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Proactive Spatial Planning in Regard to a new Regional Mobility Hub – the case of Ebreichsdorf

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1 ABSTRACT

The City of Ebreichsdorf is a fast growing municipality in the metropolitan region of Vienna, Lower Austria and Burgenland. Especially the southern suburbs of Vienna such as the region surrounding Ebreichsdorf are gaining from the growth of the Austrian Capital City Vienna. The expansion of the railroad track of „Pottendorfer Linie“ to a double track railroad and the thereby even better connexion from Ebreichsdorf to Vienna will strengthen its growth process even more. A new regional mobility hub is planned to be built, located on a greenfield site, between the city districts Ebreichsdorf and Unterwaltersdorf. The existing railway track is going to be abandoned.

In spatial planning terms, its leading goal is to locate future growth in the area of the new train station. Unfortunately, Austrian planning practice tends to adopt reactive behaviour in the context of infrastructure and settlement development. Thus, simultaneous planning of high-level-infrastructure and surrounding station area is mostly missed. Especially small and medium-sized cities are often overwhelmed by this task. The results of this uncoordinated approach vary from non-development of suitable land to uncoordinated urban sprawl around the stations. Furthermore, only reactive actions can be taken to contain negative consequences and to enable an orderly, soil-saving settlement development.

Therefore, in February 2016 the Smart City Ebreichsdorf project (SMCE) started as an exploratory study funded by the Klima- und Energiefonds (KLIEN 'climate and energy fund') with a duration of one year. The research focus was on creating a proactive planning community together with citizens by acting on four thematic topics: planning and process; railway station; district; and energy and resources, to. As a result, four scenarios have been developed for Ebreichsdorf including necessary dimensions of action. Criteria for an innovative implementation were defined and necessary actors for the continuing project were involved at an early stage of the development process. The Smart City concept obtains incresasing importance in the course of urban and regional development. Thereby, new technologies are used to create a sustainable environment and economy in order to ensure quality of life for further generations. Particular measures are: minimizing soil sealing, adopting technologies for future mobility, preventing urban sprawl, de-densification, as well as creating cities of short distances. The participation and awareness of the citizens are of fundamental importance. Using the example of the test bed Ebreichsdorf, the main aim of the SMCE project is to demonstrate proactive city development with an overall systemic, interdisciplinary approach to an area, and involving the population and the relevant stakeholders of the political, administrative and private sectors.

This paper examines how this proactive planning-process of Smart City Ebreichsdorf is working. It shows the development process in the exploratory project and its results and explains the integrated dimensions of action. Building on this, it presents the current project and new planning approaches, e.g. to avoid soil sealing. With a focus on Ebreichsdorf, this paper demonstrates how such a proactive planning process can be used for a smart urban and regional development.

Keywords: mobility, smart city, Ebreichsdorf, urban sprawl, urban development

2 SPATIAL CHALLENGE

The project Smart City Ebreichsdorf (SMCE) is a research project concentrating on energy efficient and sustainable development of the municipality Ebreichsdorf with due regard to surrounding municipalities. Ebreichsdorf is a fast growing city in the area of the metropolitan region of Vienna, Lower Austria and Burgenland. The southern suburbs of Vienna such as the region surrounding Ebreichsdorf are gaining from the growth of the Austrian Capital City. Furthermore the Austrian Federal Railways (ÖBB) is currently expanding the southern route “Pottendorfer Linie” from the new Vienna central station “Wien Hauptbahnhof” across the newly build freight centre “Güterzentrum Wien Süd (Inzersdorf)”, up to a new 27,3 km long tunnel “Semmering Basistunel” between Lower Austria and Styria (see Fig. 1). Especially the new freight centre in Inzersdorf as well as the growing suburban region in the south of Vienna and the faster

connection to Styria making the expansion of the southern route into a four-track railroad between Wiener Neustadt and Vienna necessary (ÖBB Infra, n.d.).

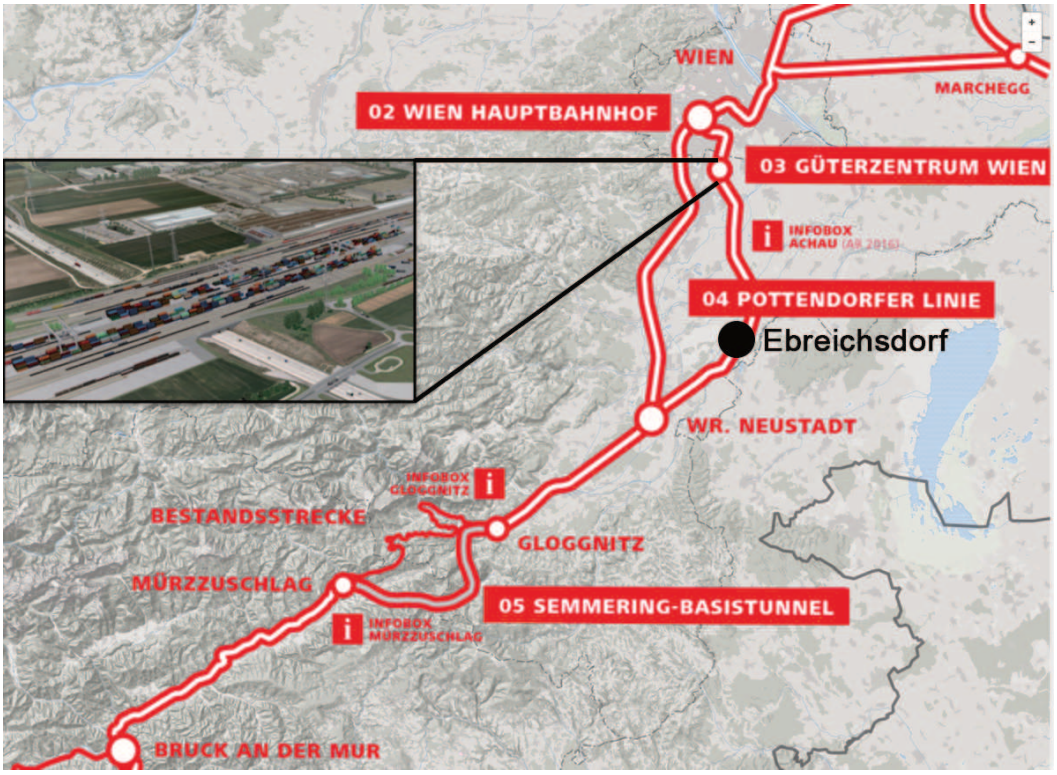

Fig. 1: The new southern route "Südstrecke" of the ÖBB (Source: (ÖBB Infra, 2016 b); own presentation)

A new impulse for the region will be the expansion of the “Pottendorfer Linie” to a double track railroad. This will reduce the traveling time from Ebreichsdorf to Vienna to less than 20 minutes and strengthen the growth process of the city and the region even more than now. As part of the expansion a new railway station is going to be built on “green field” land between the two city districts Ebreichsdorf and Unterwaltersdorf within a distance of about 500 meters to each urban centre (ÖBB Infra, 2016 a). The train station is expected to play an important role in the region of Ebreichsdorf. It was planned as a regional mobility hub with a Park+Ride parking lot for maximum 600 vehicles and a regional bus station with four parking spaces. It is also the last stop for express trains outside Vienna. However, there are no concepts of adequate transport links and the use of the station environment. Also, the existing railway is going to be abandoned (see Fig. 2), while the new railroad, as well as the new train station, should provide a full service by 2023.

This current development of Ebreichsdorf results in new challenges like the development of the existing and new train station as well as expected growth processes. Unfortunately, in Austrian planning practice, a reactive behaviour is usually observed in the context of infrastructure development and settlement. Simultaneous planning of high-level-infrastructure and the surrounding area of the station may well be missed. The state Lower Austria and the City Ebreichsdorf are well aware of the future challenges. Thus the idea of planning and implementing a „Smart City“ or a „Smart Urban Region“ at this specific area has moved in the focus of considerations. According to contemporary spatial planning approaches, it is goal leading to locate zones of future growth in the area of new railway stations. Possible options of action to form such an innovative growth process around the railway station have been developed in a first project.

As well as formulating the growth process the future use of the existing railway track should also be discussed at an early stage. The preliminary project answered the question, how this new railroad track and station can be used as an impulse for smart urban and regional development. The main aim was to initiate a process of awareness building and reflection, as well as to enhance a proactive planning approach. Hence, the focus in the first step was not on concrete solutions, but on the examination of potential actions and planning processes. The continuation of the project, on the other hand, aims to provide concrete plans for the future development of Ebreichsdorf through a proactive planning process.

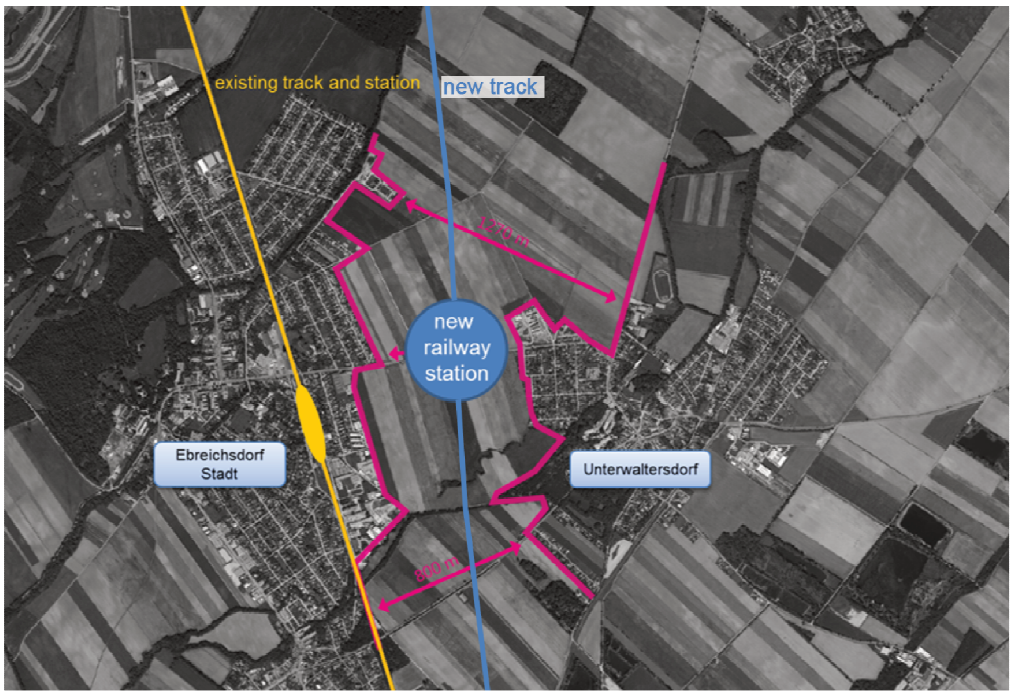

Fig.2: Location of the new railway station Ebreichsdorf (Source: map data (google maps, 2016), own presentation)

3 SETTLEMENT STRUCTURE AND THEIR EFFECTS ON MOBILITY BEHAVIOR

The spatial coordination between traffic stations and settlement structure makes it possible to reach a larger number of destinations and sources via short distances from train stations and stops. This shortens door-to-door travel times, improves accessibility and increases the demand potential, especially when a large proportion of passengers reach the stations by foot or by bicycle. Nevertheless, so far this aspect had only a minor significance in the discussions of plans for upgrading railway lines (Bahn.Ville, 2004; Rump, 2004; ILS/MASSKS, 1999). The consideration of catchment areas, which can deviate strongly from the frequently used spheres of influence depending on the settlement structure and the road network (Jermann, 2004), plays an important role in this.

The development of settlements in the catchment area represents an opportunity to increase the demand potential by increasing the sources and targets located in the surrounding area. This opens up the following possibilities:

- Reclassification of building land: in the immediate vicinity of numerous train stations and stations, there are still plots of land and areas which, despite their general suitability, are not designated as building land.
- If a traffic station is located within an existing housing estate, the demand potential can be expanded by using internal potential areas (Professur für Raumentwicklung, 2012):
  - undeveloped reserves: undeveloped land intended as building land (eg construction gaps),
  - floor space reserves, which result from the difference between the actually constructed areas and the planning permissible areas,
  - unused or under-used areas (eg brownfields).Railway use depends on a number of influencing factors.

Wulfhorst (2003) has classified these factors in terms of their relevance and modeled their interactions. In addition to the quality of the railway offer (travel time, clock, etc.) the location of stations which expresses the accessibility of residents was attributed a significant role. Settlement structural factors, such as settlement density, functional mixing, are also, directly and indirectly, effective in traffic behaviour (Matthes and Gertz, 2014). In addition, soft factors such as a successful urban integration of the station are also important. This has a positive effect on the quality of stay, subjective safety and cleanliness which, in turn, indirectly increases the use of railways by the population (Wulfhorst, 2003).

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4 THE "SMART CITY" CONCEPT IN THEORY

The term "Smart City" has come to be well known by a wide section of the population and often used by municipalities as well as in politics, although there is no shared definition about the concept of a "Smart City". Even in recent years, there have been different projects concerning this term (Dameri, 2013) (Hollands, 2008). This urban labeling has often been associated with new technical-based solutions to counteract the challenges of growing cities and urbanisation along with several technical, economic or social problems.

An aim of Smart City is to create a sustainable environment and economy in order to ensure the quality of life for the further generations. The city performance should primarily be improved by using Information and Communication Technologies (ICT) (Neirotti, et al., 2014). However, the term "Smart" is not only used as a positive description for urban-technological innovations and adjustments like ICTs but also as a synonym for cities with a special focus for e-governance, participation, communities and social learning in order to gain more public and social value (Hollands, 2008). In contrary to that, citizens are often ignored in the definition of Smart City, although they can be seen as a fundamental aspect of the concept (Dameri, 2013). As Caragliu et al. (2011) have shown social and human capital such as social skills are essential ingredients for smart city performances. Thus, considering only "hard" infrastructure as well as the exclusive focus on ICTs and technological improvements are not expedient. This means, that "smart" depicts a combination of technological and socioeconomic development (Nam & Pardo, 2011 b).

Due to the many possibilities to define Smart City, there are also different ways to describe the specific characteristics. Giffinger & Heindlmayer (2010) identify six smart capacities such as environment, mobility, people, governance, economy, and living, which rely on independence and awareness of citizens. To specify each characteristic several factors are mentioned. For example, a smart environment is defined as sustainable resource management and environmental protection in order to ease pollution. Linked to this topic smart mobility is defined by sustainable, innovative and safe transport systems as well as the local accessibility to transportation systems amongst others. Together these characteristics can make a major contribution to save energy and to use green energy. In order to implement a forward-looking development of the built environment smart living, as housing quality or social infrastructure, and smart economy in terms of competitiveness are primarily mentioned. Lastly, flexibility, creativity, open-mindedness, and participation in public life are examples of smart people. Possibilities of participation, transparent governance, as well as social and public services, can be mentioned as aspects of smart governance. Comparing these two characteristics, smart people and smart governance, highlights, that there is quite an overlap between them.

Due to a lack of only one valid definition of Smart City, also other characteristics like smart transportation, smart education or smart energy can be mentioned (Nam & Pardo, 2011 a), but they all have similar intentions by using ICTs and awareness of citizens to preserve or even improve the quality of life, as well as to protect the environment through resource-saving technologies.

5 DELIVERABLES OF THE PRELIMINARY EXPLORATORY PROJECT SMCE[1]

When planning the regional mobility hub, it was assumed that the existing settlement borders would remain and that the land surrounding the station would not be available for settlement development. The consequences, opportunities, and requirements that such a high-level infrastructure project brings with it for the community and region were not considered in advance (see section 3). It was not until the previous exploratory SMCE-project that new options for action in an iterative work process and with the active participation of the population and stakeholders were developed on the basis of four different scenarios. Furthermore, the exploratory project has already familiarised a broader public in the city region with the idea of "smart city", thereby starting a necessary social innovation process.

The main questions in the project were about the "conceivable" and "possibility". In the one-year SMCE project, possible development scenarios for the municipality of Ebreichsdorf were compiled considering all relevant, present and future development trends and discussed on a broad level in politics and with the public. The term Smart City in the project "Smart City Ebreichsdorf" stands for a future-oriented, sustainable and proactive planning practice, with strong involvement of the citizens. Awareness-raising measures and

[1] cp.: TU Wien, Stadtgemeinde Ebreichsdorf, Energiepark Bruck/Leitha, eNu, 2017. Publizierbarer Endbericht Smart City Ebreichsdorf (SMCE). Wien: TU Wien

specially designed participation formats were carried out in which all interested residents were able to contribute their suggestions, visions, but also fears and concerns about the development process. For example, 4 project newspapers were distributed to all households in Ebreichsdorf; there were information stands at community festivals and workshops in the town hall with the inhabitants. All results are incorporated into the research project. In addition, there were workshops with experts and stakeholders from politics, administration, and science on topics such as soil management and process control in order to clarify the possible implementation challenges as early as possible.

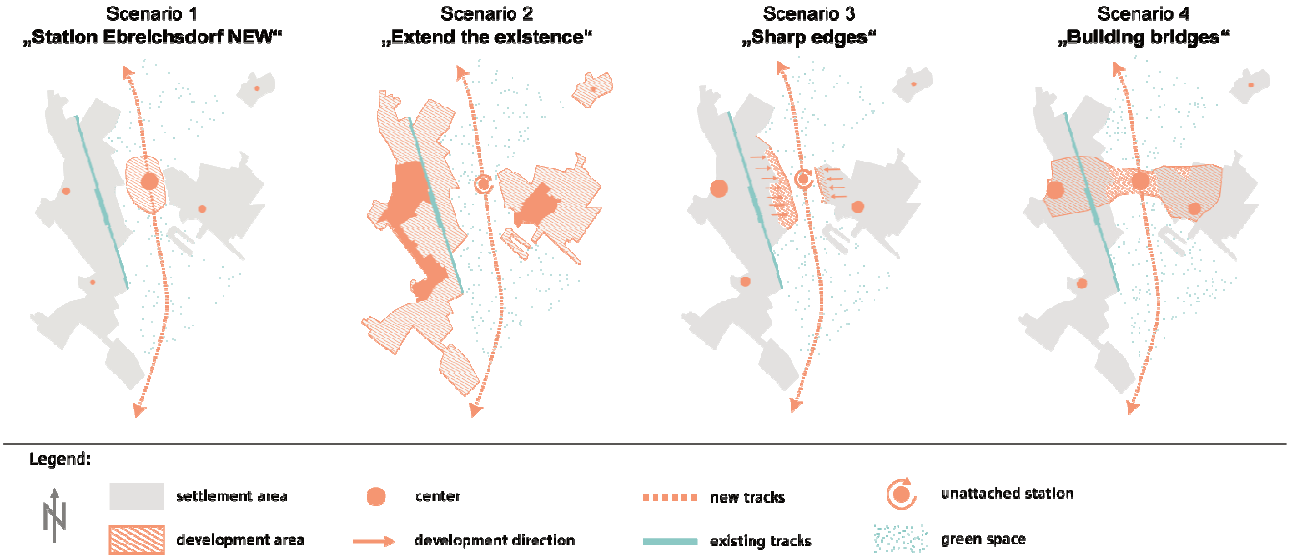

Fig. 3: Four scenarios for Ebreichsdorf (Source: (TU Wien, Stadtgemeinde Ebreichsdorf, Energiepark Bruck/Leitha, eNu, 2017), own presentation)

Using the scenario technique the future development of Ebreichsdorf and the area surrounding the new regional mobility hub was simulated. Four different scenarios were developed that bring different advantages and disadvantages for the city (see Fig. 3). At a workshop with all researchers, the four scenarios were discussed and challenges such as energy-efficient settlement development and the potential impact of the new station to the existing town centres were highlighted. Moreover, the scenarios were the basis for the "future-workshop" with the citizens. In addition, they served as a decision-making basis for the policy on the question of how the community should evolve.

- The first scenario "Station Ebreichsdorf NEW" concentrates the future development of the city around the new station. New settlements for living and work are to be built just around the station. Thereby, old town centres will be partly replaced by the new centre in their meaning and function.
- In contrast to this, in the second scenario "Extend the existence" there will be no development around the station and the impulse of the new station will be concentrated in the existing centres. Post-compaction and the reduction of vacancies will be the focus. The area around the station will function as a local recreation area which prevents the merging of Ebreichsdorf and Unterwaltersdorf.
- Similar to this, also the third scenario "Sharp edges" prevents new settlements around the station, but concentrates the expansion of Ebreichsdorf in the direction of the new station. Clear settlement boundaries and a recreation area around between Ebreichsdorf and Unterwaltersdorf are the consequences.
- The fourth and last scenario "Building bridges" concentrates development around the station, but also links the city districts. Thus, a new centre is being built without weakening the existing centres. The barrier effect of the railroad track will be minimized.

The results of the project have shown that the area between Ebreichsdorf and Unterwaltersdorf is significantly upgraded by the new station and has the potential of a centre that connects both spatially and socially-emotionally. The direct connection to the public transport promotes short distances and the change to train and bus. From a spatial planning point of view, it is therefore expedient to provide settlement and open space developments in the vicinity of the new station that exploits the potential and thus achieves site-

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appropriate use. This district is given high priority for the future development of the municipality of Ebreichsdorf. Hence, the municipal council decided on scenario 4 in a fundamental decision and is going to develop the area around the station. However, it is clear that such a planning task exceeds the technical, personnel and communicative capacities of the small township of Ebreichsdorf or is in no comparison to the intensity of planning and scientific reference to similar areas in large cities. The new framework conditions also raise new questions and challenges. Therefore, a sequel project was designed, concentrating on two topics, land management and urban planning competition for the area around the station to ensure orderly development.

6 FROM THEORY TO PRACTICE[2]

6.1 Need and setup of the project

A holistic concept of urban development for the establishment of a concept of short distances, with low floor and energy consumption, valuable green and recreational space as well as new mobility approaches could be pursued well in this new district. For a smart district with a high quality of life, the future-oriented connection and networking of the regional mobility hub with the district, the city, and the region is a central field of action. Added to this is that the station or the immediate station environment represents a new centre for the newly emerging district and thus must have new uses and functions. These are to be combined in cooperation with the district conception.

However, any planning will not help if the required land is not available. The areas around the new station are owned by 16 owners. The possible security and accessibility of these high-quality areas for site-appropriate use (urban development) and the protection against land speculation are a great challenge for an orderly growth of the municipality. Only the active involvement of the 16 property owners concerned as well as the local and supra-local decision-makers can ensure an orderly and resource-efficient spatial development. With Ebreichsdorf as a test bed, new forms of land policy can be developed and tested, which are also of great importance for other communities with similar problems.

Smart urban development will not meet the demands of integrated and site-appropriate use with conventional planning tools. In order to be able to solve this problem, it is necessary to further develop the planning instrument of the cooperative planning procedure, which has been applied in practice, to a dialogical planning process in the elaboration of a master plan for urban landscape planning. Another challenge for medium and long-term development projects is the provision of information and the associated participation of the wider public. Above all, interventions and actions on site are necessary in order to make the vision of the future tangible.

Therefore, Smart City Ebreichsdorf focuses on the smart development planning of areas located in the immediate vicinity of train stations. For the successful implementation of the project, the following aspects must be researched and applied under real conditions for the first time in Lower Austrian planning practice:

- Development of the immediate station area and station district
- Development of a soil management
- Public relations and participation procedures

6.2 Aims and methods of the project

The SMCE exploratory project already used the method of "visioneering" – a combination of visionary-creative and engineering-scientific technical thinking (see Fig. 4). With the participation of the population, four scenarios could be developed and finally, a vision for Ebreichsdorf emerged. Using the "visioneering" method, the results of the SMCE exploratory project can be directly transferred to the continuation project. Based on the vision, concrete steps are now taken in the future. The area around the new station should thus be converted to a location-appropriate use (see Fig. 5).

[2] cp.: TU Wien, Land NÖ, Stadtgemeinde Ebreichsdorf, Dialog Plus, Riegler Rechtsanwälte, 2017. Projektantrag Smart City Ebreichsdorf (SMCE). Wien: TU Wien

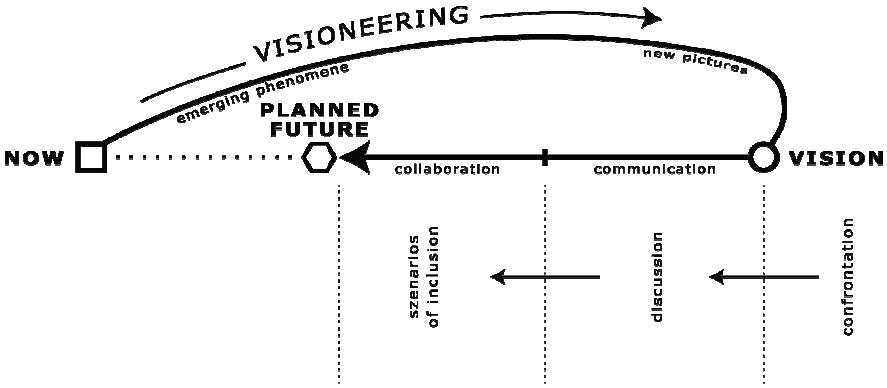

Fig. 4: Visioneering model (Source: (TU Wien, Stadtgemeinde Ebreichsdorf, Energiepark Bruck/Leitha, eNu, 2017), own presentation)

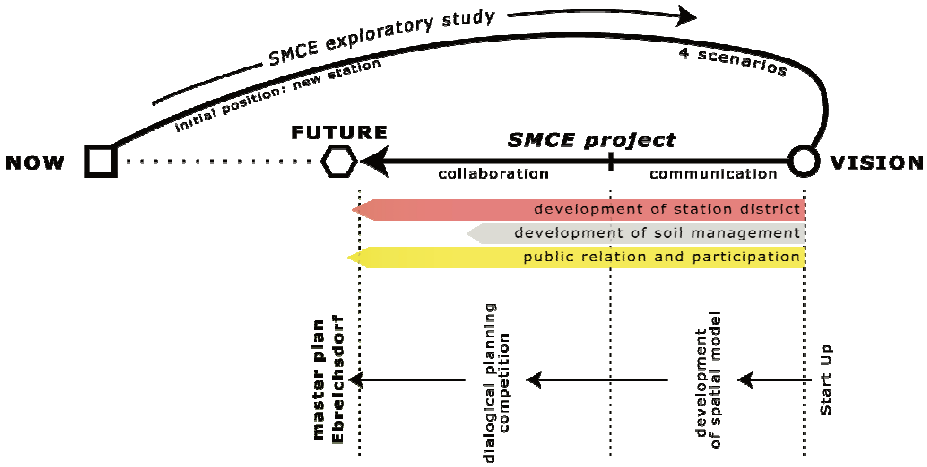

Fig. 5: Implementation of visioneering in the SMCE project (Source: (TU Wien, Land NÖ, Stadtgemeinde Ebreichsdorf, Dialog Plus, Riegler Rechtsanwälte, 2017), own presentation)

Specifically, the SMCE project uses a dialogical planning process to design an urban planning strategy for site-appropriate reuse. At the same time, in an active cooperation with the property owners, an innovative public-policy strategy is being drawn up, which creates the conditions for realisation. Parallel to this, both public relations and participation events take place. The results of these events (workshops, think tanks, etc.) flow directly into the master planning process and facilitate further social innovations. The research results are applied directly to the test bed Ebreichsdorf but also serve as a recommendation for comparable development sites in Austria and internationally. The insights gained are intended to trigger learning processes in politics, planning administration and the scientific community and to secure the concrete Smart City implementation in Ebreichsdorf. They pursue an integrative urban development approach.

Development of the immediate station area and station district

From the present development scenario 4 for the station district, an urban planning and landscape planning concept in the sense of a master plan is to be derived. Based on a mission statement, it should clarify a concrete spatial development, which is a solid and robust basis for concrete construction projects. On the one hand, a location is to be developed which is well connected to the railway station, and on the other hand, provides effective contributions to the further development of existing settlement areas. Important ecosystem services of the landscape area and climate-effective measures are to be considered. The dialogical planning process serves as an innovative and transparent method for urban development.

The development process is carried out in the sense of a dialogical competition procedure. 3-4 teams (composed of architecture / urban planning and landscape planning) are identified through a selection procedure in order to work on a spatial concept. The teams compete with each other in the competition for the best and most innovative solution. Due to the complexity of the question, the process is designed to be dialogue-oriented. In the context of a kick-off, intermediate and final colloquium, there is a close exchange

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between the teams, all development-relevant stakeholders, the citizens and the professional public (talks, forums, workshops, lectures and discussion events). Intermediate studio phases guarantee the planning teams a focused work on the respective concepts.

Development of a land management

With the development of a new land management concept, the implementation of the master plan should be secured. An in-depth analysis of the legal and institutional framework will help to implement an innovative land policy strategy to secure rights of the disposal and use of the land covered by the Master Plan. Risks and limitations of the application of different instruments of land policy are to be recorded and presented. These should be based on an evaluation of the public and private law instruments with regard to the subject of settlement development. Finally, a draft contract is to become designed, which can / should serve the municipality as well as the property owners concerned as a legal document (land management tool) with the future development of the objective real estate.

The work package uses various methods for processing the individual content chapters. The development interests of the owners, the community, and the country are raised in discussions. The preparation of the legal and theoretical foundations is carried out primarily by research activities with the consultation of experts. The various options for land policy and strategies are brought to the overall project in the form of workshops. Interim reports on the individual topic blocks will be prepared, submitted and introduced into the discussion. Among other things, the support and monitoring of the local political decision for a development scenario are accompanied by arrangements to secure the rights of disposal and use of the properties in question.

7 CONCLUSION

The future Smart City Ebreichsdorf (SMCE) is a fast-growing municipality in the city agglomeration Vienna, Lower Austria and Burgenland. The two-track extension of the Pottendorfer track and the cities better connection will create a new regional mobility hub and thereby reenforce the growth process.

From smart thinking to smart acting – Based on the results of the exploratory project, where the research focus was on the development of dimensions of acting along four themes, planning and process, railway station, district and energy and resources, the current project has the primary goal to develop a new city district along Smart City principles. The main questions in the exploratory projects were about what was "conceivable" and "possible". Now a concrete and integral implementation concept is in the forefront. With the decision of the city council to develop the target area the implementation process has begun. The province of Lower Austria, as the administrative authority in charge of controlling zoning issues, supports the city council's decision. Austrian planning practice tends to adopt reactive behaviour toward infrastructure and settlement development. This project is characterised by proactive actions based on changed conditions of spatial planning and development.

From smart goals to smart implementation - Social innovation in the implementation of an integrated and forward-looking interim and post-utilisation concept is the focus of the project. Through a new content and temporal interlacing of participatory, planning-technical and land policy elements, a future-oriented development process will be adopted. In the realisation phase of the railway project, the use of the future city district will be prepared. In a dialogical competition, an urban-planning and open-space planning master plan will be drawn up, whereby the station becomes the important mobility turntable in the context of local and regional mobility. An innovative land management model is used to ensure implementation in cooperation with the real estate owners.

From smart projects to smart society - The aim of the project is the demonstration of a city (regional) development using the example of the test bed Ebreichsdorf in terms of an overall, systemic, interdisciplinary approach of the area, involving the population and the relevant stakeholders of the political, administrative and private sectors. The results obtained can be used directly in university research and teaching and can be applied to comparable settlement development projects in the catchment area of railway development projects.

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