*College:* **HTL Rankweil**

*Location:* **Vorarlberg, AUSTRIA**

*Practice:* **College of Civil Engineering: Engineer's Project**

Providing real-world experience for civil engineering students

| | |
|---|---|
| *Year Started* | *1998* |
| *Budget* | *$1,000* |
| *Program Participants* | *4* |
| *College FTE* | *842* |
| *Target Sector* | *Engineering* |
| *Staff Size* | *7 FT* |
| *Structure* | *This is a project included in the engineering curriculum.* |
| *Key Outcomes* | *Students gain experience and the chance to interact with professional and civil groups.* |

## Introduction

Travel in mountainous regions can be difficult. And while significant resources are spent providing roads and bridges for cars (and trains in some countries), in many small communities walking or biking remains the preferred mode of travel. Yet these are modes of travel largely neglected by transportation planners.

To help resolve this problem, HTL Rankweil (an Austrian Higher Technical Institute) joined with three communities in that country's western Vorarlberg region. Students from the college of civil engineering spent a year researching and designing a foot and cycle bridge to link the three communities. The students' work was of such good quality that the plans they submitted were accepted as design plans for a construction project. At a design cost of US $1,000, this project proves that pooling resources is an appropriate way to meet community needs.

## Community Background

Vorarlberg, in the mountains of western Austria, is largely rural and is the smallest of the nine federal states of Austria. Though the agricultural sector of the economy is declining, the local metal, electrotechnic, and textile industries are stable or growing. The rate of employment is stable.

Transportation in the region can at times be a problem. The river, Dornbirner Ache, presents a natural obstacle to foot and bicycle paths between the communities of Lustenau, Hard, and Fubach. The bridges for automobile travel leave pedestrians and cyclists at a distinct disadvantage. Though not a new problem, increasing congestion has made cycle travel more problematic in recent years.

| Program focus | Sector specific | Economic condition | Economic base | | | Target populations |
|---|---|---|---|---|---|---|
| | | | Mfg | Agr | Svc | |
| *Technical education* | *Yes* | *Growing* | *43* | *2.9* | *22* | *Youth/students* |

| | |
|---|---|
| *Service Area* | *Vorarlberg (federal state in western Austria)* |
| *Total Population* | *320,000* |
| *Median Household Income* | *1,400 Euro* |
| *% Below Poverty Level* | *N/A, 2% on public assistance* |
| *% Unemployment Rate* | *4.2* |
| *% Minority Population* | *14.9 (foreign nationality)* |
| *% Rural Population* | *24 (outside towns)* |
| *% High School Graduates* | *40 (However, half of Austrian young people pursue apprenticeship programs from age 15 to 19 which are separate from upper secondary programs.)* |
| *% College Graduates* | *9* |

## Program Description

The first suggestions for a foot and cycle bridge over Dornbirner Ache were made in 1988; however, the first project proposals were not written until 1996. Local officials were considering the proposals when HTL Rankweil, the local Technical College, expressed interest in participating in a civil engineering project. (Technical Colleges prepare students for fields as diverse as engineering, social work, teaching and forestry.) Subsequently, the school's civil engineering department took on the project of designing such a bridge.

The project was divided into several steps. First, students worked together to inspect the proposed construction area, analyze the construction area's geology, collect data from various civic authorities, and determine the extent of current cycle pathways.

Second, students designed eight schemes and submitted and defended them for jury evaluation. Representatives of the Vorarlberg regional government, landscape conservation authority, and local communities all sat on the jury. Third, two proposals were selected for further development—including detailed calculations of the bridge, its foundations, uprights, and span—which the students did.

## Outcomes

The final result of the project was a design for a 44-meter-long cycle track that could incorporate either of the two bridge types—an arch bridge or an inclined-cable bridge. Detailed enough to meet the government's requirements, the project was slated for construction in 1999.

The bridge, however, is not the only outcome of the project:

- Students gained valuable real-world experience in research, design, and presentation. They also gained the motivation of having the potential to see their designs actually built.
- Including younger citizens in the process of community planning created an investment in the community by the students, increasing the probability that they would remain after graduation.
- The project united the three communities, as well as the college and students, in solving a common problem.
- The project resulted in good press coverage for the college, students, and community.

## Strengths, Challenges, and Replicability

Strengths of the project hinge primarily on the real-world experience afforded the students. In addition, the problem and task were tangible and well defined.

The main challenge of the work presented was the extra amount of time required for each participant before passing the examination. This averaged around 300 hours per student. However, the project offered a unique opportunity for the students to become motivated about having a significant impact in their communities.

*For more information, contact:*

Dipl. Ing. Hermann Kert, Director
HTL Rankweil
011-55-22-42190-301 – phone
011-55-22-24190-204 – fax
hermann.kert@mail.HTL-Rankweil.vol.at