

The Analytical and Alternatives Generation Phases in Urban Design Practice in US Cities. The Case Study of Pittsburgh Development Plan 2001

Firas A. Al-Douri
Doctoral Candidate- Department of Architecture
Texas A&M University
College Station, TX, 77843, Mail Stop 3137
USA
E-mail: firasahd@neo.tamu.edu

Second Author: Dr. Mark J. Clayton
Associate Executive Dean-College of Architecture
Texas A&M University
College Station, TX, 77843, Mail Stop 3137
USA
E-mail: mark-clayton@tamu.edu

ABSTRACT

According to some experts, urban design plans adopted in US cities are often developed without being underpinned by relevant analytical content, or are not based on in-depth analysis for the specific problem of the study area. There may be need to examine current urban design plans to provide local authorities with new processes that would improve urban design and implementation. This paper examines the analysis and alternatives generation methods used in a selected case of urban design practice in Pittsburgh and compares them against various theoretical conceptions. It attempts to establish gaps in its methodology and to explore the extent with which the analytical content underpinned the design solutions. It has been found that the plan's content has emphasized the role of research and analysis in its methodological framework and had a significant impact on the development plan yet with various degrees of success. The paper identifies the methodology and techniques adopted in both phases, and highlights the gaps in each phase as well as gaps between both phases. The paper found that the analysis phase and the analytical content have had significant impact on the general and the specific levels of the development plan yet with different degrees of success. In sum, the policies were generally good at expressing the analytical content and consultative bases of policies.

1. PRELIMINARIES OF THE DEVELOPMENT PLAN: THE HISTORICAL AND URBAN CONTEXT

Recent urban development of Pittsburgh features three main distinct stages throughout which it has been regarded a model of public /private development. In the first stage during the 1940's and 1950's, it was the site of the first American urban development project. It is believed, according to Garvin (2002), that Pittsburgh would not rank sixth in the nation as a major corporate headquarters center if it had not virtually rebuilt its downtown through this project and other related projects such as Point State Park and the gateway center office complex at the confluence of the Three Rivers,⁴⁷ one of the city's nationally recognized icons (Garvin 2002, p.3). At the second stage during the building boom of the early 1980's, a number of large corporate towers and mixed-use projects were built in the commercial core of the Golden Triangle which is defined by the Three Rivers. At the turn of the 21st century which marked the rise of a third stage of Pittsburgh's development, the regional economy completed its transition from manufacturing to a more varied and diversified base primarily driven by technologies and knowledge-based enterprises (Stern 1998, p.25).

⁴⁷ - Monongahela, Ohio, and Allegheny Rivers.

In spite of the major economic and social changes throughout these stages, Pittsburgh's Downtown maintained its competitive advantages and efficiencies over suburban locations such as the high concentration of the region's office space⁴⁸, the strong architectural character and sense of history and place, and its location at the center of the region's radial transportation system. Therefore, Pittsburgh's Downtown maintained its role as a regional center of business and employment, which includes its role as a transportation hub, a symbol of national and international recognition and identity, and a main stage for business, ports, and cultural achievement (Downtown Development Plan, 1998, p.3). However, certain stress points evolved gradually in its urban fabric and lead the city to experience certain weaknesses relative to its fast-growing surrounding suburbs. The Downtown has remained largely a 8:00 AM - 5:00 PM business center with a vulnerable retail district, an underachieving entertainment sector, a meager residential population, worsening traffic congestion and parking shortage, and limited riverfront access and amenities despite its prime setting (Stern 1998, p.25; Downtown Development Plan, 1998, p.3).

In light of these realities, it was essential to develop a comprehensive development strategy to address the afore-mentioned stress points and to manage the major economic changes in its Downtown that occurred since the last development plan in 1961. Hence, *Pittsburgh's Downtown Development Plan (PDDP)* is meant not only to address the downtown's weaknesses but also to integrate the ongoing and proposed development projects. The plan's explicit and foremost goals were transforming Pittsburgh Downtown into an 18- to 24-hour city, and integrating ongoing public and private development and planning proposals, including transportation and public infrastructure, into a "comprehensive 10-year vision" (Stern 1998, p.25; PDDP, 1998, p.3). The mission of the development plan was "creating a vision" for Pittsburgh's downtown within which the plan aimed at creating a downtown of a great social and economical diversity that could serve the maximum number of citizens.

2. SCOPE AND APPROACHES OF THE DEVELOPMENT PLAN

2.1 Scope of the Development Plan

Although the Golden Triangle, the area bounded by the Three Rivers and the Crosstown Expressway, has traditionally defined the Downtown (Figure 1), the plan extended the scope of the study area to include other surrounding areas such as the north and south shores as integral parts of the anticipated downtown development (Figure 2). This conceptual shift from the downtown's traditional limits meant that the plan has re-imagined downtown as encompassing the entire "Three Rivers Basin" with the rivers flowing through the heart of the city rather than dividing it. In a broader scope, the plan also considered the downtown's regional context within metropolitan Pittsburgh to strengthen the downtown's role as the core of the city and to help maintain its regional role in all aspects of urban life. Accordingly, PDDP considered downtown development at three concentric levels: the traditional downtown, the development plan study area which includes the traditional Downtown as well as its surrounding areas and shores, and the regional context of Pittsburgh's downtown.

2.2 Approaches of the Development Plan

2.2.1 The Collaborative and Multidisciplinary Approach

The initial step in the plan's development process focused on designing an action plan to guide and advance each stage of the process. It involves defining a team structure which consisted of four key participants: the oversight committees, the community task forces, the planning group, and the core team that would generate and serve as a container of

⁴⁸ Two thirds of the regional office space is located in Pittsburgh Downtown.

information (PDDP 1998, p.7). Each team was assigned certain tasks which helped create a multi-disciplinary collaborative professional environment. The Oversight Committees formed a partnership to bring the diverse technical, financial, and managerial expertise to the development process. Community Task Forces that correspond to the six focus areas of the development plan convened a diverse group of business leaders, administrators, design professionals, residents, clergy, and other concerned citizens (PDDP 1998, p.7). The planning team invited public participation and conducted detailed research and analysis to inform the development plan and underpin its design policies with analytical content.

2.2.3 Design and Development Approaches

The plan states that:

.....there is no right way to organize an effort as complex and all-encompassing as Pittsburgh Development Plan. Its attempt was to be inclusive at every turn and to create a process that covers as much ground as possible and allows ideas to surface (PDDP1998, p.7).

The plan's methodology adopted two main approaches that affected the plan's structure and the type of its design guidance. The first approach, which affected its structure, was breaking the plan into a series of interlocking parts in the form of six focus areas that could contribute vitality and strength to the whole. In another breakdown, the development objectives and projects were broken into two phases. In phase one (1-4 years), most projects were proposed inside the traditional boundaries of Pittsburgh Downtown and were integrated with transit and pedestrian improvements⁴⁹. In phase two (5-10 years), the emphasis in development projects shifts into the areas surrounding the traditional downtown.⁵⁰ The second approach which affected design guidance was combining two types of design guidance. The first, highly prescriptive guidance, contains fixed requirements for mix/density, sets out a road layout, and provides an indicative site layout. The second, enabling guidance, places most emphasis on design and the relationship between buildings, vehicles, and the landscape, with minimal restriction on layout and access position (Turner 1994, p.297). This approach facilitated flexible change of design control and level of details in both, focus areas and districts. For each focus area, an agreement was first reached on broad principles that subsequently laid the foundation for a general development strategy of the plan. Therefore, the design guidance involved emphasis on design elements at various hierarchical levels ranging from the intermediate scale of landscape and urban design considerations to the detailed issues of architecture and urban management.

The adoption of both approaches may be viewed as a response to two various attributes of PDDP. The first is the variety of the plan's goals from the broader level of development plan such as integrating the work of task forces and focus areas to the more specific level of urban design focus areas such as studying the physical implications of development proposals. The second is the multiple levels of details in designing the different districts of PDDP which was essential to address the diverse types of developments proposed within the study area at both design phases.

3. METHODOLOGY OF THE ANALYSIS PHASE

⁴⁹ Of eleven projects proposed in this phase, six were proposed inside traditional Downtown, four were outside it, and one project was a connecting bridge across one of the rivers.

⁵⁰ Of ten projects proposed in this phase, one of them only was located inside the traditional downtown, and the others were distributed throughout the surrounding areas.

Urban design process operates within a wide range of scales, which necessitates different levels and techniques of analysis. This section explains the levels and techniques of the analysis phase in PDDP, and compares them with their counterparts in theory.

3.1 Levels of Analysis

Analysis in urban design practice takes place at three various levels: the level of town in its landscape setting, the level of the built-up area which is subdivided into various urban areas that share specific homogeneous form characteristics, and the level of urban space in each of these urban areas (Gosling 1993, p.216; Skaug 1995, p.427). Carmona et al (2003) defines the analysis levels with different hierarchical order: district/region-wide, area-wide, and site-specific-wide. However, PDDP methodology did not structure and organize the analysis process according to scale criterion but under three various headings of tasks that were conducted progressively as the plan's content develops from general to specific issues.

The first analytical task was collecting and analyzing existing information about the downtown area in relation with its urban context to identify the areas' strengths and weaknesses. This task lead to defining the plan's outline, scope, goals, and most importantly, the major aspects comprising the downtown plan: economic and social life, physical attributes, and transportation systems. The second analytical task departed from the premise that the downtown's form and function are affected by two major factors: the current committed or under construction development projects, and the anticipated market forces which recommended conducting extensive research to identify the future market demands for various development types in the downtown area. Hence, this task involved field survey, data gathering, and analysis of three major focus areas of the development plan: market analysis, design issues, and transportation (Figure 3). The second analytical task has lead to the definition of the plan's specific goals and objectives, and the development of focus areas and task force key principles and development initiatives in order to accomplish the plan's objectives.⁵¹ The third analytical task subjected each focus area and key principle to an analysis-synthesis procedure as a tool to create scenarios of downtown development. This stage of the work involved design charrettes to analyze the development scenarios in order to select and developing a draft development strategy.

3.2 Analysis Techniques

Each analytical scale and context requires relevant analytical technique and assessment approach to develop alternative concepts based on an understanding of the area's positive and negative characteristics and distinctive patterns (Carmona et al 2003, pp.240-244). The methodology of PDDP involved three main analytical techniques: the SWOT, the cities tour, and computer-assisted analysis.

The SWOT⁵² technique was conducted within the first analytical task to collect and structure data. The information collection and analysis were structured by listing and categorizing aspects and qualities of the project area under three main categories: strengths, weaknesses, and opportunities. The threats category was not considered in that approach. SWOT technique used the matrix form implicitly as a tool for dissecting the project area's properties and potential which were examined under three main broad headings: the physical attributes of the built environment and its infrastructure (particularly transportation), the natural environment and open space, and the economic conditions. The outcome of that analysis did not follow the same structure. Instead, it was represented as a list of statements that indicates the potential of each project area for achieving the desired goals and

⁵¹ Those focus areas are: retail and attractions, business climate, housing, institutions, transportations, and urban design.

⁵² SWOT technique refers to the following indicators: Strengths, Weaknesses, Opportunities, and Threats.

objectives. The list did neither outline the policies or steps necessary to achieve the desired goals and objectives nor did it question the underlying premises.

The analysis phases involved a tour of other downtown cities to compare Pittsburgh situation to that of other metropolitan areas⁵³ that were selected because of having successful experience in one or more of the areas that were considered as major aspects of Pittsburgh downtown plan. The findings of the tour were one of the major sources of information upon which the plan's recommendations were based.

The analysis phases also involved using a 3D computer model to support planning teams at different stages of the plan's development. Images of ongoing and proposed development proposals imposed on Pittsburgh's downtown computer model were extensively presented in the final report. It was used to build a set of analytical capabilities whose layering structure was arrayed into three groups: environmental-geographic, movement fabric, and architectural components. All development proposals were placed in this model at their real sites and elevations to examine how the parts could fit together and retain spatial coordination (Gosling & Gosling 2003, p.251). However, it was not effectively used for these analytical techniques or in any other core tasks such as research, analysis, synthesis, or implementation. The computer model had to fully represent the topographic structure associated with extending the downtown realm beyond the limits of Golden Triangle. It may be used also as the interface of the task forces and planning committees with public at large to analyze development scenarios in design charrettes. The computer model may have been used a means for visual analysis and objective analysis of the three-dimensional fabric of the city derived from Kevin Lynch's -or other's- vocabulary of urban form. The outcome of that analysis also could have been extended into a more subjective analysis upon which areas of tranquility, repose, confusion, permeability, and imageability may be defined either by task forces, groups or from sample surveys selected from groups of users, residents, and visitors.

3.3 Gaps in the Analysis Phase and the analytical Content

Literature suggests that analytical methods should be easy to comprehend and should embrace all aspects of the urban environment (Punter and Carmona 1994, p. 208). In PDDP, other analytical methods and techniques for which computer models are either useful or essential could have qualitatively improved the analytical content. The following is a list of methods and techniques that may have been useful to address major aspects and focus areas of PDDP such as pedestrian movement, spatial structure, transportation, and three-dimensional modeling of development proposals:

- Spatial structure analysis, which includes space syntax to analyze the pedestrian network and to configure the public realm. Both of which are major elements of the urban design policy and its desired objectives.
- Network analysis for modeling transportation and vehicular links.
- Computer analysis to assess the visual and physical impact of the development proposals, and to assess how these proposals integrate with other aspects of the development plan (Roberts & Greed 2001, p.52).
- Tissue studies which involves comparing the scale and layout of different urban fabrics.

Analyzing the context of new development and utilizing it to develop design principles is critical if sound design policies are to develop (Punter and Carmona 1994, p.208). Content analysis indicated that the analytical content of PDDP lacks the coverage of three essential components: detailed functional analysis, land subdivision and building coverage analysis, and visual analysis. The first component, detailed functional analysis should include analyzing the constituent elements of the study area and their interrelationships over time, in

⁵³ These cities were: Indianapolis, IN, Denver, CO, Seattle, WA, Oakland and San Francisco, CA.

both original and contemporary urban fabric to understand how different land-uses, activities, and spatial relationships have evolved. Although this technique has been used in analyzing only a single major aspect of the plan, i.e. the market forces which involved housing market, retail market, office market, business climate analysis, and entertainment market, a comprehensive analysis of city functions was required to address the functional relationships between market and other uses such as education and hotels. For the second component, land subdivision and building coverage literature suggests that consideration of land and its subdivision makes the link between the building scale and the city scale, and helps better understand the major qualities of the urban environment such as human scale, permeability, variety, pedestrian comfort, and visual qualities (Sandalack 1998, p.36). However, analysis included examining block organization, but did not consider the scale of the lot⁵⁴. Ideally, land subdivision patterns should be mapped and critically analyzed in the study area. This component is specifically important to Pittsburgh because its plan involves developing large office, entertainment, and parking structures as well as hotels. These developments translate to massive structures which may eventually lead to block consolidation and lot amalgamation that requires assessing how they respond to and be integrated with the existing urban patterns, overall spatial structure, skylines, and street vitality.

The third component, visual analysis, is critical because the integration of Pittsburgh Downtown into its metropolitan context is the plan's overall goal. Therefore, a clearer understanding of the character of that context was critical and requires a qualitative assessment of its visual aspect such as elements of the urban form, the volumetric characteristics of the urban fabric, and most importantly, the physical and visual relation of the Three Rivers Basin with its urban context. A clearer understanding may help designers critically evaluate the spatial changes that may take place due to development proposals (Sandalack 1998, p. 36). Although the 3D computer model was used to represent the visual impact of the development proposals on their urban context, it was not used effectively to create 3D views that may explicate the above-mentioned analytical tasks or bridge the gaps in the analytical content.

Finally, a typical SWOT analysis should comprise socio-economic conditions as a main heading (Moughton 1999, pp.70-71). However, content analysis was confined to economic conditions only and did not indicate any reference to the significance of social aspects.

4. CONCEPTS GENERATION

4.1 The Methodological Approach of Alternatives Generation Phase

The gradual movement of the plan's content from the general to the specific was guided by the methodological approach of the six task forces that addressed the three major aspects of the downtown plan. At each focus area, the task forces conducted a five-step systematic process to establish their broad design principles and implementation tools. This process involved five steps: challenge, research, approach, opportunities, and guidelines. Each task force determined the desired goals that guided the subsequent phases of survey, research and analysis of the existing, on-going, and proposed projects. The design principles of each focus area were subject to discussions and revisions in Task Force Workshops to create developed design principles and concepts. Subsequently, the developed principles and concepts were synthesized in development scenarios that have been reviewed and analyzed in design charrettes.

⁵⁴ Lots are the basic cells of the urban fabric, and their significance stems from their role in linking built form to the land and open spaces.

Upon setting the methodology of PDDP against various design paradigms, it may be argued that its framework has followed the *analysis-synthesis model*. Theoretically, this model is a didactic approach that defines design as a process in which standard rules are applied, general and more specific data are analyzed, and new ideas are developed and tested (Figure 4). It utilizes the design process as a vehicle for incorporating information collected in various ways while expressing design proficiency. The first step in this model, research, involves the acquisition and assessment of knowledge to produce general rules, while the following step, design, is a process that breaks the design problem into discrete elements. The next step, analytical activity, involves analyzing research information and applying it to the discrete elements that are synthesized into a coherent whole in the following step, synthesis. Subsequently, the final stage involves evaluating the results after implementation to improve future projects (Figure 5).

In PDDP, analysis phase and its content have had dual effect. The first, they have determined the approach, goals, and premises on which the methodological framework was developed, and the second is the level of the plan's major aspects and their corresponding areas. Yet, PDDP's methodology deviated from the conceptual framework underlying the analysis-synthesis model, because it dealt with the discrete elements as parts without consideration to or assessment of their complex relationships and interaction within the urban environment as a whole. That deviation affected the design process in its analysis as well as alternatives generation phases. In analysis, it deprived the process from thorough and comprehensive understanding of the issues inherent in urban design problems. In alternatives generation, the impact might have been significant because at that phase, the planning teams seek an integrated solution which synthesizes their understanding of the design problem with other sources of information such as research data and findings, SWOT analysis, distinctive characteristics of the study area, public input, and project's program. The final recommendations of the development plan, as such, were derived from several sources, but ironically none of them refer to the analytical content⁵⁵ (PDDP-Executive summary-p.2).

4.2 Gaps in the Alternatives Generation Phase

Literature suggests that there are two types of activities involved in generating alternative solutions. The first, search, involves identifying existing prototypes to be taken of the shelf as the occasion requires, and the second, design, depends on innovation and creative response (Bayne 1995, p.307). The methodology of PDDP, in spite of few gaps found, emphasized the role of search as well as research, survey, and public input, but the role of design was meant to be vague and too implicit to be interpreted through content analysis. The PDDP did not explain explicitly how essential intellectual tasks and decisions, such as the development, assessment, and selection of scenarios have affected alternative generation and selection. For instance, the transition from, and the input of, research and analysis phases into scenarios has not been explicated or even documented. The numbers, development procedure, constituent factors, and variables affecting scenarios have not been revealed or made explicit. The criteria with which scenarios in the design charettes have been assessed and selected were not discussed. Although the plan argue that the public input has had significant impact on the plan methodology, particularly in analyzing development scenarios, they did not indicate the extent to which that input has influenced the development process and how did it vary-if any-from recommendations made by planning teams.

In another related gap, the role of subjective interpretation of the planning teams was not explicated. Literature suggests that the definition of the problem and the approach of concept

⁵⁵ the stakeholder group reports, the economic impact study, the cities tour report, main street principles and programs, urban retail properties response to the collaborative, modified "market place" plan,, construction cost analysis, information provided by the Urban Redevelopment Authority, national Institute for Justice, and Pittsburgh History and Landmarks Foundation

generation depend in large on these interpretations which are influenced by the analysis process (Bayne 1995, p.309). The content analysis was unable to interpret how the planning teams found the best fit between the study area problems and the study approach. This gap highlights the importance of comprehensive documentation of the design process which should include the intellectual tasks, discussions, annotations on plans and documents, and criteria adopted in generating, assessing, evaluating, and selecting the design solutions.

4.3 Role of Analysis in Alternatives Generation

According to Milburn and Brown (2002), data and research are collected, analyzed, and then integrated with the design process in three forms:

1. Criteria against which design concepts are tested and modified.
2. Experiences and information, which aid in creating general principles used to assess specific design situations and to evaluate alternatives.
3. An intellectual framework for design which is assessed according to criteria established by rigorous research and behavioral studies (Millburn, L. and Brown, R., 2002, p.49)

Although PDDP has integrated information and research in all the above-mentioned forms and at various levels of its development process, these forms had various degrees of influence on that process. The content analysis was unable to clearly recognize or identify the impact of the first form because the process of developing, assessing, evaluating, and selecting design alternatives were not explicated. The impact of the second form was particularly significant in developing key design principles of task forces. Each task force has utilized survey, analysis, and research to identify their objectives, a statement of a mixture of economic, aesthetic, functional, and behavioral ends. Subsequently, each task force identified its approach, which includes principles explaining the link between their desired design objectives and a pattern or layout of the urban environment. Finally the task forces utilized design guidelines, the operational measures which specify how to meet the design objectives. Similarly, the six task forces and their design principles that addressed the focus areas should deliver a full range of design alternatives or development scenarios, the number and content of which were derived from the overall goals, objectives, and the methodology of the design process. Therefore, survey, analysis, and research have had significant impact in setting the design objectives as well as design principles and guidelines used to achieve them which, all together theoretically determine the quality of the urban design product (Uniatty, 2000, p.4). The third form has affected the plan's methodology. It helped identify PDDP major aspects which highlight the areas in which consultancies should conduct analysis⁵⁶, and then identify the six focus areas by the collaborating groups.

Theoretically, as important as the analytical content is the process of translating it into design concepts, strategies and alternatives. Conceptual urban design plans provide a means to convert urban analysis into positive design proposals at a city scale (Gosling 1993, p.221). Other supporting illustrations such as concept diagrams; building envelope guidelines; indicative sketches; axonometric drawings; and models illustrations could enhance the role of conceptual urban design plans in guiding the transition from analysis into concept generation. The role of those illustrations may be even emphasized by plans such as location plans, plans of site and surrounding area, historic plans, and figure-ground diagrams. In PDDP, conceptual urban design plans have not been used as a means to deliver alternative solutions. The other illustrations were used discretely, particularly in layering the proposed development projects and movement networks on their urban settings. They did not represent a coherent intellectual phase within the methodological framework, and, as such, did not influence the process of synthesizing the analysis into design alternatives and solutions, and, in consequence, were not effective in generating the development scenarios.

⁵⁶ These areas are: market forces, design issues, and transportation.

Therefore, in PDDP, the impact of survey, analysis, and research on the procedural aspects of the design process was significant, but a similar impact on the substantive aspects was not recognized. As the plan content moved from general to specific, that impact was also recognized in the six focus areas and their respective task forces, but diminished substantially in the alternatives generation phase. Most importantly, an effective impact was neither recognized at the scenario development phase nor at the following phases. The variety in the magnitude of impact may be due to the different urban design modes of PDDP that translate to different degrees of abstraction and intervention in the urban environment. These interventions ranged between prescriptive urban design guidelines to a more detailed and enabling design guidelines.

5. CONCLUSIONS

Several major conclusions could be drawn concerning the gaps at each phase and between both phases in PDDP. Although the plan content emphasized the role of research as well as analysis in its methodological framework, the extent to which the analysis phase and the analytical content underpinned design policies is difficult to assess because these policies feature various degrees of reference to that analysis. Few policies revealed their analytical methodologies or the extent of their surveys and studies. The content analysis identified four types of reference to the analysis: explicit, implicit, integral, and no evidence of analysis. Explicit analysis is evident in the plan and provides a clear analytical basis for policy making. The plan's topics which involved this type of analysis such as land-use and transportation, urban design, open space, and economic factors responded directly to local conditions, often tailoring policies specifically to individual localities and often including details of the analysis within the plan. Implicit analysis is interpreted in some topics such as user perception and behavior. Analysis that is integral to the plan, such as in the areas of sustainability and natural factors sets future directions for development, yet it tends to be largely descriptive and did not translate to clear design principles. Some topics such as historical areas and plans' history show no evidence whatsoever of analysis of the locality. In sum, the policies were generally good at expressing the analytical content and consultative bases of policies.

Further, the content analysis found that the analysis phase and the analytical content have had significant impact on the general as well as the specific levels of the development plan yet with different degrees of success. At the general level, it helped establish the conceptual framework on which the methodology was based, and it has succeeded to recognize the distinctive characteristics of the project area at the contextual urban level. That success was paralleled by another success yet less rigorous in addressing what is unique and distinctive at the local urban level. Some policies, such as transportation policy, were underpinned by a thorough, all encompassing, and in-depth comprehensive analytical task, as opposed to others, such as public realm guidelines. Ironically, the plan content considered the public realm "the focus of concern for the urban design guidelines" whereas the analytical content lacks thorough study of its spatial structure. This phenomenon recurred in the sustainability policy where analysis, performance criteria, and design guidelines have not addressed that issue comprehensively.

Another gap existed in the analysis and alternatives generation phases when an explicit analytical content did not underpin any respective policy. Consultants analyzed Pittsburgh's downtown physical assets and found that the architecturally significant stock of historic buildings and structures represent important physical assets of its downtown and make important contribution to the visual character and texture of the city. However, the list of focus areas and their task forces lack any independent historic preservation policy or conservation

study. Instead, vague prescriptive and subjective guidelines such as, sympathetic infill, promote contextual design, and sensitive renovation have been embedded within the urban design policy. An independent historic preservation and conservation study was essential to assign significant visual, aesthetic, functional, and cultural roles for historical buildings as a whole as well as building group particularly those which are considered nationally recognized landmarks.

Collectively, the plan was successful in seeking an optimum balance between being general and specific. However, focusing on retail, business and marketing was a slight deviation from that balance, and represented a flaw aggravated by the lack of a parallel focus on socio-cultural context.

The awareness of design as a process had underpinned the whole methodological approach, and was recognized particularly in the development proposals of some districts. These proposals were diagrammatic and abstract, which implies that they follow the approach of “urban design as a second order” to create a sound environment for subsequent detailed architectural design decisions. However, the notion of design as a process should have encompassed the entire range of contextual and development-specific considerations and weight them against one another. Obviously, that entire range was not fully considered in the analysis phase of PDDP.

Although the computer model offers capabilities that help conduct additional analytical tasks that are otherwise inapplicable with conventional tools, it has been used as a presentation media to represent the development proposals in their context rather than to support planners in core design tasks through the analysis and alternative generation phases. These additional analytical tasks could have improved the analytical content and helped tailor the design policies to the study area’s environment.

Finally, the analysis and proposed policies were very weak in their theoretical underpinning. Analytical techniques were not based on any coherent framework neither at the second level i.e. major aspects of the downtown plan, nor at the third more specific level. The analytical content could have improved the quality of the urban design process and product should that content relied on values, principles, vocabulary, and methods of a theoretical framework.

6. FIGURES





Figure 2: The traditional scope of downtown Pittsburgh

Figure 3: The project area encompassing downtown Pittsburgh with its urban context

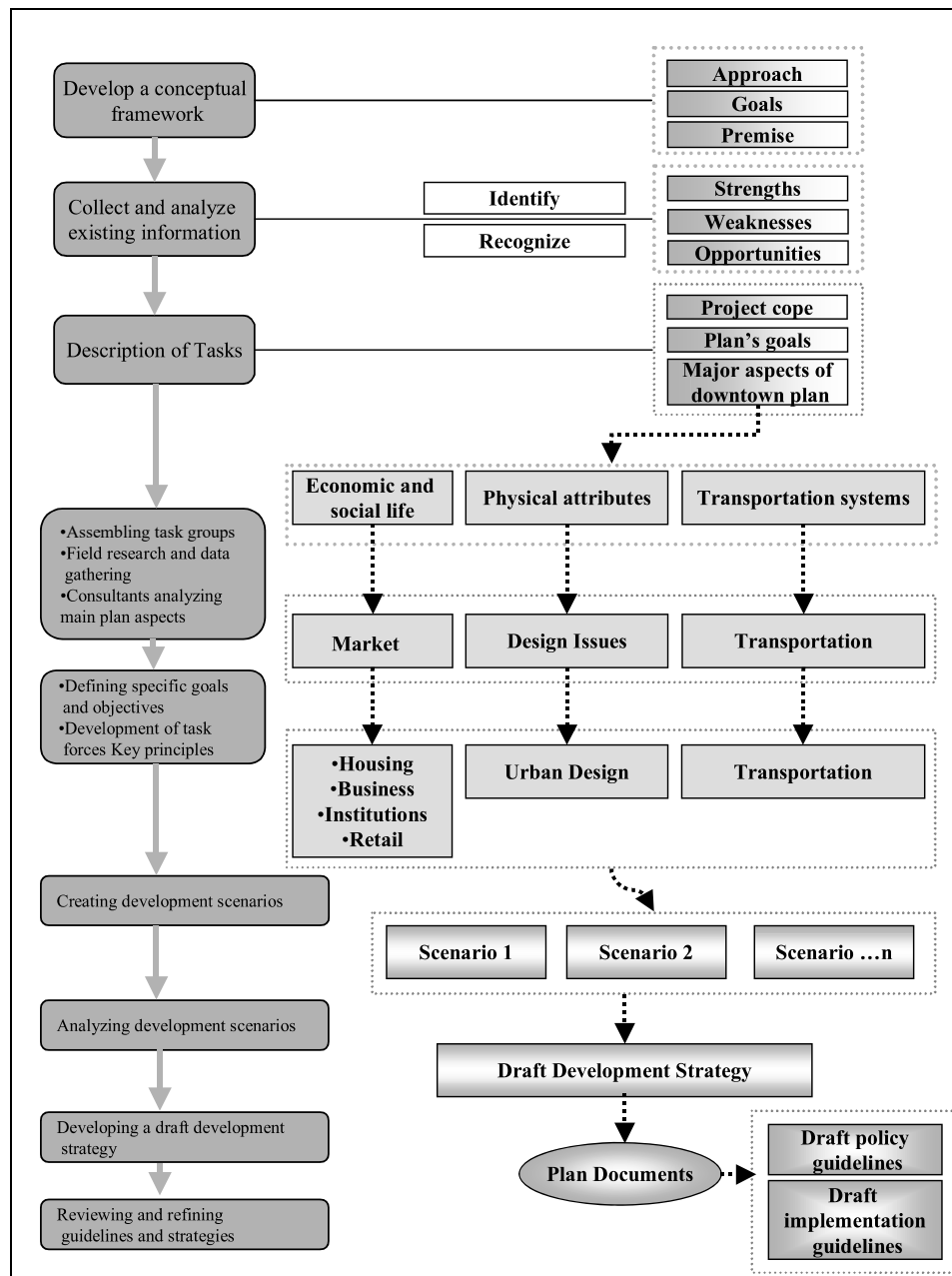


Figure 4: Schematic diagram conceptualizing the main intellectual tasks and products in the development process of Pittsburgh downtown plan.

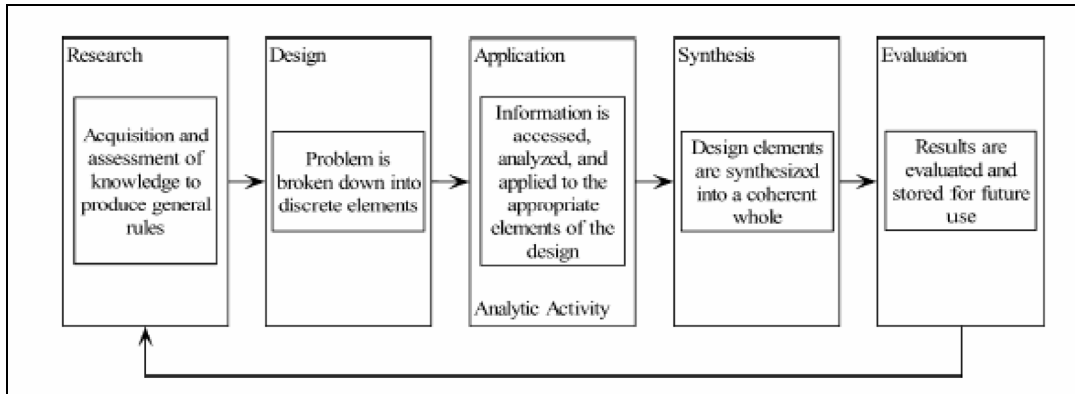


Figure 5: Relationship between research and design as identified by the analysis-synthesis model (Milburn, L. and Brown, R. 2002 p.51)

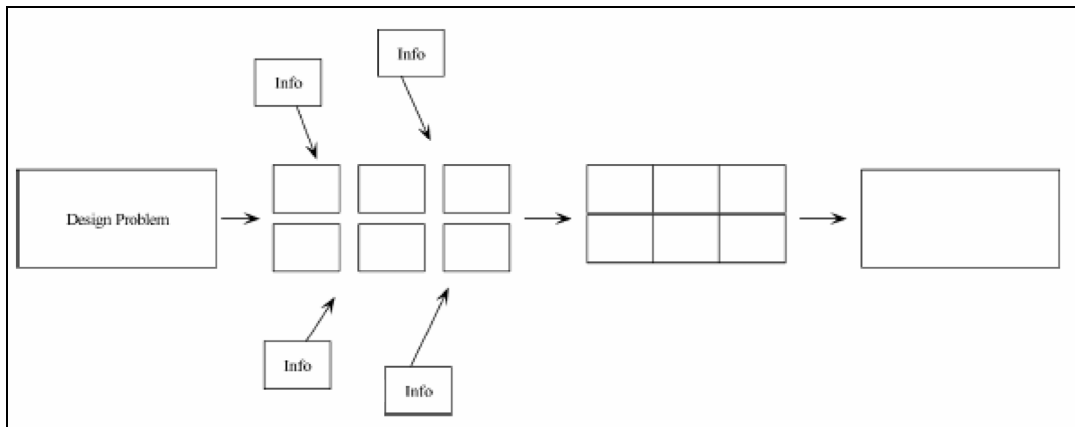


Figure 6: Schematic diagram of the analysis-synthesis model (Milburn, L. and Brown, R. 2002 p.52).

7. REFERENCES

- Bamford, G. (2002) **"From Analysis/Synthesis to Conjecture/Analysis: A Review of Karl Popper's Influence on Design Methodology in Architecture"** Design Studies.Vol.23, (245-261).
- Carmona, M., Punter, J. and Chapman, D. (2002) "From Design Policy to Design Quality" RTPi, Thomas Telford Limited, UK.
- Dave, B & Bishop, I. (2000) **"Multiple Representations for Diverse Perspectives: Collaboration in Urban Design"** in Proceedings of SDH 2000:9th International Symposium on Spatial Data Handling, Beijing, August 2000, Beijing.
- Garvin, A. (2002) **"The American City. What works, what doesn't"** McGraw-Hill Book Company. US
- George, R. Varkki (1997) **"A Procedural Explanation for contemporary Urban Design"** Journal of Urban Design.Vol.2 Issue 2 (143-164)
- Gosling, D. & Gosling, M. (2003) **"Evolution of American Urban Design. A Chronological Approach"** Wiley-Academy. UK.
- Gosling, D.(1993) **"Techniques of Analysis and communications in Urban Design"** Landscape and Urban Planning.No.26 (215-230)

- Hall, A.C. (2000) **"A New Paradigm for a local Development Plans"** *Urban Design International*. Vol.5 (123-140)
- Lang, J. (1994) **"Urban Design. The American Experience"** Van Nostrand Reinhold, New York.
- Milburn, L. and Brown, R. (2002) **"The Relationship between Research and Design in Landscape Architecture"** *Landscape and Urban Planning*, Vol. 64, Issue 1-2, (47–66)
- Moughton, C. et al (1999) **"Urban Design. Methods and Techniques"** Architectural Press.UK
- PDDP (2001) **"The Pittsburgh Downtown Plan. A blueprint for the 21st century"** City of Pittsburgh. Pennsylvania. US
- Poerbo, H. (2001) **"Urban Design Guidelines as Design Control Instrument"** Ph.D. Dissertation (Dr.-Ing.) Faculty of Architecture. University of Kaiserslautern.
- Punter, J. & Carmona, M. (1997) **"Design Policies in Local Plans. Recommendations for Good Practice"** *Town Planning Review*. Vol. 68, No.2, pp. 165-199
- Roberts, M. & Greed, C. (2001) **"Approaching Urban Design. The Design process"** Pearson Higher Education Limited. UK.
- Sandalack, B. & Nicolai, A. (1998) **"Urban Structure. An Urban Design Approach"** TUNS press, Canada.
- Southworth, M. (1989) **"Theory and Practice of Contemporary Urban Design"** *Town Planning Review*, Vol.60, No.4 (64-81)
- Skauge, J. (1995) **"Urban Design Analysis by Computer"** *Cities*. Vol. 12, No.6 (425-430)
- Steino, N. (2001) **"The Process of Urban Design"**. School of Architecture, Denmark. Retrieved on Jan 2003 from the URL: <http://www.a-aarhus.dk/welfarecity>
- Stern, M. (1998) **"Expanding Pittsburgh's Idea of Downtown"** *Urban Land*, Vol.57, No.8 (25-27)
- Turner, S. (1994) **"The Design Content of Development Briefs: a critical evaluation"** M. Sc. Dissertation, Department of Town and Country Planning, University of Reading, UK
- Uniaty, Q. (2000) **"Research in Urban Design"** Retrieved on July 2002 from the URL: <http://www.trisakti.ac.id/news/jurlemlit/9Quin00.htm>
- Wang, L. et al (2002) **"Collaborative Conceptual Design. State of the Art and Future Trends"** in *Computer-Aided Design*, 34, (981-996)
- Wang, Y & Duarte, J. (2002), **"Automatic Generation and Fabrication of Designs"**, in *Automation in Construction*, 11, (2002) pp.291-302.