

Title

## **System Oriented Evaluation of Infrastructure Variants for New Mobility Concepts in Municipalities**

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### **Description of the Problem**

The community of Bressanone (Brixen) in Italy has, in close proximity, its Hausberg Plose (2,576 m. = 8,451 ft.) which provides year-round vacation and sports opportunities for locals and tourists alike. The idea of a direct connection from the city to the mountain has already been pursued for many years — not just to offer a practical means of transportation for recreational athletes but also for commuters and students. The most recent attempt — a scheme for a cable car from the city's train station — failed fundamentally. Numerous protests formed against the negative effects of the project as planned and because of the lack of transparency of the project as a whole. The vehement political confrontations ended in a people's referendum which, once the votes were counted, resulted in rejection. It produced an awkward situation that made every attempt to revisit the idea of a direct connection to the mountain extremely difficult. The project described in this paper represents a fresh start.

Based on the two authors' recommendation, the development of a criteria-and-evaluation model takes center stage with the (political) discussion and decision-making processes aligned with it supported by a different kind of project communication and citizen involvement.

- Previous mistakes had to be avoided. Most important among these were: Lack of transparency and clarity about goals and performance criteria for a technical transportation solution whatsoever
- Lack of adequate consideration for the aspirations and misgivings of future users, citizens and neighbors.
- Too little active involvement and inadequate representation of different interest groups in the process of project development.
- Opaque communications obscured the process and there were too few opportunities for dialog during the process.

One interim goal of the new effort was to obtain the municipal council's acceptance of the evaluation model so that it could serve as the authoritative basis for the tender offer in a competition of ideas as well as for the following planning process. It was also to be consulted in evaluating technical options.

### **Research objective**

The objective was to develop and apply methods and approaches for a comprehensive description of objectives and then evaluate the mobility solutions that resulted through appropriate discussion and decision-making processes combined with project communication and public participation.

The model for goal description and evaluation of mobility solutions was to follow holistic and system-oriented approaches that passed beyond the old-fashioned evaluation and weighting models.

For this project of “Connecting the City to the Mountain”, the two authors have, based on their many years of research and practical experience (Vester, F. et.al 1992-2006, Harrer, G. 2015) working with communities on the subjects of “New Kinds of Mobility” and “Infrastructure Projects”, developed and implemented the approach we see here, while working with representatives of the city of Bressanone on the complex situation they faced.

The guiding principle was to work out an integrated and transparent approach that gave urban policy and city management a sound basis for the further development of mobility measures and quality of life for their citizens, guests and businesses in the city and in participating settlements.

In addition, tried and tested systems approaches were combined in an iterative approach and adapted for use in the development and decision-making processes.

### **Methodological approach**

In all stages of the project and on all working levels, various systemic approaches were used and adapted and combined in the application, depending on the requirements of the situation.

#### **All-embracing selection of participants and experts**

- For the selection of participants in working groups, steering committee and for public dialog: ensuring that the relevant stakeholders were adequately represented with respect to language group affiliation, gender, city/country, age, membership in interest groups, political parties, and occupation. Selection took place in part through nomination, in part through quotas, and in part through tender offerings and lotteries.
- Bringing together knowledgeable persons from different fields: technical experts, management specialists, transportation operators, future users and political authorities in order to form the working group.
- Adaptation of the intended mobility solution in a larger design context (i.e. overarching mobility concepts, foundations of space planning and principles of community development).

#### **Combination of systems-oriented methods**

- Learning from mistakes (Dörner, D. 1989) through prior research on similarly structured projects in the German-speaking realm and especially also critical discussion of one’s own failed processes of the past
- Bottom-up: iterative development and operationalization of criteria from the ground up (Vester, F. 1999/2002; Wulfhorst, G. 2013)
- Application of the fuzzy domain extension principle (Zadeh, L. 1965) when defining and operationalizing the criteria
- Observation of the causal relationships and interconnectedness of the criteria (Vester, F. 1999/2002)
- Systemic moderation method and feedback in the dialog with citizens (iterative discussion of the criteria with all groups, input from citizens and future users and interest groups, incorporating the feedback through the working group, etc.)

#### **Coupling of different systems**

- Networking of relevant subsystems (among them, district council, city council, political groups, citizens, state government, operators of mobility options, local urban districts, municipal administration) through representation in the work group
- Integration with the political system/process: District council orders about the approach, interim reports to political groups, introduction of the evaluation model in

front of the municipal council, resolutions of the municipal council, tender offer processes and evaluation on the part of the judging panel.

- In the interest of transparency and participation, linking of the project process and the political process with the general public by means of an ongoing, detailed documentation of the approach in the [www.stadt-berg.it](http://www.stadt-berg.it) blog.

## **Results**

The evaluation model worked out by the working group met with unanimous approval (cf. <https://www.stadt-berg.it/--website> version of 24 February 2019) by the municipal council. It thereupon served as input for the tender offer and finally, for the evaluation of the mobility alternatives that were handed in. The project idea chosen as the winner by the awards jury proved to have been comprehensively thought through and was innovative. It found broad acceptance by the population. The planners of the winning approach had, according to their own statements, grappled intensely during their development efforts with the evaluation model and the criteria defined therein. In the documents they submitted, they had referred appropriately to all of the criteria.

The overall approach that was developed — including the development process for the evaluation model, the (political) discussion process, the decision-making process and the comprehensive communications and participation design — could be implemented as planned. It has proven itself to be very robust and it functioned quickly in all phases. As a result, just 12 weeks passed (from 28 April 2017 until 28 July 2017) from the first meeting of the working group until acceptance of the evaluation model by the municipal council (cf. <https://www.stadt-berg.it/> -- website version of 24 February 2019).

Through the active inclusion of all relevant groups, the transparent formulation of goals and criteria and the taking into account of concerns and misgivings, earlier conflicts could be overcome and an open discussion atmosphere was once again the result.

With the “citizens’ dialogue” and the participation of citizens in the working group, the active inclusion of the population became established as an important element. This concept of dialogue is now continuing in further proceedings. Along these lines, the population was invited, after the winning project had been introduced, to ask the responsible politicians questions and obtain their feedback. The knowledge gained, including also some very good ideas for further improvement of the proposed project, continues to flow into the planning processes that have followed.

## **Particular success factors**

A lot of special attention was placed on the clear definition and proactive coordination of processes, approaches and methodology in the overall project. Approach, methodology and participation in every process and every step were reconciled with the relevant political decision-makers and committees that had been defined. No project step took place until full political consensus had been afforded it. This required additional time, particularly during the assembly of the working group; however, as soon as the political consensus was there, it became possible to proceed on a robust basis with very rapid implementation, especially for a public project like this one. In addition, this principal of operation was the basis for the fact that step by step, more and more confidence arose in and around the project.

During the design of the overall approach, the precisely planned dovetailing of the work on the evaluation model by the working group with the political agreement and decision-making process (e.g. the adoption of the project procedure and the agreement by the municipal council with the proposed evaluation model) can be singled out in particular. This

amalgamation has significantly contributed to the robust course of the project as well as to its fast execution time.

A significant element in the broad acceptance of the overall approach and specifically, of the evaluation model, was the fact that the more than 20-person working group, that consisted of a good combination of stakeholder representatives, experts and users, developed the criteria and their operationalization themselves from the ground up. An evaluation model “of our own” thereby emerged that did not have to come from any “outside” expert of any kind. In this case, a certain level of complexity and variety was quite consciously planned in and tolerated in order to make the inclusion of all relevant perspectives possible and at the same time, offer a platform for constructive discussion and treatment of all inputs. The project approach was, in this regard, conceived with the complexity of the project in mind — in the sense of Ashby’s Law: “Only variety can absorb variety” (The Law of Requisite Variety, Ashby, W.R. 1956).

### **Summary**

With this systems-oriented approach, a criterion model could be developed from the ground up within a short period of time, while including all relevant interest groups. This approach has proven to be very robust and is suitable for the overall evaluation and decision-making of all types of complex, urban infrastructure projects, including transport and mobility solutions.

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