Urban Renewal: Negotiation Procedures and Evaluation Models

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Abstract. In complex programs of urban redevelopment recourse to negotiation procedures between PA and private developers emphasizes the role of evaluation, both in terms of the collective advantage and from the point of view of financial feasibility. The purpose of the contribution is twofold: the first is to investigate the role that can be exercised by the evaluation in order to confer efficiency, fairness, transparency and democratic participation in the processes of formation and implementation of strategic programs for urban and metropolitan development characterized by high levels of complexity, the second objective is to provide an integrated assessment model which can fulfill this role properly and adequately support the decision-makers and the public in decision-making ex-ante to an integrated assessment of the "public convenience" and at the same time check whether there are sufficient margins of feasibility and financial sustainability for the private developer to carry out the investment program.

Keywords: Integrated evaluation · Evaluation models · Multicriteria analysis · Financial feasibility · Strategic programs · Urban development · Public-private partnership

1 Introduction

The return of urban property to the center of the European agenda is not only an opportunity to redefine the profiles of competitiveness, sustainability and cohesion of nations overwhelmed by the tsunami of crisis, but also the opportunity to review the paradigms that guide both analysis and practices for the territorial government [13].

Since complex urban regeneration policies require huge investments in the face of limited resources or the increasingly stringent budgetary constraints arising from the credit crunch, and the domestic fiscal policy or the EU (European stability pacts and internal agreements) the state is increasingly urged to involve new actors to prosecute

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public works, to set priorities and resort to political incentives rather than coercion[13]. This implies a major change in the management of public works and it is in this context that we discuss the various forms of Public-Private Partnership (PPP) [4], [18].

With the definition of PPP as identified today, forms of public-private partnership have become ever more diverse and articulate [4], [7], [16]. Yet there is a very clear common goal: the involvement and use of private resources, financial, managerial and creative programs in complex urban regeneration (PUC), to build and / or manage equipment [5] or public service activities. In Italy, in the process of urban development, this involvement took place in the wake of the European experience, very gradually, especially during the nineties, and legislation has gradually introduced several sophisticated tools to cope with the many demands on the city, within a framework of increasingly limited availability of public resources.

These new instruments highlight the need to develop tools that enable flexibility in providing immediate and transparent assessments, whilst at the same time, prior assessment of the feasibility of such investments and a verification of the results and financial operations [4], [21]. The PUC in the PPP relationship is substantiated by the Public Administration (PA) in making the investment with a sufficient margin for the private developer, obtaining as much as possible by negotiation, in terms, for example, of works and additional services to the statutory minimum (standard).

There is obviously a model of optimal negotiation to be applied in all circumstances, but the explicit objectives of the actors should be quite clear: for the private developer: gain for the highest possible return commensurate to the risk, for the public to ensure that the program is realized and obtain the highest standards of construction for the city in terms of public works and additional services, thus ensuring competitiveness between developers [4], [5], [8].

The object of the exchange is the surplus or profit from the land defined by the PA through the definition of land use decisions, the areas to be developed, the works to be realized, indices of airspace, etc.

Bargaining can only take place based on the substance of a prior transparent assessment which allow the PA to measure the requests of the developer [4]. If this does not occur the consultation is likely to become an empty ideology making it an unlikely opaque process for the transformation of land. Here lies the risk.

This essay will therefore deepen the role that can be exercised by the assessment in negotiating procedures between public and private and then provide a useful methodological contribution for which it may perform properly. The aspiration is to help the parties involved in their negotiations - the PA on the one hand and private developers on the other - to arrange a PUC that reconciles the maximization of urban quality pursued by the PA with all the convenience of private investment in property. To this end, an integrated assessment model is proposed that combines two different methodologies: financial analysis (DCFA) with Multicriteria Decision Analysis (MCDA).

The verification of the model to the case study found that the model is able to overcome the weaknesses and exploit strategic synergy resulting from the integration of two different valuation methods to support transparent decision-making processes relative to complex programs of urban transformation brought by private developers.

The presentation of the model is preceded by an illustration of the problems that have stimulated the development and role of evaluation in the context of complex decision-making.

2 Methodology Used for "new rules" Research

In reference to the case study, Calabrian Region governmental legislation states that the municipalities must identify the areas of their territory to be covered by urban development and set the objectives of environmental, social and architectural quality that they intend to achieve. Under this law, municipalities should promote the involvement of public and private developers in the preparation and implementation of urban regeneration programs through public tender [18]. However, where privately owned properties are present in the areas to be covered by urban renewal it is stipulated that in place of a call for tender the Municipality activates negotiation procedures with developers which are aimed at defining the forms of their participation in the program [8], [9]. The outcome of such negotiation procedures may constitute a variation to the Master Plan (MP).

In such circumstances, this "transgression" of the rule refers to a specific asset or set of rules for which transformation is recognized as being in the public interest, as represented by the elimination of degraded conditions in the pursuit of an objective to improve urban quality. The "transgression" index of "buildability" is then commonly implemented in specific urban areas with new rules.

The argument then recognizes the important role of evaluation [10] which is essential for achieving the following goals:

- making the consultation and the final decision transparent;
- explicating public objectives and maximizing their level of achievement;
- finalizing the process of formation and appropriation of urban land.

The municipal administration would do well to officially recognize this reevaluation of the assessment procedure, further specifying that the assessment of a private project must be undertaken in an objective manner, with reference to data of a technical nature (town planning, environmental, financial, etc.) The "new rules" used in the evaluation procedure must be disclosed to all potential developers, i.e. to all owners of areas subject to urban regeneration. The contents of the procedure must be technically examined with the results verified at a political level.

The assessment model for consultation between the public administration and the owners/private developers is divided into two components, as shown in Figure 1:

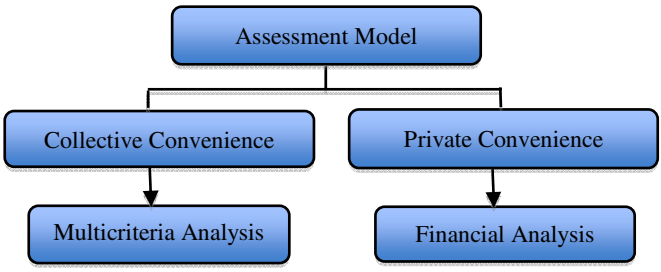

Fig. 1. Assessment model

- evaluation of the collective convenience (MCDA);
- evaluation of the private convenience (DCFA).

The increased complexity of urban transformation requires a systematic approach and non-linear to complex problems, hence the need for an integrated assessment of valuation methods in order to overcome the weaknesses and exploit the synergies arising from the integration of strategic assessments MCDA and Discounted Cash Flow Analysis (DCFA), and support transparent decision-making processes relating to any plan for urban transformation proposed by private entities.

The integrated use of the two assessments allows the public entity on the one hand to check under ex-ante if the effects of the implementation of private investment are generally positive on the system environment, urban and social, and therefore acceptable to the community, and at the same time on the other side to check, through the DCFA, if there is sufficient room for feasibility and financial sustainability for the private party in making the investment.

The DCFA, here used in the public sector for the evaluation of private investment, of course, it is a technique of quantitative-monetary and optical private law does not take into account either the social effects of an intervention, or any opportunity costs of alternative projects, nor qualitative aspects not monetized: to measure these externalities recourse is to be used in conjunction with the AMC. The MCDA are a tool to support the public body in decision making ex-ante, and are designed to provide a rational basis to problems of choice but in reality are characterized by a multiplicity of objectives / criteria often in conflict with each other in order to identify possible alternative processing and the advantages and disadvantages that may result from their implementation [22, 23], [25, 26].

The private feasibility study provides an explanation of the pricing system, the costs for the private developer and also the value of the property to be transformed, what development will result in the area, the developer's profit and the interest on capital advances. This activity is intended to alleviate the lack of information between the public administration and the private developer: while the latter contains detailed information about the financial aspects of the project, the first does not [16], [18], [22].

However, this information is directed towards the public administration and is unavailable to the private developer, except to a partial extent and in a summarized form that can be deduced from Administration documents. The information on the need for

goods and public services is part of the interests and skills of the public sphere. However, this information is often inaccessible to the public body to the extent that it can be profitably used in a contractual relationship, as witnessed in the case study, with the private developer. In addition, the PA - unlike the private developer - is interested in the effects produced by private development on the urban environment, i.e its externalities. An evaluation of public convenience therefore aims to increase the PA's level of information concerning the effects of the project and to state the desired public objectives [1, 2, 3].

As already noted, the improved accessibility of information is especially beneficial for the public sector. In a negotiating context such as that described, the combined use of the private convenience and the collective convenience evaluation is aimed at identifying a single solution, which satisfies both the private and public sectors [13].

As regards the private feasibility study, it is necessary that the proposal of urban transformation advanced by the private developer is accompanied by a pre-feasibility study, which can be prepared according to the technical standards defined by the public Administration. This must then also contain technical requirements of an economic-financial nature, such as the completed clarification market surveys, the costs outlined, all financial processing performed, and so on [21].

The feasibility study prepared by the private developer must justify the "buildability" and the proposed destinations. In turn, the PA, through its Technical Department, and possibly assisted by external experts, ensures the reliability of the feasibility study contents and the accuracy of its results.

In this regard, the evaluation technique is consolidated. Through the financial analysis of the investment project and then the calculation of the Net Present Value (NPV) and the Internal Rate of Return (IRR), the public administration can verify how reasonable the building costs and zoning requested from the private developer are.

As regards to the assessment of collective convenience, however, there is no single universally accepted procedure, unlike financial feasibility [21]. Consequently, when there is no monetization of problematic decisions and qualitative problems remain relevant, the preferred solution is sought is through the MCDA [25, 26]. The MCDA, which abandons the simplistic concept of optimization, incorporates a choice for the type of "justified" approach, in which subjective perspectives can be made explicit, that is, defined and justified in a way that can be subject to public debates [24]. For these reasons, its use is also beneficial in the decision-making context, search the ″most satisfactory solution″. Since the MCDA includes a combined set of models and methods [17], [22, 23], [25, 26] the evaluation procedure to be applied to private projects of urban regeneration must be specially prepared.

The assessment model proposed in this paper was used on an experimental basis, during the consultation procedure between the PA of Reggio Calabria and the owners of the properties within the subject area destined for urban regeneration. The urban and environmental degradation in a predominantly residential area, within a context of social degradation, led the PA to make it the subject of redevelopment and to invite private developers to present their plans on the general objectives of urban quality.

In response to the request, private parties (owners and property developers) have presented a project destined predominantly for a residential area. However, the proposed costs were significantly higher than the Master Plan had considered for areas of redevelopment. The assessment procedure therefore has become the technical

framework for consultation between the PA and private entities, for the urban transformation project to be realized.

3 The Private Feasibility Evaluation

The evaluation of the private feasibility study requires that the value of the area be costed for the urban renewal program. These costs are compared with the current value of the real estate in order to verify the financial convenience for private developers to perform the transformation.

To estimate the value of the real estate in its current condition requires an estimation of the market value of the real estate under current market conditions in reference to the demand for real estate. In this respect, the information provided by real estate analysts and by sectorial real estate publications can give the first indications. More detailed information regarding the costs of sale which are similar to those estimated must be found through deeper investigations. Essentially the characteristics of the area being valued and the data collected mean the value of the building complex is identified with the aid of well known estimative methods [12], [14, 15].

The research into the value of real estate as a result of a transformative project is based on the Value of transformation estimate criteria (Vtr) [4, 5], [19]. The DCFA gives a more analytic estimate of the Vtr [21]. This technique estimates the transformation of the property by estimating the flow of costs and revenues related to the investment project carried out by a developer. Generally, the DCFA involves the resolution of the equation:

$$NPV = F_1 / (1+r) + F_2 / (1+r)^2 + \ldots + F_n / (1+r)^n \quad (1)$$

where *NPV* is the Net Present Value (NPV) of the investment project, *F* is the difference between revenues and costs for a period considered, *r* is the discount rate and *n* is the length of time considered for the implementation of the project.
The NPV is therefore the value that the good assumes due to the assumed conversion:

The use of DCFA requires that specific assumptions are made on the expectations of revenue and cost (Table 1), and are then identified:

- value (revenues) of the real estate under development;
- investment costs;
- active and passive interest rates and the discount;
- profit.

In the application of the experimental method set out in this paper, the developer has made a summary estimate of the real estate in terms of construction costs and an estimate of the revenues from sales of real estate in order to explain the absolute profitability and percentage deriving from the building investment.

The PA, in turn, looks to gain from their assessments. The NPV of the property was estimated by a process of synthetic-comparative. This value was then compared with the value of transformation resulting from DCFA, mentioned in Table 2 and shows a pattern application.

Table 1. The assumptions used for the application of DCFA

Entries	Quantity	Unit value (Euro/m^2)	Percentage (%)
URBAN DATA			
Territorial area	30.000 m^2		
Building permission index	2,00 m^3/m^2		
Building area	16.100 m^2		
Building volume	60.000 m^3		
Total volume	59.000 m^3		
REVENUES			
Tourist accommodation areas	9640 m^2	180,00	
Tertiary-commercial areas	2.400 m^2	108,00	
Tertiary-business areas	4.088 m^2	143,00	
Total revenues		431,00	
COSTS			
Production costs		1.740,00	
License fees		n.a.	
Professional fees			10%
Total costs		1.740,00	
INTERESTS and PROFITS			
Passive Interest rates			8%
Active Interest rates			3,20%
Discount rate			5%
Profit			5,11%

However, rather than having only the Vtr, the PA can consider two temporal scenarios - a horizon of 6 years and one of 8 - and check the resulting value for the real estate property from a combination of the following variables for each of them:

- the index required by the building rights vs. a property index of 1.0 m^2/m^2 maximum considered by the PA in terms of the urban load permitted;
- the quantification of the costs of primary tabular urbanization vs cost estimate of urbanization that the new urban settlement would really require.

Therefore, the following disparity was verified:

$$Vtr > Vm \tag{2}$$

where: *Vtr* is the Value of transformation obtained by the DCFA and *Vm* is the current market value of the real estate obtained through a synthetic comparative method.

The DCFA has highlighted how the transformation was financially sustainable with a lower urban load with an index equal to 1,0 m^2/m^2, but it has also made clear that by attributing the entire cost of urbanization to private developers, as deemed necessary by the PA, it would make intervention problematic and convenience questionable for the private developers.

In addition, in the model, combining traditional evaluations based on NPV with more flexible models was considered appropriate: tools such as Real Options Analysis (ROA) [9] allow a dynamic analysis of the investment, which makes the strategic dimension of urban regeneration programs explicit [6, 7]. This internalizes the estimate of the opportunity cost which can be deferred over time, pending administrative scenarios and a more favourable market value, until the uncertainty that characterizes the decision variables is resolved. It also allows the development of a comparison between several alternative scenarios on the density and the intended use [5], [9].

Table 2. A diagram of the DCFA application (values €x1.000)

Entries	Total value	I year	… year	V year	VI year
REVENUES					
Tourist accommodation areas	€ 1.731,00	--		€ 1.731,00	€ 1.731,00
Tertiary-commercial areas	€ 258,00	--		€ 258,00	€ 258,00
Tertiary-business areas	€ 583,00	--		€ 583,00	€ 583,00
Residual value real estate	€ 25.450,00				€ 25.450,00
Total revenues	€ 2.572,00	--		€ 2.572,00	€ 27.872,00
COSTS					
Area market value	€ 3.600,00	€ 3.600,00		--	--
Production costs	€ 28.024,00	€ 4.203,00		--	--
Operating costs				€ 1.770,00	€ 1.770,00
Total of costs	€ 31.624,00	€ 7.803,00		€ 1.770,00	€ 1.770,00
BALANCE		-€ 7.803,00		€ 802,00	€ 26.102,00
Interests	€ 7.018,00	€ 1.145,00		--	--
Debt exposure	€ 2.133,00	--		€ 2.133,00	€ 2.133,00
PROFIT (NPV)	€ 8.411,00				

4 The Evaluation of the Collective Convenience

The evaluation of the convenience to the community resulting from the transformation of the area was achieved through MCDA, thus based on multiple evaluation criteria [17], [22, 23], [25, 26].

The objective of this evaluation is to determine whether the resulting effects from the implementation of the proposed project by the private developer compared to the current use of the area are generally positive in terms of the impact on the environment, urban and social system, and therefore acceptable to the community. In relation to this evaluation profile there must be a comparison between the zero option (the

actual state or non-intervention) and option one (the transformation project presented by private developers) and option 2 (ideal project: with a lower urban load).

In this case, the MCDA evaluation process aims not only to measure the alternatives (i.e to indicate which of these is preferable) but also, to measure the impact of the various options on the urban system [18, 19, 20]. It is necessary in order to determine whether the difference, in environmental, social, economic and urban terms, between the realization of one alternative or another implies significant or negligible impact, made explicit in numerical terms, and therefore these differences are easily communicable [11].

The system evaluation alternatives are articulated into the following steps:

- description of the alternatives;
- choice of criteria for the evaluation of impact;
- construction of indicators for measuring the impact;
- analysis and survey of impact;
- standardization data and presentation of the weight of evaluation criteria;
- choice of the ranking technique for the alternatives.

However, in the experimental application of the proposed model, the multicriteria evaluation - as you will see - concludes with a measurement of impact. This is because the objective information given by the impact matrix was voted on by public decision makers, providing sufficient detail to start the negotiation process with individuals.

4.1 The Description Phase of the Alternatives

The first step is the description of the alternative projects, due to the zero option (status quo or non-intervention), option one (project submitted by private developers), option two requiring less urban infrastructure (ideal project). The different alternatives are represented (Table 3) as values that express the main urban characteristics, in terms of activities and public spaces laid down by law.

Table 3. Land use to design alternatives (m^2)

Land use	Option 0	Option 1	Option 2
Totale area	30.000	30.000	30.000
Green park, public spaces, walking and cycling paths	26.000	-	-
Parkings and roads	-	12.000	12.000
Public utilities (cultural, recreational, etc.).	-	4.088	4.088
Accommodation activity (hotel)	0	9.640	8.380
Accommodation activity (residence)	0	-	1.300
Skilled and administrative services	2.800	-	-
Business	200	2.400	2.400

4.2 The Definition of the Evaluation Criteria

For an assessment of urban projects a balanced evaluation characterized by three criteria was decided as the best strategy: the criterion environmental/cultural, the economic criterion and the ethics criterion (or social justice) [1,2], [13], [17], [23], [26]. In this case the criterion of environmental quality was also chosen as it allows a better assessment of "collective convenience" for the transformation intervention compared to the urban environment in which the area is located. Below is the valuation criteria used with respective measurement modes (Tables 4, 5 e 6).

- *Environmental sustainability* is measured by a lower consumption of natural resources, for consumption we intend the return on the resource in terms of "pollution" (e.g. polluted air, contaminated soil, etc.) and the increased provision through development that involves a reduction in the agents that cause a negative impact on the environment and humans (e.g. green barriers for the mitigation of noise pollution, energy and economic saving etc.).
- *Urban quality* is measured by the completeness of infrastructural facilities and punctual collective nature to the needs of the settled population.
- *Social solidarity* is measured by the degree of response to the potential demand. The higher the percentage of people served by the structures and spaces specially dedicated to the specific requirements, plus the criterion is satisfied.
- *Financial sustainability* is measured by evaluating the cash flows DCFA through the criterion of Net Present Value (NPV).

4.3 The Construction of Indicators for the Measurement of Impact

For each evaluation criterion sub-criteria were defined to enable a more specific general criterion. The next step was to define a set of indicators for the different sub-criteria, that could measure in quantitative terms to achieve the objective underlying each sub-criteria. The indicators were not only chosen according to their significance, but also by the availability of the data (or data necessary for the indicator construction), officialdom of the source and the possibility of an update [10]. As illustrated in the attached tables (Tables 4, 5 and 6), on each evaluation matrix given, the operational definition for each indicator is represented making the quantification feasible, allowing the expected trend with respect to the objective function of the corresponding sub-criterion (i.e. maximization, minimization or tending to zero) and giving values of the performance for each project option. Here, for lack of space, the operational definition of each indicator has been omitted. The indicators were obtained by processing the data of the project, sectoral plans (urban traffic plans, zoning acoustic plans, etc.) and detailed planning, from simulations conducted specifically in this sector.

4.4 The Analysis Phase and Detection of Impact

The analysis phase of the impact renews the techniques of impact assessment, from a definition of the effects to an analysis of the impact. Once the criteria is defined, it establishes the most appropriate indicators for measuring impact [17], [22, 23], [25, 26].

(e.g. for noise pollution, an indicator may be the daily number of cars in the input and output from peak hours, as a source of noise) [11]. The calculation of values was made using coded analysis techniques (traffic analysis for the estimation of cars, induced employment analysis, etc.). In a specific summary table the impact generated is illustrated for the project alternatives.

Table 4. The evaluation matrix for MCDA: Environmental sustainability

Evaluation criteria	Indicators category	Objective function	Option 0	Option 1	Option 2
Noise pollution	Permissible noise levels	tending to 0	0	0	0
	Presence of activities classified as sources of noise	min	0	0	0
	Noise levels as laid down by acoustic zoning classification	min	0	0	0
	Presence of air pollution from mobile sources	min	60	30	30
	Morphology of the settlement	h. min	6	21	18
	Noise impact mitigation measures	n. trees max	20	20	20
Air pollution	Road traffic entering and exiting from study area	n. cars min	0	320	246
	Presence of permanent sources of air pollution	m^2/m^2 min	250	600	450
Water consumption	Soil permeability	m^2 max	22.000	13.800	13.800
Energy saving and bioarchitecture	Sunlight and brightness	n. max	0	178	150
	Ventilation	n. max	0	0	20
Energy and economic saving	Cost of maintenance and management heating system (Convention Centre)	€/m^2 min	---	532,00	423,00

Table 5. The evaluation matrix for MCDA: Urban quality

Evaluation criteria	Indicators category	Expected developments (objective function)	Option 0	Option 1	Option 2
Standard facilities	Free public parking spaces	$m^2 \geq 0$	0	7.000	7.000
	Private parking spaces	$m^2 \geq 0$	….	5.000	5.000
	Urban green areas	$m^2 \geq 0$	….	1872	2100
Accessibility	Links to road network	ml max	0	900	900
	Area accesses by external users	n. max	1	2	2
Community facilities	Supra-municipal services	m^2 max	10	21	24
	Equipment of local interest	m^2 max	0	0	0
Functional complexity	Diversification of business in the area	m^2 max >10	2	6	8

Table 6. The evaluation matrix for the MCDA: Social solidarity

Evaluation criteria	Indicators category	Expected developments (objective function)	Option 0	Option 1	Option 2
Safety	Accessible, protected, Pedestrian and cycle paths towards the services and city center with rest areas	m^2 max	0	0	0
	Open spaces for meeting and socializing served by public services	m^2 max	0	250	250
	Presence of interventions included in the Program of Safety	m^2 max	750	750	750
Social integration	Green areas for play time and meeting	m^2/inhab ≤ 0,5	0	0,3	0,4
	Commercial services in the Neighbourhood	m^2/inhab. > 0 and ≤4	0	2	3
Employment	Sustained employment	n. max	12	26	26

4.5 The Evaluation Phase: Standardization and Ponderation

The next steps are the standardization of values and the importance of weight assignment to different evaluation criteria.

If the data is used for quantitative analysis, it is necessary to conduct an operation of data homogenization, using a procedure of standardization. All values are mathematically processed so as to become dimensionless numbers between 0 and 1 and therefore comparable. Among the many methods of homogenization, generally one of the two most commonly used methods are chosen [26], obtained from the following formulas.

$$Eij = (eij - \min eij)/(\max ej - \min ej) \quad (3)$$

$$Eij = eij/\max ej \quad (4)$$

where *Eij* is the data corresponding to the criterion *j* and to alternative *i* standardized, e*ij* is the data before standardization. and *max eij* e *min eij* respectively represented, the maximum value and the minimum value observed for the criterion j from all the other alternatives (i = 1, 2, ..., I). With the first method of standardization, the highest value is 1 and the lowest 0, while in the second method of standardization, the lowest value can be different from 0. For the estimation of the weights, in the trial illustrated, a method of rating was used, often applied in planning practice [23], [25, 26]. This type of method requires the interlocutor to assign a predetermined amount of points (e.g. 100) to the criteria identified in such a way that the number of points assigned to each criterion reflects its relative importance.

4.6 Ranking the Alternatives

Finally we calculate types of alternative by combining weights and indicators with respect to each alternative. The methods for doing so are many [11]. Among the qualitative methods, which rely on the retrieval of numerically measurable data, chosen for use - as part of the "Electre" methods processed within the French school [23]: the Analysis of concordance / dominance that accepts 'intransitivity' and lack of comparability in preference relations between the alternatives. The analysis of concordance / dominance is a relatively simplified analytical translation procedure of decision making, far from rigid constraints of a mathematical nature and, conversely, more suitable to perceived indications from decision-makers and opinion-leaders.
This analysis, beyond the structural differences [23], [25] expected:

- Allocation of weights to the criteria according to preferences;
- Calculation of the value of the coefficients Concordance $Con_{i,k}$ and Discordance $Dis_{i,k}$ between pairs of alternatives;
- Verification of the existence of a relationship between pairs of outranking alternatives (on thresholds concordance and discordance thresholds);
- Ordering of alternatives;
- Sensitivity analysis.

The concordance (Con) measures the satisfaction of choosing the Alternative *i* (Ai) of the Alternative *k* (Ak) (compared to the criteria C1, C2, etc.) and is the sum of only the weights, for which the criteria explains the satisfaction of choosing the first alternative rather than the second (often, but not necessarily, normalized by the sum of the row):

$$Con_{i,k} = \sum_j w_j \tag{5}$$

Conversely, the discordance (Dis) measures the regret in discarding the Alternative *i* (Ai) of the Alternative *k* (Ak), and is measured (usually) as the maximum difference between the values of the indicators of those criteria for which regret is expressed at not choosing the second alternative rather than the first (usually, but not necessarily, normalized to the maximum difference in the column):

$$Dis_{i,k} = \max \left| a_{kj} - a_{ij} \right| \tag{6}$$

At this point it is possible to construct two matrices of pairwise comparisons (respectively that of discordance and that of concordance) with the values thus obtained. These values are aggregated respectively in two vectors, whose elements are the Indices concordance (Ic) and Indices discordance (Id), determined in accordance with the formulas:

$$Ic(i) = \sum_j Con_{i,j} - \sum_j Con_{j,i} \tag{7}$$

$$Id(i) = \sum_j Dis_{i,j} - \sum_j Dis_{j,i} \tag{8}$$

The alternatives are then sorted into two lists: an index of increasing rates for concordance and decreasing rates for discordance.

Finally, simultaneously taking into account the Test of concordance (Tc) and discordance (Td), an outranking report is built (S) (outranking.), on the basis of which the different alternatives are hierarchically arranged with all criteria taken together. The alternative to outperformance is that if *aj*, with reference to the pair (ai, aj), where both the tests of concordance and that of discordance are exceeded, according to the threshold values of concordance (C *) and discordance (D *) predetermined.

$$S(ai,aj) = \begin{cases} 1 \text{ se } Tc\ (a_i,aj) \geq C^* \quad e \text{ se } Td\ (ai,aj) < D^* \\ 0 \text{ if otherwise} \end{cases} \tag{9}$$

Finally, the results of the model of decision support to determine which variations of the model can generate substantial differences in the performance of the alternatives are obtained through sensitivity analysis. Generally, these investigate the values of criteria and indicators which correspond to the "turning point", that is, when the ranking of alternatives is reversed [11], [17].

4.7 The Results of the Assessment

The successive methodological phases, including the standardization of data, the weighting of the criteria and the ranking of the alternatives, the application under examination did not take place. In fact, the PA considered that the matrix of impact provided a comprehensive information framework to start negotiating with individuals. Initial meetings between the PA and private developers have targeted a sharing of methodology whereby multicriteria analysis can be used to evaluate their project proposals including the development of the evaluation criteria and proposed indicators. As hoped, the sharing of criteria by private developers was immediate, and the choice of indicators has not been questioned. Private developers were then involved in gathering the data relating to the quantification of the indicators for two of the three options. In the next step the PA highlighted the impact resulting from the implementation of the various project proposals and together with the private developers explored the possibility of any intermediate design changes, between the proposed project and the one initially proposed as an alternative by the PA. Although there was an initial rejection of new solutions, the transparency of the evaluation procedure, designed to measure the negative and positive impacts associated with different alternatives, helped overcome the initial uncooperative attitude. Revision and project development then took place. The results of this evaluation led the PA to favour the alternative option 2 -project ideal that produces less negative impact and greater benefits for the community, while maintaining adequate profitability for private investment.

The outcome of the negotiations was positive: the PA was satisfied with the role played by the multicriteria evaluation as a support to the decision.

5 Conclusions

The trial adopted was accompanied by the emergence of various expectations. First, the "new rules" - that is, the evaluation procedures described - are capable of ensuring in the decision-making process the PA requirements of transparency and fairness to the

citizens, thus obviating the serious lack of current experiences of concerted planning. Second, the quality of urban transformation occurred at the outset in several respects: not only aesthetic and functional, but also expressed by performance indicators of urban nature, environment, social and economic-financial.

Finally, the need to ensure the viability and sustainability of the redevelopment means that objectives, resources, the possible actions of the different actors can interact with each other and co-exist. Thus, there is the opportunity to assign evaluation as a process that accompanies every stage in the formation of the program, as a role of coordination and training through planning to satisfy divergent interests, that explores alternative hypotheses and, if necessary, the need to amend and / or supplement the initial proposals in the program in relation to both its structure and organization in its relationship with the social, economic, environmental and cultural context, all of which are selling points.

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