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City Action RDT Programme. Towards a better liveable city. Background paper.

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The scope of the programme refers to the diagnostic aspects by developing instruments to deepen the understanding of the city problems and the cure aspects by pointing to increasing the portfolio of options.

The program is subdivided into three objectives and 5 actions.

- Objective A): To develop new global urbanistic concepts aimed at the promotion of human centred (*agora*) city plans which, by applying technology options will enable social cohesion, cooperation for co-development of human being, multi-cultural and multiracial co-existence.
    - ACTION 1- Develop new global urbanistic concepts integrating technological building blocks and verifying applicability to actual city cases
- Objective B): To create the condition, by using technology options, to master the pressures from the globalisation of the economy on the city development choices and future prospective with the aim to maintain the local diversity and valorise the local resources.
    - ACTION 2 - Identify instruments to promote the city and its regional basin as local interactive networks
    - ACTION 3 - Promote the development of new functions and services from intra- and trans-urban networks
- Objective C): To contribute to develop technology options for the realisation of a sustainable city.
    - ACTION 4 - Develop simulation models of given cities for effective assessment of alternative actions
    - ACTION 5 - Assess technology options to approach the challenges of a saturated city system

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CITY ACTION RDT PROGRAMME

TOWARDS A BETTER LIVEABLE CITY

background paper

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CITY ACTION RDT PROGRAMME
SUMMARY

GENERAL AIM

* to better understand the behavior of the city system
* to envisage solutions using technology options and conceptually testing their impact on the city as a global interacting system
* to valorize the diversity and exploit the local assets
* to add value to the actual local innovative initiatives by providing a common scheme for evaluation that can help the diffusion of successful approach to other cities.

EXPECTED RESULTS

to update and enlarge the portfolio of ideas on potential solutions using technology options to help translate perceived challenges into problems definition in order to initiate actions on actual city systems

THREE OBJECTIVES
5 ACTIONS

Objective A) *to develop new global urbanistic concepts aimed at the promotion of human centred (agora) city plans which, by applying technology options will enable social cohesion, cooperation for co-development of human being, multi-cultural and multiracial co-existence.*

ACTION 1 Develop new global urbanistic concepts integrating technological building blocks and verifying applicability to actual city cases.

Objective B) To create the condition, by using technology options, to master the pressures from the globalization of the economy on the city development choices and future prospective with the aim to maintain the local diversity and valorize the local resources.

ACTION 2 Identify instruments to promote the city and its regional basin as local interactive networks
ACTION 3 Promote the development of new functions and services from intra- and trans-urban networks

Objective C) *To contribute to develop technology options for the realization of a sustainable city.*

ACTION 4 Develop simulation models of given cities for effective assessment of alternative actions
ACTION 5 Assess technology options to approach the challenges of a saturated city system

FAST 29 April 1994

CITY ACTION RDT PROGRAMME

TOWARDS A BETTER LIVEABLE CITY

1) THE RATIONALE

To live and to govern the city is increasingly difficult. This is dramatically evident in very large urban agglomerations. While the city remain the privileged space for human development, an 'urban malaise' seems to diffuse to all cities, even those with a more manageable size.
What the reasons for? which the symptoms? can we develop a diagnosis followed by a cure? can RDT be of help?

The challenges and problems facing cities are numerous, complex and difficult to delimit. Three groups of problems emerge quite clearly:

* problems related to human co-existence (social exclusion, multicultural and multiracial conflictual situations), representation and consensus (governance difficulties)
* problems related to the pressure from the globalization process leading to development choice disconnected with local needs and social networks betterment;
* problems related to the reaching of saturation levels in many of the city functions and characteristics (such as saturation of traffic, air pollution, social solidarity);

To simplify, the situation can be synthesized by pointing to three syndromes that characterize the 'urban malaise':

* ***the alienation syndrome***: excessive specialization and functionalization of urban space.
* ***the de-localization syndrome***: globalization's challenge to the local identity in a multidimensional networked space.
* ***the holistic syndrome***: everything interacts with everything else inducing a crisis in city governance.

In terms of actions three new concepts are emerging that synthesize aspirations towards a better future for the cities:

* 'agora' city - a human centred city with an harmonic relationship between the citizen and the urban space, social cohesion and economic development.
* 'glocal' city (global/local) - a city with a better balance between the globalization process and the ability to valorize local resources and diversity.

* **'sustainable' city** - a city that internalize the problems it generates solving them instead of transferring to others or to future generations.

Accordingly, the initiatives are already numerous. To those started at the national and local levels other are added sponsored by the European Union.

Some of them explicitly refer to the call of RDT to develop advanced approaches to problem solving. All of them recognize the novelty of the situations and of the challenges that require to react with innovative and creative approaches, experimenting 'on the field' with pilot projects.
The table in the following page summarizes the EU initiatives.

The new URBAN initiative, recently approved by the European Commission, is a major shift in the scale of EU intervention, recognizing the need to launch pilot projects to test innovative ideas to help cities (that fall under Objective 1 and 2 of the Regional Fund) to react to crisis and decline.
While the 4th FW Programme for the Scientific and Technical activities of the European Union already develop several actions that directly or indirectly deal with city problems, there is the need to update and increase the portfolio of technological options not only to react to urgent critical problems, but to help the transition towards the desirable city of the future.

RDT can give important contributions in this process by evaluating the existing potential solutions, by developing new ideas, by pre-assessing the response to actions of the highly complex city system.

The City Action RDT Programme ***intends to produce a portfolio of specific ideas for future 'on the field' actions which will complement and accompany those already underway*** (which, been decided as urgent reactions to the city challenges, are based on the limited available options).

EU COMMISSION INITIATIVES ON CITIES	
DG-I	MED-URBS (NETWORKS OF CO-OPERATION OF NEIGHBORING MEDITERRANEAN COUNTRIES)
DG-III	ANALYSIS OF URBAN GUIDED TRANSPORT INDUSTRY
DG-V	HORIZON (SOCIAL INTEGRATION IN URBAN ENVIRONMENT), POVERTY III (EXCLUSION PROBLEM), ERGO & LEDA (DEVELOPMENT OF KNOWLEDGE BASE WITH FOCUS ON URBAN ISSUES)
DG-VII	INTERSERVICE GROUP ON URBAN COLLECTIVE TRANSPORT
DG-X	CENTRES FOR LOCAL URBAN INITIATIVES IN 6 CITIES
DG-XI	GREEN PAPER ON URBAN ENVIRONMENT & EXPERT GROUP; LIFE (PILOT PROJECTS IN 3 CITIES AND INTEGRATED MANAGEMENT MODELS TO IMPROVE URBAN ENVIRONMENT), SUSTAINABLE CITY
DG-XII	RDT ON GENERIC TECHNOLOGY RELEVANT TO URBAN ENVIRONMENT, ENVIRONMENT RDT PROJECTS RELATED TO SUSTAINABLE CITY PROBLEMS, RENEWABLE ENERGY IN HISTORICAL CITY CENTRES, MONITOR/FAST ON 'THE FUTURE OF CITIES: THE ROLE OF S&T' AND SUPPORT OF ROME NETWORK (16 CITIES)
DG-XIII	PROJECTS IN ESPRIT ('INTEGRATED HOME SYSTEMS', 'INTELLIGENT BUILDINGS'), RACE II URBAN RELATED PROJECTS (TELEBANKING, ETC.); DRIVE (31 CITIES INVOLVED IN TRANSPORT RELATED PROJECTS), DELTA (DISTANCE LEARNING); AIM&TIDE (DISABLED AND ELDERLY PEOPLE)
DG-XVI	STRUCTURAL FUNDS PARTICIPATION IN CITIES UNDER OBJECTIVE 1&2; RESIDER, RENAVAL, RECHAR, RETEX (ECONOMIC CONVERSION OF CITIES UNDER INDUSTRIAL DECLINE); EUROPE 2000 (STUDY ON URBANIZATION AND FUNCTION OF CITIES); CO-FINANCING OF 15 URBAN NETWORKS
DG-XVII	ENERGY MANAGEMENT PROJECTS SUPPORT; EUROPEAN NETWORK OF CITIES FOR ENERGY MANAGEMENT; THERMIE (ENERGY SAVING PROJECTS RELATED TO URBAN ISSUES); SAVE (SPECIAL ACTION FOR VIGOROUS ENERGY EFFICIENCY); ALTENER (ALTERNATIVE ENERGY)
DG-XXI	STUDY ON FISCAL ASPECTS OF URBAN CONCENTRATION, PROJECT IN THE FIELD OF LOCAL TAXATION (WITHIN THE MED-URBS INITIATIVES)
DG-XXIII	EURO-INFO CENTRES; BC-NET, STUDY ON 'RETAILING AND THE CITY'
EUROSTAT	URBAN DATA DEFINITION AND COLLECTION
SECRETARIAT GENERAL	EUROPEAN DRUGS MONITORING CENTRE; TOWN TWINNING
JOINT RESEARCH CENTRE	DSS (DECISION SUPPORT SYSTEM) FOR COMPLEX MATTERS SUCH AS URBAN TRANSPORT &SOLID WASTE MANAGEMENT. URBAN QUALITY STUDIES IN A FEW EUROPEAN CITIES.
EUR. FOUND. FOR IMPR. WORKING CONDITIONS	SOCIAL INTEGRATION, LAND USE MANAGEMENT IN URBAN ENVIRONMENT

2. THE AIM AND THE SCOPE

To counteract to the syndromes of the urban malaise one need first of all to deepen the diagnosis of the situation identifying options for cure and then plan corresponding actions.
The situation is in many cities so compromised that one need ***to rethink and to replan the city to regain liveability and governability,*** *far from the ill effects of saturation.*
The **aim** of the program is to contribute building **a portfolio of ideas and potential solutions** as options for updating and reviving urban planning.
It is a most important aim since today the ability to even think of urban planning seems to be lost.

The **scope** of the programme refers to the diagnostic aspects by developing instruments to deepen the understanding of the city problems and the cure aspects by pointing to increasing the portfolio of options.

To point to **the need for better instrument to diagnostic** the city illness one can look at the city problems from different points of view.

From the viewpoint of the ***organization and use of the urban space*** there is an excessive specialization and functionalization of the space. This has made less efficient to use the city services and to live and work in it. Furthermore, there is an increased interference of the external space organization (trough the development of global networks) on the city one. It looks like if the space has become multidimensional with different *metrics* according to the variable one is looking at: physically faraway points can become very close, while close ones can be felt as faraway according to the existence or not of communication infrastructures. A tension is developing between the physical feeling of the space and the virtual proximity for faraway points in the infrastructures networked space. The citizens cannot but feel the increasing dis-harmony with the urban space, developing alienation, segregation, impotence to take action to modify the situation.

Considering the city ***as a privileged space for economic activity*** one detects a decrease in efficiency. The ability of the city to develop virtuous circles of wealth generation is broken. In the past, economic activity produced 'positive' externalities that increased the advantage to locate further economic activities. This seems now to have turned to the opposite, producing 'negative' externalities with negative effects not only on economic activities, but, more generally, on the quality of life in the city. To this, one should add that the 'individuality' of the city as a centre for wealth production seems to be loosing ground to the new phenomena of globalization. The low mobility of production factors which in the past has been the base to develop local advantages, is now substituted by an increased volatility. This leads to the necessity for the city to compete with other ones to attract the localization of globalized economic activities. The risk is to loose autonomy, drown the 'diversity' assets in a 'sea'

of homogenization, become a 'dual' city separating dwellers from users, the ones that take the burden (the tax payers) and the ones that get the advantages (the 'foreign' users).

More in general, looking at the city from the viewpoint of ***the multifaced social process*** that develop in it, one detect a decreasing ability to govern the process. Everything is interacting with everything else. The system is close to saturation in many of its characteristics and it becomes difficult to efficiently manage it.

To move from diagnosis to actions, to unblock the current stall in urban planning, society needs ***to agree on the priority values and objectives*** and to spell them out ***in a desired 'future scenario'*** for the city. It is felt that a new vision of urban plan is needed. A clear one, however, has not emerged yet. Technology should be called in to help. To take advantage of technology, however, depends on our ability to define clear objectives to be met. Technology directions of progress have to be considered as providing opportunities more than biasing the setting of values and objectives. Opportunities have to be understood in terms of objectives to be reachable. [1]
Technology options are needed that will help to overcome the alienation, de-localization and holistic syndromes. New concepts has been advanced for urban planning such as that of 'the urban village'. Others need to be developed to increase the portfolio of alternatives to help better focusing the terms of reference for a desired city scenario. And for all the different scenarios meeting the overall objectives of a desirable city, it has to be spelled out clearly what role will be played by technology.

The programme will contribute by developing a portfolio of technological options to make the chosen scenario feasible

But is technology - which tends to develop along its own trajectories - a tool available for whatever scenario? The present programme will show that the answer is positive and that it can support a desirable human-centred scenario far from the following two extreme caricatural scenarios to which technological options often refer:

* **the super-functionalized and space-specialized city**: the sectoralization of the *modernistic* city plan that have divided its space into 'efficient' monofunctional zones (where to work, where to shop, where to live) - with the citizens hurrying as aliens to move from one zone to the others - will be increased by the intervention of the new ICT (information and communication technologies). Intelligent skyscrapers, glass-surfaced building will represent the added new specialized zone of teleports for specialized service to the global economy, with further alienation induced by the 'dual' city.

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[1] This might be particularly difficult for new technologies - such as ICT, biotechnology and bioengineering, non-linear system modeling - the full potential of which in terms of applications has yet to be grasped. For this to happen we are required to develop visions on the alternative futures made possible by the use of technology.

* **the virtual-space home-centred city**: thanks to the new ICT a super-functional home is the place where the individual can stay to perform all the functions (telework, teleshopping, telebank, teleschool, teleplaying) with no need to move others than for leisure.

To guide the RDT action program it is important to ***spell out the desirable human centred city scenario***. To define it, one can learn from revisiting the city of the past where the urban space were organized - at the fine local scale of the quarters - to allow a complex uniform mix of activities and functions. In the same buildings lived rich and poor people, artisans and *rentiers*, professionalists and workers. Boutiques and shops, offices and small factories were more or less uniformly distributed across the quarters. Individuals interacted easily in an informal ways in the streets and piazzas.
We refer to this scenario as that of an **agora city**.

In general the scenario for a desirable city point to three directions of change with respect to the present prevailing situation: towards **sustainability**, **glocality** and **agora**.

THE THREE DIRECTIONS OF DESIRABLE CITY SCENARIO	
towards sustainability	
from a **reductionist** city (a parcel of an exogenous standardized global production system) whose future is exogenously determined and depends from the ability to win harsh competition with other cities	to a **self-supporting** autonomous local holistic system inserted in a network of interacting local systems
towards glocality	
from the city as a modern castle **citadel** with high towers of information hubs ('excellent' buildings) connected to the external worlds of infrastructures **surrounded by the bidonville** of the '*servi della gleba*'	to an **integrated local space**, (a set of human-social-institutional local networks) developing **a local network logic based on diversity** and local assets which balance the logic of the global external dominance
towards agora	
from an **hierarchical segmented functional** urban plan	to a ***milieu*** of urban culture which values co-existence and co-development.

The space organization should favor the natural needs for socialization of the human being, favoring solidarity and social cohesion, while the technological options should permit to regain the efficiency of the city 'machine' to assure development prospective by valorizing the local assets of diversity.
With respect to the city of the past the new 'agora' city should be able to find an equilibrium between a human centred local space and the 'multidimensional networked virtual' space in a balanced 'local-global' (glocal) vision of human activities.
Another important new aspect with respect to the past is that leading to the holistic syndrome due to saturation and unsustainability of the city system. Lacking the possibility to increase the capacity of the system the scenario has to include ***a new 'wisdom of complexity'*** that permit to regain governance of the system by better understanding its intrinsic dynamics so that human action can find a multiplicative effect in the endogenous system forces to assure an inter-generational identity of the local diversity in an autonomous and self-supported (sustainable) city system.

3. THE CRITERIA TO FOCUS RDT ACTION ON CITY PROBLEMS

The endeavor needed to develop a better future for the city - regaining its past role of a privileged centre of civilization - is certainly ambitious in its aim, large in scope, requires long term commitments and social consensus (difficult to be met in a so complex situation). It will require to follow parallel roads of search with trials and errors accepting the need to experiment *in vivo*.
Policy makers are confronted with the contrasting needs to intervene with urgency (at least to tackle emergency situations, to fight against the decline and the increased ungovernability of the city saturated systems), while deeper reflections are needed on the best way to proceed and on the definition itself of the problems requiring a solution. The decision-making situation is paradoxical, because the ability to intervene with urgency has to rely on the existing subdivision and sectoralization of institutions with power to act, while the complexity and saturation of the system require an integrated approach.
One has therefore to expect that trials and errors trajectories (including the emergence of new actors and institutions to better deal with the city problems) will be followed also at the general level of policy-making .

Because of the expected state of flux in city policy-making, it is important that RDT actions are anticipated to help improving the policy-making mechanism itself. To see how, one has to better understand the complex decision-making process through which, at the end, direct actions aimed at system changes will develop.

The process to arrive at such a decision normally begins with the identification of a challenge. It might be *the desirability of a scenario* different from the today state of the city (e.g. that for an 'agora' city). It might be *the preoccupation to compete with other cities* to attract 'foreign' investments adding a 'local value' to new 'volatile' technologies. It might be *the need to address local problems*

resulting from reaching saturation.
The challenge however is not yet a detailed specification of the problem to be solved. A given challenge might lead to focus on alternative problem specifications. On the reverse, the process to try to specify the problem might unveil a deeper challenge masked from the preliminary perception.

To pass from the challenge to ***the specification of the problem*** *to be solved* and the related plan for action is therefore a complex circular process where perceived challenges are confronted to potential solutions. In the process, initial challenges are better focused or redefined, needed actors are identified (which might not be represented by existing institutions), and so on.
RDT can contribute to this process the more so the more the challenge is a new one. The more the complexity of this first phase of the global decision-making process is recognized and the necessary resources allocated, the better it will be for the subsequent problem-solving phase.

The first phase (from challenge to problem specification) is aiming at the **effectiveness** of the problem-solving process (definition of values, objectives, targets, actors) while the second one is concerned with efficiency.
RDT can play in an important role in the search for effectiveness and not only for efficiency.
Specifically, the role of RDT at effectiveness of action is to assure that:

* a better and deeper understanding of the city as a complex system be available to permit detailed diagnosis of the city syndromes,
* a sufficiently large portfolio of ideas on potential solutions be available so that an *'optimal selection'* of the problem specifications to respond to the challenges is done (no short cuts followed due to lacking of ideas while under the pressure 'to do something').

The present City RDT Action Programme is focused to the effectiveness phase of intervention.

The three directions of change that characterize the move towards a better city scenario are very innovative and require the support of many RDT areas as the few examples in the table indicate.

TOWARDS	EXAMPLES	INVOLVED TECHNOLOGIES
sustainability	- air pollution - security - waste management	- energy, traffic, work mngt, ecology - ICT, social sciences - biochemical processing
glocality	- equality access to network - public transport - utility network management	- ICT, cabled city - driver aids, dial a ride, light metro - system modeling
agora	- neighborhood feeling - urban plan	- ICT tele-services - urban science, city modelling

4. PROPOSAL FOR RDT ACTION

The proposed RDT agenda is targeted **to update and enlarge the portfolio of ideas on potential solutions to help translating the perceived challenges into specific problems definition** to initiate actions on actual city systems (to move them towards the implementation of the characteristic spelled out in a desirable city scenario).

The basic aims of the RDT agenda are:

* to better understand the behavior of the city system
* to envisage new solutions and conceptually testing their impact on the city as a global interacting system
* to valorize the diversity and exploit the local assets
* to add value to the actual local innovative initiatives by providing a common scheme for evaluation that can help the diffusion of successful approach to other cities.

The RDT agenda refers to **3 objectives** and the programme is subdivided into **5 actions.**

The first appeal **(Objective A)** is related to the importance to develop new global urbanistic concepts based on the agora city scenario.

The recommendation **(Action 1)** is to call urban designers together with other urban scientists and researchers to develop their own interpretation of a new city responding to the 'agora' scenario by making use of new technologies. Multiple independent response are needed so that - by comparing them - we could extract suggestions for more mundane initiatives on modifying existing urban environment. Since the city is a complex system made of sub-systems and of 'elementary units' (building blocks), the global urbanistic concept should be accompanied with ideas on the potentialities to innovate and to change the city 'elementary' building blocks.
The availability of a portfolio of ideas and potential solutions from both a global city concept and city 'elementary' building blocks can help decision-makers of a specific city to tackle the problem of the reality of the present state of the city system and to take actions to help the system to move towards the desired scenario. To help this effort the urbanistic global concept exercise should be extended to show the potentiality of application of the underlined design philosophy to few selected significative cases of different cities.

The second area of concern **(Objective B)** is that of the impact of globalization on the city future perspectives. In the Western World the response to the globalization challenge is often seen as a move towards tertiarization and to high technology industrial products. The de-localization of more conventional industrial activities is accepted as a trend difficult to contrast. Development of

complex services to production is considered a prerequisite also to shift production activities to higher technology products. Public policy to help the shifting tends to concentrates on initiatives having a high visibility, such as the construction of high rising 'intelligent' buildings to host new services activities, the launching of specialized districts (such as research parks, business innovation centers, technological districts), the adoption of special facilities (such as teleport) to assure interconnection with the world communication system, and so on.
This action-plan is based on a somewhat pessimistic vision of the internal capabilities of a declining city to change the course of events without interventions from the exterior. Technology is called in to 'adapt' the city to serve the needs of the external users by realizing sophisticated facilities and assuring connection to the wide open world.

The pertinent question to respond to the globalization challenges, is whether the outbound approach to adapt to external changes is the only one.
An inbound approach might be tried that assumes more optimistically that the city has internal capabilities to react to the challenge taking advantage of its 'diversity' and looking for internal leverage effects.
The alternative here proposed to respond to the globalization challenge is to invest to substitute the balanced network logic for that of center-periphery. By balanced network logic it is meant that the different nodes can participate to the network activity and creativity in a non-hierarchical way, so to increase the opportunities to exploit existing potentiality of each node.
To make an example, the 'network logic' might facilitate the emergence of a new functions and services to the small firms in the network that can act as a "meta-organizer' substituting for the role played in the past by larger industry (as client of local suppliers) which might now be in crisis.

The network logic therefore points (Action 2) to the need to improve the infrastructures of the local networks.

It also let emerge specific problems whose solution (Action 3) leads to the development of new services that enrich and valorize the portfolio of existing production capapabilites.

The challenges coming from the saturation of city systems is well perceived.
It is also well recognized that to respond to the challenge and to move towards (Objective C) the realization of a sustainable city one needs an integrated approach while our decision-making capability is sectoral organized.
The perusal of the challenges that are on the discussion table on the issues for a sustainable city, the confrontation with potential solutions (that the RDT activity will have contributed to collect and to develop) should permit first of all to contribute to underline the ambiguity of the challenges, and how dangers an opportunities might be mixed together
To show potential results to be expected from this type of study, the first point to be considered is that the challenge is coming from a very complex system (therefore a precondition to successful intervention is that the problem solving

process be adequate to the complexity of the system). The second obvious point is that **the more one knows on system behavior the more one will be able to make "rational" choices.** This statement carries even more weight if one considers necessary **to seek for leverage effects** from the system. To do this not only one has to understand the system as it is now and how it behaved in the past, but how it will move in the future and to which extent it will feel the intervention or not.

On the research agenda one will therefore have to point (**Action 4**) to the need **to improve our understanding of city behavior as a complex system.**
In general one should call attention of the science policy to put the **research on "urban science"** among the priority issues.
To an increased interest in fundamental research, more **applied intervention** are to be added to help the decision-makers to respond to the urban challenges.
Recipes are well known and should be implemented.
The advancement in complex system simulation can be applied to **develop specific "simulation models" of given cities** to be used by the concerned actors to simulate effects of conceived intervention.

The following item (**Action 5**) in the research agenda is to **develop a portfolio of specific ideas, and assess them, on potential solutions using technology options to approach the challenges of a saturated city system.**
Because of the inertia of any large and complex system for the proposed solutions to be effective one should try to look for leverage effects coming from the system endogenous dynamical trends.

In synthesis the Proposal RDT plan for action is divided into 5 actions responding to three main objectives (*agora, glocal, sustainable* city), each one corresponding to one of the three directions of change to move to the desired better liveable city scenario.

CITY ACTION RDT PROGRAMME

GENERAL AIM

* to better understand the behavior of the city system
* to envisage solutions using technology options, conceptually testing their impact on the city as a global interacting system
* to valorize the diversity and exploit the local assets
* to add value to local innovative initiatives by providing a common scheme for evaluation that can help the diffusion of successful approach to other cities.

EXPECTED RESULTS

to update and enlarge the portfolio of ideas on potential solutions using technology options to help translate perceived challenges into problems definition in order to initiate actions on actual city systems

THREE OBJECTIVES
FIVE ACTIONS

Objective A) *to develop new global urbanistic concepts aimed at the promotion of human centred (agora) city plans which by applying technology will enable social cohesion, cooperation for co-development of human being, multicultural and multiracial co-existence.*

ACTION 1 Develop new global urbanistic concepts integrating technological building blocks and verifying applicability to actual city cases.

Objective B) To create the condition, using technology options, to master the pressures from the globalization of the economy on the city development choices and future prospective with the aim to maintain the local diversity and valorize the local resources.

ACTION 2 Identify instruments to promote the city and its regional basin as local interactive networks

ACTION 3 Promote the development of new functions and services from intra and trans-urban networks

Objective C) *To contribute to develop technology options for the realization of a sustainable city.*

ACTION 4 Develop simulation models of given cities for effective assessment of alternative actions

ACTION 5 Assess options to approach the challenges of a saturated city system

APPENDIX

ACTION 1 Develop new global urbanistic concepts integrating technological building blocks and verifying applicability to actual city cases

Problem statement

We seems to have lost interests in the design of '*new cities*'. This might be due to deception from the outcome of the application of the *functionalist city concept* and from the development of the 'new cities' of the years '30-40. Or, we are so overwhelmed by the urgency of the problems to be solved in existing in-urbated area that we have no time and space to dream about new cities.
We accept that the basic issues in urbanization is to do something on the existing inhurbated spaces. However, it will be a mistake to think that to conceive a desirable city - starting from the green field - will be of no use if our problem is to restructure an existing city (such as, thinking of new uses of old industrial buildings, how to change the quality of life in dormitory quarters, how to insert a 'city spirit' in peripheral urban zones).
The design of a conceptual '*new city*' could show concretely how new ideas - that derive from the sensitivity of the urban designer to the society needs and dreams as well as from the new technological options - can be integrated together into a coherent approach.
A portfolio of alternative conceptual cities will help to show possible actions to respond to today city problems. Multiple independent response are needed so that - by comparing them - one could extract suggestions for more mundane initiatives on modifying existing urban environment.

The city is a complex system made of sub-systems and of 'elementary units' (building blocks). The availability of alternative global system concepts is important as an ideal reference against which to frame the concrete intervention on a given existing city. On the other hand one needs also to be confronted with ideas on the potentialities to innovate and to change the city 'elementary' building blocks. Therefore, in parallel to filling the portfolio of ideas with potential solutions on the global city concept, one needs ideas and suggestions on a lower scale, that of city's elementary building blocks.
How much elementary is a building block is part of the question to which the RDT activity has to respond. To support the scenario of an 'agora city', the building blocks should be complex enough to assure the integration of the qualities that characterize the city scenario. All the ingredients to assure the quality of life in the city (mobility, environment, security, human relations, work, amenities, social activities) should be represented in the building block. Or, at least the building block has to show its ability to behave as an interactive node in the web of networks of city activities.
A reference block might be a building, a quarter, a cross road between quarters, an entire mono-function network (e.g. the health care network).

To give examples, if it is a *building* it might have to be characterized as an 'intelligent' one (to assure integration on the communication networks, optimal response to energy use and to waste disposal, etc.).
If it is *a quarter* it has to show how a mix of different activities can easily be included, how basic issues such as security are taken into consideration, how technology could facilitate diffusion of service to people, commercial activities and so on.
If the building block is *a specialized network*, such as the offices of the local municipalities, the solution has to show the provisions to facilitate access to the network service by the users, the integration with interactive communication networks, the ability to produce quick response to emergency, etc.
If it is *a cross road block*, it has to show integration of public and private transport, flexibility for installing future new infrastructure for physical and communication services, contribution to quality of the environment (e.g. reduction of noise level), integrability of construction techniques with existing viary system and service networks and buildings, speed up of construction time, etc.

Each city is an individual system having its proper identity which resulted from a complex interactions of history, cultures, recent and remote events, physical and human resources. The action on a specific city is therefore a specific project to which RDT of course can contribute.

The availability of a portfolio of ideas and potential solutions from both a global city concept and city 'elementary' building blocks can help decision-makers of a specific city to tackle the problem of the reality of the present state of the city system and to take actions to help the system to move towards the desired scenario. The question to be posed here is, however, if RDT could contribute to build examples of potential solutions on the possibility to intervene on the actual city system with its individual and idiosyncratic characteristics. This could be done if, while respecting the individuality of each city case, we accept that there is a taxonomy of cases that can be considered as a rough reference for the individual city. As a matter of fact, studies on the major european cities have allowed to identify few paradigmatic models.
One such classification refers to five subsystems-networks to characterize a city: i) economic and industrial subsystem, ii) social structure, iii) technological subsystem, iv) environment, v) internationalization.
Using these key elements to look at the city system, typical patterns emerges:
a) cities having an *international leadership* (subdivided into 'pure' cities - e.g. London - and 'complete' ones - e.g. Paris);
b) cities in *industrial and technological transition* (subdivided into cities in 'technological transition' - such as Munich, cities with 'consolidated industrial structure' - such as Dusseldorf, cities 'functionally constrained' - such as Genoa, cities with a 'traditional industrial structure' - such as Bourdeax);
c) cities into *negative industrial transition* (subdivided into cities under 'tertiarisation' - such as Utrecht, and cities under 'urban obsolescence' - such as Manchester).
The paradigmatic characterization of cities into city models can therefore be used to apply the potentialities both of the 'new cites' concepts and of the

'elementary new building blocks' to show the possibility of intervention in different types of cities.

Action

To call urban designers and other urban scientists and researchers to develop their own interpretation of the 'agora' city scenario by designing a 'new city' which make use of new technologies.
To compare the alternative designs to extract suggestions for more mundane initiatives on modifying existing urban environment.
The concepts should illustrate how new 'elementary building blocks' for the city can be developed using adapted technology as a base to intervene for the transition from the today city to an 'agora' city. The building blocks should be complex enough to assure integration of the qualities that characterize the agora city scenario.
Efforts should be made to show the applicability of the new city concept. By starting from an actual city plan, one should show how it can be moved in the direction of a chosen reference 'new city' plan by the aid of the introduction of new elementary building blocks. One or more specific cities to be investigated will be chosen with reference to a city taxonomy, coming from the analysis of today city dynamic patterns.
To show the applicability of the concept to a concrete city case, the results should be translated under the form of a 'term of reference' for city action.

ACTION 2 Identify instruments to promote the city and its regional basin as local interactive networks

Problem statement

In the Western World the response to the globalization challenge is often seen as a move towards tertiarization and to high technology industrial products. The de-localization of more conventional industrial activities is accepted as a trend difficult to contrast. The chosen priority of actions is to 'hook' the city to the external webs of infrastructures to facilitate the communication with the world. These interventions can change the *metric* of the external space, by making the city very close to geographically faraway places. However, the distances within the city itself and its local environment might not decrease. It might still take hours to move from periphery to the center because of traffic jam.

This response to the globalization challenges, is therefore an outbound approach to adapt the city to external changes. It is propose to explore instead an inbound approach which point to the existing city capabilities to react to the challenge taking advantage of its 'diversity' and looking for internal leverage effects. The city can - as well as the external 'global space' - benefit for its internal needs from the new communication technology and from the emergence of global system of services. The new communication technologies not only can reduce the distance between faraway places but also between close ones. To give an example, fax is not only used for long distance, but often to send letters and notes between offices at different floors in the same building.

The city is already a network inserted in a regional network of cities with some kind of hierarchy between quarters within the city and between cities within the region. The globalization challenge is having impact on the local and regional networks. Some city quarters might be more directly affected than others by the decline of city production activities. At the same time the hierarchical status of a city with respect to the others in the regional network might be challenged. Smaller and peripheral cities might find different ways to react to the challenge, e.g. by shifting their relationship to another regional basin of attraction.
Seen from a local and regional point of view the globalization challenge might therefore be an occasion to modify the center-periphery scheme both at the city level and within the cities of the region.

The alternative which is here proposed to respond to the globalization challenge is to invest to substitute the balanced network logic for that of center-periphery. To this effect, one has to change the 'local space metric' to reduce the 'distance' between the nodes of intra-city and regional inter-city existing networks. The nodes of the networks should become 'loci' of equal opportunities in terms of connection to the webs of internal and external networks and access to the networks services.

In terms of the intra-city network this will mean first of all to recognize the existing and potential 'carrefour' nodal points and to invest for completing the potentiality of the carrefour to access the complex infrastructures facilities and services.
The carrefour nodes will play the role of the basin of attraction of the neighboring space. For this latter to become an equal opportunity space for different productive activities, the actual time for a person to move from one node to the others should be reduced (by improving the transport means and infrastructures) to a small fraction (say 10 minutes) of the total daily time budget allocated for moving.

For the inter-city regional networks, to develop a more balanced equal opportunity spatial networks the existing hub type liaisons between the 'regional' capital and the other cities have to be corrected by reinforcing the direct links between the minor cities of the region.
To exploit the 'network potentialities' the 'time distance' between the cities have to be reduced (say to half an hour) to make possible to consider moving from one city to the another in the network within the daily time budget.

The research task is first of all to understand, for paradigmatic actual city cases and their regional basin, how the existing system can be understood and its behavior simulated in term of a web of interacting networks. This tasks will require system simulation coupled with data collection from the field.
Secondly, the research should be concerned with the 'elementary units' of the intra-city network (the carrefour nodal points and the links between and to the external 'world network') and of the trans-city ones (especially the links).
Specifically the investigation should aim:
i) to develop concept for advanced carrefour nodal point as a complex system of facilities interacting with the networks;
ii) to develop concept of special carrefour junction between local and external network (such as the interaction between inter-city and intra-city transport, between surface and air transport),
iii) to evaluate the use of existing technologies to link the nodes (such as TLC highways, surface public transport for intracity transport, fast train intercity connection);
iv) to develop innovative example of advanced services for the network user (such as development of new product that can profit of the existing production capabilities).

Action

To call for a system analysis of reference (paradigmatic) city cases to show the potentiality to modify the existing local (intra-city and trans-city) networks layout to obtain a more homogenous equal opportunity urban and regional space with respect to the today prevailing central-periphery scheme.
The 'glocal city' scenario will be set as a reference.
The analysis will show how and for which conditions (changing the 'local space metric' to reduce the 'distance' between the nodes of intra-city and regional

trans-city existing networks; equipping the nodes of the networks with infrastructure and facilities to become 'loci' of equal access opportunities to connect to the webs of internal and external networks services) a local 'network logic' can emerge, with cooperation between local actors to better exploit local assets and to better interact with the global networks and the globalization process.

The analysis should include the conceptual design of the 'elementary units' of the intra-city network (the carrefour nodal points and the links between them and to the external 'world network') and of the inter-city ones (especially the links).

Finally, the concept should be applied to one or more chosen significative city case with its regional basin showing specific hard and soft investments that will lead better integrated networks.

To show practical application of the study, the results should be translated into the form of 'terms of reference' for city action.

ACTION 3 Promote the development of new functions and services from intra- and trans-urban networks

Problem statement

The network approach applied to local urban and regional space points first of all to the need to improve the infrastructures of the networks. The full realization of the networks should change the logic of interaction among the networks users. A network logic (by which it is meant that the different nodes can participate to the network activity and creativity in a non-hierarchical way) should emerge, so to increase the opportunities to exploit existing potentialities of each node. From the network operation will also emerge specific 'network related' problems whose solution leads to the development of new functions and services that enrich and valorize the portfolio of existing capapabilites (production of goods services and knowledge). It increases the 'external' attractiveness of the city.

To make an example, a problem that often characterize the critical situation in an industrial city under decline is the loss of the organizing power that major industrial enterprises had in the past on the tissue of smaller industrial and service firms. Who can substitute for such organizer role? One possibility is that the 'network logic' might facilitate the emergence of a 'meta-organizer' as a service to the small firms in the network. The case of Prato (a textile city in central Italy) has shown the workability of the concept.
The challenge is to maintain the existing tissue of industrial capability finding new costumers to offer an 'integrated' output of the otherwise dispersed production capabilities (thanks to the intervention of the 'meta-organizer'). Tentative to develop a 'meta-organizer' capability (in the practical form of new functions and services) can be noted e.g. by the activity of Commercial Chambers to let the production capability being known abroad, by the participation to commercial exhibitions as a 'local group', etc.
However, a much more direct intervention is needed such as that of 'designing' new products that can be built by using the available local production as components of the final products. The design activity might be responsible to aggregate the today single supplied parts (each one produced by local firms) into a complex subsystem for a product.

Another case come from the valorization of the knowledge producing activities existing in the city (universities, private and public research laboratories and institutions, cultural and artistic endowment). There is a potential synergetic effect by consider the multifaced knowledge-base existing in the city as a unity. This potentiality is however seldom implemented, because of sectoralizations, disciplinary diversity, lack of occasions to work together. The development of a network logic among the different elements and actors of knowledge production in a city could let emerge a coordinated 'knowledge offer' to meet interdisciplinary demands from the city itself as a 'user' of technology (to respond to the many city challenges) and for other local or external demands.

Action

To call for studies and investigations for reference (paradigmatic) city cases showing: a) how cooperative design activity can be developed which aggregate the simple components and parts produced separately by local firms (as suppliers to larger firms) into complex subsystems (to be cooperatively supplied to firms responsible for the end product); b) how the existing knowledge base can be valorized and translated into an offer to meet local and external demand.
The 'glocal city' scenario will be set as a reference.
The proposed cases should be elaborated to show how the emergence of a network logic of cooperation carries new problems whose solution leads to the development of new functions and services so enriching and valorizing the portfolio of existing local capapabilites and resources increasing the 'external' attractiveness of the city.
The results of the analysis should be translated into the form of 'terms of reference' for city actions.

ACTION 4 Develop simulation models of given city for effective assessment of alternative actions

Problem statement

The challenges coming from the saturation of city systems are well perceived as well as the urgency to take-actions. It is also well recognized that to respond to the challenge one needs an integrated approach. However, passing from the perception of the challenge to the planning of specific actions is here particularly difficult because an integration approach call in the entire complexity of the 'global' city system. There is an intrinsic contradiction between calling for a global ('holistic') response and the fact that a plan for action has somehow to be 'reduced' to manageable conditions. In practice, integration of today sectoralized decision-making is difficult to obtain.

The perusal of the challenges that are on the discussion table on the issues for a sustainable city, the confrontation with potential solutions (that the RDT activity will have contributed to collect and to develop) should permit first of all to contribute to underline the ambiguity of the challenges, and how dangers an opportunities might be mixed together. Comparing challenges and solutions is an important ingredient not only to better specify the challenges, but to rank them into a priority scale according to some parameters (e.g. capability to realistically apply the solutions, possibility to find the resources needed, etc.).

To show the potential results to be expected from this type of study, let us deal with the "meta-challenge" (challenge of the challenges): how to improve our ability to respond "rationally" (maximizing the probability of success and the "global quality" - joint optimization of values/ objectives/ results - of the intervention) to any one of the challenges. The first point to be considered is that the challenge is coming from a very complex system (therefore a precondition to successful intervention is that the problem solving process be adequate to the complexity of the system). The second obvious point is that the more one knows on system behavior the more one will be able to make "rational" choices. This statement carries even more weight if one considers necessary to seek for leverage effects from the endogenous system forces.
To do this one not only has to understand the system as it is now and how it behaved in the past, but how it will move in the future and to which extent it will feel our intervention or not.
To this effect, one should develop specific theoretical investigations on typology of city problems, collect, analyze and compare data coming from experiments performed by cities in different conditions (exemplary cases of urban taxonomy). The potentiality of theoretical investigations has progressed recently by the increasing attention by many scientific disciplines (economy, sociology, geography, system analysis) to the urban problems to the point that an "urban science" is emerging as a discipline on its own right. To an increased interest in fundamental research, more applied intervention are to be added to help the

decision-makers to respond to the urban challenges. Recipes are well known and should be implemented.
The advancement in complex system simulation can be applied to develop specific "simulation models" of given cities to be used by the concerned actors to simulate effects of conceived intervention. The simulation model however have to be made interactive with the actual city system, by continuous feeding the model with data collected on the system itself. Special sensors might have to be installed to monitor continuously the system (such as in testing air quality). So instrumented, the city system will send useful information to the simulation model which can then be used not only at the moment when the choice to intervene on the system will be taken, but, even more importantly, later on to understand the effects of the intervention (if it is producing good results or not, if any leverage effects from the system is emerging or not).

Action

To call urban and system scientists and researchers to apply existing knowledge on urban science and on complex system analysis to develop "simulation models" of cities to be used by the concerned actors to simulate effects of interventions. The model should be conceived to be made interactive with the actual city system, by continuous feeding the model with data collected on the system itself. The scenario for a 'sustainable city' will be set as a reference andthe model should consider the reaching of saturation levels in the city subsystems.
The structure of the model should be such to include all the major city subsystems and their interactions, having general validity to be applicable to different city cases. For a selected few significative city cases the details of the model should be developed at least for the most important subsystems and their integration - including the specifications of the indicators and detectors to collect data from the city - to the extent that preliminary simulation could be run on computer to show effects to be expected by the non-linear coupling of subsystems and the potentiality for using the model.
The results of the study should be translated into 'terms of reference' for city action.

ACTION 5 Assess technology options to approach the challenges of a saturated city system

Problem statement

Many of the problems to which one refers when concerned about the non sustainability of today city systems are due to the reaching of saturation levels in some of the city variables, sectors or sub-systems. The more clear examples are that of traffic and of air pollution. It might, however, also be the saturation of social solidarity faced to increased immigration The exhausting of system capacity to adjust to changes or injuries coming from the exterior or the interior of the system are less visible when they are related to 'soft' more than 'hard' resources or to the future more than the present of the system state. Concern for a sustainable city, however, have to point even more to the less evident 'soft' resources (e.g. saturation of the 'solidarity' resources) and to the saturation crisis that will emerge in the future. One should, in fact, avoid to transfer to other generations the ungovernability of the city system.

The difficulty to govern a system under saturation is well known. If the system capacity cannot be increased, then the holistic nature of the system with the non-linearity of feedbacks emerges in its completeness and new modes to assure system stable operating condition have to be developed. The intrinsic difficulties of the task can be somewhat reduced if one is able to take into consideration the high reactivity of the system when close to saturation. A clever governance policy is therefore needed to exploit the intrinsic system dynamics looking for multiplier (leverage) effects to amplify the endogenous system changes in the desired direction.

The focus of the concern here is to apply the circular decision-making process - from the initial challenge perception to the preliminary specification of the problem to be addressed, to the feedback effects of the conceivable system reaction - in order to better define the challenge to be addressed and subsequently the terms of reference of the problem. The analysis will have to show the positive leverage effects from the system intrinsic forces.

In this process, the portfolio of potential solutions plays an important role. One should expect, however, that the existing portfolio will not cover the needs because of the novelty of the saturation situation which we have to face. Most probably, solutions developed in the past - which build up the actual portfolio - were aimed at increasing the city system capacity more that to govern a saturated system (e.g., advanced technology in street tunneling will not help much, because they will not increase system transport capacity, but just shift saturation of traffic in some other section of the city viary system).
The research will therefore, on one side, try to understand the process of governance for a saturated system, and, on the other, for each considered challenge to update the portfolio of potential solutions with new ones better

adapted to the saturation situation.
The strategy of the research have to be such to consider, at least conceptually, RDT as part of a broader intervention with a mix of short and longer terms initiatives involving not only the "sectoral" response, but citizen solidarity, urbanistic concept revision, incentives for personal services, etc.

Action

To call for proposals for theoretical and empirical investigations to develop terms of reference for problems to respond to integrated city system challenges due to the reaching of saturations in the urban systems. The scenario for 'sustainable city' will be set as a reference and guid the entire analysis. The investigation should show how the initial perceived challenges is changing because of the non linearity effects of systems reaction and how the problems specifications could take advantage of the intrinsic system forces and inertial dynamic patterns.
For a selected number of significative urban challenges, a mix of short and longer terms initiatives for action taking has to be suggested that involves not only the "sectoral" (or multi-sectoral) responses but citizen solidarity, urbanistic concept revision, incentives for personal services, etc.
The analysis should show how the proposed intervention on the city system will take into consideration the dynamic trends of the city system and could take advantage of leverage effects from the system endogenous forces.
The devised responses for each of the selected challenges should be, at the end of the analysis, translated - with reference to selected city cases - into the form of "terms of reference" for city actions.