The 5P model: Public Private People Policy Partnerships
A novel concept for the renovation and regeneration of public buildings for cultural heritage management purposes

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Abstract

Municipalities typically face difficulties in conserving and managing their public cultural heritage, which often lingers in a condition of neglect, and there is a strong need to identify a set of additional and innovative tools capable of providing adequate financial resources as well as new skills. The use or reuse of public cultural heritage buildings can be managed through the adoption of Public–Private agreements and novel models. The paper illustrates the new 5P concept model of Public-Private-People-Policy-Partnerships that has emerged as a way to address the problems related to Public-Private Partnerships by bringing the citizens (People) into the Partnerships alongside with Public and Private actors and with the strategic local Policy makers (Policy). The paper illustrates a practical case of applying the model to a R&D green building project.

Keywords: Public Private Partnerships, Building Renovation and Regeneration, Public cultural heritage Management, Conservation and Valorisation.

1. INTRODUCTION

Municipalities typically face difficulties in conserving and managing their public cultural heritage, which often lingers in a condition of neglect, and there is a strong need to identify a set of additional and innovative tools capable of providing adequate financial resources as well as new skills. The use or reuse of public cultural heritage buildings can be managed through the adoption of Public–Private agreements and novel models. These novel models contemplate the convergence of investments from different sectors into cultural heritage by means of negotiation dialogues and fostering the use of non-heritage funding originating from other domains such as the labor market, the third sector, regional development and creative industries for the sake of achieving heritage and non-heritage-related goals. This alternative approach to cultural heritage enhancement implies that a trade-off be pursued between different parties with a collaboration leading to resource collection for the purpose of conservation and valorization activities, thus boosting the exchange of good practices and abilities, and making new networks possible [1]. Although well-established opinions state that the conservation of cultural heritage as common goods basically pertains to the purview of the public sector, the participation of private resources may nonetheless pose an opportunity for the public administration to profit from novel funding channels and the public sector should revise its own approach to incentivize the private sector's becoming involved and investing in cultural heritage through new financial instruments such as tax breaks, differentiated value-added tax brackets, well-designed grants, loan programs and public–private partnership schemes [2]. There are many challenges in current ways of combining public-private partnerships, policy makers and citizen participation. It is for example often emphasised how public-private cooperation between city administrations and private actors such as land-owners and developers limit the transparency of decision-making and the possibility for public input. Emphasising the different positions of private actors and citizens in planning processes, point out how public-private partnerships and citizen participation are based on different ideas and principles. Public-private partnerships are based on an idea of networked governance practiced through negotiations and formalised through binding contracts. The imbalance between the influence of private actors and the general public is also affected by the temporal gap between public-private partnerships and public participation and very long periods to develop and implement the policies [3]. It is a recognised problem that binding agreements between public and private actors may outline the development principles early in the project, while the public participation processes often take place later in the process. Lack of public input early in the planning processes is found to risk increasing the focus on

economic considerations and economic sustainability of the project on the expense of creating liveable urban environments based on the needs of the local communities.

2. DIFFERENT FORMS OF PPPs

In this paragraph an overview about the most common forms of Public Private Partnerships is provided. The exact definition of a PPP contract depends on the extent of involvement of different parties and the risk taken by the private partner. The PPP is usually defined in an agreement or contract between the public and private partners, were responsibilities and requirements are written down and the risks allocated [4]. The following figure provides a rough overview on different PPPs, provided by the World Bank group. The main forms of PPP can be divided into four different types:

1. Management and operating agreements:
   - Public party contracts a private company for implementing certain services or actions; private party is paid by a fixed fee.
   - Generally short term (2-5years).
   - Public party bears risk of asset condition.
   - Agreements can be performance-based, oblige the private party to maintain the assets and to take over some operation risks.
   - Commonly used in Europe for waste water management, waste disposal etc.

2. Leases contracts:
   - Public party as owner of the assets contracts a private company as operator. A part of the incomes out of the operation is paid back by the private company to the public contractor, the remains are retained by the operator.
   - Usually the fee for lease is fixed, the private operator takes risk on income collection (e.g. charging of customers...).
   - Public contractor remains responsible for financing and managing investments in the assets.
   - Usual contracting durations of 8-15 years.

3. Concessions:
   - Public party gives a private "concessionaire" the long term right to use all utility assets conferred on the concessionaire, including responsibility for operations, maintenance and some investments.
   - Concessions can be given for existing assets, an existing utility, or for extensive rehabilitation and extension of an existing asset.
   - Concessionaire takes risk of condition of asset and risk on income collection.
   - Usual contracting durations of 25-30 years (possibility to amortize major initial investments).
   - Concessions are usually given for infrastructure services e.g. operating a road, a railway network, etc.

4. Contracting models such as Energy performance Contracting).

5. Build Operate Transfer (BOT) – type of concession:
   - Private contractor receives a concession from the public entity to finance and construct the utility or system and operate it commercially until the end of the project period. Afterwards the public contractor takes over the facility.
   - Private operator obtains its revenues usually by charging the public contractor.
   - Private entity bears a substantial part of the risk.
   - Long-term contracting durations of 25-30 years (possibility to amortize major initial investments).
   - Typically used to develop a generally new (greenfield) discrete asset.

6. Further variations of concessions: the following forms can be advantageous forms of financing projects, depending on the external circumstances. These forms provide possibilities to lower political risks, technical risks and financing risks. There are several more forms available, the most commonly known ones are listed below.
   - DBO (design-build-operate): public contractor owns and finances construction of new assets, private contractor designs, builds and operates it.
   - BOOT (build-own-operate-transfer): private contractor additionally owns the asset during the concession period and the ownership is transferred back to the public authority.
   - BOO (build-own-operate): ownership remains at the private company.
   - BLT (build-lease-transfer): private company builds the project and leases it to public entities. After the end of the leasing period, ownership is transferred to the government.
   - DBFO (design-build-finance-operate): similar to BOOT, but no ownership transfer (public entity is owner over the project period).

The above-mentioned matters are graphically summarized in Figure 1. The extent of private sector participation rises with different financing schemes from left to right.

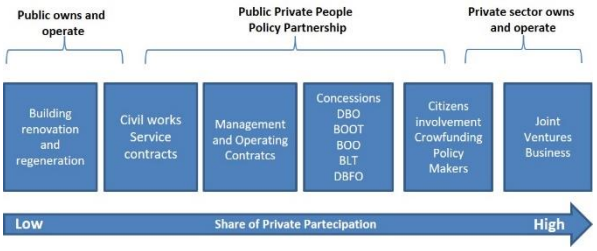

Figure 1: Main forms of PPPs.

Figure 2 gives an overview on the base models. Usually, these base models never occur in their pure form on the market. More common are mixed variations. Basically, the table shows the share of private participation in

different project phases.

Model	Ownership	Operation	Financing
Operating Model (e.g. BOOT, DBFO)	Private/Public	Private	Private
Cooperation Model (e.g. management and operating agreement)	Private/Public	Private/Public	Private/Public
Concession Model	Private	Private/Public	Private/Public
Contracting Model (e.g. EPC)	Private/Public	Private	Private
Leasing Model	Private	Private/Public	Private/Public

Figure 2: Base PPPs models.

3. FROM 3P to 5P

3.1 Public Private Partneships

The term "public-private partnership" (PPP) is generally used with reference to any type of operational agreement based on mutual commitments and responsibilities between public bodies and partners that operate outside the public sectors [6]. The lack of a precise definition seems to have arisen on the one hand from the fact that in general - in the last twenty years - the terminology used to indicate the private sector's involvement in distributing public services has become more complex, varied and open to different interpretations, even ideological ones; on the other hand, from the use, in particular, of similar acronyms in different countries that however imply different processes. The term is also not defined at Community level either. In this case, the term is used for any form of cooperation between public authorities and the world of business aiming at ensuring the funding, construction, renovation, management or maintenance of an infrastructure or building or the provision of a service.

PPPs can contribute to economic growth and sustainable development in the European Union. According to the Organisation for Economic Cooperation and Development (OECD, 2018) a "public-private-partnership" is an agreement between the government and one or more private partners (which may include the operators and the financers). The private partners deliver the service in such a manner that the service delivery objectives of the government are aligned with the profit objectives of the private partners. The effectiveness of the alignment depends on the sufficient transfer of risk to the private partners". Additionally, PPP is based on a long-term relationship (at least three years).

More precise, (EUROSTAT, 2013) claims that PPPs involve substantial capital expenditure to implement the project by a private partner, which then operates and manages the project to produce or deliver services to the public. At the end of the contract, the public partner usually acquires legal ownership of the project. The basic structure of a PPP can be seen in the Figure 3. In contrast to traditional public procurement, the government commissions a private partner, which is then responsible for all further actions. At traditional public procurement, the public party must fully take care of the implementation of the project.

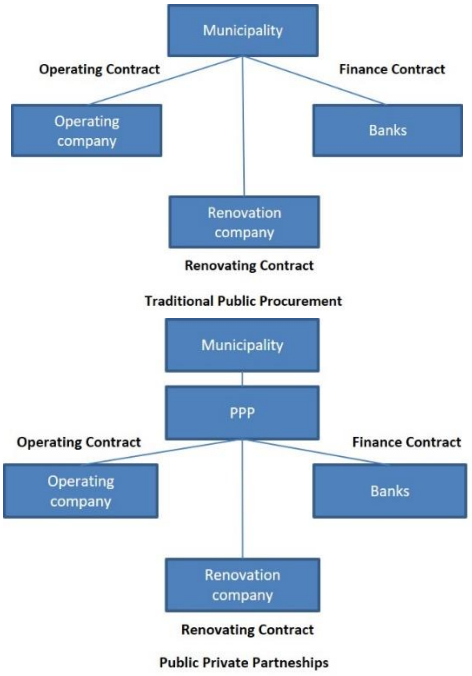

Figure 3: From Public Procurement to PPP.

PPPs have different manifestations, depending on type of PPPs. When building a PPPs, the public partner defines the required quality and quantity and allows the private partner to implement actions according to this framework. The picture below shows the different shapes of these partnerships and the risk allocation. The higher the degree of privatization, the more is the risk reduced for the public party. The types of partnerships can basically be divided into:

1. Complete government production and service. All actions are completely carried out by governmental institutions.
2. Traditional public procurement. Private partners, chosen by tender processes, deliver certain services, etc.
3. Public Private Partnerships PPPs (as well as EPCs as form of PPP). The private company finances, maintains and operates the project and is paid for it. The project e.g. building reverts to the control/ownership of the public sector at the end of the contract term.
4. Concessions. Can be considered as type of PPP.
5. Privatization. Full responsibility for service/project is given from public to private partner.

Public procurement refers to the process by which public authorities, such as government departments or local authorities, purchase work, goods or services from companies. To create a level playing field for businesses across Europe, EU law sets out minimum harmonised public procurement rules. These rules govern the way public authorities and certain public utility operators purchase

goods, works and services. They are transposed into national legislation and apply to tenders whose monetary value exceeds a certain amount. For tenders of lower value, national rules apply. Nevertheless, these national rules also have to respect the general principles of EU law [6].

The main difference or advantage of PPP versus traditional public procurement is the lack of needed initial investment. The major investment in the beginning is done by the private partner, whereas the public contractor pays a certain fee on a regular basis over the contracting time. This allows public institutions to distribute expenses over a longer period, which may have positive influence on public accounts. The basic principle is shown in the next figure. PPP's usually require a lower initial capital contribution by the public party, which may result in higher operating costs (additional costs for service fee for private partner, etc. The detailed cost allocation depends on the contractual arrangement between the involved parties.

In literature it is recommended to already have sufficient or major public monetary resources before commencing PPP models for keeping the financial part of the project in public responsibility. Although the financial liabilities can be outsourced and considered as off-balance sheet in certain cases, they are still present and affect the public budget for a long-term. In addition, public parties usually get cheaper financing from banks, since they usually have a better rating (creditworthiness) than private companies [7]. A Public Private Partnership exists when the public sector (state, regions, cities, local or agencies) joins with the private sector or service provider, to attain a shared goal. We acknowledge that every partnership is unique, but that they share one or more common characteristics:

- Bringing together public/private sector partners.
- Working together toward shared goals or objectives.
- Contributing time, money, expertise, and other resources.
- Sharing decision-making and management responsibilities.
- Adapting to innovation and change
- Recognise and use new opportunities

New policies, funding regimes, political situations or economic circumstances (good and bad) can provide unexpected opportunities. These may be the stimulus to undertake new initiatives and activities that entail a PPP approach.

In particular, the European Community makes a distinction between:

- PPPs of purely contractual nature, in which the partnership between the public and the private sector is based solely on contractual links,
- PPPs of institutional nature, involving cooperation between the public and the private sector within a distinct entity.

The following elements normally characterise PPPs:

- The relatively long duration of the relationship.
- The method of funding the project, in part from the private sector, sometimes by means of complex arrangements between the various players.

Nonetheless, public funds - in some cases rather substantial - may be added to the private funds.

- The important role of the economic operator, who participates at different stages to the project (design, build, management, funding).
- The distribution of risks between the public and private partner, to whom the risks generally borne by the public sector are transferred.

Partnership is therefore an organizational issue that implies some degree of cooperation between public and private entities, aimed at performing public duties and by which the resources and risks are shared on the basis of each partner's own field of expertise [8]. The interest toward partnership schemes is consistent with the multiplicity of interactions they create and variety of operational instruments whereby they are implemented (concessions, sponsorships, etc.). As P3s have already been adopted in the past and in diverse contexts, as for instance infrastructure development, it can be interested to explore the possibility to innovate this alternative way of funding, describing and analysing this emerging way of transacting between public and private organizations in the building renovation and cultural heritage field, for it has not been widely adopted yet. In this context, heritage partnerships should be aimed at ensuring continuity and good planning in conservation activities to avoid becoming involved into fragmented and unvirtuous projects or even having to resort to divestment programs. Indeed, resources should be used not solely for renovation, but also for continuous sustainability, conservation and continuation after said plans have been accomplished.

At the moment there is a demand for further research on instruments and approaches that can be used to incentivize private and third sector involvement in the cultural heritage field and to encourage the public sector to work with private and third sector. The term "partnerships tools" refers to a wide range of management approaches and instruments, from procurement forms all the way to voluntary agreements, each of which aimed at different publicly pursued objectives. Introduced as they have been in the past few decades, they may vary based on their fields of pertinence and the legal frameworks mandated and enforced by each given country. Sometimes, a relevant degree of inconsistency emerges within individual, national legislative frameworks – as is the case with Italy – which in turn warrants that terms and definitions be used and interpreted with special care. What matters here is that private sector organizations perform activities normally and naturally pertaining to the purview of public entities. Indeed, P3s are a form of long-

term cooperation between public and private entities aimed at absolving public duties such as the design, construction, management and maintenance stages of public works or services – in it, resources and risks are shared based on each party's skills and contribution. The component of build may include renovation, retrofitting and/or rehabilitation and the public-private partnership (P3) is a broad term that can be used to describe public facility and infrastructure contracts that minimally include components of design and build (e.g. construction, renovation, rehabilitation) in a single contract. Components of financing, operations, maintenance, or management may be included within this single contract. Thus, one important implication is that a given contract may entail an obligation of conservation upon restoration works completion [9].

Apart from the above, private actors can either be driven by:

- For-profit objectives, in which case, some return on investment must result. The transaction at issue can be termed a P3, to wit, a collaboration between public and private entities aimed at eliciting some return in terms either of money or image (this is why, sponsorship initiatives are included). The private entities at issue pertain to the business sector and may be either natural persons, legal persons with for-profit objectives (e.g. private universities), economic operators (e.g. construction companies) or financial institutions (e.g. investment banks, pension funds, insurance companies).
- Non-profit objectives, in which case a return on investment may be missing. The transaction at issue can be termed a public–private–people partnership (P4) and relates to instances of philanthropy in the presence of community support and with common citizens acting as project developers. The private entities likely involved are of a civic-minded nature and may be either natural persons, legal persons with non-profit objectives (e.g. ecclesiastical entities), non-profit organizations, associations and various types of foundations (e.g. banking foundations).

3.2 Moving towards 4Ps

To date, the P3 approach seems to be the offspring of neoclassical economic ideology, for private partners are considered as for-profit actors. Not surprisingly, most of its practical applications seem to have been designed and implemented as mere project financing tool transfers. The connection between political institutions and business sectors as well as heavy community involvement encourages the implementation of projects and renders the solution of collective problems more effective. Adding to the P3 model the contribution suitable to be lent by the general population, a P4-based model will emerge, which provides for the involvement of the following groups of stakeholders:

1 Public entities, i.e. the central government, municipalities, local governments and public estate owners;
2 Private entities, i.e. businesses, developers and private owners;
3 People, i.e. common citizens, the non-profit sector and end-users.

The P4 concept has created possibilities for engaging new pro-active and positive participation methods and solutions, not only for the early stages of urban development process (planning and design), but also for construction, operation and management of local economic and social infrastructure taking also into account of end-user-oriented method to evaluate P4s encompasses not only value-for-money criteria, but also the categories of lifecycle approach and diversity [10]. Thus, the involvement of social and economic actors plays an important role in governmental processes, and mainly so on a local scale. It discloses opportunities for implementing novel, proactive and positive ways of participating not only in the development of the project (as the investment and service provision-related decisions are typically made during the planning and design stages), but also for the executive and operational stages. The whole community's involvement is strongly recommended even in urban preservation, and one of the prerequisites for sustainable operations warrants that each individual stakeholder put on the table all their competencies [11]. The P4 model represents a highly refined form of integration by which people give birth to a quasi-organization, to wit something amounting to a half-formal, half-informal mechanism. As being a diverse and cohesive set of socio-economic actors cooperating with each other and public institutions, non-governmental actors are actively involved in the solving of shared problems. Citizens will thence become co-designers, co-producers and co-evaluators. Moreover, the P4 model should be implemented in a context of mutual trust and accountability between stakeholders, namely, natural persons, groups and private sector entities.

Italian Legislative Decree July 03, 2017 n. 117, also known as "The Third Sector Statute," mandates that social cooperatives can be entrusted with managing cultural heritage provided they are equipped with the competencies set forth within the service contract. Its provisions confirm the current trend toward the fostering of non-profit entity involvement in these kinds of activities and services. More specifically, the decree proposes forms of co-design between public administrations and the third sector, and provides the concession of publicly owned built cultural heritage needing restoration to third sector entities. The concession must aim at implementing a management project by ensuring adequate conservation and valorization. The role of non-governmental organizations mainly consists in the identification of critical heritage buildings, provision of public advocacy, the rallying of support and initiation of redevelopment process. Besides, the third sector can also play a relevant role in providing an equity position,

heritage conservation expertise and long-term supervision and assisting the public partner in marketing the project to potential private partners [12].

Also, for a P4 initiative to be financially sustainable, some adequate risk assessment must be performed. As in the case of P3, the main categories to be included are risks consistent with politics, the environment, funding, design, development, restoration, unexpected events, enduser demand and/or revenue, operations and maintenance. In political decision-making, the risk can be controlled by getting all relevant policy makers to become involved. in this case we can define a new model that extends the partnership also to policy makers: the 5P Model (Private Public People Policy Partnership).

3.3 The 5P Model

The concept of the Public–Private–People-Policy Partnership (5P) is an emerging way of highlighting the need for developing the involvement of private actors and the general public in a joint process with policy makers. EU cities emphasise the importance of citizen participation in their planning legislations and policies. At the same time, they continuously develop new models in order to make private companies more involved in planning processes through different types of public-private partnerships and cooperation modes. Typically, city administrations' cooperation with companies on one hand and citizen participation on the other hand is discussed separately although they both are expected to influence the same planning process.

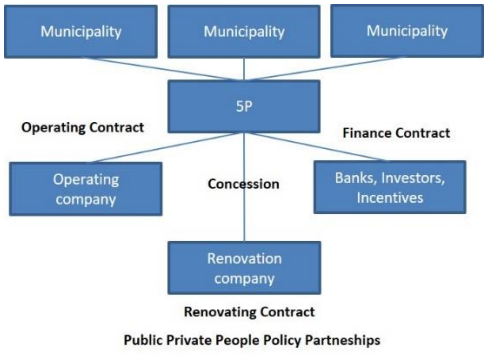

Figure 4: From Public Procurement to PPP.

The concept of Public-Private-People-Policy-Partnerships (see Figure 4) has emerged as a way to address the problems related to public-private partnerships by bringing the general public ("people") into the partnerships alongside with public and private actors and with the strategic local policies. There are also other new policy concepts with an aim to create more inclusive governance involving different actors, but the 5P-approach specifically targets attention to adding the general public and the citizens to public-private partnerships and particularly addressing the problems of exclusion and lack of transparency. There is no single model or definition of the concept, and its principles can be adapted in different ways case by case. In general, however, 5P approaches focus on developing planning processes that can be both efficient and open by including both private actors and citizens. Practices of stakeholder involvement stem from legislation and local and national planning cultures, and can thereby be difficult to influence by individual planners. By pointing attention to the in-built imbalances in terms of positions and influence between private actors and the general public, however, the concept of Public-Private-People-Policy partnerships could at least be a first step of helping planners to become aware of, and address the differences in resources and influence between actors, and also to find ways to utilise the strengths of the different actors to comply with specific policies.

Since the 1980s it has become more and more apparent that public services don't always run efficiently, that public funding everywhere is decreasing, and increasingly inadequate to finance urban regeneration projects. In 2003, the European Commission through its Directorate General for Regional Policy published a set of 'Guidelines for Successful Public-Private-Partnerships ' and a resource book on PPPs. These documents were designed as practical tools for PPP practitioners in the public sector faced with the opportunity of structuring a PPP and of integrating or "blending" European Communities grant financing in PPPs. They did not attempt to provide a "recipe" for setting up PPPs or defining policy but rather they offered guidance for those involved in the dialogue on the use of PPPs.

4. OPPORTUNITIES OF THE NEW MODEL

4.1 The 5P Model for Urban Regeneration

To varying degrees across Europe, urban regeneration poses a major challenge to city authorities and requires significant investment, whether this be financial, creative or managerial. Many cities are no longer able to meet these investment challenges on their own whether this is because of shortages of public money, limited professional skill pools or simply because the associated risks are too great [14]. Through this paper we aim to demonstrate that Public Private People Policy Partnerships (5Ps) can overcome some of these difficulties and ensure that urban regeneration projects are successfully implemented and completed in a timely way. That is not to say that 5Ps are the answer to the realisation of all urban regeneration projects. There will be times when cities have the funds, professional skills and management to undertake projects without the help of the private sector. We can identify five major reasons for adopting a 5Ps Partnership approach.

1. Finance and access to additional finance is perhaps the major attraction of the approach. 5Ps bring private sector finance to the project; they also frequently provide access to a funding pool which

none of the partners might have if they acted alone. This is of particular importance in large scale, complex projects and in project aiming at take advantage of incentives available for private organizations but not for the public ones. In this case, public partners can grant a concession for a loan agreement to use the building, which can then be renovated with tax incentives which will benefit by private partners through tax credit.

2. Importantly, partnerships can help organisations to learn and innovate. The public and private sectors have traditionally approached problems from different perspectives - one with its responsibility to the community, the other to its shareholders. In the past, this has led to tensions and disagreement. Partnership increases our understanding of the interests of the other partners, and forces us to jointly examine if there are better ways of doing things and as a consequence develop trust and understanding between the sectors.

3. 5P model offer the opportunity to minimise the limitations of individual partners through joint working and joint action. Private partners for example bring project management and organisational simplicity to projects which the administrative complexities of the public sector are unable to match. Community organisations are flexible, close to informal networks and represent long-term interests of the local community - their involvement therefore underpins the success of regeneration projects (as projects will be based on the needs of the locality) and also helps ensure public acceptance and support.

4. 5P model allows to bring expertise and know-how to a project. Many city administrations do not have sufficient project development and implementation professionals with the skills associated with major development projects.

5. With a common understanding of both purpose and approach resulting from the involvement of all stakeholders, projects can be delivered more rapidly and with greater long-term sustainability.

4.2 Partnerships Development

There is no definition of what constitutes the right partnerships. The right partner will be the best suited partner for the specific particular purpose, project or plan. However, clarity of role is vital to the search for partners and the roles of each partner may also change at different stages of the process. The variety of different roles identified by the network is illustrated in Figure 5.
It will be crucial to find partners who have compatible long term goals in developing the project, the capacity and drive to deliver the agreed result according to a clear and transparent structure / contract and the capability of reacting to and accommodating unexpected changes.

Role of Public Sector	Role of Private Sector	Role of Community Groups	Role of Policy Makers and Agencies
Leadership/champion	Investment capital	Help to identify local needs/problems and different possible solutions	Develop strategy/vision
Initiate development	Hands-on approach: project development and delivery	Voluntary work, knowledge and support	Evaluation and monitoring: postimplementation
Subsidy provision, invest/ co finance	Finance	Involvement in process: as part of administrative procedures	Secures funding
Appraisal / negotiation with property/land owners	Delivery	Hands-on approach in community-based regeneration	Define strategies
Use of legal powers	Provision of knowledge/information	May be absent where there is no Community	Adopting EU policy to local needs
Project management/ co management	Networks with other private investors		Relations with regional, national and EU authorities
Allocates and secures funding	Innovative in service delivery		
Complements private sector initiatives	Provide delivery impetus and reduce / avoid delay		

Figure 5: Roles of different partners.

5. AN EXAMPLES OF 5P APPLICATION: THE EPOPZEB PROJECT

P5 instruments are funding and management models aimed at conserving and valorizing activities based on the involvement of public private actors and also citizen involvement such as civic crowdfunding, online petitions, creation of living labs and definition of local policies and the involvement of regional innovation agencies [15]. They are examples of self-organization, which have resulted in response to challenges posed by complex systems such as cities and society and can be also supported by philanthropy, volunteering and novel technologies. To this end, we should also stress that digital technologies and social media play critical roles and offer new opportunities. Civic crowdfunding is one of the most novel transaction forms involving citizens and public administrations, which is spreading, thanks to the internet. It differs from simple crowdfunding because it is aimed at financing public services and works. Albeit collective funding for public purposes is nothing new, its link with information technology marks an innovative aspect nonetheless. Civic crowdfunding differs from fundraising, also thanks to its internet-based functioning and huge number of backers. Online platform can be used to connect not only the financial institutions with the project, but also the different backers with each other, thus consolidating an otherwise highly dispersed financial capacity. It implies a direct community involvement in the planning, development and implementation of the public intervention. After the project has been accomplished, the management stage is oftentimes supported by further non-profit associations. Civic crowdfunding is a spontaneous phenomenon, as such not contemplated within the classical model of public management. Besides, it allows to overcome the traditional top-down approach and develop decentralized forms of public government.

Two more tools suitable for consideration are social bonds and sustainability bonds. One of the relevant emerging issues is that public administrations are still to become familiar with these kinds of alternative funding instruments. Even concession, which is a Design–Build–Finance–Operate–Maintain (DBFOM) tool mainly used in P3s, may

be employed in operations aimed at involving the third sector. Indeed, in P5s, the concession fee is generally either not contemplated or of a symbolic extent, as in the case of the ePopzeb project.

The epopzeb project is a research and development project funded with structural funds under a regional call "Smart Buildings" under the 2014-2020 Operative Programme. An innovative prototype of a modular wooden building equipped with a building automation system and an IoT smart monitoring platform was created during the project and it is shown in Figure 6.

Figure 6: The Smart City Lab of Rome and Lazio.

The project represents an example of practical application of the 5P model. In fact, it was developed by a partnership including private partners (3 smes and 1 private university), public partners (1 municipality and 1 public university), the citizens of Colleferro and a Regional Agency for the management of structural funds. In addition, numerous stakeholders from the construction and IT sectors were involved during the execution of the project. During the project, an experimental building prototype has been constructed. The building has been managed by a temporary business association that developed the prototype thanks to the free concession of the area where it has been built and owned by the municipality of Colleferro. Currently the building is used as a living lab where local citizens can carry out joint research projects and training activities. The laboratory, called Smart City Lab of Rome and Lazio, is managed by the same consortium that built it, thanks to free loan agreements that are renewed every year and it represents a user-centered, open-innovation ecosystem operating in the territorial context, integrating research and innovation processes. The lab is based on a co-creation approach integrating research and innovation processes. These processes are integrated with the co-creation, exploration, experimentation and evaluation of innovative ideas, scenarios, concepts and related technological artefacts in real life use cases. This approach allows all stakeholders involved to consider both the global performance of a product or service and its potential adoption by users. The lab is based on:

- Co-creation: bring together technology push and application pull into a diversity of views, constraints and knowledge sharing that sustains the ideation of new scenarios and concepts and contributing to local policies.
- Exploration: engaging citizens, innovators and all stakeholders at the earlier stage of the co-creation process for discovering usages and behaviours in real or simulated environments.
- Experimentation: implement the proper level of technological artefacts to experience live scenarios with a large number of users while collecting data. Evaluation: assess new ideas and innovative concepts as well as related technological artefacts in real life situations and evaluating also socio-economic aspects.

Special attention ought to be devoted to the experiences made by the partners of the ePopZeb project. The project has been developed trying to involve stakeholders, catalyze resources and strike, as well as strengthen alliances between public and private bodies. Aimed as it is at valorizing innovations in the green building sector in terms of local development as part of a long-term vision, and doing so by means of investments in human capital, integration between the realms of research, business, manufacturing, culture, innovation in services and methodologies and sustainability, the project can be considered a vivid example of culture-focused community welfare. The activities developed within the project were aimed at establishing interactions between different sectors while handling the economic, cultural, social and environmental domains as a whole and also involving the third sector actors. The project is part of the broader program promoted in cooperation with Lazio Innova, the Region of Lazio and the Municipality of Colleferro and other institutional partners alike, the purpose of which is to ensure reuse and fruition of public buildings. The said operation is addressed to economic operators capable of employing public–private agreements in developing high-potential, innovation-oriented projects aimed at local areas and providing benefits for the community. A public consultation was launched citizens from Colleferro lent their contributions in the form of ideas and suggestions and in the organization of events.

6 APPLICATION OF THE 5P MODEL FOR THE RETROFITTING OF AN HISTORIC BUILDING IN ROME

In this paragraph we will discuss the possibility of applying the 5P model to the renovation of old and historic public buildings. In Rome there are several historic buildings that, while having been abandoned and unused, are also part of a cultural heritage and cannot be demolished on account of the legislative protection meant to protect them from reckless actions, and their regeneration is the only possible solution to reuse them and contribute to the cultural identity of the city and to the sense of belonging to a place of a whole community. Economics Renovation of existing buildings, especially if historical, is more expensive than standard, because it needs specialized

operations and the preliminary count evaluation is upset during the construction phase and there may be barriers related with the bureaucracy for obtaining the permission by Historical and Architectural Heritage Superintendence. After intervention, however, market value can increase for the building and also for the surrounding area. Unfortunately, municipalities often do not have the necessary resources to renovate or regenerate these buildings or, despite the availability of financial instruments, they do not have the necessary technical and financial expertise to put projects into practice and intercept private partners and funding to be able to requalify and reuse this architectural heritage. In this regard, the 5P model can be very useful to allow the municipality to renovate these buildings by assigning the buildings under concession to companies or nonprofit organizations to carry out the works and take advantage of national incentives. In fact, currently in Italy it is possible to take advantage of incentives for the energy efficiency of buildings thanks to a national program called Superbonus which allows to obtain a tax credit of 110%. Only citizens, private companies and non-profit organizations can apply for and obtain these incentives while municipalities cannot. By establishing a loan for use contract between the municipality and a non-profit organization, it is therefore possible to obtain the concessions offered by the Superbonus and allow the municipality to renovate a public building without financial outlay.

Moreover, the city of Rome is adopting a regulation on urban commons as a means of regenerating public buildings. Implementation of the regulation rests on the possibility of signing pacts of collaboration between citizens – including informal groups, associations and NGOs –, private investors and city authorities. These pacts will regulate the renovation, design, management and monitoring of activities related to use of abandoned urban buildings. The concession on free loan of goods owned by the municipality is to be considered admissible in cases in which an effective public and social interest is pursued. The buildings will be transformed in hubs of resident participation to foster the community spirit as well as the creation of social enterprises. New forms of commons-based urban welfare will be created to promote social mixing and the cohesion of local community, making residents actor of the urban change while the local authority will act as facilitator of innovation process already ongoing in the urban context.

A preliminary analysis has been conducted to quantify the building stock of the municipality of Rome. Results from the analysis show that the city of Rome owns a building stock which includes approximately 4,750 non-residential public buildings and 44,290 residential buildings. Of these, 140 non-residential buildings and 251 residential buildings are managed by the Rome II Municipality and the majority of them show very low energy efficiencies with energy consumptions that go beyond the limits imposed by the labelled Energy performance Certificates and which belong to worst performing buildings energy classes (>160kwh/m2/year). Among these there are several buildings characterized by small dimensions (2-4 floors between 200 and 700m^2 in total, (some of which are historic buildings subject to environmental constraints or architectural-artistic value), with energy and environmental performance even lower (with energy consumption between 400-500 kWh/m2/year and 30-40 kgCO2Eq/m2/year of emissions).

In particular, a building located in the Roma II municipality was selected to simulate its energy consumption in order to use it as a reference baseline. The energy and environmental performance of this building have been analysed by numerical simulation with the aim to identify intervention strategies aiming at the reduction of energy consumption, the minimization of CO2 emissions and at maximizing the use of sources of renewable energy. The simulation considered the radical renovation of the building to transform it into a building for municipal offices and spaces for social and educational activities by a major renovation aiming at seismic and energy upgrading. Current energy needs values and thermal comfort conditions before and after possible retrofit measures are compared (see Table I).

Description	Energy need	Before renovation	After renovation	Saving
Heating	kWh/m2/year	342.7	42.3	88%
DHW	kWh/m2/year	44.4	33.6	24%
Electricity	kWh/m2/year	45	20	56%
Total / m2	kWh/m2/year	432.1	95.9	78%
Total 500 m2 building	kWh/m2/year	216,050	47,950	78%
Energy label		G	A	
Carbon emissions/m2	kgCO2eq/m2/year	29.8	5.8	80%
Carbon emissions 500m2 building	kgCO2eq/m2/year	14,900	2,900	80%
Building	**Address**	**Surface m2**	**Year of construction**	**City**
Two floor historic building	Via Nomentana 423-425	500	1900	Rome

Table I: Case study building in Rome.

The structure, located in Rome, is shown in figure 7 and is a two-floors building of approximately 500m2 constructed in 1900.

Figure 7: Case study building in Rome.

The building is in a quite ruined state of conservation: walls are crooked and presented different solutions, moisture affected wooden elements in the floors and in the roof. Specific goals that have been considered for the simulation are:

- to achieve the A class energy classification according to Italian regulations;
- to consolidate and to reinforce the building structure;
- to improve the indoor thermal and acoustic quality;
- to transform the building in a prestigious building with all comforts to host offices, social spaces, co working spaces and living lab.

The analysis considered a renovation that takes particular account of the thermal insulation of the building envelope and with a special attention for the mechanical ventilation and the renewable energy utilization (both solar thermal and photovoltaic system). Building envelope presents a traditional construction system, based on bearing masonry with covered solid bricks. The windows frames are made of wood with single glass windows. There is no insulation in the external walls, roof and floors. The following technologies and measures to achieve A energy class have been considered:

- high insulated windows,
- high level of opaque walls insulation,
- mechanical ventilation system with heat recovery,
- solar thermal panels and PV systems,
- water to water heat pumps and chillers.
- Specifically, two types of insulating are considered:
- expanded polystyrene (EPS) foam placed directly on masonry
- rigid mineral wool panel with a plasterboard cover.
- Roof replacement with a new structure and insulated with wood fibre and water tight covering.
- All existing windows replaced with a low-energy double layer one within wooden frames
- Efficient LED lighting system

Indoor climate technical improvements:

- Mechanical balanced ventilation with heat recovery and a carefully adjusted supply temperature
- Reduction of losses through walls, roof and windows
- Reduction of the thermal bridges allowing to eliminate related condensation problems
- Control of indoor temperature and humidity without relevant energy costs.

The planned interventions can allow to obtain about 78% saving of energy needs and 80% CO2 emissions.

The costs of the renovation can be estimated around 1,800-2,000 €/m2 depending on the final finishes and according to the current conditions of the building market in the Lazio region with a total necessary investment of 900,000-1,000,000 €.
Economics Renovation of existing buildings, especially if historical, is more expensive than standard, because it needs specialized operations and the preliminary count evaluation is upset during the construction phase and there may be barriers related with the bureaucracy for obtaining the permission by Historical and Architectural Heritage Superintendence. After intervention, however, market value can increase for the building and also for the surrounding area. Furthermore, the application of the 5P model can allow the following benefits:

- allow the municipality to renovate buildings without major upfront investments;
- allow private companies and non-profit associations to manage public assets for their social or business activities;
- allow the use of public spaces for social activities that actively involve citizens both in activities and in decision-making processes.

7 Advantages and Risks of the 5P Model

7.1 Advantages

5P can offer several advantages for participating parties

- Use of private know-how
- Extent of needed private know-how depends on public body, e.g. if a small municipality needs to carry out a one-time project, private partners such as construction companies may have superior knowledge.
- 5P can be used to gradually expose state owned enterprises and government to increasing levels of private sector participation (transfer of skills…).
- Governments can abstract from concrete management and focus on results.
- Use of innovation potential.
- Traditional public tenders usually consider the actual state-of-the-art. Requirements of tenders must be fulfilled quite strict during the implementation phase. This can be an advantage of 5P: if potential efficiency increase possibilities occur during the planning and implementation phase of a project, private partners can take these possibilities easier.
- Private sector technology and innovation are

introduced to public infrastructure, which may result in better operational efficiency.

Other advantages are:

1. Lifecycle-oriented project development and budgetary certainty.
   - In 5P projects it is state of the art to consider lifecycle-costs of a project. This guarantees to find the cost-optimal solution
   - Improved budgetary certainty for present and future project costs
2. Renegotiation in public tenders
   - In public tenders it is very difficult or even inadmissible to renegotiate contracts and costs. Private partners don't underline these rules and can try to achieve cost advantages through negotiations
3. 5P is an incentive for private sector to deliver in time and within budget.
4. 5P can be seen as way for developing local private sector capabilities through joint ventures with large international firms, as well as sub-contracting opportunities for local firms in areas such as civil works, electrical works.
5. Risk transfer to the private sector over the life of the project – from design/ construction to operations/ maintenance.
6. Supplemented limited public sector capacities, increased and earlier provision of infrastructure (expectations of public services haven risen steadily).
7. Lower initial capital contribution by the government (deferring spending, without deferring the benefit, lower immediate impact on government borrowing)
   - Short-term public fiscal targets can be reached (tempting for cash-strapped governments)

7.2 Disadvantages and risks

The most common disadvantages and risks of 5Ps are mentioned and described below.

1. High transaction costs boost project volume (Development, procurement (bidding process), contract management, termination management). Additionally, private partner has to make a profit, so projects are more likely to be expensive. The public partner must determine if the greater costs involved are justified.
2. Off-balance sheet debt creates contingent and future liabilities – reduces budget flexibility in the long term.
3. Private sector will do what it is paid to do and no more than that – therefore incentives and performance requirements need to be clearly set out in the contract. Focus should be on performance requirements that are out-put based and relatively easy to monitor.
4. Government responsibility continues – citizens will continue to hold government accountable for quality of utility services. Government will also need to retain sufficient expertise, whether the implementing agency and/ or via a regulatory body, to be able to understand the 5P arrangements, to carry out its own obligations under the 5P agreement and to monitor performance of the private sector and enforce its obligations.
5. A clear legal and regulatory framework is crucial to achieve a sustainable solution.
6. The private sector is likely to have more expertise and after a short time have an advantage in the data relating to the project. It is important to ensure that there are clear and detailed reporting requirements imposed on the private operator to reduce this potential imbalance.
7. Renegotiation is common and tend to favour private partners (tariff increase, concession fee decreases, decrease of the private company's obligations)

7.3 General information on legal framework

Legal frameworks, which must be considered when implementing PPP depends on the country of implementation. Below a list consisting of possibly relevant legal matters for public building renovation PPP projects.

1. General Legislation
   - Laws/Concessions Laws
   - Privatization Laws
   - Legal Frameworks for Project Companies under Civil Law
   - Insolvency Laws
   - Anti-Corruption/Freedom of Information Laws
   - Procurement Laws
   - Theft and Non-technical Losses
2. Sector specific legislation
   - Energy Law and Regulation
   - Telecoms Law, Regulations and Licenses
   - Water Laws and Regulation
   - Regulatory Framework for PPPs in Buildings

8 Conclusions

Thanks to P5 initiatives such as the EpopZeb project, the Smart City Lab or concession of public buildings to privates, not only outstanding artifacts, but also some instances of "minor heritage" recognized as such by local communities underwent conservation and were made accessible to citizens. Other than P5 operations, the latter programs consisted in the large-scale integration of different forms of cultural and economic activities and, what is more, proved to be a viable means of increasing awareness and social participation in the heritage protection sector. Indeed, the projects' main objective was to not solely plan a strategy of cultural heritage valorization based on high-end interventions, innovative actions and a long-term perspective, but also to mutually integrate the cultural supply chain and the local economy and implement an innovative approach to activity management and development to be defined in cooperation with all local stakeholders.

The strategy developed during the project highlights the

need to involve society as a whole in defining and managing cultural heritage, recognizes the collective nature of said commitment and fosters competency synergies between public and private actors. Results of the project underscores the relevance of the concept of heritage community as consisting of people who value specific aspects of cultural heritage which they wish, within the framework of public action, to sustain and transmit to future generations. This allowed the joint action by public authorities, experts, owners, investors, businesses, non-governmental organizations and civil society, to develop innovative ways for public authorities to co-operate with other actors, and encouraging non-governmental organizations concerned with heritage conservation to act in the public interest. The European PPP Expertise Centre stressed that public authorities usually embark on projects the investment into which makes good economic sense. Nevertheless, and compared to conventionally procured projects, partnerships also imply a set of non-financial benefits to end users and, in broader terms, society as a whole. Some benefits may be valued in monetary terms, whereas others may be quantified yet not valued in monetary terms, and others still can neither be quantified nor valued but only identified. The current public management is acknowledging some limits in the traditional models focused, as they are, solely on economic outcomes such as the gross domestic product (GDP) impact and instead considering novel holistic approaches including qualitative aspects, such as the administrative process democratization, social equity, community involvement and individual well-being. Despite reward assessments being a difficult task, one of the key benefits of 5P is that it adopts a life-cycle approach aimed at preserving the function and usability of an asset for the contract period which generally corresponds to its useful economic life. In this respect, further lines of research will likely focus on both the financial and nonfinancial benefits to these operations, with special regard to the data resulting from actual case studies and practical experiences. Besides, more research is warranted as to further P5 types, to best assess the potential and limitations inherent to the various partnership tools either available or under development. Even if some positions envision partnerships as a form of commodification, we ought to stress that these initiatives call for the partners involved to ensure not only long-term protection of the public buildings to be managed and used, but also some management skills consistent with long-time conservation and valorization. All public and private parties need to boast competences consistent with such partnership tools and be aware that the resources shall be allocated not solely for restoration works, but also to ensure a condition of ongoing care for the asset at issue. The implementation of the interventions must be carefully monitored by the public entity in charge throughout all stages of the process until the completion of all operations.

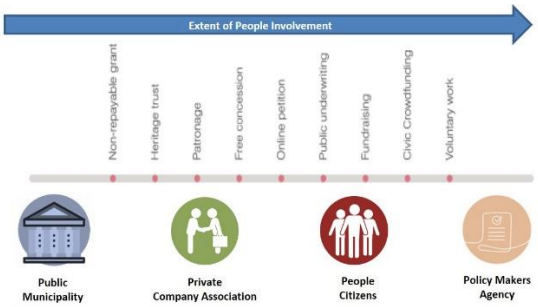

Figure 7. P5 tools, level and kind of people involvement

The problem that has emerged with the implementation of the above-mentioned processes lies in the fact that:

- it is not always possible to precisely and clearly define the expected social output and outcome objectives;
- the public body does not always have the necessary skills for programming, monitoring and assessing the performance of the private distributors, to create incentives and clear mechanisms against opportunistic behavior, as well as for entirely controlling the public processes that are now fragmented. In conclusion, contracting out seems to be an appropriate solution only for certain types of services

Recognizing these difficulties leads to a new way of approaching complex problems which are the ones now being faced by the public administration: no longer entirely empowering the private body but trying to reach the jointly established goals, accepting the dependence and interaction that exists between the various different players and emphasizing their complementary characteristics. This allows governments to use competition between service providers.

Within this new vision, the public administration and the policy makers are not placed "above" the citizens, private profit and non profit organizations, but they are placed "next" to them through horizontal types of steering: cooperation between public and private bodies, promotion and improvement of all self-organized types of civil society and of the initiatives undertaken by various different players including the policymakers, represent the innovative government and coordination modalities for the socio-economic systems of the new 5P paradigm. Also in this case problems and limitations exist because networking must not be interpreted as a source of problems and difficulties which have to be mastered, but as sources of innovation, a critical success factor is the capability to manage relations among multiple players with different objectives and that can limit the effectiveness of cooperation. This role must often be carried out by the public operator whose capabilities in this sense still seem limited.

The competition/collaboration dichotomy is, therefore,

useful to understand the changes currently taking place in the public service, but the reality is more complex and subtle. For this reason, the change in the public sector can be studied through the analysis of the forms of social coordination, governance and policy instruments. Having a role in the 5Ps involves increased complexities for the public operator which has to wear a number of different hats. As managers of contractual relationships, public bodies: authorise contracts (government as concession grantor); evaluate infrastructural needs (government as network planner); provide supporting facilities (e.g. land) and pay for services (government funding); define performance outcomes and standards (government as customer); undertake detailed procurement planning (government as project manager); ensure facilities are constructed, used and maintained satisfactorily (government as inspector); require compliance with standards and specifications (government as overseer); monitor business and financial viability (government as contract manager); assess environmental impacts (government as protector of the environment); and guarantee community access and achieve social policy objectives (government as representative of the public interest)". In view of the above, we have analysed the regeneration theme, a contest in which PPPs seem the most appropriate organizational form.
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10 REFERENCES

1. Council of Europe (2005), "Framework convention on the value of cultural heritage for society".
2. Dente, B., Bobbio, L. and Spada, A. (2005), "Government or governance of urban innovation?", The Planning Review, Vol. 41 No. 162.
3. European PPP Expertise Centre (2011), "The non-financial benefits of PPPs. An overview of concepts and methodology".
4. Gustafsson, C. (2011), The Halland Model. A Trading Zone for Building Conservation in Concert with Labour Market Policy and the Construction Industry, Aiming at Regional Sustainable Development, University of Gothenburg, Gothenburg.
5. Macdonald, S. and Cheong, C. (2014), The Role of Public-Private Partnerships and the Third Sector in Conserving Heritage Buildings.
6. Martin, L. (2018), "Public-private Partnerships (P3s): what local government managers need to know. A policy issue white paper for ICMA, International City/County management association", International City/County Management Association, Washington, DC.
7. National Institute of Governmental Purchasing (2016), "Public procurement practice. Public-private partnership (P3): facilities and infrastructure", Guidance Issued by the National Institute of Governmental Purchasing to State and Local Government Procurement Officials.
8. Martin, L. (2016), "Making sense of public-private partnerships (P3s)", Journal of Public Procurement, Vol. 16 No. 2.
9. World Bank Group – Public-Private-Partnership Legal Resource Center (n.d.), "About public-private partnerships".
10. Majamaa, W. (2008), The 4th P - People - in Urban Development Based on Public-Private-People Partnership, Helsinki University of Technology, Espoo.
11. Mantysalo, R. (2016), "From public-private-people partnerships to trading zones in urban planning", in Concilio, G. and Rizzo, F. (Eds), Human Smart Cities. Rethinking the Interplay between Design and Planning, Springer, Cham.
12. Morena, M. (2020), Strumenti finanziari alternativi per la pubblica amministrazione. Civic Crowdfunding, Social Bond, Green Bond e Sustainability Bond, XIII Edizione OPPAL – Osservatorio Permanente sulla Pubblica Amministrazione Locale, Politecnico di Milano, online event, 26 November 2020, Milano.
13. Puerari, E. (2016), "Urban public services innovation. Exploring the 3P and 4P models", PhD thesis, supervisor Concilio, G., Politecnico di Milano, Milano.
14. Rojas, E. (2012), "Governance in historic city core regeneration projects", Licciardi, G. and Amirtahmasebi, R. (Eds), The Economics of Uniqueness. Investing in Historic City Cores and Cultural Heritage Assets for Sustainable Development, The World Bank, Washington, DC.
15. Rypkema, D. and Cheong, C. (2012), Public-Private Partnerships and Heritage: A Practitioner's Guide, Heritage Strategies International, Washington.