
External benefits of private property-led development projects

Stefan Thiel / Michael Nadler



Professor Dr. Michael Nadler (Hrsg./Ed.)

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Prof. Dr. Michael Nadler	Prof. Dr. Michael Nadler
Lehrstuhl Immobilienentwicklung	Chair Real Estate Development
Fakultät Raumplanung	Faculty of Spatial Planning
Technische Universität Dortmund	TU Dortmund University
Postadresse/Adress:	August-Schmidt-Strasse 6
	44227 Dortmund; Germany
Telefon/Phone:	+49-231-755-7986
Telefax/Fax:	+49-231-755-2415
E-Mail:	immo.rp@tu-dortmund.de
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1 Introduction

In the context of urban and real estate development, the fundamental aim is the improvement of living and working conditions in cities. In terms of welfare theory, this view upon urban development is based on the idea that single urban development projects directly as well as indirectly affect the environment and the residents and industries of the concerned region in a positive way. External benefits become more important, because urban development projects can create precisely these positive effects. On this particular point one can observe that private economy now dominates these kinds of projects and that the public sector is losing importance in this field.¹

In this context, the systematic analysis of external benefits can make an important contribution. Current literature indeed deals with large-scale projects in the context of urban development. However, theory and practice haven't systemized these effects yet.² Therefore, the aim of this research paper is the *systematization of external benefits* that emerge through private investment projects in urban and real estate development. *Section 2* presents the theoretical background that leads to the systemization of the mentioned external benefits. Against this background, the next section (3) focuses on the systemization of external benefits that enables the deduction of a set of indicators in the context of urban, and real estate development. The final *section 3.4* serves as a test for the systemization of external benefits by illustrating the example "Le Quartier Central" in the city of Düsseldorf.

¹ Cf. Heinz (2005), pp. 824.

² Cf. BMVBS (2011).

2 Theoretical background on urban development

2.1 Urban dimension in the context of the European Cohesion policy

The term “development” is used very broadly for different areas. According to the UK Town and Country Planning Act 1990 “[...] ‘development’ means the carrying out of building, engineering, mining or other operations in, on, over or under land, or the making of any material change in the use of any buildings or other land” (Section 55(1) TCPA 1990).

This definition is also very broad in its content and thus covers all activities in urban development, e.g. housing, retail, industry or green development. Further, it comprises both stages the primary development and the redevelopment. The Leipzig Charter on Sustainable European Cities in 2007 stated that cities and urban areas play an important role for future economic development in Europe. Cities have different faces: as modern service provider centres, seats of industry, preferred residential cities and as cities attractive to tourists. In cities, life is vibrant, cities proved the place and starting points for technological and social innovation at the same time. They develop their image and compete for investors, inhabitants and funds. They are equally living, working and trading centres, places of education and culture. In order to strengthen these areas, the EU Commission launched various initiatives and strategies developed with a focus on accommodating the potential of urban areas as well as current requirements. The EU's Cohesion Policy, through the Structural Funds, plays a key role in underpinning the development and revitalisation of Europe's towns and cities.³

Key elements to achieve sustainable urban development are concrete investments in terms of development projects in urban assets. Urban development projects are the manifestation of strategic urban planning and the starting point for the present work. Investment projects in urban and real estate development deliver external benefits. One can differentiate the following urban assets according to their *life cycle*:

³ Cf. Europäische Kommission (2010), p. 3. In this context, the JESSICA initiative has the primary objective to support sustainable urban development by providing the financing instrument of Urban Development Funds (cf. Kreuz/Nadler (2010)).

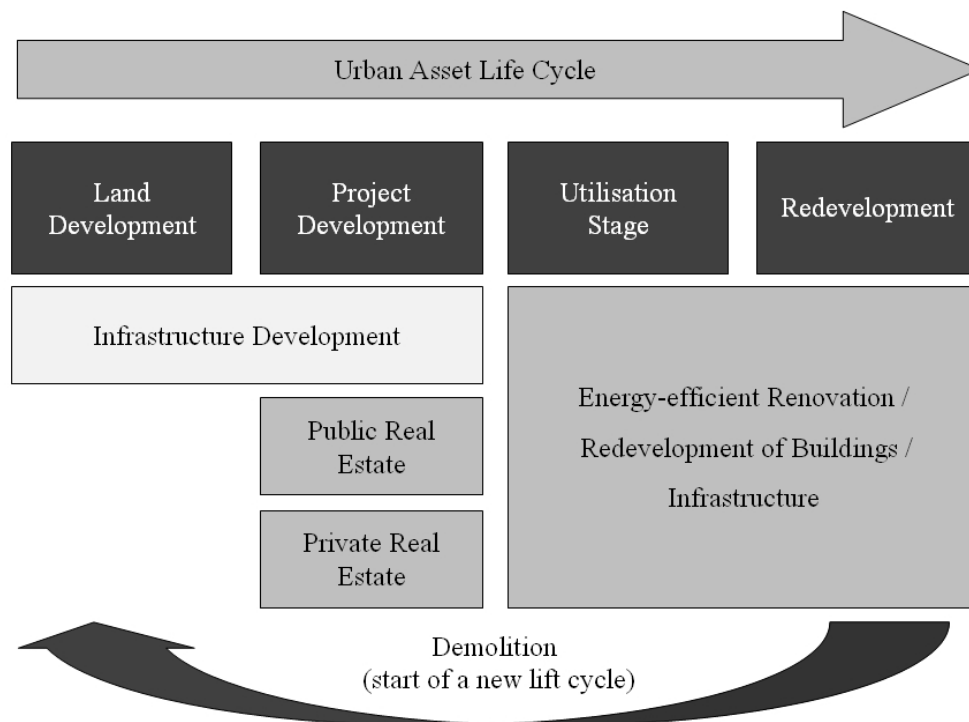


Figure 1: Classification of urban development projects according to the life cycle of urban assets (Kreuz/Nadler (2010), p. 16)

In the first stage, the land development phase, (land) infrastructure projects (e.g. building roads, providing access to public transport, telecommunication or drainage) could serve as a prerequisite for further development of Greenfields or Brownfields. Infrastructure projects in the form of buildings (e.g. kindergartens, schools, hospitals) can also form an important part of projects for the second stage, the project development phase. In this stage, other public property developments, like administration buildings, or private property that supports urban development might follow. Private property developments cover e.g. office buildings in areas with a high unemployment rate or retail property as a social initiator for other investments in the local economy. Once the promoters have completed the development, the third stage, the operating phase, begins. Here, investments are dedicated for example to improve buildings, such as energy efficient renovation. This stage is of high interest in regards to sustainable urban development. Most of the expected benefits occur during the period of utilisation. The last stage covers the redevelopment of buildings or sites (Brownfields). In contrast to mere renovation of a building while preserving the old utilisation concept, redevelopment is characterised by a new concept of utilisation, which usually requires a much higher project investment.

2.2 Necessity and consequence of PPP models in urban development

Often not a single stakeholder but public-private partnerships create urban development projects. Due to the complexity of urban development projects and the change in the roles, mainly from the public perspective, *cooperation models* gain more importance. HM TREASURY (2000, p. 10) *defines* public-private-partnerships (PPP) in this context as follows: “*Public Private Partnerships bring public and private sectors together in long term partnership for mutual benefit.*” Kouwenhoven (1993) filters the main features for PPP in the context of urban development:

- interaction between public and private;
- focus lies on the achievement of convergent objectives;
- synergies are most likely;
- objectives are both, social and commercial;
- identity and responsibilities of each partner remain.

Promoters implemented models of PPP long before the scientific debate started.⁴ In the USA (since 1970) and in Western Europe (since 1980) the significance of PPPs has increased enormously.⁵ The reason for the rising importance is that public funding for urban development retreats. Thus, projects more and more depend on inputs both material and immaterial from the private sector. Furthermore, in the context of urban development, there is a fierce competition for innovative industries and solvent households. To be competitive and to strengthen the image, large-scale urban development projects often play an important role. In particular, these projects require a lot of funding as well as an extensive specific knowledge. Both factors are not available in most of the municipalities – cooperative models with private partners seem to be a suitable answer to these requirements for delivering urban development projects.⁶ Here, the public sector is not any more the investor and creator of development. Rather the role of municipals is to exercise planning competences. It is their strategic role to formulate

⁴ For instance in France, the *Sociétés d'Économie Mixte (SEMs)* are responsible for different kinds of large-scale projects, such as infrastructure provision.

⁵ Cf. Dubben/Williams (2009), p. 35.

⁶ Cf. Heinz/Scholz (1996), p. 13 f.

mission statements and hence to create a *development framework* for sustainable urban development. The role of municipals has evolved towards a process companion and moderator, which means that municipalities increasingly provide *non-financial support* in urban development processes.⁷ This can be achieved by provision of technical and social infrastructures or acquisition of government aid funding (e.g. from the European Regional Development Fund).

As in PPP projects inherently different actors are involved, the *aims* differ⁸. For the private perspective, the main objective is to achieve a profitable project. From the public perspective, the objectives are much more diverse. Since one should avoid a one-sided burden on the public side (e.g. unjustifiable risks or long-term costs), typical public objectives of public private partnerships are mobilizing of additional private capital, acceleration of projects in urban development and discharge of public budgets and administration.⁹ PPP models are suitable and positive only in case of a win-win-situation. Both partners cover economic chances and risks.¹⁰ Very often, the public sector anticipates further *public benefits* occurring from cooperation with the private sector in these development projects. These public benefits are “*external effects*”, which define MANKIW/TAYLOR (2012, p. 229) as follows: “*An externality is the impact of economic activities on the welfare of an uninvolved third party, for which no one pays or receives compensation. If the effect is harmful, it is called a negative externality, if it is favouring, there is a positive externality.*” For a long time the focus remained on the *negative* external effects resulting from industrial production and its subsequent negative environmental impacts. The centre of research was on how to internalize the costs. This is true, for example, for the taxation of wastage of natural resources proposed by PIGOU (1912). However, for our research *positive* external effects are in the centre of attention, since public actors of PPP typically are interested on benefits for private neighbours, local industries, nature or municipality itself.

⁷ Cf. Healey (ed.) (1992), pp. 281.

⁸ Cf. Kirsch (1997).

⁹ Cf. Krönert (1994), p. 2.

¹⁰ Cf. Wentz/Pelzeter (2010), p. 117, Carbonaro/D’Arcy (1993).

2.3 Using the property-led principle for the urban dimension

Although a systematic evaluation of external benefits from urban development projects does not exist in literature, urban planning practice developed an appropriate theoretical concept: the *property-led theory*¹¹. Although its origin is in the business development sector, it is possible to apply this principle also for PPP in urban development projects because in this approach public actors help to improve the climate for private investments by the creation of adequate location conditions. As a result, new business and employment as well as solvent citizens for social stabilization are expected. TUROK (1992) differentiates the following contributions to urban regeneration:

- direct employment effects of construction-related activities,
- expansion of indigenous firms,
- attraction of inward investment,
- revitalisation of run-down neighbourhoods,
- initiation of area-wide economic restructuring.

The foci of these projects can be different and range from development zones of industry through retail properties up to the new construction of mixed city quarters. Besides the different themes, the particular projects can vary in their dimensions from large-scale commercial regenerations to limited developments aiming at enhancing the cultural potential of historic areas.¹² Another field of property-led development with a larger focus on commerce are large-scaled real estate concepts such as the “Urban Entertainment Centre”, a combination of commerce and leisure. Experience with property-led projects reveals some conditions for a successful regeneration.¹³ The first step is to ensure that a project is in accordance with the strategic objectives of urban devel-

¹¹ Cf. Carbonaro/D’Arcy (1993), Jones (1996), Heeg (2007), Healey (ed.) (1992), Bianchini/Dawson/Evans (1992), pp. 245.

¹² Cf. Carbonaro/D’Arcy (1993), p. 340. The London Docklands serve as a good example of a large-scale regeneration program. The London Docklands Development Corporation has transformed almost the complete area (21 square kilometres). The size and complexity of the project required the set-up of this single function agency, which was supposed to address private sector targets to be able to achieve the ambitious goal of regeneration of the deprived area (cf. Oc/Tiesdell (2010)).

¹³ Cf. Carbonaro/D’Arcy (1993), p. 341.

opment policies. It is unlikely that detached measures can achieve the ambitious targets of regeneration. Further, the set-up of an adequate actor and project structure is crucial. A universal concept cannot be seen as there are case-specific differences and different basic views of the approach, e.g. in the US and in Western Europe.¹⁴ A further essential factor is the flexibility of the development strategy and the project structures. However, development is impossible without the integration of public sector interests. JONES (1996) considers that local authorities still play an important role regarding the assertion of public interest by e.g. allocation of utilization and zoning or construction supervision. Without doubt, there is coordination potential in the field of project and urban planning in relation to a shift in project development perspectives. The times of a classic development of solitary projects is no longer up-to-date. Project development follows an *integrated approach* and takes place within the complex context of an urban district that again is an extract of a wider urban area. Thus, project developers more deeply analyse the hard and soft location factors as well as the market conditions in an early stage of planning. Moreover, their role changes more and more to an initiator that steps up to the public actors, i.e. the communication structures also have changed.¹⁵

This development is in line with new requirements resulting from the structural change many cities face. Urban development projects nowadays are (again) an important part of strategic urban development since they bundle resources and enable a strenuous effort apart from standardised routines. Sovereign public governance gives way to a more facilitating role in terms of enabling frame conditions, quality controlling and acting in participatory respectively negotiation processes.¹⁶ This feature of the property-led principle is part of *urban governance*, which integrates networks beyond administrative policy structures that in addition to the classical government influence urban development.¹⁷ EINIG ET AL. (2005) determined a movement within the coordination

¹⁴ Cf. Kirsch (1997), pp. 28.

¹⁵ Cf. Bone-Winkel/Gerstner (2010), pp. 771.

¹⁶ Cf. Adam/Fuchs (2012), p. 563.

¹⁷ Cf. Fürst (2007), p. 6.

structures between state, private economy and society. There is a tendency towards deregulation, privatisation and a more market lead urban development. However, experience show that coordination of project and urban planning needs to be improved. A synchronisation of planning ideas and processes in partnership models seems to be a promising approach.

The property-led approach shows parallels to the field of *urban renaissance and large-scale urban development projects*. Many urban development projects using the property-led mode resemble new city districts on former Brownfields.¹⁸ These projects are likely to be market driven as private economy expects a highly profitable investment. At the same time, these projects are crucial concerning the achievement of strategic urban development objectives.¹⁹ The congruency in objectives of public and private partners increases in general. The discussion about Socially Responsible Property Investment (SRPI) in urban regeneration follows the same basic idea. Private investments in urban regeneration have the potential to reach an adequate rate of return (as compensation to the higher development risk). Against this background, SRPI follows the same objectives and seeks for “*maximizing the positive effects and minimizing the negative effects of property ownership, management and development on society and the natural environment in a way that is consistent with investor goals and fiduciary responsibilities*” (Pivo/McNamara (2005), p. 129). Therefore, several authors postulate a “new funding ethic” that integrates public objectives and aims at improving the social and ecologic situation in urban districts.²⁰

2.4 Improvement of inter- and intra-temporal allocation of resources

Property-led development can therefore mobilize private capital. This is particularly true for structurally weak areas where larger revitalization projects do not take place without the contribution of private investors. Here the public sector is limited in its actions. In this context, the property sector is a mean to economic promotion and urban

¹⁸ For the German context, cf. Breuer/Schmell (2012), Dziomba (2009), pp. 21.

¹⁹ Cf. Adam/Fuchs (2012), p. 563.

²⁰ Cf. Dixon/Colantonio/Shiers (2007).

growth. Large projects such as flagship projects enhance the attractiveness of a city.²¹ This is a consequence of the improvement in the *capital allocation process*. The goal is to achieve an optimal distribution of these resources within a period (intra-temporal) respectively over several periods (inter-temporal). The basic assumption is that an investment “today” will lead to external benefits directly and in the future.²² The following figure illustrates the idea of intra- and inter-temporal allocation of public resources in a cumulative representation in monetary terms.

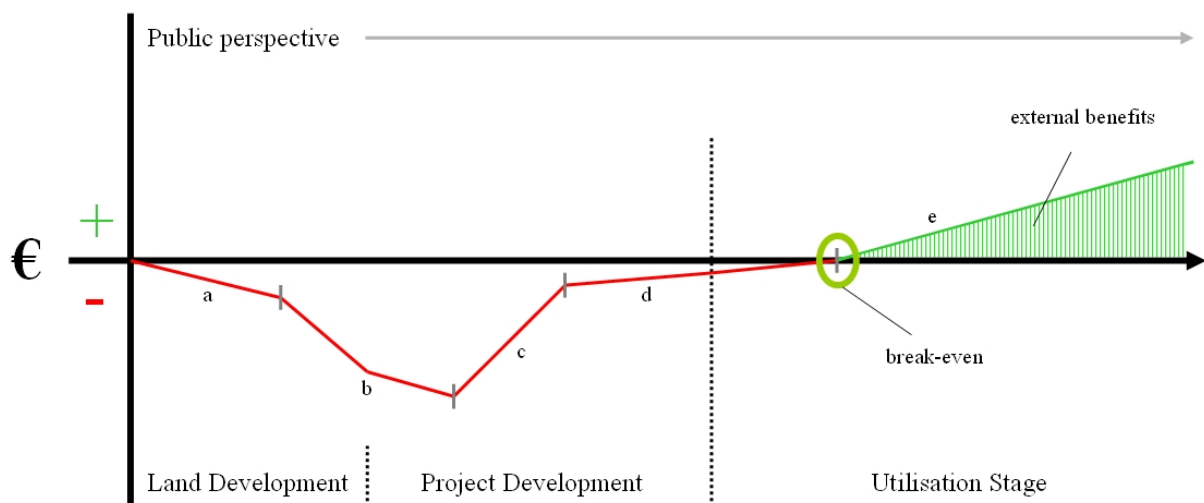


Figure 2: Intra- and inter-temporal allocation of public resources

From the public perspective, there are potential expenditures in the stages of land and project development, e.g. expenditures for administrative actions, external consultancy (a) and provision of technical or social infrastructure (b). In the course of the project development, there are short-term tax revenues through construction related investments (c) or, in the long-term view, tax revenues through employment effects or additional businesses (d). The main rationale for the employment of public resources is the expectancy of a return of investment in the public mind set through external benefits being higher than short- to long-term costs (e). If governments support private property-led projects to achieve an efficient capital allocation, one has to question whether there is cap. In the context of urban development projects, there are at least two restrictions.

²¹ Cf. Heeg (2008), pp. 46.

²² Cf. Conrad (1999), pp. 4.

First, for a public-private cooperation one has to consider the mandatory EU *State Aid regulations* fixed in the *Treaty on the Functioning of the European Union (TFEU)*. State aid is a legal term in EU regulation. It describes the direct or indirect benefits for industry resulting from government resources that distort market competition or affect the interstate commerce. The Treaty forbids State Aid in general. However, there are circumstances when government interventions are necessary for a well-functioning and equitable economy. This is also true for the context of private urban development projects, as there usually is a material or immaterial support by public authorities. Nevertheless, intervention shall be limited to the minimum necessary to proceed with a project so that the required return on equity and interest on loans by private investors does not exceed the fair rate of return. The economic viability of a project is to be ensured by improving market efficiency and/or compensating for the costs related to socio-economic benefits.²³

Second, in spatial planning theory we find an increasing relevance of so-called “*evidence based planning*”: The term of evidence-based planning is relatively new in the planning terminology whereas the basic idea behind it (“*evidence-based policy*”) is not. Evidence-based planning has emerged in the course of the program formulation “*Modernizing Britain*”.²⁴ Within this framework, constant change took place in the past decades.²⁵ In recent years, the European Union (EU) has renewed the ideas of the evidence-based planning. In order to establish future planning decisions upon a scientific and empirical basis, the focus explicitly lies on the collection of spatial data. A key program for the cross-border collection of the, in terms of space determined, data is the European Spatial Planning Observation Network (ESPON). Its main task is the “*data based support of cohesion policy and therefore the result oriented concentration on priorities and available money*” (website ESPON). Moreover, the European Com-

²³ Cf. Kreuz/Nadler (2010), pp. 12-15.

²⁴ Cf. Aring/Sinz (2006), p. 59.

²⁵ Cf. Davoudi (2006), p. 14. An example is the technocratic oriented planning approach, which, inter alia and in consideration of the on-going spatial monitoring system, was favoured in the 1970's in Germany and accompanied by the German BBSR. A critical debate started concerning the neglect of interpretations and discussions of this databased planning.

mission (EC) realized that the existence of a database is not sufficient. As a result, EC²⁶ published a guideline how to include scientific results into the political decision-making process. The goal of this initiative is to close information gaps and to support the rationality of political decisions.

In these premises, the importance of structured political decision-making with well-founded data and knowledge becomes clear. By means of the systematization of external effects of urban projects, precisely this database for the support of decision-making processes is not yet existent. However, state-aid regulation as well as evidence based planning require a measurable, meaning tangible “proof” of created external benefits.

²⁶ Cf. Europäische Kommission (2010).

3 Systemising external benefits in urban development

3.1 Overview on the concept of differentiation

The objective of sustainable urban development is often derived using models that again can be subdivided in a target system. Targets, in the following *objectives*, show the direction for urban development processes. The complex process of developing a structure of objectives is an important aspect in planning processes because it is a supporting method to design a strategy for future urban development. Different levels of accuracy of objectives lead to a consistent and complete system that illustrates correlations and possible conflicts of objectives.

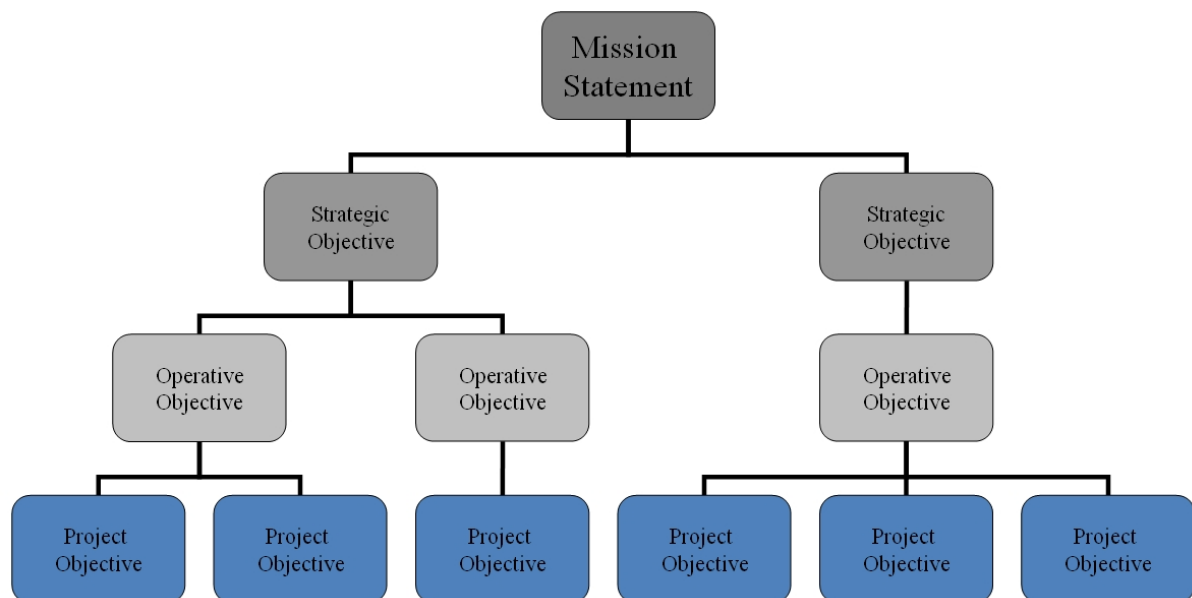


Figure 3: Systemisation of objectives (cf. Sucato/Haack (2004), p. 31)

The figure above illustrates the definition of an objective system.²⁷ The mission statement is an abstract concept for future urban development of a given area. The superior objectives on second level are more concrete but focus on strategic statements while the subordinated objectives on third level cover the indirect results of projects. The fourth level defines objectives, which are closely linked to direct development measures and project outputs.

²⁷ Cf. Fürst (2008), pp. 283.

In order to measure a development with regard to the desired status, a suitable choice of indicator is necessary. Indicators originally stem from the context of economic development (e.g. the gross national product). However, economic indicators are not sufficient in the context of urban development projects. The discussion on suitable indicators that go beyond the economic perspective and combine other aspects of urban development started in the 1960ies. Since then different concepts have evolved considering also the status and development of societal change.²⁸ In the course of the environmental movement in the 1970ies, analyst implemented ecologic indicators for assessing environmental problems. The environmental legislation and its respective standards, plans and actions fundamentally base on these indicators.²⁹ A great stimulus was the Rio Conference in 1992 as discussions intensified again dealing with the idea of a more intersectional resp. intergenerational approach (sustainability). The integrated analysis of the truly complex, in particular *urban* development gained more importance on different spatial levels. Since then research developed a multitude of documents including specific topics, targets and corresponding indicators.³⁰ However, not all indicators fulfil the relevant function of evaluation: Indicators serve as a link between statistical observations, and economic, social and ecological phenomena.³¹ Furthermore, they should facilitate the observation by the aggregation of information. To fulfil these functions indicators should be *measurable if not also monetary* and they should focus on *outcomes of policy action*. The concentration on measurable outcomes follows the new logical framework of the European Cohesion Policy.³²

SUCATO/HAACK (2004) developed a useful handbook for designing evaluation processes in the context of urban development. The handbook covers the crucial aspects in evaluating urban regeneration in a broad sense. It forms a common understanding in evaluation practice on all administrative levels in the federal state of North Rhine-

²⁸ Cf. Birkmann (2004), p. 59.

²⁹ Cf. Werner (1977), p. 10.

³⁰ Cf. e.g. Sucato/Haack (2004); Birkmann (2004); Colantonio/Dixon (2009); Horn (1993); Fuhrich (2004), Teichert (2000), European Commission (2012); Barca/McCann (2011).

³¹ Cf. Horn (1993), p. 5.

³² Cf. European Commission (2010), p. XXVII.

Westphalia, Germany. This implemented definition for the different types of objectives and indicators is suitable for our analysis of external benefits. Therefore, we use the following definition of objectives and indicators to revise the existing indicator set.

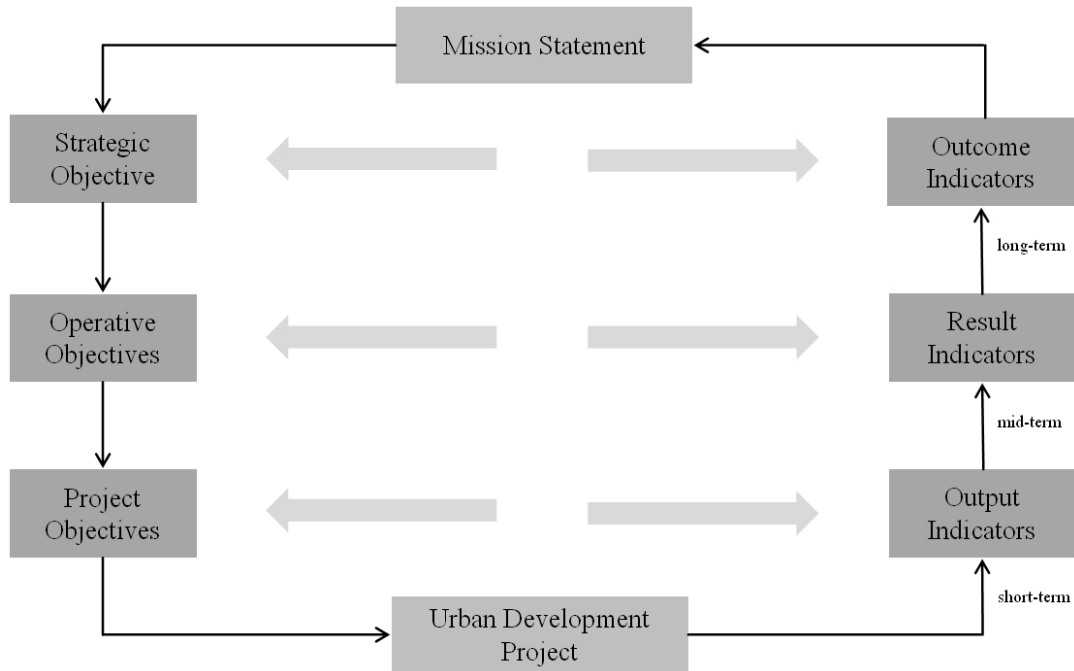


Figure 4: Logical framework for indicators in urban development (cf. Sucato/Haack (2004), p. 45)

The figure above combines both, the process of derivation of a target system with the congruent assignment of indicators for each level. The top-down derivation of a target system starts with the mission statement or more precisely the guiding principles of integrated urban development concepts. The assignment of indicators then follows the bottom-up direction considering objectives on project, operative and strategic level:

Indicator	Description	Examples
Output	Short-term direct output or „products“ of a project	a) No. of built housing units b) Sqm of built street c) No. of participation activities during planning process
Result	Mid-term indirect results of either one or more projects	a) No. of new citizens in built housing units b) No. of vehicles c) No. of integrated proposals
Outcome	Long-term outcome of a project	a) No. of additional citizens with close social ties b) Achieved saving of travel time c) Citizen satisfaction with project development

Figure 5: Examples for output, result and outcome indicators (cf. Sucato/Haack (2004), p. 46)

According to this logic, our approach considers both requirements, definition on EU level and framework for evaluating programmes in integrated urban development. Following this train of thought, an output indicator covers the “products” of a project, i.e. the direct effects resulting from a concrete measure. The long-term effect then results from these direct outputs.³³ The following setting serves as an example for developing objectives and indicators in the context of urban development projects. The exemplary presentation of a target-indicator system implies different levels of assessing indicators, i.e. the higher the degree of aggregation the more assumptions are necessary.

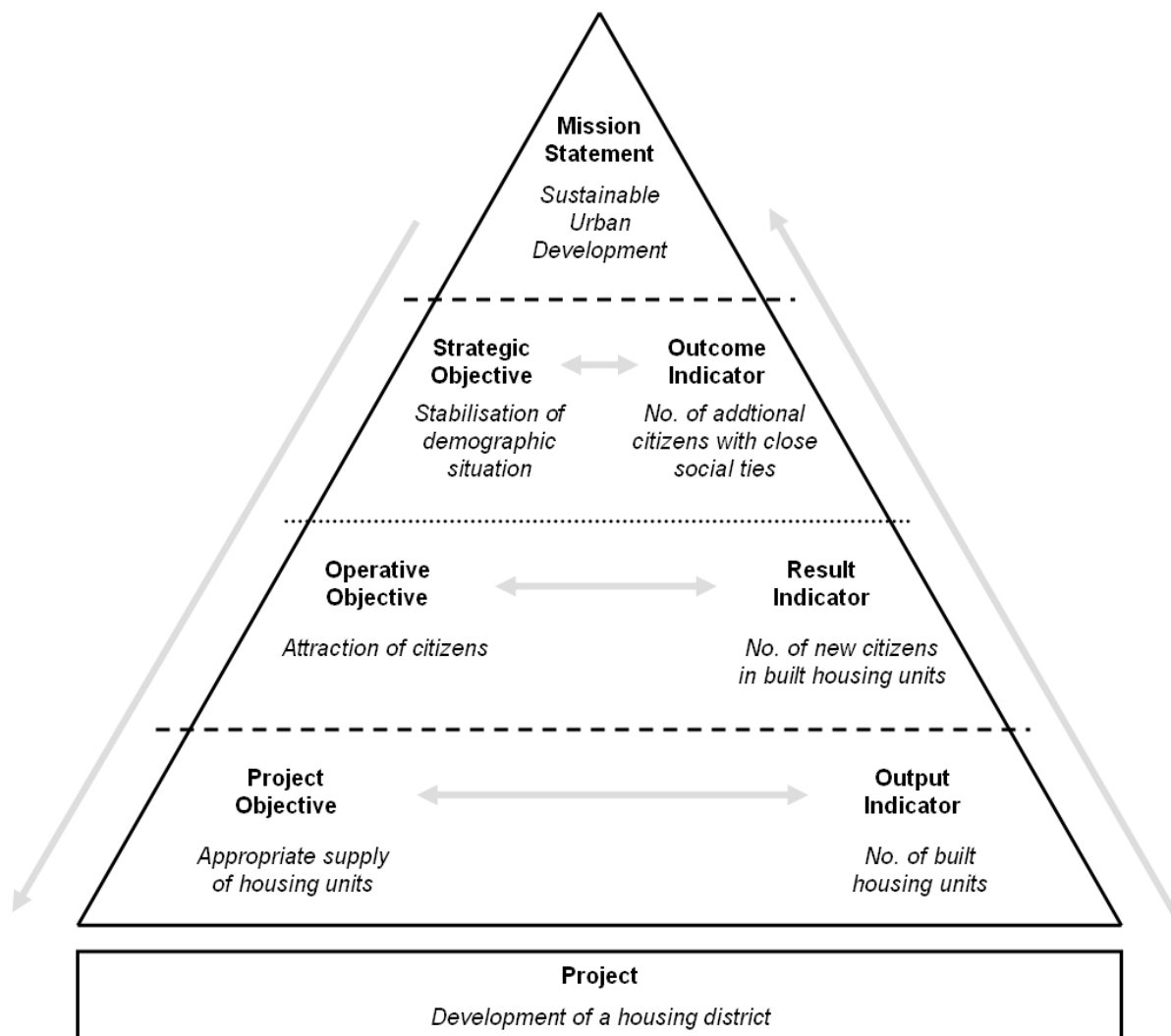


Figure 6: Examples for output, result and outcome indicators within the defined logical framework

³³ Birkmann (2004) presents a comprehensive overview in regards to the development of the current understanding of indicators in evaluation on the regional level.

Analysts are usually able to measure output indicators in a simple way without using assumptions. The example *no. of built housing units* only needs an observation of the constructed real estate resp. an analysis of the construction plans. Result indicators, however, mostly rely on assumptions. Determining the *number of new citizens in built housing units* is not only a matter of multiplying the number of built housing units with the theoretical capacity of each unit. In order to estimate the *actual* number of new citizens, assumptions are necessary. One option is to set an average for the number of persons in a household; this average then could be differentiated according to the specific unit sizes (e.g. 60 sq. metre unit: two persons, 90 sq. metre unit: three persons, 120 sq. metre unit: four persons). Further, this setting implies the necessity to differentiate in terms of household structures (“classic” family or flat-sharing community) and ages (children or elderly). In the level of highest aggregation, even more assumptions are required to be able to quantify the given indicators. The long-term oriented outcome indicator *number of additional citizens with close social ties* illustrates that the quantification is part of a complex context with several uncertainties. The question of additional citizens for instance implies a potential internal migration of citizens within the city area that could lead to empty housing units elsewhere in the city. The real share of additional citizens depends on the cities attractiveness in terms of job market, cultural choices or image. Moreover, historical statistics or population forecasts can partly assure assumptions with regard to the demographic development of an urban development project.

It becomes clear that quantifying or rather monetising external benefits of urban development projects is a challenge. Scientific quality standards are necessary for the derivation of an indicator set and the application of suitable assessment methods. These standards exist in different fields of research. The European Commission (2012) offers support in this topic by EVALSED providing a framework for evaluating projects aligned with the EU Structural Funds. From the point of view of the *German Institute for Evaluation*, indicators should feature the following criteria:³⁴

³⁴ Cf. DeGEval (2010).

- *Utility*: Purposes and information needs of the intended users should guide evaluations. Crucial in the development of indicators for their relevance is practical work. Not all statistical data are automatically as suitable indicators. Rather indicators must prove to be relevant and important for decision makers.
- *Feasibility*: Decision makers should conduct evaluations in a realistic, thoughtful, diplomatic, and cost-effective manner. A targeted and practical use of indicators requires a choice ahead. When creating an indicator list one should consider whether – and if so how – the necessary data and information can be gathered. The aim is to develop a manageable set of indicators that allows statements on the achieved progress and they have to be everyday practical.
- *Propriety & Accuracy*: Evaluators should treat all stakeholders with respect and fairness. Evaluation should produce and disclose valid and useful information and findings. An indicator must be a simple descriptive information that is understandable and communicable for all stakeholders. The development of indicators therefore requires a compromise between precise measures and methods on the one hand as well as a realistic and generally understandable mediation on the other.

While these criteria will form quality standards for choosing indicators in this research paper, there are some practical issues beyond the presented standards. An indicator set that is designed for analysing an urban development project during its life cycle needs to be stringent in both dimensions, horizontal (indicators refer to objectives on each level) and vertical (indicators are conducted bottom-up and can be summed up). Furthermore, it should be possible that private and public project stakeholder can always interpret the results. Against this background, the next step is to discuss potential methods for assessing external benefits. Here, literature offers a wide wealth of experience concerning quantitative and qualitative methods in this field.

3.2 Methodology for assessing external benefits

3.2.1 Event-Study as the basic approach to solve the additionality problem

The main challenge in the assessing of external benefits is the question whether there are *additional* effects clearly generated by a single project. In the context of urban de-

velopment projects, the Scottish national economic development agency presents a useful definition for this problem.³⁵ “*Additionality [...] is the extend, to which an activity (and associated outputs, outcomes and impacts) is larger in scale, at a higher quality, takes place quicker, takes place at a different location, or takes place at all as a result of intervention*” (Scottish Enterprise (2008), p. 22 f.). We will adapt this definition by assuming that additionality covers additional effects in regards to scale (e.g. additional jobs), time (efficient development), quality (e.g. share of green area) or place (e.g. Brownfield redevelopment) occurring only because of a project development. To apply the approach one has to define a starting situation for assessing effects. The EC terminology uses the terms *baseline* and *deadweight* to define additional benefit:³⁶

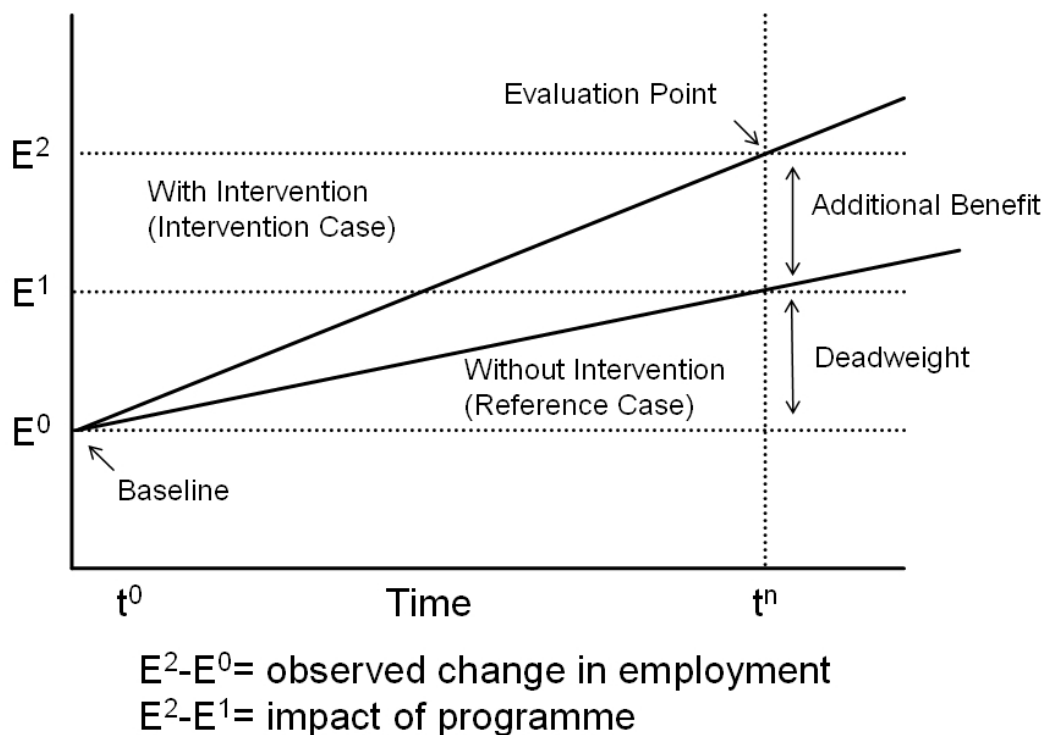


Figure 7: The problem of assessing additionality using the employment example

As a possible solution to the additionality problem, we suggest the method *event-study-methodology*. The event-study is a well-established method in economic scienc-

³⁵ This problem of additionality has been broadly discussed in various fields, e.g. in the context of EU Regional Policy. Ever since the set-up of the ERDF in 1975 the question had been raised whether Community means lead to additional activation of resources rather than replacing what national governments would have been obliged to spend anyways (cf. Comfort (1987), p. 6).

³⁶ Cf. European Commission (2012), pp. 110.

es and serves mainly as an ex-post evaluation and analysis. It is applied e.g. to analyse the impact of corporate events on the stock-market price:³⁷

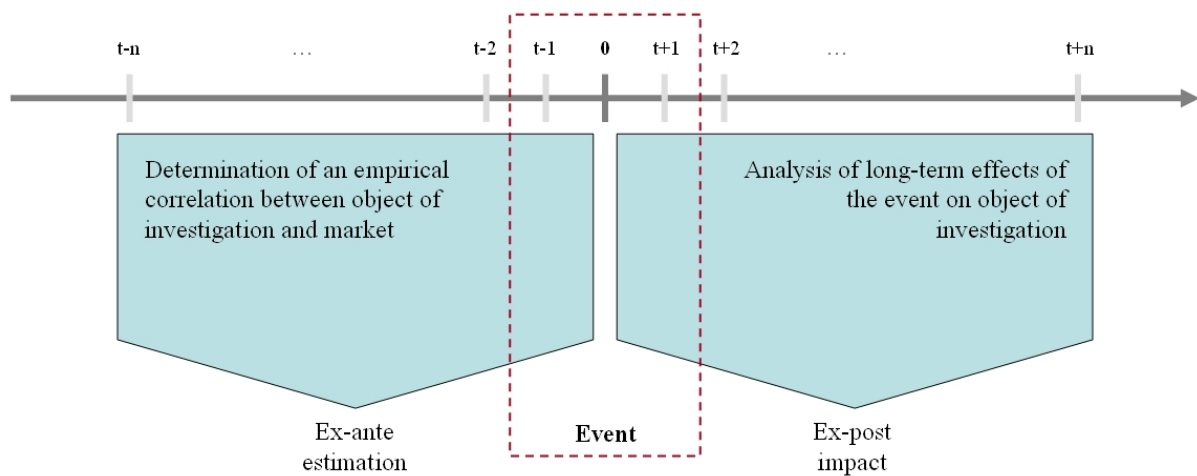


Figure 8: Event-Study, logic approach

The logic approach of the event-study consists of four basic steps:

- 1) Estimation of correlation between object of investigation (price) and market

$$R_{i,t}^{est} = \alpha + \beta \cdot R_{m,t}^{real} + \varepsilon$$

- 2) Determination of abnormal returns for the object of investigation

$$AR_{i,t} = R_{i,t}^{real} - R_{i,t}^{est}$$

- 3) Revision of the event significance for returns trend

$$t\text{-value} = \frac{AR_{i,t}}{\varepsilon}$$

- 4) Determination of cumulative (average) returns since the event

$$CAR = \sum_{t=0}^{t=n} AR_{i,t}$$

To apply the logic approach on the additional effects of private urban development projects, we define the following elements:

- object of investigation: *the project site* (as a spatial entity)

³⁷ Cf. Goerke (2008), Bowman (1983), Binder (1998).

- event: *urban development investment*
- market: *the city* (as a spatial entity)
- time course: *years*
- impacts: e.g. *demography, jobs, transaction volume or municipal taxes*

An example would be the impact of an investment on the yearly demographic development on the project site within the city borders. The additional citizens are the indicator derived as the delta of *abnormal development* vs. *estimated development*.

3.2.2 Economic valuation methods for the quantification of benefits

Based on the event-study framework it is possible to analyse the impact of urban development projects in terms of quantitative and qualitative indicators. The literature for quantifying positive or negative effects of changes in the built environment offers several approaches that we try to use for urban development project valuation.

The *travel cost method*³⁸ is used for calculating the value of an urban development feature that cannot be assessed with market prices. Analysts apply the method for assessing the value of nature protection or recreation areas. In our context, urban development projects are likely to provide at least spaces for leisure and recreation, e.g. parks or other public green spaces.³⁹ Here the method is applicable by analysing the correlations between private time- or travel expenses and the respective facility. The frequency of a visit depends on the resulting costs of a visit (demand). If one applies the correlation in a regression function, then the area under the demand curve states individual valuation.

The main idea behind *hedonic pricing*⁴⁰ is that property prices depend on specific features in terms of the object (e.g. size) but also the surroundings (e.g. ecologic quality). Therefore, a regression function shows the correlation between the price of an asset and all the attributes that affect the price. The analyst then assumes that properties are

³⁸ Cf. WBGU (1999), p. 68.

³⁹ The design of the method neglects several uncertainties and inaccuracies in regards to data collection of visits, costs and more varying determinants that e.g. differ because of travel distances.

⁴⁰ Cf. Boardman (2010), p. 353 f.

similar in all attributes except the one that is being analysed, for instance *view* or *noise*. The derivation of the hedonic price function then indicates the marginal price of this single attribute. In our context, it would be interesting to assess to what (abnormal) extent the real estate prices in the surrounding of urban development projects have changed.

The *contingent valuation* method⁴¹ is an approach to find a value for utilities or functions by asking questions to a set of probands. Here the focus lies on the derivation of peoples' willingness-to-pay for a change in the quantity or quality of goods. The question aims at the maximum value people would pay for the positive effects of a specific good (e.g. a waterfront location in an urban development project).

In general, the application of economic valuation methods is very complex and laborious as a lot of assessments base on a previous data collection. In some cases even data modelling or expertise might be necessary to derive concrete valuation, e.g. in the context of changes in traffic behaviour or noise emissions. Therefore, analysts refer to *shadow prices*⁴² from secondary sources that provide reference figures for specific aspects. The fields of application are numerous and range from the value of a statistical life to the costs of crime to the value of recreation.

Finally, DOETSCH ET AL. (1998) presented a startling approach on the societal value of land. In his research paper, he developed the so-called *land value balance* that aims to compare Brownfield redevelopment vs. green development in monetary terms. This debate finally led to the sustainable development agenda of the German government aiming at (amongst others) the reduction of land sealing to 30 ha in the year 2020. A specific aspect of this research is also applicable for urban development projects, namely the value of a square metre of green area. Analysts can calculate this land value according to its function for the provision of fresh and cold air.

To sum up, all of the presented valuation methods are useful to evaluate the (monetary and the non-monetary) value of urban development projects. However, all methods

⁴¹ Cf. Boardman (2010), p. 372.

⁴² Cf. Boardman (2010), p. 406 ff.

need as a basis a *substantial amount of data collection*. Statistical data can be raised using secondary databases, e.g. the social statistics of an urban district for conducting a social area analysis. Some external benefits of urban development projects can be roughly assessed using this data. However, the analyst has to interpret the results afterwards.⁴³ Nevertheless, there is still a need for primary analysis via qualitative interrogations. In this context, the existing possibilities of ICT are extremely helpful in order to reach a large number of relevant test persons. Web surveys thus are common types of interrogation techniques. Especially open source web-based survey applications are welcoming tools for this purpose due to the pre-configured functions that secure amongst others a standard layout inside the browser as well as a user-friendly construction, realisation and reporting of the survey. This argument becomes relevant in medium to large-scale urban development projects that normally only occur in big cities. Here, a critical mass is essential for the generation of citywide outcomes.

3.3 Four dimensions of outcomes

3.3.1 Overview of the concept with regards to the contents of urban development

From section 3.1, we learn that at first the elaboration of a target system including general principles for urban development and the particular superior and subordinated targets is necessary. With this step, the basis for further systematization is set. Now, the indicators will be structured with regard to the questions “Who?”, “Where?” and “When?” by introducing the stakeholder dimension, the spatial dimension and the time dimension. The derivation of indicators will consider these questions and specify the objects of investigation, based on the objective (example: no. of new jobs created for local citizens in Dortmund within 10 yrs.). The question “Why?” will finally be addressed and results from the joint analysis of the three aforementioned dimensions.

⁴³ A rather simple example is the following: increasing population figures in an urban district with a realized urban development project allow us to conclude that the project is the major reason for population increase. The same approach is valid for analysis of jobs in a certain area of the city.

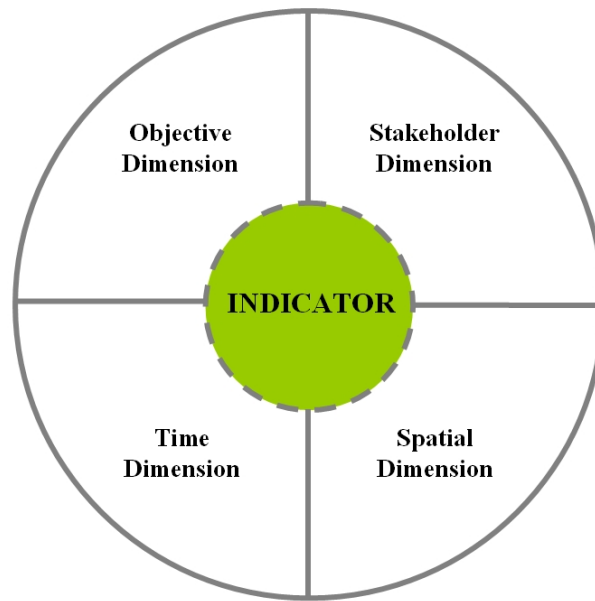


Figure 9: Systematization of indicators

We will define now all dimensions in detail, starting with the objective setting since this is the basis for the derivation of superior and subordinated targets as well as the subsequent definition of corresponding indicators. In the context of urban and real estate development, three concepts in terms of general principles for urban development seem relevant for the derivation of a suitable indicator set: Urbanity, Smart City and the European City. We will describe the concepts in more detail taking into account historical background and current relevance for urban development.

3.3.2 The objective dimension: the question of the mission statement

3.3.2.1 Urbanity as mission statement

Cities are the central living spaces of our time. The majority of the population already lives in urban areas. In 2008, more than half of the population lived in cities. This is why there will continue to be a strong competition amongst cities concerning creativity and skilled workers. This competition already manifests itself as being the most important factor through its efforts to obtain a better quality of life. In this connexion, the *concept of urbanity* is a permanent theme in debates. In these discussions, urbanity explicitly or implicitly is a central aspect for future development of cities. Statistics cannot capture all the elements of urbanity. On the contrary, a vague term is difficult to understand due to its abstract character. This is why despite a large range of theoretical

elaborations an overall definition does not exist. The very first mentioning of the so-called “urbanity” was set in 1960. SALIN’s lecture in the presence of the general assembly of the German Association of Cities and Towns in Augsburg having as title “urbanity” was the starting point and defined the debate especially in the 1960's and 1970s.⁴⁴ For this study, it is of interest to shed light on the operationalization and measuring of urbanity. Recent publications undertake this attempt. This is how MAYER-DUKART (2010, p. 104) introduces the term “*urban potential*”. Here the focus lies very strongly on the effects generated by urban development projects. She refers to several dimensions of urbanity: the socio-cultural dimension, the political dimension, the economic dimension and the urban design dimension. This approach can provide important clues for an appropriate set of indicators regarding systematization. However, there is a controversial about how far urbanity is projectable. STEINBACH (1994) points out the lack of an integrated concept of urbanity. Usually there are only certain areas included, thus, planning approaches are weak and not successful. Accordingly, he developed a behavioural and planning theoretical concept of urbanity that describes essential features of urbanity with *content of lifestyle, urban activity patterns and spatial structures in city centres*. In the following figure, we pick up this idea as it presents main characteristics of urbanity:

Socio-Cultural Dimension	Political Dimension
<ul style="list-style-type: none"> - emergence of civil society - chances to live an independent life (self-realisation) - specific lifestyle in contrast to rural society (intellectual, educated, emancipated, polite, individual) - cultural productivity - creative ideas (innovative milieu) - heterogeneity, variety of origin - tolerant behaviour - powers of social integration 	<ul style="list-style-type: none"> - emergence of democracy - chances to live a free life - political engagement and participation boomed by historical awareness - access to work, education, information, culture and politics - importance of social welfare ideas in urban planning and infrastructure provision

⁴⁴ Cf. Wüst (2003), p. 41.

Economic Dimension	Urban Design Dimension
<ul style="list-style-type: none"> - market-place in terms of periodical personal needs and commercial trade - emergence of modern economy - function of economic junctions - emergence of labour division through concentration of population - concentration of knowledge - centre of sectors with highest growth potential - creative innovations supporting economic growth 	<ul style="list-style-type: none"> - size - density - concentration and mixture of functions - historically grown cityscape - architectural heritage - diversified architecture - synchrony of private and public spaces

Figure 10: Summary of main objectives in the mission statement “urbanity”

The central basis of urbanity lies in the strategies of municipal decision-makers. This implies far more than simply the relation to constructed environment does. It rather is a multi-layered conception, which transcribes a specific lifestyle and includes important chances for sustainable urban development.⁴⁵ Moreover, the concept is relevant in the sense that private investment projects for example in the form of new mixed quarters can largely contribute to the creation of urbanity.

3.3.2.2 Smart City as mission statement

Smart City is a concept built on the basic idea of urbanity following the same goals: The improvement of the quality of life in cities in order to remain in the competition for the available intellectual and social capital. Certain general characteristics are recognizable and in the meantime allow a coherent understanding of smart cities. CARAGLIU et al. (2011, p. 70) provide a frequently quoted and current definition: Cities are smart “*when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable growth and a high quality of life, with a wise management of natural resources, through participatory governance.*” In order to elucidate this, he states six essential components promoters should invest in: Smart Economy, Smart People, Smart Governance, Smart Mobility, Smart Environment, and Smart Living.⁴⁶ All these projects have the same

⁴⁵ Cf. Eisinger (2004), p. 97.

⁴⁶ Cf. Giffinger et al. (2007), pp. 10.

approach that is intelligent interaction of man and technology in order to improve the quality of life in cities. This increase in attractiveness of a location should provoke private investments and attract innovative companies and skilled working forces. Due to these expositions, it becomes clear that the focus is on innovative technological solutions. By employing these, an important contribution for a resource-saving urban development is expected. The best possible utilization of scarce resources of natural and social capital is in the centre of attention of the European policy framework for the so-called EU 2020 goals. The contribution of smart cities can be multifaceted: innovative urban transport systems, modern building services or intelligent decentralized electricity networks ultimately support the goal of reduced energy consumption. To sum up, we can identify the following objectives of smart cities:

Economic Dimension	Socio-Cultural Dimension	Environmental Dimension
<ul style="list-style-type: none"> - sustainable growth of the economy - investments in innovative technology solutions - suitable pre-conditions for innovative technologies / companies - attractive environment for highly skilled work force 	<ul style="list-style-type: none"> - high quality of life - attractive environment for skilled workers - participatory governance 	<ul style="list-style-type: none"> - innovative transportation systems - modern information and communication networks - efficient energy production - intelligent decentralised electricity networks - exploitation of renewable energy sources - construction of energy-efficient buildings

Figure 11: Summary of main objectives in the mission statement “smart city”

3.3.2.3 Sustainable European City as mission statement

The first European Cities were founded approximately in the 9th century B.C. After the first city foundations in Mesopotamia as well as in the lowlands of the Nil, the Indus and the Yellow River, the city of ancient Greece, the so called ‘polis’, is regarded as being the origin of urban development in Europe.⁴⁷ Since then, cities have developed in different spaces as well as in the context of different political, societal and cul-

⁴⁷ Cf. Benevolo (1998), pp. 19.

tural framework conditions. Out of this historic-cultural founded perspective, the European city is difficult to define. Nevertheless, some general and socio-cultural characteristics of the European city stand out.⁴⁸ Eye-catching buildings such as churches, city halls, towers, city walls or marketplaces form the clearly apparent city centre of roman, medieval or of early modern coinages.⁴⁹ Urbanity is a further decisive characteristic of the European City. Despite the chances and potential of such unique cultural and structural qualities many European cities face outstanding economic development potential and at the same time problems of social integration. In this mission statement, the risks of missing social integration are of particular relevance. Size, density and heterogeneity of cities are social and ecological challenges for cities. Based on these framework conditions and considering the EU sustainability strategy, a very precise objective target is formulated (European Union, 24th May 2007: 1) *“All dimensions of sustainable development must be considered simultaneously and equally. These include economic prosperity, social balance and a healthy environment. At the same time, the cultural and health requirements are observed. Institutional capacities in Member States must be taken into account.”*

Out of this demand, one can derive a very extensive objective target including the classic sustainability triad of economy, ecology and social affairs. Furthermore, decision makers have to note the very different personal and material resources of European Member States, which require a concentration in their actions. Finally, this mission statement delivers also a strategy to achieve these objectives with instruments of integrated urban development programs. Therefore, the model of the European City is *most suitable for the derivation of a corresponding target system and indicator set* in order to analyse the external benefits for investment projects in urban and real estate development:

⁴⁸ Cf. Böhme (2002), p. 55.

⁴⁹ Cf. Kaelble (2006), p. 34.

Economic Dimension	Environmental Dimension	Socio-Cultural Dimension
<ul style="list-style-type: none"> - outstanding economic development potential - concentration of (im)material resources - capacities of public institutions 	<ul style="list-style-type: none"> - addressing the environmental deficits or urban areas 	<ul style="list-style-type: none"> - identification potential based on unique cultural and architectural qualities - concentration of human and social capital - ability of social integration - addressing the societal deficits (social inequality and exclusion, lack of affordable housing)

Figure 12: Summary of main objectives in the mission statement “European city”

3.3.2.4 Synopsis of the different mission statements based on the different capital stocks for urban wealth creation

We now like to come to a synopsis of the different mission statements applying the concept of *capital stocks for urban wealth creation* for further elaborations of a target system.⁵⁰ *Productive capital* comprises fixed infrastructure and cultural heritage assets, real estate capital, urban attractors and all productive, technical or logistic assets. The *financial capital* covers securities, financial assets, pension or rental schemes and other types of goods tradable on the market. Finally, agriculture, fishery, forest and mineral resources define *natural capital*. This comprises environmental quality, natural attractiveness and amenities. According to the Lisbon Strategy, the socio-cultural dimension is a key driver in wealth growth. *Human capital* covers education, knowledge and R+D as well as social qualities and the so-called soft or intangible factors. *Demographic or social capital* supplements the (individual) human capital with society wealth effects consisting of the demographic features of population, the profile, health and general conditions of the labour force. The concept of capital stocks is useful in the assessment of the value of local capital assets and its contribution to revenue generation and wealth enhancement. Therefore, we will use it for our systemization of external benefits.

⁵⁰ Cf. Leanza (2007).

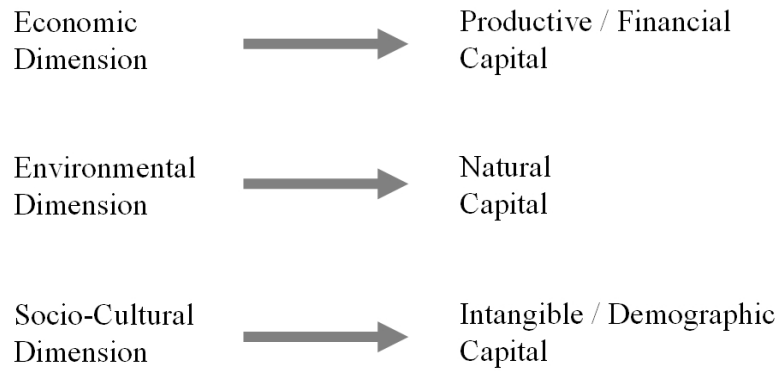


Figure 13: Transformation to capital stocks for urban wealth creation

The concept is thus a suitable basis for structuring the objective dimension. On the one hand, we develop these objectives considering the presented mission statements. On the other hand, we recall the literature dealing with indicators (see section 3.1) as these indicators also result from a comprehensive elaboration of a target system.

Urbanity	Smart City	European City	Superior Objectives
<ul style="list-style-type: none"> - Inner development for creating density 	<ul style="list-style-type: none"> - innovative transportation systems - modern information and communication networks - efficient energy production - intelligent decentralised electricity networks - exploitation of renewable energy sources - construction of energy-efficient buildings 	<ul style="list-style-type: none"> - addressing the environmental deficits of urban areas 	<ul style="list-style-type: none"> - Promotion of economic land management - Increase of the environmental quality - Environmental protection - Promotion of innovative technologies

Figure 14: Deriving objective dimension natural capital from mission statements

Urbanity	Smart City	European City	Superior Objectives
<ul style="list-style-type: none"> - market-place in terms of daily / periodical personal needs and commercial trade - emergence of modern economy - function of economic junctions - emergence of labour division through concentration of population - concentration of knowledge - centre of sectors with highest growth potential - creative innovations supporting economic growth 	<ul style="list-style-type: none"> - attractiveness of a location - innovative technological solutions - sustainable growth of the economy - investments in innovative technology solutions - suitable pre-conditions for innovative technologies / companies - attractive environment for highly skilled work force 	<ul style="list-style-type: none"> - outstanding economic development potential - concentration of (im)material resources - capacities of public institutions 	<ul style="list-style-type: none"> - Strengthening the economic base of municipalities - Improvement of business environment

Figure 15: Deriving objective dimension productive/financial capital from mission statements

Urbanity	Smart City	European City	Superior Objectives
<ul style="list-style-type: none"> - emergence of civil society - chances to live an independent life (self realisation) - specific lifestyle in contrast to rural society (intellectual, educated, emancipated, polite, individual) - cultural productivity - creative ideas (innovative milieu) - heterogeneity, variety of origin - tolerant behaviour - powers of social integration - emergence of democracy - chances to live a free life - political engagement and participation borned by historical awareness - access to work, education, information, culture and politics - importance of social welfare ideas in urban planning and infrastructure provision 	<ul style="list-style-type: none"> - high quality of life - attractive environment for skilled workers - participatory governance 	<ul style="list-style-type: none"> - identification potential based on unique cultural and architectural qualities - concentration of human and social capital - ability of social integration - addressing the societal deficits (social inequality and exclusion, lack of affordable housing) 	<ul style="list-style-type: none"> - Strengthening of socially stable communities - Strengthening of location attractiveness - Improvement of townscape and building culture - Improvement of health

Figure 16: Deriving the objective dimension human/social capital from mission statements

In the following sections, the goal is to specify the subordinated objectives and define relevant outcome indicators under consideration of the aforementioned literature. However, most of these indicators refer to the development of regions or nations. Thus, as the starting point of this research one has to select suitable indicators that show a development based on urban development projects. Further, an explanatory statement of the causality between objective and outcome indicator is necessary for most relevant stakeholders in urban development. We come back to this discussion in the “spatial dimension” of our model.

3.3.3 The stakeholder dimension: the question of the relevant urban actors

Regarding the stakeholder dimension, we distinguish private and public urban actors. Starting with the public dimension one group involved in urban development is the *policy* on different levels. Here, the main interest is the achievement of a sustainable urban development. Recalling the mission statements, e.g. the European City, the highest level that affects urban development is the *European level*, formulating guidelines and programmes that build the superior framework of urban development. The

next level refers to the *Member State*. Here politics provides the legal framework more specifically. Moreover, the national interest lies on the performance of urban areas in terms of economic growth, environmental conservation and social stability. Urban areas are the most important drivers for national development. The *federal state* is the subordinated level that provides a more specific framework for urban development. It is an important intermediate in terms of structural development as its ministries implement the European funding guidelines in Operational Programmes. Further, *regions* with own political mandates are able to influence the guidelines for urban development. Finally, the lowest level where development takes place is the *municipality*. On this level, politics decides finally about urban development strategies.

In close connection to politics are the associated *administrative bodies*. Relevant stakeholders for urban development in this context are *promotional institutes* (e.g. the European Investment Bank or banks on lower administrative levels) since they finance urban development projects in public mission. External benefits here are of major interest as financing focuses on the improvement of living and working conditions. Further, the *municipal administration* is a main actor in urban development. City planning departments elaborate professionally integrated strategies for urban development in the specific context of the municipality. In addition to this, several more special departments are involved in planning and implementation process, e.g. environment, business development, housing, traffic, social affairs, etc.

Urban development aims at the improvement of living and working conditions for diverse groups of *citizens*. To this group belong local residents living or working in a neighbourhood/district and newcomers, who want to improve their standards of living or working as tenants or property owners or employees. Further local associations, social networks or district managers address a range of interests of specific groups and contribute to the handling of community matters. Concerning the developments on the real estate market, both groups the property owners and the tenants respectively the potential purchasers are involved indirectly.

Finally, *private companies* are involved in urban development. To this group belong *promoters and investors*, which are interested in developing projects in order to re-

ceive profits. Additionally more companies that are private are involved in a project, e.g. construction companies or a variety of consultants. Moreover, private companies, mainly SMEs that expect market opportunities resulting from a project and an upgrade of the whole neighbourhood or district invest in terms of enlargements of their existing business or starting new businesses. Other beneficiaries are *smaller businesses in the local economy* that profit from increasing purchasing power.

3.3.4 The spatial dimension: the question of the relevant indicators for the respective development area

Considering the spatial reference, the question is where an external benefit exactly occurs. Investment projects in urban and real estate development have a direct and immediate effect on their location and furthermore, depending on their size, affect the *neighbourhood*, the entire *municipality* or even the *region*. Large-scale development projects, which valet a regional requirement of different residential segments respectively often, have an important radiance power and can have an effect on the regional housing market. Major infrastructure projects such as airports also have an impact on the regional level. Questionable is whether a single urban development project has outcome effects on the (*supra-*) *national level*. This might be possible although it would be difficult to quantify all of these effects because of side effects and spillovers.

3.3.4.1 Spatial outcome indicators for the productive and financial capital stock

To quantify additional and causal external effects in the derived objectives (see section 3.3.2) we need adequate outcome *indicators*. Referring to the mission statements and their resulting objectives on the public level it becomes clear that the securing of the ability to act is an essential prerequisite for the fulfilment of the objectives in the dimensions mentioned above. A municipality can only fulfil its obligatory but also its strategically significant duties if there is a sustained securing of financing. According to this, an important overall objective is the *strengthening of the economic base of municipalities* by the *maximization of revenues*:

2 Superior Objectives	6 Subordinated Objectives	14 Outcome Indicators
Strengthening the economic base of municipalities	Increase of the one-time revenues	Proceeds of real estate sale Business tax Municipal share of income tax Municipal share of value-added tax
	Increase of the permanent revenues	Business tax Municipal share of income tax Municipal share of value-added tax
	Appreciation of surrounding areas	Land tax Standard ground value
Improvement of business environment	Improvement of quality of location	Number of additionally settled companies Capital expenditures of companies
	Strengthening of the local economy	Purchasing power
	Strengthening of a sustainable and diversified economic structure	Percentage of jobs in future branches Mix of branches

Figure 17: Objectives and indicators for productive and financial capital stock

This is true for both time perspectives the one-time revenues in the course of a project development and the permanent revenues in the utilisation stage after the end of a project development. Several outcome indicators can express *increases of the one-time revenues*: simply assessable revenues are the *proceeds of real estate sale* for former municipal real estate property.⁵¹ Other revenues mainly result from taxes that emerge during the project development stage through high investments that in turn stimulates business contracts and volumes as well as employment effects and increasing purchase power.⁵² As a result, the municipality profits from several kinds of tax revenues, such as increasing *business taxes*, the *municipal share of income taxes* and the *municipal share of value-added taxes*. Another objective in this context is the *appreciation of the surrounding areas* of an urban development project. These projects do not only have an effect on the project site but also on the surrounding neighbourhood. They can become more attractive for solvent households and business investments.⁵³ The *standard ground value* expresses the price level of building lots. This indicator mirrors the upgrade resulting from project developments and thus shows the outcome of projects.

From a budgetary perspective, the local economy provides the basis for production and employment of municipalities. Companies generate profits and income from which municipalities' profit, indirectly resulting from income taxes and directly resulting from business taxes. Accordingly, an important objective is the *improvement of the business environment* in order to promote investments and the creation of jobs. A sub-

⁵¹ Cf. Bizer et al. (2007), pp. 12.

⁵² Cf. BMVBS (2011b).

⁵³ Cf. Held (2010), Ahlfeldt (2010).

ordinated objective is *improvement of the quality of the location* for example through provision of infrastructure or creation of new markets. These improved preconditions can promote investments that are expressed by *capital expenditures of existing companies*, e.g. for qualitative improvement or even an expansion, and by the *number of additionally settled companies*.⁵⁴

Furthermore, the *strengthening of the local economy* is an important aspect in regards to a stable business environment that also contributes to evolve a lively and comfortable neighbourhood. A suitable outcome indicator is the increasing *purchasing power* that results from the concentration of new respectively additional inhabitants in the district. Concerning the sustainable economic development of the district and the whole municipality, a crucial objective is the *strengthening of a sustainable and diversified economic structure*. According to the theory of economic cluster development of PORTER (1990), it is a strategic objective to promote regional and local economic development based on both aspects the endogenous potentials and the future market perspectives of specific branches. The combination of these aspects builds the common strategic framework for economic development formulated by e.g. managing authorities in operational programmes in the ERDF policy framework for the improvement of the regional structure. A suitable indicator is the *percentage of jobs in future branches*. Besides the concentration on cluster development, a sustainable economic structure is characterised by a broad diversity of branches. Mono-structured local or regional economies are vulnerable and tend to suffer from cyclical changes. The indicator to assess the economic sustainability in this sense is the *mix of branches*.⁵⁵

3.3.4.2 Spatial outcome indicators for the natural capital stock

The effects of an urban development project on the natural capital stock are versatile. Particularly on project-level, multiple possibilities exist as to achieve ecological goals for the creation of a healthy environment. In the course of planning, avoiding a re-sealing of soils, creating or cross-linking of green areas, avoiding traffic thanks to

⁵⁴ Cf. Turok (1992), p. 361, Sucato/Haack (2004), pp. 83.

⁵⁵ Cf. Spreter/Vollmer (2004), p. 86.

compact structures or preserving fresh or cold air aisles are possible development measures. Besides the immediate benefit for the ecology, the health situation of the population, which profits from an improved environmental quality, is stimulated.

4 Superior Objectives	8 Subordinated Objectives	16 Outcome Indicators
Promotion of economic land management	Promotion of inner development and compact urban structures	Reactivated brownfield (m ²) Productivity per unit area
Increase of the environmental quality	Improvement of groundwater quality	Nitrate pollution (mg/l)
	Improvement of soil quality	Soil pollution (mg/kg)
	Improvement of air quality	Emissions of sulphur dioxide (SO ₂) (µg/m ³)
		Emissions of nitrogen oxides (NO _x) (µg/m ³)
Environmental protection	Improvement of biodiversity	Emissions of volatile organic compounds (VOC) (µg/m ³)
		Emissions of ammonia (NH ₃) (µg/m ³)
		Low level ozone (µg/m ³)
		Benzene pollution (µg/m ³)
		Particulate matter (µg/m ³)
		biodiversity indicators
		Housing waste (kg/habitant)
Promotion of innovative technologies	Reduction of the primary energy consumption	Energy recovery of organic waste (t)
		Energy consumption (kWh/habitant)
		Green energy (% of energy supply)

Figure 18: Objectives and indicators for natural capital stock

Urban development is only possible with the existence of a particular resource: land. Because this resource is finite and scarce, an objective in the context of urban and real estate development is the *promotion of economic land management*. This strongly politically motivated objective⁵⁶ connects economic principles with ecological benefits because land management, inter alia, comprises the revitalization of Brownfields and the avoidance of an additional re-sealing of green areas. The *promotion of inner development and compact urban structures* specifies this objective.⁵⁷ The outcome could be *reactivated Brownfield (m²)* and *productivity per unit area*.⁵⁸

As to the objective *increase of the environmental quality*, we can subdivide it into the objectives *improvement of water quality*, *improvement of soil quality* and *improvement of air quality*. The European environmental legislation seems to be useful to derive outcome indicators. A wide range of projects is mandatory to be analysed in the framework of environmental assessment procedures. German legislation provides a definition of the subjects of protection (see § 2.1 UVPG): human (health), biodiversity (animals, plants), soil, water, air, climate and landscape, cultural and other assets.

⁵⁶ German government formulated the “30 ha-target” in the year 2000. Land consumption is to be reduced from 129 ha per day (2000) down to 30 ha per day in the year 2020, cf. BMVBS (2011).

⁵⁷ Cf. Teichert (2000), p. 2.

⁵⁸ Cf. Fuhrich (2004), p. 21.

Usually environmental assessment focuses on potentially negative effects, but we can use the same indicators also for the external benefits on the natural capital stock:

Objective	Indicators	Comment	Reference
Improvement of groundwater quality	Nitrate pollution (mg/l)	Pollution of groundwater by nitrates is a serious deterioration of environmental quality. Elevated nitrate levels have negative effects on the ecology of the water system. It can also lead to a deterioration of the quality of drinking water and thus cause health problems.	Directive 2000/60/EC
Improvement of soil quality	Soil pollution (mg/kg)	Pollution of soil shows different interactions with water and air. Legislation provides clean up standards for specific land-uses, i.e. in the land development stage it is mandatory to improve soil quality. As there is a wide range of measuring parameters (e.g. cadmium, arsenic, plumb, chromate etc.) we don't specify at this point.	-
Improvement of air quality	Emissions of sulphur dioxide (SO ₂) (µg/m ³) Emissions of nitrogen oxides (NO _x) (µg/m ³) Emissions of volatile organic compounds (VOC) (µg/m ³) Emissions of ammonia (NH ₃) (µg/m ³)	Emissions of air pollutants can cause harm to human health and the environment. Respiratory diseases were already traced back to air pollution. Initially the protective measures focused on a reduction of emissions especially in specific pollutant areas. In the 1970 also the global issues of pollution was recognized. Exhaust gases of solid, liquid and gaseous air pollutants disperse in clouds and winds around the earth.	Directive 2001/81/EC
	Low level ozone (µg/m ³)	Ozone is formed in the lower layers of the atmosphere up to about ten miles elevation during strong sunlight by photochemical reactions of oxygen and air pollution. These pollutants are mainly caused by humans. Ozone causes changes in lung function parameters during physical activity.	Regulation (EC) No 1005/2009
	Benzene pollution (µg/m ³)	Emissions from transport in urban areas of developed countries are the main source of air pollution. The most important pollutants emitted by vehicles with exhaust gases include, among others nitrogen oxides (NO _x), diesel exhaust particles and volatile organic compounds, including benzene. The highest benzene pollution is found in the vicinity of busy roads, especially in urban canyons. Benzene is particularly dangerous to human health.	Directive 2008/50/EC
	Particulate matter (µg/m ³)	Urban areas are most affected by air pollution. Cities are location for industry, transport hubs and habitat for the vast number of people. Serious problems in compliance with air quality limit values will result from the close proximity to pollution sources. The highest particulate matter and nitrogen dioxide concentrations are measured near to pollution sources. With increasing distance the concentration reduces. Since emission sources are spread over the entire city, there is a constant pollution load.	Directive 2008/50/EC

Figure 19: Selected indicators and measuring parameters for the natural capital stock

The improvement of groundwater and air quality is linked to soil quality, i.e. the site cleaning during the land development (revitalisation) contributes strongly to both objectives. Especially the improvement of air quality depends on certain potential features of urban development projects, such as enlarging or creating linked green spaces or reducing traffic emissions. A development project can promote this e.g. by improving the local public transport system and by linking the project area with the pedestrian or bicycle network.

The methods and thus the indicators for the objective *improvement of biodiversity* are still in discussion. There is hardly a single or rather a manageable set of outcome indicators. Instead, we refer again to the European legislation that provides a set of 26 *biodiversity indicators* based on the “Birds Directive” (Directive 2009/147/EC) and the “Habitats Directive” (Council Directive 92/43/EEC).

We will highlight technology and mobility aspects separately in order to take into account the current relevance of the concept Smart City. A subordinate goal in relation with the “EU energy road map 2050” is the deployment of low-carbon technologies in order to limit the resource consumption in most areas of life in a long term. In the context of urban development, thus there is a demand for innovative resource-conserving solutions for the life in cities. In consequence, essential objectives include increasing recycling of raw materials, increasing the share of renewable energies as well as the reduction of energy consumption. Moreover, smaller-scale power generators and the expansion of decentralized networks can contribute to a cheaper and more efficient power supply. All over Europe, there exist diverse examples for newly built or built-up urban areas, in which we find these kinds of solutions in close cooperation with industrial partners⁵⁹. Another focus is on resource-conserving solutions for the mobility sector, which also strive outside a quarter by attracting public transport offers whilst parallel reducing the motorized private transport. A superior objective that covers part of aforementioned objectives is the *environmental protection*. Urban development projects can contribute by providing infrastructure in terms of innovative technology that

⁵⁹ The city of Malmo with its industrial partners shows imposingly the possibilities for creating sustainable urban districts by using innovative technologies in this context.

helps tackling both protection aspects the *reduction and the recycling of urban waste*. Suitable indicators are amounts of *housing waste (kg/habitant)* and *energy recovery of organic waste (t)*.⁶⁰ The second superior objective is the *promotion of innovative technologies* that aims at the *reduction of the primary energy consumption*. The technical solutions helping to reduce energy consumption are also versatile. First, the use of green energy, i.e. the use of renewable energies supports the reduction of fossil energy sources. Specifically the use of photovoltaic, solar heat systems or geothermal energy use or wind energy plants would provide a significant development benefit. Furthermore, integration of consumers into a district heating network or peripheral energy networks can also contribute to a “smart” handling of the crucial energy issue that is expressed by the indicators *energy consumption (kWh/habitant)* and *green energy (% of energy supply)*.⁶¹

3.3.4.3 Spatial outcome indicators for the human and social capital stock

Diversity of social life affects different fields such as education, work, leisure or health. *Life quality* is a prior objective that covers all essential aspects of the social dimension of sustainable urban development.⁶² A superior objective is thus the *strengthening of socially stable communities*. Social stability can occur in many ways. With regard to neighbourhoods or districts, the demographic features express stability. Thus, a subordinated target is the *creation of a demographic balanced community*. Planers measure this by a balance of age classes, in specific the *percentage of population above 65 years old / below 15 years old*.⁶³ Another aspect of demographic stability is the period residents stay in a neighbourhood and the fluctuation of residents. Suitable indicators are the *percentage of long-term residents* and the *migration balance*.⁶⁴

Besides the demographic aspect, also the *promotion of a socio-structural mixture* is important for stable neighbourhoods. Recalling the mission statement of urbanity, syn-

⁶⁰ Cf. Fuhrich (2004).

⁶¹ Cf. Teichert (2000), pp. 3; Sucato/Haack (2004), pp. 91.

⁶² Cf. Birkmann (2004), p. 58.

⁶³ Cf. Colantonio/Dixon (2009), p. 110.

⁶⁴ Cf. Fuhrich (2004).

chrony of different lifestyles in a dense urban area is a main aspect for a sustainable urban development. Thus, a diversity of households is aspired by urban development projects. The *percentage of different types of households*, i.e. single-households, classical 3 to 4 person family-households or the so-called DINKS (double income no kids) defines diversity. The *average income per household* is a characteristic of these types.

4 Superior Objectives	13 Subordinated Objectives	32 Outcome Indicators
Strengthening of socially stable communities	Creation of a demographic balanced community	Percentage of population above 65 years old Percentage of population below 15 years old Percentage of long-time residents Migration balance
	Promotion of a socio-structural mixture	Percentage of different types of households Average income per household Percentage of welfare recipients
	Improvement of employment situation	Percentage of school dropouts Number of added jobs Percentage of unemployment
	Strengthening of ethnical integration Strengthening of empowerment, participation and access	Percentage of school dropouts with migration background Number of participatory workshops in planning process Number of local residents involved in planning process Number of local associations / social networks Percentage of registered electorates voting in national/local elections Access to open space (min walking) Access to leisure and entertainment facilities (min walking) Access to retail facilities (min walking)
Strengthening of location attractiveness	Adequate provision with social infrastructure	Number of education facilities within 500m / 15min walk Number of pupils per teacher Number of daycare places <3y. compared to total <3y. Number of daycare places 3-6y. compared to total 3-6y. Number of afterschool and youth facilities
	Strengthening of social control and security feeling	Criminal acts per 1000 habitants Number of vandalism acts (incl. graffiti) at underused real estate
	Enlivenment of the residential quarter	User of gastronomy offers after 18.00 o'clock Interaction in public space Travelling time by car
Improvement of townscape and building culture	Improvement of car traffic situation	
	Securing of architectural qualities	Percentage of newly built housing following standards
	Advancement of interim use of unused buildings Strengthening of identification	Permanent vacancy quote Reference points or landmarks
Improvement of health (increase of environmental quality)	Reduction of harmful emissions	Noise nuisance (dB(A))

Figure 20: Objectives and indicators for the human and social capital stock

Because of social problems, interventions from public actors often will be necessary to avoid trading-down effects in deprived districts. Urban development projects can promote social inclusion by stabilizing the social structures. The *percentage of welfare recipients* and the *percentage of school dropouts* show the development in the described context: the more residents find employment and the more pupils graduate, the more stable is a neighbourhood.⁶⁵ Urban development projects featuring office or industry use contribute to the *improvement of employment situation* which also relevant to social stability. Thus, the *number of added jobs* together with the development of the *percentage of unemployment* shows outcomes of projects.⁶⁶

⁶⁵ Cf. Teichert (2003), p. 10; Sucato/Haack (2004), pp. 89.

⁶⁶ Cf. Fuhrich (2004); Colantonio/Dixon (2009), p. 111; Sucato/Haack (2004), p. 85.

Because disadvantaged neighbourhoods often have a high proportion of residents with a migration background, a further important field of action is the *strengthening of ethnical integration*. The indicators showing an outcome of measures is the *percentage of school dropouts with migration background* in relation to the total of pupils with migration background. The dropouts should cover all types of schools.⁶⁷ If the figures improve, a project would strengthen integration.

A further objective is *strengthening of empowerment, participation and access* as it covers the project development stage and in the long-term view the utilisation stage. Participation is a mandatory part of public planning processes. However, promoters can improve quality of participation, if public planning departments offensively implement participation workshops. The indicators are *number of participatory workshops in planning process* and *number of local residents involved in planning process*. The empowerment of residents is an aspect considerable in the utilisation stage. One can see progress in this field by public initiatives or voluntary activities of residents to serve the community. Furthermore, interest in democratic decisions processes on the local or national level also indicates the level of empowerment and participation of residents. Indicators therefore are the *percentage of registered electorates voting in local/national elections* and the *number of local associations/social networks*.⁶⁸ Finally, in the context of social stability and democratic equality, it is also a crucial aspect to secure access to different kinds of services, supply and other activities. Specifically, this covers *access to open space/leisure and entertainment facilities/retail facilities*. Analysts have to specify these indicators in terms of walking minutes.⁶⁹

The objectives so far referred to community aspects. Important for the social capital are also the aspects connected directly to the location. The superior objective *strengthening of location attractiveness* thus refers to infrastructural aspects of a neighbourhood. The *adequate provision with social infrastructure* for instance is a major settling decision criterion for young families. This covers mainly educational or care facilities

⁶⁷ Cf. Teichert (2003), p. 15.

⁶⁸ Cf. Colantonio/Dixon (2009), pp. 113; Sucato/Haack (2004), pp. 87-90.

⁶⁹ Cf. Colantonio/Dixon (2009), pp. 118; Sucato/Haack (2004), p. 88.

for children. Thus, the *number of education facilities within 500m/15min walk*, the *number of pupils per teacher* and the *number of afterschool and youth facilities* show the quality of infrastructural improvement.⁷⁰ More important as location advantage is provision of day-care places for children under 3 years old resp. between 3 and 6 years old. An indicator would be the *number of day-care places <3y compared to total <3y* and the *number of day-care places 3-6y compared to total 3-6y*.⁷¹ Another objective is *strengthening of social control and security feeling*. Suitable indicators are *criminal acts per 1,000 habitants* and *number of vandalism acts (incl. graffiti)*.⁷²

One of the already mentioned objectives aims at the improvement of public transport and at the same time at the reduction of individual motorcar traffic. However, a certain share of residents will use cars. As urban development projects always lead to a concentration of either residents or workers in a given area, also car traffic will increase. Thus, the enlargement of the street system with e.g. bypass roads for both public and individual transport is necessary and can contribute to the objective *improvement of car traffic situation*. The chosen indicator for this is the *travelling time by car*.⁷³

The quality of city planning is an important component regarding the life quality. The construction aspects in project developments can contribute and create the structural framework for the development of urbanity. A superior objective is the *improvement of townscape and building culture*. In recent years, theory and practice of urban planning created certain standards that are now widely accepted. To achieve the objective *securing of architectural qualities* some municipalities use quality-securing processes or design advisory boards that guarantee a certain architectural standard. An indicator is the *percentage of newly built housing following standards*.⁷⁴ However, due to legislation, for instance in Germany, some construction aspects are mandatory, such as the adaption of the surrounding or the assimilation of building edges. In addition to this,

⁷⁰ Cf. Colantonio/Dixon (2009), p. 111; Sucato/Haack (2004), pp. 88.

⁷¹ Cf. Teichert (2003), p. 14.

⁷² Cf. Teichert (2003), p. 12.

⁷³ Cf. Sucato/Haack (2004), p. 92.

⁷⁴ Cf. Colantonio/Dixon (2009), p. 115; Sucato/Haack (2004), p. 86 and p. 90.

the perception of townscape also refers to the permanent occupancy of buildings. An urban development project can contribute to *advancement of interim use of unused buildings*, which reflects in declines of *permanent vacancy quotes*.

Promoters often realize development projects on former used areas, e.g. on abandoned industrial sites. It is common that residents still have a strong relation to the history of a neighbourhood and feel a high level of identification. Urban development investment projects now have the chance to create identification based on both perspectives preserving historical features of the site and creating new references for identification. The indicator *number of reference points or landmarks* expresses the correspondent objective strengthening of identification.

In the beginning of this section, we have pointed out that objectives and indicators often correlate or rather interact. This is especially true for the natural capital stock in relation with the social capital stock, e.g. in regard to the presented objective *increase of environmental quality* and its linkage to the objective *improvement of health*. Outcomes in the environmental field contribute directly to social objectives. In addition to these effects, we identify the objective *reduction of harmful emissions*. Transport in general is a major emitter not only of toxic substances but also of noise. Therefore, the indicator *noise nuisance (dB(A))* expresses the contribution of new buildings or other constructions such as anti-noise barriers to this objective.

3.3.5 The time dimension: the question of the relevant application

Analysts can evaluate external benefits *ex-ante*, *on-going* or *ex-post* in the development process. Based on this time dimension, we can derive potential application fields:

- *Ex-ante application*: If the public authorities know the external benefits, they could use them for the *objective setting on the local government level*. This ex-ante information can support strategic decisions for future urban development as it helps to select suitable projects that have the greatest contribution in terms of sustainable urban development. Furthermore, public authorities could directly use them for their *integrated planning instruments* at the municipal level of government. External benefits could become a natural part of urban development concepts. If the mu-

municipality plans to support certain development projects, they could also base their *promotional decision* on the extent of expected external benefits. This could be a possible use of the developed systemization in the management of urban development funds in the JESSICA initiative. In the same context, promoters could use the identification of external benefits *to signal public authorities possible added values* of their development proposal.

- *On-going monitoring*: A relevant application could also be the *monitoring* of the project development using the indicator set that has been elaborated ex-ante. External benefits already occur during a project development, e.g. clean-ups of contaminated land, transaction volumes, correspondent tax revenues or investments in the project neighbourhood. Using a monitoring approach, the responsible actors in public administration as well as in private development companies are in a position to *intervene during the process* if a development is not in accordance to the objectives.
- *Ex-post evaluation*: To verify the expected outcomes the *ex-post evaluation done by certified accountants* on behalf of public authorities could be a large-scale application field. The reason is that this not only would lead to a real evidence-based planning and policy. From these results, promoters can *learn* for the future. Furthermore, with huge external benefits it would be easy to justify support to private promoters and investors in urban development investment projects. This would lead to a balanced result for the test on proportionality in the context of state-aid.

From our perspective, the main application field for outcome evaluation is the ex-post audit. However, to show all three forms of time dimension (ex-ante, on-going, ex-post) and the resulting indicators of the derived systemization, we test the systemization in the next chapter. As an illustration example, we take the urban development investment project *Le Quartier Central* in Düsseldorf (North-Rhine Westphalia, Germany).

3.4 Testing the outcome systemization in the project “Le Quartier Central”

3.4.1 Overview an the central planning assumptions in Le Quartier Central

The project Le Quartier Central (LQC) is a property-led development investment pro-

ject by the private developer Aurelis Real Estate GmbH & Co. KG. In former times the site in this case study was used as a freight depot that was abandoned in 1990. The Brownfield area is located northeast of the city centre of Düsseldorf. It is part of a socially stable and attractive residential area near to the city centre and endowed with a well-developed infrastructure. It is a crucial part of the superior objectives of the city administration to expand the offers on the housing market. It is a part of the subordinated plan for the “green ring” in the inner city area of Düsseldorf that fosters the connection and expansion of public green spaces around the city centre. The city of Düsseldorf has created an integrated urban development concept for this urban development project on the district level (“New Neighbourhoods Derendorf”) which should assure the provision of good quality housing and the supply of office space for ICT and cultural industries. The *integrated urban development concept* (STEK 2020+) recognized a need in this segment. Le Quartier Central is therefore also a prominent example for an integrated plan for sustainable urban development (IPSUD). In 2003, the promoters presented the development concept in public. On about 360,000 sq. metres, the project will provide an urban mix of dominantly housing, jobs, shopping and recreational opportunities and thus meets the mentioned needs on the housing market in Düsseldorf. The overall investment will be 677 mill. Euros.



Figure 21: 3d-model of Le Quartier

In 2005, the *zoning plan* became legal. In the meantime, the developer has been very successful in land marketing. In 2006, the first housing corporations started with the

building process. It is expected that the below visualized model will be completed by the end of 2016. In order to assess quantitative external benefits, the following list shows the key basic data and scenario assumptions for the project LQC:

Scenario 1:

Dwelling units	1.773
Household size	2
Rate of additional residents	50 %
Additional residents	1.773
Rate of employees per household	80 %
Yearly gross annual income per employee	60.000,- EUR p.a.
Gross Floor Area (GFA)	144.166 sqm
GFA per job	35 sqm
Jobs	4.119
Rate of additional jobs	50 %
Yearly turnover per job	200.000,- EUR p.a.
Profit	4 %

Scenario 2:

Dwelling units	887
Household size	2
Rate of additional residents	10 %
Additional residents	177
Rate of employees per household	80 %
Yearly gross annual income per employee	40.000,- EUR p.a.
Gross Floor Area (GFA)	72.083 sq.
GFA per job	35 sq.
Jobs	2.059
Rate of additional jobs	10 %
Yearly turnover per job	150.000,- EUR p.a.
Profit	4 %

3.4.2 External effects on the capital stock of Düsseldorf

Concerning the *financial and productive capital stock*, it is possible to come to a first conclusion concerning the external benefits for the city of Düsseldorf: With the assumptions of the gross annual income, an additional annual total income of around EUR 91 mill. can be expected. The German tax system provides a local share of income taxes (on average 15 % of the total gross income) of 15 %. The city of Düsseldorf thus receives additional annual revenues from the income tax of around EUR 2 mill. The additional amount of taxable profits generated by new office jobs is almost EUR 18 mill. The base value for business tax purpose results from multiplying it with the tax rate of 3.5%. The multiplier of the municipality is 440 % for 2010. The result for the city of Düsseldorf is additional annual revenue from business taxes of approximately EUR 2.8 mill. Closely linked to the revitalization of the freight depot is the

development of real estate values in the surroundings. The land values are suitable to follow this development. Thus, an increase in land values in the immediate vicinity of the LQC is recorded. The city of Düsseldorf will participate from these effects due to the (one-time and the continuous) real estate taxes based on these higher land values:

District / Subdistrict	Standard ground value 2008	Standard ground value 2010	Standard ground value 2012
Pempelfort / Pempelfort	770 EUR / sqm	740 EUR / sqm	820 EUR / sqm
Düsseltal / Flingern	880 EUR / sqm	840 EUR / sqm	930 EUR / sqm

Figure 22: Land values

Furthermore, we assumed that in total 1,773 additional habitants would move to Düsseldorf. Besides the fact that the new citizens pay taxes they also strengthen consumption. More residents bring along purchasing power. Local enterprises and gastronomy will benefit from more local expenses. The Society for Consumer Research (GfK) states for Düsseldorf in 2010 a per capita purchasing power of EUR 23,003. Multiplied by the total number of additional residents, the result is a purchasing power of approximately EUR 40 mill.

Probably the largest effects of the urban development project LQC result for the *natural capital stock* of the city of Düsseldorf: The project meets various subordinated objectives of the economic land management. The *revitalization of a Brownfield* with approximately 360,000 sq. metres is a major contribution. At the same time, the environmental quality improves by the exchange of contaminated soil. There is no knowledge to the assessments of soil contamination. However, one can assume that there was partly a high soil contamination due to the former use as a freight station. Accordingly, by replacing the polluted soil, an improvement of water, soil and air quality results. The creation of continuous green space is a crucial aspect for the framework plan 'green ring' and fulfils different functions both a complement for city climate functions and a free spatial north-south axis as walking and cycling connection is created. Thus, fresh air corridors or areas for storm water management can meet important urban ecological functions. About one fourth of the total land is parks and green spaces that resolve largely the existing deficit in the supply of green space in the district.

Here, green space fulfils the function of wind corridors and contributes to the health of habitants and workers by supplying recreational area. During the planning process, also sectorial planning departments are involved. Therefore, the authorities secured from the beginning that there would be free corridors considering the dominating wind direction. Precisely the park areas with about 75,000 sq. metres fulfil this function. In addition, the urban planning department legally fixed in the zoning plan that punctually high buildings are allowed but do not harm the wind draught. These measures contribute to an improved air quality.

For the *social capital stock* of the city of Düsseldorf, external benefits arise from the creation of green-, park- and water spaces and from the reduction of noise pollution. The creation of social infrastructure (day-care centre and youth centre) is always an important factor for the quality of a location. It is an important element for emphasizing the character of an urban neighbourhood for living and working. With regard to the demographic change, all dwelling units are barrier free in order to be attractive to older populations. The construction of the bypass road “Toulouser Allee” on the development area contributes to relief of existing traffic network. In addition to the measurement of the road space created the saved travel time seems to be significant in terms of showing the outcome of this measure. The (landscape) architecture of the LQC perfectly fits into the surroundings. It mirrors the present structures adequately. In addition, the already completed buildings are of high architectural quality meaning that this is an improvement of the townscape. To secure the architectural quality the city of Düsseldorf made use of a quality control process. The result for each building was then mandatory for further construction. The long-term residents participating in the planning workshops achieved the preservation of several historical features, such as railway tracks or illuminations. Furthermore, because of the huge green areas in between the construction lots, a negative feeling of excessive dimensions is not to apprehend. The huge green space improves the health situation for residents in the neighbourhood and the surrounding areas. It provides important leisure and recreational functions that were poor in former times. Moreover, the future buildings and landscaping along the still used railroad tracks reduce noise pollution. For the indicator “noise nuisance (dB(A))” data was not available.

4 Conclusion and outlook on further research

External benefits are the most important driving powers for municipalities to participate in the creation of private development projects. The material or immaterial support of private investments requires a justification on a founded and transparent basis. This is even truer since the property-led approach has led to controversial discussions in the past. Critics fear that promoters would decouple their projects from the interests of local citizenship. There is a demand that the chances resulting from revitalization should also result in benefits for the local disadvantaged population. Promoters should provide a structural improvement for the neighbourhood of their projects. Here, the proposed systematization of these external benefits and the elaboration of fitting indicators can be a central component.

It is restrictively notable though and against the background of the existing methods for measuring external benefits, that none of these methods can meet the requirements of an extensive analysis in their present form. The started research reveals the requirement of a further detailing of the analysis. The test of our systemization in the example Le Quartier Central showed that there are more outcome indicators suitable to analyse. However, the analysis also has shown two difficulties. First, some data are simply not yet available. Second, the prognosis of effects is per se associated with uncertainties in regards to future developments. Nevertheless, the already presented indicators can be analysed over the period of the project development, as the project will end by the year 2016. Moreover, we are going to apply the developed indicator systemization on other types of urban development projects to point out qualitative differences. The goal is to conduct a revision of the now existing systemization, i.e. the chosen indicators will be critically analysed in order to be able to find better alternatives.

The now existing systemization of external benefits of private property-led development projects is therefore a *starting point* for a structured and consistent analysis in the context of the new logical framework in EU Cohesion Policy. If it is possible to quantify tangible, causal, additional and monetary external benefits, then it will be possible to justify external costs (coming from public development promotions) and *to create a full or integrated cost-benefits analysis (CBA)* for these urban investment projects.

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Professor Dr. Michael Nadler

Lehrstuhl Immobilienentwicklung
August-Schmidt-Straße 6
44227 Dortmund
Tel.: 0231/755-7986; Fax: 0231/755-2415
Mail: immo.rp@tu-dortmund.de
Website: www.immo.tu-dortmund.de

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