

# Chapter 3

## Implementing Transdisciplinarity: Architecture and Urban Planning at Work

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Suburban Utopia, by Josiane Dufault & Mireille Duchesneau © GIRBa

### 3.1 Introduction

“Sustainable development” and “green buildings” are two popular locutions in the discourse of many politicians. Best practices are borrowed from countries around the globe, green certifications such as LEED (*Leadership in Energy and Environmental Design*) in North America are becoming the norm in architecture, public transportation systems are being built, and eco-communities developed. Yet, in Canada, greenhouse gas emissions and energy consumption per capita continue

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to increase, and the bulk of citizens drive a car to work and either own or dream about a single-family house. French sociologist Alain Bourdin (2009) affirms that our incapacity to deal with sustainability is due to our thinking in terms of *solutions* (technical, prescriptive), whereas in actual fact it is a *complex problem*. He further argues that architecture and planning have not yet embraced the complexity paradigm with regards to multiple contemporary urban configurations, uses, and representations. By neglecting the complexity of urban life, new problems have a propensity to be tackled using familiar concepts (e.g. centre/periphery model, neighbourhood-centred lifestyles), often leading to poorly adapted solutions.

Yet we are witnessing a unique momentum in urban research with a gush of studies that stem from important societal and urban transformations (e.g. urban sprawl, geographical mobility, ICT, innovative lifestyles, social diversity), as well as major theoretical, methodological and technical development (e.g. systems theory, interdisciplinarity, GIS). This new context has generated an abundant and rich scientific literature endorsing the complexity of urban phenomena. Why, then, has it not sunk into urban and architectural practices? We suggest that this is due to the persistent gap between scientific, professional and artistic knowledge, to the sectoral division of professional responsibilities in architecture and urban planning,<sup>1</sup> and to the rigidity of established disciplinary academic traditions. This chapter is about implementing transdisciplinarity to better define complex problems and identify customised solutions for sustainable development. It illustrates how the programme of research and action of GIRBa – the Interdisciplinary Research Group on Suburbs – constitutes an attempt to stimulate and improve collaboration between scientists, professionals and policy decision-makers, as well as to train urban planners, architects and social scientists to become “agents of change”.

Our argument is that urban planning and architecture are both disciplines capable of a constructive dialogue with other domains of knowledge, including the natural and social/human sciences, due to their multidisciplinary position and action-oriented identity aimed at transforming the built and natural environment (Lawrence & Després, 2004). However, these professions’ disconnected respective training models, i.e. the long-established design studio in architecture and the more recent “rational scientist” model in urban planning, make it difficult for these two disciplines to take full advantage of their complementary predispositions for transdisciplinarity, which could lead to a more effective and better-connected problem-seeking and problem-solving process with regard to complex urban problems. By presenting the programme of research and action that GIRBa has been conducting for the past 10 years, we want to illustrate with concrete examples how the group was able to bypass the rigidity of academic disciplinary training and narrow the gap between research and practice by conducting in an intertwined manner empirical research, design, and participatory processes on ageing suburbs.

After defining in Section 3.2 the concept of transdisciplinarity as well as the main characteristics of its mode of production, we discuss in Section 3.3 the nature of architecture and urban planning as multidisciplinary disciplines and action-oriented professions. Section 3.4 illustrates how GIRBa has built on the complementary nature of architecture and urban planning, as well as on their respective openness to multidisciplinary knowledge, to define its current research and

action programme on ageing suburbs. The last section highlights the strengths and shortcomings of implementing transdisciplinarity within academia's predominantly disciplinary mode of operation and its disconnected professional and research education programmes, pointing out challenges facing both universities and professional corporations in terms of revising educational culture.

### 3.2 Defining Transdisciplinarity

In what ways does transdisciplinarity differ from the more familiar interdisciplinary and multidisciplinary concepts? Indeed, the words multidisciplinary and interdisciplinary have been used consistently to denote scientific research that involves a number of disciplines. In multidisciplinary research, each discipline works in a self-contained manner, while in interdisciplinary research an issue is approached from a range of disciplinary perspectives integrated to provide a systemic outcome (Bruce et al., 2004). In contrast, the word transdisciplinary is not confined to scientific research and has been used since the 1970s in debates about teaching and professional practice. The Latin prefix “trans” denotes transgressing the boundaries defined by traditional disciplinary modes of enquiry. For German philosopher Philip W. Balsiger (2004), the focus of transdisciplinarity is on the organisation of knowledge around complex heterogeneous domains rather than on the disciplines and subjects into which knowledge is commonly organised. While research groups are generally defined as multidisciplinary in view of the diversified nature of their members' disciplinary education, the research conducted can be either multi, inter or transdisciplinary, the latter two implying that the final knowledge is more than the sum of its disciplinary components (Després, Brais, & Avellan, 2004).

French environmental psychologist Thierry Ramadier (2004) makes a distinction between the outcome of transdisciplinary research as “knowledge coherence” and the outcome of interdisciplinary research as “knowledge unity”. For this author, instead of reducing reality to the parts researchable at the intersection of multiple disciplinary perspectives, transdisciplinary research includes at once what stands between disciplines, across disciplines and beyond any discipline, thus combining all the processes of multidisciplinary and interdisciplinary. For Balsiger (2004), implementing transdisciplinarity necessitates the replacement of strict research protocols with flexible methodological practices that stem from concerted dialogue around societal problems between academics, policy decision-makers and laypeople. Figure 3.1 recapitulates what Lawrence and Després (2004) identify as the recurrent characteristics of transdisciplinary research from the work of numerous researchers with various disciplinary backgrounds.<sup>2</sup> These are the dimensions of transdisciplinarity endorsed in this chapter.

### 3.3 Architecture and Urban Planning as “Undisciplined” Disciplines

The title of this section is borrowed from French architect and sociologist Daniel Pinson, in his contribution to the special issue of *Futures* on transdisciplinarity

- 1) Mode of knowledge production characterised by its hybrid nature, non-linearity and reflexivity, transcending any academic disciplinary structure.
- 2) Tackles complexity in science and challenges knowledge fragmentation, dealing with research problems and organisations that are defined from complex and heterogeneous domains.
- 3) Accepts local contexts and uncertainty; it is a context-specific negotiation of knowledge.
- 4) Includes the practical reasoning of individuals with the constraining and affording nature of social, organisational and material contexts.
- 5) Requires close and continuous collaboration between actors during all phases of a research project, through "mediation space and time".
- 6) Often oriented toward action, making linkages not only across disciplinary boundaries but also between theoretical development and professional practice.
- 7) Frequently deals with real-world topics, generating knowledge that not only addresses societal problems but also contributes to their solutions.
- 8) Generally aims at understanding the actual world and at bridging the gap between knowledge derived from research and decision-making processes in society.

**Fig. 3.1** Characteristics of transdisciplinary research according to Lawrence and Després (2004)  
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(Lawrence & Després, 2004). Although Pinson applies this qualifier to urban planning only, it is appropriate to extend its use to architecture.

### ***3.3.1 The Case of Urban Planning***

When Pinson (2004) refers to the multidisciplinary character of urban planning as a profession, he brings forth three arguments. First, the initial academic training of urban planners is often completed in various disciplinary programmes. Second, planning programmes are themselves characterised by multidisciplinary curricula taught by faculty members trained in diverse disciplines (e.g. architecture, economics, engineering, geography, political science, planning, and sociology). Third, several urban planners work in multidisciplinary teams. The author points out the challenges brought by this explicit multidisciplinary position: (1) scientific knowledge about what constitutes the city in several fields must be accurately appropriated and constantly updated; (2) friction can occur during exchanges between the various disciplines represented in a planning team; (3) last but not least, planners are often questioned about the originality of their contributions. This author advocates that the capacity of urban planners to bring together knowledge from multiple disciplines in order to define complex urban problems in a relevant way should not only be highlighted but also developed in a more systematic way during academic training.

Pinson (2004) also affirms that the evolution of democracy has changed the conditions of planning practice, altering the connections between power and decision-making in relation to physical planning. It is increasingly difficult for urban planners to act as delegated experts working on the basis of scientific knowledge and judicial authority; working with citizens is now part of their responsibilities. Although the concept of “citizen participation” has been used since the early 1970s, namely with advocacy planning growing out of a reaction to the urban renewal movement in the 1950s and 1960s (Davidoff, 1965), a new intensity has been given to public participation since the late 1980s, prompted by societal problems and pressure from user groups (e.g. environmental activism, peace and conflict research, international cooperation, women’s studies) asking for their know-how or tacit knowledge to be considered (Elzinga, 2008). Collaborative planning theory and practice arose in response to the inadequacy of traditional public participation techniques to provide real opportunity for the public to make the decisions affecting their communities. Collaborative methods are designed to empower stakeholders by actively involving them as legitimate decision-makers, along with public agencies, in the planning process. The aim is to reach consensus or at least an acceptable compromise (e.g. Patsy Healy, University of Newcastle-upon-Tyne, UK, 2005, 2007; Judith E. Innes, University of California, Berkeley, USA, 2003; John Forester, Cornell University, USA, 1999; Susan S. Fainstein, Columbia University, USA, 2000). Urban planners must be able to handle mediation tasks, mixing scientific and political interests. In Canada, the US and the UK, several urban planning programmes have been or are being adjusted to prepare future planners for these tasks. For those that are not, graduates are forced to learn in the course of job training where they are inevitably brought to work with citizens, not always with the best results. This competency should therefore be reinforced as an urban planning strength. With their respective books, *The Deliberative Practitioner* (1999) and *Collaborative Planning* (2005), US and UK planners John Forester and Patsy Healy have made significant contributions to help schools of planning with revising their curricula.

According to British architect Nigel Taylor (2007), urban planning was much closer to architecture before the 1960s. Both disciplines were then considered an art, albeit “applied” or “practical”, in which utilitarian or “functional” requirements had to be accommodated. He associates this major shift to the 1960s, and summarises it as the replacement of a physical or morphological view of towns by a definition of cities as systems of inter-related activities. Cities here are considered to be constantly evolving rather than static entities, including social and economic activities, as well as a conception of planning as science rather than art, requiring specific training to support rational decision-making with empirical modes of investigation. One drawback of this shifting vision is that urban planning gradually lost its expertise on the physical aspects of projects. Indeed, despite the fact that the focus of this discipline was on planning the built environment, planners got more and more detached

from the design dimensions of their work, which required, beyond scientific knowledge and consensus-building skills, aesthetic and technical knowledge as well. For this reason, they have made a more limited contribution to physical interventions, and became commonly dedicated to regulations and master planning.

### 3.3.2 *The Case of Architecture*

This situation gave way to a theoretical and professional reorientation of architecture toward urban planning in the last two decades or so, with a specific interest in project-making (e.g. Ian Bentley, Oxford Brookes University, UK; Andres Duany and Elizabeth Plater-Zyberk, University of Miami, US; Jan Gehl, School of Architecture in Copenhagen, Denmark; Bernardo Secchi and Paola Vigano, Venice University Institute of Architecture, Italy). It gave birth to urban design as a specific area of academic training now taught in various programmes around the world, including Laval University in Quebec city, Canada. As a field of professional practice, an important share of the contributions from urban design have been carried out by architects and architect-planners (and also landscape architects), owing to their capacity to formalise and materialise projects through the design process. The increasing presence of designers in this growing field of practice is sometimes considered threatening by planning educators who feel the invasion of artist-designers might jeopardise more “rational” and “scientific” approaches.

Thanks to the development of systems theory (Simons, 1969), complexity paradigm (Morin, 1977) and constructivist epistemology (Piaget, 1967), design is now recognised as a legitimate mode of inquiry that requires specific skills, knowledge and intuition to translate multidimensional problems into design solutions. In *What Designers Know* (2001), UK architect Bryan Lawson describes the specificity of design as the combination of both precise and vague ideas, systematic and chaotic ways of thinking, calculations, and creativity. Lawson qualifies design as interdisciplinary by its very nature, the smallest project making connections between a variety of factors, calling for different types of knowledge and involving several actors. Confirming the complexity of the process, US architect Robert S. Harris (1972) identifies five interrelated dimensions of any design project that correspond to different modes of inquiry for designers: ecological, societal, operational, experiential, and perceptual. The sequence with which knowledge is integrated into the design process is not linear but iterative, involving several loops in which hypothetical solutions are constantly adjusted with additional information brought by clients, users, decision-makers, and experts. For Harris, design decisions are a result of group interaction involving individuals who contribute their own creative insights: “The processes of design must allow for open and continuous externalization [sic] of ideas and information, and must welcome contributions from numerous directions and at all times” (1972, p. 1). This implies that designers must develop skills for working with others and assure that effective decision-making includes being able to hear what others are saying and respond constructively to one another. One specificity of design brought up by Lawson (2001), that supports designers in their collaborative work, is the use of drawings and images to not only convey their ideas

and converse with others, but to serve as a tool for problem-solving. Drawings and computer models are indeed not only used to communicate but also to build up knowledge on multidimensional problems and develop solutions. This creative process also calls for intuition. In his seminal work *The Reflective Practitioner*, US philosopher Donald Schön (1983) refers to a kind of “knowing in practice” or tacit knowledge possessed by practitioners, a “capacity for reflection on their intuitive knowing in the midst of action” and which they sometimes use “to cope with the unique, uncertain, and conflicted situations of practice” (pp. 8–9).

Although scientific and multidisciplinary knowledge is essential to the definition of complex design problems (e.g. sustainability), architecture students have less opportunity compared with planners to interact with researchers from the social sciences and learn to interpret scientific results from research during their education. Indeed, architectural programmes across the US and Canada are overseen by national architectural accrediting boards, which dictate considerably their educational content. Conditions for accreditation include 32 criteria for evaluating student performance classified under three realms: a) critical thinking and representation; b) integrated building practices, technical skills and knowledge; c) leadership and practice (NAAB, 2009). The criterion “understanding the role of applied research in determining function, form, and systems and their impact on human conditions and behavior [sic]” (NAAB, 2009, p. 22 - criterion a.11) was just added to the 2009 edition. Although the “ability to work in collaboration with others and in multidisciplinary teams to successfully complete design projects” (NAAB, 2009, p. 24 - criterion c.1) is also one of the criteria, it is more difficult to operationalise since faculty members are, with few exceptions, trained as architects (although their post-professional degrees might be in related disciplines). Indeed, because design studios constitute the heart of an architect’s education, as a means for developing students’ “proficiency in using specific information to accomplish a task, correctly selecting the appropriate information, and accurately applying it to the solution of a specific problem”, educators must be able to teach such processes (NAAB, 2009, p. 21). As a result, few students have the appropriate training for searching scientific databases for specific cutting-edge knowledge and translating it appropriately to support decision-making, and most do not experience working in close collaboration with social scientists. This separation between research and design continues well into professional practice where architects’ exposure to research is often limited to conference attendance and continuing education programmes. Lawson (2001) criticises the fact that despite its interdisciplinary nature, design often sits uncomfortably in the old-fashioned structures that he encourages us to challenge. Easier said than done! How can academics train architects and planners differently within existing educational cultures?

### ***3.3.3 Narrowing the Gap Between Research and Practice***

Social scientists are generally trained to conduct and interpret empirical research early in their educational training. However, those involved in urban studies (e.g.

urban sociology, urban geography, urban anthropology, environmental psychology) are often disconnected from the applied world of planning and urban design, except for the expert opinions and research they might be required to understand. The gap between research and design, criticised over 25 years ago by Schön, seems to persist: “[. . .] research is institutionally separate from practice, connected to it by carefully defined relationships of exchange. Researchers are supposed to provide the basic and applied science from which to derive techniques for diagnosing and solving the problems of practice” (1983, p. 26). Again, academic institutions might have contributed to the situation. Even though multidisciplinary training is valued and encouraged – for instance at Laval University, ten percent of the total credit load must be acquired outside the student’s main department – in reality, programmes are often competing for students, namely with regard to annual budget calculation methods, thus discouraging mobility across disciplines. On the other hand, topics taught in the social sciences often fluctuate according to both faculty research interests and the priorities of research funding agencies. This is the case with urban sociology, which used to be one of the strengths of Laval University’s sociology program, but where no course on the topic is being taught anymore. This situation adds to the challenge of bringing together architects, planners and social scientists to work together on complex urban problems.

On the other hand, a growing number of architects and planners are seeking specialties beyond their professional education and, for this purpose, engage in a complementary research programme (Master’s degree in sciences or PhD). In this manner, they are combining their competencies for collaborative multidisciplinary work and problem-solving with a capacity to conduct and interpret “scientific” research. They are becoming privileged knowledge translators, able to interact with social scientists and interpret research data in terms that can be understood by designers and integrated in the design process.

UK planner Patsy Healy (2007) challenges us “to make sense of the complexity of urban life” and manage “the dilemmas of ‘co-existence in shared spaces’” (p. 3). GIRBa’s experience suggests that together, architects, urban planners and urban researchers hold complementary sets of competencies that allow for implementing transdisciplinary research and action programmes that, in turn, could lead to identify creative solutions to complex urban problems. To reach this goal, however, we need to train the next generations of professionals and researchers to work closely together, and to show mutual respect for each other’s knowledge and skills. How is it possible to do so within the disciplinary limits and constraints of architecture, planning and social sciences education?

### **3.4 Bringing Architects, Planners and Social Scientists to Work Together: The Case of GIRBa**

This section presents a modest example of how transdisciplinarity can be operationalised within academia. More specifically, it tells the story of how GIRBa (in



French: Groupe interdisciplinaire de recherche sur les banlieues) came to implement a transdisciplinary programme of research and action at Laval University, in Quebec City, Canada, with the intention of identifying alternatives to urban sprawl and its negative consequences on environmental, economic and social sustainability. The programme of research and action emerged gradually and almost naturally as GIRBa's understanding of the complexity and the multidimensionality of the problem took shape. The group went from conducting interdisciplinary research, on the one hand, and architectural and urban design, on the other hand – two distinct knowledge production modes – to their integration into a transdisciplinary mode, issuing back and forth between practice-based research and evidence-based design through collaborative projects. In other words, GIRBa went from the distinct production of publicly-funded interdisciplinary research, contractual applied research, and architectural and urban design professional training, to being an integrated programme of research and action where each of the above contributes to the others in a truly transdisciplinary manner.

GIRBa is an academic research group that annually comprises around 25 members – professors, postdoctoral fellows and graduate students – the majority of which are trained in architecture and planning, but also in sociology, rural engineering, geography, political science, and environmental psychology. The group's headquarters are located in Laval University's School of Architecture, in the Faculty of Visuals Arts, Architecture and Planning. GIRBa is part of the broader Research Centre in Planning and Development (CRAD) that comprises 16 regular faculty-researchers teaching in the departments of social and human sciences, science and engineering, administrative sciences, as well as arts and humanities, along with about 50 graduate students and fellows.

### ***3.4.1 A Context to Narrow the Gap Between Research and Practice***

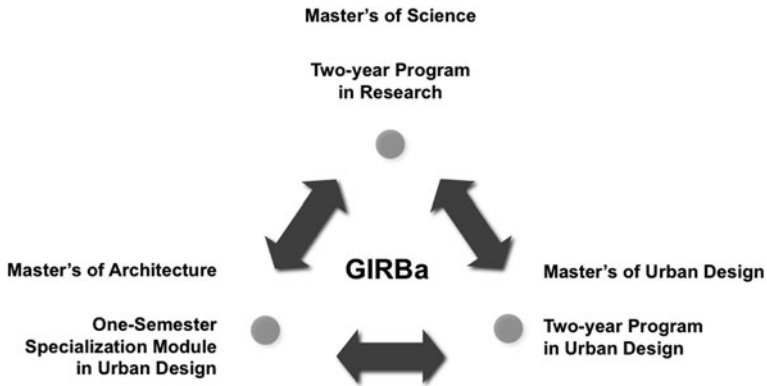
In 1998, Carole Després, professor of architecture and urban design, and Andrée Fortin, professor of sociology, teamed up and were granted money from the federal agency SSHRC to study ageing post-war suburbs. Geneviève Vachon, professor of architecture and urban design, joined the team, as did Thierry Ramadier, a post-doctoral fellow in environmental psychology from Paris. The objective was to understand how people's residential biography and aspirations influenced their attachment to their home, and also how their use of a car for daily mobility influenced their experience and representations of the city, suburb and countryside, with a special attention paid to elderly suburbanites. The mode of knowledge production was interdisciplinary. The group addressed the multiple challenges of learning a common vocabulary since members held various disciplinary backgrounds, of establishing what was shared at the intersection of the disciplines involved in terms of theory and methods, of defining a consensual research protocol, and of identifying powerful interpretative concepts. Apart from several master's and doctoral students contributing to empirical research, professional master's students were working

in design studios on projects for retrofitting ageing suburbs, on the basis of what resident surveys, as well as demographic and spatial analyses, had revealed. In parallel, contractual research was being conducted by GIRBa's directors with the help of graduate students for suburban municipalities and governmental planning agencies (e.g. the development of intergenerational housing types, the revision of zoning regulations, and the analysis of suburban poverty).

After 3 years of moving back and forth between fundamental research, contractual research and design, we realised that not much had been published on ageing suburbs, neither in Canada nor in the US, and there were a lot of negative stereotypes circulating about these neighbourhoods and their associated lifestyles among architects and planners from both the private and public sectors. In fact, suburbs were being left out of various planning debates and new research directions. We thought our work could contribute to change the situation, at least locally. We wrote the book *La banlieue revisitée* (2002, in French), which we purposively addressed to a wide audience. Together, the chapters describe the morphology and origins of post-war suburbs, their demographic outlook, the activity of residents, and representations of housing and neighbourhoods, as well as propose sustainable design solutions to retrofit these suburbs.

In the meantime, GIRBa was granted 3 years of funding from one of Quebec's main research agencies, FQRSC, to coordinate its work around a programme of research and action on suburbs, with a strong emphasis on knowledge transfer. The grant was timely, just a few months in fact before the City of Quebec amalgamated with its surrounding suburban municipalities in January 2002. This gave GIRBa a unique opportunity to share its knowledge of post-war suburbs with decision-makers in a more active and structured manner. GIRBa invited decision-makers from key government agencies to take part in a collaborative planning exercise on the future of Quebec City's post-war suburbs. During the process, two other university colleagues joined the group, GianPiero Moretti, professor of architecture and urban design, Florent Joerin, professor of geomatics and head of the Canada research Chair in territorial decision-making strategy, as well as a post-doctoral fellow, Nicole Brais, specialised in urban geography and citizen participation. An important number of graduate students – researchers and designers – in architecture, urban design, planning and sociology also took part in the project.

Some additional contextual information will help understand why GIRBa was able to involve architects and urban designers in such a research and action program. First, Laval University was one of the first American universities to offer, 25 years ago, a 2-year professional master's programme in urban design to architects. Since then, the programme was opened to landscape architects, environmental designers, and more recently to planners. Second, in 2001, it became mandatory for architects across Canada to hold a Master's degree to access their professional order. Laval University's School of Architecture, with its well-established tradition of scientific research, took advantage of this additional academic requirement to introduce a series of elective one-semester specialisation modules led by faculty members specialised in particular areas of leading research (built heritage, programming, physical ambiances, construction, digital architecture, international



**Fig. 3.2** The functioning of the urban design programme and specialisation module at Laval University, Canada © GIRBa

cooperation, urban design). Since the three faculty members teaching urban design were GIRBa members, the research group gradually, and almost naturally, became associated with the education of urban designers. These combined circumstances contributed in drawing research and design closer together, allowing for a constant to-and-from between GIRBa's funded research projects, urban design studios and class assignments, and contractual research mandates. Since 2002, as part of mandatory urban design studios, about 30 graduate students have annually searched for original solutions to retrofit ageing suburbs and minimise urban sprawl, in collaboration with researchers and decision-makers. Several architectural and planning students have graduated since then with theses directly related to our research programme. Figure 3.2 illustrates the functioning of the urban design programme and the urban specialisation module at Laval University, Québec city, Canada.

### ***3.4.2 A Research and Action Programme on Suburbs and Urban Sprawl***

In 2002, an 18-month collaborative process was put together, involving over 100 stakeholders in more than 45 activities. The ultimate aim was to build consensus around: (1) a diagnosis on ageing suburbs, (2) general planning orientations and means of retrofitting suburbs, and (3) a strategic revitalisation plan. As the process evolved, GIRBa conducted fast-track research to give a voice to tenants, teenagers, single-mothers and immigrants, as well as to families with young children who were under-represented in an initial survey. Overall, close to 500 citizens were consulted in face-to-face interviews, focus groups and through an Internet survey. GIRBa's graduate students were involved at all stages of the project. Their specific contribution varied according to their own disciplinary training, such as conducting relevant research and literature reviews and developing exploratory design hypotheses, identifying appropriate collaborative activities and organising planning sessions, and

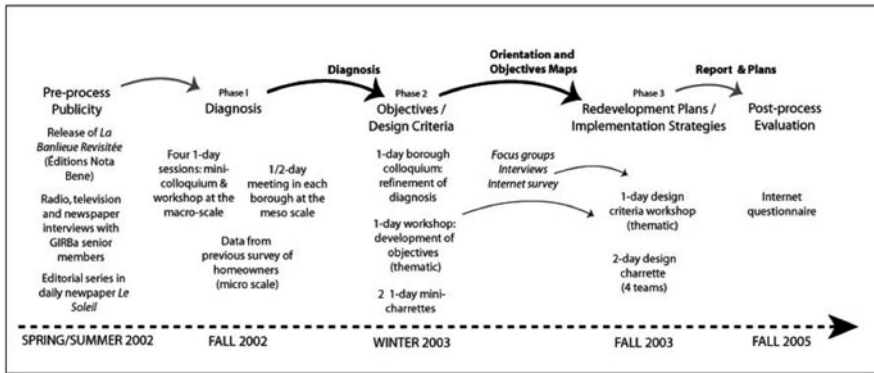


Fig. 3.3 GIRBa's collaborative planning process on the future of post-war suburbs © Springer

building the communication plan. They also participated in the collaborative activities, which could involve presenting their own research and hypotheses, taking and transcribing meeting minutes, redrawing in-progress diagnoses, visions and design hypotheses, preparing the final reports, updating the website, and also taking care of logistical aspects. The project is presented in more detail in Després, Brais and Avellan (2004), in a special issue of *Futures* on transdisciplinary research. Figure 3.3 summarises the collaborative process.

In 2005, 2 years after completing the collaborative planning exercise, GIRBa posted an Internet survey on its website and invited all participants to evaluate their perception of the strengths and weaknesses of the process, as well as of the success of its outcome. The overall results suggest a very positive perception of the collaboration. Several key actors indicated that the general orientations, objectives and design criteria had made their way into their government agency, something that GIRBa was able to verify in their official documents and websites. The results are presented in a chapter of the *Handbook of Transdisciplinary Research* (Després et al., 2008). Although the GIRBa students' evaluation of the collaborative exercise was monitored in the survey, it is not considered in the chapter's analysis since we wanted to evaluate first the perception of non-academic participants. Nevertheless, both a debriefing meeting with all GIRBa's participants and the survey results confirm that the students were very satisfied with what they had learned throughout the process. First, they had learned a lot about suburbs. Second, they saw at work the respective rationalities and types of knowledge of different stakeholders, and realised how they can be complementary but also contradictory, revealing the complexity of the problem. Third, they learned how to plan and conduct a collaborative project through concrete experience. Fourth, students in social sciences learned to read maps and drawings and relate research data to specific geographical locations and intervention scales; designers learned to translate research data into design objectives, criteria or spatial concepts. Last but not least, students were able to start building up a multidisciplinary professional network.

This collaborative strategic planning exercise convinced GIRBa that in order to solve complex urban problems, four types of rationality and knowledge must be brought together, which Jürgen Habermas’ *Theory of Communicative Action* helped us to articulate: (1) *scientific rationality and knowledge* or what is generally held as “what is true” (most often the result of empirical research); (2) *instrumental rationality and knowledge* which refers to practicality or to “what is possible”, the knowledge of how to go about things; (3) *ethical rationality and knowledge* or “what is good”, which is linked to customs, beliefs, values and past experiences that help people to determine what is wrong and what is right on a specific issue; (4) finally, *aesthetic rationality and knowledge*, or “what is beautiful”, which comprises images and refers to aesthetic judgment and experience, as well as to tastes, preferences and feelings about the built environment. By bringing together stakeholders of these four types of rationality and knowledge in face-to-face interaction, a fifth type progressively emerged which was more than the sum of the four others since incoherencies in thought and arguments were revealed and collectively overcome. Figure 3.4 illustrates GIRBa’s model of knowledge production.

GIRBa’s transdisciplinary program of research and action is since then formally organised around three types of research: (1) *fundamental or scientific research* on suburban morphology, uses and representations; (2) *design research* mostly conducted in advanced urban design studios; (3) *collaborative planning* projects with municipalities, government housing and planning agencies, as well as with the population. Figure 3.5 illustrates the structure of the team’s transdisciplinary research and action programme.

GIRBa’s approach allows for blurring the frontiers not only between academic disciplines and designers, but also between academia, practitioners, decision-makers

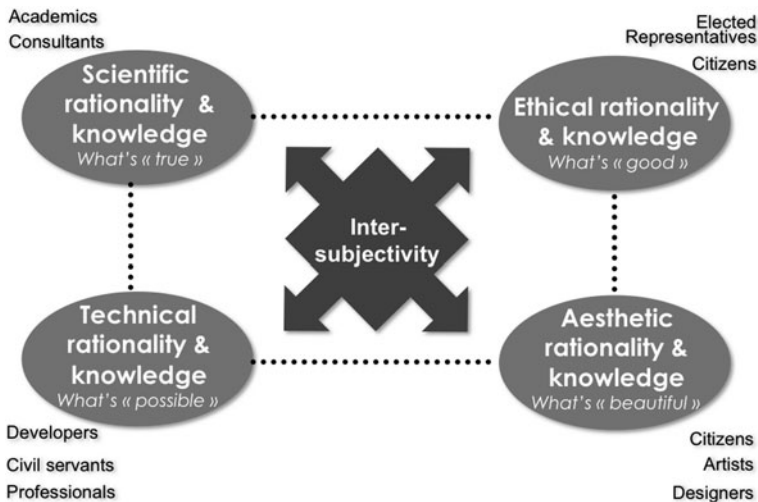


Fig. 3.4 GIRBa’s model of knowledge production for complex problems © GIRBa

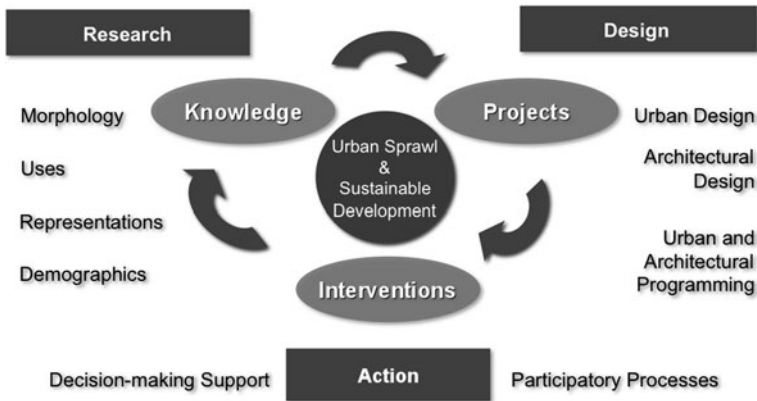


Fig. 3.5 GIRBa's transdisciplinary research and action programme on suburbs © GIRBa

and citizens. The group's experience in working on the issue of ageing suburbs strongly supports the following points: (1) *scientific research* is not performed in the same way when conducted in *close and constant collaboration between researchers from different disciplines*; (2) *design research* is a legitimate and autonomous way of producing knowledge for a given problem, one that accepts *intuition and uncertainty*; (3) finally, *action research* has proved to be an alternative mode of knowledge production that recognises *practical reasoning, material and organisational constraints*, and which values *public debate*.

### 3.4.3 The Limitations and Strengths of Operating Within Academia

The limitations and strengths of GIRBa's work can be summarised as following: on the one hand, a limited power within academia to actually implement design solutions and policies; on the other hand, a definite capacity to empower future generations of architects, planners and social scientists and decision-makers with an understanding of the complexity of urban problems and a concrete experience of how to work in a collaborative manner as professionals, taking advantage of their respective skills and knowledge.

Throughout its involvement in community projects and citywide strategic planning, GIRBa earned respect from the population as well as from public and private planning agencies. The team received an accomplishment award from Quebec's Architecture Institute (Ordre des architectes) for its contribution to making suburban culture better understood by the profession. Faculty members and graduate students are frequently contacted by journalists to comment on new developments and projects in Quebec City, as well as by other municipalities in the province who

are also faced with the phenomenon of ageing suburbs. Carole Després is sitting since January 2009 on a task force mandated with developing a sustainable mobility plan for Quebec City; urban sprawl and increasing car dependency are at the heart of its concerns. Requested by the above task force, Geneviève Vachon was the head of two urban design studios in the autumn of 2009 with 30 Master's students reflecting on the types of environments that might favour sustainable mobility in Quebec City.

Over the years, GIRBa has become a real incubator for transdisciplinarity research for theses and studio projects, as well as a training centre that initiates future social scientists, architects and planners to collaborative planning and design. GIRBa students are trained to work differently, understanding the need for scientific evidence, technical and aesthetic knowledge, as well as ethical considerations. Our program of research and action is a good example of the potential contribution of universities in training professionals and researchers with different disciplinary backgrounds to work together, which may very well have positive effects on all levels of society. Several of GIRBa's graduate students are now working as civil servants in government agencies or in private firms in architecture, urban design and planning; they understand suburbs and are able to coordinate collaborative planning processes.

Ageing suburbs are now perceived as a valuable asset for the City, which is slowly endorsing a polynuclear urban model, with older suburbs acting as urban stepping-stones. The combination of quantitative and qualitative research, design and participatory processes certainly contributed toward a better understanding of the issues and challenges at stake with regard to the retrofitting of these neighbourhoods. The resulting "transdisciplinary" knowledge underlies the complexity of the problem and its multi-faceted reality. Even though a strategic plan for their requalification has yet to be adopted, several government authorities have explicitly integrated ageing suburbs into their policy orientations.

### 3.5 Conclusions

GIRBa's experience illustrates how students in architecture, urban planning and social sciences working closely together with decision-makers and stakeholders can make a significant contribution to understanding complex urban problems and identifying solutions for strategic planning. It constitutes an example of how academic institutions can play a leadership role in training future professionals to tackle sustainable development with approaches adapted to the complexity. The team has learned from its own experience that: (1) research competencies must cover the large spectrum of urban knowledge to increase architecture's chances of effectively contributing towards sustainable and durable cities; (2) architects, planners and researchers must be trained as agents of knowledge transfer; (3) design research must be considered as a legitimate way of producing knowledge; and (4)

professionals and social scientists should not only be taught not only how to work on collaborative projects but also how to put them into practice.

In *Les Sept savoirs nécessaires à l'éducation du futur*, Edgar Morin (1977) invites us to revise pedagogical models in order to deal with the complexity of our contemporary world. GIRBa's experience is an example of what can be done within existing academic structures, reminding us that universities are not only the locus of knowledge production but also of knowledge transmission; they are institutions where one learns to produce knowledge and to apply it (Lawrence & Després, 2004, p. 398).

## Notes

1. Urban planning is used indifferently from town planning or city planning throughout the text.
2. See also *Handbook of transdisciplinary research* (Hirsch Hadorn, et al., 2008).

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