

**The Planum Plenum** - Strengthening dialogue among citizens: a challenge and an opportunity for town planners in the era of information society

## **The many voices of a city: involving the community of Bologna in the definition of the new city master plan by means of direct participation and interaction with new technologies**

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### **Foreword**

Bologna is a Northern Italy with 380.000 inhabitants in a metropolitan area that counts up almost 900.000 inhabitants.

Bologna is the regional capital of Emilia Romagna, and a compulsory point of passage between the North and South of the Peninsula: Bologna is thus a strategic knot in the Italian infrastructural system as the most important motorways and railways cross its territory.

In the charming historical center, among the best preserved in the world, many ancient palaces and churches stand and witness the cultural relevance that Bologna has had in the course of the centuries.

Bologna economy is based on the industry (mechanical sector and food processing), on its huge University and on some main activities such as its international trade fair.

### **Participation and co-operation process for the new master plan**

In order to define its new Master Plan (PSC <sup>5</sup>), the Administration of Bologna has chosen to value relations and to search synergies with all the institutions of the territory, the subjects that compose the economic and social tissue and the citizens.

Main aim of this activity is to conjugate institutional metropolitan co-operation <sup>6</sup> and promotion of a new role for the city Quarters, as a support to the decisions of the City Board

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<sup>5</sup> PSC is an acronym that stands for Piano Strutturale Comunale (City Structural Plan)

and City Council, in a dialogue that fully realises the possibilities of open participation and consultation given by the regional law on urban planning <sup>7</sup>.

The drawing, publication and discussion of the knowledge data base and of the “preliminary document” <sup>8</sup> has allowed the city "to watch itself to the mirror" and to begin to reason on the options of change for the future.

Involvement and participation have been promoted in different places and with different instruments and modalities:

- 1 Information and involvement of the city Quarters. Beyond forty public meetings held in the arc of year 2005 in the nine city Quarters.
- 2 The Forum "Bologna. A changing city". Constituted with the aim to widen the participation to the planning process and to discuss the contents of the new plan. Representatives of the institutions took part to the Forum together with the civil society, stakeholders, local committees and single citizens.
- 3 Renewal of the exhibition held in the urban centre called eBo. In order to favour the information, the communication and the active participation of the citizens, the urban centre of eBO has been renewed and reopened.
- 4 Discussion tables with the economic and social associations, carried out in the months of October and November.
- 5 the “planning conference” as a formal process which involves public local agencies and the competent public administrations <sup>9</sup>.
- 6 District laboratories. Some important transformation areas of the city are rethought through the combined contribution of technicians, administrators, local associations, committees and citizens. They have the opportunity to discuss and choose strategies and consequent design solutions <sup>10</sup>.

Work has been carried out with an extensive and systematic use of new technologies especially provided within the city GIS system <sup>11</sup> which aims:

- ? to make available the territorial, environmental, mobility, social and economic data;
- ? to allow, in an interactive way, the comparison between data of every kind, included historical data, in reference to a same physical or virtual element of the territory;
- ? to diffuse to inner and external users a varied complexity of queries for the database and results of simulation tools.

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<sup>6</sup> E.g. surroundings municipalities and Province

<sup>7</sup> Regional Law n. 20/2000

<sup>8</sup> The document containing main strategies and policies of the plan foreseen by Regional legislation.

<sup>9</sup> See more at <http://www.atlante.provincia.bologna.it>

<sup>10</sup> See more at <http://www.iperbole.bologna.it/iperbole/laboratoriomercato>

<sup>11</sup> See more at <http://www.comune.bologna.it/sit>

### **City Forum “Bologna. A changing city”**

The Forum is a place of discussion for the civil society (the associations but also the citizens). It was created with the objective to favor a full participation to the planning processes.

It has been articulated through a program of encounters in order to elaborate a document with the contributions of the city to its Structural Plan in course of definition.

The Forum has thus started in coincidence with the approval of the preliminary documents of the Plan in order to raise the discussion since the earliest planning phase.

The Forum has represented one of the more important innovations in the process of construction of the Plan, recording an intensity of participation, a competence on the thematic issues, and an attention to the specific themes of the various city situations, that did not appear at all foreseen.

The Forum activities, from the 14 of April to the 15 December 2005, have been articulated in six plenary sessions and ten thematic encounter, based on three main themes: environment, mobility and urban structure. Side by side to these public meetings a “virtual” Internet forum has been set up in order to concur to extend the discussion.

Proposals and problems raised from citizens, economic associations and categories, have been brought back to the institutional discussion and have contributed to a revision of the documents centers in the previous phase the adoption of the Plan<sup>12</sup>.

#### **FORUM NUMBERS**

##### **recorded participants**

- n° 150 associations
- n° 260 citizens
- n° 40 average participation to thematic sessions
- n° 180 average participants to plenary sessions

##### **Sessions**

10 thematic sessions  
6 plenary sessions  
2 city walks through areas of the city

##### **Contributions**

More than 50 written documents received and processed

##### **on-line Forum**

n° 176 recorded participants  
n° 240 messages  
n° 75 issues  
Contacts: min. n° 27 readings/message, max. n° 2322 readings/message

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<sup>12</sup> A new version of the Preliminary Document has been approved by the City Board on December 28th

### **City Quarters designers of the Plan**

The role of City Quarters has been recognized of extreme importance to widen the participation to active citizenship. During year 2005 Quarters have been involved three times on three different steps of the work:

- ? Local administration have been met in order to define a joint vision of criticities and opportunities of the territory
- ? In the first months of 2005 the analysis done at the local level have been presented and discussed in public meetings held in the Quarters
- ? In autumn 2005 the Preliminary Document of the Plan has been presented and discussed in public meeting
- ? The Quarters Councils formally defined their position towards the preliminary documents. Positions that have been integrated in the new version of the document.

The contribution of the Quarters, from the levels of government - Presidents, Councilmen, Commissions - to the citizens assemblies - revealed of decisive importance in the construction of a shared vision of the local territories: from indications for the removal of critical factors to the recognition of the real demand that every part of the city expresses to the Plan.

### **The Planning Conference**

The Planning Conference is the instrument of the institutional cooperation for the sharing of the changes that will interest the territory..

Introduced by regional law 20/2000, the activity of cooperation among public Administrations and territorial agencies is a necessary phase of the process of elaboration of the Structural Plan .

The Conference has recorded one extended sharing of the strategic objectives contained in the Preliminary Document.

The cooperation has been extended to a systematic activity of coordination for the Structural Plans being developed by municipalities of the metropolitan area,.

#### **Conference in numbers**

Obening: 14 september 2005

Conclusion: 18 january 2006

n° 5 sessions

n° 32 public agencies and administrations that have signed the minutes of the closing session

n° 24 written contributions sent

### **The City GIS as a tool for the territory**

Geographic Information Systems (GIS) are powerful instruments of collection and elaboration of the information that always serve as support for the decisions, and the planning activity.

Internet is changing the availability of GIS in radical way, allowing to pass from a hierarchical access reserved to skilled technicians to an open model which allows the direct access and participation of citizens and makes them the protagonists of the planning process. Bologna Municipality have extensive territorial data banks aged since 1996 by its GIS department <sup>13</sup> running under different environments. Since the year 2000 the Municipality have also set up a data warehouse where data coming from different sources and information subsystems are grouped and integrated, and may be accessed via territorial key.

Aim of this activity is to enable the exchange, the comparison and the evaluation of data using a territorial approach.

The System architecture is based on a set of integrated application programs which

- ✍ enables the running ,the updating of the territorial and cartographical data banks of the municipality
- ✍ enables the correlation to the territory of the managerial data available in the municipal information system
- ✍ makes it possible the access and processing of information to users by intranet and /or internet connections.

Data quality is guaranteed by decoding operations and correlation to the territory, essential condition for the creation of an effective data warehouse.

A Repository has been created in order to run and orderly keep the information relative to all data banks. Repository is a catalogue composed of metadata which describes the data banks connected to the GIS: technical cartographies, cadastre ,thematic cartographies and legacy data base.

The end user, by means of analysis and application programs, can enter the repository to select and load in his work environment the data banks he is interested in (cartographies or linked alphanumeric data).

The potentialities offered by the application programs run by GIS can be experienced at different levels and for their characteristic are addressed to differentiated profile users.

## **Innovative instruments**

### *New digital cartography*

Since 2001 the Bologna Municipality has been carrying out the new digital photogrammetric cartography and high resolution ortophoto at the scale 1:2000 for the whole Bologna territory of about 14.085 hectares.

**The Municipal Technical Map** is organized in structured levels reproducing each unit (in Gis model **procedure shape**) and elements of vectorial graphic “dress”.

In July 2002 the new cartography was completed with a relative digital ortophoto at the scale 1: 2000 of the whole Bologna territory, with a resolution level (1pixel =20 cm) that makes it possible to study details keeping intact the readability even at high scale. It is also possible to effect evaluations, i.e on the condition and consistence of public parks and gardens, buildings, street furniture ,road markings and conditions and other infrastructures even in difficult situations.

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<sup>13</sup> SIT – Sistema Informativo Territoriale: see web page <http://www.comune.bologna.it/sit>

### *The 3D model*

At first a TIN model was realized, starting from the morphological data reproduced in the Municipal Technical Map (i.e layers of level lines equidistant 2 mt. -ordinary lines- and 10 mt - guiding lines-, the quoted points , with a density of 2 points per hectare - 4 in areas of less than 2% slope), using the software 3D Analyst ArcInfo by ESRI.

An operation of clipping has been made to cut out the data outside the municipal border not to alter the model.

The resulting TIN, composed of 3 million triangles, accurately reproduces the physical form of the territory and can be analysed in bidimensional or tridimensional representations by the software ArcScene of 3D Analyst Program.

Buildings can be added to the ground model (by an operation of surface extrusion) using the value of their elevation quotes to obtain a virtual “ plastic model” of the city and of the territory.

To make the model more realistic we have worked with Technicians who, using the Skyline Terra Building software, have shaped the ortophoto on the building sizes and on the landscape morphology.

To make it possible they have converted the TIN in GRID, a grid composed of 5 mt cells.

To obtain a good result we need an ortophoto and cartographies georeferred to the same reference system and the same precision values ( nominal scale 1: 2000)

The result is a very detailed and realistic model from the geographical point of view ( more than 50.000 objects are reproduced) ideal to run georeferred data.

The 3D model obtained is richer than a photography of a 3D design and allows a complete mobility , in three directions, on the represented geographic surface :that is a real virtual flight over the city.

The creation of the model, starting from the buildings and the ortophoto, makes the flight time dimension static ,linked to the date of the updating of the used material.

This limit does not exclude the possibility of increasing the information offer of the program with updating modalities and improvements (enrichments) in order to satisfy the need of reading (reproducing) the actual changes of the urban reality.

A first application of the system makes it possible, to analyse, from a highly dynamic point of view ,the prospects of development in the urban planning.

Infact it is of a great interest to evaluate, from an urbanistic point of view, the impact resulting from the building of an architectural area .So adding the area of the project to the model,we can simulate planning hypothesis.

### *Internet access to the 3D model*

The acquired model is then internet navigable from the GIS web site such as a flight simulator and thanks to the informative substrate richness (more than 50000 objects) it supplies a realistic vision of both the city and the landscape.

The system offers the users the possibility to see and know their city from a different point of view, through an approach more involving and interactive than traditional maps.

We can add to the model thematic layers, for examples the map of hospitals, monuments,museums,city services ecc. This is the highest level of integration between SIT data banks and 3D model.



### **Foreseen developments**

The next phases of the forum will take place in 2006.

To that purpose a new web instrument is being developed: the "Cartographic Forum", that is based on WebGIS application allowing interaction and integration on territorial data. It is conceived as an integration between a classic web Forum with a GIS.

With this system the final customer can interactively express a comment relative to a specific localization of the chosen territory on the cartography; the moderator therefore can start topics on territorial base, in reference to a specific public service, or to the realization of a given project of transformation, or to optimal localization of particular resources.

A system of consultation of the state of the urban planning instruments is now being published: through an interface of easy reading it is possible to reperire information of detail plans, reference technicians, iconography and whatever available in order to supply the citizens with the best vision of what is happening in the city.

These services in continuous enrichment and modernization are thought as web applications but they are made available also on multimedia emplacements for free consultation at the Urban Center eBo.

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## Ortophotos "dress" 3D model



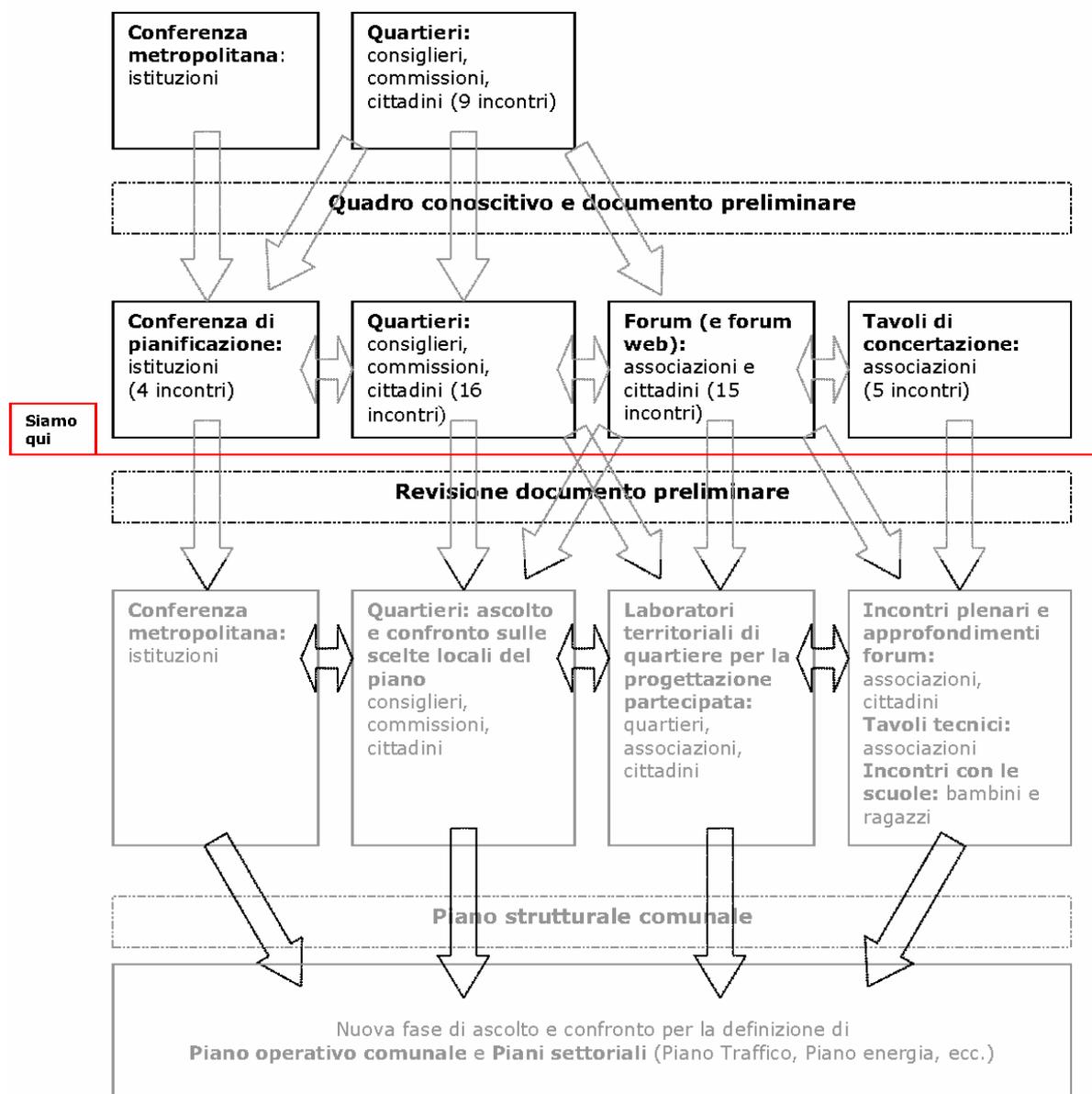
The DEM and the 3D models for all the buildings and the relative ortophotos which "dress" their shapes were obtained by the aid of dedicated devices. The acquired model is then internet navigable such as a flight simulator and thanks to the informative substrate richness, beyond 50,000 3D objects, it supplies a highly realistic vision of both the city and the landscape.



*An example of the 3D model*



*The Forum map being discussed. The final version of the map has been translated to the GIS publishing applications.*



*The Cooperation and Participation process for the new Structural Plan*



*Discussions in the Forum thematic sessions*