



**Integrated Project on Interaction and Presence
in Urban Environments**

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Demonstrators of Urban Renewal applications
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Abstract

This document describes research done during the first 12 months of the project on how to support the collaborative envisioning and experiencing of change and development in an urban context.

This was done in several steps:

- Initial fieldwork was carried out at three sites – the psychiatric hospital Sainte-Anne in Paris, the urban renewal office of Vienna's 16th district, and VIBRA, a student project on connecting/rethinking Vienna-Bratislava – and the material was used for developing first scenarios of use for technology probes
- Conceptual development - based on urban planning expertise and initial fieldwork an initial set of concepts was developed that capture the complexity of urban renewal on a variety of levels
- The technology probes, which were developed as part of WP4 and WP5, were used in early field trials with users with the aim to test first concepts about technologies to be developed in support of 'collaborative envisioning' and experiencing
- Altogether three workshops with users were organized, each of which contributed to further conceptual and technological development, involving architect-users and researchers as reflective co-designers, evolving from early visions to more integrated scenarios and prototypes
- A set of scenarios, reflecting this research, envisions the use of IPCity technologies in month 30 of the project.

The research also contributed to clarifying the key challenges of conceptual and technological development for WP6:

- Exploring the notion of 'Mixed reality' - different ways of meshing real/virtual – and supporting users in switching between different MR configurations
- Collaboration support - how to support the ad-hoc creation of these 'MR configurations as an integral part of expressing and experiencing
- Immediacy – how to support users in generating 'content' in a fluid and informal way as part of the process
- Integration with common work practices of planners, such as creating scale models (of buildings), sketching and annotating, as well as negotiation
- Support of 'urban themes' – scale, temporality, borders and layers, fuzziness, ambience, and mobility.

Intended Audience

This document is intended to all partners of the project, the EC, and to the reviewers for the first project's phase.

1 Workpackage Objectives

Objectives Phase I	<p>The objectives of this phase were to carry out field work and application development to explore how to support the collaborative envisioning and experiencing of change and development in an urban context.</p>
Results Phase I	<p>Initial fieldwork was carried out at three sites – the psychiatric hospital Sainte-Anne in Paris, the urban renewal office of Vienna’s 16th district, and VIBRA, a student project on connecting/rethinking Vienna-Bratislava – and the material was used for developing first scenarios of use for technology probes.</p> <p>Conceptual development - based on urban planning expertise and initial fieldwork an initial set of concepts was developed that capture the complexity of urban renewal on a variety of levels.</p> <p>The technology probes, which were developed as part of WP4 and WP5, were used in early field trials with users with the aim to test first concepts about technologies to be developed in support of ‘collaborative envisioning’ and experiencing</p> <p>Altogether three workshops with users were organized, each of which contributed to further conceptual and technological development, involving architect-users and researchers as reflective co-designers, evolving from early visions to more integrated scenarios and prototypes.</p>
Evaluation Results Phase I	<p>In all three workshops users related to the technology probes in very positive and constructive ways and constructively collaborated in modifying features and defining new features. Major insights concerning 3D scenography, content creation (visual and sound), collaboration support and on how to support urban themes were gained.</p>
Objectives Phase II	<p>In the next phase we will further develop the demonstrators into prototypes and conduct more comprehensive field trials, also including citizens. A set of scenarios, envisions the use of IPCity technologies in month 30 of the project.</p>

2 Field Studies and Initial Concept

2.1 Field Studies - Introduction

Initial fieldwork was carried out at the three sites, using a variety of methods:

- As the research team at UMVL was already familiar with the situation in Sainte-Anne and had access to all the planning material and the responsible architect (Roueïda Ayache, Architecture Studio), a rich description of the situation and scenarios of use could be produced.
- The team of TUW participated in a series of meetings at the urban renewal office of Vienna's 16th district, in particular: several meetings of the urban renewal team with representatives from different local authorities and planners, a meeting of young architects, landscape planners, artists living/working close to Brunnenmarkt, and a stall owner, as well as a public presentation of the project to concerned citizens. Team members also accompanied planners on walks through the area, observing their interactions with inhabitants and recording their explanations.
- VIBRA is a project carried out by students of a Master Programme 'Urban strategies' at UniAK. The team of TUW participated in several feedback sessions of visiting architects who reviewed individual student projects as well as some of their lectures on urban planning strategies.

The fieldwork initiated cooperation with first users and helped us learn about their themes, visualizations strategies, and problems-

2.2 Sainte-Anne, Paris

The first experimentation area in France is Sainte-Anne hospital in Paris since the project in process on this area can receive inputs from IP City at its early stage. It is most probable that larger sites will be identified for further experimentations, at a more advanced stage for technologies.

2.2.1 History

Sainte-Anne hospital was built around 1650 in an area other facilities of this kind existed already (such as, for example, "La Santé", which is now a prison). The hospital was soon transformed into a farm where insane people came to work from a nearby hospital.

The creation of psychiatric hospital was decided by Napoleon III in 1863 in the location of Sainte-Anne farm (see *Figure 1*). It is called "clinical asylum" since it is intended to be a place for treatment, research and teaching about mental illness. Baron Haussmann is in charge of this urban operation. The asylum is inaugurated on the 1st January 1867 and the first patient admitted on the 1st May the same year. For a long time, mental illness was treated with the means of the epoch and research made important progress. This structure had also the role of protecting the patients from prejudice and mistrust of what is difficult to understand.

The asylum gets new services in 1892 (dental care and other free surgery consultation) in order to reduce the number of confined patients. A new building was built, very modern for the epoch.

Sainte-Anne hospital is always associated with innovation: in 1941, there is one of the first laboratories for electroencephalograms (EEG) in France, in 1947 a special sector is devoted to children mental illness and help for their families, in 1952 Sainte-Anne researchers fully participate to a great worldwide advance in therapies with the first neuroleptics and other important novelties in neurosurgery (included for pain treatment).

Finally, since 1970 psychiatric health care is organised in sectors: treatment structures get closer to population through external services, community clinics, post-cure hostels, day and night hospitals, week structures and therapeutic flats.

In Sainte-Anne a service of neurology is founded in 1974 and neuroradiology becomes an advanced sector, with innovative equipment. Sainte-Anne hospital is considered a model for developing parallel innovation in various fields.

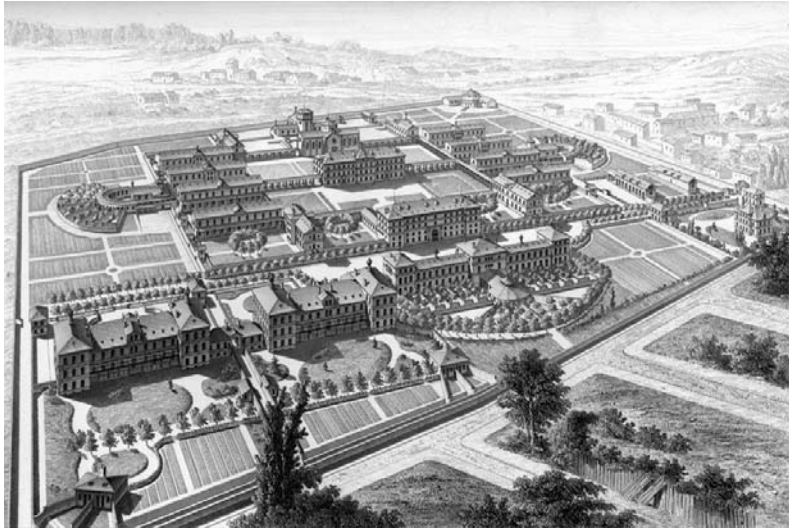


Figure 1: Original structure by Questel

2.2.2 The project

In 2004 Architecture Studio won the competition for an architectural and urban project to be finished in 2007. The program includes giving appropriate spaces for the Clinic for Mental Illness and Encephalon (CMME in French). It is composed of 3 hospitalization structures (with 63 beds in the whole): for food disorders, temper disorders and general psychiatry. A week structure, a consultation service, a quantitative psychopathology unit, a structure for expression and rooms for university teaching are also planned, as well as the Neurosciences Institute (where congresses should take place), the headquarters of the French Federation of Hospitals (FHF in French) and residential buildings.

The architects and urban planners in charge of the project are asked to deal with the following themes.

Sainte-Anne area should be integrated to the neighbourhood.

Like “La Santé” nearby, Sainte-Anne has always been separated from the rest of the town by a wall. Nowadays it is still present and high in some parts of the perimeter, while in some other there are just traces. Anyway, the area is perceived as an enclosed site and there is the wish to open it out to the town. However this idea can be problematic for what concerns the relationship between the patients and the exterior world, from which they are “protected” by the wall. The inhabitants of the area may also have some questions about how to deal with “different” people, with different degrees of mental illness or addiction.

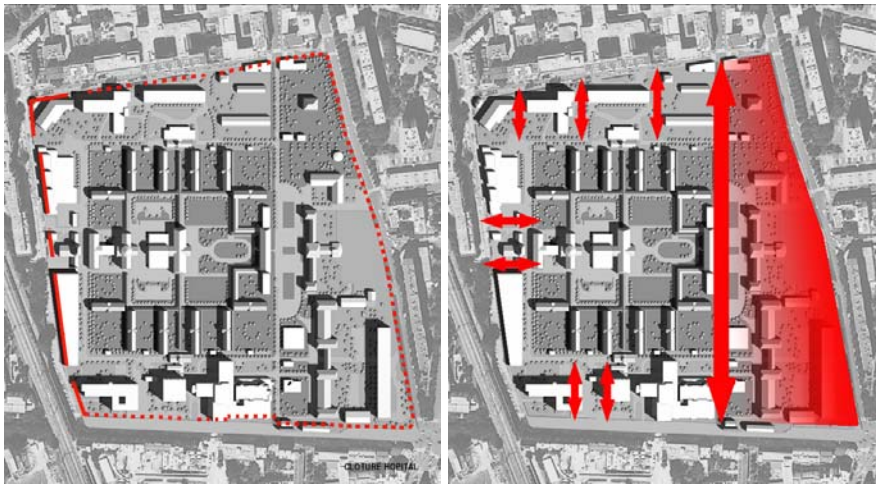


Figure 2: The site perimeter (wall and buildings) and the fringe (images by Architecture Studio)

Sainte-Anne Site is composed of a central square area (with another wall) and a fringe area, which is already in some kind of relationship with the town: the wall is not present everywhere, the are entrances to various buildings open with different degrees to different public (see *Figure 2*).

Wish to highlight the architectural and historical heritage.

The site of Sainte-Anne is organised around a geometrical structure of very high quality. The original buildings and the wall are listed as cultural heritage. Building and gardens have equal importance in the plan: the open spaces take a great place in the general perception. Some of them are already open to visitors (see *Figure 2*).

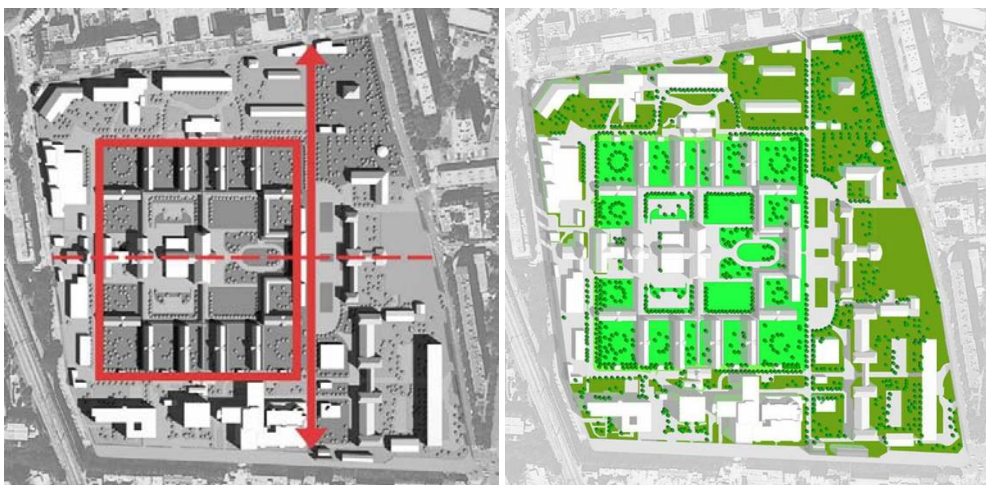


Figure 3: The composition structure of the site and the gardens (images by Architecture Studio)

The original medical pavilions are in the central square area; the central axe is composed of major equipment (the Rotunda, the Chapel and the Clock Building) and ends outside the square with a panoptical structure. The main axe crosses a perpendicular composition axe: the main entrance alley.

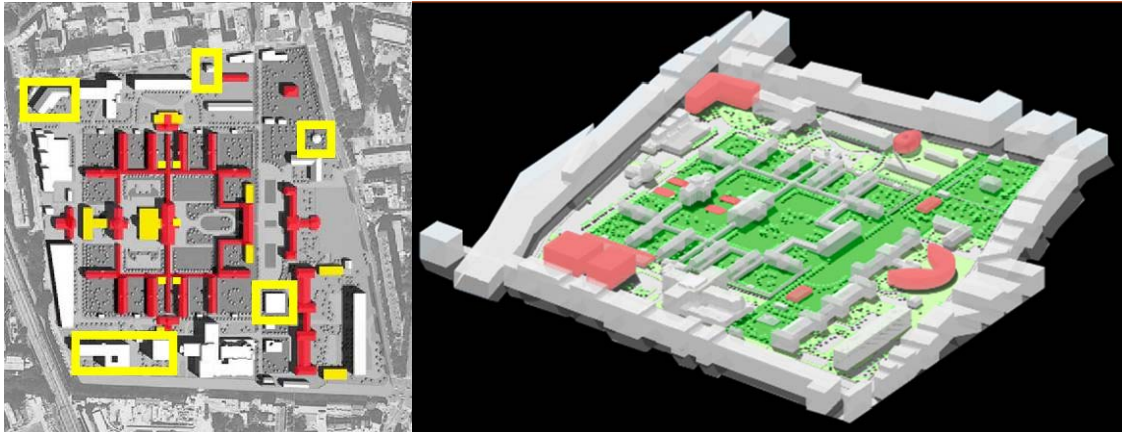


Figure 4: Left: Original buildings (red), demolitions (yellow); Right: Pink elements are to be built (Architecture Studio project)

In recent years (since the seventies) many new buildings have been added, essentially in the fringe area, in order to bring modern equipment into the hospital. These modern additions are of low architectural quality (for a map see *Figure 4*): the master plan expresses the intention of eliminating what “disturbs” the original structure, putting all the new elements together in the fringe area (see *Figure 5*).

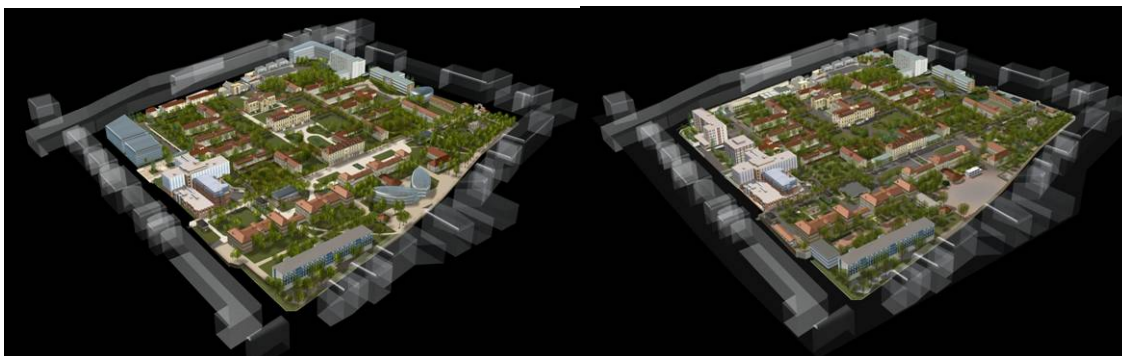


Figure 5: The project situation

The existing situation

Functional optimisation

The highlighting cultural heritage passes through a functional re-organisation, which is also necessary for efficiency reasons. Old buildings are not always suitable for modern uses and technologies, especially for the sophisticated equipment of hospitals. Moreover, regulation is getting stricter in various domains.

Therefore, it was necessary to plan new buildings corresponding to new needs and allowing to group activities in a more rational way. Moreover, in such a complex site, proximity logic has to be respected, especially for what concerns circulation issues. For example, activities connected to each other must be located in the same area and some of them need to have direct access to the exterior. Hospitals generally have 3 separated entrances: one for the emergency service, one for suppliers and one for pedestrian visitors (see *Figure 6*).

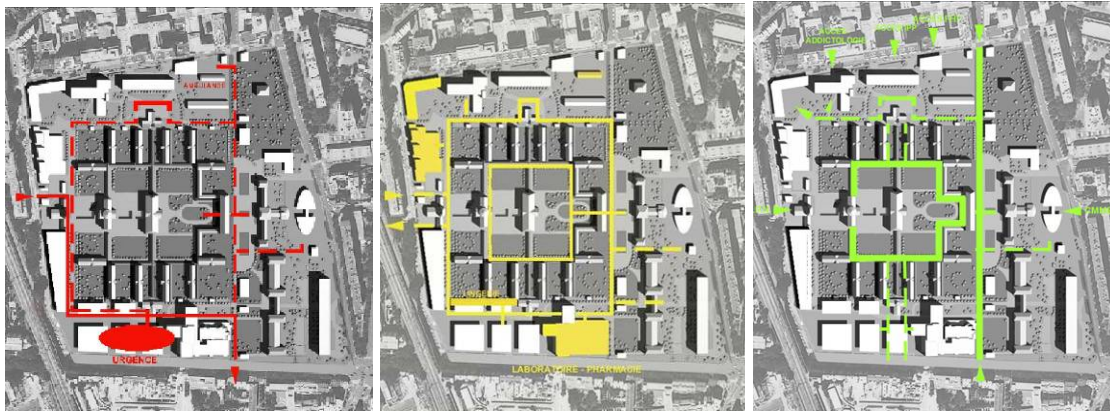


Figure 6: Access for ambulances (red), suppliers (yellow) and pedestrians (green)

Moreover, the project has to deal with different levels underground, since the whole area is built over an old quarry and over the Parisian catacombs. The Institute of Neurosciences site plays with these different levels: visitors will attend the historical buildings, part of the gardens, but also underground conference rooms and the museum of “art brut” showing the huge collection accumulated by Sainte-Anne about therapy through artistic creation (see *Figure 7*).



Figure 7: Different levels in the Institute of Neurosciences complex

2.2.3 Themes

Two themes give different possibilities in terms of experimentation in Sainte-Anne site: the wall and the axial “*parcours*” connecting major equipments. These themes are complementary since they tackle different themes.

The wall

As seen above, the Sainte-Anne site is organised by 2 walls: the external one and the one around the square in its centre. These walls have several functions:

- They separate different areas: in this sense they imprison but at the same time they protect. They protect the patients from the world outside, its dangers and its prejudices and they protect “normal people” from a delicate contact with “different people”.
- They structure the site and its neighbourhood. Especially the internal wall is a visible sign of the organisation in the square area in the centre of the area. The external wall shows a characteristic of this particular part of Paris, with big equipments (such as La Santé, but also other hospitals and convents) giving a particular texture to the urban situation (see *Figure 8*).



Figure 8: Wall and parcours

- Its materiality is a trace of architectural heritage. This is the reason why the wall is protected, as well as the buildings. The planners had to find a more complex solution than simply demolish it. Since it is considered a cultural element, it is not any more the symbol of shame and prison (see Figure 9).



Figure 9: The most imposing part of the external wall – present situation

The architects had to change their first proposal (replacing the wall with a gate) and find more complex solutions to keep the gate and give it a different value (with transparent openings, for example see Figure 11).



Figure 10: First proposition by Architecture Studio: the gate

Moreover the ground levels influence the perception. In particular in this part, the street level is lower than inside Sainte-Anne. The wall is therefore perceived as much higher (like a prison) from outside than it looks from inside. The gate solution allows to temper this effect.

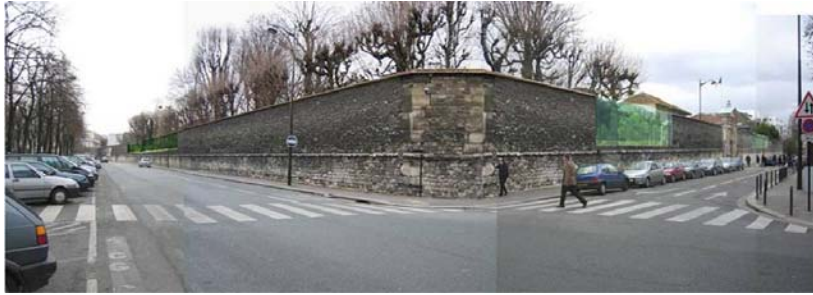


Figure 11: More recent proposition: keeping the wall in all its materiality but facilitating the dialogue inside-outside through openings for specific views

The treatment of the wall induces to deal with several themes. Closing or opening have to do with intimacy and exposure especially of patients, but in a sense also of the city and its inhabitants who are exposed to the delicate world of mental illness. Safety and security are issues that concern both categories of people: the “inside world” (patients, health care providers, administration staff...) and the “outside world” (neighbours, visitors...). This scenario is much about borders and limits: crossing them can mean invading (see *Figure 11*).

Moreover, the protected atmosphere inside Sainte-Anne largely depends on the wall, since it influences the soundscape: noises and sounds are very different from the two sides of the wall; they can be more or less aggressive. Exploring sensations will be a central issue in this scenario.

Another important question is scale, since all the equipments like Sainte-Anne break the rhythm of urban texture by bringing a different scale (more complex than an ordinary building but perceived as a unitary entity) and therefore give a strong specificity to this particular part of Paris.

Exploring the possibility of going around in order to perceive it all evokes the theme of mobility: in IP City experimentation, scouts could catch multimedia information (images, sounds...) all around the wall.

Technologies should help to simulate different solutions: removing the wall, creating partial openings, changing its opacity/transparency, introducing different materials (see *Figure 12*).



Figure 12: Mutating the wall

The “parcours”

The main stake of this scenario is opening to the city, since the main historical buildings will be part of the Institute of Neurosciences, which will organise scientific debate. How will conference participants approach and experience Sainte-Anne? (see map in *Figure 13*)

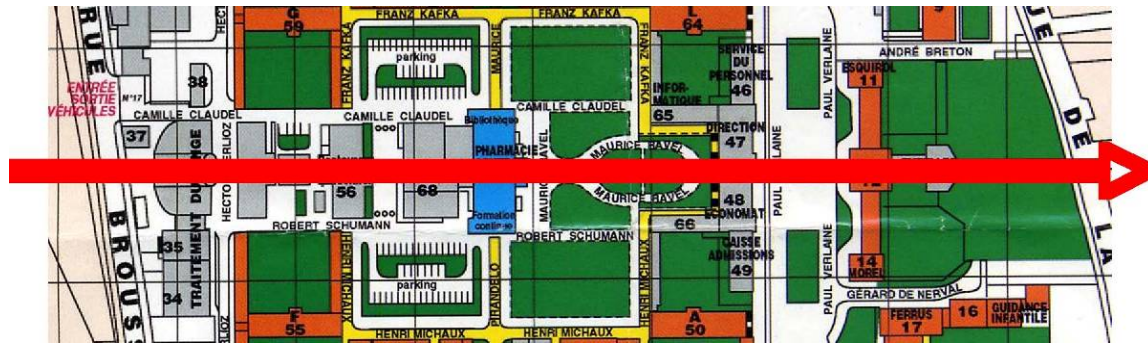


Figure 13: Parcours

The logic of imagining the flow of people coming to Sainte-Anne induce to reason by sequences:

1. Arriving with the metro or taxi: the first contact between the city and the hospital (see *Figure 14*). The entrance experience evokes the theme of borders again.



Figure 14: people queuing in front of an entrance

2. Walking in the gardens, meeting the patients: which areas are totally open? Where will there be interaction? How will mobility be organised? (see *Figure 15*)



Figure 15: impressions

3. Stepping down into the underground amphitheatre with its openings, moving on through the catacombs: a project on different levels, crossing different layers.
4. Visiting the museum with its collection of 'art brut': new kinds of visitors and interactions, not present at the moment (see *Figure 16*).

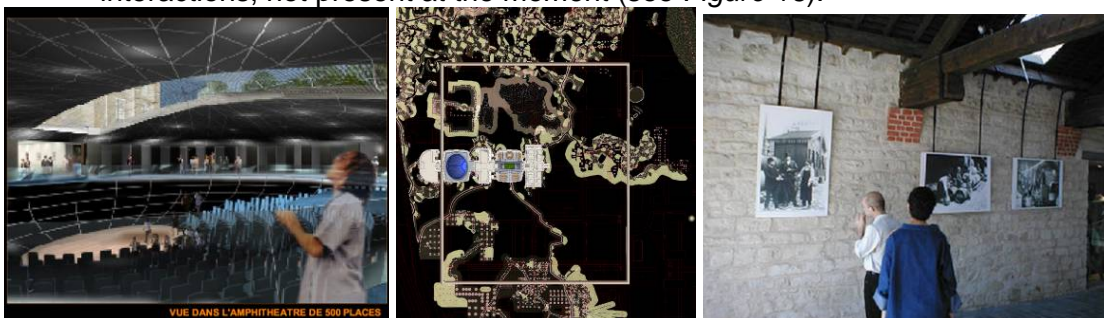


Figure 16: visions

5. (Restricted) access to the building with the (hardly visible) panoptical annex and to the new research and clinic structures: different kinds of visitors with different expectations and perceptions of the site.

2.3 Urban Renewal GB 16 in Vienna

2.3.1 The site

There are urban renewal offices in each of Vienna's 23 districts. Their task is to advise citizens in all matters concerning living in the district, to survey all renewal activities, including the planning of new buildings, and to initiate diverse activities to make the district more attractive to its inhabitants.

The 16th district - Ottakring - is one of Vienna's traditional working class districts. The social democratic city government built large social housing complexes in these districts, starting in the 1920s and 30s and continuing after WWII. During the last decades many immigrant families moved in while also many of the old inhabitants stayed.

The urban renewal team of GB 16 'Ottakring' in Vienna consists of a team of 12 people - architects, landscape architects, social workers. They understand themselves as a 'networking platform', mediating between architects, investors, citizens, and public authorities, initiating and moderating activities. At the core of their approach is citizen participation, using role play, interactive theatre, public installations, discussion groups, walk-throughs, art fairs, parties, etc.

Among their current projects are:

- *Social uses of semi-public spaces* - conflict management in social housing complexes, addressing issues such as how to convert semi-public spaces (e.g. courtyards) into social spaces that can be appropriated by the people living there and give space to the different social groups and interests; how to manage the typical conflicts - space for young people and the old, new and old tenants, dogs, garbage (see *Figure 17*).



Figure 17: Community housing

- *'Brunnenmarkt'* - upgrading and restructuring the street market, setting up a public installation and revitalizing on Yppenplatz, as well as several building projects
- Several large renewal projects, such as 'Kornhäusel unplugged' - planning an area around a historic building – and 'Radetzky Kaserne' - re-use of old barracks
- A series of renewal projects concerning old and decrepit building stock - 'Blocksanierung' (see map in *Figure 19*)
- *'Soho in Ottakring'* – an annual art festival, which this year has as its theme 'Construction site' (see *Figure 18*).



Figure 18: Soho in Ottakring



Figure 19: Brunnenmarkt today

Lots of activities in the Brunnenmarkt project focus on the re-design of the stalls, which has been developed by an external architect (from the district), based on discussions with different stakeholders. One starting point for redesign was the lack of transparency of the market structure. Today many of the stalls hide what is behind them – small shops, entrance doors – and they do not leave enough space for people to pass through. Some stalls are higher than others, covering the view onto another stall behind but, as the stall owner says: “It has been that way since thirty years and why should I cut it down?”

The new market should be transparent and dynamic. The old stall characteristic should be maintained and the regulations only apply to new stalls. The formation of ‘train structures’ should be prevented (see Figure 20).

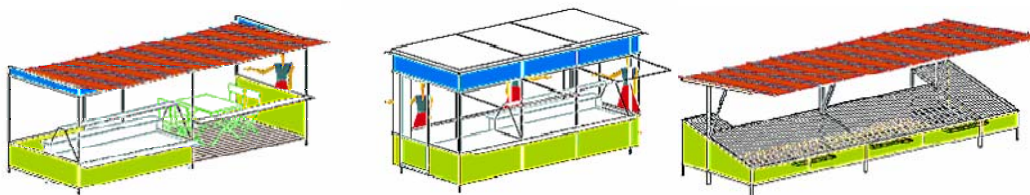


Figure 20: The new designs

The new design includes a permanent roof which should be adjustable to weather conditions. Nine meters out of twelve can be closed; in the case of grocery stores only seven (at present the stalls have a closed length between four and twenty meters). All four sides should be transparent with a maximum height of 2,65m (excluding the insulation shell that will be dependent on the type of stall) and a maximum depth of 2,20m. The shop window will be colour coded.

The architect has produced a series of simple drawings with measurements which seem difficult to read and understand. Even members of the urban renewal team mention: "I don't understand this at all", which is countered by: "Not everyone building their own house understands the building regulations". The architect also provided some simple visualizations of the types of stalls. People were immediately worried that one type of stall would be enforced and there is a discussion about individualized stall design and the need of a concept for it. The current standards require an adjustable stall where the roof can be opened up or closed for heating, with glass insulation of the walls for transparency. A cost evaluation will be needed which includes all the side costs and insurance.

There is space for sculptures at the market and it appears that a sponsor for trees has been found. But there are unforeseen constraints in the form of the recently set electricity cables which will not allow for trees to be planted. The architect's idea is to use glowing plastic palm trees – a suggestion that is strongly opposed by the lead architect.

Other issues are how to deal with temporary uses of space by stall owners, and even more importantly, the need for storage space. The current practice involves paying for the use of the space in front of the stalls. Although this is illegal, it is tolerated. A part of the pedestrian zone is used by twenty-four hour stalls; in practice component parts of these stalls, such as foulards, are left lying on street rather than being completely removed. This solution is not satisfactory since bad weather conditions mean paying for space which cannot be used and sales dropping anyhow because people don't visit the market.

There is also a lack of nearby stacking ground and some stall owners would want the city to restore and redesign the ground floor zones as stacking ground and rent it out at low prices. One of the stall owners participating in a discussion with the architects mentions that he has three stacking rooms two of which are joined to make a one hundred and sixty square meter space. A cold store is necessary for fruits and vegetables, depending on the stacking technique a space of fifty to sixty square meters is required and large quantities of goods have to be purchased in advance. The most important thing is that the storing room is next to the shop because they save their money on staff and if there are only one or two people it is not possible to leave the shop for a longer stretch of time (things may be stolen and customers are left unattended). The best would be to have everything beneath the earth.

Survival of stall owners – financing

A big question is the financial situation of the stall owners. The average income of the small stall owners within the three to four winter months ranges between 30 to 40 euros per day. In fact, some people on the urban renewal team express their being surprised how confident and happy these people are although they have so little to live on. Pre-financing the stalls would require an investment of around seventy three thousand euros. So, who can afford to pay back the debts? Is there support for the people to cover the losses they incur during the construction phase, and to enable them to cope with the financial burden of the renewal program? Stall owners are affected twice because of the time it takes to complete the infrastructure and the reconstruction above ground.

Some stall owners are extremely worried about their future, and whether they will be able to survive market renewal under these conditions. Especially critical is how to support people that only possess one stall on which their entire income is based and cannot afford to lose profits during construction. Some of the big stall owners (who have stalls in different areas of the city) have partially already found alternative locations or can afford to temporarily give up some stalls.

These questions deeply affect the success of the Brunnenmarkt project. If a few of the stall owners can afford to invest in new stalls while others can't, this may make look the old stalls less attractive. It needs one person to make the change for others to see and evaluate the changes, so that they can calculate the costs and benefits. Upgrading Brunnenmarkt will most likely mean that some stall owners will not be able to survive due to their financial situation.

Financial support is necessary if a chance should be given to everyone. The chamber of commerce will support infrastructural development and set incentives for educational training courses. But there is no commitment on the side of community organizations to support stall owners during the reconstruction phase, or to provide them with affordable loans for the necessary investments.

To date also responsibilities for negotiating with future investors in the area have not been clarified. There are a number of empty places and there is an interest to fill them with small eating places. On the other hand also stall owners may want to make use of the space. Many questions concerning the organization of the future market place are still open.

The market area

What is the future vision of the market that will attract new customers? It seems necessary to rethink the allocation of space to stall types to regulate the growth of the market and maintain the diversity of goods/products offered. There is an argument about too many cloths stores taking over, making the grocery stores less attractive. Large families are attracted by the low prices of supermarkets; the expansion of 'Hofer' (a supermarket chain) and Turkish stores is a disturbing side effect for the market. Should it be delicacy stores that attract weekend customers? Regional planning has failed to take responsibility for the development of the market because of political interests (see *Figure 21*).

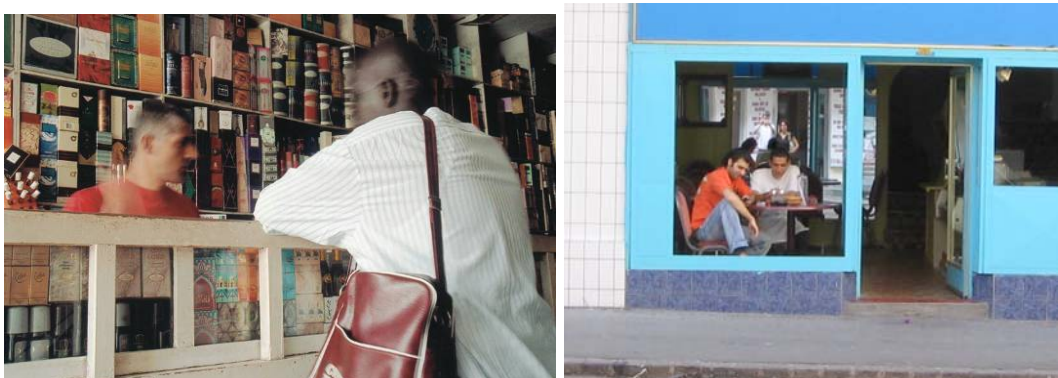


Figure 21: Attractive stores and places

Another problem is the lack of buyer groups that are needed to support the change in array of goods. Market customers are primarily immigrants. Due to the lack of transparency it takes an average of fifty market visits until a change in the array of goods is noticed, in the mean time the stall owner has suffered short time losses and will not keep offering the new non-durable goods.

There are three types of customers: 'Stammpublikum' – steady clients that will come to purchase goods independent of weather conditions; 'Gelegenheitspublikum' – occasional clients that come because they have other things to do in that area or have discovered they need something; 'Schönwetterpublikum' – fine weather clients that come for leisure on a sunny day. Mostly people come because of the salesperson they like.

Advertisement may help to attract new customers, in particular young people. There have been examples such as the 'Frischmarkt' advertisement, but it was not followed up and did not have the intended effects. Maybe Brunnenmarkt has to find a new image with which to advertise. For example, there is old baroque housing substance in the Grundsteingasse.

Effort should be made to include descriptions of the market in travel guides, to turn it into a tourist attraction.

One way of making the quarter more attractive for a day and nightlife cycle would be to increase the gastronomic offer. A biological restaurant has just opened at nearby Yppenplatz. The delicacy store 'Staud' could be used as positive identification for the market using the slogan 'living together and shopping together' ('Gemeinsam Leben, gemeinsam Einkaufen') to advertise for the market. There is a lot of invisible advertising, how to gain more presence. The events the urban renewal office is organizing, including 'Soho in Ottakring', with its strong emphasis on citizen participation, has already had some positive effects. But is still unthinkable for people to imagine nightlife in the district (see *Figure 22*).

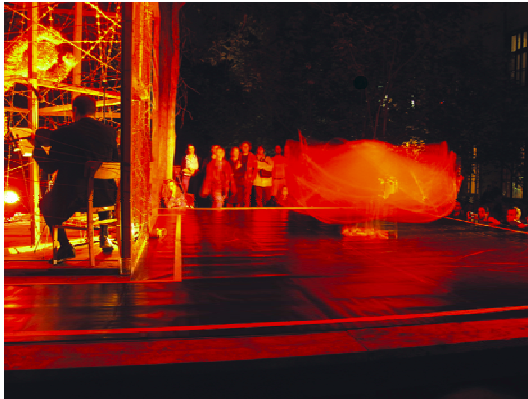


Figure 22: Bringing nightlife to Brunnenmarkt

Another strategy would be to combine the market with other attractions, so that it becomes attractive to combine the visiting of the market with other events, such as meeting friends. This includes designing for different seasons and decreasing the market's dependency on weather conditions. Ideas are to organize another 'Christkindlmarkt' as an alternative during winter time with a place for ice-skating – "Brunnenmarkt with ice-rink and sand dunes as city islands". The question again is if there will be a sufficient number of young potential buyers to be attracted to the market and how their purchase pattern can be changed. To promote the market as lifestyle and to play with the image of the 'flaneur' to attract new people that are prepared to spend more time travelling to the market.

One important pre-condition for all these changes (that is currently precluded by rigid regulations) are more flexible opening hours for the market area. Today most customers come between 10 am and 1pm and towards the afternoon there are less sales to be made. Eating places need to be open longer hours and may change the usage patterns of the area.

One project that has already been planned is to create new vistas on Brunnenmarkt – a "dynamic panorama". 'Luftfahrt Brunnenmarkt' is a platform resting on two industrial containers that will be installed during the summer. The concept is to introduce a meeting space for visitors and people around the area. It should also allow for a new dynamic panorama of the Brunnenmarkt. There will be a seating arrangement on the platform that alludes to the relationship between Vienna and Bratislava by introducing the order of tram seating in Bratislava. During the opening times drinks will be served in the containers below.



Figure 23: Creating new vistas

The project 'Space Lab' is based on a similar structure, but should attract young people from the region to gather in and around the space where there will be film projections in the evening. The plan is to realize the construction with the opening of the pedestrian zone in the summer, but this is not certain because there may either be delays in the finishing of the first construction phase or otherwise the second construction phase may have commenced. A lot of practical and financial questions are still open. A gastronomic consent is needed to use the infrastructures such as electricity and to offer small refreshments such as soft drinks. A person will have to be employed who regulates the opening times and the access to the platform (see *Figure 23*).

The 'Piazza' (Yppenplatz)

There are big plans for nearby Yppenplatz. New apartments will be created and there is the idea to fill empty ground floors with eating places with outdoor gardens, making the whole area attractive for young people.

Designing for small eating places with outdoor spaces is a challenge, since to date there is insufficient infrastructure for water supply and disposal/recycling of garbage for restaurants. Apart from this, the available spaces are not deep enough to make it attractive for gastronomy except during summer seasons in which the 'Schanigärten' are open and compensate for the missing space. Another possibility is joining two to three units, thereby increasing the depth.

Another ambitious project is to cover parts of the area with a light roof. Underneath Yppenplatz there is a 'bunker' with two shaft entrances from the park. 15 years ago the bunker was made accessible to the public for visiting and an artist made a film about the people that used it as an air-raid-shelter. Now there is discussion of how to integrate these underground spaces (see *Figure 24*).

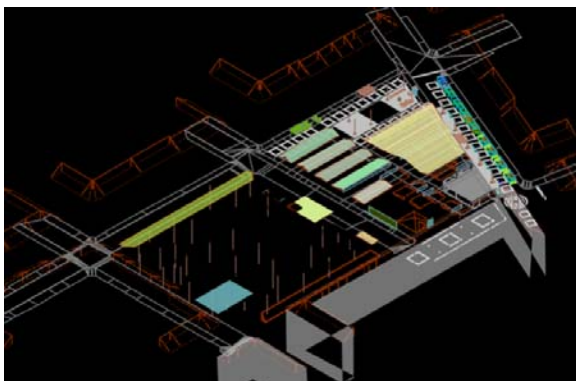


Figure 24: Redesigning Yppenplatz

A rather sensitive issue is the opening hours. Up to now this was market area and open until 6 pm and the idea is to extend this to 10 pm. Again, people find it difficult to imagine Yppenplatz with lots of activity and eventually night life.

There is only one public toilet at the Yppenplatz. People have always asked for more to be installed but none of the stores were willing to have it placed next to them for hygienic reasons. At present everyone in need uses the coffee houses close by and there is still no solution planned for. It has been discussed to redesign the apartment blocks so as to provide public toilets. Investors are relying on the fact that the district will have strong interests in investment into the area and that there will also be people with strong objections against the changes the improvements will involve. Information is needed on the conflicting interests of stakeholders (see *Figure 25*).

It is important to show the development of the area in small continuous steps, otherwise people won't see the positive effects of the building sites and just see themselves driven away from their customary market location/situation – “a piazza with the roll bars down is not a good signal”.



Figure 25: Yppenplatz

The construction phase

In the first building phase the infrastructure beneath the earth has to be installed. The position of the surface outlets to some extent also defines the position of the stalls. The planning of the electricity and water outlets which is conducted by the MA34, consumes a lot of money. To avoid later extensions of the outlets requires a precise positioning of the future market stalls. The second building phase involves the surface construction of the place ('Oberflächengestaltung' – see *Figure 26*).



Figure 26: Construction work

The construction activities already show numerous repercussions. Some of the stalls that had to be relocated temporarily are cut-off and isolated. The whole location has become less attractive. Currently, there is insufficient space for market growth and access to the market is restricted. It is better to create a higher density in a place rather than to spread out the market risking the isolation of the market centre due to increasing distances between the different parts.

Traffic

The parking lots have been in conflict with the permanent stalls; therefore the market area has been converted into a pedestrian zone ('Durchgangszone'). Additional pedestrian zones are being implemented. The bicycle paths in the Brunnen quarter have to be rethought and traced.

2.4 The VIBRA project

This year's project of the 'Urban strategies' Master Program at UniAK deals with how to rethink the 60 km strip between Vienna and Bratislava. Students work on their own individual projects, collecting materials and producing visualizations of their ideas in different media. In the main meeting room is a wooden relief model of the area (see Figure 27).



Figure 27: The model

2.4.1 Themes

Planning for such a huge area touches upon a series of complex issues (see Figure 28). We report here on some of the student projects and the feedback they received from visiting architects Tom Mayne and Jeffrey Kippnis, as well as Wolf Prix, the head of the programme.

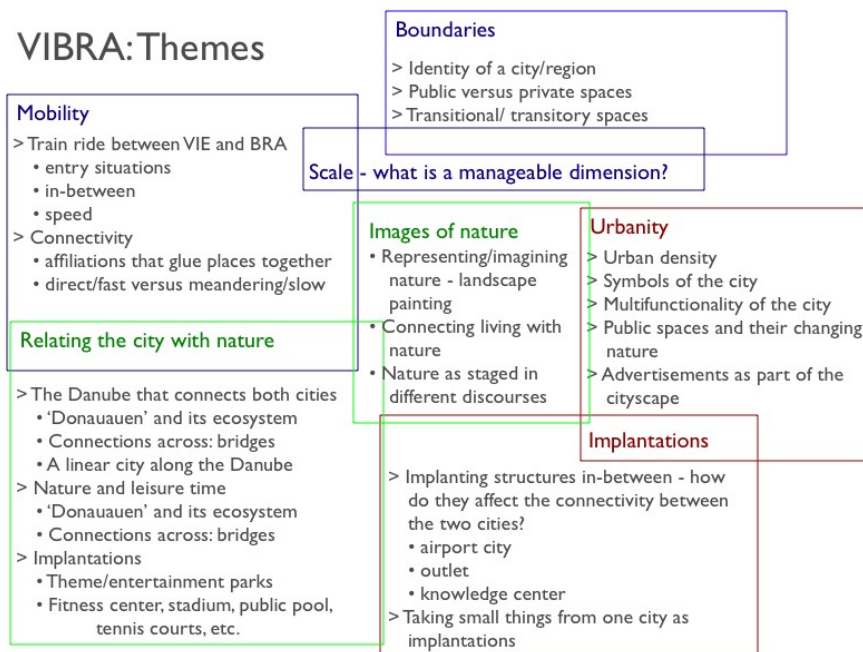


Figure 28: VIBRA Themes

Boundaries

One of the initiating points of debate is if to create a new European capital – Europola (Europa/Metropola) - located in the geographical center of Europe, intersecting the border of the former 'iron curtain'; one city representing the other EU member countries, with 6.5 million inhabitants from 25 Nations, finding a multicultural identity for Europe. The idea is that

as borders fall people will not seek their identity in relation to their country of birth but connect themselves to the notion of being European. Hence the importance of developing a sense of what it is to be European.

Given the fact that it took more than 50 years for Brasilia to start functioning like a normal city, this seems a risky approach. It begs questions such as: Is there a cultural background to define a European identity? What is the role of cities in shaping people's identity? What will people bring with them to this city? How can a new system co-exist and work with an existing old system?

This European capital may be envisioned as a new high-density node, a third independent element to catalyze the connections between Vienna and Bratislava. What are the systems defining this city, given that there is no singular political authority, not one single strategy but multiple perspectives that need to be negotiated? Actually, a city's boundaries are not fixed but change depending on what type of structures you are looking at.

VIBRA as the reconstitution of boundaries, re-aligning connections, actually 'blurring' them. One way of visualizing boundaries are the 'hay ball structures' marking the transport connections between Vienna and Bratislava. How much of the space in-between the two cities is free for new concepts of urban development (see *Figure 29*)?

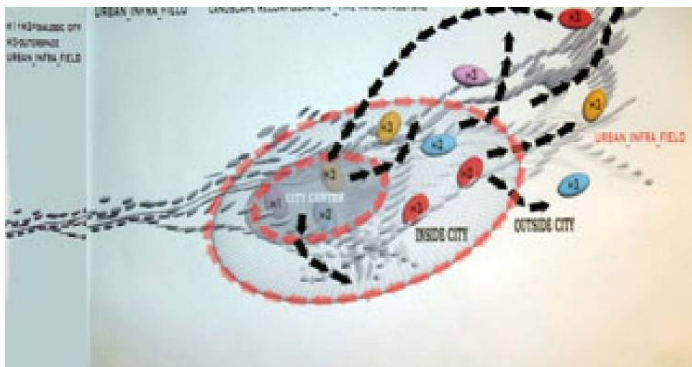


Figure 29: Hay ball structures

Other techniques are mapping boundaries for EU bird immigration in relation to ecological constraints or mapping the city in terms of the intensity of cellular activity (see *Figure 30*).

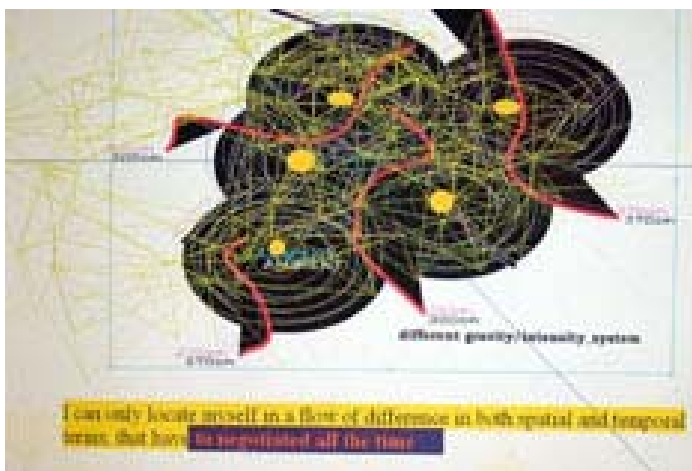


Figure 30: Intensity patterns

Urban biotope structures (see *Figure 31*) represent the habitual patterns that people display around boundaries and within certain territories. Students discussed the notion of buffer zones or transitory spaces in-between the local and the global (European).

One particular project is about creating a knowledge center (see *Figure 32*) as a connection between the two cities, the connecting element being environmental issues or music. They think to build on already existing resources, such as the national park at lake Neusiedel and nearby research centers. The idea is to attract people from all over the world to come, study, and do research. The research institutions between Vienna and Bratislava could grow into synapses for connecting the cities and relating them to others. They could provide an identity for the region.



Figure 32: Knowledge centres

Another project has looked at the network of European airports and suggests to introduce a new, artificial VIBRA city somewhere in-between the Vienna and Bratislava airports as a catalyst in the area. This should be a new zone, an airport city, a cross border region and living work environment (see *Figure 33*). The airport city also as a shopping centre and a city for the new nomads, with spaces arranged in time-use categories - one to twenty-four hours, three days, three weeks and permanently resident. "There is no need to leave the airport!"; the 'crystal' as excluding the areas in-between (Sloterdijk). A city that excludes all other cities, the American dream. They don't want to leave their city!"



Figure 33: Airport city

This also raises the question of boundaries, for example between public and private spaces. Where does an airport begin and end? Different types of public spaces can be defined on the spectrum from controlled privatization to socially centred spaces (collective places and virtual public spaces). This corresponds to a network of scales - global (virtual hub), territorial (urban attractor), regional (airport network system). With the airport as a typical non-place (non lieu, Auger) the notion of local is difficult to capture.

A third approach focuses on the notion of outlet as a catalyst for regional development. At present, two such outlets exist in the area. Parndorf is located between forty-five and sixty minutes travelling time from all surrounding cities. It is close to ecological attractions, such as Neusiedlersee, its being cheaper is just an excuse for an outing. Ground floors are used for shopping and the upper floors serve representational purposes. Among the outlet strategies is to select a location so that political borders get stretched; in a place with an attractive

typology, e.g. connected to leisure (inviting Saturday family outing); and to cater for a selected audience that has access to a car (“shopping moves people at first instance”). The Parndorf outlet has one point six million visitors a year. It acts as a catalyzing cluster, with tertiary structures developing for tourism in the region. Cheap land and vicinity to the outlet make it an interesting location for factories. New housing for employees has to be built (and financed).

The notion of outlet is again connected to issues of public and private spaces. An outlet is not a public space in the sense of a traditional market. An interesting example is Las Vegas which uses the method of disorientation to make profit (“Giving yourself up to the institution to some point”, “You don’t know where you are and what you are doing”).

Mobility

Vienna and Bratislava are connected by train. One student describes his ride on the train as “you start in no man’s land at both ends and there is emptiness in between”. He introduces the notion of ‘cuts’ – discontinuities - in the landscape. Leaving Vienna you travel through desolate suburbs and you enter Bratislava through a tunnel, with the fast trains ending outside the center.

This made him think about the quality of the connection between the two cities. Unlike Marseille and Algiers, which seem deeply connected although separated by the sea, Vienna and Bratislava almost touch each other but ignore each other. Is it possible to rethink the railway station on both sides? If the train does not stop, then the energy will not be spilled to the outside, so the fast direct connections often do not support the development of the space in-between.

Another topic is speed. It makes a difference if the train takes 12 minutes (like the super speed train in Shanghai) or 40 minutes (as the current VIBRA train connection). Having such a super fast connection gives meaning to keeping the space in-between purposively empty. An example is the high speed motor rail in LA where two stops in the middle (connecting to a hotel and a cultural center) were introduced later.

2.5 How to represent an urban situation

The IP City project aims to address issues of the city, but urban situations are complex systems to understand and represent.

Some elements of this complexity deal with the fact that:

- the same site involves different **scales** of a territory;
- urban situations are in permanent evolution and it is difficult to observe and monitor the **uses** that take place;
- A diversity of parameters and **expertises** appear in urban situations (Bonnet 2005).

We propose to analyze urban situations in a dialectic way between action and interaction (see *Figure 34*). If we consider an urban situation as a scene for the action, the people operating in it are those who intervene directly in urban renewal, large scale events, the history of the city, i.e. the contexts in which the IP City showcases will be developed.

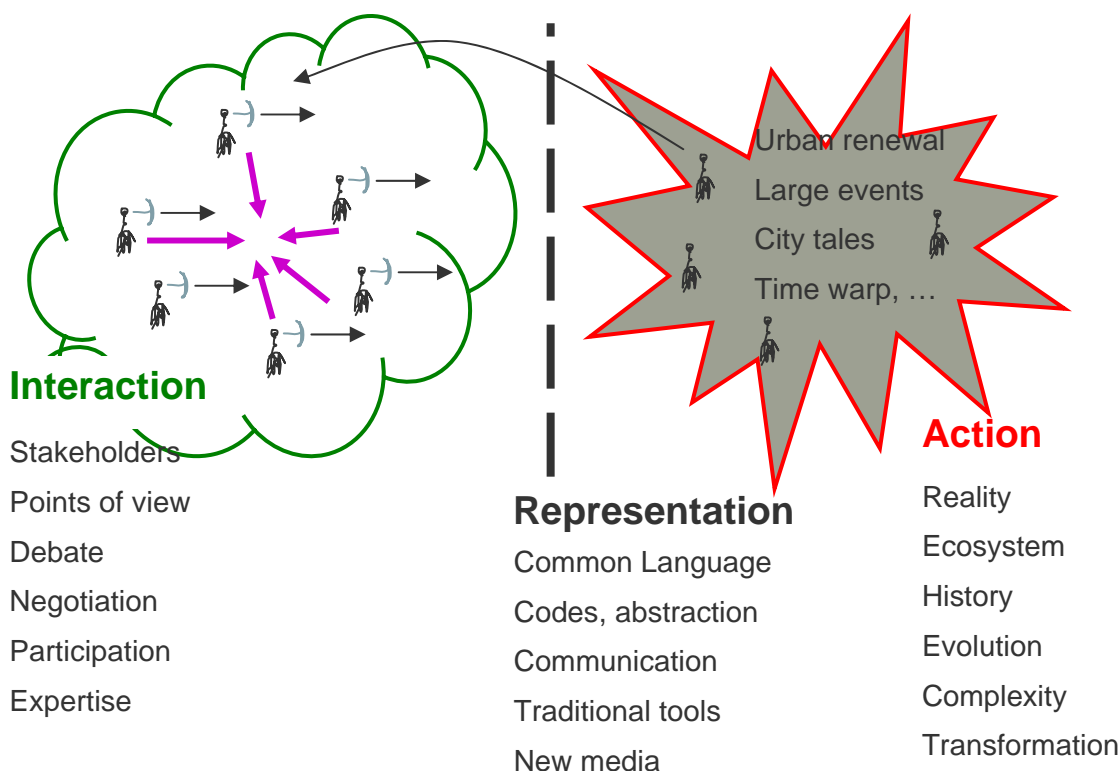


Figure 34: Between action and interaction

The interaction circle is where decisions are taken in order to implement the action: stakeholders, who are sometimes directly involved in the action, express different points of view, each one reflecting the professional culture and the interest of the entities involved in the debate and the negotiation. Sometimes experts are called to provide technical information for decision making. Inhabitants' participation, although difficult to organize, is more and more necessary to implement efficient projects responding to collective expectations.

The link between the action and the interaction scene is a question of representation of urban situations. A common language is needed for the different stakeholders to be able to communicate. Some tools have been developed especially by architects and urban planners through abstraction and codification, but the traditional tools are not always easy to understand for non-initiated people. They certainly respond efficiently to specific demands, but do not always allow all the stakeholders involved to be at the same level of information.

Moreover, they don't address all the themes that a complex urban situation needs to be dealt with.

For example, concerning the uses of spaces, depending on the expertise, different aspects will be pointed out, but a complex and complete representation is difficult to obtain. In fact, ethnologists are very efficient in observing and describing how a site "works", but they have difficulties to represent these issues visually in space, while planners and architects, who are used to graphical representation, often produce seducing images, which do not always correspond to scientific content (since the purpose is mainly commercial, to convince developers).

Seven themes appear to put in evidence critical areas in representation of urban situations. They correspond to sensible topics for contemporary urban development technology development need to take into consideration.

2.5.1 Scale

Considering that the impact of an urban situation concerns different scales of a territory, it is necessary to select the pertinent information about the question asked.

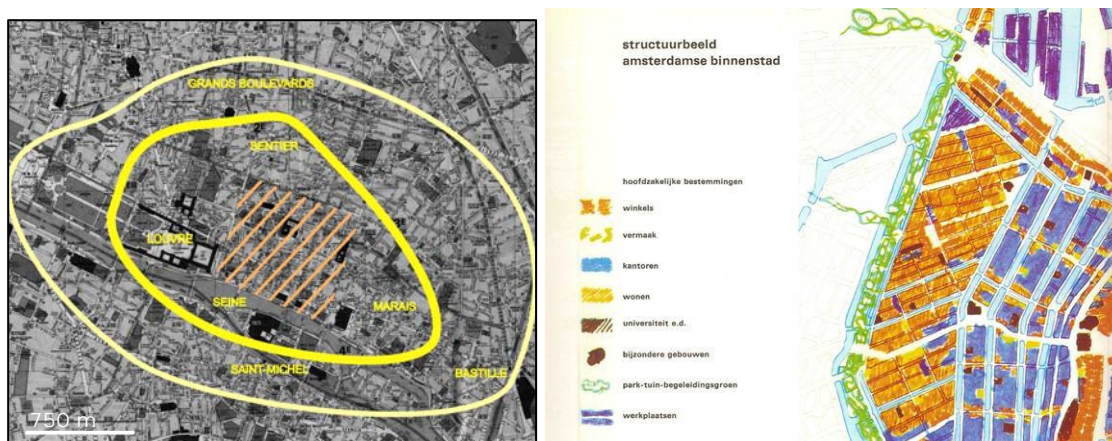


Figure 35: Les Halles, Paris, France (left), Amsterdamse binnenstad, the Netherlands (right)

Specific codifications are developed for technical representation in order to point out the elements which are appropriate for different scales: the impact of the urban situation in the strategy at the territorial, town, neighbourhood scale, the architectural stakes, from the building to the detail element (see *Figure 35*). However, these coded representations are sometimes difficult to read: it is not always at anybody's level and the interpretation is not immediate (a legend is needed; Loupiac 2005).

The representation tools must allow to zoom in, but the interaction process requires also to be able to move from one scale to another, in a discontinuous way. In fact, in debates and negotiations, general strategies often have implications upon concrete questions and detail aspects.

Moreover, the coded representation of an element at a certain scale calls in references to complex realities and its perception. A simple sketch may express implicit, but precise references common to most people (see *Figure 36*).

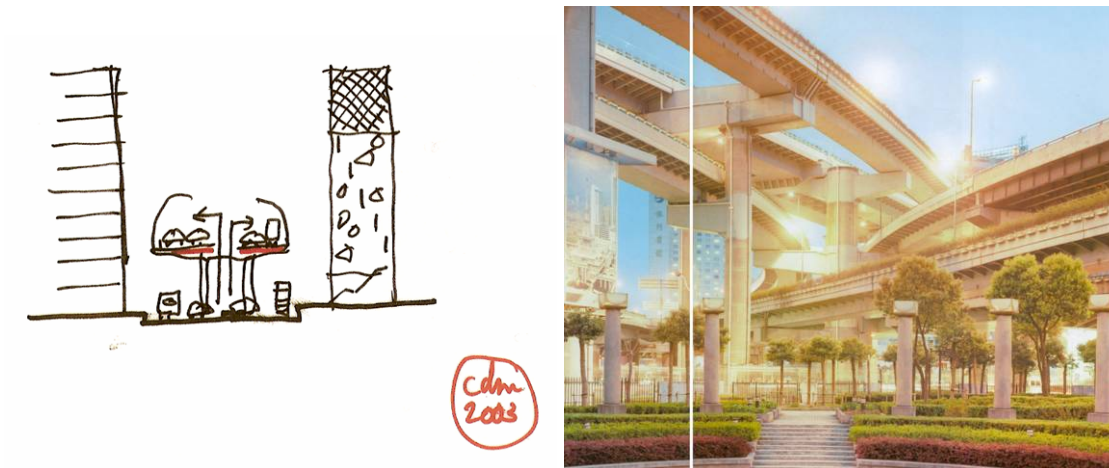


Figure 36: Representing scale

2.5.2 Temporality

Several aspects concern Urban Temporalities:

- Traces and memory
- Urban rhythms
- Evolution of a site over time
- Life cycles, transformation and sustainability
- Short – long term vision for stakeholders
- Time management.

An urban renewal project is a process with short term and long term issues, milestones depending upon very demanding agendas: political, economical, social, technical. The general agenda of a project results from the elusive crossing among the temporalities of the various stakeholders during negotiation, debate and decision making. Very specific stakes bring people together around the project and these are strategic in the process. Stakeholders have different visions: short – long term, political election, administrative deadlines, market performance, strategies and activities, rhythms of use, and so forth (Desmarais and Lamizet 2004).

Let us look at some examples: Urban projects often deal with memory. Urban sites keep traces of this process through archaeological elements, tracks, persistent uses (see *Figure 37*).

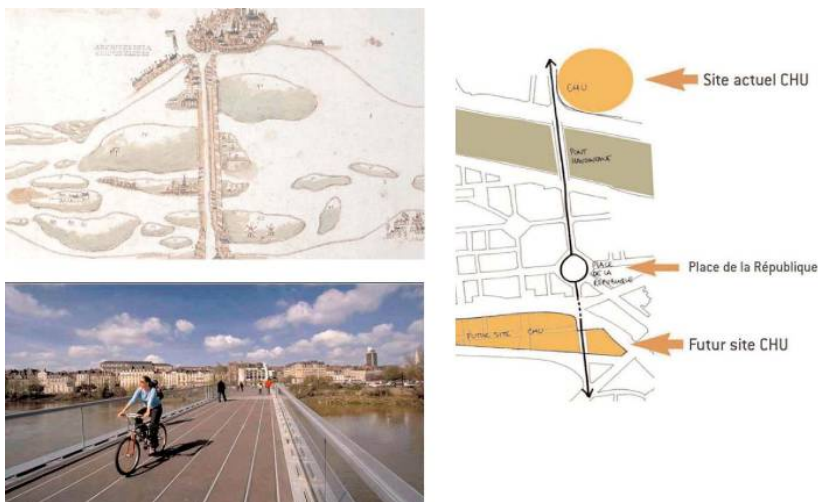


Figure 37: L'île de Nantes, France - Crossing the river and memory

It may be important to preserve buildings or features that stand for the identity of a place, as is shown in this image of a big crane which dominates an old harbour (see *Figure 38*).



Figure 38: Political and symbolic time

This has also to do with sustainable development, taking in charge the capacity of evolution, the transformation in the long term. The project needs to be adaptable, maintenance issues need to be integrated in the early discussions. Therefore the representation tools should allow to express this dimension.

Moreover, this depends also on the stakeholders' agenda, which have implications for the short or long term vision upon the urban situation. In fact, each stakeholder has different constraints: the politicians are influenced by election periods which often do not correspond to the administrative agenda, developers and business people are concerned by short term results, etc. For example, the image below reflects a debate about whether to preserve an 'urban window' (see *Figure 39*).

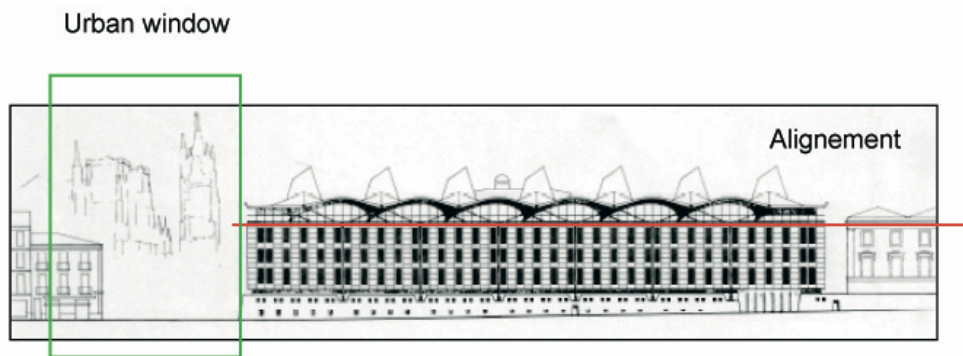


Figure 22. Façade Ouest Cours d'Albret (la cathédrale en arrière plan)

Figure 39: Evaluation of a new project

Another temporal aspect of relevance for urban projects is urban rhythms: urban situations change according to the time of the day (day and night life), the day of the week (office areas are busier in working days than during week-ends), the season of the year (indoor or outdoor), etc. (Bondue 2004) – see *Figure 40*.



Figure 40: Urban rhythms: Postcards of Montréal, Canada (Zardini 2005, p. 98 and 99)

2.5.3 Borders

In urban situations, the heart of negotiations often concerns borders, depending on uses and stakeholders' competences. Borderlines are the interfaces between different status, they can make conflicts emerge. In borderline areas, rules are ambiguous: they need to be defined in order to perform action. However, these areas are also the ones where flexibility is allowed, where innovative practices can emerge.

The borders sometimes exist from a legal point of view. In other cases they concern the uses. One of the main stakes in urban interaction is to represent what is public and what is private, what is collective and what is individual (see Figure 41). Sometimes this distinction is not clear, the uses and the competences are hybrid.

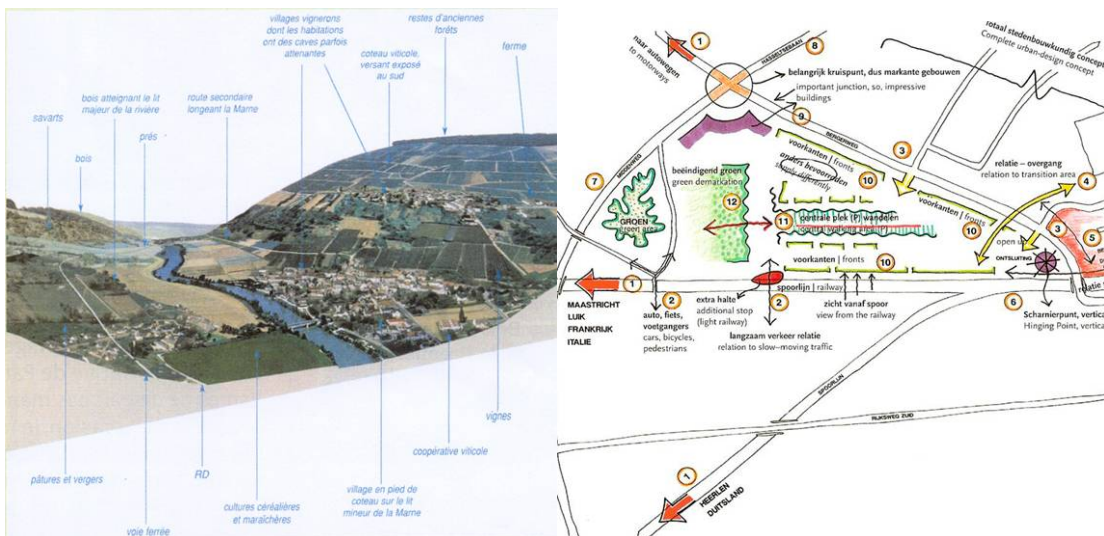


Figure 41: Borders of different consistence

It would be very useful to have tools making the borders visible on site and not only on maps in order to comprehend the complexity of the urban situation in a more immediate way: the contribution of mixed reality could go in the sense of a real scale vision, both at a global scale and giving precise information on subtle questions as the borders (image on the left).

As a matter of fact, depending on the situation, borders have different consistence and are more or less difficult to overcome. The right hand side image is an attempt to represent this aspect, but representation tools are not always sensible to this dimension (Zanini 1997).

2.5.4 Layers

Urban situations are made of layers and can be represented by layers. Layers concern both space and time.

A town lives over ground (buildings, urban furniture, vegetation...), at the ground level (the road system and its pavement) and underground (subway lines, pipelines to supply electricity, water, etc.).

The city must also deal with the layers inherited from the past. Archaeological layers sometimes interfere with modern structures, but constitute the memory of the urban situation and the bases for further developments.

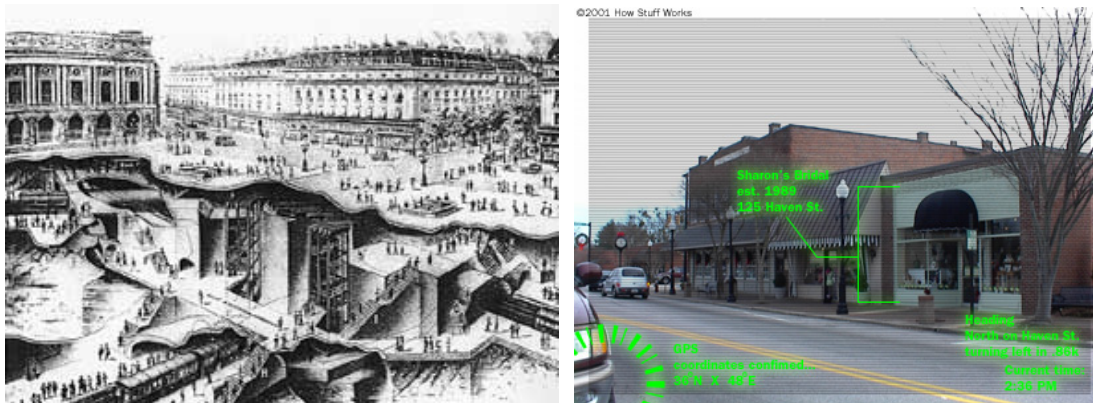


Figure 42: Layers: Opéra, Paris, France

Mixed reality technologies could help to see the invisible, both for technical and cultural purposes (see *Figure 42*).

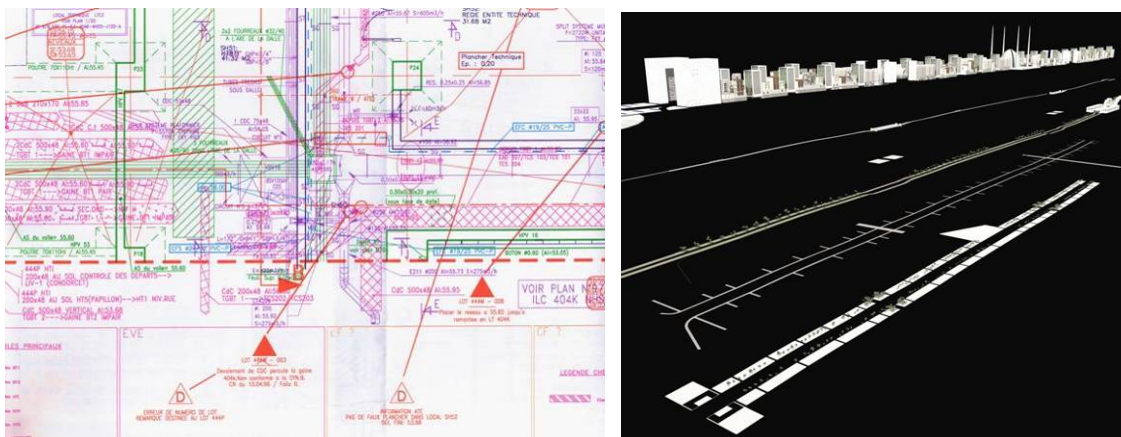


Figure 43: Underground station Magenta (RER E), Paris, Plan de synthèse (left); King Abdul Aziz Road, La Mecque (architects: Architecture Studio) (right)

In fact, architects and planners try to find ways to represent layers to distinguish technical issues (on the right) and themes of the project, in order to make it more understandable for non-initiated people (see *Figure 43*).

2.5.5 Fuzziness

There is a long tradition of fuzziness in the representation of urban situations and of architecture. There are many obvious reasons to this. Incertitude and progressive research in design are the more obvious ones. On most cases, design starts with the graphic formalisation of an abstract concept or of a literary text. The first transcription of an idea can be facilitated by a fuzzy sketch. This does not mean that the idea or the concept is vague; it only means that his representation refers to some implicit knowledge, or to a shared know-how that does not need to be detailed at this stage.

The transmission of an idea can be fuzzy if both protagonists of the exchange have the same culture. Between an architect and a craftsman or an engineer, there is no need of precise drawings to understand each other. Therefore, the language of invention is made of very simple drawings anticipating to later detailed plans.

The other reason to search for fuzziness in an urban representation comes from a need for negotiation among different stakeholders (see *Figure 44*). In order to concentrate the terms of negotiation to a precise point, documents often focus on the precise object of the debate and leave other aspects of the whole in the background. Precision is needed only where decision-making is imminent. Neutral images facilitate negotiation.

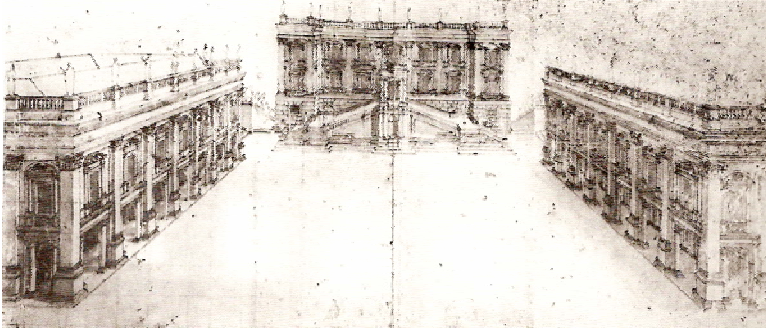


Figure 44: A tradition of fuzziness, Piazza di Campidoglio, Rome, Italy

From sketches to reality

Planners often present some of the elements of their projects in a fuzzy way: they need to give the idea of volumes and masses without getting into the detail of architectural shapes and styles. In fact, the description of a project can only progressively be communicated to the different stakeholders. The architect freezes step by step, the performances of his project, by homogeneous pieces, like an ice field, as Renzo Piano describes it. Fuzziness plays an essential role in this progression. Some of the performances have to be clarified at the very beginning of a project and formal consequences must than be identified. On the contrary, some can be left open until a later phase of the design and there representation can be kept in a more uncertain shape (see *Figure 45*, *Figure 46*, *Figure 47*, *Figure 48*).

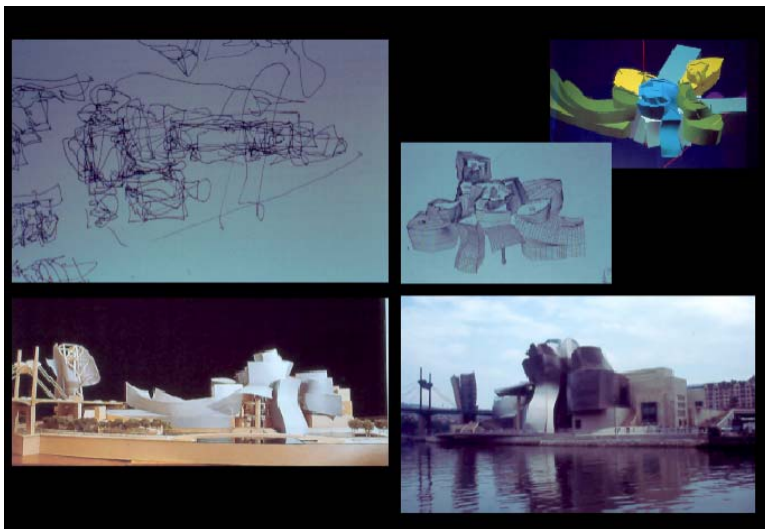


Figure 45: Guggenheim Museum, Bilbao, Spain (Architect: Franck O. GHERY)

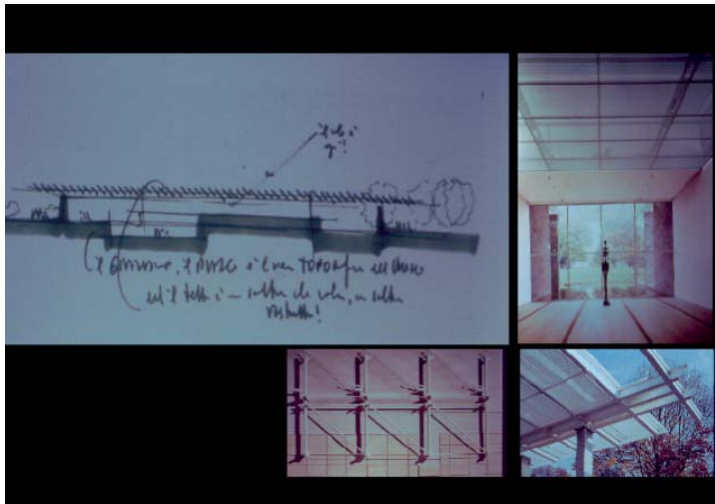


Figure 46: Beyeler Museum, Bâle, Switzerland (Architect: Renzo PIANO)



Figure 47: Paul Klee Centre, Bern, Switzerland (Architect: Renzo PIANO)

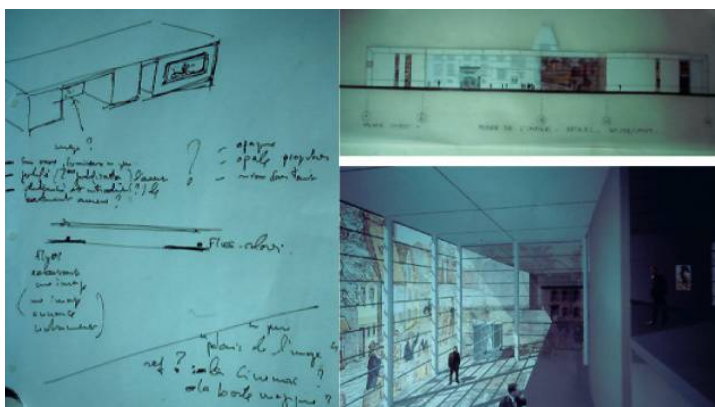


Figure 48: Musée de l'image, Épinal, France (Architect: Jean-Jacques REYNAUD)

Modes of fuzziness

Interaction upon urban situations does not need all the elements to be equally defined. Discussion might tend to focus on details, forgetting the general vision. Images do not need to be neat and complete to be able to recognise what is represented. This representation technique allows to attract the attention where needed and to postpone the debate on less urgent questions, without giving up the discussion on the general view about the urban

situation. In order to reach these objectives, fuzziness can be represented in many different ways:

By selecting an information depending on the type of representation (see Figure 49)

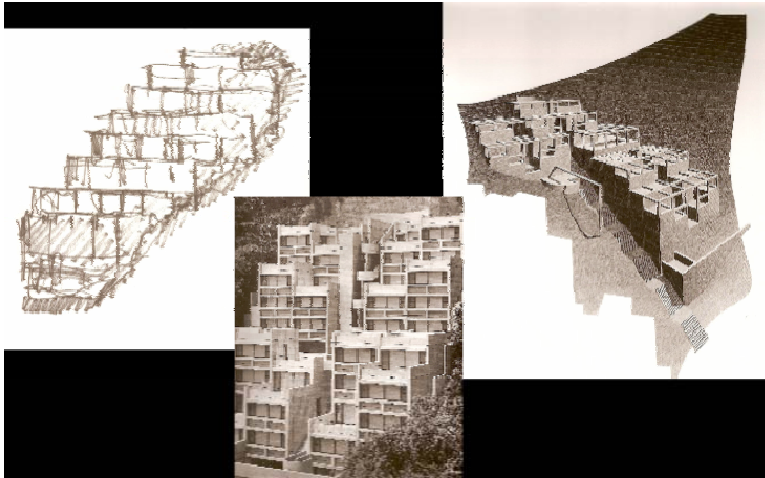


Figure 49: Residence Rokko, Kobé, Hyogo, Japan (Architect: Tadao Ando)

Through the thickness of the drawn line (see Figure 50)

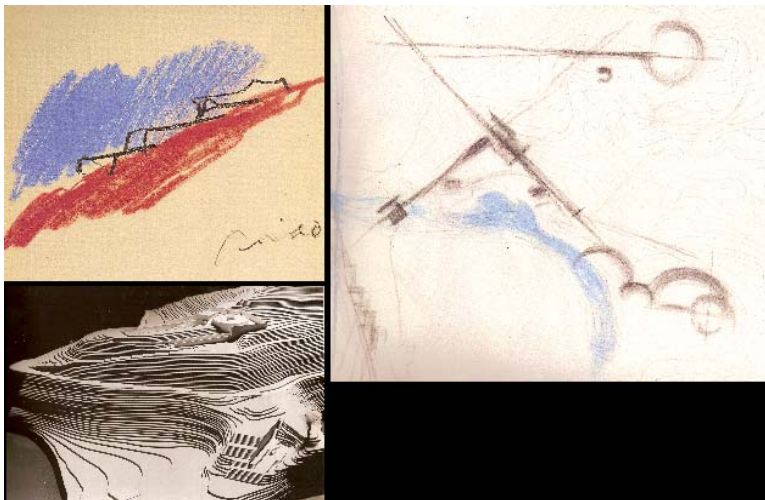


Figure 50: Hotel and Museum of Contemporary Art, Naoshima, Okagama, Japan (Architect: Tadao Ando)

Through impression of movement (see Figure 51)



Figure 51: New York, photos by Martin Lenclos

By focusing on a neat part of the image (see Figure 52)



Figure 52: New York, photos by Martin Lenclos

By selecting information through textures (see Figure 53)

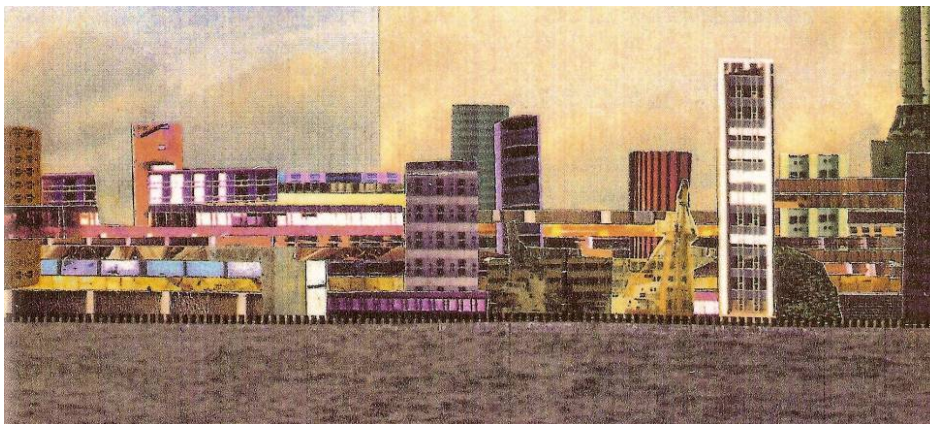


Figure 53: using textures to present information

Through transparency and shadows (see Figure 54)

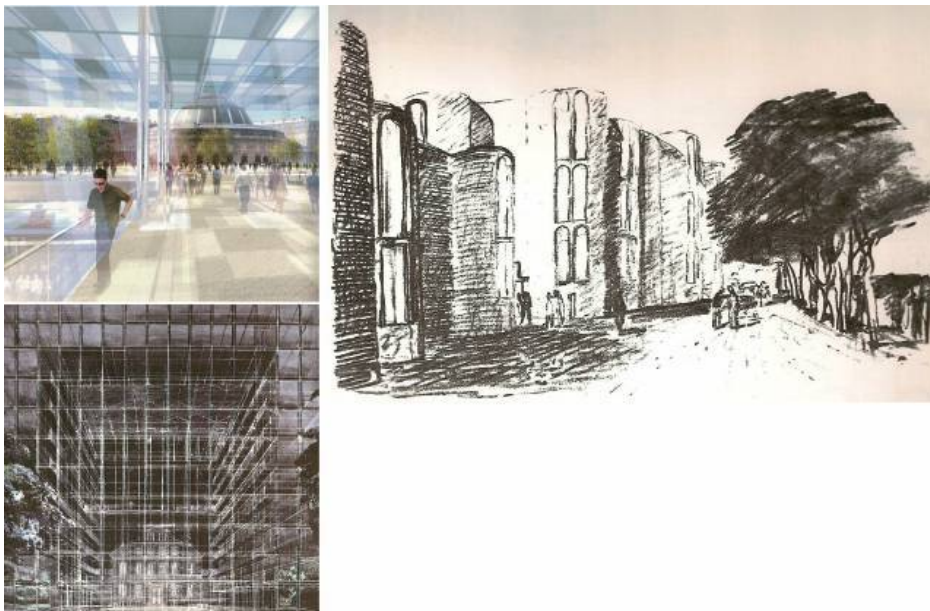


Figure 54: Les Halles, Paris, competition 2004 (Architect: David MANGIN, SEURA) (top left); Perspective sketch, Mikveh Israel Synagogue, Philadelphia, PA (Architect: Louis KAHN) (right); Maritim Tribunal, Hamburg (Architect: Jean NOUVEL) (bottom left)

By representing masses by their shadows and thinking in masses without getting into the architectural design (see Figure 55)

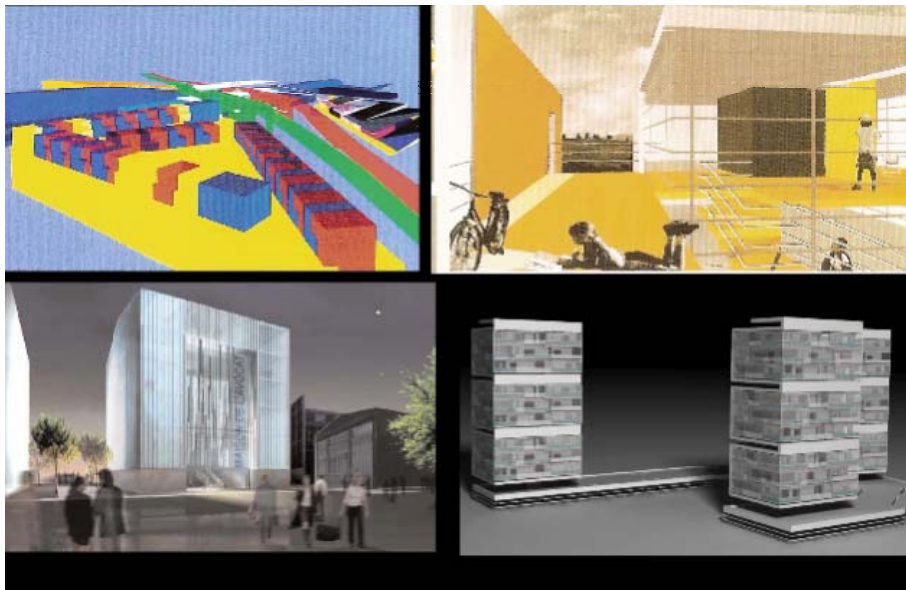


Figure 55: La Courrouze, Rennes, France, Bernardo Secchi

It is important that the new technologies to be developed let this possibility open.

2.5.6 Ambience

Representation of urban situations should include all forms of perception:

- the physical phenomenon (light, sound, temperature, smells, air movements, etc.);
- the sensible perception (physiological and psychological dimension, the interpretation of sensations);
- the social and cultural practices (uses, behaviours, “imaginaire”...).

The urban experience includes all forms of sensations about the environment surrounding the person. It is a notion crossing sensitivity (physical dimension), perception (human interpretation) and life experience (social interaction). It is both a subjective and collective notion (Amphoux et al. 2004). All sorts of elements participate to the general sensation. The pictures in *Figure 56* below show how immaterial aspects such as the light can be integrated in a project.

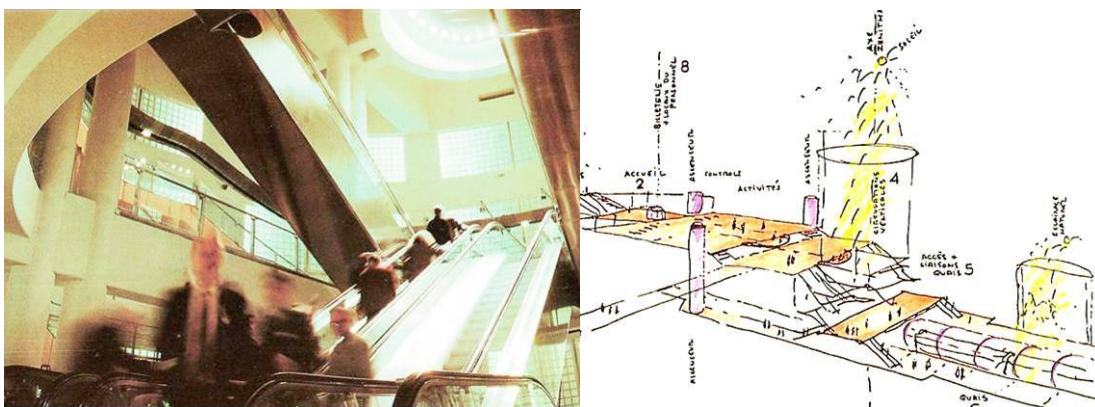


Figure 56: RATP, line Météor. St-Lazare station, B. Kohn

The importance of perceiving urban situation in its whole is demonstrated by the example of the Tivoli site, in Liège, Belgium: negotiation failed until a 1:1 model of the destroyed cathedral transept was made. The experience of this model could have been simulated with mixed reality techniques (see *Figure 57*).



Figure 57: Lema, Liège university, Belgium, 2000, 1:1 model of the Cathedral Transept

2.5.7 Mobility

Traditional representation tools are often static while urban situations often imply mobility and speed. Urban projects are often built around flows of people and vehicles (transport hubs). Designers take into account the speed at which the urban situation is perceived, like in the example below (see *Figure 58*), where the building is thought in relationship with the high speed road along which it is supposed to be built (Bellanger and Marzloff 1996).



Figure 58: Company Brembo, Stezzano, Italy, Jean Nouvel

The following scheme (*Figure 59*) is an attempt to show the perception of the same urban situation depending on the mean of transport and the speed.

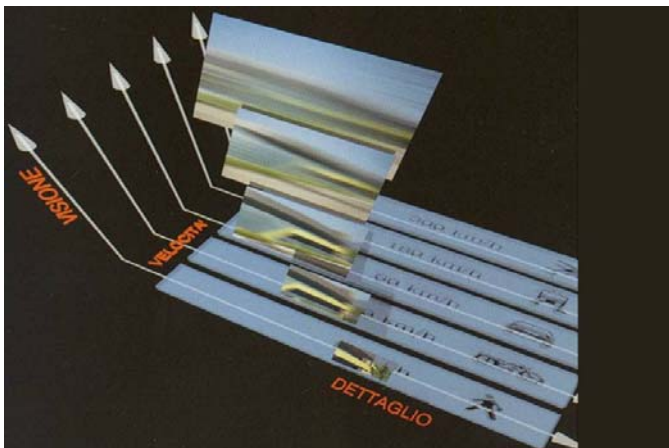


Figure 59: Representing how speed influences perception

Mixed reality technologies should integrate the possibility of a dynamic perception of urban situations.

2.6 Conclusions

The fieldwork observations and literature search on urban themes presented in this section had a strong influence on concept development for WP6. They helped understand urban

planning practices and identify the issues at the field study sites. The scenarios of use and content creation for the workshops with users were based entirely on the fieldwork observations and some of the material collected was used as content.

The 'urban themes' reflect the long experience of UML in urban planning. The visual examples have an important role in discussing how to represent an urban situation in all four showcases. They also serve as guidelines for the development of scenarios of use, the preparation of content, and technology development. They guarantee that a large scope of planning situations and contexts will be addressed.

3 Year 1 Demonstrator

The WP6 demonstrator is a complex collection of *technology probes*, which are partly connected.

The notion of technology probe was invented to denote technological interventions in a use context that are predominantly exploratory and experimental: "A probe is an instrument that is deployed to find out about the unknown - to hopefully return with useful or interesting data" (Hutchinson et al. 2003). In contrast to a prototype, a probe is

- introduced early in design process with the aim to provoke thought and enlist users' creativity
- rather simple with few easily accessible functions
- open-ended and co-adaptive - users should be encouraged to use technologies in unexpected ways.

During project year 1 the initial probes were tested and re-designed in several cycles in a user-collaborative approach, gradually developing into prototypes with more and more functionalities.

3.1 Specification

Hardware and OS	4 Dell Laptops (IP M Processor, 2.13 Ghz), Windows XP
Software	<ul style="list-style-type: none"> • JAVA 1.5.0_05 • JMF 2.1.1e • Atelier Framework (see 2.2.5) • Hyper Media Database • Apache Tomcat 4.1 • MySQL 4.0.13 • OpenTracker 2.0 (see 2.1.1) • Studierstude 4.0 (see 2.5.3) • OpenCV beta 5
Core Features	Tangible Interaction through manipulation of colored objects, barcodes to activate commands and selecting content. The demonstrator allows users to create complex visual and sound scenarios.
Status	The Demonstrator started as a collection of <i>technology probes</i> and some (older) modules are considered <i>stable prototypes</i> , newer parts are <i>beta prototypes</i> while the newest parts are still <i>technology probes</i> . The modules are also described in D4.1. The collected status is technology probe .
Intended users	Urban planning specialists, local authorities, local citizens, politicians
Research Workpackages	WP3, WP4, WP5, WP6

The following sections provide a short description of the technology probes/prototypes prepared by TUW and TUG for the first workshops.

3.1.1 Barcode player

The 'Barcode player' was introduced to provide access to digital material through use of physical handles (Ishii et al. 1997). Users are provided with a number of cards on which a thumbnail and a connected barcode is printed. These cards can then be used to access the content (represented by the thumbnail) by the users to display images, videos or assign textures to a 3D scene. For the final workshops with users barcode technology was also introduced in support of manipulating – scaling, colouring, making transparent – objects.

3.1.2 Colour table

The 'Colour table' is the basis for a number of probes/prototypes. It provides the users with the possibility to arrange and position tokens on a 2D surface. The tokens of different colours are used for associating multimedia content and for manipulating this content, varying scale, transparency, and colour (see *Figure 60*). A 3D scene is built by selecting content with the barcode reader and interactively placing and arranging different tokens on the table.

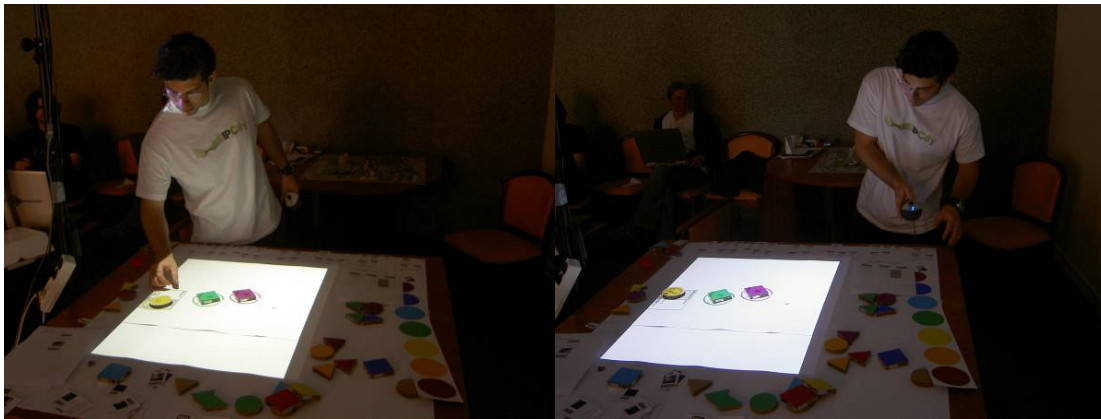


Figure 60: Colour Table Demonstrator in Paris

3.1.3 Tangible 3D Visualisation

This application uses the input from the colour table and the barcode player to visualise 2D images and 3D content as components of visual scenes that are merged with a background. This background is produced by either a real time video stream, a panorama (created by stitching pictures or a rotating camera), or a see-through installation (see *Figure 61*). The central component of the see-through screen is based on a perforated metal plate in a dimension of 100cm x 133cm. The plate is grounded and coated with semi matte white acrylic. For the first prototype we used an all-metal plate with holes of 1mm diameter and distanced at approx. 3mm from each other. The next version of the screen should be aluminium to reduce the weight (facilitating transportability).

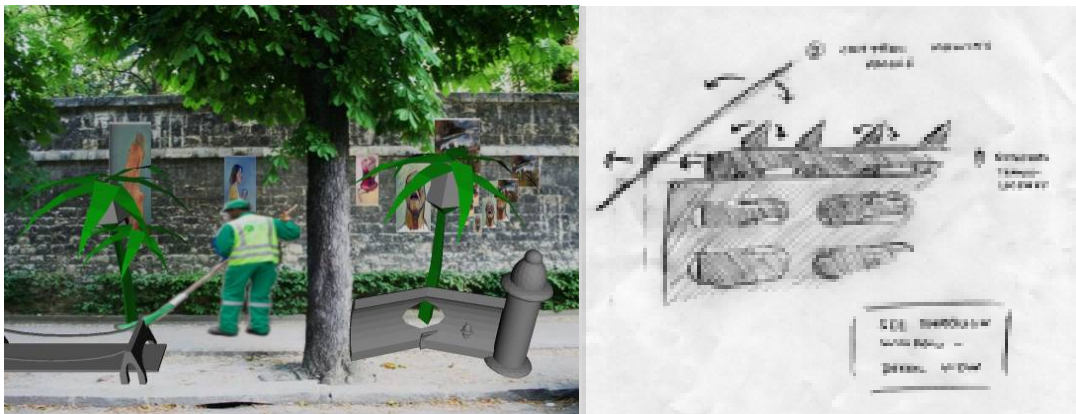


Figure 61: visual scene merged with a background, sketch of see-through augmentation setup

3.1.4 Sound application

To create an atmosphere of places and to change the feeling of a place in a subtle but effective way sound can be used. This probe allows users to associate the tokens with sound files, arrange the sound spatially and control the volume of each sound. A particular visual object can be connected with a particular sound by associating them with the same token.

3.1.5 Urban Sketcher

The setup of the Urban Sketcher uses a controllable (pan-tilt-zoom) camera looking through a window to acquire a high-resolution image of a real architectural scene, which is augmented with a spatially and temporally registered virtual scene. This mixed reality is then projected on a large screen allowing a group of urban planners to interact in a multimodal way. The overall goal is to enable interactive sketching in architectural scenes where modifications through direct interaction allow sharing the visions of future façades, buildings or skylines (see *Figure 62*). By using a wireless controlling device, the viewing direction and the zoom level of the camera and therefore the view into the augmented scene can be concentrated in order to gain a common focus. This mixed reality projection visualizes a three dimensional scene registered in the video stream where virtual textured objects can be painted and positioned in space and will be used for sketching. The texture of the object can be generated from prepared or user-generated content pictures in common formats and serve as canvas for painting with different interaction devices. Painting in this context means spraying of colour in a airbrush type manner which is also available for modifying the alpha channel resulting in the change of transparency. The configuration of the painting brush parameters like brush-size, flow, falloff, opacity and colour can be done interactively on a wireless tablet pc. For precise tracking, a responsive optical daylight capable tracking system using multiple cameras for handling occlusions allows seamless interaction. In addition, we integrated a whiteboard like interaction metaphor which will allow sketching in the video stream.

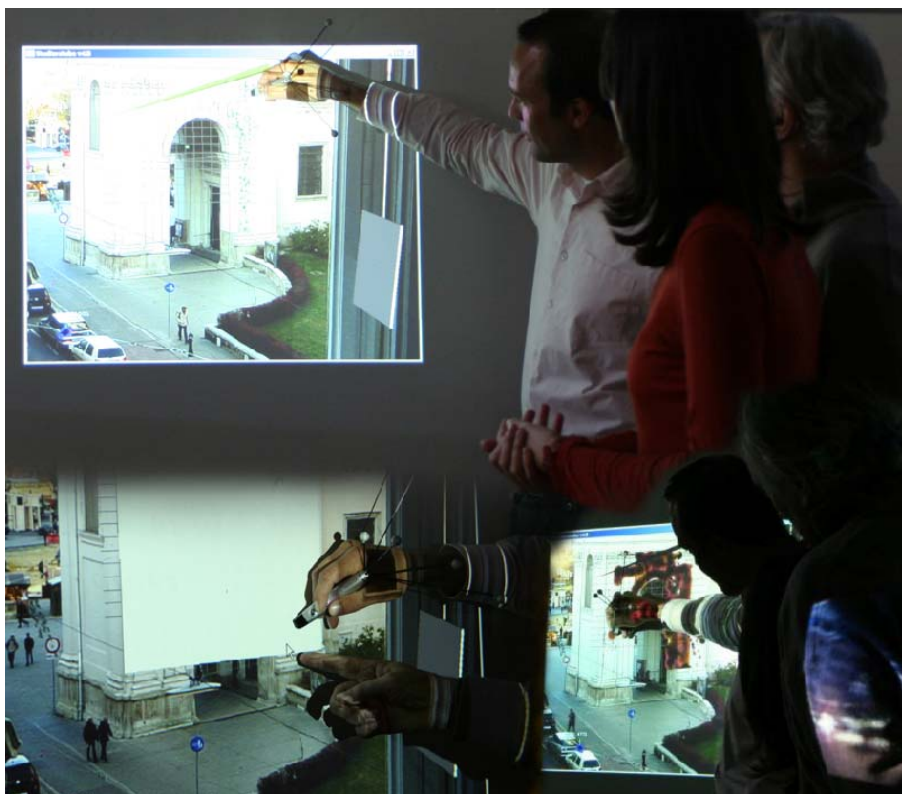


Figure 62: Urban Sketcher Demonstrator in Vienna

3.1.6 3D reconstruction

Content creation, especially 3D modelling, is a hard and tedious task which is required in an interactive collaborative urban planning environment. Therefore, we worked on a first prototype which allows the generation of coarse 3D models using automated image-based vision algorithms. The images are provided using low-end cameras typically mounted on sub-notebooks or ultra-mobile devices. The first prototype gave promising results, where a coarse textured 3D point cloud can be generated in an automated way by only using a sequence of 2D images.

3.2 Testing – The workshops

As part of the planned first workshops with users in Paris (Sainte-Anne) and Vienna (Vienna's 16th district) we used the technology probes for exploring first technology concepts for WP6. For this purpose content relevant for the cases at hand had to be prepared, following the scenarios of use we developed – 'the wall scenario' for Sainte-Anne, 'transforming the Brunnenmarkt area' for Vienna's 16th district (these scenarios are described in more detail in section 3.5). This content consists of pictures of the area (buildings, views, details, etc.), 3D objects, and sound samples. The workshops started with short demonstrations of the technology probes, followed by hands-on experiences of users with the probes, and an in-depth discussion of experiences and suggestions. For both workshops a mix of architect-planners and other users – hospital staff in the case of Sainte-Anne, representatives of local authorities in the Vienna case – was invited. As probes are mainly conceptual and do not allow for much interaction, it seemed too early to involve citizens at this stage.

Two more workshops, one internal at TUW with visitors from Oslo University and one with architect-users from the project consortium, were organized. This was to test additional and new features, to reflect research results of project year 1, as well as to develop a vision for technology development and user involvement for project year 2.

3.2.1 The workshop at Sainte Anne

We report on the first WP6 workshop in Paris, Sainte-Anne, 15-16 June 2006. The two mornings were used to introduce and discuss relevant concepts and perspectives on urban renewal and how to represent the urban situation. For the two afternoon sessions we brought several 'technology probes' to the psychiatric hospital of Sainte-Anne to engage in first conversation with users. In this first workshop only the architects engaged at Sainte-Anne, some hospital staff including two old professors of psychiatry, and additional urban planners were included. The 'technology probes' were seen as design concepts rather than early prototypes and our interest was in a conceptual discussion of issues around collaborative envisioning. For this purpose content relevant for the case at hand had to be prepared, following the scenarios of use we had developed – one of it the 'wall scenario'. Creating partial opening to the wall surrounding Sainte-Anne, using different transparencies, decorating the wall with 'art brut', changing the soundscape in the park, and so forth. The content consisted of pictures of the area (buildings, views, details, etc.), 3D objects, and sound samples. The workshop started with short demonstrations of the technology probes, followed by hands-on experiences of users with the probes, and an in-depth discussion of experiences and suggestions.

Creating visual scenes and audio spaces

From the onset the colour table was in the centre of attention. Participants used visual as well as sound material. The basic interaction consisted of picking up one of the coloured objects (squares and triangles), placing it in a small squared region on the table, and assign an image or sound file using the barcode sheets we had prepared for them. Below is the set up with the technology team explaining how to create visual scenes, with a background image and 3D objects, which can be manipulated (turned, sized up and down) by moving the shapes with which they are associated (see *Figure 63*).

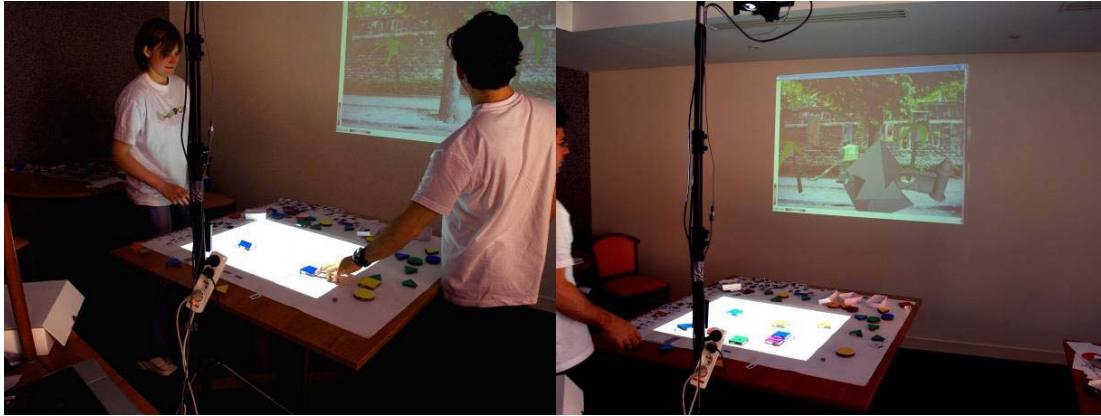


Figure 63: Users with the Colour Table in Paris

The following sequence of images illustrates different aspects of how participants interacted with the set up of colour table and barcode applications. This was the overall set up with camera, colour table, barcode reader, colour shapes, projection, and people standing around the table (see *Figure 64*).



Figure 64: Discussions facilitated through the Colour Table in Paris

The sound application worked very well. Participants explored the different possibilities of creating sound, dimming it, making it louder, mixing different sound files. As this cannot be demonstrated with images, we mostly concentrate on the visual scenes.

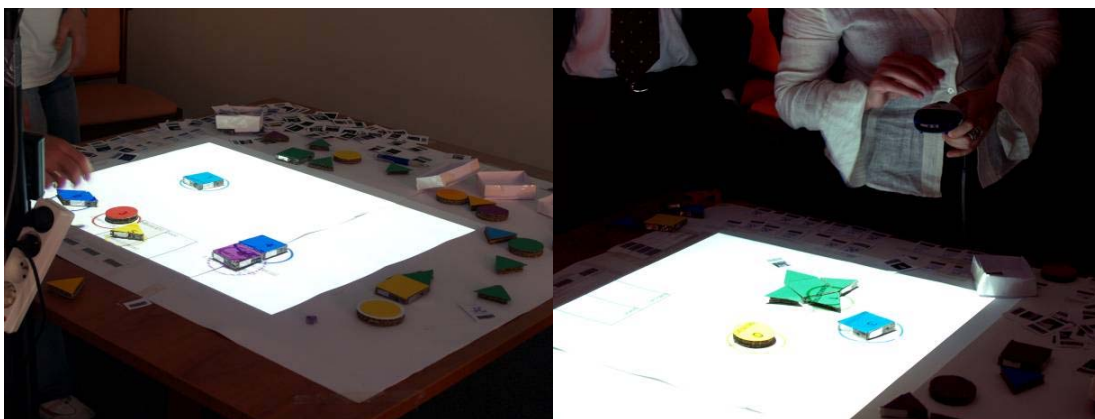


Figure 65: Visual feedback and combination of Colour Objects

The first version of colour table had two regions marked for activating a shape, either as 'billboard' (which rotates itself in direction to the viewpoint) or 'plane' (which can be rotated manually). Green triangle shapes could be turned into orientation objects and joined with another object so as to give it a specific direction (see *Figure 65* and *Figure 66*). On the table are also cut-out print-outs of barcode and thumbnail of different objects (image, model or sound file) which participants may select and pick up to associate with a shape. The

combination of pink and blue square could be used to change the background image. In the image on the right we can see how shapes of the same colour can be joined to scale up an object – in this case a tree.

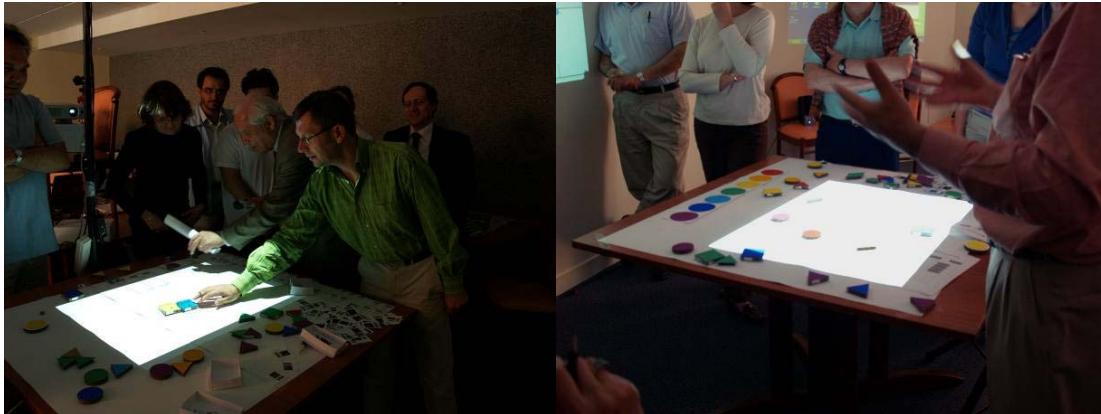


Figure 66: Users collaborating

We can see how two participants collaborate in creating a scene, with one shifting two mixed sound files away from the centre and the other one looking for an image file to go with. Participants discussed what they experienced looking at the visual scenes they had composed.

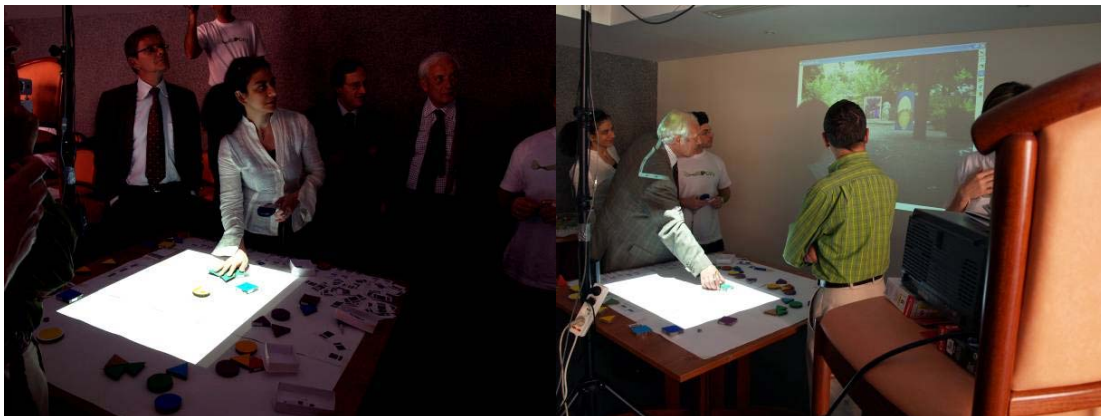


Figure 67: Users watching what is happening

For example, the architect responsible for the Sainte-Anne project observing what happens when she moves the set of trees she has created (see *Figure 67*). We can also see a participant entering in the projection field.

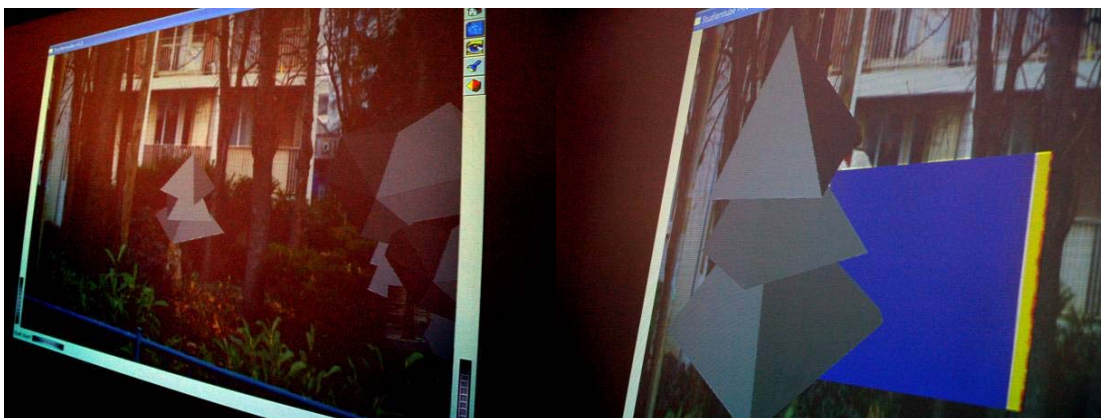


Figure 68: Scenes created by the users

These are examples of the collages the participants produced, with a background image showing parts of the park and behind a residential building, and several 3D objects – two trees and a bench. The quite clumsy 3D objects don't represent 'real' objects' but rather an abstract notion of 3D object that should facilitate discussion about the role and design of such objects for creating visual scenes. We can also see a detail of 3D objects and billboard forming part of a visual scene (see *Figure 68*).

The Urban Sketcher

TUG brought a probe of the Urban Sketcher which was still rudimentary and unfortunately could not be manipulated by participants themselves. Here is a short description of how it worked. Below is the arrangement with the camera set up to create a real time video stream, optical markers for positioning textures, and a space ball device for drawing in the scene.



Figure 69: First technology probe of Urban Sketcher demonstrator

Here we can see a projected image of the augmented camera view, with a visual marker used for placing and orienting virtual textured objects. A 'new texture' has been painted onto a object in the projected real time video image (see *Figure 69*).

3.2.2 The workshop at the Vienna Urban Renewal Office

We report on the second WP6 workshop in the urban renewal office of Vienna's 16th district, September 25 and 26. The first morning was used for discussing urban concepts and how they can inform the design of IPCity technologies. Plans for coming workshops, eventually in other European cities were made. For the afternoon session in the urban renewal office, TUG and TUW had installed five technology probes/early prototypes. We demonstrated the probes to workshop participants, supported them in exploring the probes and had an in-depth discussion based on their observations and comments. Participants in this workshop were members of IPCity from TUW, TUG, UOulu, and UML on the one hand, members of the urban renewal office itself, as well as two collaborating architects, an urban sociologist, and two representatives of local authorities. The morning of the second day was used for discussing lessons learned from this second workshop, formulating additional or modified

requirements for the IPCity technologies and setting priorities. In the afternoon the technology teams from TUW, TUG and UOulu convened.

For this workshop five probes, some of them already early prototypes had been prepared:

- An improved version of colour table (a rotating table) and barcode application for producing see-through augmentations
- The rotating colour table for working with a panorama of a site and visual scenes
- An improved version of the sound application
- An improved version of the Urban Sketcher
- An application for 3D image reconstruction

Preparing content

TUW had prepared a diversity of content for this workshop – two panoramas, inspirational material from books and art events in the district, as well as images of the stalls, the shops, vistas into streets, and people (see *Figure 70*).



Figure 70: Content created for Brunnenmarkt

Creating visual scenes and audio spaces

The see-through installation was the first probe to be experimented with. Virtual scenes were projected onto a window (which we converted into a screen) onto a narrow street and a courtyard with an apartment building. The rather narrow view together with the unfavourable lighting conditions made experiencing the see-through effect difficult. Also some objects, such as a red car parking right in front of the window proved rather intrusive. Some participants mentioned difficulties of focusing on the virtual and the real scene at the same time. Also aligning the virtual camera with the real scene outside had not yet been resolved.

Participants stressed the importance of being able to scale and position the objects. While relating to the 2D images we had prepared was easy, the simple 3D objects we had provided were obviously not suited. The need to help people's memory of which content was associated with the different shapes was expressed (this feature was implemented right after the workshop).

The sound application was well received, as it was in Sainte-Anne, and the need to create meaningful combinations of images and sound was expressed.



Figure 71: Scenes created by users at the Brunnenmarkt workshop

Participants then placed a variety of 2D objects – e.g. the playing children, a food stall, cloth racks - on in the panorama (see *Figure 71*). One of the ideas was to create multi-angle billboards which be can be turned and viewed from different angles. They expressed the desire to be able to walk around or to be able to look around from different positions. They also emphasized the need for height alignment. This inspired discussion about working with several panoramas (produced from different viewpoints) and travelling between them. Participants also want to change the panorama itself, e.g. remove a part of the environment. The map was seen as useful but it needs to be aligned with the panorama and possibly spread all over the colour table. The idea being able to produce a panorama ‘on the fly’ as part of process was seen as particularly attractive.

We had a general discussion about working with ‘constraints’, such as combinations of visuals with sound or links between objects (their attributes) and the environment, since constraints play a large role in urban planning.

Another question that was addressed was whether and how far to reduce the complexity of the arrangements that users’ manipulations.

The Urban Sketcher

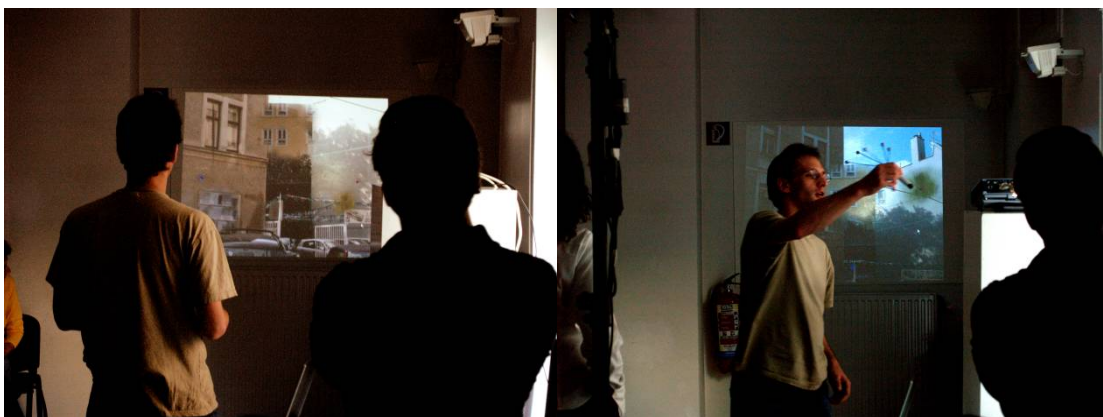


Figure 72: Urban Sketcher at the Brunnenmarkt workshop

The Urban Sketcher was demonstrated by TUG. It was immediately apparent that scaling issues were better resolved in the real-time video. The possibility to move and zoom the camera was experienced as attractive (see *Figure 72*). Participants mentioned the possibility to use this application for ‘measuring’ the real environment – to receive geometric information about different objects. They also would like to be able to add references to a building. The current input tools – space ball (a 6D mouse) and 3D pen – are far too difficult to handle.

Several user interface issues will have to be resolved: while the colour table can be further developed to support the positioning of objects, we will have to find easy ways for users to paint/apply textures to objects and for sketching directly in the scene.

On-line 3D image reconstruction

Mixed Reality applications often require a digital version of real-world models such as buildings, statues, architectural models. While these models are often manually constructed using some 3D modelling tools, an automated acquisition pipeline is still not available for that purpose. Especially for urban planning, the status quo of existing buildings often need to be available in a 3D model. Since manual model creation is a tedious and time consuming task, a need for automated 3D reconstruction is given. Therefore, we come up with the idea of using an ultra-mobile PC with an attached camera that delivers a sequence of images. These images are transmitted to a server where the 3D model is created on-the-fly by applying automated 3D reconstruction algorithms. The final 3D model is immediately available and can be used within a mixed reality application.

A first prototype of this 3D reconstruction was shown in Vienna. We captured some images of existing physical architectural models. The 3D model was available during a couple of seconds and could be observed by the spectators.

Participants could see in this tool a good opportunity for creating 3D objects 'on the fly', and e.g. to be able to place the object in a gap at the construction site. They would like to be able to add textures. At the same time they could well imagine working with 'fuzzy' reconstructions.

It was discussed how much expert users can be expected to simplify the pixel cloud so as to support 3D reconstruction (see *Figure 73*).

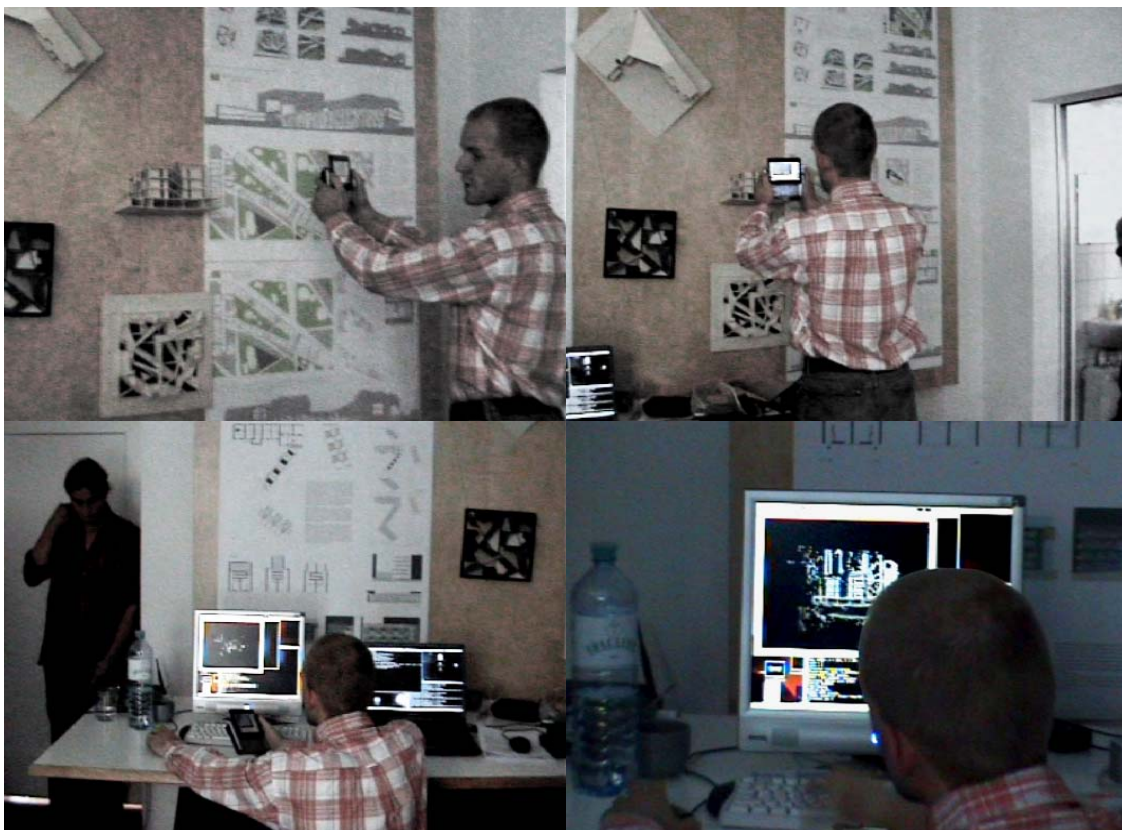


Figure 73: On-line 3D image reconstruction at the Brunnenmarkt workshop

3.2.3 The Vienna workshop

The Vienna workshop took place Dec 1, 2006, with participants from TUW, TUG, UOulu, UniAK, and UMVL. Prior to this, on Nov 16, 2006, a preparatory session testing the new colour table features and the new material for see-through had been conducted, with visitors from Oslo University as participants.

For the Vienna workshop new versions of the Urban Sketcher as well as the colour table with panorama and see-through augmentation were available. TUG had invited the developer of the augmented map for a demonstration of this technology (see *Figure 74*). The idea was to have the architects of the consortium itself work with the prototypes.



Figure 74: Augmented Map presented by an invited guest researcher

As the urban renewal office was not available for a date in early December due to other commitments, the 'site' had to be improvised. The camera for the Urban Sketcher filmed a view onto Karlskirche and Karlsplatz; the see-through was installed with a view onto the backside of Karlskirche and a small street; and a panorama of Stephansplatz had been prepared, including lots of new content, including textures for the Urban Sketcher as well as 'fuzzy' objects.

The improvised 'site' had consequences for working with the see-through as the view, hence possibilities to create meaningful visual scenes, were limited. Still, the advantage of the new screen material became evident.

The architects started working with the Urban Sketcher, practicing with the sophisticated but not easy to manipulate input device, painting parts of Karlskirche with different textures (see *Figure 75*). One of them wanted to paint a door onto a virtual façade which required positioning another smaller 'sheet' in front of it. Issues such as the need to improve speed, reduce time lag between activity and result, support filling in large surfaces, were discussed. Architects were more interested in annotating – sketching and writing on the video stream – rather than painting a façade.



Figure 75: Urban Sketcher at Vienna Workshop

The architects had prepared a scenario for working with the panorama of Stephansplatz and the see-through. The new version of colour table has already reduced the token to one shape (a cylinder) with a particular colour standing for a particular content. A booklet was prepared with the print-outs of thumbnails and associated barcodes. In addition, posters had been prepared for scaling, colouring, and changing transparency, with icons and associated barcodes representing different values (see *Figure 76*).

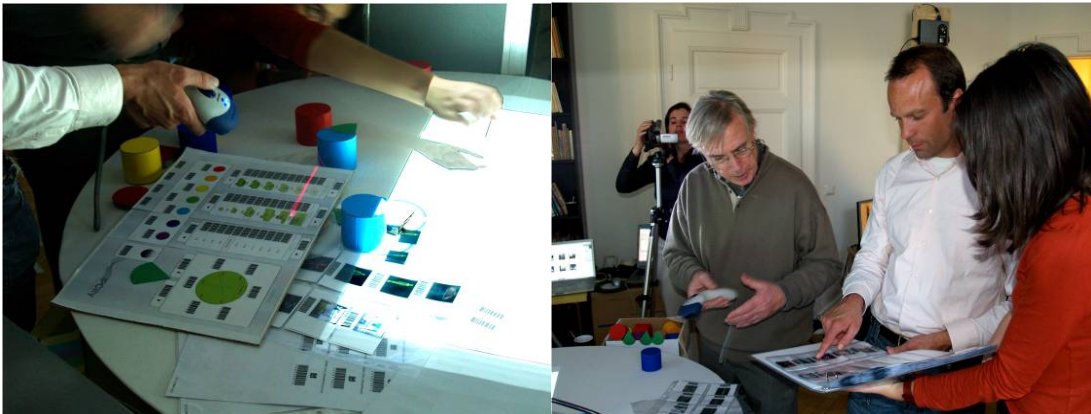


Figure 76: Barcode Poster and users at Vienna Workshop

Users found these easy to handle, even though the choice of scales needs to be adjusted. They, with great difficulty, tried to create and a new façade to a building on Stephansplatz, and with ease placed people, a cyclist, and a sculpture, exploring the possibilities to scale and position. They also experimented with making objects transparent (see *Figure 77*).



Figure 77: Scenes created by users displaying the use of transparency and fuzziness

Users then created a spontaneous connection between applications by turning the rotating camera of the Urban Sketcher onto the panorama in order to paint part of it. There was a discussion about scaling, positioning, and the difficulties of creating spatial set-ups with the current version.

Finally, the possibilities of creating soundscapes were explored. Users associated different visual objects with different sounds and experimented with mixing them.

3.3 Evaluation

3.3.1 The very beginning

Although at Sainte-Anne the probes were rather rudimentary, we received very valuable feedback simply by demonstrating, probing and reflecting with interested and engaged users with different background. Main findings were:

- Positioning objects at a correct scale and with the perception of distances is a ‘must’ in order to be convincing for architect/planner users
- Users wanting to be able to change perspective resulted in the idea of a rotating table in combination with a static and/or a video panorama
- The quality of the content, in particular the 3D objects, and its suitability for creating urban scenes, was an issue from the very first moment, with an emphasis on fuzziness and ambience.

3.3.2 3D Scenography

We from the start worked with different types of ‘Mixed reality’ – see-through, real time video, and (static or dynamic) panorama. There is a need to connect these different MR types and to support users in making transitions. For example, to be able to place colour table objects

in the Urban Sketcher application, to paint and annotate the panorama and objects of the colour table application; as well as to be able to rotate the Urban Sketcher camera by rotating the colour table. These possibilities have to be further explored.

Working with the Urban Sketcher

There is the need for an improved, easy to handle input tool, to reduce the time lag between action and result, and to optimize for small brush size suited for sketching and writing on a scene, which is a major user requirement. One of the restrictions is that only one user at a time can perform with the tool.

Working with the panorama

The panorama emulates a representational practice with a strong tradition and architect-users stress its importance. Although up to now we have worked with a static panorama made from photographic images stitched together, it will be fairly easy to use the rotating camera for producing a video panorama. The panorama allows users to stand in one or several different positions within a space, to 'look around' and to position objects.

To date building spatial set-ups is not sufficiently supported. It is difficult to orient a 2D object, for example along the façade of a building. In the future we will need a 'rough' 3D reconstruction of the environment. We also plan to work with multiple panoramas. This will allow to, for example, position an object behind a building or to remove an object (with the object behind it becoming visible). There are several scenarios about for example preserving an 'urban window' (described in 2.5) or replacing a building.

Working with see-through

The new material gives excellent results and it is expected that the construction of the MR-Tent will help control the ambient light. The architects stressed several times that the 'parallax problem' is not a problem for them. People adjust easily to the fact that a specific MR configuration can only be seen 'correctly' from one position. See-through is the most perfect mixture of real and virtual and has a more powerful presence effect than the other constellations (see *Figure 78*).



Figure 78: Improved screen material versus metal screen

3.3.3 Content creation

Visual content

There are several open questions concerning content creation for urban renewal projects within IPCity. Our experience is that users don't have the time to prepare content for field trials with the technologies. Content preparation is time consuming and demanding. The content has to have high aesthetic quality to be appealing to architects. While for dynamic planning sessions with citizens and other stakeholders more simple content (images, sound) may be sufficient and appropriate, creating ambience/atmosphere requires complex content.

Also, different purposes require different image/sound quality. We aim at developing tools for users to create their own content 'on the fly' but still a lot of the content will have to be prepared so as to be able to work with a rich repertoire of material of all kinds.

We envision different types of content and modes of content creation:

- Inspirational material – the plan is to build a library of 2D and 3D objects which are connected to urban renewal themes but not necessarily specific to a particular project. Selection will primarily follow artistic criteria, working with qualities such as fuzziness and ambience.
- 3D reconstruction looks very promising. It allows easy capturing of real 3D objects (buildings, sculptures, architectural models, etc.). Textures can be applied either using an application such as Photoshop or using the Urban Sketcher.
- Users expressed a need for transforming/manipulating 2D objects (billboards), e.g. cutting out, bending, within an application. Technical solutions to this need to be explored.
- Users will be supported in creating 2D content, e.g. sketches and paintings, 'on the fly'.

Sound

Several applications in the IPCity project intend to use sound:

- Urban renewal (WP6) uses a sound application in connection with the colour table allowing to associate sound to the objects introduced in the MR system and to explore urban situations in a more complex way than by ordinary visual representation tools
- Time Warp (WP8) uses time-related sound to reinforce the sense of presence in the different epochs provide awareness of the time the player is actually situated.

The multisensorial dimension of these applications contributes to presence issues. Sound can be useful for orientation in an open urban space, whether real or virtual. It also qualifies a space in terms of ambience, helping to perceive depth and distances, visual layers of the landscape, changes in temporal rhythms, like day and night, movement of people, vehicles, etc.

However, sound cannot be manipulated the same way as visual information. It needs specific attention and can reveal aspects that do not appear with other tools. A few principles need to be further explored with the help of specialists:

- Identifying sound is not only a question of origin (the source) and destination (the listener), but depends also on the space (volumes, distances, materials, open/closed space, etc.). All these elements contribute to qualify an urban situation.
- The mechanisms of visual and sound perception are different, especially concerning the degree of consciousness. While the eye needs to focus on an relatively broad area, the ear works at two different levels: on the one hand, hearing means receiving inputs constantly (which aren't immediately elaborated but which indirectly participate in creating references to the environment in our mind), and on the other hand listening means selecting specific information at a specific moment.
- Complete silence is as fastidious as loud noise. Actually, what is really pertinent is being able to distinguish a variety of specific elements in a sound environment. The problem of noise pollution is less a question of quantified volume (sound perception is more subjective than visual) than of sound variety (e.g. car traffic kills the richness of other sound elements in an urban situation).

3.3.4 Collaboration aspects

The colour table

The colour table as a user interface works well in supporting collaborative envisioning. Several improvements were achieved since the workshop in Sainte-Anne:

- We use one shape (currently a cylinder) with different colours standing for different content (assigned with the barcode reader) and the possibility to add a small green triangle for rotating the object
- Assigning content, positioning and manipulating an object are performed with one and the same token, positioning it in the 'active corner' on the table
- Barcode sheets are used for choosing scale, transparency and colour
- A feedback mechanism has been implemented in the form of a small thumbnail which is projected close to the token, as a reminder of the assigned content. Also the current size parameters are blended in but users do not find 'numbers' as relevant as relative scale
- A detailed map of the panorama can be projected onto the table. Users would prefer a virtual floor (optional) in support of positioning.

Negotiation

Users think of the 'immediateness' of the applications as their greatest strength (in comparison with carefully prepared VR scenes). The applications support collaboratives of urban planners and citizens in expressing their ideas visually (adding sound) whilst talking, as part of the planning process. The collaborative features of the colour table enable this together with the possibility to create content 'on the fly'. Another, still unexplored, issue is introducing rules (e.g. in the form of object attributes) and supporting users in defining their own rules. Urban planning is about dealing with constraints, in innovative ways, and there is a need to explain those constraints to lay people. Still another issue is how to use the IPCity technologies to increase trust - e.g. what is a socially accepted noise level (airports, historical centres) involves collective deliberation, efficiency and negotiation

3.3.5 How to support urban themes

The workshops also gave the opportunity to reflect on how to support working with what we identified as urban themes (described in 2.5). We have just started working with these themes and there are a number of open research issues connected in particular to fuzziness, mobility, and ambience.

Scale is a theme that is taken care of – a virtual floor and a 'rough' 3D reconstruction of the environment will make it possible to position objects, at a correct scale and with the perception of distances, and to create complex spatial set-ups.

Borders and Layers need to be further explored. Writing, drawing, and painting directly on the scene supports working with borders, marking terrains, and negotiating spaces for different uses. An open issue is how to 'make the invisible visible'. A city's infrastructure (pipes, underground traffic, etc.) can also be represented as a panorama but this would in most cases be a VR set-up.

Temporality: Urban projects have a diversity of temporal aspects. We already started working with urban rhythms – panoramas of a place at day, during the night, at busy times, etc. Another issue is inserting movement (of busy people, traffic, etc.), which up to now has been done through fuzzy images in the static panorama. The video augmentation is a natural way of capturing ongoing movement in a filmed scene. A third question is how to enable a dynamic debate and evolution of projects, keeping a trace of the different MR configurations. We currently save snapshots of each scene but these need to be stored in ways that represent important decisions.

Fuzziness: Our aim is to support different kinds of fuzziness ('le flou') – things being transparent, blurred, sketchy, diffuse, light, dense, just suggested. This is in parts also a question of content production which needs to be based on knowledge about representational techniques in architecture and artistic experience.

Ambience: Another aim is to support creating different atmospheres that evoke e.g. feelings of distance/proximity, serenity/anxiety? Sound, in combination with visuals, and light will play a large role in this.

Mobility, speed and flow: This about transit and traffic, visualizing the perception of the city according to different modes, levels and speeds of travel.

3.4 Scenarios of use

What we envision to be able to explore towards the end of project year 2 is firmly grounded in our observations, conclusions and plans for further technology development. At the same time we know from experience that further workshops with the IPCity technologies will stimulate new ideas and directions to take. In this sense the scenarios should be read as a plan for project year 2 which needs to be kept open to new and emerging possibilities.

3.4.1 Scenario 1: The Wall at Sainte-Anne

Themes

The wall surrounding Sainte-Anne (see Part II) encourages relationship between the patients and the practice of psychiatry from one side, the city and its inhabitants from the other side; inside patients and health care providers, outside neighbours, visitors.

For the patients, the wall is a pledge of intimacy and protection. It makes them feel at home, at least in an unified and quiet space. On an other hand, the wall gives them also the sensation to be locked up. For the medical staff, the wall helps structuring the inside space and to keep it under surveillance. For visitors, either patients not living in Sainte-Anne, patients' families or people enjoying the gardens, the wall is less present – "it's just the same for them as entering in any public building (university, administration, historical building...)"

For the neighbourhood, Sainte-Anne looks like a fortress, like La Santé prison located in the same street, a few blocks away. The wall protects them: while locking in the patients, it is supposed to protect them from "delicate" encounters. But the inhabitants of the district also have a feeling of curiosity and mystery on what happens behind the wall.

The professional visitors whether they are people coming for symposiums and conferences, researchers, or suppliers, the wall can be a help for orienteering, directing them. It's an important landmark in the urban texture. It is therefore considered by politics and administration as a cultural heritage.

The wall is doubtless of architectural quality. In this respect, dealing with the wall means dealing with materials, transparency, diversity, rhythm, depending on the perimeter for the action. The wall could than facilitate the physical understanding of the site in terms of closure/openness, intimacy/exposure, safety/security, by crossing sounds, borders, visibility, etc. from the two sides of the wall.

The wall can also be considered as a screen, as an information support, a landmark, an icon for the urban situation. Saying this, means that the wall can be considered as a media, the support of an exhibition for example. Knowing that there is a tradition in Sainte-Anne to encourage patients to express themselves trough graphic means, an exhibition of the art brut collection of the hospital could be an interesting way to express a link between the world of therapy and the outside world. People passing could also be involved by being able to give and modify information, leave and remove messages, etc.

The scenario

We have set up the MR-Tent in one of several alternative locations, as indicated below (see *Figure 79*).

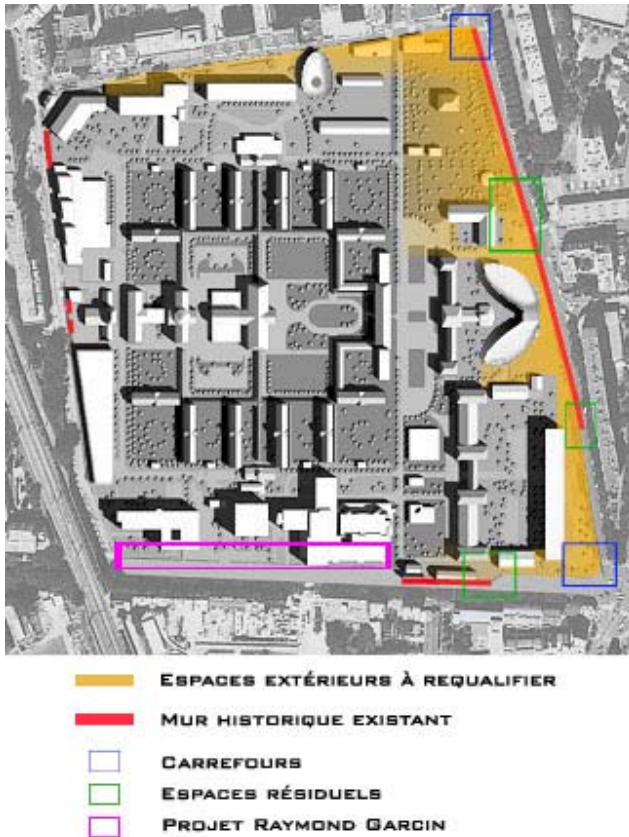


Figure 79: Planned alternative locations

Users start viewing the wall with the rotating camera, rotating the camera by rotating the colour table, zooming in, looking at interesting details, exploring different perspectives from inside onto the wall (see *Figure 80*). This helps establishing a shared understanding of the wall, its extension, and its variations.



Figure 80: Image of the existing wall

The architect in charge explains envisioned interventions sketching and writing on particular views of the wall.



Figure 81: The wall

The research team has prepared multiple panoramas with photographic images that allow exploring the view from inside, in daylight as well as during the night and create several layers (see *Figure 81*). This makes it possible to for example cut out parts of the wall in several places, filling them with transparent material. Users place cars and people that pass by or curious onlookers staring into the park behind the openings and let noise filter inside, mixing the sounds coming from outside with those inside. They experiment with different ways of creating movement behind the wall. One participant has to idea to at the same time let a crowd of conference guests invade the park.

The next step is to film the panorama and paint parts of the wall with different textures, including plants, exploring the effects of different materials.



Figure 82: Texturing the wall

See-through onto the wall is used for arranging an exhibition of art brut (see *Figure 82*). Another option is to explore the neighbourhood by looking up at the surrounding buildings, towering over Sainte-Anne, animating them with people.

Another panorama is used for exploring the view from outside. A walk around parts of the wall (using video) is arranged as well as the experience of looking through the openings inside, seeing staff and patients move around, providing vistas on some of the old and planned new buildings.



Figure 83: Images from the scout

There is also a role for the scout, who, equipped with camera, recorder and GPS, has taken snapshots and sound probes from different places outside (see *Figure 83*). The augmented map allows reconstructing where these have been taken. Users also can observe the scout by 'helicopter'.

3.4.2 Scenario 2: Brunnenmarkt and Yppenplatz

Themes

Brunnenmarkt is on the one hand supposed to preserve its attraction as a colourful ethnic place in Vienna, on the other hand there is the plan to upgrade the area extending its attraction to more affluent people and enlivening it also during the night. This has mixed implications for the old inhabitants.

One theme is connected to helping stall owners to imagine how the new stalls they are encouraged to install will look like, how they have to use a standard design but can vary it individually. Another change theme is upgrading the market, offering a larger variety and higher quality of goods, experiencing it at night, with the stalls lighted and cafés open.

Construction of an apartment building and a new super market at Brunnenmarkt has just started. There is the need to imagine how this will affect the market area.

Brunnenmarkt leads into Yppenplatz, a large square with market stalls on one end, a few small restaurants, and space for basketball. An important issue is borders and zoning – how to allocate different social uses. There is also room for events, such as theatre performances, and temporary art installations.

The scenario

The MR-Tent has been installed on Yppenplatz, with a camera view into Brunnengasse. The rotating camera turns around Yppenplatz, zooming in and out, with the urban renewal team sketching and annotating particular views, explaining the different options.

A see-through view onto Yppenplatz, with a virtual floor blended in, allows to place different social uses – children, elderly people on benches, outdoor gardens for restaurants, etc. (see *Figure 84*)– shifting borders, trying out different configurations. Associated with the visual objects symbolizing these uses are typical sounds, with the possibilities of experiencing how these sounds meet, disturb/eliminate/resonate with each other.



Figure 84: different social uses

Participants film the different zoning arrangements, sketching and annotating each of it, and store it with a small explaining caption.

A panorama view allows to change season and whether conditions.

Next users work with a video augmentation of Brunnenmarkt, with the camera capturing the place where the construction site for the supermarket is located. One of the architects has generated a 3D reconstruction of the scale model, taking a series of snapshots and applying textures. Although it is a fuzzy representations, inserting it in the video stream facilitates discussion of the entrance situation into the super market, with people entering and leaving. Stall owners place 3D reconstructions with the new stall designs, of varying length and with different textures, probing the effects. Also available are billboards with other types of shops, old-fashioned, modern style, exotic, having taken images from markets around the world. An issue is transparency, seeing the shops and entrances behind the stalls. The application supports quite precise positioning of these objects in line with or slightly behind existing ones.

In doing this, users switch to the panorama (which consists of two layers) since this allows them to remove all stalls or shops and replace them with the new ones. There are panoramas of Brunnenmarkt during the day and at night, in the summer and in winter. Again 3D reconstructions of stalls and small shops are available, including lighted cafés with people sitting outside (see *Figure 85*).



Figure 85: Prepared content for Brunnenmarkt

One of the construction sites is of particular concern since a decision about what to do with it is still outstanding. One of the architects rapidly produces a sketch on paper, colouring it. The sketch is scanned, the background extracted and a thumbnail printed out with a barcode.

The application allows bending the 2D image so that it has a '3D look'. Participants have an opportunity to see a possible solution in the panorama as well as in the see-through augmentation.

The augmented map shows the whole urban renewal area, with points of intervention marked. Each point corresponds to a series of images/video clips. The architect uses the map for telling a story about changed traffic flows, which are also visualized on the map and explains additional residential building projects close to Yppenmarkt, which are not directly visible.

4 Dissemination

The IPCity project, WP6 and the demonstrator were presented at a number of workshops:

- St. Anne, Paris, Workshop (June 15-16, 2006)
- GB16, Vienna, Workshop (September 25-26, 2006)
- MCIS, Venice, Workshop (October 8, 2006)
- Preparation Workshop (November 16, 2006)
- Vienna Workshop with architects (Dezember 1-2, 2006)
- The demonstrator has also been shown at the Beginner's Day at Vienna University of Technology with about 100 starting computer science students (October 2, 2006)

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*For further information regarding the IPCity project please visit the project web site at:
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