

# Plan coherence through PPR — the case of Porto

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## Abstract

The ‘Plan-Process-Results’ (PPR) method checks for the internal coherence of the municipal structural plan (PDM) of Porto as an attempt to determine, and potentially increase its efficiency.

## 1 The problem

The concern (Y) of internal plan coherence is explored in a case study from the municipality of Porto, Portugal (Figure 1). The objective (Z) of the case study is the link between a plan’s objectives and the associated proposals, so the main task (X) of the case study is to visualise that link. The outcome (Z’) is a set of tables identifying and assessing the links, which corresponds well to the case study’s objective (Z).

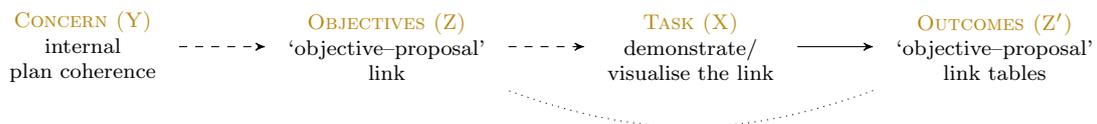


FIGURE 1 The problem of the case study in an ‘XYZ’ configuration (Perdicoúlis, 2013, 2010)

## 2 The broad concern (Y)

In the preparation of any kind of plan, one of the fundamental concerns is its internal<sup>1</sup> coherence — that is, everything stated, claimed, and ordered therein must match. Internal plan coherence is a broad concern (Y): it practically means that there is no room for contradictions, *non-sequiturs*

<sup>1</sup>This is in addition, for instance, to *external* relations such as compatibility — or even synergy — with other concurrent plans in a relevant physical space.

(inconsequences), unsatisfied objectives, or superfluous action, and thus becomes a necessary — although not sufficient — condition for a plan’s efficiency.

Municipal structural plans — or *Planos Directores Municipais* (PDM) in the Portuguese context — are not exempt from this condition. By their very nature (MAOTDR, 2009), PDMs are complex documents and in many cases this complexity leads to situations where the parts of the plan may produce contradictions (Oliveira, 2011; Perdicoulis and Glasson, 2011). While simplicity could reveal any possible shortcomings regarding internal coherence, its absence calls for special analyses and assessments such as in the case study of the PDM of Porto (CMP, 2006).

### 3 The objective (Z)

For the particular case, the internal plan coherence (Y) would be considered minimally satisfied by the existence of explicit relationships between the plan’s *objectives*, on one hand (‘Point A’) and three particular *proposals* of the plan on the other (‘Point B’) — land use, urban systems, and implementation mechanisms — as a response to those objectives. Hence, the objective (Z) of the case study is a way of knowing that the objectives of the PDM (‘Point A’) correspond to the proposals of the same plan (‘Point B’) — Figure 2; Table 1.

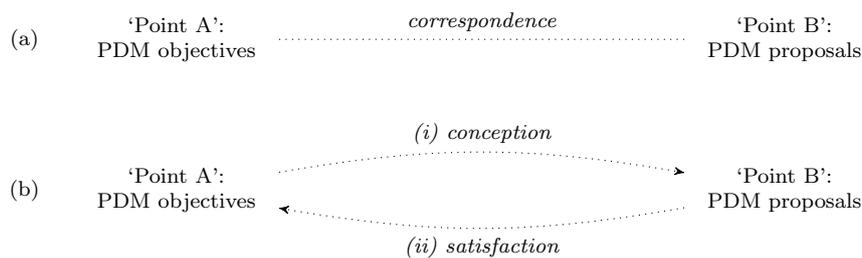


FIGURE 2 The objective (Z) of the case study in general (a) or in some detail (b)

## 4 The task (X)

### 4.1 Typical action

Internal plan coherence rarely undergoes a formal assessment (Alexander and Faludi, 1989). In traditional municipal spatial planning, as with PDMs, the correspondence between ‘Point A’<sup>2</sup> and ‘Point B’ (Figure 2) would be verified empirically. Hence, the application of PPR through the case study brings a conceptual innovation: explicit thinking or, more specifically, an ‘evaluation culture’ (Oliveira, 2011).

### 4.2 Designated action

The specific task (X) set to reveal and examine the internal plan coherence (Z) in the case study applies a custom-made analysis of PPR to the PDM of the municipality of Porto (CMP, 2006). The operands of the task (X) are presented in Table 1.

<sup>2</sup>NB: Portuguese planning practice usually subdues the explicit formulation of the plan objectives, but this is beyond the scope of the case study.

X OPERANDS	PDM CONTENTS
Objectives (‘Point A’)	Five objectives: the enhancement of the urban identity of Porto (Obj.1); the rehabilitation of public space and the built environment (Obj.2); the rationalisation of transport systems (Obj.3); the reduction of existing social and territorial imbalances between the eastern and western parts of the city (Obj.4); the rehabilitation of historical quarters and the central area (Obj.5).
Land use (‘Point B <sub>1</sub> ’)	Ten form-based zones: Historical Areas; Areas of Continuous Building Frontages and Largely Replete Plots; Areas of Continuous Building Frontages and Plots in the Process of Repletion; Single-Family Housing Areas; Areas of Isolated Buildings; Areas of Public Services; Special Urban Development Areas; Business Park; Green Areas; Transport Areas.
Urban systems (‘Point B <sub>2</sub> ’)	Three urban systems: environmental system (US1); built heritage system (US2); and mobility system (US3). <sup>a</sup>
Implementation mechanisms (‘Point B <sub>3</sub> ’)	The mechanisms for plan implementation included a number of urban actions and investments (IM1), and the identification and definition of a number of smaller operational units for planning and management (UOPG) for further analysis to later support detailed planning proposals (IM2).

<sup>a</sup>From these systems, two particular features should be highlighted, the definition of a municipal ecological structure and, for the first time in the plans for Porto, a clear focus on public transport policies in detriment of the private car.

TABLE 1 Operands of the task (X) and their specific contents (CMP, 2006)

### 4.3 Methods and techniques

PPR, which supports the execution of the selected task (X), originated in an academic context (Oliveira and Pinho, 2009), was subsequently launched in the international debate on evaluation in planning (Oliveira and Pinho, 2010a,b, 2011), and was later experimentally applied in practice through case studies in the municipalities of Lisbon and Porto. PPR takes interest in a set of key elements of the spatial development process such as the city users (residents and workers), the local politicians, the plans (e.g. PDMs), as well as the planning system — including the relationships between these elements.

The execution of the task (X) was initiated in a qualitative manner, but concluded with numerical reporting. The text and drawings of the plan were read to gain an understanding of the PDM’s objectives, territorial model (zoning proposal and urban systems) and implementation mechanisms. This led to an initial qualitative appraisal. Subsequently, ‘Point A’ and ‘Point B’ — i.e. the operands of the task X (Table 1; Figure 2) — were related in ‘impact matrices’ (Tables 2, 3 and 4), enabling a quantitative reporting of the assessment on the robustness of the relationships between the different parts. Each ‘impact’ refers to the *satisfaction* of ‘Point A’ by ‘Point B’ — Figure 2(b).

## 5 The outcomes (Z’)

Tables 2, 3, and 4 synthesise some of the relationships between ‘Point A’ (objectives) and ‘Point B’ (proposals).

PROPOSAL	OBJ.1	OBJ.2	OBJ.3	OBJ.4	OBJ.5	TOTAL
Form-based zones	2	2	1	1	2	8

TABLE 2 The territorial model (zoning proposal) against the PDM’s objectives

PDM objectives such as the ‘enhancement of the urban identity of Porto’ (Obj.1), the ‘rehabilitation of public space and the built environment’ (Obj.2), and the ‘rehabilitation of the historic quarters and the central area’ (Obj.5) are intrinsically associated with the definition of land use<sup>3</sup>, and the two naturally demonstrate their strong relation in Table 2.

PROPOSAL	OBJ.1	OBJ.2	OBJ.3	OBJ.4	OBJ.5	TOTAL
Environmental system	2	2	2	1	2	9
Built heritage system	2	2	1	1	2	8
Mobility system	1	2	1	1	1	6
TOTAL	5	6	4	3	5	23

TABLE 3 The territorial model (urban systems) proposal against the PDM’s objectives

PROPOSAL	OBJ.1	OBJ.2	OBJ.3	OBJ.4	OBJ.5	TOTAL
Urban actions	2	2	0	1	1	6
UOPG	1	2	1	1	1	6
TOTAL	3	4	1	2	2	12

TABLE 4 The implementation mechanism proposal against the PDM’s objectives

On the contrary, the link between the objectives and the mechanisms of plan implementation (Table 4) is less clear. One of the reasons for this might be that the PDM objectives are general, while the implementation mechanisms are operational and thus more specific.

## 6 Efficiency assessment

By providing a satisfactory outcome ( $Z'$ ) — i.e., a set of tables that visualise and communicate the plan coherence —, the case study achieved its objective ( $Z$ ) — i.e. a way of knowing how objectives correspond with proposals. Hence, the gap between  $Z$  and  $Z'$  (Figure 1) is considered negligible. While ‘satisfactory’ reflects a level of acceptance in the particular case study, satisfaction itself remains an issue of *quality* that should be explored further (§ 7.2).

Any operation — with the particular case study being no exception — is likely to produce ‘unintended outcomes’, or side-effects (Equation 1). In a case of information processing, such as the particular case study, side-effects could be errors, or the introduction of uncertainty or ambiguity, which could possibly degrade the quality of the original information or produce inappropriate conclusions. After an error check in the processing and conclusions, verifying that none of the original information was transformed irreversibly, no side-effects were considered to arise from the case study.

By these two partial assessments, constituting the numerator of the ‘efficiency equation’ (Equation 1; Perdicóulis, 2013) —, the case study can be considered *effective*.

$$\text{Efficiency} = \frac{\text{Intended Outcomes} - \text{Unintended Outcomes}}{\text{Required Resources}} \quad (1)$$

<sup>3</sup>The existing urban forms in Porto suggest the definition of different zones and provide the criteria for the design of new urban forms, thus contributing to the achievement of the three objectives mentioned above.

Being a ‘study’, as opposed to a production environment, the time invested in producing the outcomes ( $Z'$ ) does not count in the denominator of Equation 1. What would carry over to a production environment would be the technical demands for its implementation (i.e. creating the impact tables), which are indeed frugal — i.e. do not require a great investment in skill or learning. So, overall the case study can be considered to have contributed to the *efficiency* of the PDM of Porto.

## 7 Discussion

### 7.1 Thus far

The way the 2006 PDM was produced could be the probable cause of the low scores presented in Tables 2 to 4 — more so in Table 4. The plan-making process was carried out during a time of significant changes in the administration of the municipality (e.g. governance, technical staff), and also a shift of duties from external consultancy to in-house preparation. Certain parts of the PDM, such as the urban form, remained largely untouched during these changes, so the PDM is more coherent between points ‘A’ and ‘B’, as verified by the consistent high scores in objectives 1 and 2.

Efficiency in this case study was attributed to the plan (PDM): it should be at least coherent between its objectives and its proposals. PPR managed to bring this relationship into view, using a simple technical way: juxtaposing the two parts in tables. This setup allowed for an efficiency assessment of the PDM, and could probably suggest where improvements could be made in the PDM, in case the local authority wished to consider these in a follow-up.

### 7.2 Even better

Although the case has already made a contribution to efficiency, aspects of quality indicate where and how its objective ‘Z’ could be achieved with even more efficiency. One leverage point is the technique of visualisation, chosen in the particular case study to be ‘impact matrices’ (Tables 2 to 4). Alternatives for the visualisation of two-part relations may be graphs in a general or specific form, such as the ‘descriptive causal diagrams’ (DCD) of Systems Planning (Perdicoulis, 2010). Furthermore, the set-up of the case study could even change so that the particular relations between objectives and proposals of the PDM could follow in the definition of the ‘XYZ’ problem, as in Figure 1, again featuring DCDs.

A second leverage point is the resolution of specialised information. Planning themes such as land use, urban form, housing, transport, and the natural environment require adequate understanding and, by extension, specialised research and interfaces. This calls for the addition of specific perspectives at the operational level through instruments such as ‘*Morpho*’ regarding urban morphology (Oliveira, 2013) and ‘SAL’ regarding urban mobility (Silva and Pinho, 2010), to achieve more definition in the information, and hence better judgment per subject regarding the coherence of the plan — still revolving around the verification of the ‘Point A’ to ‘Point B’ correspondence.

Any of the two enhancements would *reduce* the initial efficiency of the coherence assessment, as it would require an investment of intensive learning and/ or theme-specific assays (Equation 1), but the resulting benefits of (a) easier and more flexible visualisation and (b) better understanding through higher-definition information would pay off in the long run, producing a more coherent, and thus more efficient PDM. As illustrated in Figure 3, it is wise to start the investment well before production time ( $t = 0$ ), so that the project does not suffer any consequences of the apparent inefficiency ( $t < 0$ ).

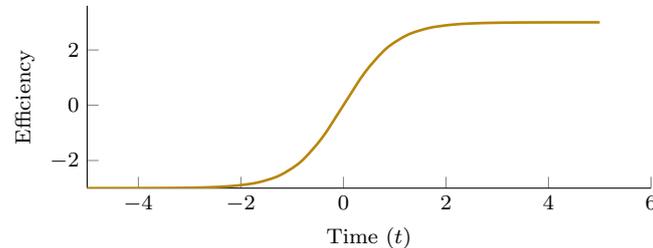


FIGURE 3 The results of the extra investment come slowly, but are rewarding (arbitrary units)

## 8 Conclusion

Efficiency of a municipal structural plan such as the Portuguese PDM could be checked through the necessary but not sufficient condition of its internal coherence, as experimented with the case of Porto. The PPR method attempted to start an ‘evaluation culture’ in the municipality, so far achieved through a visible analysis and assessment of the plan’s internal dynamics. The plan’s efficiency could be actually enhanced by correcting the detected inconsistencies, which is left for the future — e.g. in the revision of the PDM.

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