PUMAS Voyage: A Participatory Approach towards Healthy School Travel

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1 INTRODUCTION

Schooltravel plays an important role in the development of citizens' mobility. For students, school travel is the first way of commuting, for parents it is often the first context in which they take responsibility for traffic conditions motivated by the care for their children. Consequently, the reflection on school travel is part of the general curriculum in some countries (e.g., in Germany, cf. KMK, 2012). At the same time, school travel is an important field for participation in general. By involving in school travel planning, children and parents can in an ideal case experience a child friendly city that takes into consideration the competencies and needs of children.

This larger view on the relationship between cities and children gained attention through the Child Friendly City (CFC) programme of the United Nations Children's Fund (IRC, 2004). It aims at a high commitment to children's rights in the development of cities, including among others, the rights of children to express their opinion for changing their city, increased participation of children in social life, better road safety, less pollution, and green spaces in the city. Given the fact that school travel is a big step for children in taking responsibility for their mobility in the city, it should be considered as an important field of action for a city that wants to become a CFC in the above sense. In Italy, the CFC has a long history. In 1998, the Ministry for Environment initiated the Sustainable Cities for Boys and Gils (CSDBB) initiative (cf. CORSI, 2002). Consequently, Italian CFCinitiatives among others focussed on "reduction of air pollution, […] enhancing green spaces, […] promoting mobility, [… and] participation." (ibid, pp. 170f.) A fundamental factor for a child friendly city is the "direct involvement of children in the initiatives proposed." (ibid.). In the following years, the encouragement of free movement has become an integral part of the Italian CFC initiatives (IRC, 2005, p. 37f.). It also became clear that this topic has to involve not only children but also their parents, teachers, and city planners.The authors of the report already observed that opening up the process leads to a higher level of complexity (ibid., p. 41).

Within the European project PUMAS that investigates sustainable urban mobility planning in the Alpine space, one pilot activity coordinated by the City of Venice focused on a multi-stakeholder process for the participatory planning of healthy and safe school travel in the sense outlined above. The goal of the pilot was manifold: Children and parents should reach an increased awareness on healthy and safe school travel, all stakeholders (children, parents, teachers, planners, and politicians) should engage in a process for identifying challenges in local school travel and envisioning new ideas for a healthier and safer school travel, and finally, low-cost measures should be implemented and other measures planned in order to raise the perceived empowerment and responsibility of the stakeholders for their city. The initiative was planned as a technology-supported participative process. A mobile participation software, PUMAS Voyage, developed at the FernUniversität in Hagen, enabled situated communication and participation of different stakeholders.

Within this paper, we first summarize existing approaches for participation and empowerment in the context of school travelplanning and identify reasons why such activities are needed and why they contribute to a child friendly city. While the current state of the art provides valuable examples for school travel planning, we assume that new technologies can be an additional way for reaching the goal of a participative initiative towards a child friendly city. We present and describe an integrated process for school travel planning that can be applied in primary schools and outline the various stages in which awareness on traffic behaviour is established and communication takes place. It makes use of the PUMAS Voyage applicationto reflect on current school travel behaviour and envision new solutions. The process and the technology have been applied in six primary schools in Venice. We report on experiences with the process and the technology involving a large number of students and parents and show how the participating students, parents, teachers, and planners developed a vision for a safer and healthier home-school journey. Finally, we provide an

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outlook on how these insights of the process will lead to concrete measures in the updated mobility plan of Venice.

2 RELATED WORK ON PARTICIPATORY SCHOOL TRAVEL PLANNING

2.1 Participation Processes towards school travel in a CFC

Taking a look at existing activities and literature on school travel planning, we can identify several goals and motivations for engaging in school travel planning and improving travel conditions for the route from the individual students' homes to the schools.

(1)Improving healththrough activeschool travel (AST): A frequent theme in school travel research and practice is the improvement of health through increased physical activity. Instead of using motorized modes of transport, students should be empowered and encouraged to walk to school or use their bicycle.Although working with adults, BELON et al. (2014) have provided indications that there is a relationship between the physical activity and the community environment. The authors used the PhotoVoice method to better understand this dependency. Participants of the study were asked to take pictures of places in their environment that encourage or discourage physical activity. In a subsequent interview, they could comment on these pictures. The authors showed that physical and sociocultural aspects were the main hindrances for physical activity. Among physical hindrances were dirty or demolished sidewalks or too much traffic preventing a safe use of the bicycle. Sociocultural arguments against physical activities included, e.g., the car culture that lets people use the car even for short distance trips. When raising awareness for improvements of school travel, both sociocultural and physical aspects should have their space. We argue that physical aspects can well be captured using photos and textual descriptions. Sociocultural aspects, on the other hand, require a space for telling stories about social interaction. A participation process should thus encourage students in telling their story.

(2)Increasing road safety for school travel. Although the total number of fatal accidents with pedestrians or cyclists decreased by approx. 9.5% from 2009 to 2013 (data based on WHO (2009; 2013)), the number of approx. 1.000 fatal accidents in Italy is still high enough to let parents and children fear an accident on their school journey. This fear is reported from other countries as well, e.g., a PhotoVoice study with school children from 4th to 6th grade who frequently expressed their fear of being hit by a car (FUSCO et al., 2012). This personal feeling is in line with political roadmaps: road safety is one of the five minimum objectives of a Sustainable Urban Mobility Plan (SUMP, WEFERING et al., 2014, p. 8). A participatory approach to school travel planning should seriously communicate on personal safety fears of children and parents. It should raise awareness on danger spots as well as safe traffic situations.

(3)Reducing air pollution created by motorized (individual) traffic to schools: Besides the positive effect on child health outlined in the first issue, the reduction of motorized transport also has a positive environmental effect. From a child's perspective, the access to clean air can be seen a fundamental child's right. This need is shared by a growing number of citizens: it is also a minimum objective of SUMP (ibid.). Since CO2 is invisible, children need to establish a mental model in understanding the effects of air pollution. Graphical tools, such as info graphics, could support this process.

(4)Increasing the feeling of ownershipfor the city, i.e., the perceived level of influence and the possibilities for participation. The study of FUSCO et al. (2012) showed that children can have detailed perceptions on their environment. They are capable of detecting spaces that require improvement and may even contribute a perspective that adults have lost. With FUSCO et al., one could even say that children have not yet undergone a process of estrangement from their environment. Frequent references to the natural and social environment made in the PhotoVoice study of FUSCO et al. could be indicators for this thesis (children, e.g., took photos of leaves or trees that were important for them; they reported that they stopped to interact with other people or animals on their school trip). Adults, in contrast, often rather aim at time efficiency when planning the school travel.

The CFC initiative also emphasizes the involvement of children:"Their active participation as citizens and rights-holders is promoted, ensuring them the freedom to express their views on 'all matters affecting them' and making sure that their views are taken seriously – in government, in their neighbourhoods and schools and in their families." (IRC, 2004, p. 2).

We argue that an ideal process for school travel plan development should foster participation using the children's language. For first grade children, this language is often visual. The use of sketches or other graphical forms could help to involve children as active planners. At the same time, not all planning-related aspects can be reduced to a simple language. When communicating about locations, maps are an efficient means for adults to focus the communication. Instead of abandoning this means, we assume that children can understand the language of the map when exploring this together with adults. One promising approach could be to pair children and parents in these phases of the process.

Ideally the different motivations result in concrete measures. Current research has frequently addressed the following activities:

(5) Creating a school travel plan: School travel plans (STP) are mandatory in many regions of the EU. The content and the process how they are developed vary from region to region. For instance, in the UK, the Travelling to School Initiative (TTSI) has coordinated the creation of school travel plans. 2009, 81% of the schools in the UK had a STP in place (TAYLOR, 2010). Although a systematic review of the UK STPs cannot be included here for space reasons, we can summarize that most of these plans include not only proposals for routes to school but also aim at raising awareness for a healthy and safe school travel. Therefore, the plans make visible the current modal split (gained through surveys), include testimonials of students apprising AST and also report on issues in the village or city that prevent children from AST (ranging from missing or narrow pathways over unsafe road crossings up to polluted roads).

(6) Planning and implementing mobility measures is thus the consequent next step after the development of a STP. Our literature study showed that some of these measures can be developed at low cost and are under control of the school. For instance, NEWSON et al. (2010, p. 26) reported on a case where a school opened a second entrance for children walking to the school. This entrance was from then on the high priority entrance so that it was clear for children and parents that walking should be the preferred mode of transport. As discussed for the role of child participation, the implementation of concrete mobility measures may reach the limits of the possible participation. Not all ideas are feasible from financial, technical, or political perspectives. Nevertheless, we think that an approach for STP should allow participating children to envision their future school travel and share these dreams with the school community and beyond.

2.2 Current tools for supporting participative planning in school settings

Technology support for the goals outlined above requires that data on school travel behaviour is captured, discussed, and manipulated to develop new visions for a healthy and safe school travel plan. Computed data can support students in becoming aware of their travel behaviour and the joint interaction on future visions can lead to a shared understanding of SUMP in the shared physical environment.

To address these needs, we investigated different fields in which aspects of our requirement set were addressed before: mobile blogging for mobility andcollaborative geographic information systems (collaborative GIS).

(1) Mobile blogging systems have become more relevant, the more capabilities the technology offers. They especially support situated reflection (SCHOEN, 1983). Early works in the context of school mobility relied on the use of feature phones. BAMFORD et. al (2008) report on a feature-phone-based system that allowed students to capture their school travel and add geo-coded pictures and comments. The system aimed at teenagers (12-13) and was tested in a group of 30 students. Since it built on simple technology, there was no means for manipulating the pictures. But interviews showed that even with a limited technology, the students started to reflect on their school travel.In a later study, the authors report on traffic-related reflection (POOLEY et al., 2010): one participant, e.g., complained about traffic lights making the bus stop too long. The study also showed that students started to capture places they like, such as their favourite tree. This indicates that mobile blogging can support the understanding of students' school travel behaviour. However, the interaction mainly focussed on the interviews. Direct interaction between students was not intended.

(2) Mobile collaborative GIS, such as the one proposed by ZORITA and BALOIAN (2013), go one step further by structuring the interaction process in the application: Students were provided with an application that allowed them to take pictures of locations with problems or opportunities in an urban area. Each comment was uploaded to a shared map so that it became visible for their course mates. They could then comment the pictures and initiate a discussion. The application was develeoped for undergraduate students.

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In the context of our setting, a much simpler and child-oriented user interface and process will be needed to be accepted by the children.

3 A PROCESS AND TECHNOLOGY SUPPORT FORSCHOOL TRAVEL DEVELOPMENT

Motivated by the concrete setting of six schools in Venice, we designed a process that combines the strengths of the travel planning aspects discussed in the previous chapter. The process especially addresses children from 3rd to 5th grade. While the focus lies on the school children, we also approached parents, teachers, politicians and planners and convinced them to participate in the process. It is supported by traditional and computer-based technology accessed with a tablet computer. Phases of collaborative co-located interaction alternate with phases of individual or small group reflection on the route or at home.

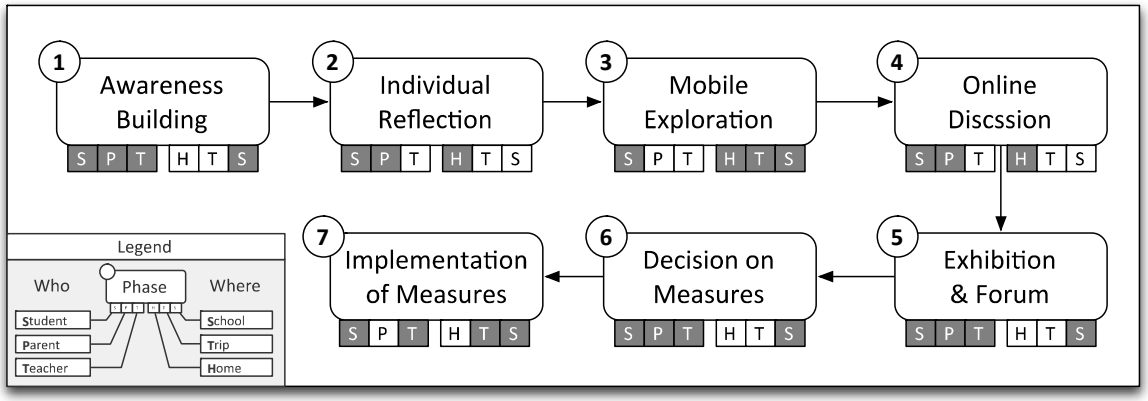

Figure 1: The Process for Participatory Home-School Trip Improvement

The process and the main participants in each phase are outlined in Figure 1.Steps are shown as rounded boxes. The small letters below each box indicate who participates in the phase (students, parents, or teachers) and where the interaction takes place (at home, on the trip to/from school, or in the school). If a white letter appears on a grey background, the phase is intended for this participant or location.

In the remaining part of this section, we will provide a summary for each phaseand outline the intended interaction in the specific phase as well as some anecdotal experiences made in the phase.

(1) Raising awarenesson the importance of healthy home school-journeys through group brainstorming in the school (without the use of computer technology). Participants: Students, parents, and teachers; Location: School.

Figure 2: Reflection on the feelings related with the school-travel and the modal split (right).

The goal of this first phase is to sensitize the students on the first three issues (health, road safety, and air pollution) so that they understand the need for improving their school travel. Four offline activities were conducted at the schools: (1) A large public whiteboard was used to collect impressions of the school travel. Students were asked to complete the sentence “My school travel is …” with coloured chalk on the board (Figure 2, left). The board was located at a central place at the school, visible for children and parents when entering the school so that it reminded students on the subject every morning. (2) Children were invited to stick a symbol with their mode of transport to a large banner (Figure 2, right). This helped to better

understand the modal split of the school community and to raise attention on a shared responsibility for school mobility. (3) Based on the data expressed on the modal split banner, the school earned a ranking of its current mobility efficiency. We used a A-D colour scale as it is known for efficiency information sheets of electronic devices. The slogan “La miaScuolava in classe A” (“My school goes in class A”) served as a motivator to improve the school’s modal split. (4) Finally, students “planted” paper flowers in the school yard and next to the main paths to the school. The goal of this action was to trigger a visionary mode and increase the feeling of ownership for the school and the roads leading to the school. Students should grasp a feeling of how a more colourful and natural green environment could look like.

(2) Individual reflection on the home-school route supported through computer technology. Participants: Students and parents; Location: At home.

Children and parents draw their route together on an on-line map and think about both, attracting and danger spots along the route. A wizard guides the students in this phase. They first locate their home. The school was already assigned by the teacher before the teacher gave the access token for the application to the student. Now the task of the student is to connect home and school using points in the map that lie on the student’s typical school road. Students can select different means of transport by clicking on the respective icon (the mapping is shown in the left screenshot of Figure 3). Once the route is complete, the PUAMS Voyage application analyses the route and provides feedback on the CO_2 footprint of the trip in order to raise awareness on the environmental effects. Since CO_2 is not visible, we decided to use an info-graphic that explains the environmental characteristic of the route. The sample shown in the right part of Figure 3 explains that the provided route would produce 97kg CO_2 per year and that a tree would need approx. 4 years to convert the CO_2 again. The effect of this graphic typically was that children started to think about the sustainability of their school travel.

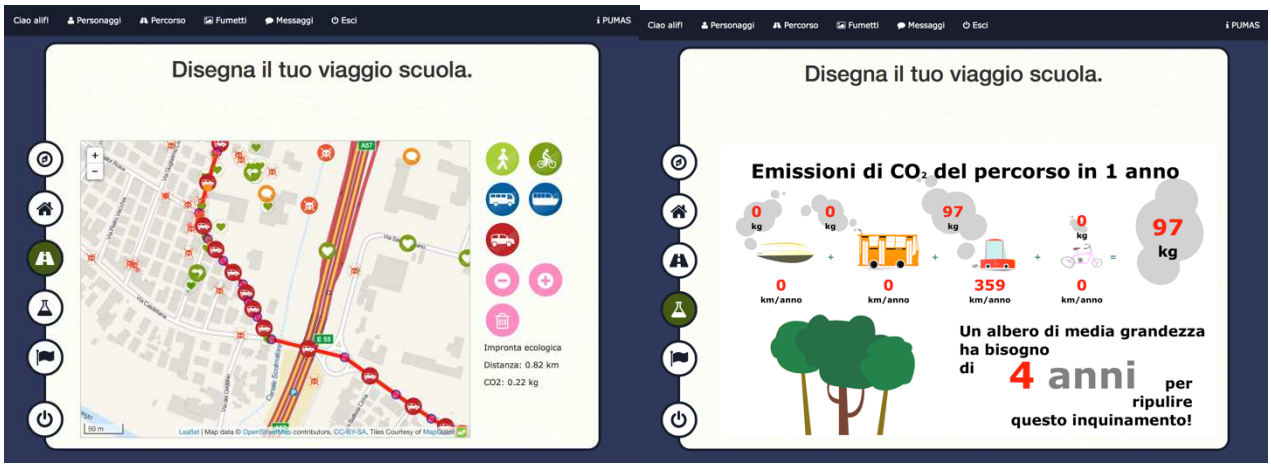

Figure 3: Mapping the way to school and analysing the personal travel behaviour in the context of sustainability.

The third step of phase 2 requests another look at the route. Children and their parents shall think about danger spots and nice places along the route. Each student was asked to contribute at least 2 spots of each type. They can add a spot by selecting the spot type and then clicking on the map. The system will show a dialogue where the children can add a title and a description. Finally, all spots and the use of different means of transport are visualized in a comic strip that will become relevant in Phase 3.

Our experience with this second phase is positive. Most of the 134 students who contributed meaningful routes were able to map their school trip without any difficulties. Some students forgot to do the mapping. For these students, the mapping was done immediately before phase 3. Since their parents were not with them that day, facilitators of the PUMAS Voyage project had to assist the children. Approx. 5 students created unreal routes. One student explored the map and created a route around the globe. For future applications of the approach, one could imagine to have a geographic corridor restrict larger detours. Teachers should also be involved more closely in this phase. They could monitor the progress of the students and remind them of their mapping task. This could ease the start of Phase 3 and establish a shared understanding of the current process.

The documented school travel behaviour was more sustainable than expected. 104 students (78%) reported that they walk at least parts of the route. 24 students (18%) said that they would use the bike for a part of

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their trip. 28 students (21%) said that they would use the car, although only 12 students drove the whole route by car (others walked the last part of the trip). Compared to the banner with traffic symbols used in Phase 1, we could observe that participants of Phase 2 less frequently said that they would use the car to reach the school (12% compared to 21%). This was probably due to the fact that students were only allowed to put one icon on the banner in Phase 1. The possibility to select different transportation modes thus could lead to a more detailed picture of the school's travel behaviour (the sample size is too small to make a reliable statement on this thesis).

(3) Mobile exploration and future vision using a mobile application on a tablet computer. Participants: Students; Location: At home, on the school trip, and at the school.

In this central phase of the PUMAS Voyage approach, students document their trip in a mobile application on tablet computers while travelling from their home to the school. The mobile application tracks their location and allows them to create a comic story about their trip. They can take pictures of interesting places and paint their ideas onto the photos to show how they envision an improvement of these places.

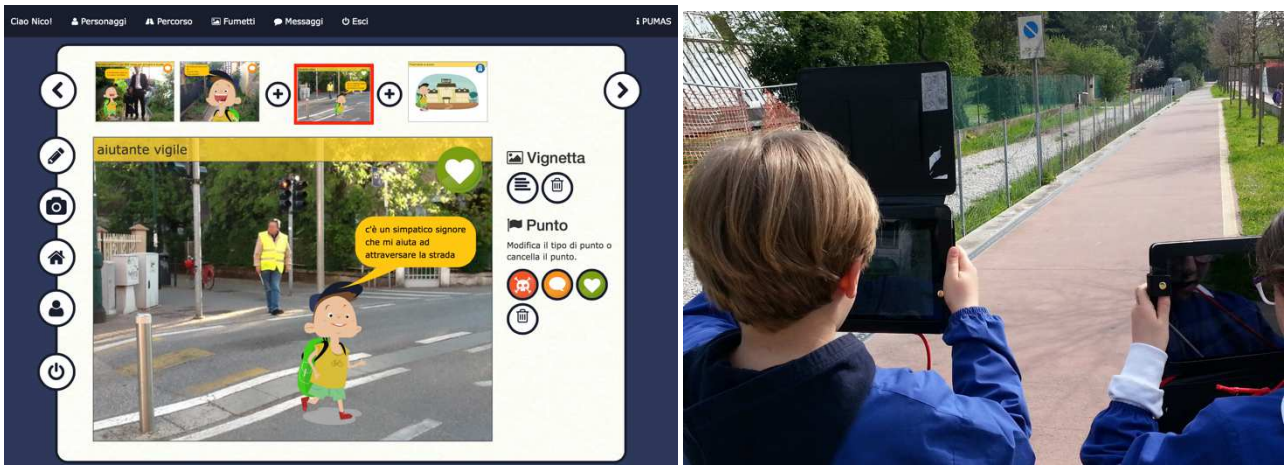

Figure 4: Mobile capturing and annotation of the home-school trip.

We equipped two classes at a time with tablet computers that they could keep for two weeks. During the first day, facilitators of the PUMAS project accompanied the students in small groups. On subsequent days, the students took pictures alone or together with their class mates (Figure 4-right). The app either shows a map with their route and the positive and negative spots. To add a new spot, the students enter the comic mode and press the camera icon. The system then takes a picture using the tablet's built-in camera and adds it as a background image to the comic frame. Students can assign a type (the icons next to the "Punto" heading in Figure 4-left) and place avatars on the picture. They can also place a microphone image on the picture to visualize that they were speaking with a person. Avatars and microphones can have speech bubbles so that the students can use the characters to tell their personal story. Freehand drawings can be used to create a vision of future road constructions or other changes of the environment.

The students' feedback regarding the comic creation was very positive. They had fun picking places they considered as important. In average, each student created 17.8 slides (M=15). About 43% of these slides had photos and an avatar or a caption explaining the photo, 20% included freehand drawings and 9% contained a photo and freehand drawings. Some students also took pictures of their families accompanying them on their trip to the school. Some of these slides were deleted in the finalization phase of the comic. Minor technical problems were related to the use of the tablet (missed PIN code or password). Some students were disappointed that the tablets were security protected so that they could not use the tablet for installing and playing with new games. In these cases, the tablet remained unused during the two week period. Other students only used the tablet for some days. However, in average, the application was used for 12.4 days (M=7). The most active user continued to use the system for a total of 69 days (from a personal computer at home). Less motivated students thus should be reminded to work on their stories during the two week period. Since not all teachers of the involved schools took the PUMAS Voyage project as an opportunity to learn about traffic, geography, communication, and other related subjects in their classes, the Voyage activities remained side activities. For future applications, one should ensure a strong teacher commitment so that the creation of travel stories becomes an integral part of the lessons.

(4) On-line discussion of comic storiessupported by a traditional web application. Participants: Students and parents; Location: At home.

The goal of the fourth phase was to share the individual comics with other class-mates again. After the students returned the tablets, they were asked to visit the web page of the PUMAS Voyage system and explore spots of the other students.

Figure 5: Exploring hot regions on the map and participating in a discussion on dangerous locations within the comic.

Points were shown on a school issue map as semi-transparent dots (Figure 5-left). The more spots a place had, the darker was the colour on the map. It became clear that the navigation to the spots was the biggest challenge in this phase. Users wanted to maintain an overview and at the same time be able to distinguish the different spots. We decided to work with detail maps (the small map in the upper right). By clicking on a point in the large map, the system zooms the detail map so that it shows the 5 closest points. Titles and descriptions for the five points are displayed in the text area. Clicking on such a message opened the detail in the comic. Here, users could add comments or vote for the spot. In the example sown in Figure 5-right, the student warned that the bicycle path is dangerous since flowerbed stones were used. This observation of one student was confirmed by another participant of the PUMAS Voyage pilot. Two people actually voted for this danger spot with the result that it received a higher priority in the following discussions.

Only 21 of the 134 students participated in the discussion and contributed comments. The average number of comments per user was 4.7 (median = 2). The main problem of this phase was that it ran in parallel to Easter vacations. We assume that most students did not want to think about their school travel during vacations. After the vacations, the teachers did not get back to the task. The Voyage project was on hold until it gained a new momentum in Phase 5.

(5) Face-to-face exhibition bringing the digital artefacts created in the previous phases back to the school community. Participants: Students, parents, and teachers; Location: School.

Figure 6: Students exploring the comics of their peer students (left) and rating these stories (right).

We selected the format of a (paper-based) exhibition for Phase 5. All comics of a school were printed together with a detailed map for the specific comic. Students and parents were invited to visit the exhibition, rate for the individual scenes (by attaching a “like”-sticker to the scene) and add comments. The exhibition

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was open for several days. The main advantage of this phase was that the whole school could visit the exhibits. Ideas created in Phases 2-4 thus received feedback from a wider audience.

Our experience with the exhibition was very positive. Parents stopped when bringing their children to the school. In 5 schools, special focus sessions were held to which all the parents were invited. On average 80-100 parents and teachers joined these sessions. The 6th school decided to involve all parents in the exhibition. Over 300 people visited the exhibition and engaged in face-to-face discussions about the issues identified in the stories. In all schools, approx. 2.500 students were involved to vote on the slides. In order to distinguish the child opinion and the parent opinion, two kinds of stickers were issued, one for parents and one for children. Stickers were widely used during the exhibitions.

(6) Planning of concrete measuresin traditional workshops held at the schools. Participants: Students, parents, and teachers; Location: School.

For those issues that are of general interest, a participatory planning group is established. The purpose of this planning group is to collaborate with city planners and other stakeholders and plan changes around the school building (again in a participatory face-to-face setting).The proposals made by children should be carefully analysed by planners and transformed into a design that can be implemented. Regular meetings with the school community are needed to ensure that the proposed solutions are still satisfying the needs expressed in the comic scenes.

During the pilot project in Venice, a planning group was established at each school. The group collaborated with city planners. Twice, the collaboration was opened up to the whole school community to ensure that all stakeholders stay involved. The outcome of the planning group was a collection of low-cost and high-cost measures. Based on this output, additional departments of the Venice municipality were involved and checked the feasibility of the plans.

(7) Implementation of measures in selected schoolstogether with the students.Participants: Students and teachers; Location: School and parts of the trip.

While extensive reconstruction of the environment often requires long planning and negotiation processes as well as a large financial budget, there may also be opportunities for mobility improvement that can be directly carried out. The results of the plans developed in Phase 6 should be separated into low-cost and high-cost measures. Low-cost measures should be implemented immediately with the help of the school community while high-cost measures should become a part of the planning strategy of the city (e.g., part of the city's SUMP and the school's STP).

But even low-cost measures may require the participation of the mobility department of the city (e.g., when public roads or paths are concerned). But the concrete implementation can be carried out by the school. These measures should be carried out as part of the process so that the participating children and parents see a direct impact of their activities.

Figure 7: Participatory implementation of measures

In the PUMAS project, it became clear that low-cost measures should concentrate on visual aspects (e.g., colouring the road or placing traffic signs) or temporary traffic calming measures. Figure 7 shows how the entrance road of one participating school was changed at the end of the participatory process. Again, children were actively involved in painting the road or creating new signs using abandoned traffic signs from the City of Venice. The feedback on these measures from the involved stakeholders was very positive.

High-cost solutions will be described in the New Mobility Plan to be adopted by Venice Municipality and realized in the next years.

4 TECHNICAL BACKGROUND OF THE PUMAS VOYAGE TOOL

For space reasons, we only summarize core aspects of the PUMAS Voyage software architecture. The server is built using the Web framework Ruby on Rails. The client is an HTML5 offline web application that permits a high level of interactivity.

The software runs on tablet computers that are connected to the PUMAS Voyage server (a part of the PUMAS ASC) via a 3G network. However, the connection quality varied in different locations of Venice so that the availability of the PUMAS Voyage server could not be guaranteed. Thus, we pre-configured the clients so that each student found all relevant data for the client application already cached on the system.

Data stored locally includes information on points of interest, routing information for the home-school-trip, and comic sketches in which the participants commented their trip and included avatars and photos. After the web application was installed on the device and added to the home screen, the students could interact with the application without any communication to the server. Whenever a user takes a photo or paints on a comic slide, these changes are only done locally, which significantly improved the responsiveness of the application. The only aspect of the application, that was not available in offline mode, was the map data (since it was retrieved from an externalMapQuest server). In situations where this data was not available, the application only showed the local data, i.e. the points of interest, route data, and comic data.

Once the application had Internet connectivity again (either through the 3G network or via a wireless network connection), the application synchronized local changes with the Ruby-on-Rails server.

The discussion phase of the PUMAS Voyage application was implemented as a classic web application where the application data was requested from the server on-demand.

5 SUMMARY AND LESSONS LEARNED

School travel planning and practice is an important aspect of a Child Friendly City. It helps to establish awareness on health, safety, and environment-related mobility issues and is one of the first fields where school children take responsibility. In this paper we presented a process and tools for facilitating participatory school traffic planning. The process has shown to work well in a pilot with six schools in Venice involving in total over 3.000 stakeholders. Students and parents became aware of the importance of health, safety and environmental effects of car use and approached active school travel modes.

For the City of Venice, the whole process was an important component of the overall mobility plan (that has a special focus on sustainability). Involving children in this planning process helped to reach a high level of participation, which is key for Sustainable Urban Mobility Planning (SUMP).

The PUMAS Voyage application developed in the context of this project can support the process by employing a method of comic-oriented story-telling. In our experience, this extends the PhotoVoice method with support for creating a future vision. Children appreciated that they could draw their visions of the future. Being heard in the discussions and seeing parts of their visions implemented let them take ownership for their city. The tool is currently transformed into a commercial product and we plan to make use of it in other school travel planning settings as well as other participation processes where storytelling can be a good way for envisioning the future.

Besides these positive results, the study also pointed to some caveats: Especially when working with schools, the commitment of teachers and the integration of the process with the “normal” lessons is a crucial success factor for phases with remote interaction (Phase 2 and Phase 4 of the proposed process). Schools, parents, teachers, and children need constant reminders to keep up a high participation level. Where this works, the process and the technology can lead to promising participation in a Child Friendly City.

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