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MobilitySchool – How to act multimobil daily?

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Executive Summary

"Mobility School" is a Year 2013-15 Project of "International Showcase Electric Mobility Berlin – Brandenburg" funded by German Government. It was a collaborative effort of BSM, TU Berlin and Driver School "Verkehr human" exploring chances to influence attitude of Driver School Participants learning about Electric Vehicles as well as Multi-Modal mobility and to reflect the various mobility options available in urban areas when deciding daily about personal available means of transportation, from electric vehicle to car-sharing, tram, bus, train, pedelec, e-bike, scooter, etc. – when using smart phones with navigation, mobility and transportation apps, as available now to the Public.

Keywords: BEV, education, mobility concepts, sustainability, training

1 How to effect changes in favour of Mobility versus Driver Schools?

1.1. The more rapid Mobility innovations mature the more Driver Schools struggle

Most people would agree to the saying 'more rapid innovation leads to more rapid evolution'. Consensus may be reached as well by saying that in an innovative branch like automotive industries, worldwide, we would expect a wave of new Laws and Teaching rule changes to happen accordingly. That should apply as well to Driver Schools and its Teachers - at least with some time lag. But the opposite is the case. With reference to Germany. Regarding updating Teaching and Training in Driver Schools. Ongoing Market introductions of Innovations in the Automotive Markets were always reflected too late in Driver School Training course adoptions.

However we have to face the fact that any changes in Law or Executive orders by Governments took so long time on National or European levels with regard to Driver Schools? The last European Union Ruling on Drivers Licences or Driver School matters took place 2006 with "DIRECTIVE 2006/126/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 December 2006 on Driver licences" and took years, too, to be transferred into National Law.[i] Thereafter only minor adoptions took place from time to time.

1.2. Time consuming EU Commission and German Government Driver School activities

It we take a view on EU Commission activities regarding Research and Studies in the area of Driver Schools and the future development focusing Electric Vehicles including Light Vehicles, CarSharing, Mobility services, Automated drive technologies and prototypes, we get to know only European Studies, which did not address such topics from a Driver School view-point at all.[ii] Focus was on Studies researching "Professional Expertise and Knowledge of Driver Instructors" or "Educational-psychological and pedagogical professions of Driver instructors" or " Qualification level of Driver instructors and access requirements for Driver instructor professions" as a German Study[iii] described, making reference to the European Projects as outlined in Note 5. It is fair to say that the "Multimodality and Modality" aspects, as focused in "MobilitySchool" 2013-2015 Berlin project, were neither mentioned nor addressed at all on European level and seem to be still way out of thinking in the Stakeholder networks in Germany as well as in Europe – at least at EU Commission level, for example DG MOVE.

Only a few months ago in Spring 2017, German Parliament passed a Bill (Executive Order as a matter of fact) overworking the 1999 established "Fahrlehrerausbildungsverordnung"(FahrLVO) i.e. (Driver Teacher Executive Order for training) which was more than three years discussed between many Interest groups and between Provincial and Federal Governments as well.[iv] This bill will come into Law on 1st January 2018 only and at least gives a small room to "Multimodality" issues in the reshaped Curricula of (FahrLVO).[v]at least during a 45 Minutes Theory Lesson this issues can be focussed amongst others according to Bill mentioned. (FahrLVO) for first time ever is referencing item "Multimodality" in Driver School Curriculum.

1.3. "Micro World of Vehicle Training" dominates view of "Macro World of Urban Transport Infrastructures and existing Mobility Services"

As it looks from an innovative 'Multimodality' Point of View nowadays, Stakeholders and Bill makers involved seem to rather focus on Personal Professional Competencies of Driver School Instructors / Teachers and the future enhancement of trained skills at the compulsory Instructor Trainer courses before getting licensed as Driver Teacher and in-between rather than building bridges in Theory and Practice between the "Micro World of Vehicle Training" and the "Macro World of Urban Transport Infrastructures and existing Mobility Services". It is remarkable to take note of the huge gap between 'Mobility Thinking' of todays advanced Driver Instructors, as seen in Berlin, and the huge boundaries – by law - such persons face, when willing to go the extra mile to give Driver School Participants some more possibilities "at hand": How to organize their personal daily mobility better, (exploiting the digitized mobile services) when having obtained their Driver's license BE. The Intentions of City / Regional Governments to get better Modal Split[vi] ratios achieved, to encourage lesser use of private cars on polluted roads and to cope with Climate Change get no support on a broad basis through (FahrLVO) new Bill - much to our surprise. The Capacities and to some extent available professionalism amongst an important minority of Instructors available on side of professional Driver Schools for supporting change to a better Ecosystem and City environment are not used at all.

Exemplary Curricular Training content of new FahrLVO in Germany effective 1st. Jan. 2018

The new curricula "Mobility behaviour in Germany" are mentioning first time the term "Multimodal Mobility". The Driver Instructors shall tackle issues like "Possibilities of environmentally sustainable and sustainable mobility design" according to the new FahrLVO. The bill enables the task of instructing drivers and Driver instructors to work for BE license holders in the subject area "1.1. Traffic behaviour "1.1.2.": 40 minutes on the subject of "Driver behaviour" under 1.1.2.4 "Responsibility for people and the environment", also Multimodality. With a view to the findings of the project "Mobility School" and the demands derived from it, this is a tiny step forward, but absolutely inadequate with regard to the mobility challenges in the Urban areas or large Cities of Germany, let alone in Europe or with regard to the World "Mega Cities".

2 How to focus Multimodality in Driver School: A modular approach

As it's known Driver Schools in Germany are facing many challenges: The demand for Driver's license BE is continuously decreasing, the "Price package" approx. 1.900,00 € - on average statistically- is undercut often due to fierce competition between the very small (<45T€), the middle size (150/250T€ Turnover) and the large Driver Schools (> 250T€) with many branches. Approx. 10.000 Driver Schools are coping with Law, Regulation and Market conditions daily in Germany.

The German legislature stipulates[vii] that applicants for a Driver license in classes like BE (car driver) attend and pay at least 12 hours of Special Road trips (Practice) and 14 hours for class B and 16 hours Theory lessons at a certified Driver school. Prior registration for the theoretical or practical Examination is not possible. An education by laymen is forbidden in Germany.

Despite the generally increasing employment in Germany, the number of Driver Instructors did decrease in the past but is now increasing again nationwide, while the Driver Instructor constituency is becoming increasingly deficient, and the average age of the Instructors is growing steadily. These are the ongoing challenges faced by the Driver School sector in 2017 in Germany.

The number of employees subject to social insurance and slightly employed drivers is as follows: On the deadline in September 2016, 16,011 Driver Instructors were employed as employees and 6,824 Instructors were slightly employed – less than fulltime. Compared to the previous year, there is a general increase of 4%, or 945 new Instructors, which is made up of 5.6% more employees and 1.3% more so called mini jobbers. The proportion of women is 13.5% and the minor employed women account for 9%.[viii]

During Project period "MobilitySchool" we worked together with ten Driver Instructors in three Berlin Driver Schools whose principals did know before the Project team was shaped in 2012/13. The motivation of the Driver Instructors in favour of Multimodality and Electric Vehicle was already apparent due to past smaller experiences and Berlin contacts. "Verkehr human GmbH" Driver School had gained already a reputation in Berlin – Kreuzberg for Eco friendly mobility, training School participants on OPEL Gas fuelled vehicles since years. Due to previous contacts with BSM – Federal Association of Solar Mobility[ix] in Berlin and BSM's contact with TU Berlin, Institut für Land- und Seeverkehr (ILS), Chair of Integrated Transport Planning[x] , Project application was agreed in Summer 2012, the project commenced June, 2013, when the Project "Mobility School" was granted to the Consortium.

The main challenge for the Project Team and in particular participating Driver Schools was, how to motivate Participants to spend extra time and effort to attend Theory #1 and # 2 Modules besides Practice Driver Lessons with Electric cars (OPEL AMPERA at the beginning and then VW e-UP later on) and to attend eCarSharing course (for legal reasons after Driver's License exam passed successfully) – and to cooperate in answering questionnaires of TU Berlin Ancillary Research and some being prepared for personal interviews, as organized by TU Berlin. As known, the general Theory modules in Driver Schools are already demanding and at time of project "MobilitySchool" the public attitude in general and expressed opinions towards Electric Mobility and "Multimodality" were very divided in 2013, 2014 ff. (more comment in Summary, further down)

2.1. The Objectives of “MobilitySchool” project can be summarized as follows:

1. Development of Driver School Curricula modules (Prototypes!) motivating drivers for clarifying the "why?" about Electromobility and Inter / Multimodality.
2. Development of a Webpage "Mobility School" including CI and LO and Tools for integrating into the 3 Driver Schools of Teachers and for professional contributions and lectures and into Social media of Stakeholders
3. Participation and networking with a Stakeholder Network that implements Berlin-wide, intermodal routing on the basis of information systems of Public transport Berlin-Brandenburg, Rail, Tram, Bus and eCarSharing. Target: Get to know all options for daily route planning and transport options.
4. Use of two Driver School Electric Cars (EV) for extra hours (not paid by) Training of Participants , including process of Charging EV and swapping EV to Pedelec to eCarSharing to Public Transport (“Mobility Chain” challenges and how to benefit from intermodal offerings).
5. Extensive use of mobile devices, on-board computers, navigational aids (charging apps including routing) in Driver Schools. In Theory and Practice. Target: Give users comfort and routine.
6. Development Curricula “Theory #1 "90 Min - Electromobility / Vehicle" and Module #2 – Mobility culture and Multimodality – reviewed by Ancillary Research Team of TU Berlin.

   With Module #1 the view goes far beyond the subject of electric car and also includes other vehicles with electric drive (e.g. Pedelec, Electric scooter). The main goal of the module was to impart basic knowledge about the technology and the chances of the electric drive.

   In Module #2 the aim was to take a closer look at one's own everyday mobility with the participants, to reflect their own choice of means of transport, to make multi-modal mobility alternatives aware and to provide them with the possibilities of different information media for the individual Mobility planning (apps etc.)

3. MobilitySchool: How to change “Status Quo”?

Figure 1: Logo for new approach to train Multimodality in Driver Schools. Participating schools used it.

Figure 2: Learning of Multimodality: How to influence Mind-set of Attendees? Using Role games.

MobilitySchool was – within the legal boundaries of strictly ruled content of Theory Lessons of Driver School Instructors – moderate successful to explain and to practise with pupils all options available and how to organize and manage via 'Tablets' with Apps the various options, fitting with specific daily Mobility Services or Vehicles needed to match own agenda of Participants. The "extra lessons" in Theory and Practice (Driver Electric Vehicles) where paid from Project Budget rather than by Driver School Participants, who have to pay for their Driver's License (BE) for Vehicles on average statistically 1.900,00 € net/person in Germany. Of course Top of Agenda, was also to learn to know how to use and drive with Electric Vehicles and Pedelecs /E-Bikes and make use of E-CarSharing. Reflection during Theory Lesson, what influences daily Participants Motivation and Decision making: "How to commute / travel?" - was a key issue and lead to many debates between Participants and Instructors and Participants-to-Participants.

However at the end, even the sophisticated new curricula 'E-Mobility' could not overrule the pre-disposition of Driver School pupils, developed through seventeen years ++ daily mobility routines within their social environments, e.g. families and friends, etc. of each of the Participants. To put it in a small sentence: The ones who were educated to walk to school or using bike or commute by Public transport responded more open to accept multimodal commuting, only occasionally using (own) car than the ones who were raised as kids 'on back seat of Daddy's or Mum's car'. Second conclusion is, you cannot expect to achieve better results in Driving School if two Theory Modules are dependent on own motivation and time only and are not part of compulsory subject. The curricula need to be revised and not just "amended". The Theory Modules must be further developed and expanded. And integrated into new Curricula which places people as mobility seekers in the foreground and not as vehicle drivers only.

From 74 participants, having passed Theory and Practice modules, in second round of interviews, stated: With regard to the classification and assessment of the driving school process and, in particular, the new contents of the additional #1 - #4 modules, almost everyone was in agreement. An over-sized majority of more than 90% of the interviewees would be in favour if the additional modules were to become a binding subject in the future and thus become part of the regular training (curricula) system. 240 Participants took part in first round of interviews when passing Theory #1 and #2 modules. However to include in next round of interviews, too proofed to be ill footed, because the time period between Drivers Practical test (B license) and end of Theory lessons turned out to be too long for many participants. In Berlin it can take up to 9 months to get Driver license application at Local Administration Office (Bezirksamt) approved!

3.1 How to visualize ‘Mind-set’ and support motivation to think and act beyond Cars?
- From Transport to ‘Multimodality. Motivation of Consortium members ‘MobilitySchool’

Figure 3: MobilitySchool used new developed ICONS to explain intermodal options for better cover daily mobility needs

The members agreed about a particular “E-Mobility” Scenario as developed by a TU Berlin/IVP lead consortium prior to beginning of “MobilitySchool” project. What did it mean for the Project as such and the Motivation of Consortium members? We had a common understanding from the beginning:

"E-Micromobility" Scenario: "The core idea of the scenario is that Electromobility has prevailed but not by replacing vehicles with internal combustion engines powered by battery powered vehicles. The change in traffic is much deeper. Individual mobility is still a great asset, but it takes place almost exclusively in the context of Multi- and Intermodality, on the basis of a broad spectrum of mobility services and a change in mobility behaviour. "In the urban area and especially in Berlin, small and very light commercial vehicles are of paramount importance. Thanks to intelligent, IT-based networking of transport modes and transport, the ecological and economic benefits of electric mobility in private transport are fully utilized.” “[xi]

‘The developments in mobility and the "E-Micromobility" scenario presented here and discussed in the “MobilitySchool” project served the scientific contextualization of future mobility in urban densely populated areas. As a result of the comparative-systematic evaluation of studies, scenarios and analyses on future manifestations of mobility, they legitimize the contents of the curriculum in this curriculum, thus contributing to the professionalism and future viability of the teacher training’, concluded TU Berlin/IVP project team members.

Figure 4: Efforts to visualize new generation of ‘Driver School’ as ‘MobilitySchool’

The concept of sustainability is also becoming more and more effective in the field of education[xii]. More and more, the focus of attention is on the subject of sustainable mobility education. At present, the classic traffic education is still dominating the agenda in terms of traffic safety.

3.2. Sustainable mobility behaviour in the context of Driver schools should be focussed on the following topics:

- Human as a driver & mobility planner
- Situative use & reflection
- Energy efficient Driver
- Alternative means of transport and mobility

The motorized road user is not just a driver, but also a planner. Mobility starts in the head! The project was immediately implemented in its own design, which was followed by the projects of the mobility school and the aims of the mobility school in the context of the state of science.

3.3. Summary of supplementary modules 'Curriculum Driver Instructor Training'

It was agreed in "MobilitySchool" project team to shape Curriculum with regard to the prototyped Modules Theory#1 and #2 and Modules Practice #1 and #2 on base of the below stated Table of Contents:

1. Introduction
   - Goal
   - What is a curriculum?
   - Limits of the scope
   - Structure and structure
2. Today' State Driver Instructor training
3. Contexts: The future of mobility
   - Developments and connections
   - National Transport Policy and EU Programs
   - Scenario E-Micromobility
4. Part Curriculum Mobility culture
   - Mobility culture: Ethics, Values and Behavior
   - Sustainable Mobility
   - Sustainable Mobility behaviour
5. Part Curriculum Multimodality
   - Transport Combination & Networking (mobility pooling)
   - Collaborative systemic mobility
   - Mobility Services & Integrated Services
   - Integrated routes, tariff planning and assistance systems
6. Electromobility Part Curriculum
   - Electromobility as a Mobility concept
   - Electrically driven drive concepts
   - Safety, Maintenance, Technology

4. Discussing Project results: Summary

Discussing Project results we have to take into account the changed views on Electric mobility as such during Years 2013 – 2015. The impact of Electric Mobility in the future on Germany's roads was in 2012-2013 (project drafting and implementation) grossly overstated. When the project was approved, it was assumed that there would be a considerable increase in Electric cars in the near future. The conclusion was made, that many Electric Vehicles on Roads become a relevant topic for Driver Schools! The technical development during the project implementation, however, went in a completely different direction: Electric cars continue to play a rather marginal role, while the issue of "Autonomous Driver" has become much more relevant for Driver Schools and Driver Training Associations. In the overall view, the results of the project therefore question less the issue of Electric drives and Multimodality than the existence of the classic Driver School education as a whole. This is also the case, for example, by the parallel shifting of Traffic education, which has previously been presented to Driver Schools, to Public Authorities (for example, the training of small scooter Driver in parts of Lower Saxony is now taking place in normal schools). The Driver instructor training as shaped today by Law will not serve the Driver Instructors of today to play an important role as in the past. They are called upon to act, respond and to develop new offers that meet the requirements of "Lifelong Learning". This starts with offers for Kindergarten children and goes continuously through up to "Refreshments courses" for Pensioners.

In order to be able to respond and react in a comprehensive way, in addition to a radical reform of classical Transport education in favour of an Integrated Mobility education, it is also necessary to change the professional image of the Driver Teachers / Instructors towards direction of much broader skilled professionals, like Mobility Educators (Mobilitätspädagoge) The education of the drivers, as it is now established, will not be able to create the necessary conditions for this, as our Colleagues from TU Berlin / IVP have summed up their conclusions, which is shared by the whole Project Team.

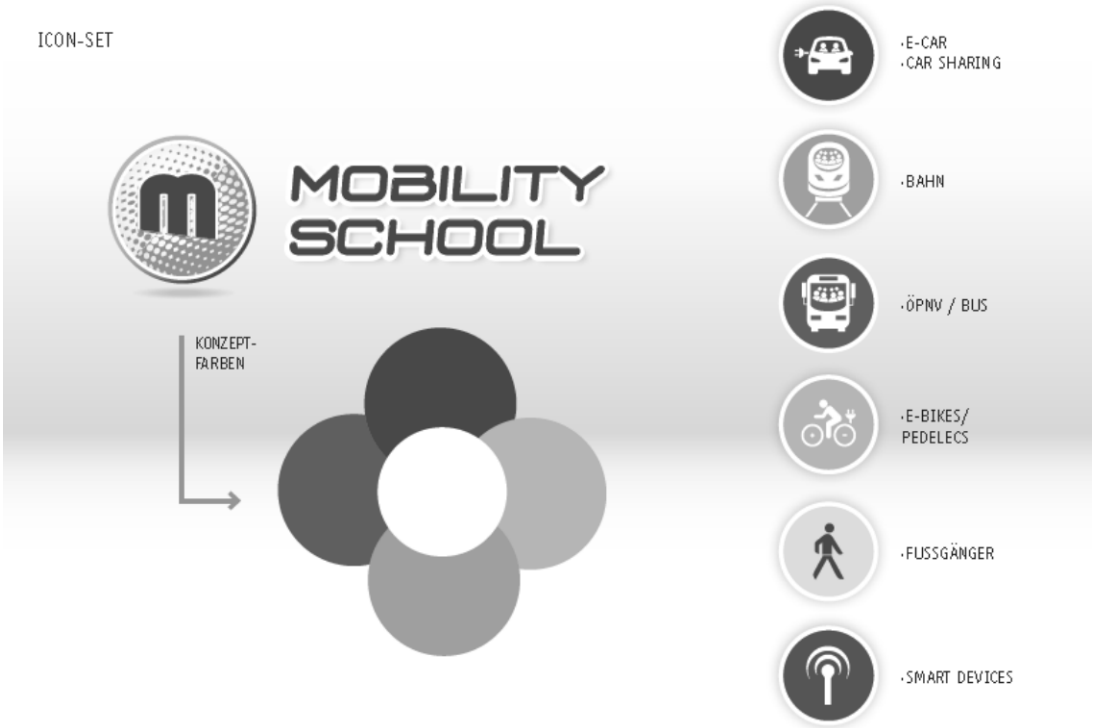

Figure 5: New ICON set in order to visualize 'Multimodality' in 'MobilitySchool'

4.1 What may be international impact of MobilitySchool project findings?

'Multimodal Mobility' should be supported – hopefully - specifically with reference to Climate Change Transport and Traffic policies, not only because of Electric Mobility and the political efforts on side of European Union, National Governments till Local Governments – in particular by the Urban areas, "Metrolpolregionen" in Europe and large Cities. Because? Cities and their Transport companies plan already more passengers to use the intermodal transport offerings of the future. Too much investment in Public Transport Infrastructures did happen already and more money needs to be spent to meet Climate Change and to reduce Traffic caused Emission Limits. Public Transport Vehicles are causing lower emissions, as we all know. Private cars are causing too much GHG and air pollutants already, as we read every day. Only MobilitySchools with new Curricula and newly trained professional Driver Teachers can inform, teach and motivate new generations in urban areas reasonably according to the "Local Mobility Profile Description' City governments long for when describing their own "brave citizens of the future"- as they plan with. As seen in traditional Driver Schools, it is important to train and educate future Drivers of Vehicles with regard to Safety, Technical skills, Social competencies and Driving capabilities. Insofar newer Bills like FahrLVO in Germany 2017 are helpful, for example to reduce traffic accidents, to decrease mortality rate - hopefully- and to cope with increasing traffic situations in congested areas. However only new generations of 'Mobility Schools' Participants can eventually cope with nowadays and future multiple Mobility service offerings of Transport providers and match offers on a daily base with their specific requirements and needs – on a time pressure personal base under changing conditions, for example. As could be shown in the Berlin Project MobilitySchool, it is not easy even for the new Smartphone generation to get along with diverse offerings, to compare routes, prices, traffic hurdles and to come to terms with all Apps and their respective specifics in order to find alternative routes and means of transport to destinations, daily.

Of course the Learner / Instructor Training needs to be further improved and needs new impulses as well. We talk by intend about adopting Mindset of citizens, people towards a more diverse consumption of mobility options of making use of transport services – beyond own car usage. Who can be qualified to influence in a positive and social manner participant's Mindset? The Instructor? The Educator? Who? At least we know: The Mindset has to change from Driving to Multimodal Mobility for sake of Urban Regions!

And the dramatic increase with regard to innovations in areas like "Automated Driving", "Electric Mobility", "Smart Driving" in "Smart Cities", etc. will be further demanding for all Decision makers and Stakeholders involved adjusting Driver Instructor Training Curricula in the future again and again. This is in our opinion a field of more action for European Union as well because of the overall dependencies and cultural, political, economic und regional issues involved. Certainly a European effort to establish new MobilitySchool projects must enter now European Agenda where action is urgently required in order to develop a broadly based new Multimodality Concept for MobilitySchools. New Curricula - beyond traditional scope - would give new motivation for those Driving Schools who demand a more sustainable future oriented Multimodality teaching Driver School and a new job profile for Driver Instructors as mentioned already: "Multimodality Educator"! If on base of a Project tender three / four different project groups from nine/twelve countries would develop in parallel new Curricula for MobilitySchools for future of healthy Urban living, it would serve the demanding tasks of Urban areas and larger cities to better manage Climate change actions as needed in the Transport and Vehicle sectors of each of their Urban Regions. Bearing in mind the high mobility of younger generations within Europe and beyond it gives reason to explore whether it makes sense to develop in line with European Multimodality cultures – in accordance with EU plans to develop further European Train and Public Transport connections to further improve European inner market.

Last but not least the full paper is addressing the topic efficient, integrated and sustainable transport and traffic by explaining how young drivers – and each of them a 'Mobilist' - can better learn through their Instructors - if and when these Instructors can broaden their professional knowledge and expertise and can learn how to adapt to a 'Multimodality Trainer or Educator or Coach' rather than stick to role of traditional Driver Instructor patterns and habits – as enforced by national laws and rules now.

We need other Curricula for MobilitySchools teaching Multimodality than for traditional Driver Schools. That was apparent when Project closed.

The questions remains at the end: Why do we allow ourselves to invest so small money into Driving Instructors when so much public wealth is at risk?

Figure 5: Three Berlin Driver Schools trained more than 240 Participants and 72 passed EV Driver Courses during Project period. 17 pupils learnt too how to use E-CarSharing accordingly when they had der license acquired.

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