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The rise of a city – Technological innovations for human well-being in the built environment in Bienne (CH) and Borgosesia (IT): “a quite honest confrontation”

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The rise of a city - Technological innovations for human well-being in the built environment in Bienne (CH) and Borgosesia (IT): “a quite honest confrontation”

Mario Fosso , Carlo Consonni¹

Bienne, a Swiss city north of Bern, has undergone changes closely connected with the success of its own industry over the years, in particular that of watchmaking. As a result of financial promotion and urban development policies led by the Municipality while co-operating with architects and urban planners, the city has implemented a positive process of re-development and re-use of its own disused and abandoned industrial areas for some years now. Suburban areas with a little interest have now become attractive areas for the whole city, in that they feature high-quality dwellings, leisure-time areas, cultural and recreational spaces, a university campus and new manufacturing plants. Furthermore, investments in fields of skilled labour education and training have brought about added value in a number of sectors such as medical technology, telecommunications and electronics applied to mechanics. A new relationship between innovation and tradition emerged, between form of the city and technology, as well as a more effective accessibility and a new centrality within a global perspective.



Figura 1

In fact, Bienne represents the paradigm of a city that is intended for a new life in its own context, within the framework of a new Humanism reconciling nature with technology. Its rise consists in the development of a virtuous model that can be adopted and analogically applied to other realities that are similar in terms of history and characteristics. Students, graduands and professors from the School of Architecture of Milano-Bovisa, along with the local government representatives, have

¹ This paper has been extracted from the book: AA.VV., *City Uses and Community in the Low, Medium and High Sesia Valley*, under permission of the authors and editors Mario Fosso and Carlo Consonni, Milan 2017

recently developed an in-depth historical survey and re-design of Valsesia, a territory that is at the foot of Mount Rosa and in many ways similar to the Swiss one. It aimed to identify an operational strategy for its urban and landscape design as well as its architectural design. That involved devising new possible scenarios to oppose both financial decline and social impoverishment brought about by the crisis in the textile industry. Eight specific points were identified for the city of Borgosesia that were connected with a shared settlement hypothesis, organised around a new railway backbone. The infrastructure, following the course of the Sesia river, allows the realisation of a new identity called Sesia City within a shared hypothesis of all urban services. Moreover, the Valsesia morphology would enable the development of a high-effective hydro-electric power generation system, also involving the testing and manufacturing of fuel cells that are now the new horizons in the research and training of that field. All potential effects were also identified that could be open to a number of designing applications in both the civic and landscape fields as well as to a new centrality of the Sesia river. The actions identified within the research carried out, both in case of Bienne and in that of a simple study of Borgosesia, contribute to an idea of development and humanization of the urban vision that means a higher community cultural level and a smart and sustainable use of all resources available. In addition to that, the possibilities offered by the new communication tools need to be properly exploited within the globalization process. In a territorially contained context it will then be possible to combine the different work ways, whether material or intellectual. On a local basis, with the 'Hubs of Knowledge' while on a global basis, with the virtual networks.

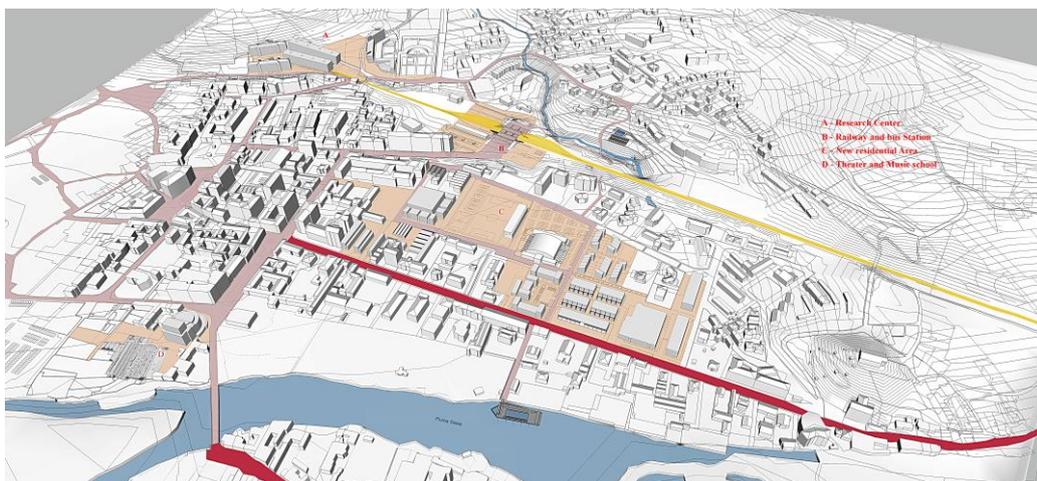


Figura 2

URBAN DEVELOPMENT AND ECONOMIC PLANNING OF BIEL/BIENNE (CH)

The changes affecting the town of Bienne in its development were closely connected with the success or decay of the watchmaking industry. Due to the rise in industrial manufacturing, in particular that of watches, its population increased from 30,000 inhabitants in 1900 to 65,000 inhabitants in 1965.

A new far-reaching financial crisis broke out in 1970 and led to the final shutdown of the General Motors' assembly factory in 1975, that only forty years before represented one of the most important assets of the Bienne's industry.

The big watch manufacturers' trademarks that could not face up to the powerful Asian competition were obliged to stop their manufacturing and close their industries. As a result, the factories of Swiss important names such as Omega, Mido, Bulova and Tissot, as well as those specialising in fine mechanics and other suppliers had to shut down from one day to the next. Some factories and entire industrial districts were abandoned, buildings were destroyed or turned into smaller units for different uses such as laboratories, offices, shops and also dwellings (lofts for instance).

As a consequence of this serious industrial crisis, between 1970 and 1980, the town population decreased by 10,000 inhabitants (from 64,000 in 1960 to 54,000 inhabitants in 1980).

Only in the 2000s the demographic curve started to significantly rise again. Currently, 60,000 inhabitants are registered though a rising trend can be noticed.

Over the last years the town of Bienne has undergone a dramatic change and is now involved in a renewed attention to its area and all activity sectors involved.

The redevelopment of the urban disused areas and the abandoned factories is currently diversified. The economic and town planning development policies of the Municipality aim to diversify its activity sectors as much as possible so as not to depend on a single sector such as the watch industry, that anyway still is a beacon in this regard.

In fact, the presence of the 'Manufacture des Montres Rolex S.a.' and of the 'Swatch' Group (Omega, Longines, Tissot, etc.) makes Bienne the world capital of the watchmaking industry.

At the same time, labour from the watchmaking field that is highly skilled in precision expertise has generated added value in a number of other sectors such as the medical technology, telecommunications and the automotive fields. Not to mention the tertiary sector (related to vocational training and research services) that has significantly developed over the last years.

The change in the abandoned areas was possible since different parts of the urban fabric, as a result of the town development, passed from being suburban areas with a little interest to being very attractive areas engrossed in the town centre and equipped with exclusive residential districts and facilities. The town of Bienne is the most important owner of land in the municipal territory (perimeter of 'railway station', the 'Gurzelen' and the 'Champs-de-Boujean'). This aspect is crucial in that it allows actively promoting strategic projects for the urban development.

In order to ideally promote disused industrial areas, it is absolutely essential that the authorities involved be able to initially establish firm foundations and plan necessary and early investments.

Operational strategies:

- Increasingly effective accessibility: establish a good road and railway network as well as create a connection with the nearest airport
- International context: encourage International relationships
- Attractive elements: create an attractive and multipurpose labour market, a good work environment, encourage multilingualism
- Training: develop an innovative network of skills, promote vocational training schools, especially addressed to skilled jobs
- Appealing advantages: promote for instance cultural activities and tax advantages for the creation of new businesses
- Plan additional development: identify development poles and strategic reserves of land

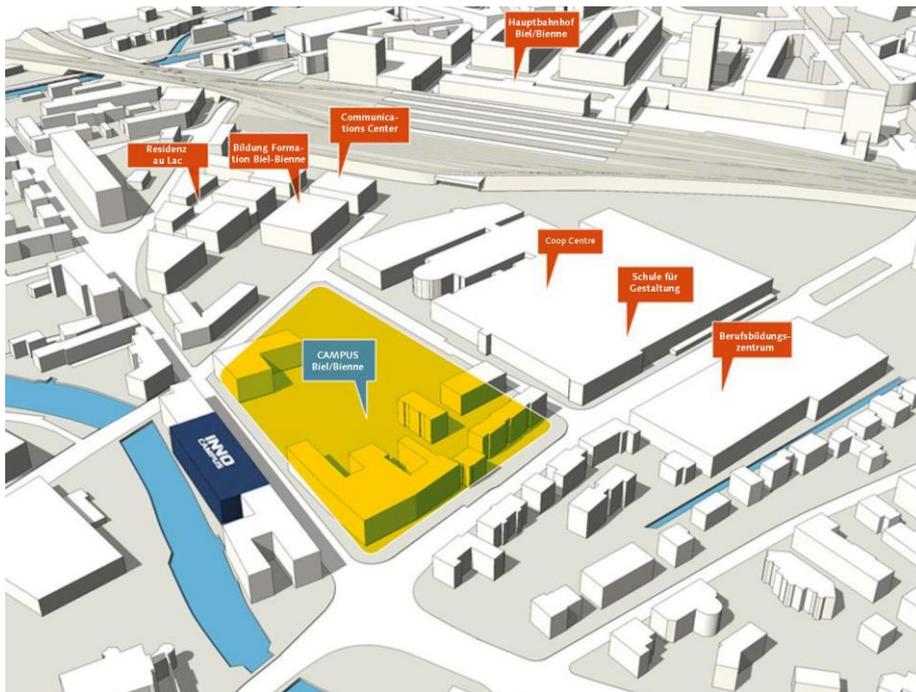


Figura 3



Figura 4

BORGOSIESIA A STUDY-CASE FOR THE THEME OF AN INDUSTRIAL CITY'S REVITALIZATION

The idea of setting up a Design Workshop in Borgosesia, open to contributions from architecture schools of international fame in the Fall of 2013, came from the research and study commitment undertaken together with a group of students and teachers of the Polytechnic of Milan during the last academic year. Starting from History and Country Planning of Valsesia, with the active collaboration of the cultural institutions and in fact we have done in past years, in-depth analysis of the character and specificity of the Valsesian landscape. In terms of urban design and architecture we have also formulated specific urban plans of intervention for the municipalities of Varallo-Sesia and Alagna. At the centre and in support of these proposals placed itself strategically the infrastructural issue. The reactivation of the historical railway – Novara Varallo - and its doubling in the branch between Borgosesia and Alagna is proposed as a very advanced system of gauge-reduced railway of the Tram-Train type, a system specifically developed and designed together with Gianni Grassi a transport engineer and lecturer at the Polytechnic of Milan.

The City of Borgosesia has in the past year particularly favored the coming together of the two realities: School of Architecture and municipality. It has provided aid, knowledge and technical support and the two institutions have finally recently signed an agreement for scientific cooperation for the following three years. This can concretely contribute to a vital exchange of knowledge and documentation between universities and municipality, but also provide evidence of the idealistic capacity which alone can arise from a fresh look at existing urban reality. The themes and the functional design, will then be able to form a character for the new architecture alongside the the character of the newly educated students. Should also be noted that from 2009 together with other teachers of the Politecnico of Milano, University of Ljubljana and the Faculty of Architecture in Spittal in Austria we have had access to funding from the European Community, dedicated to the Intensive Programs. These have allowed us to set up some thesis completed in July 2012.

Eight projects for five scenarios From the analysis by sectors of the urban reality of Borgosesia structures and artifacts emerged particularly relevant in terms of size (represented by the system of ancient and more recent textile factories dedicated to the processing of wool in all its phases - from raw material to the finished fabric). All these must be considered with: Schools, Former-Hospital, etc.. and houses for medium and high bourgeois, they offer evidence of a period of rise and subsequent decline of the manufacturing industry of wool, which coincided since the seventies of the past century, with the emerge of a global economy. With it not all companies have been fit in a competitive way, lacking a renewed and necessary technical equipment. During the research phase comparisons have taken place highlighting the need to define specific strategies and reconnect various and differentiated

hypotheses of intervention. Settlement strategies within are here outlined, by way of examples with emblematic meaning and images, in order to show the five possible scenarios for Borgosesia.

FIVE SCENARIOS FOR A FUTURE REVITALIZATION

I - SCENARIO: INNOVATION AND PRODUCTION

- Research and its fall out in the field of energy
- un-productive factories and their reallocation
- museum of textile as redefining the industrial identity

II - SCENARIO: RESEARCH / EDUCATION AND RECEPTION

- institutions of higher education in the fields of technical qualification
- botanical garden as a field of naturalist and medical testing
- temporary housing (college)
- theatre circuit as cultural training and entertainment

III - SCENARIO: RENOVATED CIVIC CHARACTER

- historical and monumental buildings
- residences/open spaces and urban quality
- the circuit of lower schools and education
- leisure activities and associations

IV - SCENARIO: RIVER LANDSCAPE AS A CENTER

- the River Sesia fruition - industrial fronts along the river side
- open spaces and long lines of the cycle-pedestrian routs
- the river landscape as a shared space / trekking
- outdoor activities and sports

V - SCENARIO: NETWORKS AND MOBILITY

- the railway as the backbone and service for city-use
- network system and inter-modality
- parking and sustainable mobility



Figura 5

FOR AN ADVANCED AND SUSTAINABLE DEVELOPMENT

MANUFACTURING AND ENERGY IN VALSESIA

MANUFACTURING AND INDUCED SOCIAL CHANGE IN THE VALLEYS

In Valsesia the energy of the watercourses attracted the installation of factories whose arrival changed the demographics, commercial and economic activities and education, redefining the classification of the historically inhabited villages. The most thriving from the Middle Ages until the mid-nineteenth century had been on the sunny mountain slopes, wherever there was grass for raising cattle and arable land for growing cereals, potatoes and vegetables to support the resident population. The males would learn a trade early in life, traditionally different from village to village, and practise it by emigrating together in parental groups to Italian cities such as Rome, Turin or Milan, or better still abroad to France, Germany, Britain and Russia. The roads were essentially mule tracks along the mountain ridges and slopes, because the valley floor, sparsely inhabited, was subject to seasonal flooding of the watercourses, forming extensive marshes. But the factories could only be established in the valleys, next to the rivers, where the small and almost non-existent hamlets became the most highly developed and populous places as a result of the industrial revolution. They were settled by the technicians, mostly foreigners, or at least outsiders, and the workers. New families sprang up among the immigrant men and local women; and since the female workforce from the area willing to work in the factory was insufficient, young people were recruited in the countryside of Novara, Vercelli, Pavia and Milan through the parish priests and housed in dormitory accommodation supervised by nuns. Marriages also took place between these young people and the locals, with the

factory serving as the intermediary. This was the mechanism that made Borgosesia the most important town in Valsesia, just as it made swell the populations of localities such as Quarona, Valduggia, Serravalle Sesia and Grignasco. Varallo shared in the industrialisation, but because of the Sacro Monte and its geographical location in the valley it was already home to a professional, commercial and business middle class and had an educated and progressive clergy. When it came to progress, since 1893 Varallo had had public electric lighting and a first network distributing it to private buildings. Public electric lighting reached Milan in 1894 thanks to the engineer Conti, but with a Tosi steam-powered plant.

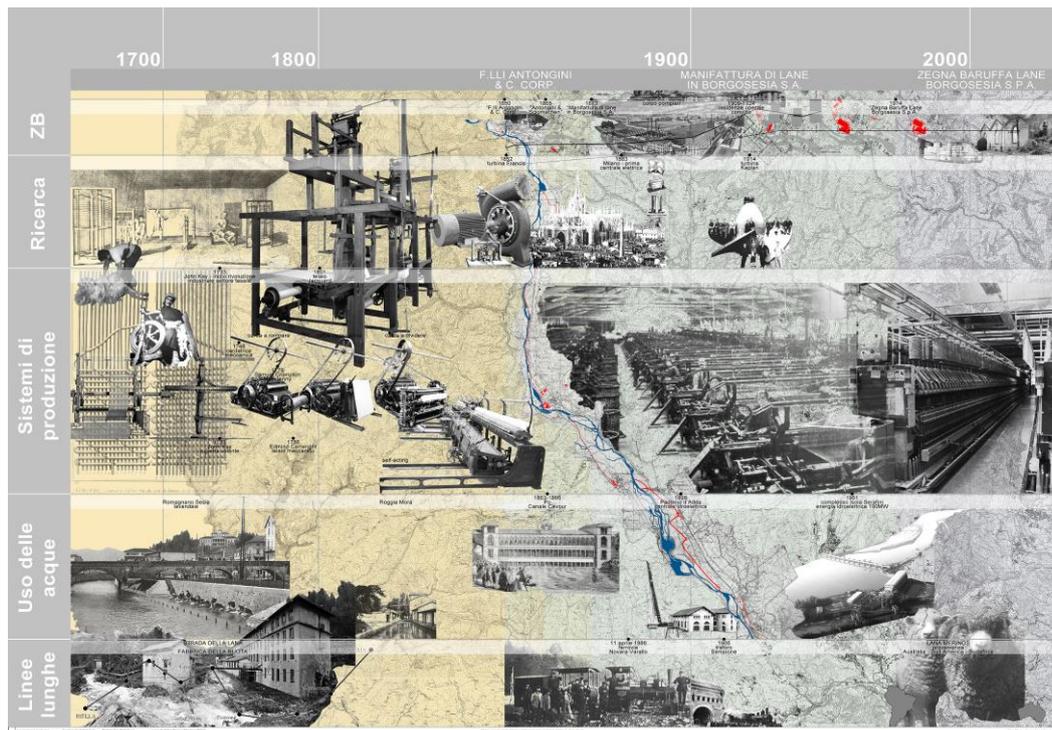


Figura 6

From the late nineteenth century down to World War I, these industries employed over 7,000 workers in the valley alone, and Italy developed so rapidly due to hydraulic power that the Ministry of Commerce of the United States, in a report on Commercial Relations of the United States with Foreign Countries in 1905 declared that 'if the history of the progress of Germany reads like a romance, that of Italy is like a fairy-tale. There has been an industrial development such that no nation in the world has ever had. It could rightly be called a commercial and industrial renaissance. Hampered for two or three hundred years by lack of coal, Italy had to wait for the wand of the electric wizard to awaken the power sleeping in the waters of its mountains. They have harnessed watercourses and transformed them into a useful force. The Italian people are pushing into all parts of the world, gathering money and sending it to the banks of their country. The circulation of the Kingdom is now at par, its credit at its highest and its factories are working day and night.' These hydroelectric plants are all

still in operation, automated and connected to the grid, except for the Morca plant, formerly Elettrolitica. All the factories are now closed, except the Manifattura di Lane in Borgosesia, now named ZEGNA BARUFFA LANE BORGOSIESIA S.p.A., which employs over 400 workers. Some water jumps neglected at the time are now being exploited, so that the Valley has some twenty hydroelectric plants with over 22,000 kW of concession and with production feeding over 150 million kWh into the grid, exceeding the consumption of families, businesses, and local government bodies.

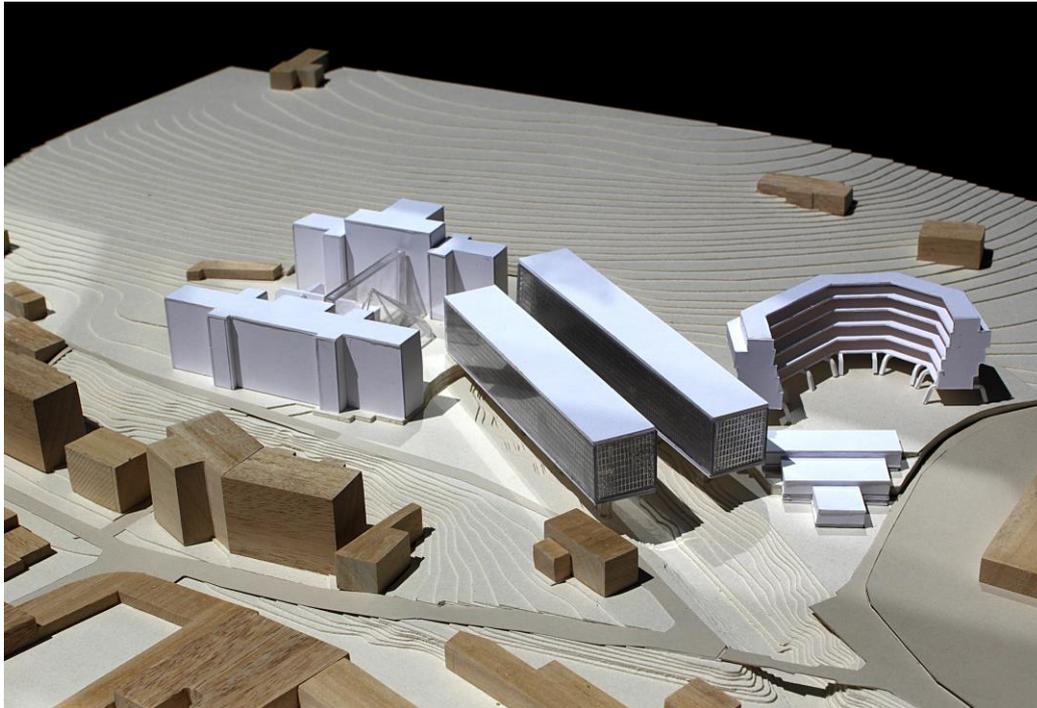


Figura 7

A futuristic project that can be realised in the short term would be the creation in a small environment of diffused settlements that lend themselves without great inconvenience to investments in experiments taking advantage of generation diffused across the territory. This would involve creating a network of electric or hybrid car charging stations, equipping public or commercial car parks with charging turrets functioning as follows: the motorist parks and, if he/she wishes to recharge the car battery while engaged in other occupations, he/she enables the turret by introducing a credit card. The turret accepts the insertion of the plug and then the motorist removes the card. On returning, the motorist reintroduces the card and removes the plug. The turret's software reads the kWh absorbed, prices it and charges the card if prepaid or the correspondent bank. Another desirable application to achieve energy autonomy in the territory is the integration of each hydroelectric power station with a water electrolysis system for producing hydrogen and oxygen. The hydrogen can be introduced into the network for heating or used in gaseous or hybrid form in vehicles, while the oxygen can be used as a comburent in welding metals or heat treatment of other industrial processes (glass, etc.), while avoiding removing it from the

atmosphere and without generating nitrogen oxides, or for sanitary uses. This does not alter the fact that the hydroelectric plant will have as its first purpose feeding the network, but it will be turned to electrolytic use only when the network is locally saturated, so avoiding having to raise the excess current to be transmitted away, when the supply is lost due to accidents on the lines or for other reasons. It is important not to overlook the fact that switching off the network should occur at low load times, when energy, unless it is operating with an all-inclusive tariff, is of little value. The production of hydrogen, in addition to attaining the goal of preserving the reserve of energy, would improve the economic viability of the investment. These goals are all geared to promoting the area in its present environmental and anthropic value, and allowing the realization of sustainable and energy-autonomous towns, with fewer greenhouse gases and carbon producers. These are certainly sophisticated applications, but the technology and people capable of applying them are already among us, even in Valsesia. This will be the energy future of our water resources and population centres: we will find the energy and the financial means to invest, provided we want it and believe in it. In this case, those engaged in local politics should look to this future not only through the political lens, but also with the enterprise and foresight of economists.

A FUTURE RAILWAY SYSTEM AS BACKBONE FOR CITY-USSES IN VALSESIA

The railway made the fortune of many Alpine areas early last century, when cars were rare. Today, however, Alpine railways select visitors more closely and encourage a more correct relationship with the environment. An example are the Swiss private railways that continue to promote tourism in many mountain areas, such as the Rhaetian Railway, founded in 1889, which connects many of the more than 200 municipalities of Graubünden, twisting and turning on its way through 485 viaducts and 116 tunnels in the midst of magnificent, if not unique, alpine landscapes. The most beautiful and important routes are three in all: the Engadin Express that runs between Saint Moritz and Scuol; the Bernina Express between Chur and Tirano, which climbs without a rack rail to 2328 meters; the Glacier Express, the world's slowest express train, which takes eight hours to cover a distance of 290 kilometres, with some gradients as steep as 110 in 1000.

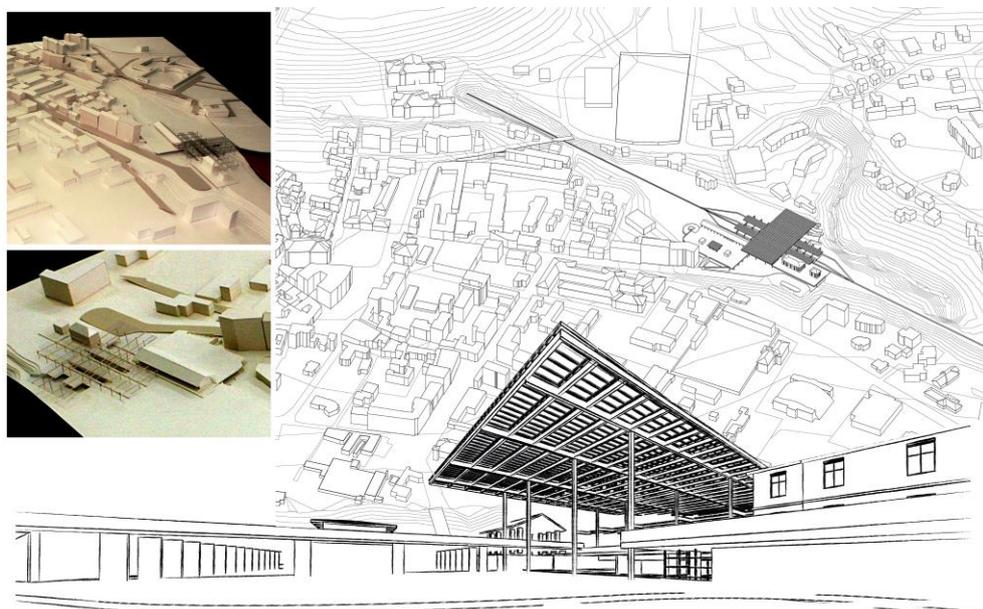


Figura 8

Individual or collective transport? Unfortunately, in Italy, including Valsesia, there is no deeply rooted preference for collective transport of the kind found in other parts of Europe and in some Italian regions, such as Alto Adige and the Val di Non/Val di Sole (with the Trento-Malè railway line). But the introduction of electric vehicles, pedal assist bicycles and two-seater micro cars, as well as minibuses with electric engines, together with appropriate marketing campaigns, could radically change the way the public think, even over a reasonably short timespan. In this context the railway could have a new role not only in tourism but also in providing connections with centres of attraction such as Milan, Turin and the airports. This accessibility could then be offered as one of the advantages of rail travel over road transport like cars and buses.

Trains and electric vehicles, whether company-operated or as forms of car-sharing, individual or collective, will clearly reduce pollution from fossil fuels and save energy by using electric power supplied from renewable sources in a system with a low accident rate.

Reducing the use of motor vehicles in the overall context, cutting back on the number of accesses in the lower part of the valley, ensuring accurate and efficient coordination of schedules between the different modes of individual and collective

transport as well as making the system easy and convenient to use, even by older people, would be the best response to the new needs that are emerging.

As for Valsesia's connections to Milan and Turin (and the airports), clearly services and connections of this kind should have two functions: to ensure rapid and convenient access to the centres of the most attractive metropolitan cities and to facilitate urban penetration and access to the high-speed rail network and the national and international airport system.

Then there is naturally the function of tourism. Basically this would be served by a train from Varallo to Milan (without changing at Novara) and a similar one in the afternoon to Turin. There would always be two trains, one in the morning and one in the afternoon but changing at Romagnano with the direct Arona-Turin train.

In the morning, the train should reach the business centres of Milan and Turin during business hours (before 9 a.m.?) while the return journey to Varallo will have mainly to serve tourism (from Milan and Turin simultaneously at about 9 a.m.) with special multiple discount rates of the kind already in force in other parts of Europe.

THE EUROPEAN COMMUNITY'S INTENSIVE WORKSHOPS FOR THE MILAN'S POLITECNICO AND THE VALSESIA VALLEY

The teaching and research project conducted in Valsesia in 2011-15 was held thanks to the possibility of having access to the intensive planning workshops funded by the European Union. They were connected with the study of specific territorial and urban themes and sponsored by individual institutions, both public and private. In our case the Politecnico di Milano and the town of Borgosesia signed an agreement making it possible to engage in such a collaboration over several academic years. The educational activities carried out in them concerned related disciplines such as architecture, urban planning and landscape design. The work was directed at the development of a method of project learning based on local knowledge, identifying its weaknesses and strengths, and on proposals for appropriate solutions to the use of individual areas and issues. In this way it aimed to restore and renew the vitality of those areas, their social and economic cohesion, and to introduce new functions.

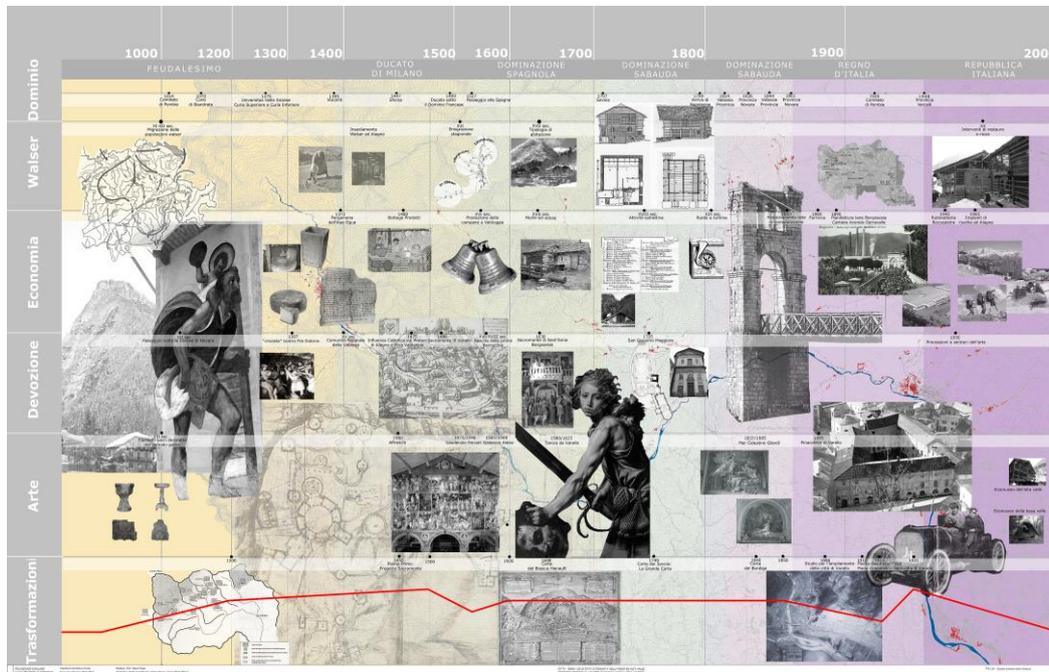


Figura 9

THE SURVEY AND THE ANALYTICAL PHASE

The knowledge that emerges from an examination of a territory becomes experience through the memory of its places. Making a survey means walking, taking photos, being aware of the surroundings. Redesigning what we have seen is the correct way to appropriate the characteristics of an urban space as well as a natural environment. The complementary tools of this process, inherent in the stage of exploration and acquisition from life, are the chrono-thematic sequences and the layer method.

Chrono-thematic sequences consist of comparative techniques and related analytical procedures. The topics are selected and reconstructed in keeping with a chronological path that leads to an understanding of them and of the mechanisms of transformation that underlie the formal and morphological phenomena of a given territory. It is essential to grasp all the forms of self-representation and diversification of the social structure that can be transferred into iconographic images, seemingly distant from each other. In the case of Valsesia and in particular Borgosesia the focus was on historical, productive-economic, social, devotional and artistic characters. The 'layer method', also known as the 'tracing paper' method, is likewise similar to that used by Professor Frits Palmboom (TU Delft Faculty of Architecture). This is a technique of overlapping geometrical and topographical surveys, identifying correspondences between points, objects and surfaces, ultimately their geometric layering. The correspondences involve both the original features of the territory and the anthropic landscape, helping to clarify trends in development, population, income, level of education and access. Setting out the data gathered by bibliographic, iconographic and cartographic research made it possible to gain an immediate understanding of our areas of study on several levels. This way, on the layers we find the morphology of the territory documented by historical maps (municipal, regional) and those of the I.G.M. (Istituto Geografico Militare).

While the chrono-thematic sequence depicts essentially the historical, productive and cultural characters of a given territory, with all its problems and its questions, analysis through the 'layers' foreshadows the project hypotheses and their insertion as the final stage of the survey.

POINTS OF APPLICATION

At Borgosesia many functions were recognised as necessary to upgrade the old facilities of the industrial city and identify new ones. These services are part of the overall reality of the Valsesia that we termed 'City uses and Communities'. In the framework of a common settlement strategy, some sectors were therefore identified and given the project aims of an idea of the city based on areas, shared activities and strategic functions. The 'geography of the urban sectors' of Borgosesia comprises the whole series of brownfield sites and some sites in particular that overlook the River Sesia. They represent an invaluable patrimony in urban terms, to be considered as so many individual case studies susceptible to project work in theses and teaching workshops.

The five scenarios previously envisaged for Borgosesia introduce qualitatively defined parametric uses, both with regard to innovation and the transformation of the existing. The new functions are intended to increase the overall attractiveness of the city, both by the conditions of contemporary living and standards today. The scenarios, as elements projected into the future, should be considered as a true programme which provides the city with a destiny of integrated functions, shared resources, development of research and production relations. The river landscape and the infrastructures are the cornerstones for free and dynamic accessibility. The projects then undertake the task of establishing a connection and relations between the programme, or scenarios, and the system of areas or sectors. The basic idea of such relations is that of the circuit, meaning exchange and integration between the various parts of the city. The task of the project is to establish a coherence between areas and functions, as well as a complementarity between places and activities. Hence they take the form of integrated systems and the circuit of production and culture, whose accessibility and attractions sustain the key assumptions of the projects.

These projects constitute so many theses and workshop projects. Hence they concern the theatre, the museum, housing and the station as activities revisited according to a certain line of action, approach and program. They also renew the centrality of the River Sesia and the brownfield sites, as well as the civic character of the open spaces (streets and squares), understood as parts of an urban project designed by public places and locations for socialisation.

MAIN THEMES DEALT WITH

With the project for the new University campus, which we called the 'Crown of the City', to valorise the morphology of the area that is the site of the former Hospital dominating the city, we sought programmatically to fulfil the first scenario, one integrating Innovation and production. With it we hypothesised the content of a research (in the wake of the production tradition of Valsesian industries), applied to the energy field, capable in theory of positive benefits in both production and employment throughout the Valsesian area. The idea of the intervention to the north of the city concerns the hilly area overlooking it where the big former Hospital building, publicly owned and now completely abandoned, is to be repurposed as a research and higher education centre. The higher education complex that it configures would include: workshops for applied experimentation, teaching departments, student residences, and whatever else serves to integrate the scientific studies and residential functions of a scientific community. This would not only satisfy the need for a renewed manufacturing base in the field of conservation and

distribution of energy through the ideas and achievements of applied research, but it would also attract families, services and revenues with a beneficial knock-on effect on services and employment.

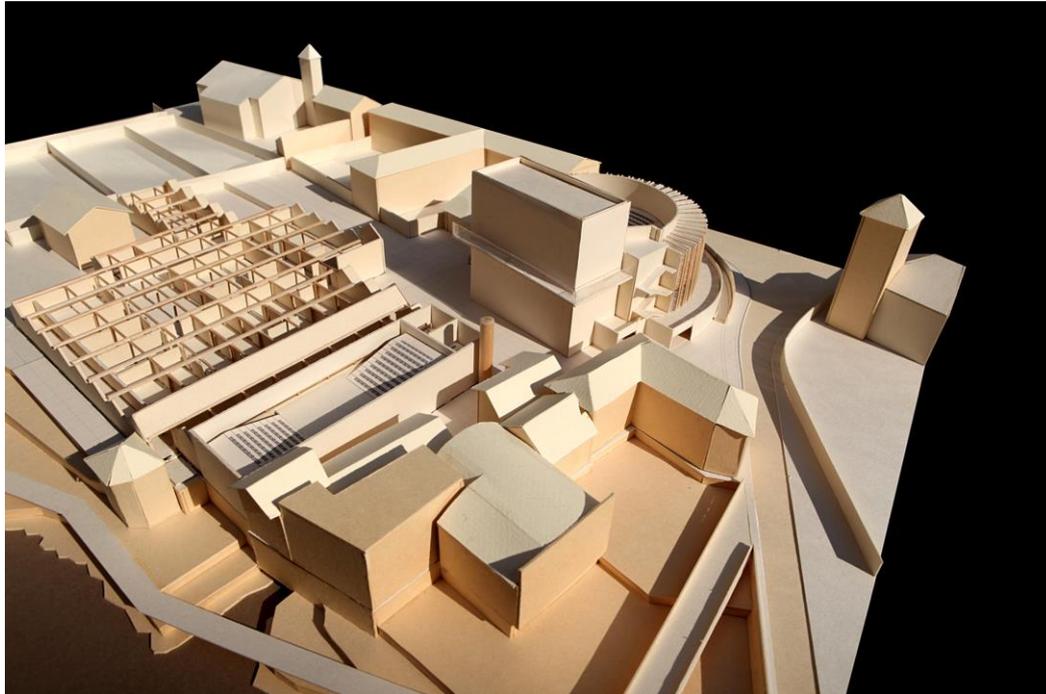


Figura 10

The Research Centre, with paths and connections aligned with the railway lines of the theorised dual gauge Borgosesia-Varallo-Alagna railway line, is connected by a pedestrian route to the new station. (In this respect, compare the issue of mobility as it has been addressed and proposed in this volume together with that devised by the engineer Gianni Grassi.) With specific assumptions dictated by the fifth scenario, namely the use of the railway as the backbone for the future uses of the city by the whole valley, it would also be possible to create an intermodal system and new car parks to replace the existing ones, with a view to sustainable mobility and new intermodal access serving the university and town. This philosophy underlies the design of the campus, which is integrated with the project for the new station. The New Station on the existing track bed, will become the link between the two parts of the town currently divided by the railway line, and connected by a new underpass at grade. An equipped cycle lane and pedestrian path will appropriately connect the two previous projects with a set of new upgraded areas in the zone around the stadium. The study of the open spaces has made it possible in this case to create internal connections and links with the old town, which make the new interventions legible as a single project. The conjectural new functional uses of abandoned buildings and brownfield sites assume the construction of new housing and commercial and cultural services in the intermediate area below the railway line.

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The rise of a city - Technological innovations for human well-being in the built environment in Bienne (CH) and Borgosesia (IT): "a quite honest confrontation"

Figura 1

Bienne (CH). Aerial View of the Station sites. To the south of the tracks, the urban redevelopment area "Gare / Lac". Former General Motors factory, now shopping center (2007) with a new higher technical education campus.

Figura 2

Borgosesia. (IT). Prospective view of the city center. Highlighted areas of intervention and the projects proposed by the graduates of the Faculty of Architecture of the Politecnico di Milano (2015).

Figura 3

Bienne (CH). Prospective view of the "Gare / Lac" area with highlighted projects already realized as part of the area recovery plan of the expected Higher Education Campus. [Extract from the city's magazine : "Update" (April 2016).]

Figura 4

Bienne (CH). Aerial view of the new Rolex factory. (Completed 2012). Together with the new industrial buildings realized in the new expansion zone "Les Champs de Boujean".

Figura 5

Borgosesia (IT). Views of the river Sesia from the bridge of Aranco. The river was strategic in the history of Valsesia for the energy provided to many factories placed along its banks. A new centrality is considered equally strategic for the future services and infrastructures envisaged in the research project: "City Sesia".

Figura 6

Borgosesia (IT). Chronotematic table related to the development of the textile industry in Valsesia (graduation 2011-2012). From mechanical driving force to turbine electric power drive, because of the many electric power stations located in the valley during the 19th and 20th centuries.

Figura 7

Borgosesia (IT), Project for the recovery and transformation of the area of the former Hospital of Borgosesia - Municipal Property (2015). Master degree project. A new Research Center as a detachment of university establishments. Energy Sector. In the picture the whole campus model.

Figura 8

Borgosesia (IT). New railway infrastructure and new interchange station, according to the strategic mobility guidelines. (Master's Degree, 2012-2013). Model and perspective views.

Figura 9

Borgosesia (IT). Synoptic picture and collage of the history of the Sesia Valley (Master's Degree 2010-2011). The valley analyzed according to the main themes: economy, art, religion, political dominance. Chronological location and mapping of facts and events.

Figura 10

Borgosesia (IT). New theatrical complex, with an adjacent music and philharmonic school. Project for the recovery of the area of the former textile factory Pettinaroli (1876 – destroyed in 2017). Photos of the Master's Degree Project Model (2013-2014).