum Prague, Survey, Preperation of Final Presentations
	28	Final presentations & Farewell party
	29	Individual activities in Prague
	30	Departure of students from Prague back to Dresden and Chiba
Post-course	26 October	Feedback from the GSP Team, Reworking of final presentations Final preparations for the 2023 booklet

Collaborators and Organizers

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Program Components

The framework of the 2023 Global Study Program between HTWD & ChibaU evolved from a collaborative discussion among the instructors involved on both sides. Because HTWD is strong in terms of vehicle engineering and electronic vehicle research and the challenges of Light Electric Vehicles have become focal in Dresden, we decided to design this year's program to have students learn about the urban context, city development, sustainability issues and mobility focusing on LEV. This of course also included to give the students ample experience to use LEV. Also, because the topic as of now is not yet as prevalent in Japan, where the LEV trend still struggles to take root due to the good quality public transport system, it was neccessary to make the Japanese students more aware of LEV. During the program we could understand from the input of the various stakeholders that LEV of course also play a major role in rural areas and have also an impact on the mobility of the elderly.

To foster pre-program understanding among the Japanese students of the German case but also to introduce the German students to the fact that LEV are still less visible and perhaps even feasible in Japan, we designed the pre-education course with lectures that gave students a chance to understand the situation in the respective countries. Special to this year, we gave the task to the Japanese students to introduce the LEV available in Japan and talk about the infrastructure in a presentation to the German students. It was of great benefit for the Japanese students to indeed go and try some of the LEV offers in the greater Tokyo Bay area and Yokohama.

Some pre-education sessions were held together online in real time, so that the participants from both countries could meet and discuss first impressions about the topic, but also in order to prepare the various field work once in Germany. Other sessions were done remotely, having the students educate themselves with several online lectures and other materials such as documentaries about the issues but also academic papers. Also it shall be mentioned that there are more preparatory sessions for the Japanese students, such as an introduction on the OPAL System which is used for the collaborative work with German students and is akin to Moodle. Also, there is a safety session conducted by the JTB staff. We were happy that Mr. Arima in person could again take the time for this session. Last but not least, the cultural presentation preparation is part of the pre-education. To give students more agency and flexibility, us instructors tried to meddle less in their preparations but just conducted some quality control measures in the end.

Concerning the main program, the central program components – as it is always the case with GSP – were intercultural collaborative workshop sessions with international teams, the fieldwork, including lectures and presentations from stakeholders, interview and survey sessions, and the cycle of mid- and final presentations. This spiral-like approach to collaborative learning ensures that students can continuously test the feasibilty of their ideas, their relevance for the field and whether or not there are fallacies and caveats in their ideas and arguments. The overall GSP structure also helps students to continuously learn new facettes of the main topic.

This year, the overall idea of the main program components was to start out in Dresden to see how LEV incorporate into daily life as well as famous tourist sites, and observe how the inhabitants as well as tourists are using LEV, and for what purposes. Thus we had a visit to the so-called MOBI-Points integrated into the program, and touring the city, find some dangerous spots for traffic safety and also exhaustively tested the public transportation system of the city.

Through visits at many research facilities and stakeholder offices, the students could gain first-hand insights into the state of the art in battery research, urban planning for LEV,

and how they are put to practical usage. With test rides of HTWD's research facility LEVs, the cargo-bikes of the ADFC, and those LEV that are used by the German postal service (DHL) on a daily basis, the students could feel the different approaches to LEV from research, to practical private usage and to business usage. It was not only great fun for us all to actually try out these LEV, but the practical facettes helped students from both countries to be better able to judge about LEVs. At Fraunhofer IWS, we were not only introduced into battery production and the theory thereof, but could visit the research laboratories and see how scientific research is conducted.

Then, the case study of Dresden was to be compared with another city. Prague, while still being close to Dresden, is the capital city of the Czech Republic, neighboring Germany and also part of the European Union. Showing similarities in its urban layout, Prague is also more hilly than Dresden, which translates to other needs and uses for LEV. It was the first time for GSP to move into Prague. Of course this was not for leisure purposes, but conceptualized as another case study to test the overall ideas and proposals by the students. Surveying the city and its LEVs as well as public transportation network, especially the visit to the Czech National Technological Museum gave us deep insights into the urban planning and sustainabilty as well as environmental issues of the city, which the students could well contrast with our visit to the Museum of Transportation in Dresden during the first week of the program.

Last but not least, the lectures provided during the program were always a backbone, helping to set the field visits into the proper contexts and widening the student's understanding of certain sites prior to visiting. Also, the workshop sessions were a time for students to digest what they had seen and experienced and facilitate their learning. More than in prior years the schedule was quite packed due to the fact that a visit to Prague was integrated into the program. The students gave their best to use the few hours of group work to efficiently work on their collaborative projects. Thanks to the careful selection of students and group divisions, students could put in their own expertise and ideas. So once again, we managed to have a busy, but neatly planned program with very high student output that has been deemed quite feasible and interesting by the stakeholders who took part in our program.

This year, more than in any year before, the actual workshop time for the students was quite limited. Thus us instructors gave on-the-spot guidance on how to proceed with the groupwork and introduced the students to methdologies on how they can get their work done efficiently. As always, we thereby strictly adhered to our policy that GSP group work means collaborative teamwork, not single students being responsible for several slides and then just pasting them together. Still, workshop time did not suffice, but fortunately our groups were very motivated and did not fear to work overtime and in the evenings, thus being able to experience different working styles.

GSP は日本での事前学習と渡航先での協働学習によって構成されている。事前学習は 4 月から 7 月にかけてそれぞれの大学において行われ、渡航先で行う文化紹介のプレゼンテーションの作成や授業テーマであるマイクロモビリティや協定校の国・地域に関する学習などが 8 回にわたって実施された。内容としては、お互いの国の文化紹介のプレゼンテーションの発表、専門の教授を招いた授業、大学の研究室の見学や大学で研究中の最新モビリティの試乗といった大学内での学習はもちろん、ドレスデン市内外でのフィールドリサーチも行われた。これには、電動自転車の普及を進める活動団体の訪問、配送に電機自動車を使用している郵便機関での体験学習、モビリティをテーマとする博物館の訪問、ドレスデン市民のマイクロモビリティに対する意識調査などが挙げられる。学生のアイディアは中間発表と最終発表で具体化した。（小西一則 / Kazunori）

Pre-course lectures and activities

Pre-course education

In preparation for the main program in Dresden, the participants learned knowledge and issues related to the theme LEVs. Main topics were the Japanese concepts of mobility, the challenges of e-mobility, and what status LEV have in German society. The lectures were given in English and looked at LEVs from a variety of angles, ranging from the history and transition of e-mobility to more specialized topics such as the structure of e-mobility. These lectures helped us to deepen our understanding of the concept of LEV, a term that is not familiar to us, and to organize our arguments.

As part of the preliminary learning, the Japanese team presented a report on the current status and challenges of the Japanese LEV services, especially LUUP. This was the first collaboration in the program, and each of the 12 members of the Japanese team had a role to play in ensuring that the presentation was coherent, allowing us to experience the practical aspects of collaboration and fieldwork that characterize the GSP.

In summary, from the pre-course education, the team deepened its knowledge about LEV and the issues of them, then also learned about the practical aspects of collaborative work and how to approach the fieldwork. These experiences provided the basis for the main program and helped us to learn better in Dresden and experience more of the city (Kodai)

Main course start

Cultural Presentations

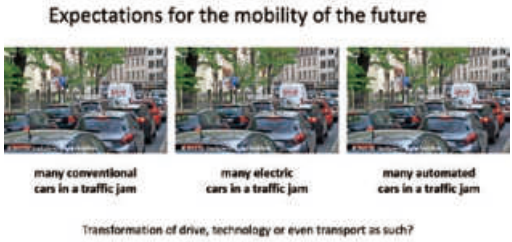
The first day of the German-Japanese exchange program at HTWD brought an exciting mix of culture, traditions, and culinary experiences. After a hearty lunch where the students were already eagerly getting to know each other, small group presentations on classic customs and traditions of both countries took center stage.

The Japanese students impressed with insights into the world of dating and falling in love in Japan, as well as the fascinating concept of supermarket fast food. The German participants proudly presented their culture, including the pickles, the nostalgic Simson bikes, Halloren balls, and German holidays.

Following the inspiring presentations, a lively Q&A session sparked engaging discussions and served as the perfect icebreaker. Subsequently, all participants gathered in the “Technikum” for a warm welcome celebration. Here, over bratwurst and fresh beverages, they continued to converse eagerly. (Dominik)

結論から言うと、渡航前に行われた事前教育は大変意義のある良いものであったと思います。というのも、事前教育で日本でもできることは事前に済ませておき、渡航中は現地での活動を通してでしか得られない経験に集中することができたからです。LEV とは何か、どのようなものが実際に走っているかなどを知らなくてもプログラムに取り組めるよう、簡単な講義が用意されていました。また、学生が日本の LEV について調べ（実際に LUUP という LEV のレンタルサービスも体験しました！）、発表する機会が設けられていたことで基礎的な知識を活動を通して養うことができ、現地で LEV に関連する講義を受けたり、フィールドワークを行ったりする際に活動をスムーズに進められたように思います。加えて、このプログラムの参加者は異なる学年・学部・学科で構成されていたこともあり、初対面の人が多い状況でした。発表は日本人側の学生全員で協力して取り組むものであったため、事前教育に取り組む時間は日本側の学生同士の関係を構築する時間ともなり、渡航した際ドイツ側の学生と集団で交流する際の助けになりました。（河野宙 / Sora）

Main Program: Sep 19
Lecture by Axel Wittkuhn



Axel Wittkuhn from the Dresden Transport Development Department visited the GSP programme to tell us about the Dresden Mobility Plan 2035+.

He started his presentation by showing us that today, more daily journeys are made by walking, cycling or public transport, but on the other hand, most daily kilometres are still driven by car. Car-sharing is also on the decline, further worsening the environmental situation. The Mobility Plan 2035+ aims to solve these problems by setting targets for the mobility the city wants to have in 2035. Various calculations were made on how emissions could be reduced with different approaches, such as electrification of vehicles.

Various pull and push factors were also listed. For example, push factors could be laws that prohibit cars from entering certain areas. Pull factors are used to make the plans more attractive. For example, cycle highways leading in and out of the city, or cycle routes in the city to make it safe to cycle in the city.

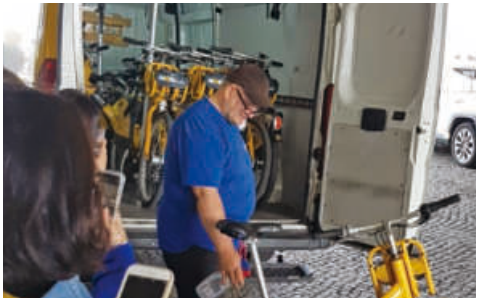
MOBI points also play an important role in these plans. These points link public transport with various rental services in the city. These points are often located next to a tram station. So, when you get off the tram, you can rent a bike, or a car for the final approach to your destination. As you can see, the city is planning well to make public transport and cycling in the city much more attractive, so that car traffic and the high emissions associated with it are reduced. (Max)

A first walk in Dresden
Visit to MOBI Points / Interviews

We embarked on a tram journey to explore Dresden. While encountering historic buildings, we also delved into exploring the latest developments in transportation infrastructure. This included specific features like "MOBI points" for electric vehicle charging, bicycle rental, and integrated spaces for car-sharing. During the explanations at the various sites, we were amazed to learn about the collaboration between the government and businesses, working together to promote environmentally friendly initiatives in the community. Additionally, we observed the bicycle-sharing services in action, both in terms of maintenance and usage.

Our curiosity extended to Dresden's traffic signals, which featured images of people, specifically a character known as "Ampelmann." Many of us were on the hunt for the female version, and it became a source of amusement among us. Conversations with German students highlighted numerous differences between Germany and Japan, making our interactions insightful and engaging.

Our teachers' hints and observations during the walk proved to be valuable for our subsequent group work. But of course, the walk was also very pleasant by itself, and it was nice to see Dresden and get a feel for its different quaters. The walk also proved a good chance for students of both nationalities to chat and exchange ideas. After the official part was over, we decided to walk a bit further and also check out the tourist sites of the city, still keen to spot some LEV. We found that some LEV were also used as "e-powered Rikisha" for tourists. (Hana)



私たちは、9月20日にHTWのラボに足を運びました。その場所では、自動車やエンジンのモデルだけでなく、実際に研究対象としている車両も間近で見ることができるんです。しかし、そこに展示されているモデルたちは、単なる見学では終わらない魅力がありました。教科書や画像とは異なり、ここでは自ら手を動かし、そのメカニズムを直接触れて理解できるんです。これは、私の好奇心を掻き立て、車についての知識をもっと得たいと思いました。私のように車について詳しくない人でも、ますますその世界に引き込まれたことでしょう。

このラボで、3つの異なる乗り物を実際に体験することができました。それは自転車、自動車、そして三輪車型の乗り物で、どれも電力を活用しているんです。特に印象的だったのは、三輪車での体験でした。座ったまま、自転車のようにペダルを漕ぎながら、電気モーターによるアシストができるんです。道路を走行中、その速さに驚かされました。いつかはこの乗り物で長距離旅行をしてみたいと思いました。その他の乗り物も、これまでの私の経験とは異なり、すべてが新鮮でワクワクするものでした。この素晴らしい体験を通じて、私たちは新たなLEVに関するプロジェクトアイデアを思いつくインスピレーションを受けました。この体験は、新しい未来の交通手段を考えるための扉を開いてくれました。（二宮彗太朗 / Seitaro）

Main Program: Sep 20

Visit to the HTW Laboratories

Wednesday started for some of us in the HTW basement and others on the HTW vehicle test site in front of the beautiful K-building. At the test site, where my group started, three different LEVs were available: an e-bike with Anti-Blocking-System, a Velomobile, a kind of recumbent bike and the Opel Rocks-E, a microcar. We could test-drive all the vehicles, which was much fun. Especially with the Velomobile, because you could reach a fast speed within seconds.

After we finished at the test area, we went to the basement of the HTW, where Professor Himmer told us about mysterious white powder from South America, imported at a high price tag – I'm still unsure if it was a joke or really from there. It turned out that it is the material needed for a powder 3-D printer. Employing this printer, one could create filigree and detailed prints, which could even be linked together as a big peace with moving parts. It was a great experience to see what can be done in the labs of our university! (Rufus)

Main Program: Sep 20
Visit to the Transportation Museum

We were at the Dresden Museum of Transport for the exhibition "MOVE - Verkehr macht Stadt". Our tasks were to understand the infrastructure of Dresden and find out more information about the LEV's.

Dresden is a green city and has many opportunities for children and families to let off steam. Playgrounds, parks and bike paths are available. Nevertheless, many citizens had wished for more green spaces, as was found out in the exhibition. Visitors could write their wishes on paper and add them to a network of many other wish lists. There were also many papers with the "LEV problem". The environmental pollution, space occupation and the disturbance of the beauty image by LEV's was criticized.

Also many other problematic issues were pointed out. For example, the little space on a sidewalk because it is blocked with garbage cans, construction site signs or bike racks. There were also many hands-on stations in the exhibition: A small sidewalk parcours, a future mobility simulator and much more.

What us students found most interesting was the station where you could combine road users to find out how many accidents can occurr. For example, the combination of car as the main culprit and bicycle as the victim showed an accident rate of 58000 cases in Germany in 2021. Many questions we had about mobility issues were answered in the museum and the exhibition especially. So a lot of material could be collected for our collaborative group work and the fun was not missing thanks to the hands-on stations. Afterwards, we went for another round of interviews (Schanet)

ドレスデンの ADFC というサイクリングを促進する団体に見学に行き、自転車大国のドイツにおける先進的なカーゴバイクについて学びました。（次ページ ジにて英語で詳しく紹介されます。）３つの種類のカーゴバイクについて ADFC の方からお話を聞くだけでなく、実際に乗ることで、よりそれらの自転車の利便性や機能について実感することができました。特に興味を持ったカーゴバイクは、後方に大きな荷物を置く用の車体がつながっているもので、日本では見たことのない形で、電気自転車であるために荷物が重くても少しのエネルギーで運転することができ、自動車を使わなくても大きな荷物を運搬することを可能にしました。それは、温室効果ガスの排出削減にも役立つと考えられます。しかし、日本での活用という面では、より細い道が多いために通りにくく、車との衝突が起きる可能性があること、またサドルの高さが高いためにこぎにくいという懸念が考えられるため、実践に向けて日本人や日本社会に合わせた調整を行っていく必要があると感じました。（豊口里菜 / Rina T.）

Main Program: Sep 21

Visiting the ADFC Dresden

On the 21st we visited the ADFC (German Cyclists Association) Dresden, which represents as a stakeholder the interests of cyclists to-wards local politics and the city administration (especially traffic planning). The aim of the association is to promote cycling, particularly by creating improved cycling infrastructure. Thus, our first excursion went to Dresden-Neustadt. Two groups took turns in visiting the ADFC with the professors, while the other group had a walk with Professor Himmer.

Our main contact was Mr. Nils Larssen, who works on a voluntary basis at the ADFC. He pointed out the significant growth in cycling in the city. Mr. Larssen comes from Denmark, which is considered the European country with the best infrastructure for cycling. He explained that progress such as the expansion of cycle lanes or the creation of bicycle parking spaces is progressing very slowly.

We discussed the challenges of a bicycle-friendly city and had the opportunity to ride conventional and electrically assisted cargo bikes ourselves. Such bicycles can be rented free of charge (even for non-members) at several locations in the city. Due to their size and heavy weight, some vehicles can only be controlled safely with a little practice. A technical special feature was an electrically supported trailer that can be used to move relatively high loads of up to 200 kg. The weight of the trailer, including the load, is compensated by its own battery-electric drive, so that the additional weight is not noticeable. (Stephan & Horst)

Main Program: Sep 22

Visiting Fraunhofer IWS

Every LEV requires an energy storage system. In the majority of cases, these are batteries. We had the opportunity to tour the battery lab at FIWS to learn about the development of modern energy storage concepts. The tour began with an introduction to the topic in a presentation by Dr. Althues, where he explained about future concepts of batteries. We were then taken to a lab where the development of new innovative chemical concepts was being tested to make battery storage even more efficient. Great emphasis was also placed on the environmental compability of these modern concepts. Afterwards, we were led through a second lab where strategies for small- scale battery production were being tested. We saw a small production line and observed the strict guidelines under which battery production is carried out at Fraunhofer IWS. In a subsequent discussion, any remaining questions were addressed, allowing us all to learn a great deal during this excursion. (Albert)

On the afternoon of the 21st, we had the opportunity that Mr. Vollmer from HTW showed us his private LEV. We had ample time to talk to him about his motivations and experiences. He told us a lot about his cargo bike. He talked about the facts of range, battery charging time, braking systems and told us how he uses it as mobility factor for him and his family. It spoke for itself that the family decided to get rid of a second car and went for the cargo bike for easier city mobility, less taxes and a commitment toward the environment. Still, we were very impressed about the high price and wait time neccessary for buying the bike. Many students were impressed by Mr. Vollmer's choice to privately purchase such a bike and were greatful for his detailed explanations on additional parts and various ways of usage for the bike. (Stephan & Horst)

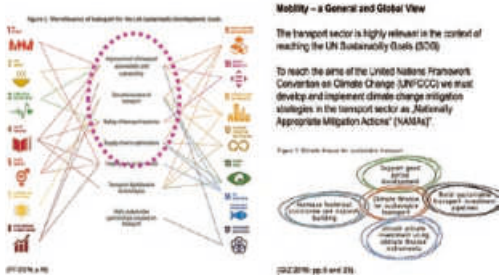
Main Program: Online Content

Prof. Scherzer's Lecture

We attended Professor Scherzer's online lecture, which was highly valuable to me as an urban planning student. Among the topics, the evolving use of urban space in Dresden caught my attention.

Dresden has seen changes in its urban fabric over the years. There was a time when tram and road networks dominated, leading to a car-centric city. However, in recent years, there has been a reevaluation of the importance of pedestrian zones, emphasizing coexistence between mobility and people. Moreover, I learned the Dresden has set clear goals for sustainable transportation planning in the future, actively working on their implementation.

The trend toward compact electric vehicles suggest potential shifts in public spaces and infrastructure. Understanding the close relationship between mobility and urban planning is crucial for envisioning how cities should adapt for the future. (Hana)



Main Program: Sep 23

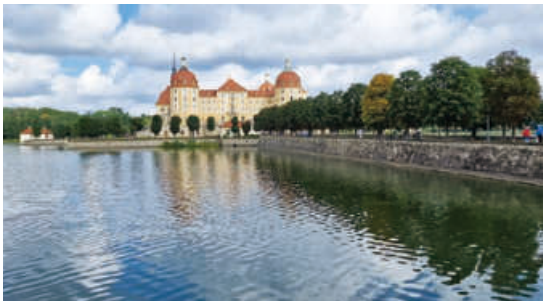
Mid-term presentations

The Mid-Term Presentations took place on the Saturday of the first week. Group A started presenting on how the awareness of LEVs could be increased. They first talked about their survey results and then about ideas and solutions on how the awareness and popularity could increase. After them Group B had their presentation on the sustainability and environmental aspects of LEVs. They focused a lot on sustainable and recycled materials. Group C talked about LEV Infrastructure. They showed different types and concepts for paths and roads for LEVs, rental charging points and storage areas. They further discussed how they could be implemented. Group D talked about the dream LEV They compared the LEV stations in Dresden and Tokio and then showed the different specs of the LEV. At last Group E held a presentation about the Current state of LEV usage. They presented about common LEVs in Dresden, battery improvement and pros and cons of the infrastructure specific to Dresden. (Pascal)

発表は 1 グループ 4、5 人で 5 グループに分かれて発表を行いました。各グループに LEV に関連したテーマが与えられ、それについて 15 ～ 20 分程度発表するという形でした。テーマは「LEV に対する市民意識の向上」、「環境・持続可能性からみた LEV について」の議論、「LEV の利便性や安全性向上のためのインフラ整備について」、「さまざまなニーズを取り込んだ理想の LEV」、そして「LEV 利用に当たっての地域的問題と今後の見通しに関するドレスデンとプラハの対比」の 5 テーマでした。短い時間の中でお互いが母語ではない英語でコミュニケーションを図り、協力しながら発表の内容を深めることに苦戦しました。私の班は発表前日の活動が終わった段階でも役割分担すら決まっていない状況でした。他の班の人もそれぞれ大変そうで、みんな夜遅くまで発表資料をまとめていました。当日は班員が言っていることに関連性が見られない、もっと新しいアイデアを出して欲しいなどという指摘を受け、最終発表に向けて課題が残ることになったものの、どのグループも中間発表を乗り越えました。（望月咲百合 / Sayuri）

Main Program: Sep 24

Outing to Moritzburg



On Sunday, the 24th of September, we had the first purely cultural activity on our schedule – a visit to Moritzburg Castle. As one of the many residences of August the Strong, it is located in the more rural north of Dresden and surrounded by an artificial lake. In Germany it is widely known due to the fairytale of Cinderella, which was partly filmed there in 1973. It was originally built by August the Strong during the 18th century as a royal hunting lodge and now happens to be a quite popular sight for locals and tourists.

Meeting up in Radebeul, a smaller neighbouring city to Dresden, we commuted to the castle by the historical, steam locomotive "Lößnitzgrundbahn". Wooden seats, the smell of the steam and a beautiful landscape offered us a very pleasant ride into the past. In the city of Moritzburg we came across an outdoor bookstore, which was set up on a stone wall and offered a wide variety of german books. Many students used this and acquired a souvenir.

We continued walking along the Schlossallee - a big, perfect straight street with trees to each side leading to the castle. When we arrived, we took a group picture in front and then continued in small groups through the historical exhibition inside the castle. Countless antlers, extraordinary furniture and a virtual interactive tour showed us how the powerful ruler and elector August the Strong would spend a weekend with his family back in the 18th century. Even us German students who are used to these views were again amazed by the beauty of the area. (Hannes)

Main Program: Sep 25

Visiting DHL in Ottendorf-Okrilla

On our last day in Dresden, we visited a DHL center, where all parcels and letters are sorted for further distribution. Jessica Quander and her team cordially welcomed us. She gave a wonderful presentation about DHL's overall mission and its commitment to go green. The company went all the way to go zero-emission and did this even in disregard of financial losses but for the sake of a better future. It amazed us even more given the contrast that we priorily learned how difficult it is at the moment in politics to enforce LEV. Overall, LEVs are currently still too little integrated into the infrastructure and also not everyone's cup of tea. So it was very stimulating to see how DHL did the feat and integrated their GigaBox self-designed LEV. The Japanese students were amazed that the handle was on the right side as in Japan. This is to ensure driver safety, because the delivering persons can disembark on the side of the pedestrians walk this way. They featured other, very unique LEV that are purpose-cut and super efficient. In the afternoon, we could then test-ride all the LEVs to our hearts content under the supervision and instruction of Mr. Holger Conseur. Driving these LEV needs surely a lot of practice! It was really impressive to see the internals of the company. Thanks for the amazing badge! (Horst & Juljan)

9月24日は、ドイツに来て初めて一日自由行動ができる日でした。ほとんどの学生は、先生方やドイツ人学生と汽車でモーリッツブルク城を訪れました。バロック様式の可愛らしい色をした城ですが、城内には数多くの鹿の角のコレクションがありました。城周辺には馬車が通っていたことも印象的です。城内では、タブレットを借りることができたため、日本語で城の歴史を詳しく知ることができました。各自自由にモーリッツブルク城の観光をし、昼食をとった後、再び汽車と電車を乗り継いでノイシュタット駅で解散しました。

9月25日には、ドイツの国際輸送物流会社である DHL を訪れました。まず、DHL が脱炭素を目指すためにどのような取り組みを行っているのかレクチャーを受けました。DHL は、基本的に自社の屋上の太陽光パネルで発電をした電気を使って、運送に使用する電気自動車や LEV を走行させているそうです。レクチャーを聞いた後、DHL が実際に運送に使用している LEV（E-Trike）や EV のトラックに試乗したり、社内を案内してもらったりしました。（中村千博 / Chihiro）

Main Program: Sep 26-27

Nat. Technology Museum Prague

Visiting Prague's National Technical Museum was an incredibly enriching experience. The museum's extensive collection of exhibits showcased the evolution of Czech industrial technology, leaving us in awe. Through these exhibits, we gained a deep understanding of the Czech Republic's history as an industrial powerhouse.

The museum's striking old Soviet-style architectural design also evoked a sense of nostalgia for me, as it reminded me of similar buildings from my childhood in China. Each floor of the museum housed a variety of exhibits, covering everything from timepieces, printing machines, household appliances, architecture, astronomy, to various modes of transportation. The wealth of content on display was truly impressive.

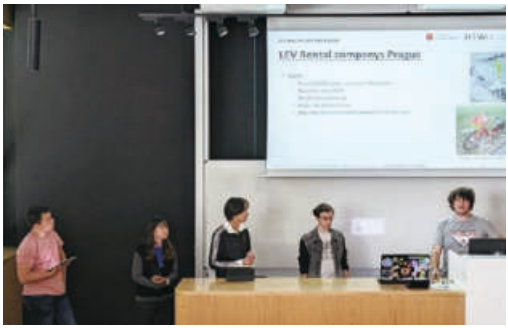
One of the highlights of the museum was the extensive collection of vehicles. There were bicycles, motorcycles, cars, planes, and locomotives, each telling a unique story of technological advancement and innovation. It was fascinating to see the progression of transportation technology over the years.

Only a few hours's visit was not nearly enough to explore all the museum had to offer, and I left with a strong desire to return in the future. The museum left me with a profound appreciation for the Czech Republic's contributions to the world of technology and a deeper understanding of its industrial history. I hope I will be able to visit again one day. (Nadire)

電車でプラハに移動してからは、ホテルを拠点に活動を行いました。近くにはショッピングモールがあったので食料調達や買い物を簡単に済ませることができましたが、日本とは違って横断歩道の青表示時間がとても短いので走って渡っていたのが印象的です。最終プレゼンの後は、みんなでプラハ城やカレル橋など世界遺産に行きました。建築物はどれも美しく、教科書や映像で見てきた場所へ実際に行くことができてとても充実した 1 日となりました。プラハ城では聖ヴィート大聖堂に登ることができ、約 300 段の螺旋階段の先でプラハを一望できたのは貴重な経験です。また近くにはお土産屋さんも多くありチェコ土産もたくさん調達できました。しかし、やはり観光地ということでスリへの注意の必要性やタバコを吸っている人が多いことによる不快感がありました。その後解散してからはプラハを自由に巡りました。美術館や博物館に行ったり、先生主導のもとオペラ鑑賞に行ったりと、それぞれプラハで思いの限り残りの時間を楽しみました。(山口莉奈 / Rina Y.)

Main Program: Sep 28

Final presentations at CTU Prague



In the final presentations, each of the five groups gave a presentation followed by a question-and-answer session. Each group made improvements based on the questions and advice they received from students and professors in their mid-presentations, and incorporated the results of their fieldwork and interviews, turning data to diagrams, etc. By incorporating photos taken during the program, it can be said that the presentations made full use of what the students had learned during the program. Although the time frame was limited to five days after the mid-presentations, each group was able to create one presentation through repeated trial and error, group discussion, and cooperation. In the process leading up to the final presentation, there was a lot of learning that was not limited to academics, such as the difficulty of learning a specialized field in English, how to communicate smoothly, and the importance of conveying opinions and ideas. I believe that there was a lot of learning achieved by the framework of mid- and final presentations. In the evening, we had a nice farewell party over the roofs of the city in a huge beer garden (Aoka)

最終プレゼンテーションでは、５グループそれぞれの発表と質疑応答が行われた。各グループが中間プレゼンテーションで学生や先生方から質問やアドバイスを受けた部分をふまえて改善を行い、フィールドワークやインタビューでの調査結果、データ資料や図を組み込みながら、より各々のテーマ内容を深めた発表を行った。実際にプログラム中に撮影した LEV などの写真や、訪れた研究所、博物館での写真も取り入れることで、プログラムでの学びを生かしたプレゼンテーションであったといえる。中間プレゼンテーションから５日後という限られた時間ではあったが、一人一人が試行錯誤を重ね、グループで話し合い、協力し合いながら一つのものを作り上げることができた。最終プレゼンテーションに至るまでの過程においても、「日本」と「ドイツ」という文化も母語も異なる学生同士でのグループワークを通して、英語で専門分野を学ぶことの難しさや円滑なコミュニケーションの方法、意見や考えを伝える大切さなど学問に限らない学びというものが多くあったのではないかと思う。（能島青花 / Aoka）

Final Presentations (Sep 28)

1. Raising Awareness and Acceptance for LEVs

Group A conducted a survey about the topic with people in the downtown area of Dresden, the „Altstadt“. The results were then analysed and rehashed in a proper visual manner using pie charts. Afterwards the four students thought of ideas to improve the knowledge and acceptance for LEVs. Unfortunately many people still don't know a lot about LEVs and quite a few prejudices still hold some merit within the public viewpoint on these vehicles. To bring about some change to this predicament the group thought of some ways to raise awareness and educate the people on LEVs. Thus the idea of the "Educational LEV Rally" was born, where people could come together to learn about these vehicles, try them out and have a good time. The rally is supposed to be for people of all ages, so they can experience LEVs in a lighthearted environment. The important thing about this rally is that people can learn more on their own terms and are not forced to do so. Of course the event with all the stations, like a slalom course or short lectures about maintenance and safety, would be free. To help with funding, the event could be incorporated into the "European Week of Mobility" which takes place yearly and is supported by the Ministry of Environment. We really hope that this will help raise awareness and acceptance for LEVs! (Yannick Hensel)

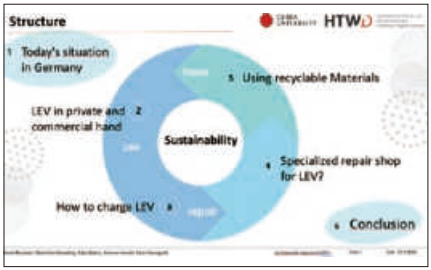
2. Sustainablility and environmental issues

Sustainability and reducing human impact on nature are two issues that are more important than ever. Many people are making a positive contribution to this issue by changing the way they use different modes of transport. For many people, especially those living in cities, switching to a bicycle for short daily trips is a good option. LEVs support these people by reducing physical effort.

Some replace their second car with an LEV. So, we need a more sustainable energy supply to recharge the batteries of our LEVs in an environmentally friendly way. Also, the charging infrastructure needs to be developed much further to make it easier for people living in apartments to use an LEV.

But when an electric vehicle gets used every day it's also possible that it gets damaged. But who will repair these damages? We found out that in Germany most people can repair a bicycle themselves. Therefore, there must be a way, such as workshops, where people can learn that they can also repair small parts on their e-bike by themselves, for example. Apart from the motor and battery, of course, but they need to get rid of their insecurity when it comes to small repairs on LEVs. We also need to consider using recyclable materials for new parts, such as bamboo, plastics, wood, or carbon fibre.

It is important to note that the industry already has very good recycling capabilities, but the prices need to become more attractive to compete with, for example aluminium frames. (Max Kesselring)



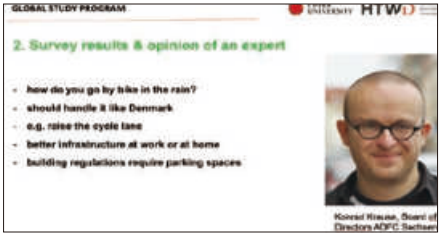
3. Vision: Infrastructure for LEV

Cities overfilled with cars that are stuck in traffic jams while emitting lots of „unused“ emission to the environment are a big problem all over the world. In order to solve this issue this presentation focused on one of the biggest pull factors, the infrastructure. The presentation gave an overview concerning the current situation in the cities Dresden and Prague and to work out several solutions that could be realistically implemented during the next years.

The survey showcases that many people would cycle more if the roads would be safer so it´s an obvious issue that there arent enough paths and roads for cycles that are seperated from the common road with cars and buses. Building coloured cycle paths next to the road would improve this issue enormously.

The second problem ist the lack of charging stations in the cities. To use the potential of an LEV you need electric power to charge your batteries over the night which isnt possible curently. To fill this gap there could be an yearly investment into charging stations near households which also function as storage space for the LEV. It would increase the feeling of security during the night cause the next day the LEV will not be stolen but just fully charged.

All those examples could lead to a more sustainable individual mobility. It needs to be investigated how people accept and use such new opportunities. (Leander Jancyk)

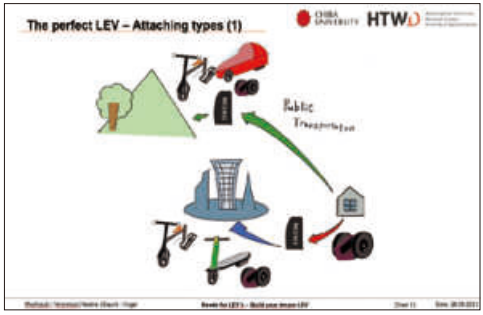


4. What are the needs for LEVs? Build a dream LEV

First of all, we gathered information about which LEV's are already offered to use in Dresden and Tokio. The general goal of providing a more environmentally friendly city and reducing carbon emissions is uniting both cities at this point. Furthermore, we took a survey with a chain of questions to find out if people have used LEV's so far and especially their reasons for or against.

In our final presentation we referred to our first concept for a dream LEV in the mid-term presentation and introduced a brand-new version: The LECV (Light Electric Click-On Vehicle). It is an easily portable, short-range device that can be attached to one's feet. By tilting forwards or backwards you control the speed, just like a segway. In this way, we want to address the smallest level of micro mobility. But what if you want to commute a longer distance? Just use a modular extension.

You can choose the scooter module, providing a longer distance and higher speed. There could be a cargo version with a loading area. Bigger batteries ensure enough power to transport heavier goods. Lastly there is the long distance, waterproof version which is optimized for higher speeds. Depending on the extension, the LECV can also be transported on public transport. (Hannes Vogel)



Final Proposals (Cont')

5. Current state of LEV-usage in Dresden and Prague

We made it our task to look at the current state of LEV-usage in Dresden and Prague and to make a comparison of them. The role of LEVs in general is to reduce CO2 emissions and car traffic. First, we looked at common LEVs and found that Dresden and Prague both have rental e-scooters. Prague also has fully electric rental bikes while Dresden only has normal bikes. Both cities have electric delivery services with only small differences. The infrastructure for these vehicles is far from perfect in both cities. Streets are often in bad conditions and bike lanes are to narrow. Still, cycle highways are planned, and most streets at least have bicycle lanes. In Prague bike lanes are almost always located at the edge of the road and are way to narrow. By survey, we learned that people in Dresden are more open to LEVs than people in Prague. Every consultant in Dresden said that they believe in LEVs increasing in the future. In Prague 1/3 of sadly could not imagine this. Both cities need to improve to make LEVs more lucrative.(Yannik S)

Final Observations by Prof. Himmer

This GSP, students from Chiba University and HTW Dresden worked in mixed teams to address and work on current problems on the topic of "Sustainable micro-mobility with Light Electric Vehicles – LEV".

Due to climate change and the associated realignment of private and public transport, the topic is being discussed controversially. Further efforts need to be made to reduce the carbon footprint, which is heavily influenced by individual mobility. Based on this situation, the GSP 2023 focused on current developments in the implementation of novel micro-mobility concepts.

The students worked in separate working groups and analyzed current problems related to the different LEV mobility concepts in Japan and Germany.

Various lectures were given on the topics, including by the city of Dresden, the ADFC and the professors from HTW. The program was rounded off with excursions such as to the DHL sales center in Ottendorf-Okrilla, to Fraunhofer IWS, to the Dresden Transport Museum and to the Technical Museum in Prague.

Students from different faculties of the participating universities have shown, that they can collaborate on technical topics very well and they learned how to improve their presentation style. The final outcome of their work was well shown in the end.

Proposal for GSP in September 2024 in Chiba

Preparedness for environmental risks in a resilient society - Disaster education and management in Japan

Japan is a country renowned for its stunning landscapes, technological advancements, and rich cultural heritage. However, it is also a nation that is no stranger to natural disasters, given its location along the so-called „Pacific Ring of Fire“. From earthquakes and tsunamis to typhoons and volcanic eruptions, Japan faces a wide range of natural calamities. In recent years, North Korean atomic bomb testing and rocket missiles have kept the nation in alert as well. Consequently, disaster preparedness has become an integral part of daily life in Japan. In this GSP, we will delve into the importance of disaster preparedness, including education measures and special efforts geared toward foreigners.

Disaster preparedness in Japan is not merely a government initiative, dedication to readiness is rooted in historical lessons. The Great Kanto Earthquake of 1923, the Kobe Earthquake of 1995 and the still recent Great East-Japan Earthquake of 2011 with the ensuing „Threefold catastrophe of Fukushima“ underscored the necessity of disaster preparedness and resilience.

Important key factors are Education and Awareness, Prevention Technology, Infrastructure Resilience, but also Community Mngagement. Due to the surge in international tourism, education for foreigners and multi-language support in case of disasters became important as well. citizens are taught about

Topics and Research Questions:
- How aware are people of disaster?
- How safe is safe? Atomic Disaster&Food Safety
- Landslides and Flood prevention
- Earthquake and Tsunami damage mitigation
- Typhoon
- Early warning systems

Preeducation:
Movie-Screening and lectures

Activities during main program:
Visit a shelter facility
Visit to the disaster prevention goods zone
Visit to the Museum for Disaster Prevention
Visit to the „Shakeout Center“
Visit of Firefighters Station
Visit to a Hospital (Emergency infrastructure)
Lectures about Scenario analysis & predictions
Lectures and museum visits about the history of disasters and their prevention

The tentative date for the GSP 2024 in Chiba is September 15th to September 27th. The program may extend a bit, so please keep your schedules free some days before and after.

For questions and further information please contact the GSP team:
Prof. Biontino: biontino@chiba-u.jp
Prof. Nishio: y.nishio@chiba-u.jp
Prof. Himmer: thomas.himmer@htw-dresden.de
Prof. Zipser: stephan.zipser@htw-dresden.de

Participants

Through GSP program, I had full of first-time experience, first time to go to Europe, to eat Schnitzel, to make Germany friends, and more. If you are interested in another new world, you must participate in GSP! (Shiomi Takenouchi)

This was a meaningful experience, which I wouldn't get from a regular study abroad although of course it was sometimes tough for me. Thank you for everything. (Rina Yamaguchi)

The Global Study Program was a fantastic opportunity to engage with Japanese culture. As such, this program was both culturally enriching and academically rewarding. (Albert Sagawe)

Il'm really happy I was part of the GSP it was such an amazing opportunity to leanr about LEVs, connect with new people and learn a lot about another culture. I had a great time and I hope I get to meet our new friends again soon! (Yannick Hensel)

I was a little nervous about this program, but I'm glad I participated because I was able to experience a lot of valuable things. Thank you all. (Aoka Nojima)

Collaborating with German students was an incredibly valuable experience,and it gave me fresh ideas. Riding the LEV allowed me to acquire new knowledge through hands-on experiences. Moreover, I learned new perspectives and worldviews. (Yamaguchi Hana)

A big thank you to everyone who took part in the GSP. It's a great opportunity to meet new people from a different culture and have a great time together, both during and after the daily project work. (Max Kesselring)

The time was exciting, extraordinary, educative and a lot of fun. Many friendships were formed and I learned a lot about myself and others... About different lifestyles and that we are all the same. Thanks! (Schanet Baumann)

I realized the difficulty of collaborative learning with people from other countries during this study abroad program. I was also able to deepen my understanding of mobility. (Kazunori Konishi)

Although it was only two weeks, I learned a lot about LEV and other things in this program. The experiences I gained from my time in Dresden and Prague will be unforgettable! (Sora Kawano)

It was a special Experience for me to learn about e-mobility with LEV in Dresden with HTW students, and I would like to think about ways to promote e-mobility in Japan. (Toyoguchi Rina)

The Global Study Program was one of the best thinks I have done so far! Thanks to all participants and professors for the fantastic time. And to all those who are curious about the GSP: I highly recommend signing up! (Rufus Bräsicke)

At first, I was thinking I couldn't get so much from a program that ran only two weeks, but this was totally not the case. The program was hard and stimulating accordingly. Joining GSP was a great choice for me. (Sayuri Mochizuki)

For me it was a great time during GSP! It was the first time that I made friends from another nation. I was also able to train my English language, to get personal insights from the life in Japan and to experience many trips and freetime activities. I can only recommend the GSP! (Leander Janczyk)

For me participating in the GSP was one of the most spontaneous and yet best decisions of the whole year. I met enchanting people with lots of humor and had an amazing, memorable time. Thank you and see you soon! (Hannes Vogel)

I feel extremely fortunate to have had the opportunity to visit Dresden and Prague, where I enjoyed a wonderful journey. The friendly classmates and the stunning landscapes left a deep impression on me. The course on new energy electric vehicles expanded my horizons, and I look forward to returning to these beautiful places someday. (Nadire Aximu)

Before the project, I rarely recognized rental bicycles or e-scooters consciously. Now I regularly use MOBI Bikes to commute throughout the city and even tried out LIME scooters. So, my awareness for the topic is certainly raised. (Yannik Schmidt)

In the beginning, I was very excited and not sure if it was the right decision to participate. However, getting to meet so many new and interesting people and being able to exchange ideas was the best decision of the year. (Dominik Frisch)

The GSP was a fun experience. I got to know some new people from a different Culture, and I also learnt a lot about LEV´s and how they can improve our cities. (Pascal Otto)

The transportation network in Germany was quite different from that in Japan. Since I am interested in sustainable transportation, GSP was a great opportunity for me to learn about the advanced German transportation system. (Chihiro Nakamura)

I very much enjoyed taking part in the GSP. I was able to enhance my ability to collaborate and carry out work efficiently and was able to learn a lot about collaboration through practice. (Kodai Deguchi)

The best part of this program was that we did not just learn English, but we learned with English. By spending a lot of time with German students instead of only interacting with Japanese students, I was able to not only develop my English skills but also learn about their ideas. I also became more interested in the transportation issues and urban development that Japan has. This was an idea that I was able to gain only by going to Germany and making comparisons. (Seitaro Ninomiya)

Incredibly beautiful time, very exciting, and of course also associated with hard requirements from the professors Many new friendships made and a very nice finale in Prague. Thank you! (Horst R. Bauch)

It was nice to see that the cooperation between the Japanese and German students became more intensive and personal. I hope that all participants will remember our time this positively. (Stephan Zipser)

I learnt so many things from the GSP. It was also a great experience to see how German and Japanese students communicate with each other - not only for the final presentation. Well done, amazing! (Yuko Nishio)

Thank you for your active participation! The quality of the presentations improved significantly during the program. I hope to see all the students again in Chiba next year! (Thomas Himmer)

It was a pleasure for me to see how students got engaged in their tasks and had a good time! Thanks to HTWD for all the organizational work! (Juljan Biontino)

Global Study Program

2023:
SUSTAINABBLE MICRO MOBILITY WITH LIGHT ELECTRIC VEHICLES

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